F&B. TRADE MARK

THEODORE W. FOSTER & BRO. CO.

1073 F&B TRADE MARK

Manufacturing Jewelers and Silversmiths,

100 Richmond Street, PROVIDENCE, R. I.

are pleased to announce to the Trade that they have just added to their already extensive line a few articles in **STERLING SILVER HOLLOW-WARE.** The design is that of their already well-known **JEFFERSON PATTERN.**

1307. Coffee Pot, 6 half-pints.
1306. Large Tea Pot, 5 half-pints.
1302. Small Tea Pot, 1¼ pints.
1304. Large Sugar.
1301. Small Sugar.
1303. Large Creamer, 1 pint.
1300. Small Creamer, ½ "
1305. Spoon Holder.

906. Large Hair Brush, Jefferson pattern.
908. " Cloth Brush, " "
912. " Bonnet Brush, " "
904. " Mirror, " "
996. Comb, " "
916. Nail Polisher, " "
888. Manicure Scissors, " "
893. Banker's Shears, " "
1015. Whisk.
1145. Large Puff Box, Victoria pattern.
983. Small Puff Box, Jefferson "
976. Paste Box, " "
1153. Cigar Jar, Victoria "
1201. Cut Glass Bon Bon.
1292. Cut Glass Candle Stick.
1157. Heart and Crown Coin Box.
1378. Ink, American Beauty pattern.
1285. Cut Glass Pungent.
1381. Cut Glass Pungent, Jefferson pattern.
1382. " " " "
922. Shoe Hook, " "
921. Shoe Horn, " "
918. Nail File, " "
1281. Cut Glass Violet Holder.
1284. Cut Glass Crown Salts.
1385. Cut Glass Cologne.
1023. Pin Tray.

Illustrations ⅛ scale

Improved Machinery and Tools, combined with methods acquired by **twenty-seven years** of experience in making Fine Jewelry, has taught them how to make high-grade goods at prices that defy competition.

Set No. 18'

A- absolutely a n
a continuous
B- batteries, and tern
whatever other
impress the trade v
a **GRAVITY** clock,
it, the electricity me
gravitating position r.
stantaneous contact
everything pertaini
The movement, as ife.
PLICITY. The **GR**
by any one. These
same s Shotee ap·
1319. Tooth Brush.
1346. Glove Stretcher (Steel).
1347. Manicure Scissors
1352. Mirror.
1358. Hair Brush.
1367. Bonnet Brush.
1374. Nail Paste Box.
1374. Nail Powder Box.
1388. Comb.
1391. Puff Box.

¼ scale.

Set No. 182.

American Beauty Pattern

(Medium).

No.
1327. Nail Polisher.
1329. Corn Knife.
1331. Shoe Horn.
1332. Button Hook.
1333. Tooth Brush.
1337. File and Cuticle Knife.
1346. Glove Stretcher (Steel).
1347. Manicure Scissors.
1353. Mirror.
1359. Hair Brush.
1368. Bonnet Brush.
1373. Nail Paste Box.
1373. Nail Powder Box.
1388. Comb.
1391. Puff Box.

In Toilet and Manicure goods they have full and complete lines of all the parts in FOUR different patterns—WASHINGTON, JEFFERSON, VICTORIA and AMERICAN BEAUTY.

When you have a call for Chains, Bracelets, Lockets, Brooches, Lace Pins, Belt Buckles or Link Buttons, always remember they have an assortment large enough to stock a store entire.

They are just showing a very beautiful new line of BROOCHES at prices below comparison. Ask to see them.

SEND FOR THEIR NEAT LITTLE CATALOGUE OF STERLING SILVER GOODS.

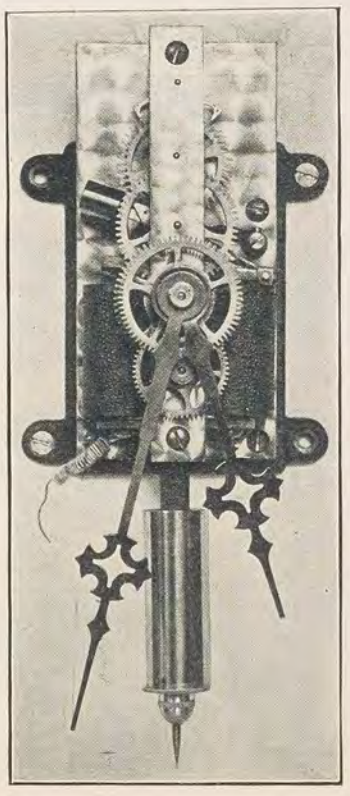
Just Watches and Chains— but everything getable in Watches and Chains.

The Non-Retailing Company,
Jobbers in Watches and Chains,
Lancaster, Pa.

This is the MOVEMENT of the Marvelous NON-WINDING, LONG-RUNNING, PERFECT TIMEKEEPING

GRAV-ELEC CLOCK

IT is absolutely and without qualification **GUARANTEED** to run continuously for **TWO YEARS**, on one set of **DRY** batteries, and keep **PERFECT TIME,** with no attention whatever other than ordinary regulation. We wish to impress the trade with the fact that this is not an Electric but a **GRAVITY** clock, gravity being the motive power that drives it, the electricity merely lifting the small driving weight to a gravitating position every two minutes, by a slight and instantaneous contact. There is **NO WIRING** from the outside, everything pertaining to the clock being contained in the case. The movement, as shown, demonstrates its **EXTREME SIMPLICITY.** The **GRAV-ELEC** can be handled and put in place by any one. These Clocks are listed from **$15.00** up, and the same guarantee applies to our $15.00 article as to those of higher price. This Clock is made in solid quartered oak, finely finished, is 23 inches high and 20 inches wide. Why **RENT** time when you can buy a clock that will serve you better for the same money that it costs you for one year's rent? This is worthy of consideration to every one who rents time. Remember, we give you a **WRITTEN GUARANTEE** that every statement we make is correct, or money refunded. It will pay you to give this Clock a trial, as its simple construction and exactness in timekeeping makes the **GRAV-ELEC** its own greatest agent. These Clocks are not on an outside electric circuit, consequently they are thoroughly free from any danger of elementary disturbances, or of giving the person handling them the slightest shock, as the quantity of electricity used is infinitesimal, and could not be felt by the hand, were it brought in direct contact. The **GRAV-ELEC** is always running and always on time.



Correct Time

Non-Winding

Constant Running

Elegant Finish

Moderate Price

The above is the combination that makes the incomparable

GRAV-ELEC CLOCK

GRAV-ELEC CLOCK COMPANY, 177 & 179 Broadway, New York

AGENCIES WANTED THROUGHOUT THE COUNTRY.

Have you ever had trouble with good mainsprings that run irregular in temper, or with bad ones that have no temper at all?

Have you ever stopped to consider the waste of labor (money) used to put an extra polish on a mainspring of mediocre quality? when the same does not aid the functioning of a timepiece, and when it could be used to much better advantage by employing not good steel, but **THE BEST.**

If you have ever thought of these things so have we, and the results are told below.

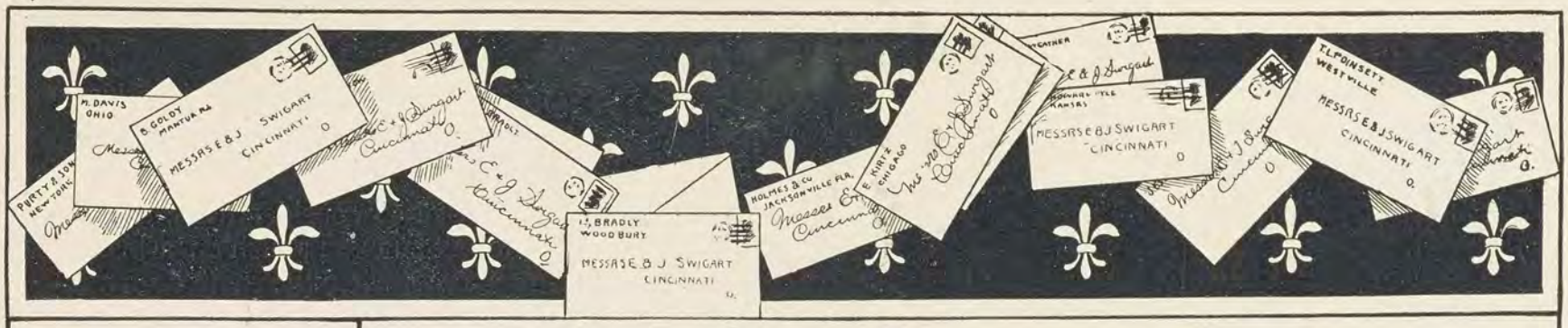
MAINSPRINGS

Price
$12.00 per Gross
To be had of all Jobbers

Made for all American Watches

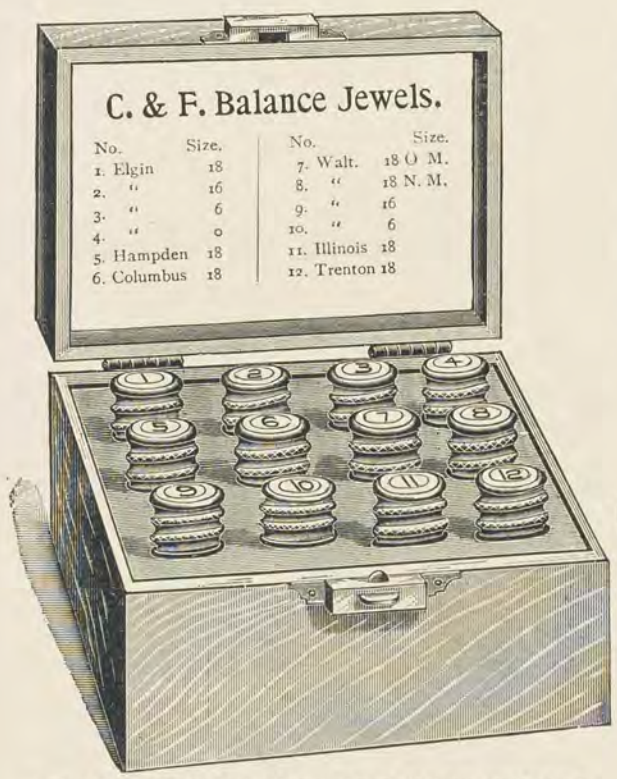
WINDSOR SPRINGS are made from **WINDSOR STEEL,** which has been tested and found to be perfect. Windsor steel produces a more perfect mainspring than any other steel, and has been compared with over fifty other makes.

If you want a **GOOD MAINSPRING** that will give you as little trouble one month as another, and with ordinary care never break; that will run the same in quality year in and year out, we advise trying the **"WINDSOR."**



THE MAILS ARE OUR AGENTS

MAIL order business is a specialty of ours. It is quick, safe, satisfactory. We have one of the largest mail order branches in our line in the United States, and we have gotten it by teaching our mail customers that we fill their order even a little "sooner than right away," and that what they order they get—**exactly.** We have a special system of handling mail business. It insures that your order goes back to you just as soon as we can get it ready, and we start to get it ready the minute we receive it. If you want some small part like a Staff, Jewel or Pinion matched in a hurry, mail us the order and see how we do business.



ASSORTMENT OF COCK AND FOOT JEWELS.

No. 252.	Cabinet of 3 doz.	Genuine Factory Jewels,		$6.00
No. 452.	" " 3 "	E. & J. S.	"	4.50
No. 552.	" " 3 "	Eagle Brand	"	2.50
No. 253.	" " 6 "	Genuine Factory	"	11.50
No. 453.	" " 6 "	E. & J. S.	"	8.75
No. 553.	" " 6 "	Eagle Brand	"	4.75

Prices less 6 per cent. discount for cash.

ASSORTMENT OF BALANCE STAFFS.

No. 249.	Cabinet of 3 doz.	Genuine Factory Staffs, . . .		$5.00
No. 449.	" " 3 "	E. & J. S., American-made Staffs,		3.25
No. 250.	" " 6 "	Genuine Factory	"	9.75
No. 450.	" " 6 "	E. & J. S., American-made	"	6.25
No. 549.	" " 3 "	Eagle Brand, " "	"	2.50
No. 550.	" " 6 "	" " "	"	4.75

Prices less 6 per cent. discount for cash.

ASSORTMENT OF ROLLER JEWELS.

No. 256.	Cabinet of ½ gross, genuine,		$3.75
" 257.	" " 1 "	Eagle Brand,	2.50
" 258.	" " 1 "	" "	2.00

Less 6 per cent. for cash.

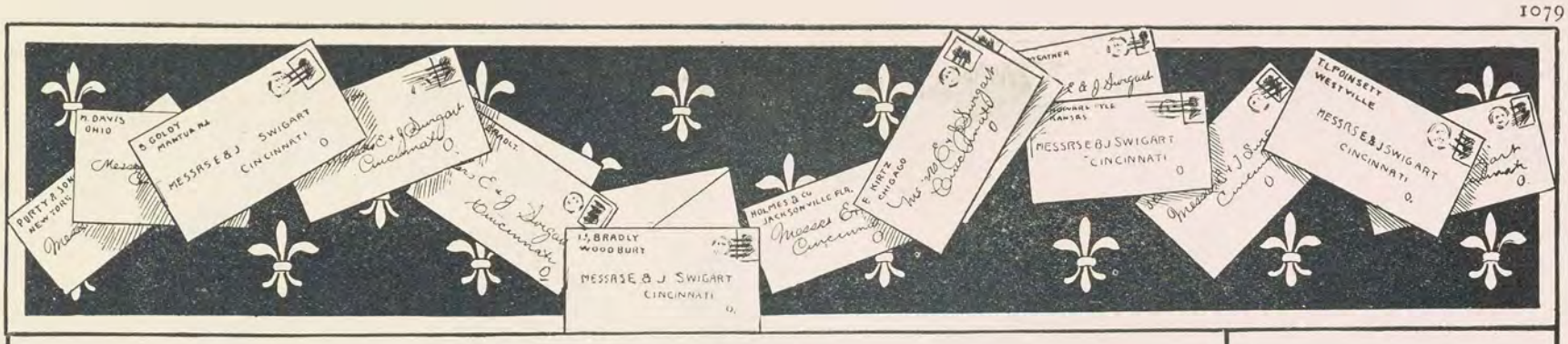
ASSORTMENT OF END STONES.

No. 255.	Cabinet of 3 dozen, genuine,		$3.75
" 455.	" " 3 "	E. & J. S.,	3.00

Less 6 per cent. for cash.

The greatest convenience we know of, in ordering by mail, is our illustrated Tool and Material Catalogue—a big and valuable reference book. Send your business card for a copy.

E. & J. Swigart, Cincinnati, Ohio.



WATCH BOXES.

		Per dozen.
No. 76.	Plush, plush lined,	$2.75
No. 176.	Plush, plush lined, very fine,	6.00
No. 77.	Leather, velvet lined,	3.00
No. 291.	Red Kid, velvet lined, very fine,	6.50
No. 290.	Velvet, good quality,	6.00
No. 90.	Velvet, finest quality,	9.00
No. 295.	Elephant Hide, very fine (see cut),	7.12

Less 6 per cent. for cash.

No charge for stamping, except No. 76, for which add 25c. per dozen for stamping.

PRICES OF PAPER BOXES.

	Gross.	Gross Printed.
No. 141. White, six in nest,	$1.00	$1.35
No. 1639. White, six in nest,	1.40	1.75
No. 1939. White, six in nest,	1.90	2.25
No. 230. Colored, six in nest,	1.75	2.12
No. 1680. Single Tea,	3.20	3.55
No. 1678½. Six Tea,	3.60	3.95
No. 1699. Single Coffee,	2.40	2.75

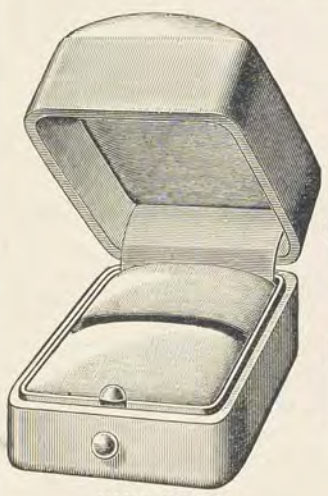
Less 6 per cent. for cash.

BROOCH BOXES.

		Per dozen.
No. 54.	Brooch Box, leather,	$2.88
No. 154.	Brooch Box, elephant hide, fine,	6.00
No. 254.	Brooch Box, velvet, good,	5.50
No. 354.	Brooch Box, velvet, finest,	9.00
No. 454.	Brooch Box, velvet, ordinary,	2.75

Less 6 per cent. for cash.

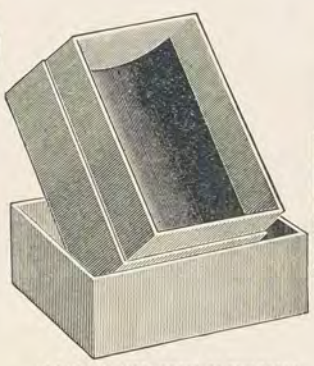
For prices of Ear Drop, Sleeve Button, Scarf Pin, etc., Boxes, see special catalogue.



RING BOXES.

		Per doz.
No. 8.	Leather,	$2.25
No. 118.	Morocco,	4.50
No. 218.	Elephant,	6.00
No. 318.	Velvet, good,	4.25
No. 418.	Velvet, fine,	6.00
No. 1050.	Celluloid,	6.00

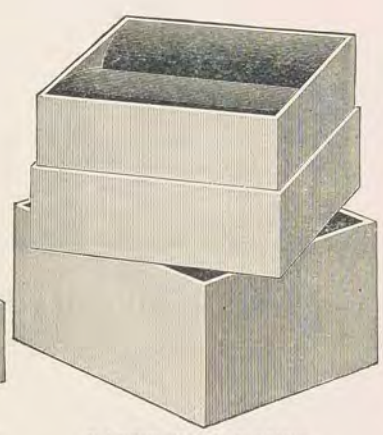
Less 6 per cent. for cash.



PAPER THIMBLE BOXES.

No. 1583.	Per gross,	$2.75
No. 1583.	Per gross, printed,	3.10

Less 6 per cent. for cash.



PAPER RING BOXES.

	Per gross.	Printed.
No. 1550. Large seal,	$2.90	$3.25
No. 1554. Medium "	2.75	3.10
No. 1553. Small "	2.65	3.00
No. 1556. Baby,	2.65	3.00

Less 6 per cent. for cash.

WHITE KID PAPER BOXES.

		Per dozen.
No. 3050.	Ring,	$1.00
No. 1019.	Stud,	1.00
No. 1083.	Thimble,	1.00

Less 6 per cent. for cash.

We have a special Box Catalogue which gives prices and pictures of paper and fancy boxes not mentioned on this page. We have everything a jeweler needs in the box and wrapper line—Silverware and Jewelry Boxes, Cards, Tags, Trays, Twine, Paper, etc. Better let us send you this catalogue.

E. & J. Swigart, Cincinnati, Ohio.

DON'T GET IN A BOX ON BOXES

Order them now while our stock is unbroken and before the holidays come on with their hurry and rush. When you order boxes from us, you can be sure of two things—You will get exactly what you order, and you will get handsome, distinctive goods that will do credit to the finest business.

SPRING RINGS

ESTABLISHED IN 1858

Incorporated Oct. 1st, 1898

1 5 10 15 16 20

IN GOLD, SILVER AND ROLLED-PLATE

We manufacture all kinds of **Jewelers' Findings,** and sell direct to the jobbers and manufacturers only.
Retail jewelers can get our goods from all jobbers.

GEO. H. FULLER & SON CO.

CHICAGO OFFICE: 103 State St., Columbus Memorial Building. **Pawtucket, Rhode Island.**

SEND FOR CATALOGUE OF MASONIC AND OTHER SECRET SOCIETY CHARMS, JEWELS, RINGS, BADGES AND LAPEL BUTTONS.

SEND FOR CATALOGUE OF COLLEGE BADGES CLASS PINS AND SCHOOL MEDALS.

CHAS. G. BRAXMAR
MFG. JEWELER
No. 10 MAIDEN LANE
NEW YORK.
BADGES & MEDALS
A SPECIALTY.

SEND FOR CATALOGUE OF MILITARY G.A.R. ATHLETIC, SHOOTING AND SPORTING MEDALS.

SEND FOR CATALOGUE OF FIRE AND POLICE DEPARTMENT AND OTHER OFFICIAL BADGES.

We are head 1/4 1/4 for **GOLD SHELL RINGS, SPECIAL GOODS, BURGLAR-PROOF PIN TRAYS, GLASS CASES,**

and all other paraphernalia and modern improvements pertaining to Rings.

Gold Shell.

No. 2103.

No. 2059.

No. 2162.

Over 2,000 Patterns, and *"NOTHING BUT RINGS."* New Patterns Every Month.

Send for our *"HOT CATALOGUE,"* Containing Cold Facts and Pretty Pictures.

CLARK & COOMBS,

86 WEST EXCHANGE ST. PROVIDENCE, R. I.

L. Lelong & Brother

Gold and Silver Refiners, Assayers and

SWEEP SMELTERS

BULLION SOLICITED ***SMELTING FOR THE TRADE***

Prompt attention given to Old Gold and Silver forwarded to us by mail or express.

Southwest Corner Halsey and Marshall Streets

Newark, N. J.

SWEEPINGS OUR SPECIALTY

A WORD TO THE WISE IS SUFFICIENT

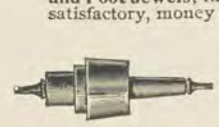
STAR ★ BRAND
AMERICAN MAINSPRINGS BEST ON EARTH.
TRADE MARK

If you are not satisfied with your Material House, send us a trial order, as we have had twenty year's experience in filling material orders.

Our motto is, "A pleased customer is our best advertisement." Remember, orders filled from any catalogue published. The items below are a few of our leaders. Notice the reduction in prices.

★ **"STAR" Brand American Mainsprings,** extra quality, **crocus finished,** are now put up in enameled anti-rust tin boxes. **Special, 85 cents per dozen; $9.25 per gross.**

Balance-Staffs made for American Movements, and American-made Cock and Foot Jewels, in settings, to fit the following movements, at **65 cents per dozen.** If not satisfactory, money cheerfully refunded.



Waltham, 0, 1, 6, 16 and 18 sizes,	65 cents	dozen.
Elgin, 0, 6, 16 and 18	" 65 cents	"
Hampden, 6, 16 and 18	" 65 cents	"
Illinois, 6, 16 and 18	" 65 cents	"
Columbus, 18	" 65 cents	"
Rockford, 18	" 65 cents	"
Trenton, 18	" 65 cents	"
N. Y. Standard, 18	" 65 cents	"

GENUINE FANEUIL LATHES:

The "Faneuil" Lathe made by the Faneuil Watch Tool Co., by the same help that make the celebrated Rivett Lathe, including Tailstock Spindle and its Steel center, 6 Wire Chucks assorted, 1 Taper Chuck, 1 Screw Chuck, 6 1/4-inch Cement Brasses and 9 feet Round Belting.
Special, $23.50 net cash.

Genuine Webster-Whitcomb Lathe, with 10 Chuck Combination, at the extremely low price of **$31.00 net spot cash.**

★ **The "Star," Moseley Style Lathe, 1 x 2.** The ideal Lathe, at a very small price, with 14 Chuck Combination, **Special, net cash, $20.75.**

Geneva Lathes, very latest style, 14 Chuck Combination, **Special, $14.75 net cash.**

★ **"STAR" Brand American Roller-Jewels,** one gross (12 dozen) nicely assorted in walnut cabinet, 12 bottles, for the leading makes of American watches, perfect fit. **Special price, complete, $2.25, or 25c. doz.**

Swiss Cap Jewels, 20 cents, 45 cents, 75 cents and $1.25 per gross.

Swiss Roller-Jewels, oval or round, per gross, **25 cents.**

★ **"STAR" Brand American Long Case-Screws,** best quality, one gross (12 dozen), nicely assorted in walnut cabinet, 12 bottles, for the leading makes. Price complete, **Special, $1.75 (dozen, 20 cts.).**

German Silver Bows, first quality, American sizes, 2, 3, 4 oz., assorted, one dozen on card, **25 cents.**

Silver Crowns and Stems, one dozen nicely assorted on card. Per card, **90 cts.**

American Pendant Screws, a very handy screw for holding in stem, per gross, well assorted, **50 cents.**

American Spectacle and Eye-Glass Screws, assorted, per gross, **75 cents.**

Mascot Pivot-Drills, per dozen, **30 cts.**

★ **"STAR" Brand Pin-Tongs,** extra stiff, best quality, put up in separate sizes, in box, per gross, **75 cents.**

Seamless Gold Filled (12 K.) Watch Bows, 6, 16 and 18 sizes, assorted on card, per dozen, **$1.75.**

Gold Solder (N) Brand, low karat, very easy flowing, per dwt., **25 cents.**

Silver Solder, first quality, **(N) Brand,** in 1/4 oz. sheets, per sheet, **35 cents.**

All the above prices are strictly **NET CASH.**
Orders filled in rotation as received.

H. B. Peters & Co., 177-179 Broadway, New York

Mail orders accurately and quickly filled from any Catalogue at lowest market prices.

Use the "Imperial" Mainsprings

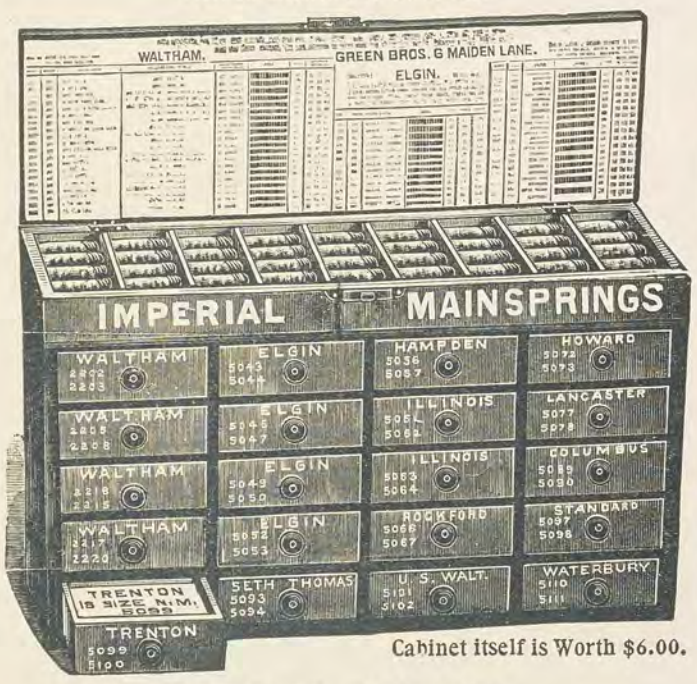
They are the best, the most reliable, are coiled and tagged, put up in the most convenient manner, and are "Guaranteed for One Year."

Beware of Imitation !!!

Price, $12.00 per Gross. 1.00 per Doz.

Cabinet Sent GRATIS.

WITH 36 SCREW-TOP BOTTLES.



Cabinet itself is Worth $6.00.

SPECIAL NOTICE.

With a first order of one gross of the **"Imperial" American or Swiss Mainsprings,** we send **gratis our improved handsome polished Solid Black Walnut, Oak or Cherry Mainspring Cabinet,** as shown in cut. It is well made, cabinet finished and dovetailed throughout, and the cover closes with a patent snap lock, nickel-plated. It is the only cabinet made that will properly systematize and keep in thorough order the many American and Swiss mainsprings necessary at the present time, and will be greatly appreciated by all watchmakers. Besides being very useful, it makes a very handsome appearance. It has twenty drawers, with fancy knobs, brass trimmed, and the top is arranged in grooves for thirty-six screw-top glass bottles for watch and jobbing materials. **It will hold 6 GROSS Imperial American or Swiss Springs.** We also include two sets of perforated gummed labels, with name, number and size of the springs, so the drawers can be numbered as desired. These numbers correspond to a directory of all American springs which is printed on the inside cover, showing the **correct style, width and strength by Dennison's Standard Mainspring Gauge,** and the proper **numbers** and **names** for ordering.

GREEN BROS.

6 Maiden Lane, New York.

Importers and Jobbers of

Fine Grade Watch Materials,
Tools and Jewelers' General Supplies.

CUT THIS OUT and keep it for reference.

The following list shows the CORRECT STYLES, WIDTH and STRENGTH by DENNISON'S STANDARD Mainspring Gauge and the proper NUMBERS and NAMES for ordering the

IMPERIAL AMERICAN MAINSPRINGS

Registered Trade Mark and Facsimile of Wrapper on our Imperial American Mainsprings

Exact cut of the Imperial Spring, coiled and tagged.

The Imperial Mainsprings are guaranteed for one year.
Each Spring bears the word "IMPERIAL."

Each Spring is tagged with the Name and Size; for FINISH, TEMPER, ELASTICITY and DURABILITY they have no equal.

NOTE.—By giving the number no mistake can occur in filling order.

Waltham,

No.	Size	Name	Description of Barrel	Description of Movement	Style	Width	Average Strength
2201	18	Old Style	Gilt Barrel	Full Plate	Imperial	19	3 to 4
2202	18	New Style	Gilt Barrel	Full Plate	Imperial	19	3 to 4
2203	18	New Model	Nickel and Gilt Barrel, "Wide"	Full Plate	Imperial	20	2½ to 3½
2204	18	New Model O. F.	Nickel and Gilt Barrel, "Narrow"	Full Plate	Imperial	16	2 to 3
2205	18	Pendt. and Lever Set	Nickel and Gilt Barrel	Full Plate	Imperial	21	1 to 2
2206	18	Crescent St.	Gilt Barrel, "Narrow"	Full Plate	Imperial	14	1½ to 2½
2207	18	Crescent St.	Gilt Barrel, "Wide"	Full Plate	Imperial	16	2½ to 3½
2222	18	Vanguard Movement	Steel Barrel	Full Plate	Imperial	23	3½ to 4½
2208	16	Lever Set	Nickel and Gilt Barrel	¾ Plate	Imperial	14	2½ to 3½
2218	16	Pendant Set	Steel Barrel	¾ Plate	Imperial	19	4 to 5
2209	14	Adams St. and Cres Gard. K. W.	Gilt Barrel	¾ Plate	Imperial	14	3 to 4½
2210	14	Old Style	Nickel and Gilt Barrel, "Narrow"	¾ Plate	Imperial	12	2 to 3
2211	14	New Style	Nickel and Gilt Barrel, "Wide"	¾ Plate	Imperial	16	2½ to 3½
2223	14	Pendant Set	Steel Barrel	¾ Plate	Imperial	19	5 to 6
2224	12	Pendant Set	Steel Barrel	¾ Plate	Imperial	12	6½ to 7½
2214	10	Key Wind	Gilt Barrel	¾ Plate	Imperial	14	3 to 4
2215	8 and 6	Lever Set	Nickel and Gilt Barrel	¾ Plate	Imperial	10	3 to 4
2217	6	Pendant Set	Nickel and Gilt Barrel	¾ Plate	Imperial	10	5 to 6
2219	6	Pendant Set	Steel Barrel	¾ Plate	Imperial	11	7 to 8
2216	1 and 0	Old Style	Nickel and Gilt Barrel	¾ Plate	Imperial	8	6 to 7
2220	0	Pendant Set	Steel Barrel	¾ Plate	Imperial	7	7 to 8
2221	00	Pendant Set	Nickel Barrel	¾ Plate	Imperial	7	7½ to 8½

GREEN BROS., 6 Maiden Lane, New York.

Elgin.

NOTE.—The Double Braced Springs are now being used in all Elgin Watches. It can be used in Watches having the Old Style Single Braced Mainspring, by filing off one side. By giving the number, no mistake can occur in filling orders.

No.	Size	Name	Style	Class	Width	Average Strength
5041	18	Double Braced	Imperial	1	20	4
5042	18	Double Braced	Imperial	2	20	3
5043	18	Double Braced	Imperial	3	20	2
5044	18	Double Braced	Imperial	4	20	1
5045	16	Double Braced	Imperial	1	18	4
5046	16	Double Braced	Imperial	2	18	3
5047	16	Double Braced	Imperial	3	18	2
5048	6 and 8	Double Braced	Imperial	1	10	7
5049	6 and 8	Double Braced	Imperial	2	10	6
5050	6 and 8	Double Braced	Imperial	3	10	5
5051	0	Double Braced	Imperial	1	4	10
5052	0	Double Braced	Imperial	2	4	9
5053	0	Double Braced	Imperial	3	4	8

Hampden.

No.	Size	Name	Style	Width	Average Strength
5056	18	New Style	Imperial	20	2 to 3
5057	16	New Style	Imperial	20	4 to 5
5058	6	New Style	Imperial	9	5 to 6
5059	000	New Style	Imperial	5	7½ to 8

Illinois.

5061	18	New Style	Imperial	20	2½ to 3½
5062	16	New Style	Imperial	17	2 to 3
5063	8	New Style	Imperial	9	3½ to 4½
5064	6 and 4	New Style	Imperial	9	5 to 6

Rockford.

5067	18	New Style, H. C.	Imperial	20	1 to 2
5068	18	New Style, O. F.	Imperial	17	2 to 3
5069	6	New Style	Imperial	10	5 to 6

Howard ($1.50 per doz.)

5072	18	New Style	Imperial	19	3 to 4
5073	16	New Style	Imperial	19	4 to 5

GREEN BROS., 6 Maiden Lane, New York.

Lancaster or Keystone.

No.	Size	Name	Style	Width	Average Strength
5077	18	Old Model	Imperial	20	2 to 3
5078	18	New Model	Imperial	18	2 to 3

Columbus

5089	18	New Style	Imperial	20	2½ to 3½
5090	16	New Style	Imperial	15	3 to 4
5091	6	New Style	Imperial	10	5 to 6

Seth Thomas

5093	18	New Style	Imperial	24	4½ to 5½
5094	6	New Style	Imperial	10	5½ to 6½

Standard

5097	18	New Style	Imperial	21	2 to 3
5098	6	New Style	Imperial	10	5 to 6

Trenton

5099	18	New Style	Imperial	20	3 to 4
5100	6	New Style	Imperial	10	4 to 5

United States Waltham

5101	18	New Style	Imperial	20	2½ to 3½
5102	16	New Style	Imperial	13	4 to 5
5103	6	New Style	Imperial	10	4½ to 5½

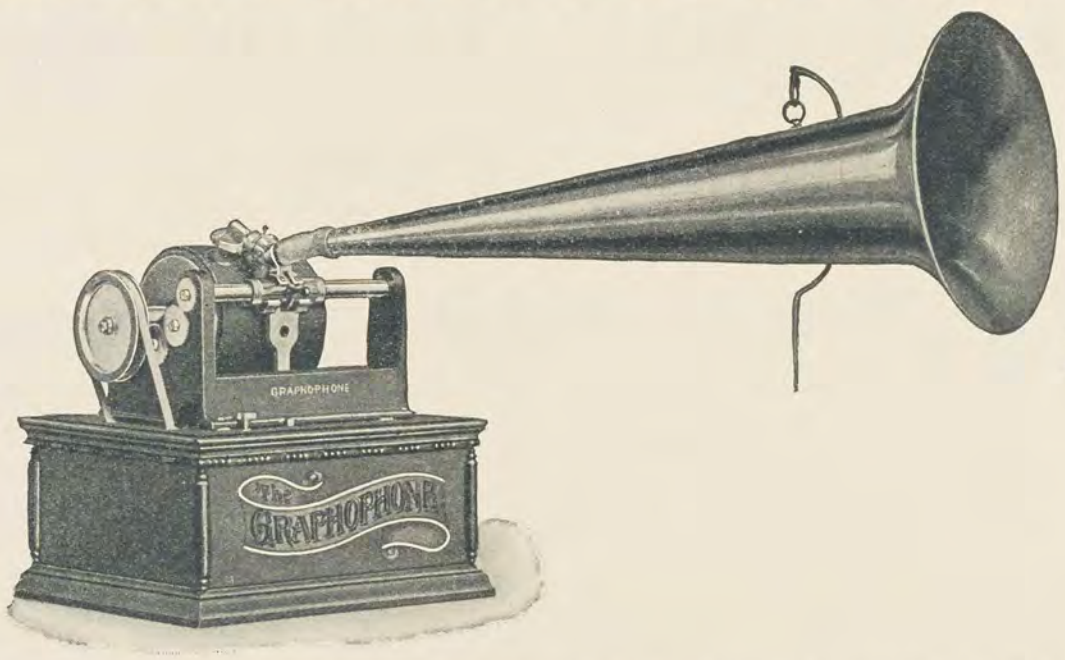
Waterbury.

No.	Series.	Style	Width	Average Strength
5109	E.	Coiled Style	13	8
5110	H.	Slip Style	10	8
5111	I.	Plain Style	18	6
5112	J.	Plain Style	18	5
5113	K.	Plain Style	18	5
5114	L.	Slip Style	10	7
5115	N.	Slip Style	10	8
5116	P.	Slip Style	10	7
5117	R.	Slip Style	12	6
5118	S.	Slip Style	3	10½
5119	T.	Slip Style	18	6
5120	W.	Slip Style	10	8

GREEN BROS., 6 Maiden Lane, New York.

The Home Grand Graphophone

For the Home, $100



For the Concert, $100

A NEW AND MARVELOUS TALKING MACHINE, RECORDING AND REPRODUCING SOUND IN ITS ORIGINAL VOLUME AND PURITY.

Price, $100.

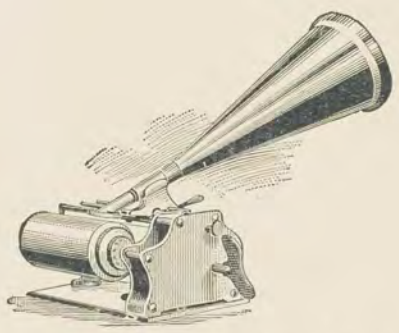
INVENTED IN OUR LABORATORY. MANUFACTURED IN OUR FACTORY.

The latest and greatest sound reproducing machine. Entirely new. Just out. Different from the one you're thinking of. Have you heard it? You haven't unless you've heard a machine that's as much ahead of all others, in loudness, clearness, sweetness and brilliancy of tone, as the ocean greyhound of to-day is ahead of Robert Fulton's original "Clermont."

For Entertainment at Home or in the Concert Hall, our Grand types are unequaled.

BEWARE OF IMITATIONS.

This wonderful improvement has been imitated in an inferior machine. Get the original and best—made solely by us.



A GRAPHOPHONE FOR FIVE DOLLARS.

Clockwork motor. Reproduces musical and other records sweetly and brilliantly.
This machine, if accompanied by a recorder, can be used to make records.

Price of $5.00 Graphophone with recorder added, $7.50.

Eagle Graphophone, $10; Columbia Graphophone, $25; Universal Graphophone, $50.

The lower-priced Graphophones are the most perfect and satisfactory talking machines made for any price, except our Grand types. Their reproductions are clear and brilliant.

Liberal discounts granted dealers can be learned through inquiry at any of our offices.

Write for Catalogue.

Columbia Phonograph Co., Dept. 21,

PHILADELPHIA, 1032 Chestnut Street.
NEW YORK, 143 and 145 Broadway.
Retail Branch, 1155, 1157, 1159 Broadway.
SAN FRANCISCO, 723 Market Street.
WASHINGTON, 919 Pennsylvania Avenue.

BALTIMORE, 110 East Baltimore Street.
ST. LOUIS, 720-722 Olive Street.
CHICAGO, 211 State Street.
BUFFALO, 313 Main Street.

PARIS, FRANCE, 34 Boulevard des Italiens. BERLIN, GERMANY, 55 Kronenstrasse.

TRENTON WATCHES

are increasing in popularity because they contain the greater value for the least money.

18 Size.

No. 7.—Seven Jewels, Nickel, Damaskeened, Brass and Steel Composition Balance, Screw Bankings, Straight-Line Lever Escapement, Hardened and Tempered Hairspring, Handsome White Enamel Dial; fits regular Lever or Pendant Set Cases.

Price, $3.74.

6 Size.

No. 52.—Seven Jewels, Brass and Steel Composition Balance, Quick Train, Straight-Line Lever Escapement, Screw Bankings, Plain Dial.

Price, $4.66.

12 Size.

No. 10.—Seven Jewels, Nickel, Damaskeened, Compensation Balance, Safety Pinion, Solid Plates, Separate Barrel Bridge, Quick Train, Straight-Line Lever Escapement, Screw Bankings, Handsome White Enamel Dial.

Price, $6.50.

Htg., 12 Size, Complete.

Coin Silver, . $13.00.
Five-Year Filled, 13.00.

PRICES ACCORDING TO KEYSTONE KEY.

Our 12 Size complete watches appeal to a refined class of trade which does not wish to pay a large price for a watch of this size. They are easy to sell. Better send for samples.

If your regular jobber cannot supply you, will take pleasure in referring you to wholesale dealers who can.

Write for price-list.

Trenton Watch Co.

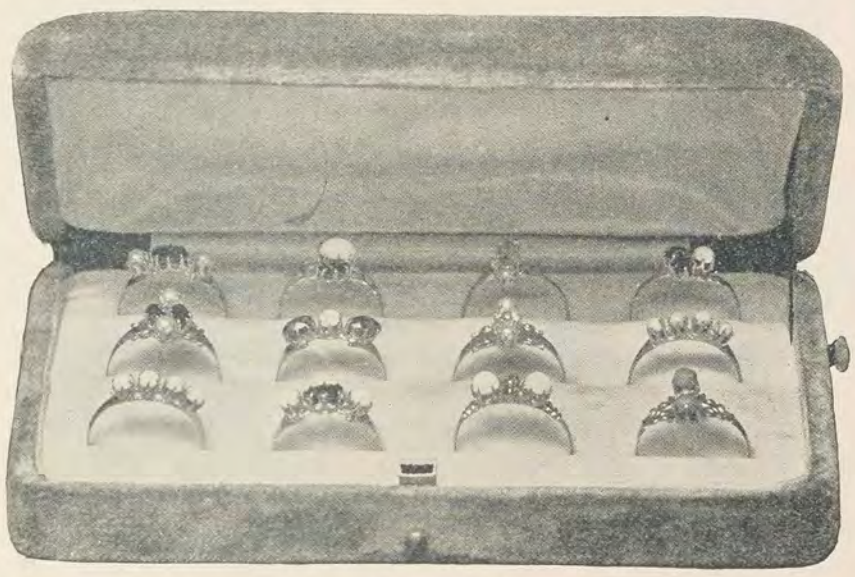
Trenton, N. J.

Something New Every Week in the Year!

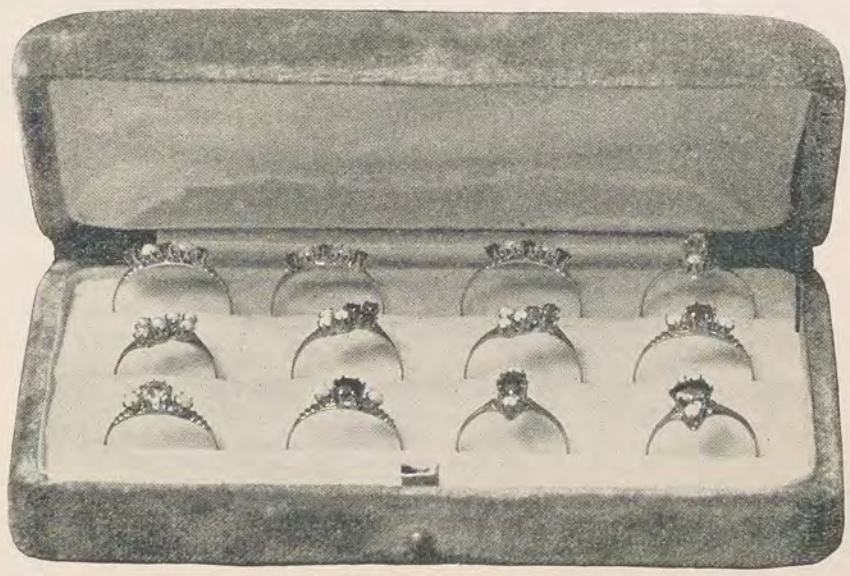
SOLID GOLD. Assortment No. 100.

RINGS

SOLID GOLD. Assortment No. 200



1 dozen Rings in velvet tray. Price, **$4.50,** net.
3 dozen Rings in velvet needle tray. Price, **$12.00,** net.
Set with opals, coral, amethyst, ruby, emerald, turquoise and pearls.



Solid Gold Rings. Guaranteed 8 K.
Set with genuine opals, ruby, emerald, amethyst, turquoise and pearls.
1 dozen in velvet tray. Price, **$8.00,** net.

IT WILL PAY YOU TO BUY FROM US							
$2.25	per dozen,	net,	for	25-cent	Sterling	Silver	Leaders.
4.00	"	"	"	50 "	"	"	"
6.00	"	"	"	75 "	"	"	"
8.00	"	"	"	$1.00	"	"	"

AVAIL YOURSELF OF THE OPPORTUNITY OF OUR TWO SPECIALS.

SOLID GOLD RINGS FOR XMAS.

We manufacture a complete line of **STERLING SILVER NOVELTIES,** the largest pieces at the price of any line on the market, none excepted, and sell direct to the retail trade. Selection sent, on five days' approval, to responsible parties.

EBONINE MANICURE PIECES with Sterling Silver Mountings—File, Hook, Letter Seal, Letter Opener, Paper Cutter, Cuticle, Shoe Horn, Tooth Brush, Nail Brush, Curling Iron, Blotter, Darner. **$2.25 per dozen,** net, for the assortment of twelve pieces.

Manufacturers of
RINGS and STERLING SILVERWARE

ARNSTINE BROS. & MIER

46, 48, 50 EUCLID AVENUE
CLEVELAND, OHIO

Phillips's *Silent Salesman* TRADE MARK Show Case

WILL INCREASE YOUR SALES 50 PER CENT.

We can refer you to merchants who will endorse this statement.

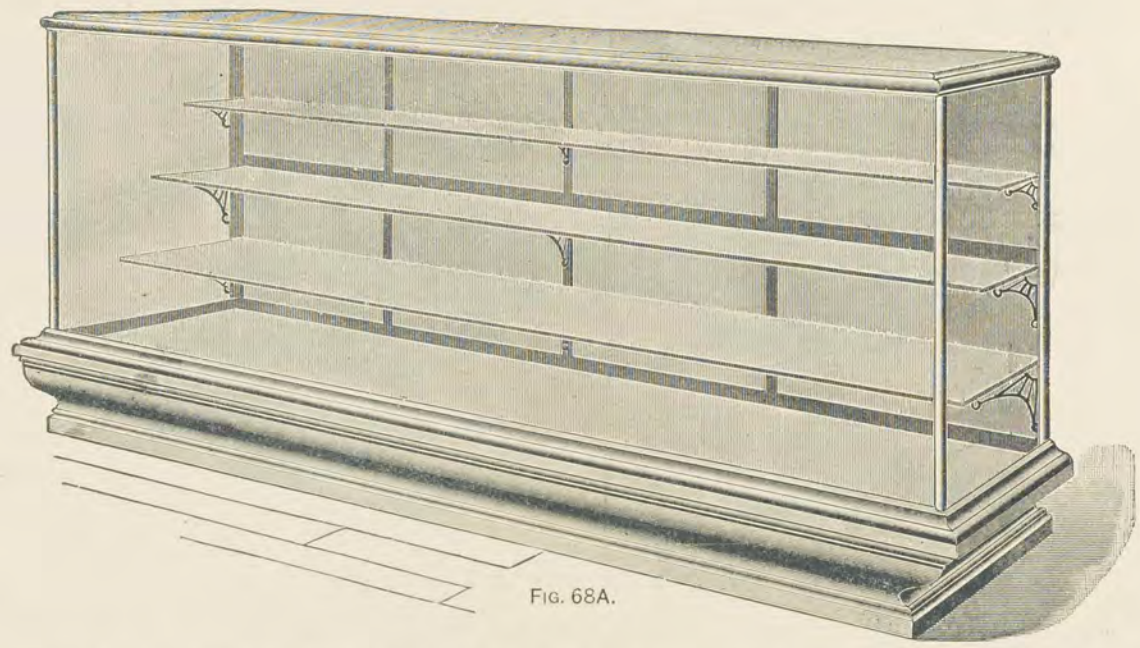


FIG. 68A.

This case is made with one or more shelves, or fitted with sliding trays, as desired. Every inch of space is utilized and every article is properly displayed and easily accessible.

Cases for Christmas trade must be ordered now, as they are in great demand.

We have a patent system for ILLUMINATING these modern CASES that makes selling easy.

Send for a descriptive circular.

Canadian trade supplied from Windsor, free of duty.

JOHN PHILLIPS & CO., Ltd., Detroit, Mich.

Makers of MODERN SHOW CASES, WALL CASES, ETC.

S. MARTIN, Jewelry Auctioneer

784 First Street, MILWAUKEE, WIS.

BUSINESS STRICTLY CONFIDENTIAL.

"KING OF AUCTIONEERS,"

Says D. H. FOSTER.

D. H. FOSTER,
STATIONER AND JEWELER,
BELOIT, WISCONSIN.

TO WHOM IT MAY CONCERN: August 22, 1899.

It is with the greatest pleasure that I am able to recommend Mr. Sam Martin as a capable and efficient auctioneer, who knows his business from the word go.

When I first engaged Mr. Martin he made what appeared to me, the most unheard-of and absurd statements as to the time it would take him to sell out and in regard to the prices he would get. The truth was only half told, for he doubled the prices and sold the entire stock in just one-half the time he had promised.

As an auctioneer and a gentleman, Mr. Martin is above criticism. He is a king in his chosen profession.

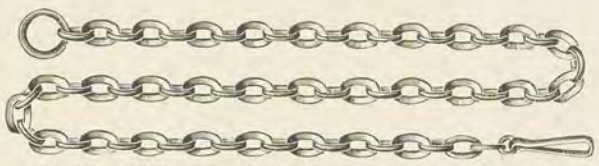
D. H. FOSTER.

"Experience," said Dr. Johnson, "is the great test of truth." Mr. Foster's experience, as stated above, is similar to that of **every Jeweler** for whom I have made a sale. It will be **your** experience if you decide to secure my services. "Martin's the man for you," is a familiar phrase in the jewelry trade.

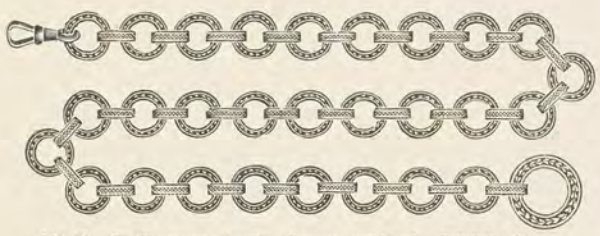
General Prosperity.

is the accepted hero of the day. Give him a warm welcome by displaying a hot line of popular goods at popular prices. We show them in large varieties. TRY A SAMPLE ORDER.

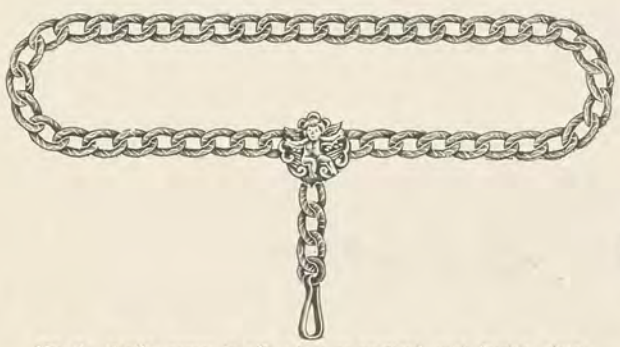
CHAIN GIRDLES ARE THE POPULAR FAD.



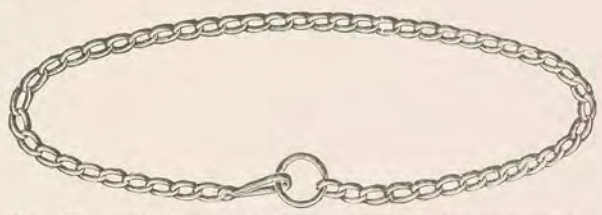
No. XX. Girdle, comes in gilt, Roman or silver, with chased link. **$3.00** a dozen.



No. 7. Girdle, comes in gilt, silver or oxidized. **$6.00** a dozen.



No. 9. Girdle, comes in gilt, silver or oxidized, with buckle, clasp links, chased. Very swell. **$6.00** a dozen.



No. 953. Girdle, in silver, gilt, Roman or oxidized, plain or chased link. **$4.00** a dozen.

No. 3. Girdle, gilt, silver or oxidized, plain link.
In soldered link, ... **$12.00** a dozen.
Not " " . . . . . 6.00 "

No. 0. Girdle, in gilt, silver, or oxidized. Very rich and swell looking. **$6.00** a dozen.

No. 5438. Celluloid braid clasp, in shell set with brilliants **$6.00** a dozen.

No. 8227. Side Comb, heavy celluloid, shell and amber. Set with brilliants. **$4.00** per dozen pairs.

No. 5451. Back Comb, in shell only; hand carved. Set with brilliants. **$9.00** a dozen.

Write for our descriptive circular of Plain and Mounted Hair Ornaments.

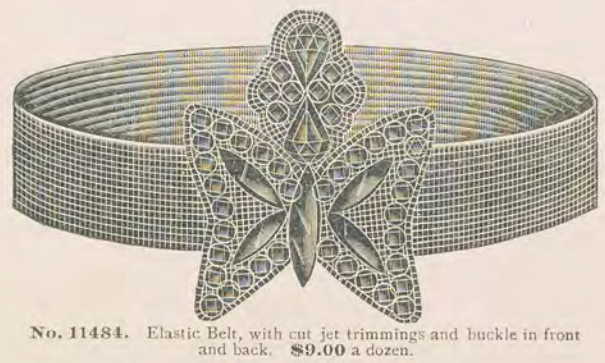
No. 1787. Comes in gilt, silver or gun metal. **$4.50** a dozen. With long chain, **$6.00** a dozen.

No. 654. Chatelaine Purse, something new and swell. Comes in silver, gilt and oxidized. **$4.00** a dozen. With long chain in place of chatelaine to go around the neck. **$4.50** a dozen.

DOG COLLAR BELT.

The latest felt back with highly polished nickel trimmings and padlock attachment. **$7.50** per dozen.

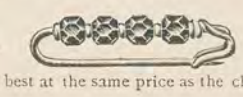
No. A 5432. Pompadour Comb, in shell and amber, good weight; set with brilliants. **$4.00** per dozen.



No. 11484. Elastic Belt, with cut jet trimmings and buckle in front and back. **$9.00** a dozen.

No. 175573. Elastic Belt, with steel and cut jet trimmings. **$7.50** a dozen.

OUR ORIGINAL CYRANO BEAD BEAUTY PIN.



Do You See the Point? THE ONLY PROTECTED POINT.

When buying, get the best, especially when you can secure the best at the same price as the cheap. There is no better pin made. Price, **$1.50** a gross.

OUR PEARL BEAUTY PIN.

Best pin ever introduced. Pearl looks rich, don't tarnish or get out of style. Price, **$4.00** per gross.

WRITE FOR OUR NEW FOUR-PAGE CIRCULAR. NEARLY 200 POPULAR SELLERS.

SELECTION PACKAGES SENT ON REQUEST.

Goods not wanted, to be returned within three days of their receipt. We carry everything pertaining to ladies' and men's wear in jewelry. Give us an idea of quantity desired and prices you wish to pay. Goods not satisfactory may be returned. We have immense lines of BELT BUCKLES, COLLAR CLASPS, HAIR ORNAMENTS, HAT PINS, Etc. Remember, we have something new all the time. Come and visit us when in our city. A trial order from you means a permanent new customer for us. Write us for anything you may want in our line—we have it. All orders filled promptly.

J. Floersheim, Kunstadter & Co.

ESTABLISHED 1872.

S. W. Cor. Jackson Boulevard and Market St., CHICAGO, ILL.

1086

You Get All That's Coming to You

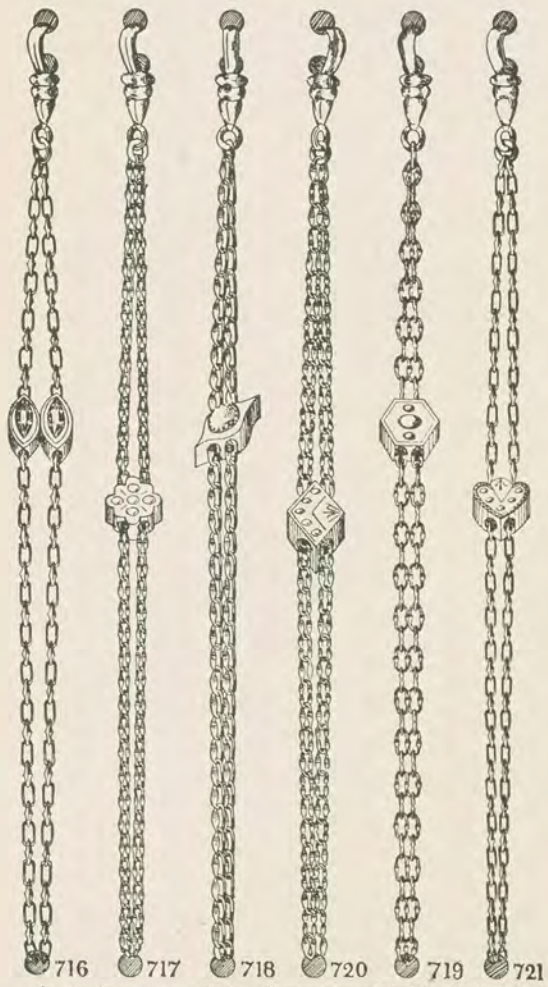
when you buy of us. **YOU PAY NO MIDDLEMAN'S PROFIT.**
We help you to increase your sales by selling goods 25 per cent. less than you formerly did, and still make the same percentage of profit.

THIS IS NOT A THEORY, BUT A COLD FACT.

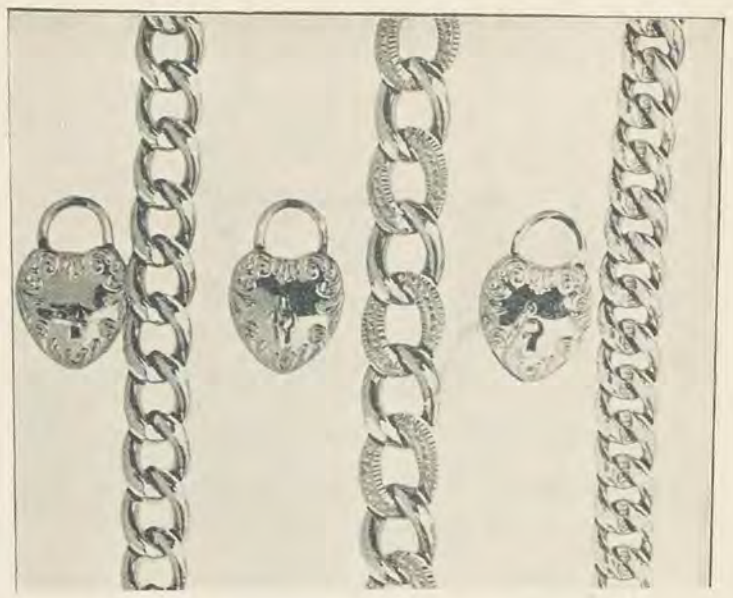
Let us prove it to you.

Quick-Selling Snaps shown in OUR

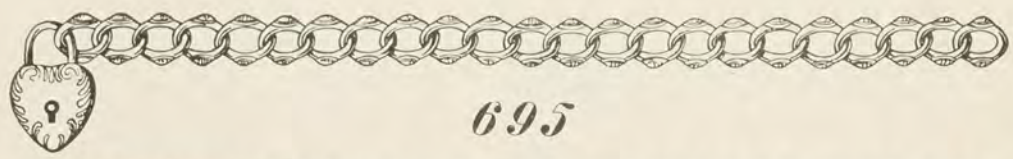
Imperial Salesman.

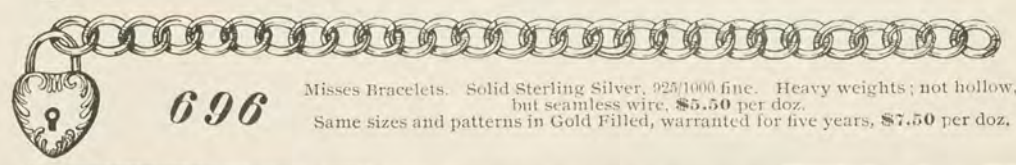


Six staple patterns, Curbs, Fancy Chased Cables and Boston Links. All soldered—made of Gold Filled Stock. Gold Slides set with Opals, Pearls, Rubies and Emeralds. Full length. Elegantly carded. **$17.50** per doz.

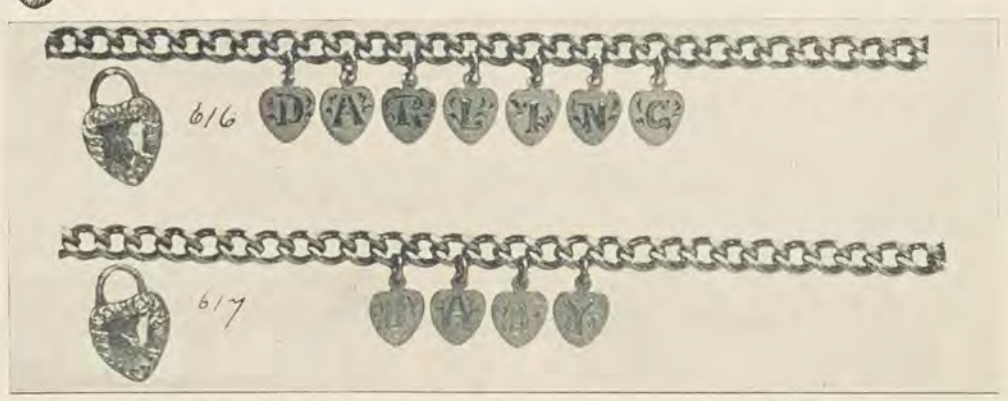


Ladies' heavy weight, 14 K. Gold Filled, Soldered Links, handsomely chased and engraved. Six pretty patterns, warranted for 20 years. **$18.00** per doz.





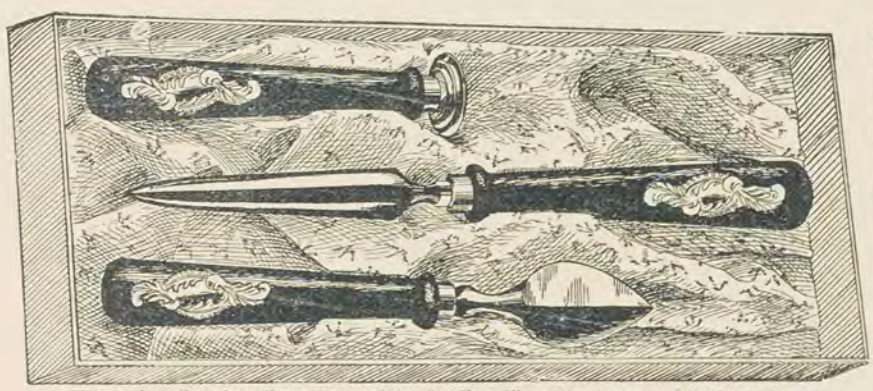
Misses Bracelets. Solid Sterling Silver, 925/1000 fine. Heavy weights; not hollow, but seamless wire, **$5.50** per doz.
Same sizes and patterns in Gold Filled, warranted for five years, **$7.50** per doz.



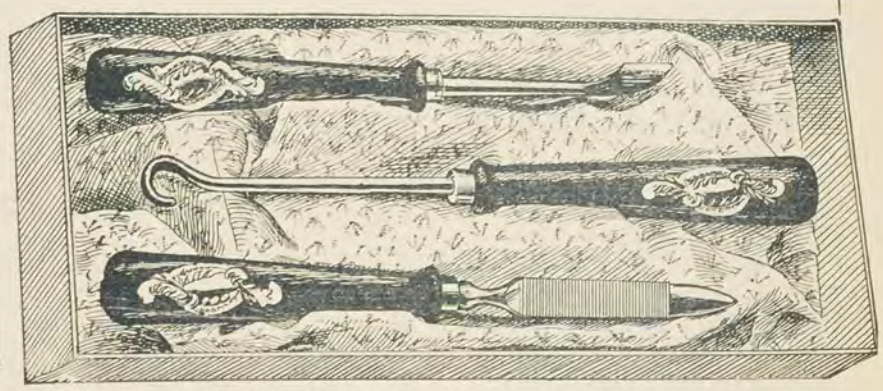
Misses Friendship Bracelets are big sellers. In Solid Sterling Silver, 925/1000 fine. **$7.00** per doz.
In Gold Filled, warranted for 5 years. **$8.50** per doz.

None better Dickens Chains can be made than these, at this price. Made of good quality stock, all soldered links. Handsome, Genuine Cut Seals.

Six patterns, Curbs, Cables and Ropes. **$11.50** per doz.



Three-piece Genuine Ebony Letter Set. Sterling Silver Mountings. **$6.00** per doz.



Three-piece Genuine Ebony Manicure Set. Sterling Silver Mountings. **$4.50** per doz.

For QUICK-SELLING, UP-TO-DATE, RELIABLE SPECIALTIES, in Chains, Buttons, Rings, Bracelets, and Silver Novelties, WE LEAD THEM ALL.
Try us on your next order.

IMPERIAL MFG. CO., Masonic Temple, CHICAGO.

IT'S A BRIGHT JEWELER

who advises his customers to use SILVER CREAM exclusively on their fine metals. It hurts a dealer's reputation to have his silverware tarnish and scratch, even though it is solely the fault of the polish used. The only polish which we know of that is absolutely harmless and yet quick and easy to use is

SILVER CREAM

SILVER CREAM is a solvent of dirt and tarnish. If there is a deposit of foreign matter on the silver, it releases it quickly, that's all. The silver is not affected—all that can be done, without doing harm, is to remove dirt and tarnish thoroughly and quickly, leaving the natural brilliance of the silver to supply the sheen.

These facts explain the really phenomenal sale of SILVER CREAM. It is a lively seller.

Look out for imitations of our packages. There are several. The following Wholesale and Jobbing Jewelers can supply you with the genuine:

BOSTON.
HARWOOD BROS.
SMITH, PATTERSON & CO.
WHITNEY JEWELRY CO.

CHICAGO.
BENJ. ALLEN & CO.
EASTERN MFG. CO.
C. H. KNIGHTS & CO.
B. F. NORRIS, ALISTER & CO.
J. H. PURDY & CO.
WARNER SILVER MFG. CO.
SWARTCHILD & CO.
OTTO YOUNG & CO.
LAPP & FLERSHEM.

CINCINNATI.
L. GUTMANN & SONS.
A. & J. PLAUT.
JOSEPH MEHMERT.
E. & J. SWIGART.
QUEEN CITY SILVER CO.

CLEVELAND.
SCRIBNER & LOEHR.
THE SIGLER BROS. CO.

DETROIT.
NOACK & GORENFLO.
H. KOESTER & CO.
KUNZ & SHUTTLEWORTH.

DES MOINES.
R. N. BROMLEY.

INDIANAPOLIS.
S. & T. NICHOLS & CO.

KANSAS CITY.
J. A. NORTON & SON.

OMAHA.
E. A. DAYTON & CO.

PORTLAND, ME.
WOODMAN-COOK CO.

MINNEAPOLIS.
MINNEAPOLIS JEWELRY MFG. CO.

ST. LOUIS.
ST. LOUIS CLOCK AND SILVERWARE CO.

NEW YORK.
L. H. KELLER & CO.
AVERBECK & AVERBECK.
R., L. & M. FRIEDLANDER.
S. F. MYERS CO.

ROCKFORD, ILL.
ROCKFORD SILVER PLATE CO.

J. A. WRIGHT & CO., KEENE, N. H.

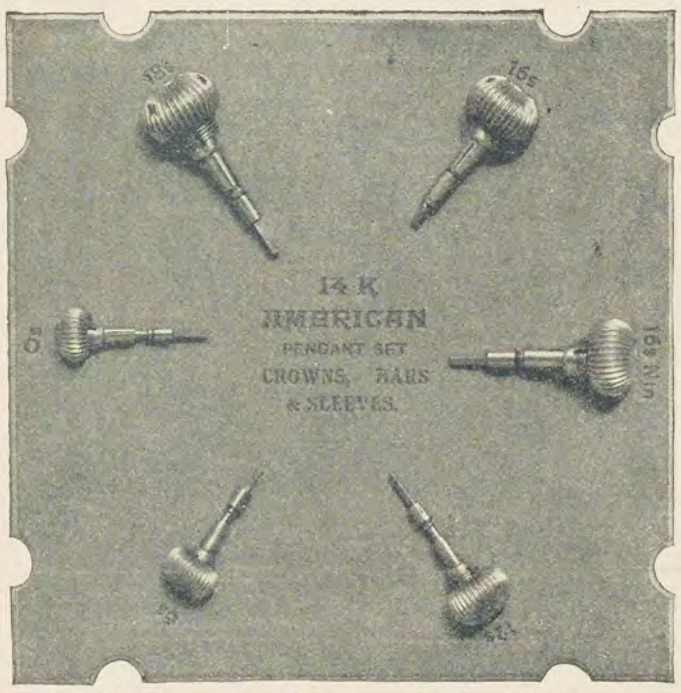
NEW YORK, 3 Maiden Lane.

The Ledos Mfg. Co.,

34-36 Pearl Street,
Newark, N. J., U. S. A.

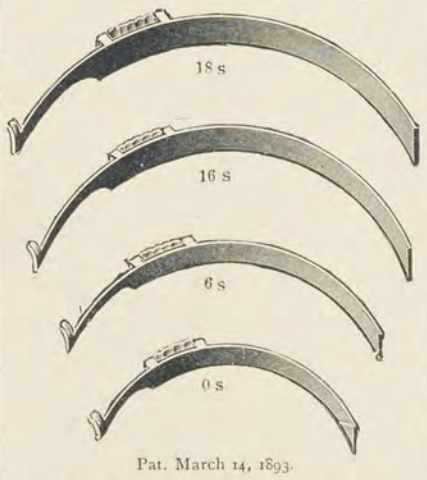
Manufacturers of Watch Case Materials and Jewelers' Findings,

CROWNS, PENDANTS, BOWS, SPRINGS, SOLDERS, ETC.



Price, $2.00 per card for any make of watch case.

The Numa Spring

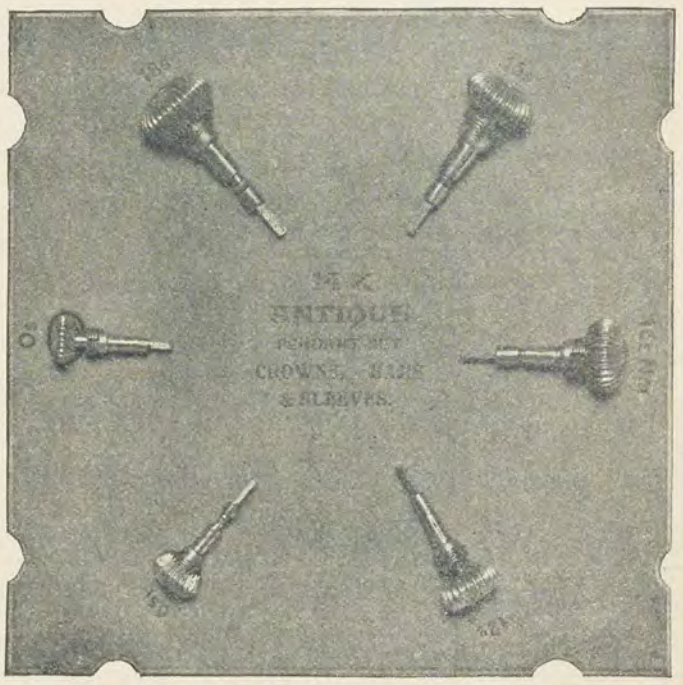


Pat. March 14, 1893.

The Most Perfect Spring Made
IN LOCK OR LIFT.

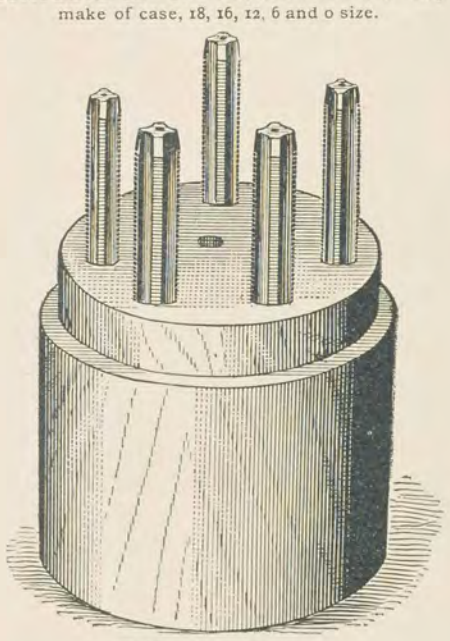
Can be used in place of a solid steel or any other spring. Presents an unbroken surface in watch case center, making the case absolutely dust proof. Every spring perfectly finished and guaranteed.

Price, 75c. per doz.

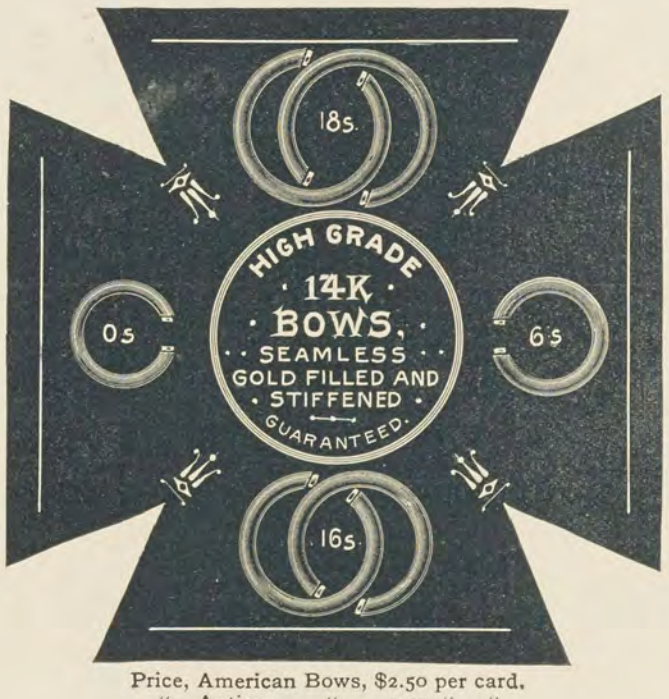


Price, $2.00 per card for any make of watch case.

COMPLETE SET OF PENDANT TAPS for any make of case, 18, 16, 12, 6 and o size.

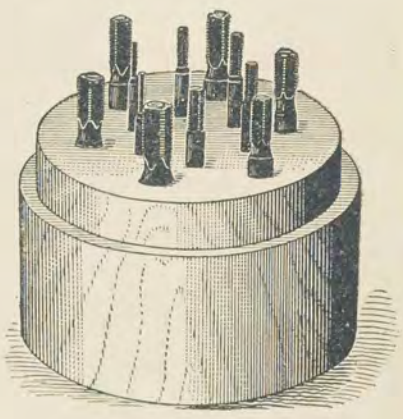


Price, $3.00 per set.



Price, American Bows, $2.50 per card.
" Antique " 3.50 " "

COMPLETE SET OF CROWN TAPS for all sizes of Lever and Pendant Set Crowns.

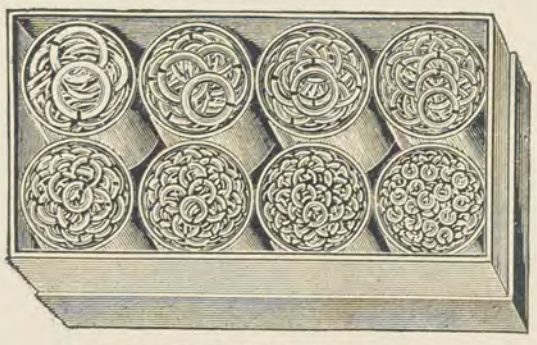


Price, $2.50 per set.

JUMP RINGS.

EIGHT ASSORTED SIZES. ONE GROSS IN BOX.

Price, $1.25 per box.



Seamless Gold Filled, $1.00 per box.
Coin Silver, 1.25 " "

Price, $1.00 per box.

NONE BETTER.

THE L SOLDER.

N. B.—We sell only to manufacturers and jobbers. You can order these goods of them.

Our Complete Catalogue of Watch Case Materials will soon be issued.
If any jeweler or watchmaker will send us their address, we will mail them a Gauge Card for American or Swiss Crowns.

THE CENTURY'S HIGHEST ACHIEVEMENT IN WATCH CASES

PHILADELPHIA, NOVEMBER 1, 1899.

TO THE RETAIL JEWELER:

Dear Sir:

On the threshold of the most prosperous holiday season of the century we take pleasure in calling your attention to our lines of watch cases in all grades, which are beyond all comparison the most comprehensive and beautiful ever shown.

As you are now confronted with probably the greatest opportunity in the history of your business, and as the season is such that only the best goods will satisfy buyers, it will pay you well to inspect carefully the following pages (which give but a hint of our complete lines) and secure as early as possible from your jobber assortments of such of the cases as you may select.

In the matter of filled cases remember that Jas. Boss cases are sold at a net list subject to the usual cash discount only. If you are offered a greater discount on other cases examine the list and figure what the goods cost you net. Then compare prices.

THE KEYSTONE WATCH CASE COMPANY,
Nineteenth and Brown Streets,
Philadelphia, Pa.

BRANCH OFFICES

NEW YORK - 23 Maiden Lane. CHICAGO - 103 State Street.
SAN FRANCISCO 126 Kearny Street.

THE KEYSTONE WATCH CASE COMPANY

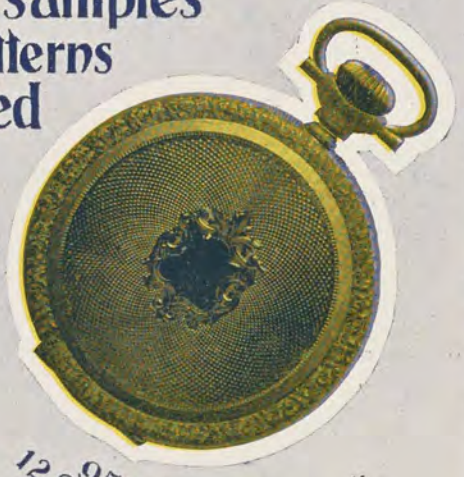
8560
0 Size Htg.

9165
0 Size Htg.

8826
0 Size Htg.

The line of KEYSTONE SOLID GOLD Cases for this Fall is the most comprehensive we have ever shown. A few samples of the many new patterns are here illustrated

9581
12 Size Htg



9547
12 Size Htg.

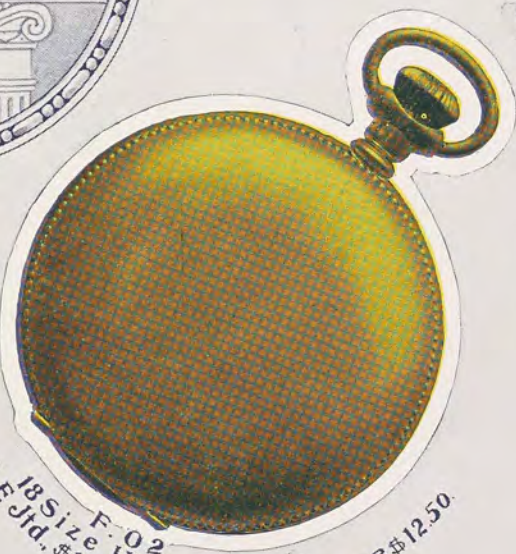
9461
0 Size Htg

9419
16 Size Htg. Elgin.

KEYSTONE
-14K-

9231
16 Size Htg Elgin

THE KEYSTONE WATCH CASE CO.



18 Size O.F. Jtd., $16.00. 18 Size O.F. Screw B.&B. $12.50.
F. 02
18 Size Htg. $17.50.

F. 94.
6 Size Htg $13.50.

16 Size O.F. Elgin Jtd. $15.50., 16 Size O.F. Screw B.&B. $12.50.
F. 287.
16 Size Htg. Elgin $17.00.

THE NEW BOSS CASES ARE THE ACCEPTED STANDARD IN STYLE AND QUALITY IN FILLED CASES

KEYSTONE WATCH CASE TRADE MARK

WE HERE SHOW A FEW OF OUR MANY NEW STYLES AND PATTERNS OF JAS. BOSS 14K. FOR FALL TRADE

GUARANTEED FOR 25 YEARS

18 Size O.F. Jtd. $17.00., 18 Size Screw B.&B. $13.50.
F. 89.
18 Size Htg., $19.00

12 Size, O.F. Jtd $14.00.
A. 9273
12 Size Htg. $15.50.

18 Size O.F. Jtd. $17.00. 18 Size O.F. Screw B.&B. $13.50
F. 176
18 Size Htg. $19.00

O Size. Htg., $12.50.
F. 78.

PRICES ACCORDING TO KEYSTONE KEY

O Size Htg., $12.50.
F. 142

A FEW RANDOM SELECTIONS FROM OUR NEW FALL STYLES OF JAS. BOSS 10K. FILLED CASES

GUARANTEED FOR 20 YEARS

19937
6 Size Htg. $11.00.

B 36
12 Size Htg. $12.50.
O. F Jtd $11.50

20276
6 Size Htg $11.00

KEYSTONE WATCH CASE TRADE MARK

B 53
0 Size Htg. $10.00
O.F. or Sky J.B. S.Bez. $7.50

B 11
0 Size Htg $10.00.
O.F. or Sky J.B. S.Bez. $7.50.

THE KEYSTONE WATCH CASE COMPANY

B 58
18 Size Htg $13.50.
O.F. Jtd. $12.00. O.F. Screw B & B $8.00

19568
16 Size Htg. $13.00
O.F. Jtd. $11.50. O.F. Screw B & B $8.00

19023
18 Size Htg $13.50
O.F. Jtd. $12.00. O.F. Screw B & B $8.00

PRICES ACCORDING TO KEYSTONE KEY

BECK
PHILA

WE HAVE READY FOR FALL TRADE A VERY COMPLETE VARIETY OF PATTERNS IN

·JAS. BOSS 14K AND 10K SCREW BACK AND BEZEL CASES·

A FEW OF THESE ARE SHOWN HERE

F 123 – B 14 K.
16 ELG. SCREW B&B $13.50

B 221 – B 10 K.
18-0.F. SCREW B&B $8.00

B 66 – B 10 K.
16 ELG. SCREW B&B $8.00

The Keystone Watch Case Company

B 218 – B 10 K.
18 SCREW B&B $8.00

F 10293 – B 14 K.
16 ELG. SCREW B&B $13.50

·PRICES ACCORDING TO KEYSTONE KEY·

The Keystone Watch Case Company

721 E
16 Size Htg., Elgin $8.00
" " O.F. Elgin Jointed, 7.50

892
18 Size Htg $8.00
" " O.F. Jointed 7.50

KEYSTONE
WATCH CASE
TRADE MARK
C

893
18 Size Htg., $8.00
" O.F. Jointed, $7.50

THE COMBINATION OF LITTLE PRICE, WITH GOLD APPEARANCE,
AND A TEN-YEAR GUARANTEE OF KNOWN RELIABILITY GIVES THE

CYCLONE

ROLLED PLATE CASES A LEADING PLACE AMONG QUICK SELLING GOODS.

GUARANTEED FOR 10 YEARS

PRICES ACCORDING TO KEYSTONE KEY

KEYSTONE WATCHCASE TRADE © MARK STERLING

"KEYSTONE" AND "STANDARD"
are convertible terms in the watch case world.
The KEYSTONE STERLING SILVER cases are the recognized standard in their grade in style and quality.

A FEW OF THE ARE HERE

NEW PATTERNS ILLUSTRATED

2374
12 Size Htg.. $6.00
12 " O.F. Jointed $5.50

0. Size 2197 Htg $4.90

2368
16 Size Htg. $7.70
16 " O.F. Jointed $6.80

The Keystone Watch Case Company

The watch case novelty of the season is the KEYSTONE STERLING SILVER case with NIELLO ornamentation

A FEW PATTERNS ARE HERE SHOWN

N 540
0. Size Htg.. $ 9.40
0. " O.F. or Sky. J.B.S. Bez. 7.50

N 519
0. Size Htg. $ 9.40
0. " O.F. or Sky. J.B.S. Bez. 7.50

N 533
0. Size Htg $ 9.40
" O.F. or Sky. J.B.S. Bez. 7.50

FOR DESCRIPTION SEE BACK COVER OF JULY KEYSTONE

PRICES ACCORDING TO KEYSTONE KEY.

KEYSTONE WATCHCASE TRADE © MARK STERLING

ECK PHILA

Silveroid cases have no equal in the Nickel class in color, construction, fit and finish. They are far ahead of any other white metal cases.

136
16 Size Htg. $2.20.
O.F. Jointed, $1.30; O.F. Screw B. & B. $1.30.

133
18 Size Htg. $2.20.
O.F. Screw B. & B. $1.30
18 Size Htg.
O.F. Jointed $1.30, O.F. Screw B. & B.

132
18 Size Htg. $2.20
O.F. Jointed $1.30; O.F. Screw, B. & B. $1.30

KEYSTONE
WATCH CASE
TRADE MARK
SILVEROID

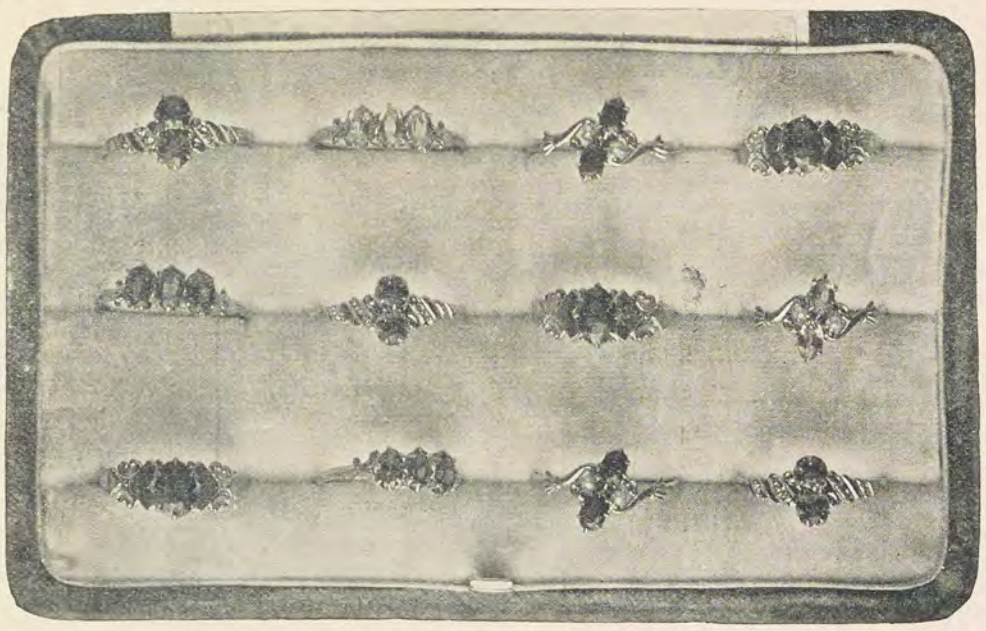
THE KEYSTONE WATCH CASE COMPANY

126
3oz. 18 Size
O.F. Jointed $1.30

151
3oz. 18 Size.
O.F. Screw B. & B. $1.30

53
3oz. 18 Size
O.F. Jointed $1.30.
O.F. Screw B. & B. $1.30

Prices according to Keystone Key



Solid Gold Stone-Set Rings

Ladies' and Misses' Sizes,
in plush hinge cover case.

EVERY JEWELER SHOULD HAVE
THIS SALABLE ASSORTMENT IN STOCK.

Box Assortment No. 359. A Bargain.

$13.50 less 6 per cent. for cash with order.

Money refunded if not satisfactory.

Other Assortments, from **$6.00** to **$18.00 per dozen.**

AVERBECK & AVERBECK, Manufacturers,

19 Maiden Lane, NEW YORK.

Canadian Horological Institute,

H. R. PLAYTNER, Director.

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THE BEST is distinguished by being known as the "One Horological School in America."—this school.

N. B.—Board, with single rooms, **$3.00** per week.

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At Greatly Reduced Prices

No. 02. $1.25 *Gertrude L. Holmes.*

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No. 06. 1.00 Silas B. Robinson, Jr.

DIRECTIONS.—Set up the desired inscription, rub the finger over engravers' transfer wax, then over the face of the type; then make the impression.

Each outfit put up in a neat box containing **150 Pieces of Type,** consisting of **2 cap A's and 3 small a's,** figures, points, spaces, tweezers and two type holders.

Does away with all tracing. The letters are printed upon the article. Perfect and uniform work is the result.

Made in nine sizes. Every engraver should have an outfit.

WM. H. DIETZ, 115 Dearborn St., Chicago.

Are You an Engraver? Are You Learning?

WANT A GOOD BOOK?

Dietz's Monogram Book

Over 2300 Designs arranged in alphabetical order; also indexed, so you can find any Monogram in ten seconds time. The Monograms are in outline, for the purpose of showing how the letters are woven together. You can then enlarge or reduce the size and fill in shading to suit.

If book is not satisfactory, money refunded.

"I consider it a fine work."
F. H. REES, Elmira, N. Y.
Elmira School of Engraving.

Price, $1.00

Pyrites Stone Jewelry

New Styles

Send for New Catalogue

Rings, Scarf Pins, Link Buttons and Emblem Charms.

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ESTABLISHED 1889

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LEADING MERCHANT JEWELERS and JOURNEYMEN endorse this school, which is proven by hundreds of testimonials at the disposal of any one wishing to take a course in the art of engraving—taught thoroughly practical in all branches. Success guaranteed. Good positions to faithful students. Engravers more than ever in demand.

Send for prospectus. Correspondence solicited by

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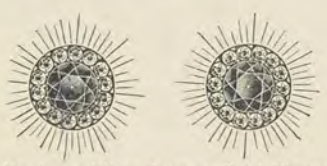
SOLID GOLD MOUNTINGS, SET WITH BRILLIANT WHITE STONES.



No. 6037. White Stone or Pearl Cluster Screws, with any color Center Stone, **$24.00** doz. With Opal Center, **$60.00** doz.

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No. 4753. Opal and White Stone Ring, **$15.00** doz.

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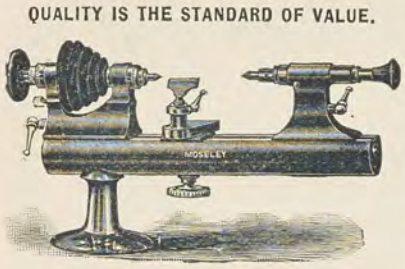
TERMS—Less 6 per cent. 10 days.

JULES ASCHEIM, 41 Maiden Lane, New York.

N. B.—Clusters have either Ruby, Emerald, Sapphire, Almidine, White Stone, Pearl or Turquoise Centers. State centers desired.

1088*b*

QUALITY IS THE STANDARD OF VALUE.



These are not the Guns that Dewey had

But these are the guns that Moseley made in 1853, that Dennison had, and Howard had, and Robbins had, and Avery had, which enabled them to repel the invasion of the Swiss watch and make it possible for our watch companies "to hold the fort."

These Guns were on exhibition at the Chicago Watch and Clock Exhibit, October 2–14, mounted in the best possible style, with all necessary attachments, fixtures and appliances for the watchmaker and repairer.

They are now with the crowd at Philadelphia, and can be seen at the store of Chas. H. O'Bryon, 730 Chestnut Street,

who will be pleased to show them to all interested in such tools, and explain anything you do not see clearly. They can also be found in the workshops of the principal jewelers in his city. Most of the watchmakers know they were among the first and best tools produced and forced their competitors to produce better tools in order to compete with them. Style and convenience are a good deal—quality everything. We think we have both.

When interested, write your jobber, or the

MOSELEY LATHE CO., Elgin, Ill.

When writing to advertisers, kindly mention The Keystone.

HALF-TONE ELECTROTYPES

A SPECIALTY

and guaranteed as good as the original.

DUNCAN & CO.

Electrotypers

621 Commerce St., Philadelphia

IT WILL PAY YOU

to send us your OLD GOLD, SILVER, FILINGS, POLISHINGS, SWEEPS, HAND-WASHINGS, ETC.

IT PAYS US

to make Prompt and Honest Returns. We want your trade and wish to keep it.

WE PAY FOR OLD GOLD

22 K., 88c. per dwt.		12 K., 48c. per dwt.	
20 K., 80c. "	"	10 K., 40c. "	"
18 K., 72c. "	"	8 K., 32c. "	"
16 K., 64c. "	"	6 K., 24c. "	"
14 K., 56c. "	"	4 K., 16c. "	"

Silver and Platinum at market rates.

FINE GOLD AND SILVER FOR SALE, EITHER ROLLED OR GRANULATED.

T. B. HAGSTOZ COMPANY, *Limited,*

Smelters, Refiners and Assayers,

709 Sansom St., Philadelphia.

Have you tried our

American-Made Sapphire and Ruby Balance Jewels

You will find, after trial of same, that the watches you repair will run closer and are more easily regulated than when using the jewels now in the market and sold at any and every price. A trial will convince you of their superiority.

American Mainspring Cabinet, the best in the market, and **One Gross "SUCCESS" Mainsprings, $10.80 net.** Write us.

Waltham 18, 16, 12, 6, 0.
Elgin 18, 16, 12, 6, 0.
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Columbus 18, 16, 6.
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STAFFS and JEWELS for above $1.25 per dozen.

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52 Maiden Lane, New York

ESTABLISHED 1876. 23 YEARS CONTINUOUS EXPERIENCE.

FRANK TRIPLETT,

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Thoroughly posted in Jewelry, Silverware, Cut Glass, Art Chinas and other Ceramic Wares, Oriental Fabrics, Paintings, Books, Bronzes, Statuary, Etc.

If contemplating an auction, I know that my terms, references and work will prove satisfactory. **I guarantee profitable sales where my advice is followed.**

All auctioneers can, **and many do,** write for themselves very flattering letters of recommendation. **I PLACE YOU IN DIRECT COMMUNICATION WITH THOSE FOR WHOM I HAVE CONDUCTED SALES.** See what they say of me.

I possess the ability to interest high-grade people and to sell high-grade goods.

MONEY BACK

WHEN YOU ORDER

Watch Material from us you have your orders filled by Practical Watchmakers (not boys)—that is the reason you always get just what you want.

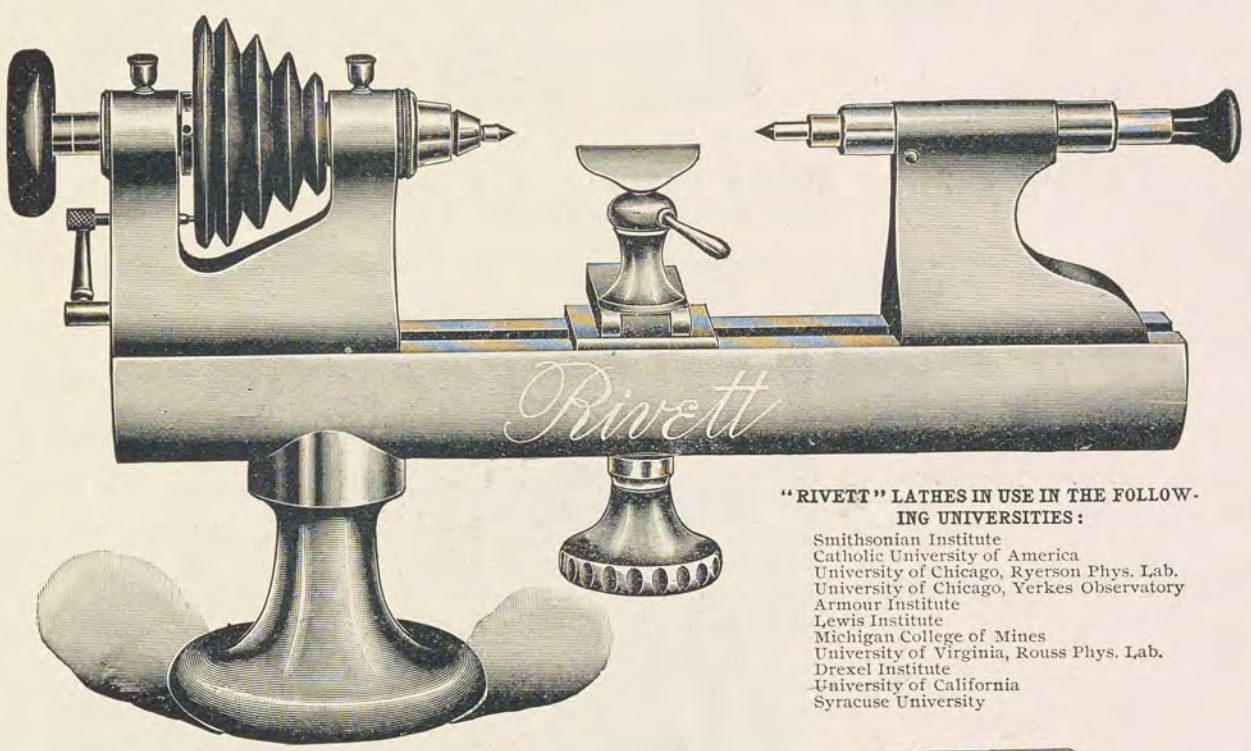
Our American-Made Balance Staffs and Cock and Foot Jewels fit perfectly. We have them for all makes of American watches. Our price, **$1.25** per dozen.

Our Red X Mainsprings are the best value offered by anyone in America. Price, **$1.00** per dozen; **$11.00** per gross.

Send us a trial order. Your money back if not satisfied.

TIDD & CO.
Columbiana, Ohio.

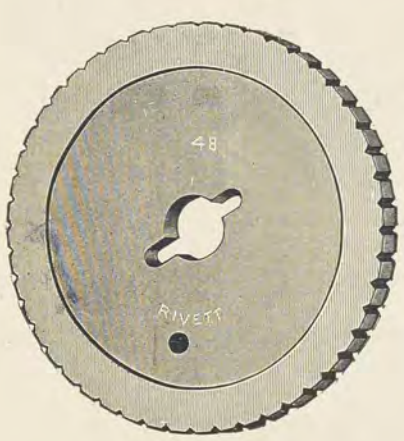
"Rivett" Quality Challenges the World



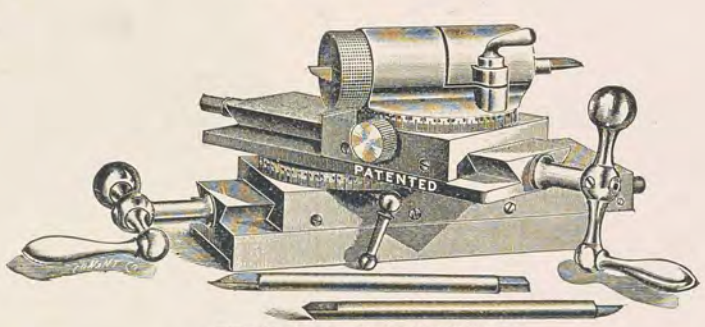
"RIVETT" LATHES IN USE IN THE FOLLOWING UNIVERSITIES:

Smithsonian Institute
Catholic University of America
University of Chicago, Ryerson Phys. Lab.
University of Chicago, Yerkes Observatory
Armour Institute
Lewis Institute
Michigan College of Mines
University of Virginia, Rouss Phys. Lab.
Drexel Institute
University of California
Syracuse University

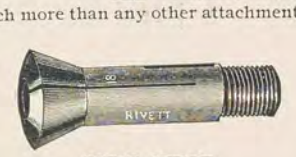
Probably no other factory of this kind in the country has orders on hand for over six months work ahead. We have, and it is merit alone which has overwhelmed us with orders.



INDEX.

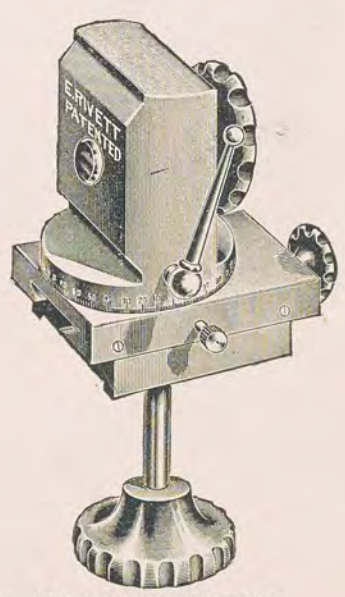


THE "RIVETT" SLIDE-REST,
which more than any other attachment has made our tools famous.



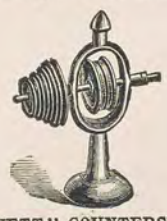
WIRE CHUCK.

"Rivett" Single-Stand Countershaft.

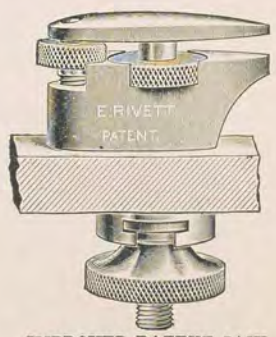


REVOLVABLE TAILSTOCK.

QUIL.

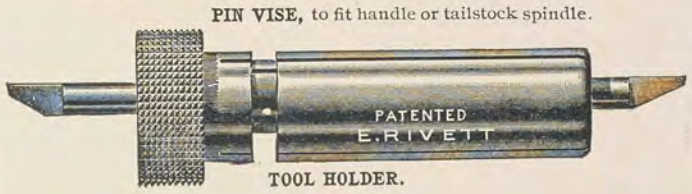


"RIVETT" COUNTERSHAFT.

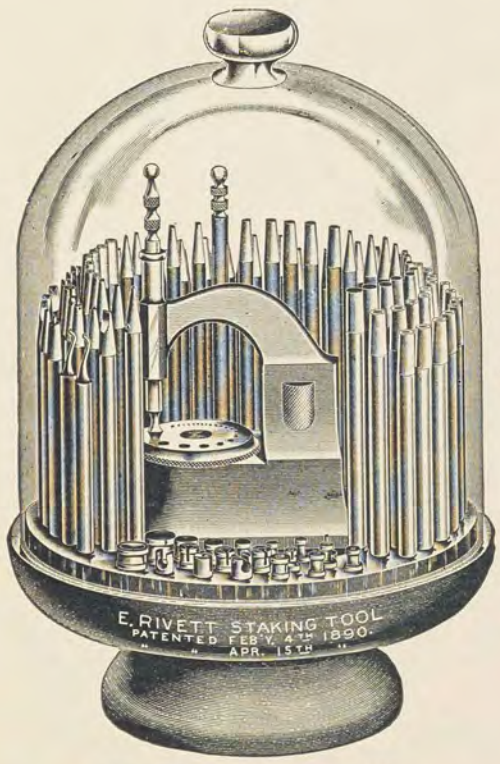


IMPROVED PATENT JAW.

PIN VISE, to fit handle or tailstock spindle.

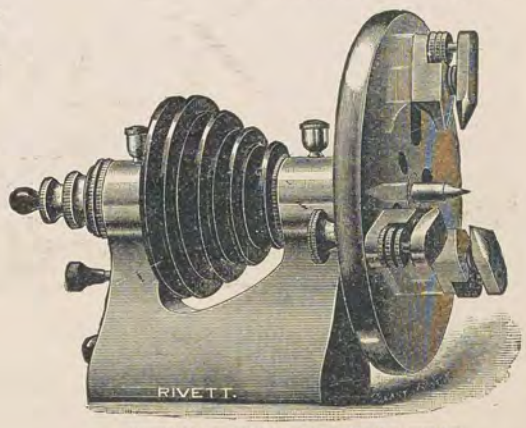


TOOL HOLDER.



THE "RIVETT" STAKING TOOL.
Original 100-punch tool; all others are copies. Binder unequaled for solidity and rigidity.

Quality has kept us at the front.
Quality has kept our price up.
Quality has brought us orders.
Quality has kept us busy.
Quality is bringing us new customers.
Quality has made the best Schools and Universities use our lathes.
Quality has made us the most successful watchmakers' lathe makers in the country.



THE "RIVETT" UNIVERSAL HEAD.
Finest in the world by a great majority.

FANEUIL WATCH TOOL CO.

Brighton, Boston, Mass.

1088 *d*

Holiday Engraving.

M. L. LANDIS, ENGRAVER AND INSTRUCTOR.

How to Make Monograms.

R H E

R H E

Send for Set of Our Engraving Charts.

Full Instructions for Making 50,000 Monograms in Four Sizes, from Gold Dollar to 18 Case Size.

OUR NEW SYSTEM.

Every letter on our charts is separate. To make monogram, draw a straight line on tissue paper and place on dotted line at bottom of "R" and trace with pencil; move to fit "H" trace, and move to "E." TRY IT. You now have Monogram "R H E" drawn, and by our System of Transferring, you can stamp on Jewelry and lead of pencil will leave tissue and stay on the metal, ready for engraving.

☞ NOTE.—The above letters show only one combination, but on Charts the "R" represents 169 different shaped letters; the "H" 196, and "E" only 121. The Hanging Monogram Letters E R H are a different shape.

Our System is copyrighted. Full set of five Charts are printed on the finest six-ply enameled card board, 6½ x 8½. Old English and Script Alphabets give complete System of Cutting, in three sizes, for convenient Transfer on Jewelry.

Complete with Instructions, price, **$1.50,** sent postpaid on receipt of money order for same.

☞ Mr. Landis solicits your Fine Holiday Engraving.
Send 2c. stamp for new style card and price-list.
Correspondence solicited.
Engraving School opens for Winter Course Jan. 1900.

M. L. Landis, 94 Miami Ave., Detroit, Mich.

Put a **Fletcher (aluminum) Watch Case Protector**

on that railroad man's watch you repaired to-day. It will please him and be a good ad. for you, helping you to sell many of them.

$1.50 PER DOZEN.

Retails for 25 cents.

M. D. Fletcher, *Manufacturer,*
Springfield, Mass.

Patents pending in U. S. and Canada.

BEST RING IN THE WORLD FOR THE MONEY.

14 K. Gold Shell (Seamless) Gold Filled

Warranted 5 years' satisfactory wear, or a new ring given in exchange.

35c. Rings, $2.25 per doz. 75c. Rings, $4.50 per doz. Subject to 6 per cent. for cash.

Retail Prices, 35 and 75 Cents.
Price per Gross, $39.60, subject to 6 per cent. for cash

Case contains
6 Doz. at 35 cts.
6 Doz. at 75 cts.

Put up as illustrated WITHOUT EXTRA CHARGE.
1000 ADVERTISING CIRCULARS GIVEN FREE WITH ONE GROSS.

12 Good Patterns, 35 Cts. 75 Cts.

Height of Case, 13 inches.

Width of Case, 13 inches.

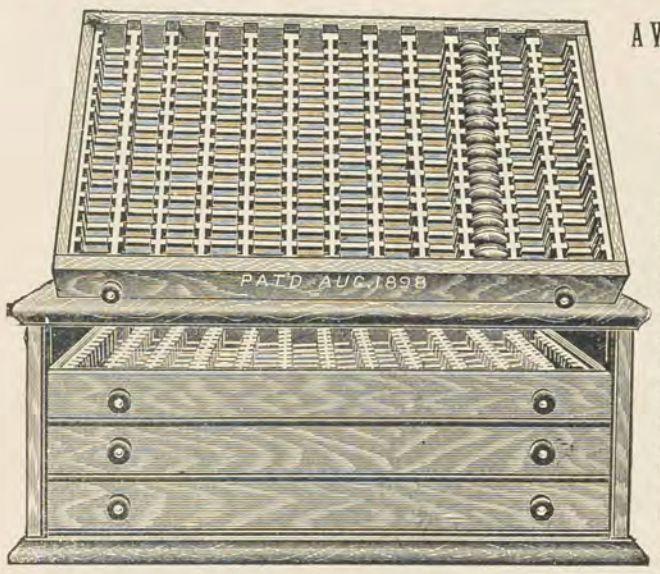
Every Ring Warranted 5 Years

This ring will wear better than a cheap gold ring.
Will furnish FREE large electrotype ad. for newspaper.

Arnstine Bros. & Mier, Sole Manufacturers and Patentees, 46, 48, 50 Euclid Ave., CLEVELAND, OHIO

Economy!

TO ECONOMIZE— 1st. Keep in order the stock you have.
2d. Buy what you need—buy the best for the money.



A Watch Glass Cabinet without an equal.

Size { 25½ inches long. 14 " wide. 10½ " high.

It is Solid Oak, highly finished. The glasses stand on edge and are easily taken out. There are 784 divisions, each division exact size for respective glass, thus impossible for the glasses to become mixed. Each division holds easily 1½ doz. glasses. Total **Capacity,** 98 gross. It admits open-face glasses from 7 to 22⅛. Hunting glasses 11 to 21⅛, each height and size kept separate.

A CABINET FOR ECONOMY!! **Price, $6.50.**

Have a Cabinet. *Keep your stock well assorted.*
Buy what you need.

THIS IS ECONOMY. THE BEST—WATCH GLASSES.

Genevas,	per gross,	$1.75 net.
Mi-Concaves,	"	2.25 "
Patent Genevas,	"	4.50 "
Parallels,	"	4.50 "

SOLICITATION!

We solicit your inspection of our line of

LORGNETTES, NECKLACES and BRACELETS in { SOLID GOLD, 1/10 GOLD, GOLD FILLED, ROLL PLATE, and STERLING SILVER, all soldered links.

GENTS' CHAINS in { FILLED, ROLL PLATE, FIRE GILT (O. M. D. only), NICKEL, WHITE METAL, STEEL.

FOBS, VEST CHAINS, GUARDS, EYE-GLASS CORDS } in SILK.

FINDINGS.

R. P. Jump rings, "heavy," one gross in box,	. .	$1.00
" Button backs, "best," per doz,	. . . .	1.00
" Pipe stem stud backs, " "	. . . .	1.00
" Regular " " " "	. . . .	.50
1/10 Gold " " " " "	. . . .	1.00
R. P. Split rings, per card of one "	. . . .	.40
" Spring " small, per "	. . . .	.75
" " " Med. " "	. . . .	.90

SPECIAL BARGAIN!

Lot Imitation Doublets, Diamond Cut, assorted sizes and colors.
While they last, per gross, **$1.50.**

JOS. B. BECHTEL & CO. 719 Sansom St., Philadelphia, Pa.

St. Louis Clock and Silverware Co.

Selections from our Fall Bulletin, mailed September 20th.

2000 ILLUSTRATIONS

Cut Glass
Bric-a-Brac
Clocks
Silverware
Pearl Goods
Ebonoid Goods

No. 173. WHISKY JUG.
St. Louis Pattern.

Height, 10 inches; Diameter, 6½ inches; Capacity, 1 Quart.
List, $26.25.

150 Illustrations of every grade of Imported and American Cut Glass.
SEE FALL BULLETIN.

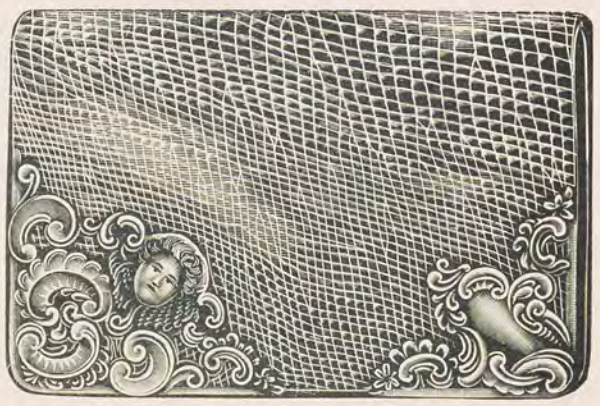
EAGLE.

Height, 8½ inches. Set with 16 Brilliants, Real Brazilian Onyx Base, Eagle and Wreath on Bottom Finished in Rich Gold. Tree Trunk Finished in Green Bronze Verde. 1 Day Time. **List, $12.50.**

2000 ILLUSTRATIONS

Leather Goods
Toilet Ware
Music Boxes
Graphophones
Novelties, Etc., Etc.

Order early while assortment is complete.



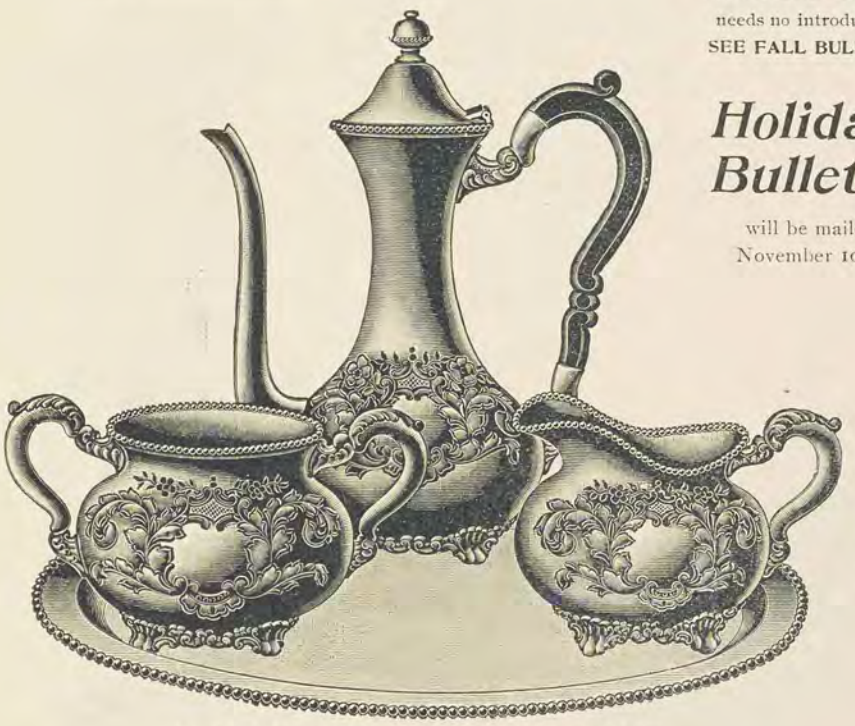
No. 0259 L. FINEST QUALITY LIZARD.

Gray Calf-lined Compartments. Mounted with Heavy Embossed Sterling Silver, Gold-Plated Mountings. Very Elegant.
List, $6.50.

Endless variety Pocket-Books. Every grade, price and quality.
SEE FALL BULLETIN.

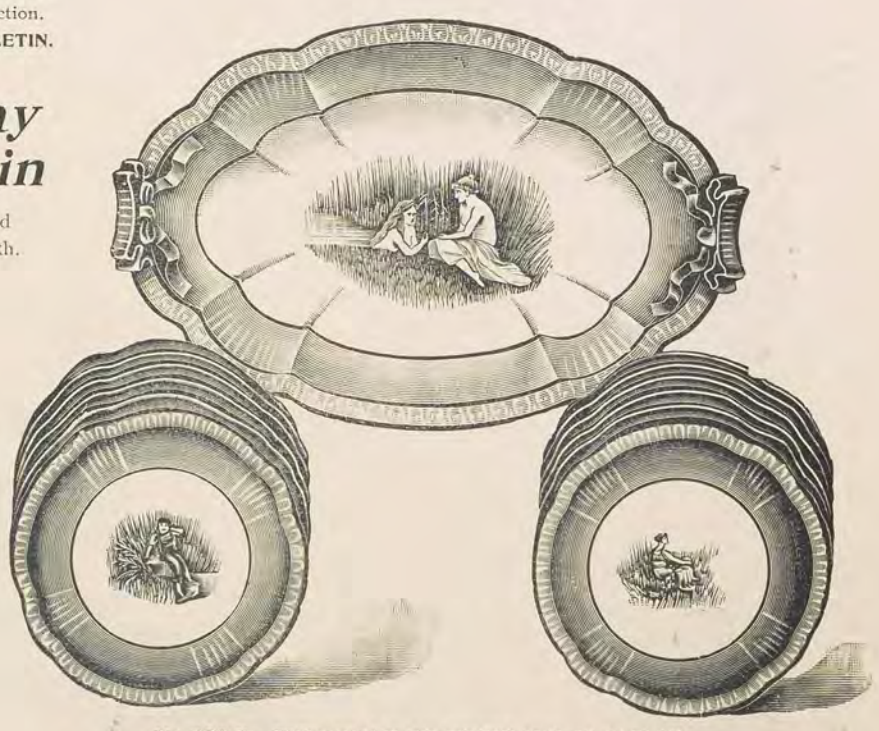
Our
CLOCK LINE
needs no introduction.
SEE FALL BULLETIN.

Holiday Bulletin
will be mailed
November 10th.



No. 52200. COFFEE SET, QUADRUPLE PLATE.
$25.00.

Burnished, Raised, Chased, Sugar and Cream Gold Lined. Coffee Pot has Ebony Handle.
Endless variety Silver-Plated Hollow and Flatware, Pearl Goods, Carving Sets.
Over 500 Illustrations.
SEE FALL BULLETIN.



No. 106 B. ICE CREAM OR FRUIT SET, 13 PIECES.

Gold Tracings, Portrait Centers, Light Green Border, Cream Tint, 12 Saucers, 6-inch Diameter; Platter, 12 x 8 inches. **List, $8.00.**

250 Illustrations Imported Bric-a-brac and Fancy Art Goods.
SEE FALL BULLETIN.

Our Holiday Bulletin will be mailed November 10th.

ST. LOUIS CLOCK AND SILVERWARE CO.

WHOLESALE EXCLUSIVELY.

419 North Sixth Street, **St. Louis, Mo.**

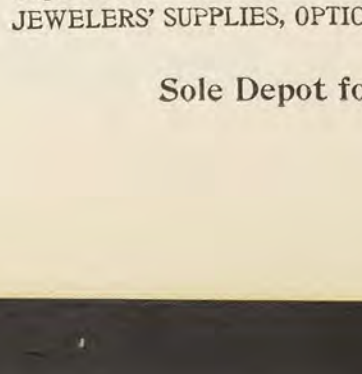
18 Size, Full Plate, Stem Wind.
"Railway King."

Dust-proof and warranted to be a first-class time keeper.
Especially adapted for Railway Service, or where accurate time is required.

Hunting and Open-Face.
Nickel, 17 Ruby Jewels, set in red solid Gold Raised Settings, Adjusted to Temperature and Positions, Breguet Hairspring, Patent Center Pinion, Patent Regulator, Polished Dust Band and Stem Wind Pearled Plates, fine white hard enameled double-sunk bevel-edged, red marginal figured Dial, Roman or Arabic, nicely Damaskeened in Nickel in elegant design . . **$36.00**
(Price According to Keystone Key.)

Our 21 and 23 Jewel "RAILWAY KING" will be ready in about ninety days. They will be the finest and most accurate Watches made.
Our 21 and 23 Jewel, 16 size thin model, will also be ready soon.

18 Size, Full Plate, Stem-Wind.



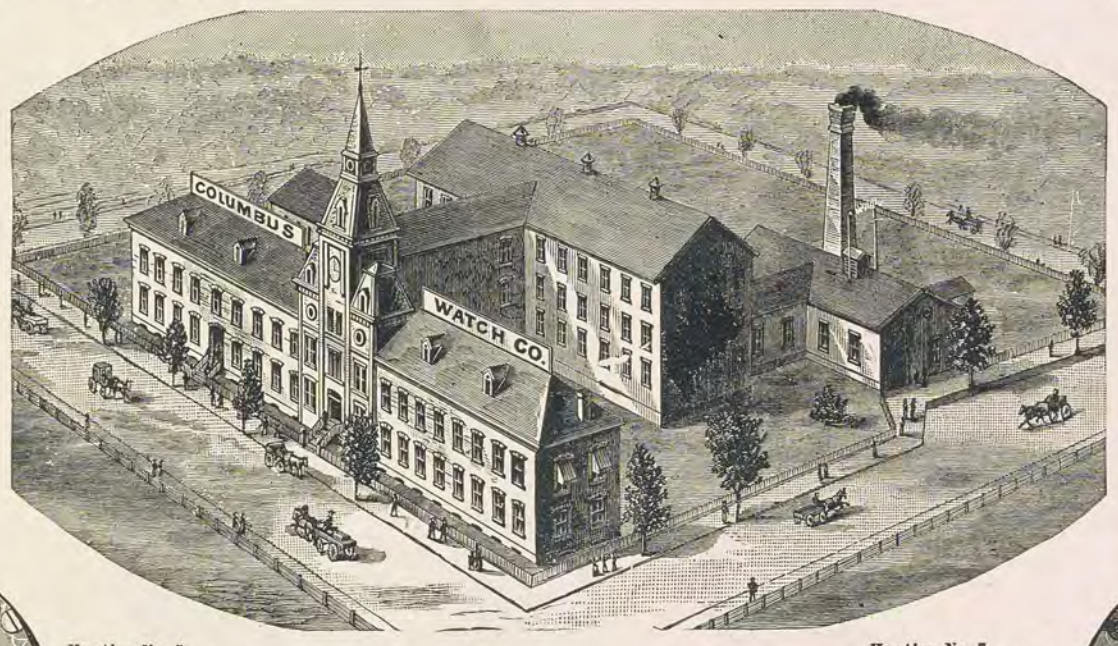
Hunting No. 5. Open-Face No. 6.
Nickel, 16 Jewels, set in red Gold Settings, Breguet Hairspring, Patent Regulator, Patent Center Pinion, sunk Seconds, black marginal Figured Dial and nicely Damaskeened. . . . **$15.50**
(Price According to Keystone Key.)

OUR MOTTO:

"Not How Cheap, but How Good"

SEND FOR NEW CATALOGUE AND PRICE-LIST OF WATCHES.

Your Jobber can supply them. If your Jobber does not sell our watches, send direct to factory for them.



The New Columbus Watch Co.

COLUMBUS, OHIO.

Hunting No. 3. Open-Face No. 4.
Nickel, 17 Jewels, set in red Gold Settings, Adjusted to Temperature and Positions, Breguet Hairspring, Patent Center Pinion, Patent Regulator, Dust Band and Polished Stem Wind, Pearled Plates, double sunk black marginal figured Dial, Damaskeened in Gold on Nickel . . . **$19.00**
(Price According to Keystone Key.)

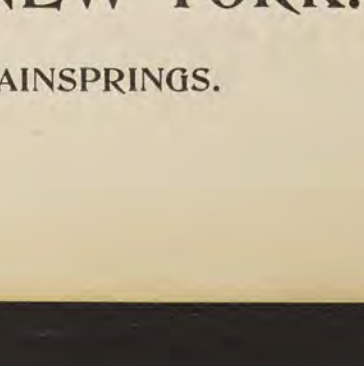
18 Size, Full Plate, Stem Wind.

Nos. 3 and 4 are adjusted and finely finished. They are money-makers for the Retail Jewelers.

Columbus Watches
ARE THE BEST.

ALL OUR WATCHES ARE LEVER SET and are made with a hollow winding pinion. They can be fitted in pendant-set cases.

18 Size, Full Plate, Stem-Wind.

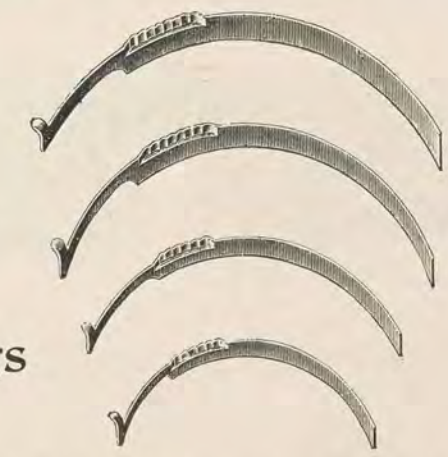


Hunting No. 7. Open-Face No. 8.
Nickel, 11 Jewels in red Gold Settings, Patent Regulator, Patent Center Pinion, Dust Band; fine, white, hard enameled, sunk Seconds, black marginal figured Dial, and nicely Damaskeened. **$11.00**
(Price According to Keystone Key.)

To the Jobbing Trade Only

We have just purchased the patent and all rights for the celebrated

Fleming's Patent Corrugated Universal Case Springs



Made of the best steel and will fit any and all sizes of Swiss and American watch cases.
A trial will convince you.

THE NEW ALUMINUM

Telescopic Watchmakers' Eyeglasses

are fitted with stronger lenses than any other eyeglass in use. For sale at all leading jobbing houses. Each one packed separate in a neat little box.


CLOSED.


OPEN.

SOLE AGENTS,

HENRY ZIMMERN & CO.

Importers and Manufacturers of WATCHMAKERS' and JEWELERS' SUPPLIES, OPTICALS, Etc., Etc.

47 Maiden Lane, NEW YORK.

Sole Depot for AJAX INSULATORS, U. S. AMERICAN and SUPERIOR MAINSPRINGS.

1088 *h*

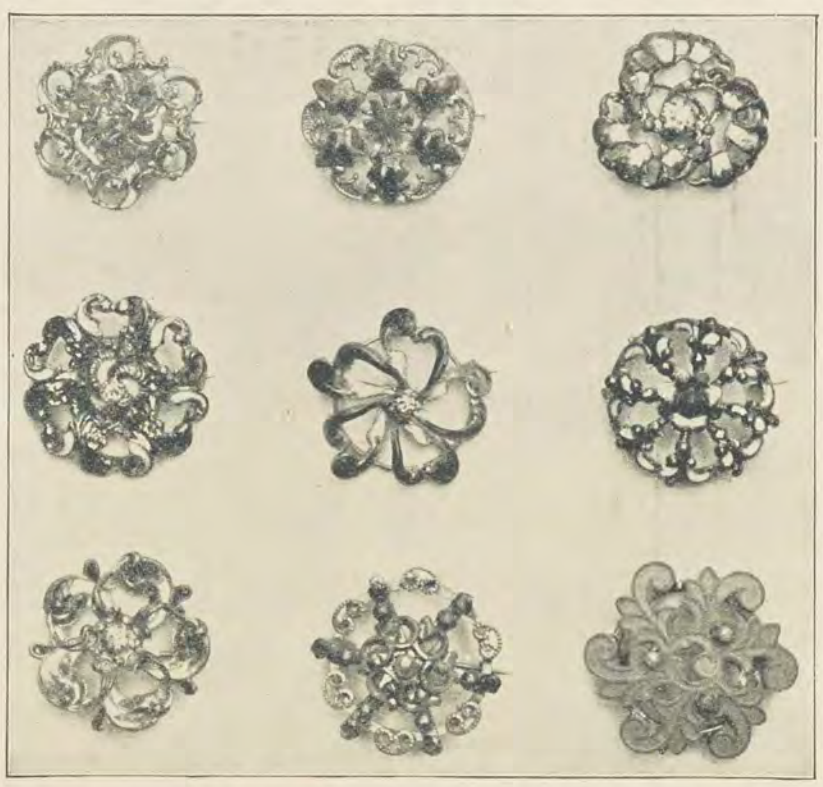
STONE BROS., Makers and Importers of

Popular-Priced Jewelry

We reproduce all kinds of Solid Gold and Precious Metal Goods into Popular-Priced Articles.
Remember, we carry everything that is made in Jewelry.

We carry a complete line of **Ladies' Fancy Silk Garters,** one pair in a box, from $2.00 per dozen up.
Have you seen our famous **Five-Year Warranted Rings** that retail at 25 and 50 cents each? They are wonders.

The Curzon Chain Girdle is our own creation. We show them in silver, gilt and oxidized. Price, without pendant, **$3.00** per doz. and up.



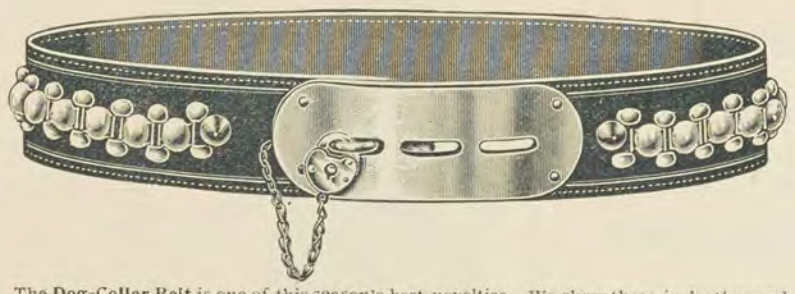
A group of our **$2.00** per dozen **Brooch Pins.** These are some of our reproduced goods.

We are showing **Chain Purses** in an endless variety, from **$6.00** per dozen up.

We excel in **Hat Pins, Fancy Stick Pins, Belt Buckles, Link Cuff Buttons,** all kinds of **Fancy Hair Ornaments,** also **Sterling Silver Novelties,** and all these at popular prices.

We are the house you want for Leaders. We will help you put new life in your business.

We don't issue a catalogue, but read of the inducements we offer to become acquainted with you.



The Dog-Collar Belt is one of this season's best novelties. We show these in leather and velvet, with nickeled trimming, from **$2.25** per dozen up to **$12.00** per dozen.

Our **Mail Order Department** is equipped with the latest and most modern devices. Goods shipped same day order is received.

Pompadour Combs in an endless assortment, from **$2.00** per dozen up.

Our **Chain Bracelets** to retail at **25 cents** and up are wonders.

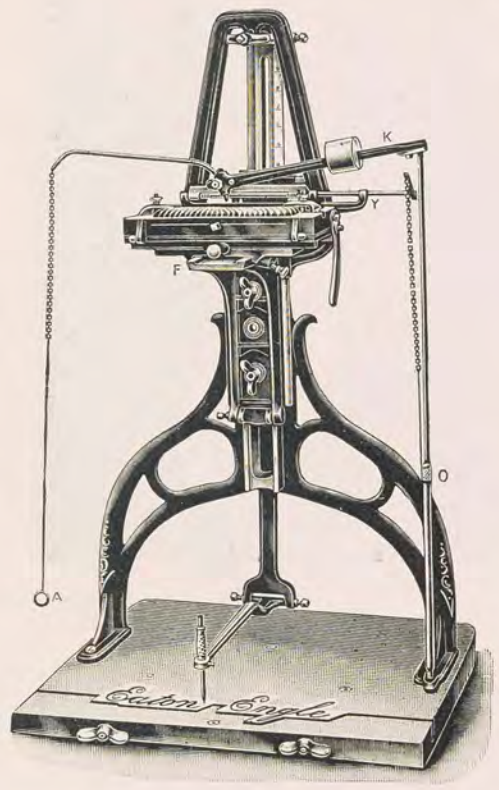
To demonstrate the reliability of our goods, we are willing to submit a package of anything you desire, giving you three days to select what you want and returning the balance at our expense.

STONE BROS., *Popular-Priced Jewelers* *199, 201, 203 MARKET STREET* **CHICAGO**

The Twentieth Century

is fittingly ushered in by this superb number of THE KEYSTONE, and not less so by that remarkable invention known the world over as the

Eaton-Engle Engraving Machine.



The Nineteenth Century has certainly been a marvelous one in respect to the number of inventions and improvements on old methods. To the up-to-date jeweler there is nothing that appeals stronger to his interests and financial standing than one of our machines. It saves time and money; it keeps you and your customers on good terms; it makes new friends for you; it helps to build up and extend your business.

Couldn't engrave; a sale and a customer lost.

This Fall you will be upset by being obliged to engrave an initial on every little thing bought at your store. Your customer will be upset when she learns that she has to wait for you to send it away to be engraved. Of course you've got to pay for having it done; add to this the loss of your time, mailing or express charges, and where does your profit come in on the sale? Besides, how does your customer feel about it?

If you had a machine your customer would take the article away when she left your store, because the engraving would be done by your boy while she waited. It's a well established fact that a pleased customer is the best advertisement a man in business can have. Better think this over.

NOT ONLY FINE LETTERING, BUT SCROLLS, ORNAMENTS, MONOGRAMS, LANDSCAPES, EMBLEMS, Etc., are easily done on our machine.

Jewelers Who Can Engrave By Hand

find our machine a wonderful help in their business. A hand engraver may (and easily does) get out of practice; a machine, never. With a machine, when you want to do a job of engraving you do it so quickly and so well that you wonder how you ever got along without one. Doesn't make a slave of you either! No more sitting up until early morning to "catch up" on your engraving. When you are busy, your wife, or daughter, or clerk can operate the machine for you.

Fig. 1 Fig. 2.

"From a hair line to a broad, bright cut, in a second"—just as by hand. Fig. 1 shows angular adjustment of graver on an Eaton-Engle that gives those elegant, bright cuts, that have made our machine famous. Fig. 2 shows vertical position in which graver is always held on all other styles of machines made previous to ours. Is it any wonder they only did "scratch work"?

YOU MUST ACT QUICKLY

If you wish to get one of these machines in time to use it for the holiday trade. Though we started last Spring to get ready for a larger Fall business than ever before, the orders have come in even faster than we anticipated, and as a consequence our surplus stock has already been exhausted and our factory is now taxed to its utmost capacity to keep up with the demand.

All orders are filled in rotation as received.

Place your order to-day.

If you have not yet become acquainted with the merits of this wonderful machine, write at once for a catalog. It tells you all about it.

Our exhibit at Philadelphia is in Main Building, Section G. 15.

EATON & GLOVER,

87 Nassau St., NEW YORK.

WHY WE CAN GIVE IT

Our large business requires complete smelting, refining and assaying departments. We handle without additional expense and use in our own factories all old gold and silver consigned to us.

If we were in the smelting and refining business exclusively, our expenses and refining costs would be 15 to 20 per cent. of the amount of old metal received, the same as that of other refiners. We therefore place that much higher valuation on all old gold consigned to us.

We Remit the Same Day

consignments are received by bank draft (on which there is no exchange to pay).

Consignments Returned Express Prepaid

in exactly the condition received, if the amount is not up to your expectation.

Send us your large consignments.
Send us your small consignments.
Both receive the same prompt and careful attention.

WENDELL & COMPANY

Smelters, Refiners and Assayers,

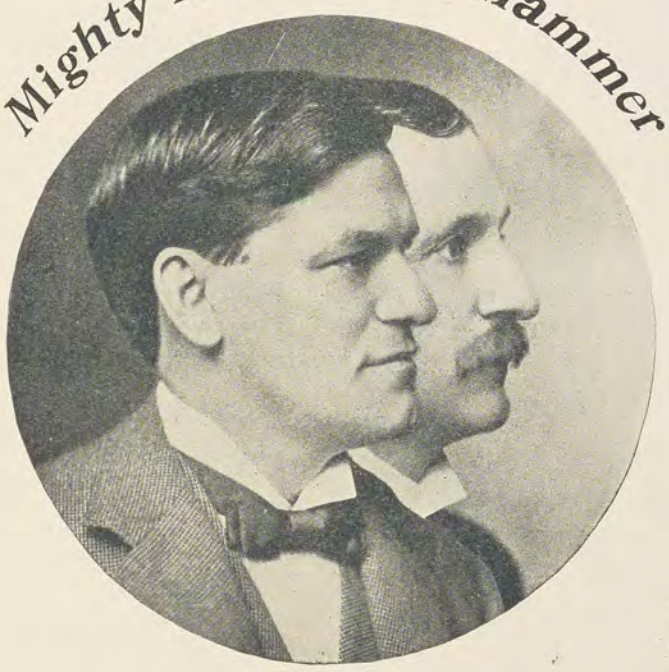
93, 95 and 97 William Street,
Near Maiden Lane,
NEW YORK.

Established 17 Years.

126, 128 and 130 State Street,
Champlain Building,
CHICAGO.

MORE CASH FOR OLD GOLD AND SILVER

Mighty Men O' The Hammer



THE TRADE

will not fail to perceive the great benefit of obtaining the services of two experienced men at the cost of one. The audience never gets tired; each has his own methods, and there is a change of voice and manner; also in case of sickness, it is an invincible argument. We work in perfect harmony, and it makes a degree of success in sales never before known. We are proving that it is the greatest combination of talent ever available.

Send for booklet containing several hundred references and testimonials from all over the country and information in regard to auction sales.

Briggs & Dodd,

334 Dearborn Street,
Room 1230, Chicago, Ill.

OVER 100,000 NOW IN USE

IMPROVED O SIZE ATLAS MOVEMENTS

Every Movement Guaranteed.

NICKEL DAMASKEENED

Price, $8.00
Catalogue List

NEW ISSUE IN NICKEL

NOW READY FOR DELIVERY

Every Movement Guaranteed.

GILT

Price, $7.50
Catalogue List

American Manufacture.
Lever Set, Hunting.
The Best American Movement
ever produced for the money.

SALE UNPRECEDENTED

Write your Jobber for Samples

ATLAS WATCH CO.

9 Maiden Lane,
NEW YORK.

103 State Street,
CHICAGO.

FRENCH STYLE EXPOSED DIALS
ROTARY HAMMER ALARMS

DOUBLE ROLLER
ESCAPEMENT.
DUST-PROOF.

PARKER CLOCKS
REQUIRE BUT
ONE-QUARTER THE
USUAL TIME FOR
REPAIRS.

ENAMELED DIAL.

CUT STEEL PINIONS.
HIGH NUMBERS.

NO PART OF THE
TRAIN DISTURBED
TO REMOVE
MAINSPRINGS.

ENAMELED DIAL.

No. 104. Cut full size.

There is no other make of clock in which the benefits accruing to the Repairer have been studied so advantageously as in these

ROTARY HAMMER ALARM CLOCKS

THESE ALARMS
ARE LOUD AND
DISTINCT
AND CANNOT
GROW WEAKER
FROM USAGE

METAL DIAL
SILVER OR GILT

FOR SALE BY
ALL JOBBERS.

PRICES LOW.
QUALITY THE BEST.
CORRECT IN
PRINCIPLE.
SUPERIOR IN
CONSTRUCTION.

METAL DIAL
SILVER OR GILT.

FOR SALE BY
ALL JOBBERS.

No. 103. Cut full size.

See Next Page

THE PARKER CLOCK CO.

Sole Manufacturers **Meriden, Conn., U. S. A.**

ROTARY HAMMER ALARM

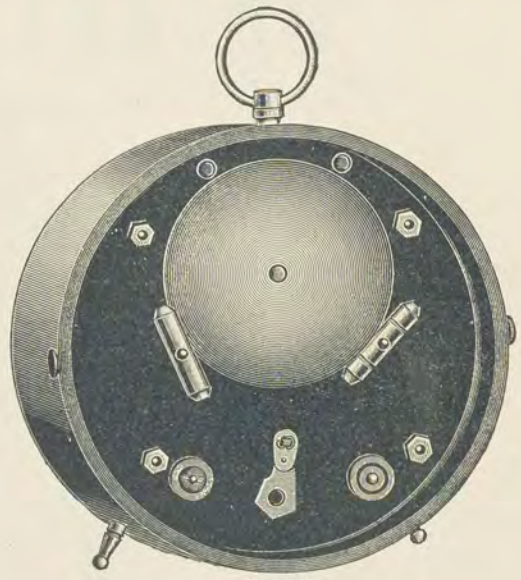
No. 97

FRONT.

TRADE MARK. PARKER.

CUTS HALF SIZE

Dial, 4¼ inches.



BACK.

Has the following mentioned ***SPECIAL POINTS,***

Making it the **BEST** and **CLEANEST** Alarm that has ever been made.

Must be seen to be appreciated. HEAVY BRASS CASE. Nickel-Plated.
Can be drawn from the Case in a second's time by simply pressing the buttons at the sides.

Mainsprings can be removed, also replaced, without disturbing the escapement or the trains.
The hands are easily set to any position on dial circle, even by those having tender fingers.
The steel pallet faces are well polished, and all wheels and pinions have higher number of teeth than any other ONE-DAY CLOCK.
The centrally mounted Alarm Pointer is another important feature, the advantage of which is apparent.

ROTARY HAMMER ALARM

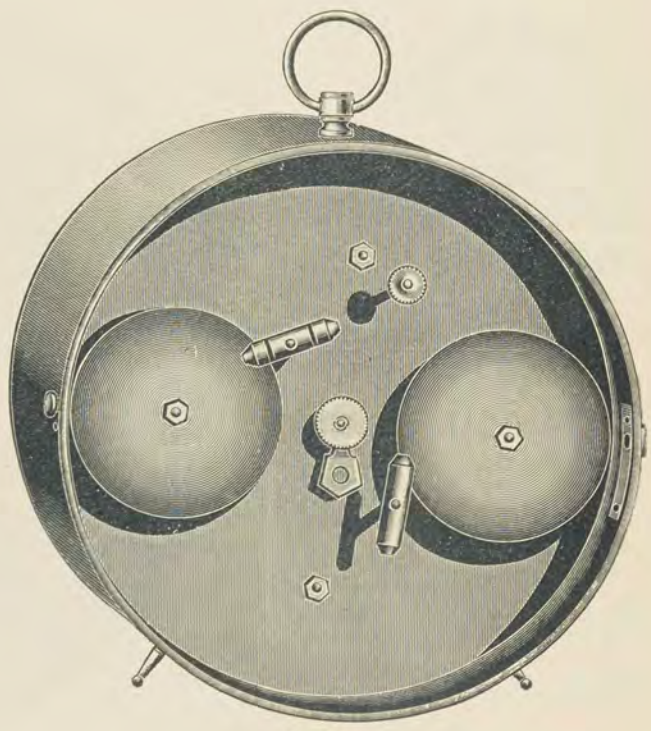
No. 98

FRONT.

TRADE MARK. PARKER.

CUTS HALF SIZE

Dial, 6 inches.



BACK.

THE PARKER CLOCK CO.

Meriden, Conn., U.S.A.

SOLE MANUFACTURERS.

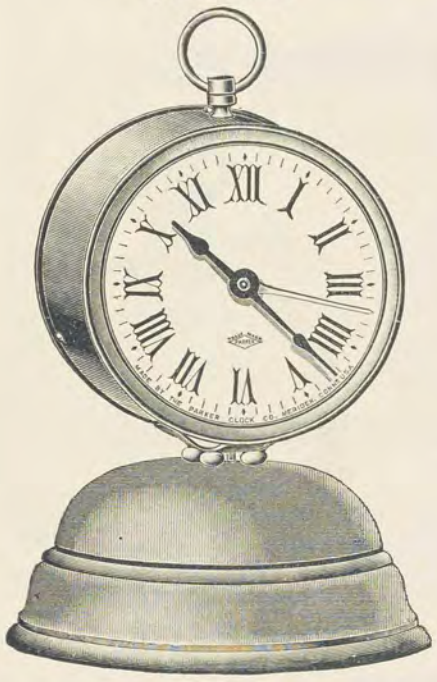
These New Model Clocks can be had from all leading jobbers.

Look for our trade-mark.

These Clocks are being sold by the best jewelers, who want an Alarm Clock that is a good timepiece and thoroughly reliable.

ROTARY HAMMER ALARMS

No. 61

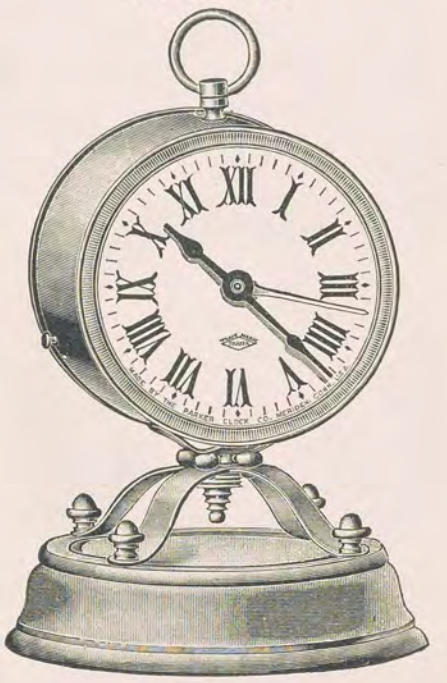


TRADE MARK. PARKER.

CUTS
HALF SIZE

DIALS, 3 INCHES

No. 63



No. 99

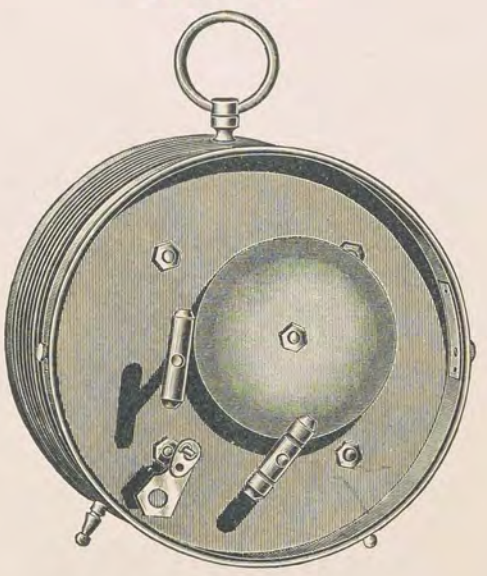
FRONT

TRADE MARK. PARKER.

CUTS
HALF SIZE

DIALS, 4¼ INCHES

No. 99



BACK

No. 100

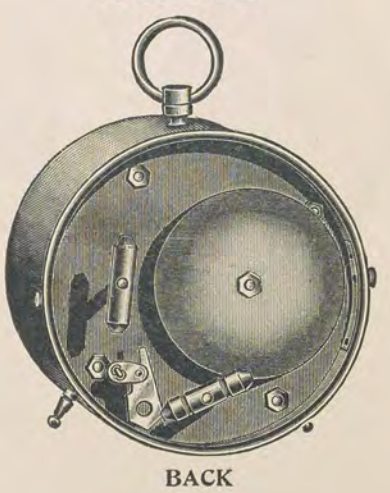
FRONT

TRADE MARK. PARKER.

CUTS
HALF SIZE

DIALS, 3 INCHES

No. 100



BACK

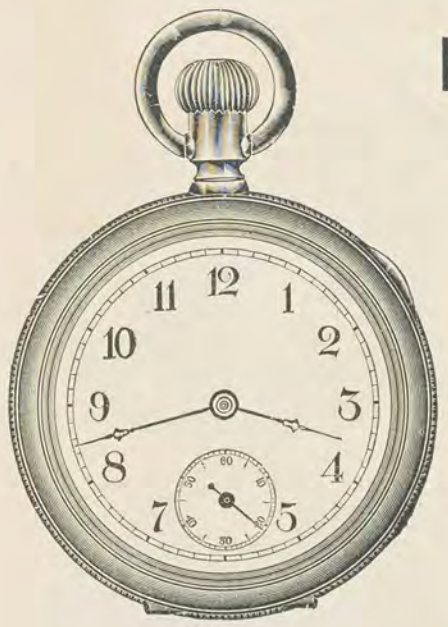
THE PARKER CLOCK CO.,

Meriden, Conn., U. S. A.

—SOLE MANUFACTURERS—

Holiday Trade Fetchers

New York Standard Watches

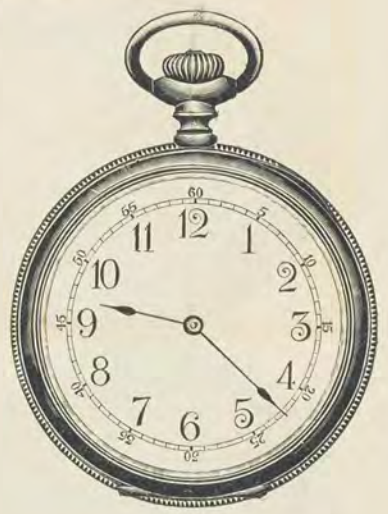


18 Size.

A small line of these goods will stimulate trade.

6 Size.

These goods advertised by you as Leaders will keep you busy.



12 Size.

FOLLOWING PRICES ARE FOR COMPLETE WATCHES:

A 32.	In Nickel O. F. Case,	$4.30	A 37.	In Nickel O. F. Case,	$ 5.44	A 42.	In Silver O. F. Case,	$10.70
A 33.	" Silver " E. T. Case,	6.50	A 38.	" Silver " "	7.36	A 43.	" " Htg. E. T. Case,	10.84
A 34.	" 5-year O. F. 14 K. Filled Case,	7.80	A 39.	" " Htg., "	9.10	A 44.	" 5-year, 14 K. Filled Htg. Case,	11.90
A 35.	" " Htg., " " "	9.62	A 40.	" 5-year Filled Htg. Case,	10.32	A 45.	" " " " O. F. "	11.40
A 36.	" Nickel Htg. Eng. Case,	5.50	A 41.	" " " O. F. "	8.50	A 46.	" Silver Htg. Eng. Case,	11.24

A 112.

Guaranteed to Wear 25 YEARS.

◆

0 Size, 14 K. Filled.

A 113.

A 114.

$10.30

WHILE THEY LAST.

A115.

DIAMOND SET CASES AT RIGHT PRICES.

A 91.

14 K. Solid Gold, with Brilliant Genuine Diamond, **$33.50**

A 92.

14 K. Solid Gold, with 8 Brilliant Genuine Diamonds, **$60.00**

A 93.

14 K. Solid Gold, with 7 Brilliant Genuine Diamonds, **$57.00**

A 94.

10 K. Solid Gold, with 9 Brilliant Rose Cut Diamonds, **$27.00**

A95.

10 K. Solid Gold, with 7 Genuine K. C. Diam. and 2 Rubies, **$27.00**

PRICES ACCORDING TO KEYSTONE KEY.

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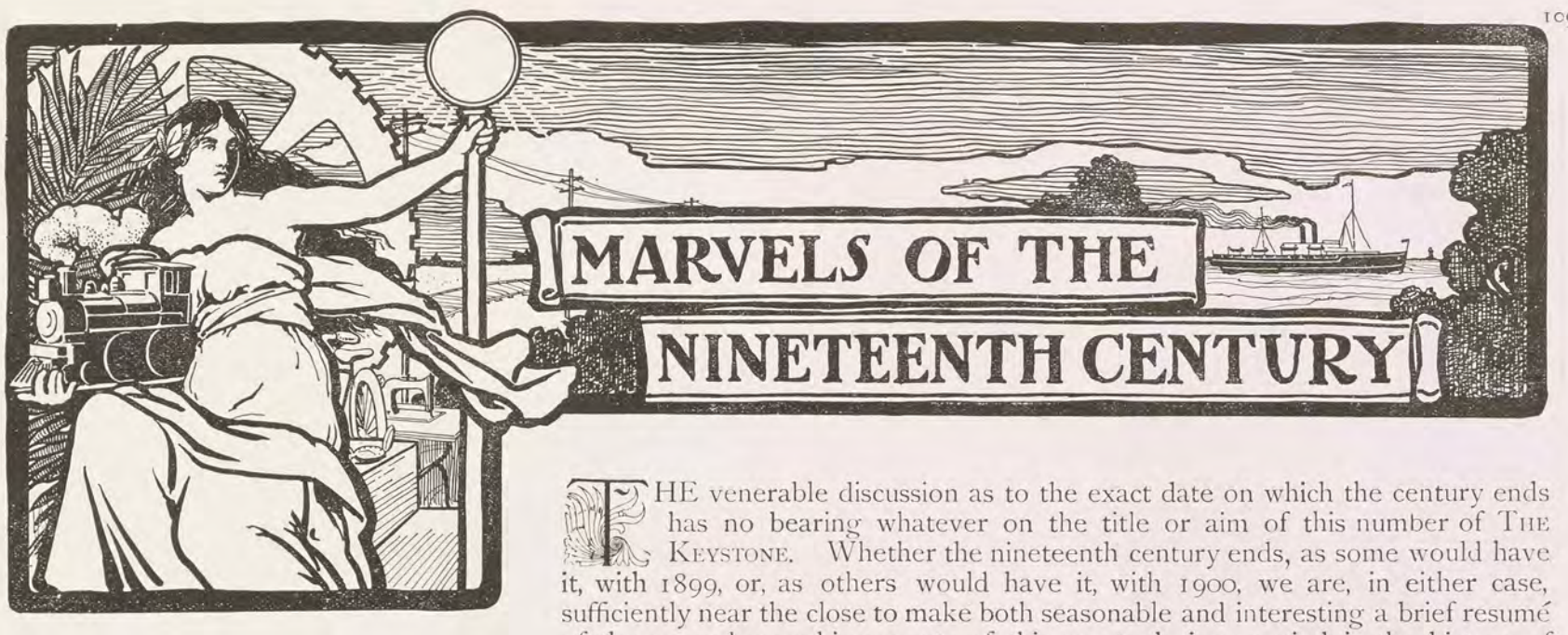

THE venerable discussion as to the exact date on which the century ends has no bearing whatever on the title or aim of this number of THE KEYSTONE. Whether the nineteenth century ends, as some would have it, with 1899, or, as others would have it, with 1900, we are, in either case, sufficiently near the close to make both seasonable and interesting a brief resumé of the marvelous achievements of this most glorious period in the history of recorded time. All time beside has been thrown in the shade by the past hundred years. The inventions, the discoveries, the victories on the fields of thought, are without parallel in the story of humankind.

The Century Summed Up

One of the greatest orators our country has produced magnificently summed up the triumphs of the century in the following eloquent peroration: "In the other centuries there is now and then a peak, but through ours there runs a mountain range with Alp on Alp—the steamship that has conquered all the seas; the railway, with its steeds of steel with breath of flame, covers the land; the cables and telegraphs, along which lightning is the carrier of thought, have made the nations neighbors and brought the world to every home; the making of paper from wood, the printing presses that made it possible to give the history of the human race each day; the reapers, mowers and threshers that superseded the cradles, scythes and flails; the lighting of streets and houses with gas and incandescent lamps, changing night into day; the invention of matches that made fire the companion of man; the process of making steel, discovered by Bessemer, saving for the world hundreds of millions a year; the discovery of anæsthetics, changing pain to happy dreams and making surgery a science; the spectrum analysis, that told us the secrets of the suns; the telephone, that transports speech, uniting lips and ears; the phonograph, that holds in dots and marks the echoes of our words; the marvelous machines that spin and weave, that manufacture the countless things of use, the marvelous machines, whose wheels and levers seem to think; the discoveries in chemistry, the wave theory of light, the indestructibility of matter and force; the discovery of microbes and bacilli, that enables us to stay the plague. The art of photography became known, the sun became an artist, gave us the faces of our friends and pictures of the world's wonders. The cell theory was advanced and science entered the secret house of life."

Robert Fulton,
Inventor of the Steamboat.

George Stephenson,
Inventor of the Locomotive.

The "Century of Invention"

It is recorded that previous to his death Benjamin Franklin, the greatest inventor of the previous century, remarked that nothing would please him so much as to be sealed up and preserved in a cask of good Madeira, and to come to life again a hundred years later, so that he might see what progress the world had made in that period. Progress, indeed! Did not the Maderia strengthen the preserved philosopher's nerve sufficiently, we may well believe that he would drop dead at the sight. So different, indeed, and distinctive from other centuries has the present one been that it has been designated the "Century of Invention," and aptly so, for it has produced a greater relative advance in mechanical and industrial improvements than was recorded in the whole of the previous history of this planet. Franklin, indeed, with his now historic kite, may be said to have been the connecting link or transitional figure between the great discoverers of previous centuries, and the long line which has immortalized our own, and made the mysterious force of electricity the hand-maiden of humanity. Limited space forbids a general roll call, and only permits brief mention of a few of the greatest.

Of the almost countless inventions and discoveries of this wonderful century, thirteen stand out in bold prominence, viz., steam navigation, railways, electric telegraph, telephone, friction matches, gas lighting, electric lighting, photography, the phonograph, Roentgen rays, spectrum analysis, anæsthetics and antiseptics. There have been numberless other inventions of immeasurable importance, such as the plow, reaper, sewing machine, improved printing press, typewriter, bicycle, etc., that played a leading part in the progress of the century, but the thirteen previously mentioned are paramount, in that they profoundly affected the habits, thoughts and even the language of the human race. It is no exaggeration to say that the century's inventions transformed the face of the earth, revolutionized the mode of living, added immeasurably to the individual comforts of mankind and as immeasurably decreased the suffering incident to disease and existence.

Compared with Other Centuries

We can best appreciate the great inventions of this century by comparing them with the important ones in all the preceding centuries. To the Eighteenth Century we may credit the development of the steam engine from the rude but still useful machine of Newcomen to the powerful and economical engines of Boulton and Watt. In the Seventeenth Century, the one great and far-reaching invention was that of the telescope, which, in its immediate results of extending our knowledge of the universe and giving possibilities of future knowledge not yet exhausted, may rank with spectrum analysis in our own era. The barometer and thermometer are minor discoveries. In the Sixteenth Century, we find no invention of the first rank, but in the Fifteenth, printing. The mariner's compass was invented early in the Fourteenth Century. Then, backward to prehistoric times, we find the two engines of knowledge—the Indian or Arabic numerals leading to arithmetic and algebra, and, more remote still, the invention of alphabetical

The "Clermont," Fulton's First Steamboat.

The "Rocket," Stephenson's First Locomotive.

MARVELS of the NINETEENTH CENTURY

S. F. B. Morse, Inventor of Telegraph.

writing. Summing these up, we find only five inventions of the first rank in all preceding time: the telescope, the printing press, the mariner's compass, Arabic numerals, and alphabetical writing—to which we may add the steam-engine and barometer, making seven in all, against thirteen in our single century.

In theoretical discoveries the Nineteenth Century has been equally prolific, though the previous two centuries must be credited with a few discoveries of far-reaching importance. For instance, in the Seventeenth Century we had established, among other scientific truths, the theory of gravitation, Kepler's laws and the circulation of the blood. In the Eighteenth Century was laid the foundation of modern chemistry by Black, Cavendish, Priestley, and Lavoisier; and electrical science by Franklin, Galvani, and Volta. In the Nineteenth Century the chief scientific discoveries are the following: Conservation of energy, molecular theory of gases, the velocity of light directly measured, the earth's rotation experimentally shown, definite proportions in chemistry, the meteoric theory, the glacial epoch established, proof of the great antiquity of man, organic evolution established, the cell theory and embryology, and the germ theory of disease.

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The Steamboat

To return to the thirteen great inventions of the present century we find that one of the greatest came into being in the first decade, and to a Pennsylvanian belongs the honor. On August 10, 1807, Robert Fulton triumphantly steered the Clermont, the first American steamboat, up the Hudson. "Fulton's Folly" was the name the people gave to his projected steamboat. Fulton himself said: "When I was building my first steamboat at New York, the project was viewed by the public either with indifference or contempt, as a visionary scheme. My friends were civil, but they were shy. They listened with patience, but with a settled cast of incredulity on their countenances. I felt the full force of the poet's lamentation.

"'Truths would you teach, to save a sinking land?
All shun, none aid you, and few understand.'"

But "Fulton's Folly" became "Fulton's Glory" on that memorable August 10th, and great has been the sequence. How the inventor would have marveled had his spirit, perched on a convenient cloud, witnessed this present year the launching of the big seven hundred and forty foot Oceanic in Belfast, or the Alabama, the prospective pride of the American navy, in our own city:

"Then Fulton looked; beneath his wondering eyes
Gay steamers lengthen round the seas and skies;
The countless nations open all their stores,
Load every wave, and crowd the lively shores;
Steamers in mingling mazes streak the air,
And Commerce triumphs o'er the rage of war."

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The Locomotive

Fulton's steamboat was soon followed by Stephenson's locomotive, and the latter was as much sneered at as the former 'till actual results brought conviction. When, in 1825, Stephenson appeared before a committee in the House of Commons, he presented a striking picture of genius badgered by ignorance and self conceit which saw visionary dangers in his proposed steam railway. "I was subjected," says the great engineer, "to the cross examination of eight or ten barristers, purposely, as far as possible, to bewilder me. Some member of the committee asked me if I was a foreigner, and another hinted that I was mad. But I put up with every rebuff, and went on with my plans, determined not to be put down."

The objections then urged to the locomotive are irresistibly laughable in the light of later developments. "The poisoned air from the locomotives would kill the birds," argued one. "Horses will go distracted," said another. "What," asked the learned *Quarterly Review*, "can be more palpably absurd and ridiculous than the prospect of locomotives traveling twice as fast as stage coaches! We trust Parliament will limit the speed to eight or nine miles an hour." But popular fears were soon dispelled, for Stephenson's "Rocket," in the life of the builder, attained a speed of thirty-five miles an hour, a wonderful achievement, indeed.

Alexander Graham Bell, Inventor of the Telephone.

Railroad building in the United States began in 1828. On the Fourth of July, in that year, the first sod of the Baltimore and Ohio Railway was cut, and the line was completed and opened for traffic in the following year. Other roads quickly followed. The progress since made is best told by some figures from the latest report of the Interstate Commerce Commission. The report tells us that in 1898 the total number of railways in the United States was 2,047, and the total number of miles of track in operation was 247,523. To operate this system required 36,234 locomotives and 1,326,174 cars. The number of passengers carried during the year was 501,066,681, and the freight 879,006,307 tons. The gross earnings for the year reached a total of $1,247,305,621!

Of course the "Clermont" and the "Rocket" were crudely imperfect compared with the great steamships and thundering locomotives of the present day. Probably the two greatest inventions that had to do with this perfection were the screw propeller of Ericsson and the Westinghouse air brake. Without the latter, for example, fruit could not be brought from California to the East, and from Florida to the North. The carrying of perishable goods over such distances necessitates quickness, and the air brake alone makes it possible to run trains on fast time with safety.

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Origin of Electric Traction

Electric power now plays a most important part in railroading, but not all are aware that the idea of electric traction originated so early in the century. The first step toward the electric railway was taken by a Vermont blacksmith, Thomas Davenport, who devised a rudimentary electric motor, and in 1835, constructed a little circular electric road, which was exhibited at Springfield and Boston. Siemens is "the practical originator of modern electric traction." During the summer of 1879, the first electric railway was put in operation by the firm of Siemens & Halske at the Industrial Exposition in Berlin.

Not 'till 1880 was any real work in electric railroading done in America. Edison was, in experimental work, first in the field; but Stephen D. Field was first in the projection of such work. May 29, 1879, F. L. Pope writes: "The credit of priority in the invention of the electric railway in its modern form—the moving electric-motor on the car connected by electric conductors with a stationary dynamo,—I believe to be justly due to Stephen D. Field, now of Stockbridge, Mass., who was living in San Francisco in 1877 The road installed in Cleveland, Ohio, thrown open to the public in July, 1884, was the first electric system to be actually operated in competition with horses on street railway lines; it was about two miles long. Lieutenant Frank J. Sprague," says Pope, "designed, carried out, and completed the first installation of electric railroading on a large scale in the world, in Richmond, Va., in 1888." It was not 'till 1888 that the electric railway became a practical commercial success. Yet at the end of the year 1898 there were 1089 lines in operation in the United States, the total track mileage of which was no less than 14,915 miles.

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Evolution of the Bicycle

While dealing with the matter of transportation, the bicycle, now so universally used, must not be overlooked. Away back in 1808 appeared in Paris the famous "hobby horse," improved by Baron Von Drais, in 1818, and shortly after patented in England. It consisted of a bicycle in form, worked by the rider's feet touching the ground. Various improvements were made, but not for almost forty years did anyone think of putting cranks on the front wheel. McMillan, in 1840, and Dalzell, in 1846, are said to have adapted crank-driving to the "hobby-horse."

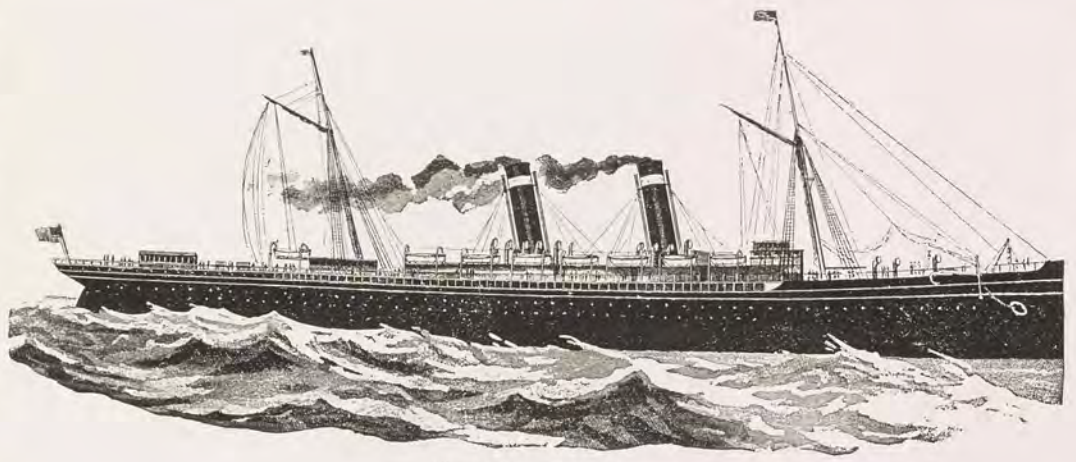
Pierre Lallement, a French mechanic, and maker of baby coaches, first observed that foot-cranks would work as well on a two wheeled as on a three-wheeled velocipede. He proceeded to act on the discovery and made the old "bone shaker" which was exhibited by his employer, Michand, at the Paris Exposition, 1865. In 1866, he patented it in the United States. In November, 1868, C. K. Bradford, of the United

T. A. Edison, Inventor of the Incandescent Light, Etc.

MARVELS of the NINETEENTH CENTURY

States, furnished the suggestion of the rubber tire; then came the pneumatic tire. So fruitful was the year 1868, that three out of the six important features of this peculiar vehicle were then brought out. To the later development of cycling it is needless to refer.

The latest improvement in methods of transportation is the automobile, in the propulsion of which compressed air, gasoline, steam or electricity may be used, but as the machine is yet in an evolutionary state further reference to it is unnecessary. That the first decade of the next century will find it in general use is, however, a certainty.



The Modern Steamship.

But the practical application of electricity has furnished the great marvels of the century. How amazed revivified Franklin would be at the varied utilization of the magic fluid which he conducted from the clouds with his kite. We can send a message in a few seconds to the most distant point of the earth, and speak with the voice across a thousand miles of distance. Think of it! When the projected cable has been laid from San Francisco to Manila it will be practicable to send a message around the world in three seconds. The most hallucinative dreamer of a hundred years ago could not have conjured up in his imagination such a seemingly impossible feat as this. But for the actuality it would tax the credulity of the mass of people in our own day. The time is past, however, when mankind is disposed to marvel at anything.

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Telegraph and Telephone

The public use of the electric telegraph dates not earlier than 1848, though the idea that magnetism could be applied for distant communication is as old as Galileo. To Samuel Finley Breese Morse, of our own country, belongs credit for the invention. Early in the thirties, while studying in Europe, he became convinced that electricity might be made a means for conveying information, and in 1837 he exhibited an insturment by which an electrical current was passed through 1700 feet of wire. In the spring of 1843 Congress appropriated $30,000 for the construction of a trial line of telegraph, and on May 24, 1844, the first line from Washington to Baltimore was formally opened. The telegraph was not the only triumph of Morse. By careful experiments he demonstrated the feasibility of submarine cables, and with Professor Draper, was the first successful photographer of living subjects. His is one of the greatest names on the American roll of fame, and it was pathetically appropriate that his last public appearance should have been at the dedication of a statue of Benjamin Franklin.

Sir Henry Bessemer, Father of the Steel Industry.

The telephone came into use more recently than the telegraph, but the possibility of the transmission of articulate speech by means of currents of electricity, was discussed much earlier. In 1837 Dr. C. G. Page, of Salem, Mass., made an important discovery as to the sound from an electro-magnet, coincident with closing or breaking the electric current, and discussed the musical note produced by the rapid revolution of the armature of an electro magnet in front of the poles. In 1854 Charles Bourseul published, in Paris, an article on the electric transmission of speech. In 1860, Reis, of Frankfort, first applied the principle of the telephone, but though sound was transmitted, the quality of the sound was entirely lost. There are several claimants for priority in the discovery of the principle of the articulating telephone. The discoveries of Elisha Gray, of Chicago, and Alexander Graham Bell, of Boston, appear to have been practically contemporaneous, and attained by different lines of study. The articulating telephone of Bell was first shown at the Philadelphia Centennial Exposition, and in its present form most readers of THE KEYSTONE are acquainted with its construction.

The development of the telegraphic and telephonic systems has been astounding. The high-water mark of the Western Union Telegraph Company, which probably does three-fourths of the business in the country, was reached in 1893, when it handled 66,591,858 messages, for which it received $24,978,000, an average of thirty-five cents for every man, woman and child in the country. This record will no doubt be far surpassed this year. In 1898, the number of conversations conducted through Bell telephones was estimated at 1,231,000,000, from a test count of 3,823,070 exchange connections made in a single day. At the end of 1897, the Western Union Telegraph Company had 841,002 miles of telegraph wire in operation, enough to reach to the moon and back and go several time around the earth. At the end of 1898, the various licensees of the American Bell Telephone Company had a total of 772,989 miles of wire, while the lines of the independent companies would doubtless bring this figure up to the lines of the Western Union. Allowing a reasonable amount for the lines of other telegraph companies, would make a total of about 2,000,000 miles of wires in the United States alone for purposes of communicating by electrical methods. In the city of Chicago alone about 220,000 connections are made daily, which, with an average of three and one-half miles of wire per connection, would make about 770,000 miles of wire connected daily in one city for telephonic purposes alone.

While dealing with the subject of electricity, we must not omit the achievement of Tesla, which makes it possible to transmit electric power to long distances. By all odds the most important long-distance electrical power enterprise is that of the Niagara Falls Power Company, in the utilization of part of the energy of the great cataract. By means of its plants on both sides of the Niagara river this company will develop 350,000-horse power; and its power house, canal and tunnel on the American side are adequate to the production of 100,000-horse power of electrical current, generated by the Tesla two-phase system. An expenditure of $3,000,000 has been made and is now yielding an income. The development of the system of transmitting electrical power, irrespective of distance, will, no doubt, be one of the early achievements of the next century.

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The Age of Steel

He would be more than mortal who would assign to their proper niches in the temple of fame the host of inventors and scientists of this century, but an exalted place is certainly due to the distinguished Englishman whose discovery inaugurated the age of steel. Sir Henry Bessemer invented the process which takes iron, burns the carbon out of it, and then adds to it just the quantity of carbon requisite to make fine steel. This process of manufacturing steel rendered the finished product so cheap that it is now in universal use. As a result of it we have the altitudinous "sky-scraper," the steel ship and steel rails. We can well imagine that the first marvel to astound a revivified Franklin on his return to this sublunary sphere, would be the modern thirty story office building—a type of structure rendered possible by two inventions, the passenger elevator and improved steel. Nowadays every very high building is erected on a skeleton of steel, which has to be of a certain quality in order to bear the weight, and the production of such metal depends on the process above referred to. As for the passenger elevator, the first devices of this kind were introduced not more than thirty-five years ago.

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McCormick's Reaper

Wonderful, too, are the improvements in agricultural machinery, all of which must be credited to this wonderful century. Chief of these is McCormick's reaper, which may fairly be said to have made this country agriculturally, for never could the vast grain fields of the west be reaped by hand. Without the inventions of Cyrus Hall McCormick the illimitable wheat fields, the bread-bearing areas of the world would have remained as of yore beyond the grasp of man. Large areas could be planted, but scarcity of help hindered the harvest. The crop was ruined by over-ripeness and storms. The area that it was possible to till was limited. Before the invention of the reaper, the average size of the farms in America was about twenty-five acres, and now it is nearly 150 acres. The reaper not merely lessened human toil, but it increased the value of every tillable acre. For the first time in history it made bread cheap in the temperate region—cheap and constant. It banished the fear of our fathers—famine times—the fear of the failure of the harvest. This glorious invention has doubled the food resources of all nations. It ensured the regular food supply of man.

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To Cyrus McCormick is due the enlargement of the results from the world's agriculture. To him is due the enormous growth in wheat raising, and the creating of the hay harvest as the most valuable of all the crops our land produces. To him is due the glory of emancipating the agriculturists of the entire earth from the cramping, back-breaking, uncheered toil of the sickle. It was a great deed!

Other, and great names, figured in the emancipation of the "man with the hoe," and to each one may his share of glory be given.

Cyrus H. McCormick, Inventor of the Reaper.

The Printing Press

To Robert Hoe, who came to this country in 1803, we are indebted for the first printing presses of iron. The printing press, in its now perfected form, is one of the most wonderful of all mechanical achievements. In its latest form the newspaper press prints several colors at one impression, folding, stitching, and counting in an hour twelve thousand colored supplements of twenty-four pages each. The presses used by the great magazines move at a lower speed, but do more perfect work, several highly specialized patterns of machinery being employed, according to the paper used and the kind of printing to be done. The machine that attaches the cover to a magazine is another ingenious device of recent invention, one of the many modern improvements that have made it possible to place good literature before the million at the low prices that now rule. There could be no better illustration of the progress of mechanical art during the present century than is furnished by the development of printing machinery. In 1800 the entire process of making a book or a newspaper was done by hand. Indeed, newspapers, as we know them, practically did not exist, and the age of illustration, with its multitude of patented processes for producing and multiplying pictures, was yet to arrive. In those times paper was made almost exclusively of rags, and was very costly. Nobody had thought of utilizing, for paper making, the material of the forests, which are now being devoured at the rate of thousands of square miles annually for the production of the daily prints. Still more recent is the perfection of the linotype, or mechanical compositor, which sets type with great accuracy and rapidity, casting the molten metal as fast as the words can flash through the mind and fingers of the operator who transcribes the "copy." It would be difficult to name an invention of the century which tended more to the progress of humanity than the improvements in printing machinery. These improvements have so cheapened literature that the most exclusive classics are within reach of the humblest individual in the land, and the daily paper, with its wealth of information from all parts of the country, is served up with breakfast in the humblest home. Knowledge is, of course, the basis of all progress, and the broad-cast dissemination of knowledge has been made possible primarily by the improvements in printing machinery.

Sir Joseph Lister, Father of Antiseptic Surgery.

Dr. W. T. G. Morton, the Father of Painless Surgery.

Antiseptics and Anaesthetics

Our readers will pardon a digression from the mechanical triumphs of the century to enable us to refer to two great benefactors of humankind, Sir Joseph Lister and Dr. W. T. G. Morton, the father of antiseptic surgery and the father of anæsthetic surgery respectively. There are great names, also, in the medical field to whom humanity owes much. In fact, the benefits conferred upon hundreds of millions by the prevention and the cure of disease by the skillful physicians, surgeons and dentists of this century, place medical progress on a par with other most wonderful and beneficent achievements of the times.

"I will have some way yet," said Morton, in August or September, 1846, "by which I will perform my operations without pain." And he did. Boldly and heroically he made the experiment upon himself; and, on September 30, 1846, inhaled ether from a handkerchief, shut up in his room, seated in his own operating chair. He speedily lost consciousness, and in seven or eight minutes awoke, in possession of the greatest discovery ever revealed to suffering humanity. The world knows the result. Antiseptics have proved no less of a blessing than anæsthesia. All are aware by this time that the evil effects which follow wounds and surgical operations, are due to the presence of microscopic organism, and the effect of their antiseptic treatment, as first practiced by Lister, is marvelous. No roll of the great ones of the century would be complete without the names of Lister and Morton.

The Sewing Machine

Who supposed, in 1880, that such a thing as a machine for sewing would ever be devised? Attached to the earliest model of Elias Howe's invention, exhibited at the Patent Office, is a label on which is written the couplet:

I am the iron needlewoman,
Born to toil but not to feel.

It may be doubted very seriously whether the sewing machine has lightened the labors of the unfortunate sewing woman, who is the most typical victim of modern civilization. In fact, the "Song of the Shirt" is probably sung in a higher key today than ever before, the invention of the machine having simply resulted in an increased requirement of production for a given wage. However, the benefits bestowed by it are seen in the enormous cheapening of garments of all kinds, which has brought comfortable clothing within reach of the poor. This, indeed, is one of the features of modern progress, even the best clothing being now obtainable at such small cost that no man or woman not actually poverty stricken can have an excuse for not being well dressed. It may be mentioned here that cheap and good shoes, attributable to new machinery, have been known only within the last few years.

The reaper, the printing press, the sewing machine and the typewriter, are indicative of the great perfection which has been attained in all kinds of machinery. The textile industries, for instance, are well nigh the creation of the last hundred years. Up to a little more than a century ago spinning and weaving were all done by hand. Since then the whole development of these industries has been through invention, and this refers not merely to looms and "mules," but to contrivances for the utilization of steam power and water power.

Prof. Bunsen, Inventor and Scientist.

The Art of Photography

The discovery of the art of photography and its development to its present perfection, has been exactly contemporaneous with the century. The honor of having been the first to produce pictures by action of light on a sensitized surface, is now generally conceded to Thomas Wedgwood, an account of whose researches was published in 1802. M. Niepce, of France, in 1814, was the first to enjoy the satisfaction of producing *permanent* pictures by the influence of solar radiations. Daguerre began in 1824 the experiments which eventually led to the discovery of the daguerreotype process. The discovery of the daguerreotype was announced in 1839, and although this process has since become obsolete, it was really the first that was of any practical value. Since then the art of photography has been developed to a wonderful extent, and perfection will probably be reached when colors can be reproduced. Bright minds are now at work on color photography, but whether it may yet be recorded among the triumphs of the century is doubtful. The

MARVELS of the NINETEENTH CENTURY

biograph is the latest marvelous outcome of the developed art of picture-taking. Simultaneous with the evolution of the photographic art has been the evolution of the camera to a greater and greater degree of perfection, until to-day this instrument can perform its work almost without human guidance. The phrase, "You press the button ; I do the rest," as applied to camera perfection, embodies a degree of progress quite characteristic of this wonderful century.

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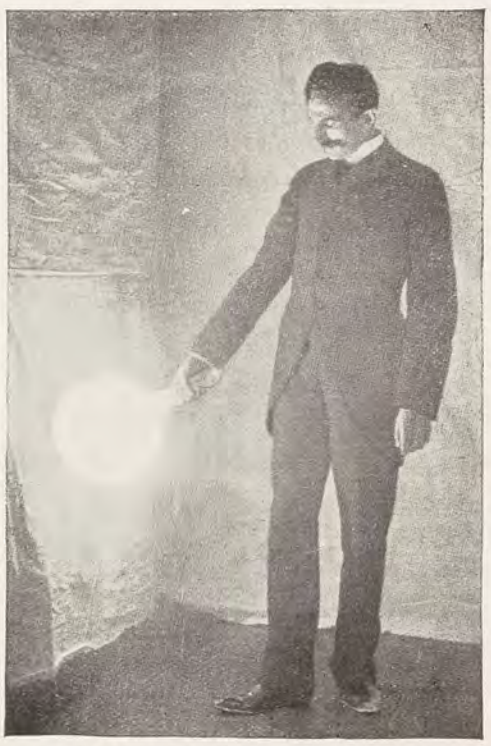
The Roentgen Rays

In connection with the subject of photography we can appropriately refer to the accidental discovery of the X-rays by Prof. Roentgen, of Wurzberg. Back in 1865 Prof. Crookes made the vacuum tube, which bears his name, by exhausting a glass bulb as far as possible and passing an electric spark through it. In 1894, Lenard noticed that the emanations from the negative pole or *cathode* of a Crookes vacuum tube passed through thin plates of metal and solid planks of wood, and Hertz discovered that these rays were sensibly deflected by a magnet. In 1895, Dr. Roentgen, of Wurzburg, working with a Crookes tube, noticed that some photographic plates in his laboratory had been affected, and this led him to the discovery that certain rays emitted by the tube, now known as X-rays or Roentgen rays, were photographically active, and that to them substances were transparent which are opaque to light. He thus photographed through thick books and wood ; and further found that flesh is transparent to these rays, so that the bones of a living being can be photographed. One would almost imagine that Dickens, in his description of Marley's ghost, had foreseen this discovery when he says "his body was transparent, so that Scrooge observing him and looking through his waistcoat, could see the two buttons on his coat behind." Already the discovery has been applied by the surgeon to diagnose fractures, dislocations, and foreign bodies. Additional value has been given it by the discovery that these rays can be rendered visible by means of a screen of platino cyanide of barium.

G. Marconi, Inventor of Wireless Telegraphy.



Nicola Tesla, Inventor of Electric Oscillator.

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Progress in Lighting

Not the least wonderful marvel of the century is the development of the art of lighting—the devising of illuminants which rival the sun and make merry with the god of night. The use of coal gas for lighting purposes, the glass chimney of the oil lamp, the introduction of petroleum, the lime light, the electric arc and electric incandescent lamp, have placed at our disposal artificial sources of illumination far exceeding anything which could have been anticipated in previous centuries. Even the useful friction match had not been heard of 'till this century. It was in 1827 that the lucifer match came into use. Think what a revolution in human affairs has been brought about by this little invention ! Its discoverer deserves to be called a second Prometheus. And it were well, perhaps, that the little match was not in existence in an age that had neither fire engines, fire extinguishers or fire escapes, all of which are products of the present century. Then again, great strides have been made in devising fire-proof material. The woodwork of some office buildings is now made fire-proof throughout, being rendered absolutely non-combustible by saturating it with mineral salts.

If we try for a moment to realize how inconvenient existence would be without matches, we can better appreciate the importance of this invention. One of the first forms of this useful article was the brimstone match, made by cutting very thin strips of highly resinous or very dry pine wood, about six inches long, with pointed ends dipped in melted sulphur. Thus prepared the sulphur points instantly ignited when applied to a spark obtained by striking fire into tinder from a flint and steel. This was in almost universal use 'till about 1825, when it was displaced by several ingenious inventions in rapid succession, until the Lucifer match appeared. So popular did these matches become that their name has been popularly applied to other kinds since invented.

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Phonograph, Wireless Telegraphy, Etc.

There are many other inventions of vast importance which are so recent that extended mention of them is unnecessary. Edison's phonograph is now found in many homes. Means of preserving and reproducing articulate speech, music, etc., is an achievement worthy of the "wizard." G. Marconi reported the recent international yacht race by means of his wireless telegraph, and our own Tesla, of electric oscillator fame, is nursing the possibility of telegraphing without a wire to the Paris Exposition next year. At the end of a century so full of marvels there is little room for incredulity. A great discovery of the century was the so-called "cyanide process" in gold mining. This process has made it possible to work low grade ores at a profit, and to this invention is due the development of the mines of the Rand in South Africa, which now yields eighty million dollars' worth of gold per annum. If it were not for the cyanide process, they would not be worth a cent. Now comes Edison with yet a newer process, by means of which, it is claimed, we can profitably extract gold from still lower grade ores. In fact, there are indications that we are on the threshold of a golden century. Recent discoveries of gold fields and new methods of extracting the metal from low grade ores, removes all anxiety as to the world's gold supply.

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Liquid Air

And now, more marvelous than all, if we credit the predictions of enthusiasts, we have the wonderful fluid, liquid air. It has, we are told, startling properties and incredible possibilities. It will do the work of coal, ice and gunpowder, and furnish limitless motive power at nominal cost. At least, so it is said, but it remains for the future to tell the story. Charles E. Tripler has now devised machinery which accomplishes its liquification in such quantity as permits of a thorough investigation of its curious properties, and the period of achievement may be soon expected to begin.

Charles E. Tripler, Burning Steel in Liquid Air.

We almost forgot the great Bunsen, inventor of the Bunsen burner, the hot blast and the Bunsen battery cell. His studies in electrolysis were most profound, and in collaboration with Kirchoff, he practically created three special branches of science—spectroscopy, as a department of optics ; spectroscopic astronomy and spectroscopic chemistry.

As we are now reaching the close of our alloted space, we can only mention such important miscellaneous achievements as the making of needles and pins by machine, the barbed wire fence, artificial stone, artificial fuel, artificial limbs, the breeches buoy, the hot water bottles of rubber, cold storage for preserving meats, petroleum, laughing gas, glucose, starch production from corn, carbonated beverages, bundle carriers in shops, condensed soups and other condensed foods, high explosives, liquid oxygen, liquid carbonic acid, etc.

We might predict some of the prospective achievement of the next century, but why anticipate?

"Like Galileo, watch I for a star.
Patience ! It sweeps not into my small ken ;
I need an instrument too great by far.
One hundred years from now—
I'll see it then !"

History of the American Watch

The Father of American Watchmaking — Builders of the Automatic Watchmaking Machinery — Wonderful Growth of the Industry

A PROMINENT place among the marvels of the century must certainly be assigned the American watch. Its right in this regard is patent to the readers of THE KEYSTONE, most of whom are on speaking terms with its most diminutive parts. We must not, therefore, dismiss the achievements of the century without referring, at least briefly, to the inception and growth of the now immense watchmaking industry. There is certainly no more glorious tribute to the wonderful genius and skill of the American mechanic.

IN the town of Freeport, Maine, there was born, in the year 1812, a son to a shoemaker. It is said that when only ten years old this boy worked at carrying a mason's hod in the village of Topsham. Three years later he was earning his own living by sawing wood in the town of Brunswick, to which place his father had removed. At fifteen years of age he was working at his father's trade of shoemaking; but having a taste for mechanical matters, he became tired of cobbling, and when eighteen years old he was apprenticed to James Carey, a Brunswick watchmaker. Three years later he went to Boston to perfect himself in his trade. During the next two years he had the benefit of advice and instruction from one of the best watchmakers of that day.

Aaron L. Dennison.

At that period he gave evidence of his comprehension of what workmanship *ought not to be;* for he wrote as follows: "Within a year I have examined watches made by a man whose reputation at this moment is far beyond that of any other watchmaker in London, and have found in them such workmanship as I should blush to have it supposed had passed from under my hands in our lower grade of work."

It is not strange that, having detected in the watches of foreign manufacture errors serious enough to call forth such a severe criticism as that just quoted, the young man should soon be studying upon the problem of manufacturing watches in such a way as to avoid the errors and deficiencies which he so strongly criticised. Four years later, in 1839, he had established himself in the watch and jewelry business in Boston, and, concerning his thoughts and schemes at that period, he, a few years later, wrote as follows: "The principal thinking up of the matter was done when I was in business at the corner of Bromfield and Washington Streets, Boston; and many a night, after I had done a good day's work at the store, and a good evening's work at home in repairing watches for personal friends, I used to stroll out upon the common and give my mind full play upon this project. And now, as far as I can recollect what my plans then were, as to system and methods to be employed, they are identical with those in existence at the principal watch factories at the present time."

IT was years, however before his ideas were embodied in brick and mortar, in revolving shafting or active machine. Money was needed, and that in sums far beyond the ability of the young man to command. But in 1849 he succeeded in interesting in his watchmaking scheme Mr. E. Howard, who had in his own mind another pet scheme for a manufacturing business, which since that time has in other hands been developed to large proportions, but at that early date was perhaps a novel scheme. Mr. Howard's scheme was the building of steam fire engines, he having at that time made some hand engines; but he was persuaded to abandon his own project and join in the undertaking to establish the manufacture of watches on a plan then wholly untried, but which nevertheless seemed promising. But could he have seen the vexations, the perplexities and the disaster that subsequently befell this pioneer in the watchmaking business, its attempt would doubtless have been abandoned. Neither of the two young men possessed the capital indispensable to even the starting of the enterprise. Years of thinking and planning had aroused in one a wealth of enthusiasm, which was certainly of no little value; the other, in the manufacture of standard weights and measures, had acquired somewhat of manufacturing experience and an appreciation of accurate workmanship. The important thing, therefore, was to secure the interest and co-operation of some capitalists. This indispensable factor was found in the person of Samuel Curtis, who was so moved by the persuasive eloquence of the young men that he consented to advance the initial capital to the amount of $20,000. In so doing he showed his faith in the new enterprise, a confidence which, despite a repetition of disasters which have befallen many subsequent attempts to inaugurate and prosecute the business of watchmaking, seems yet to inspire many a man. There seems to be a subtle fascination in the idea of watchmaking which has lured many a man to financial ruin, and the glamour of false hopes has enticed many a man into connection with watchmaking enterprises which resulted most disastrously. Mr. Curtis's money went into the business, but it never returned to him; yet who shall say that it was lost?

Ambrose Webster.

The securing of this capital determined the question of American watchmaking and gave promise that the enthusiasts' dream should become an accomplished fact. As a first step toward that result it was decided to investigate the manufacturing methods then in use in the watchmaking districts of England, and at the same time to arrange for the purchase of certain classes of material, such as jewels, enamel and watch-hands, articles not at that time readily procurable in American markets. At the conclusion of a few months of such preliminary investigation the active work was commenced. Experimental models were made and some machinery was commenced. In October, 1850, a factory building was commenced, which was completed in the following January. This was located on Hampden Street in Roxbury, now comprising that part of Boston known as the Highlands.

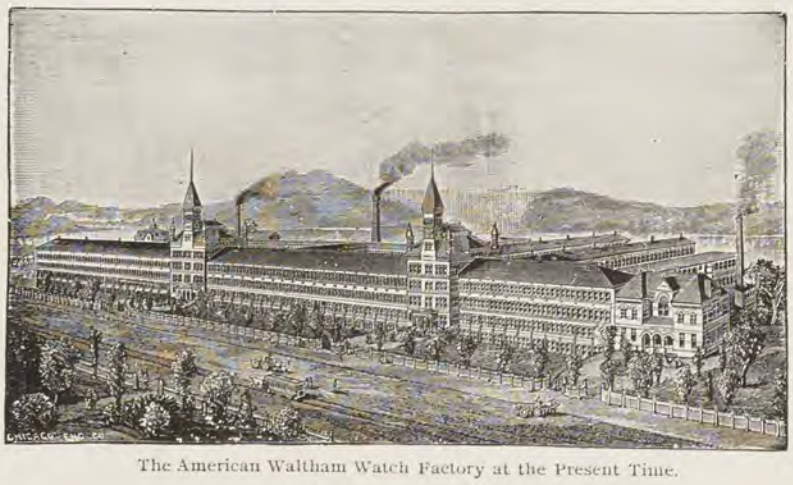
The Original Waltham Factory.

JUST here it may be proper to mention the fact that in 1838 two brothers, James and Henry Pitkin, attempted the manufacture of watches at Hartford, Conn. It is said that they made about 800 movements, but at a cost exceeding that of imported movements, which fact sealed the fate of that enterprise, which has passed into tradition, if not into history.

Among the persons employed by the Pitkin brothers was a young man by the name of Nelson P. Stratton. After the collapse of the Hartford enterprise he went to Boston and secured a position with a firm of jewelers; but the managers of this new enterprise, naturally believing that Mr. Stratton's experience would be of much value, induced him to join them. Doubtless this was a wise step for all parties.

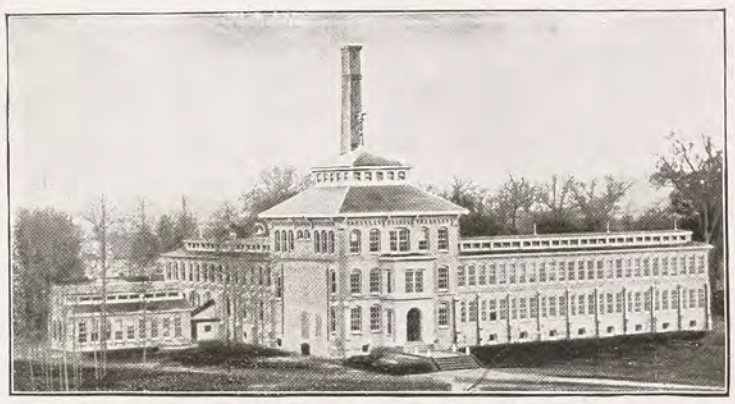
Very little is known of the theory of manufacture at the Hartford factory, although it is understood they used some special machinery. But the originator of the Waltham factory, having studied the machinery employed at the United States Armory at Springfield, Mass., in the manufacture of army muskets, was convinced that watches could be made on the same general system, that is, of manufacturing, in large numbers, pieces which should be so uniform in dimensions as to be practically interchangeable. This method is what constitutes the American system of watchmaking, as distinguished from the practice which still prevails to a large extent in all the watchmaking districts of Europe where reliance is placed on the personal skill of individual operators.

IN this brief sketch of the early history of this industry and of the steps leading to its establishment we have not yet made mention of the name of its originator, but we are glad to give you at this point not only the name, but a very good pictorial likeness of the "Father of American Watchmaking," Mr. Aaron L. Dennison. He lived to see the hopes of his young manhood more than realized, and the processes which but dimly appeared in his enthusiastic vision of the future, become actual and successful performances. Mr. Dennison died in England a few years ago.



The American Waltham Watch Factory at the Present Time.

FROM this digression we return to matters of history, to say briefly that work was carried on for two or three years at the Roxbury factory. A few watches were completed, and placed on the market in 1853, the first one hundred of which bore the then name of the company—the "Warren Manufacturing Company." The next few hundred were named "Samuel Curtis," in honor of the gentleman who had contributed the capital which made the enterprise possible. Here we may appropriately close the first chapter in this history.

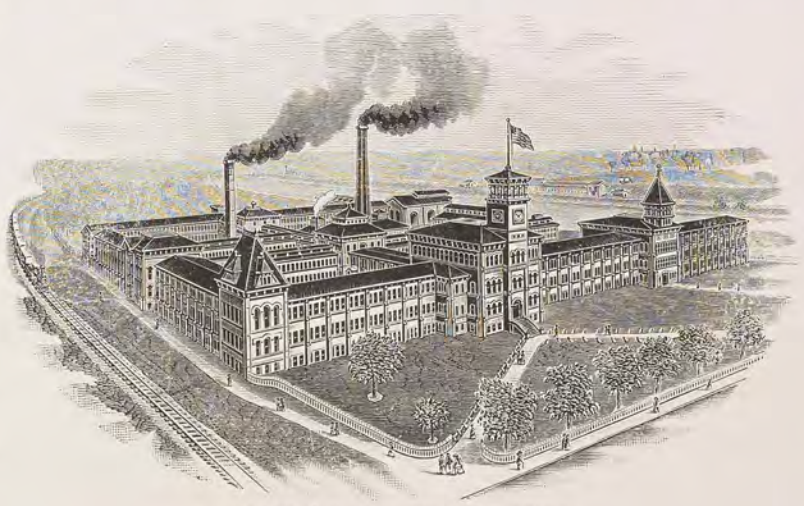


The Original Elgin Watch Factory

But it was soon discovered that the location of the factory was unsuited to such a business, and would not allow of any enlargement. Accordingly, land was purchased on the banks of the Charles River, in the town of Waltham, about ten miles from Boston. Here a new factory was built in 1854, and in October of that year the business was moved from Roxbury to the new buildings, which were made substantially in the form shown in the illustration.

Before this migration took place, it had been decided that the name of the company was not at all indicative of its business, and it had, therefore, been changed to the "Boston Watch Company." The advent of the new business in Waltham served to arouse a spirit of enterprise in some of the people of the town, who organized the Waltham Improvement Company, and purchased several hundred acres of land in the vicinity of the watch factory, which was laid out in house lots and streets, and placed in the market for sale. In the meantime, work was progressing in the factory, a few watches were being produced, but at a cost beyond their market value. Additional money was secured and poured into the hungry treasury, but the returns from sales of watches were by no means sufficient to sustain the enterprise, and there was no escape from the inevitable, and by the spring of 1857 an assignment was made. The property was bid in by Mr. Royal E. Robbins, of New York City, for himself and the firm of Tracy, Baker & Co , of Boston, to whom the watch company was indebted to quite an amount for watch cases. But the three following years were trying ones. In 1858 the property was purchased by the Waltham Improvement Company, of which mention has been made, and the capital increased to $200,000, a part of which was represented by the land in the neighborhood of the factory. On May 19, 1860, the capital was increased to $300,000, the name of the company at that time being the American Watch Company.

Chas. S. Moseley.



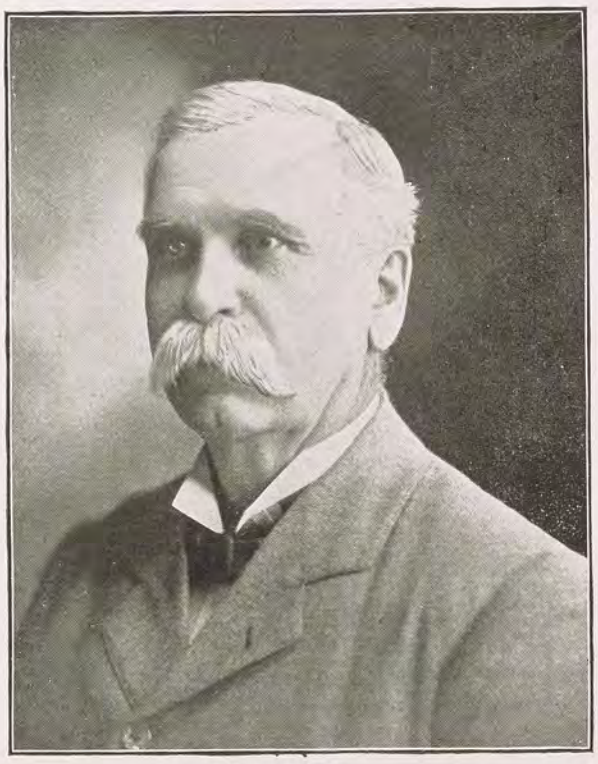
The Elgin Factory at the Present Time.

The productive capacity of the factory had been gradually increased, and there were signs of daylight ahead, but the mutterings of secession were beginning to be heard in the land, and soon the storm broke. Under such conditions what hope could there be for this new industry? Yet the very events which threatened its ruin became the means of its salvation. Our soldiers in the field wanted watches, and patriotism and self-interest alike led to the demand for American watches. All the resources of the company were therefore actively engaged in efforts to supply the welcome and unexpected demand. During the succeeding five years the factory buildings were increased to about four times their original capacity.

The continued prosperity of the factory was now assured, and already its product had attained a wide fame. The superority of the machine-made watch was fully established, and the foundation of the great watch industry firmly laid. The time and labor necessary to build a watch under the new system compared with the old hand method furnishes a good illustration of the mechanical progress of the century.

IN order to continue our story chronologically we must digress at this point to relate an event which resulted in a sudden and voluminous expansion in the watch industry. Early in the sixties Patton S. Bartlett and Ira G. Blake, employees of the Waltham factory, paid a visit to Chicago, and while there conceived the idea of starting a great watch factory in the inviting fields of the growing West. They formed the acquaintance of J. C. Adams, of Elgin, a practical watchmaker, who became enthused with the idea. After some effort a company was formed August 27, 1864, under the name of "The National Watch Co.," of Chicago, Ill., with a capital stock of $100,000. Through the influence of Benj. W. Raymond and Geo. B. Adams the location of the factory was offered to Elgin on condition that a tract of thirty-one acres of land be deeded to the company, and $28,000 worth of stock be subscribed by the city. After efforts to comply with these conditions had failed, four of Elgin's citizens stepped to the front and fulfilled the requirements. In September, 1864, Geo. W. Wheeler and Mr. Adams went East to secure competent men to help start the factory on a practical basis. They succeeded in securing the following Waltham men: George Hunter, John K. Bigelow, P. S. Bartlett, Otis Hoyt, Chas. E. Mason, D. R. Hartwell, and last, but not least, Charles S. Moseley.

The organization of the National Watch Co. was completed February 15, 1865, and the work of watchmaking was fairly begun in April of that year. This enterprise was successful from its inception.



George Hunter.

The first watch ever built in Elgin was an 18 size (English) full plate, key-wind, with quick train and straight line escapement, arranged to set the hands at the back, as was common with three-quarter plate, English and key wind watches of that day. This model, which is still a cherished treasure, was not adopted, but was changed to set on the face after the plan of full-plate movements of that day, and with that alteration it was adopted, christened the "B. W. Raymond," in honor of the first president of the company, and put upon the market—the pioneer Elgin watch, the modest advance guard of a great industry. This watch emanated from a factory—then considered great, which had a floor area of about 23,000 square feet, and which, during the quarter century of the company's existence, has increased to upwards of about 200,000 square feet exclusive of the detached buildings. This pioneer Elgin watch was a four-hole, extra jeweled, adjusted movement, and was first delivered from the factory, April 1, 1867.

In less than six years from the time of its charter, the watch company had erected its buildings, manufactured its machinery, and placed on the market more than 42,000 watches. By April 1, 1872, five years after the first watch was turned out, the reputation of Elgin watches was thoroughly established, and more than 125,000 had been marketed.

Over thirty years have now elapsed since the Elgin and Waltham factories entered upon their career of continuous prosperity, and their progress in the interval has been most wonderful. At present writing their combined product is over 4000 watch movements per day, and the field of distribution is co-extensive with civilization. A number of other factories are now assisting in supplying the enormous watch product of the country—the New England Watch Co., the New York Standard Watch Co., the Hamilton Watch Co , the Illinois Watch Co., the Trenton Watch Co., the New Columbus Watch Co., and others. All, we are pleased to say, are sharing liberally in the prosperity which our country is now enjoying and look ahead to an indefinite period of prosperity. The American watch is the watch of the century all over the world.

History of the American Watch

THE basic principle of our country's marvelous industrial progress during the century, has been the devising of labor-saving machinery, and in our modern watch factory will be found labor-saving machinery in its highest state of development. Familiar as our readers are with the parts of a watch, but few of them have ever had an opportunity of observing the operations of the thousand-and-one machines, most of them marvels of ingenuity, which, with metallic fingers, pick up the crude material—brass, nickel or steel—cut it into the desired forms in a number of swiftly succeeding operations, pass it from machine to machine, from tool to tool, and finally deposit it, completely fashioned, before the attendant, whose sole duty it is to supply the raw material at one end and receive the finished articles at the other. Limitations of space forbid any extended, or even brief description, of the almost human machines which are used in building a watch, but some mention is due the mechanical geniuses who devised this all but animate equipment.

THE idea of the machine made watch was not only conceived by Aaron L. Dennison, but he was able to contribute some of the essential foundation devices upon which the entire American system was built up. It is understood that Mr. Howard assisted in the same direction. But of the men who were most prominent in the earlier period of this business, the first place, without doubt, should be accorded to Mr. Charles S. Moseley, who very early entered the service of the Waltham Company, remaining with them until 1859, when, in company with Mr. Stratton and some others, he assisted in starting a watch factory at Nashua, N. H. This concern continued in existence long enough to enable Mr. Moseley, who was at the head of the mechanical department, to design and construct quite a number of excellent machines, which have been substantially copied in all the watch factories of this country. Doubtless the most important of all was the automatic staff turning lathe, which machine is without doubt now in use in every watch factory in this country, though in a much improved form on the original.

D. H. Church.

On the collapse of the Nashua Watch Co. its machinery and unfinished product were purchased by the American Watch Co. and removed to Waltham in 1862. Both Mr. Stratton and Mr. Moseley returned to Waltham, and Mr. Moseley was for a time the superintendent of the factory, but in 1864 he, with a number of others, started another watch factory in Elgin, Ill., as before stated, in which he held the position of superintendent. With Mr. Moseley, on his return from Nashua, came also Mr. Charles Vander Woerd, who had been associated with him in the designing and construction of machines. Mr. Woerd also was quite prolific in inventions, and as he was for about ten years in charge of the manufacturing of the three-quarter plate watches, which were first started in the Nashua factory, he had opportunity to construct some machines which served to mark one step in advance of the Moseley type, which were but partially automatic in action. Without doubt, the most interesting of the machines of Mr. Woerd's invention is the one for automatically making screws.

WE ought not to omit mention of one who, while not specially inventive, yet was able to contribute very valuable service in the organizing of the watchmaking industry. Mr. Ambrose Webster was very early secured by Mr. Dennison from the Springfield Armory, where the interchangeable system of manufacturing had then been most fully developed. Mr. Webster's particular excellence lay in his thorough appreciation of the importance of systematic methods in the conduct of any business, and especially in one so intricate as that of watch manufacturing. He was for many years in charge of the machine department of the Waltham factory, and had also the direction of the construction and equipment of the various buildings. He remained with the company 'till 1877, at which time he held the position of assistant superintendent. After leaving the factory he engaged in the business of manufacturing watchmakers' lathes and other tools. It was a boast of Mr. Webster's that he made the first automatic machine ever used in a watch factory.

A most prominent figure for many years past in the invention and improvement of automatic watchmaking machinery is Mr. D. H. Church, the accomplished and skillful master watchmaker of the American Waltham Watch Factory. Mr. Church's inventions have had a most far-reaching effect on the watchmaking industry, and their fame is world-wide. Mr. E. A. Marsh, the superintendent of the Waltham factory, is yet another whose genius and skill have accomplished much in the perfection of automatic machinery. Mr. George Hunter, the superintendent of the Elgin factory, is another of the great galaxy of geniuses who have made the equipment of our watch factories one of the wonders of the century. We regret that limitation of space forbids more extended mention of this most interesting subject of automatic watchmaking machinery and the men whose combined skill accomplished the great achievement.

E. A. Marsh.

The Watch Case Industry

IN the progress of the now enormous watch case industry the same forces were at work as in the development of movement-making manufacture. The transition from crude to more shapely models, the devising of machinery which would relieve the hand, save time, increase product and lessen expense have been contemporaneous with the development of watchmaking machinery as outlined above, though the work was carried on by entirely different persons, the two industries being entirely distinct. Early in the century the cases were made in small shops, altogether by hand and with such crude tools as the time afforded. Later when cases were required in much larger quantity the devising of machinery to facilitate manufacture began, and the gradual development of this machinery to its present wonderful degree of perfection has been among the mechanical achievements of the past thirty years. The interchangeability of parts, as in the case of watchmaking, was the object in view, and this has been attained. The progress made is strikingly evidenced in the fact that to-day one case factory has an average daily output of 2500 cases! This implies a wonderful perfection of machinery and processes of manufacture. As a case is required for every movement, the extent of the watchmaking industry is an accurate measure of the magnitude of the case industry.

Boss Case Factory in 1857.

The revolutionizing event in the history of the case industry was the invention of the popular filled case, which gave the people a gold case—pretty, serviceable and durable—at about half the cost of a solid gold case. It was in the year 1857 that Jas. Boss, of Philadelphia, case maker, invented the filled case, and probably the most impressive idea of the progress of the industry may be gained from contrasting the little shop of Boss in 1857 with the present home of the Boss cases as shown in our illustration. There are a number of large plants now engaged in the manufacture of cases.

Present Boss Case Factory.

Waltham Watches

are carried all over the world.

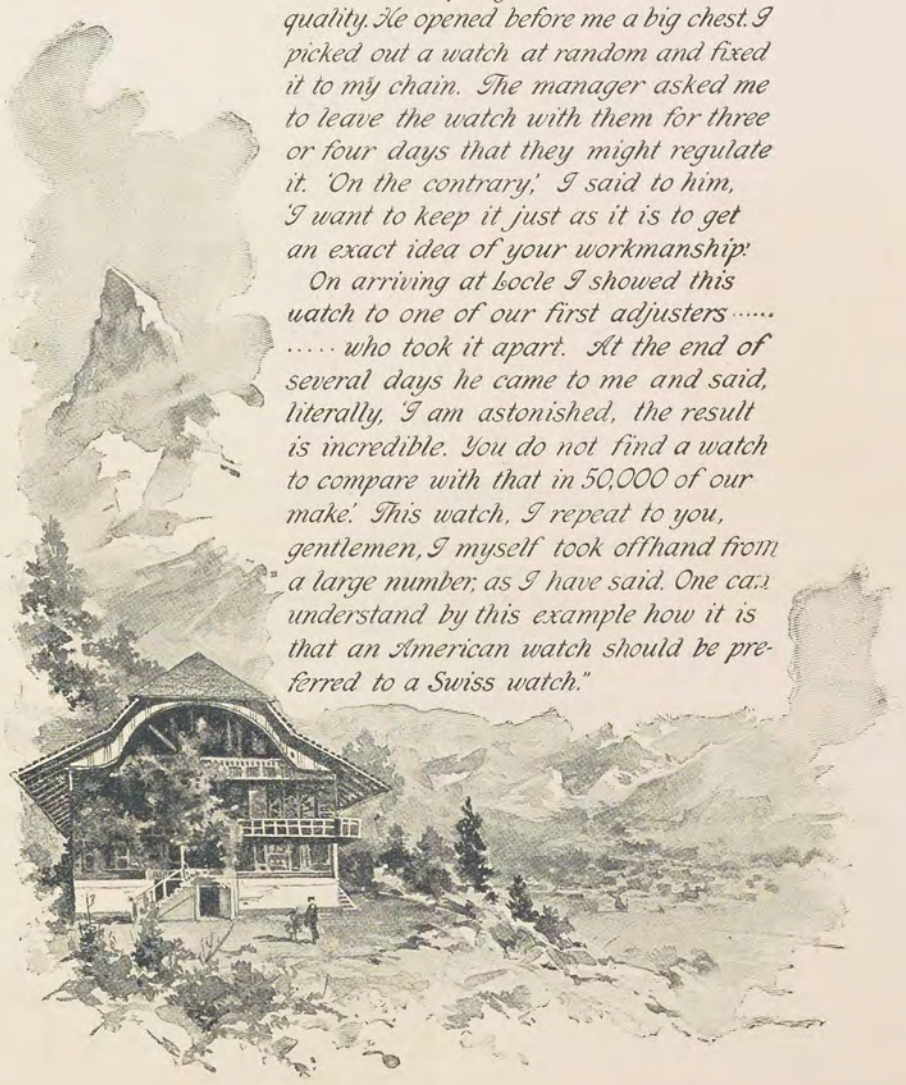
Taken from the Enemy

M Favre Perret, the Chief Commissioner in the Swiss Department and Member of the International Jury on Watches at the Centennial Exhibition at Philadelphia, speaking of the RIVERSIDE movement, said:

"Gentlemen, here is what I have seen.

I asked from the manager of the Waltham Company a watch of a certain quality. He opened before me a big chest. I picked out a watch at random and fixed it to my chain. The manager asked me to leave the watch with them for three or four days that they might regulate it. 'On the contrary,' I said to him, 'I want to keep it just as it is to get an exact idea of your workmanship.'

On arriving at Locle I showed this watch to one of our first adjusters .... who took it apart. At the end of several days he came to me and said, literally, 'I am astonished, the result is incredible. You do not find a watch to compare with that in 50,000 of our make.' This watch, I repeat to you, gentlemen, I myself took offhand from a large number, as I have said. One can understand by this example how it is that an American watch should be preferred to a Swiss watch."



VOLUME XX. PHILADELPHIA, NOVEMBER, 1899. NUMBER 11

THE KEYSTONE

A MONTHLY JOURNAL DEVOTED TO THE INTERESTS OF THE JEWELRY AND OPTICAL TRADES.

B. THORPE, PUBLISHER.

Subscription—One Dollar per year, postpaid, to all parts of the United States and Canada; **single copies,** regular issues, **15 cents;** special issues, **25 cents.** To Foreign Countries **10 Shillings ($2.44) per year; single copies, 1 Shilling (25 cents).**

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TO UNWRAP YOUR KEYSTONE, SIMPLY PULL THE STRING

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CONTENTS

Notes on Our Holiday Number.

IN presenting the "Twentieth Century and Holiday Number" of THE KEYSTONE to our readers we can well allow the massive compilation to speak for itself. We cannot refrain, however, from utilizing the achievement and the occasion to point a moral on the seemingly limitless potentiality of human effort. In accordance with our ambitious policy of excelling ourselves each succeeding year, we planned to make this issue not only the greatest in the history of THE KEYSTONE, but a unique and unparalelled achievement in trades journalism. It would, we thought, be a happy coincident if the issue of our journal, which dealt with the marvels of the century, would itself become one of the marvels, and we are not without confidence that our readers will pronounce it entitled to the distinction. In wealth of information, pictorial beauty, typographical excellence and practical worth this issue certainly represents the triumph of the century in trades journalism.

WE deem it advisable to forestall possible controversy in regard to certain matters dealt with in this issue by a brief explanation beforehand. In naming it the "Twentieth Century" number we yielded to our desire to be ahead of time, but in so doing did not commit ourselves to any particular date as to the correct ending of the nineteenth century. We simply reasoned that whether the present century ended this year or next, it was at all events advanced enough to make timely and interesting a resumé of its wonderful achievements and progress. The time-honored discussion as to when the century will end is, to our mind, as slightly important and as near settlement as the venerable question of who struck William Patterson. We leave the controversy to disputants with more leisure than we can command, but as not all may regard the matter as lightly as we, a few authoritative views on the subject appear elsewhere in this issue. We may say incidentally that the weight of the evidence, if not all of it is in favor of the view that the present century ends with 1900, and that the next begins with 1901, but as Sir Roger de Coverley once remarked, "Much may be said on both sides," and much is.

IT is quite possible that some of our readers may be inclined to take issue with us in regard to the degree of prominence or credit given certain individuals in connection with certain inventions. To forestall such controversy we would say that we were guided in this matter by public rather than by personal opinion. The public naturally give credit for an invention to the one who makes it practical, no matter who first exploited the idea or how much labor may have been expended on it by previous inventors or investigators. Convinced by what they see, and unacquainted with prior effort or achievement in the same line, the public form their conclusion, and experience proves that it is generally correct. The man who makes an invention serviceable to the public is, after all, the one who deserves most from those whom he has benefited. Of course, there are cases where credit should be divided—sometimes equally. For instance, Priestley and Scheele discovered oxygen within a few weeks of each other, and though the Englishman was slightly ahead, equal credit must be given the learned Swede. Gray and Bell are said to have evolved the articulating telephone almost simultaneously, but the name of the latter is indelibly associated with the invention in the public mind. So it is in numerous other instances.

IT would seem, indeed, that the doctrine of evolution applies to the mind as much as to the body. The frequent simultaneity of invention and discovery by different minds working sometimes in different channels would seem to uphold this view. The credit thus given individuals belongs in part to humankind at large, for there is little doubt that all or most of our great inventions would have materialized, even had those who actually evolved them never existed. We have heard it stated that but for Helmholtz the science of refraction would be to-day practically where it was fifty years ago. We cannot entertain this view. The evolution of ideas is progressive and continues, and though the cheers of the multitude properly belong to the runner who first breasts the tape, he is generally not far ahead of the other contestants. It is impossible to believe that if Harvey had not discovered the circulation of the blood this great fact would have long remained a secret. That the important discovery was not made sooner, is surprising to us in this day, but that it would have been made, and probably about the same time if Harvey had never existed, is very creditable. Most inventions are the evolution not of one, but many minds. Reis, who first applied the principle of the telephone, paved the way for the inventions of Bell and Gray. Wedgewood, who first produced pictures by the action of light on a sensitized surface, paved the way for Daguerre's greater triumph, and so it is. Thus it will be seen that the question of distribution of credit is difficult, and from the point of view of human progress it is unimportant. The triumph is the triumph of humankind rather than of individuals.

A Word of Seasonable Advice.

IT is quite unnecessary to dilate on present trade conditions to the jeweler who holds in his hands this prosperous-looking issue of THE KEYSTONE. Its 228 pages tell a story of prosperity unparalleled in the history of the jewelry business. Its wealth of announcements indicate a confidence on the part of jobbers and manufacturers such as has never before been evidenced, even in the prosperous fall of '92, and we are pleased to know that this confidence is shared by the retail trade.

In view of this enthusiasm a word of caution may be opportune. Said President McKinley in a recent speech: "We have everything, gentlemen, to congratulate ourselves over as to the present condition of the country. The only fear I have had is that we might overdo it, and that really we were not exercising that conservatism that is so essential to substantial business." There is material for sober thought in the President's "only fear," especially in this purchasing period. Buyers are sanguine, and the offerings of wholesalers and manufacturers are unusually tempting. The traveling salesmen, too, are out on a record-breaking campaign. Under such conditions we would suggest to our readers that enthusiasm in buying should be tempered by caution. Buy liberally and intelligently, as becomes the season and situation, but do not let over-confidence or persuasion influence you to pile up stock which you cannot dispose of in a reasonable time. The luminous prospects do not absolve you from weighing carefully the possibilities before recklessly assuming obligations. Use discretion and sound judgment, and a remunerative holiday trade is assured you, but make sure that the profits of the season will not be discounted later by piles of unsold stock.

Telegraphing Without Wires.

WIRELESS telegraphy is the latest achievement in the field of scientific research. Marconi, the young Anglo-Italian scientist, who some months ago flashed messages from one British man-of-war to another, eighty miles distant, repeated his triumph on this side of the Atlantic by reporting the recent yacht contest in this strange fashion. For this purpose a large ocean-going steamer was equipped with a slender mast which extended some fifty feet vertically above the foremast of the vessel. A similar mast was carried by the Mackey-Bennett cable steamer, which was anchored at the starting point, off Sandy Hook, and had temporary connection with the submarine cable at that point. The Marconi apparatus was installed in the chart-room on each vessel, and the progress of the yachts was telegraphed at intervals of a quarter of an hour from one vessel to the other. From the steamer at Sandy Hook the messages were sent to New York, whence they were distributed throughout the world. The experiment proved to be perfectly successful, and the reports contained in *The Evening Telegram* appeared from two to three hours sooner than those transmitted by the ordinary method.

Fresh from his success reporting the yacht races, Marconi installed his apparatus on several of the United States warships, and again proved the efficiency of his system.

WHETHER messages will ever be flashed across the Atlantic by means of the Marconi system or not, and it is not improbable that they will, the fact that they can be flashed for even a hundred miles is an innovation of immeasurable importance. Apart from its value in shipping, it would enable us to maintain telegraphic communication between Maine and all the islands off its coast; between the mainland and Nantucket, Martha's Vineyard and Block Island; between North Carolina and the reefs that enclose its sounds; between Florida and the Bahamas; between every West India Island and the next, from Cuba all the way around to South America; between California and all the islands off its coast; between the mainland of Washington and all the islands in Puget Sound; between the mainland of Alaska and all the islands along the coast, together with the whole of the Aleutian chain; between every island of the Hawaiian group and the next; between every island of the Philippine archipelago and its neighbors.

And all this can be done at practically no cost, for the apparatus can be procured for a few hundred dollars, and set up anywhere. In the future of our planet space will count for little.

Mother Shipton's Remarkable Prophecy.

IN view of the list of inventions of the century, related elsewhere in this issue, it is interesting to recall the remarkable prophecies of Mother Shipton, whose phrophetic powers were famous throughout England in the reign of Henry VIII. She is said to have lived at the end of the fifteenth and the beginning of the sixteenth century, and if the prophecies credited to her were really promulgated during her life her reputation as a prophet is well founded. It is remarkable that a contemporary of Columbus should boldly declare that

> Carriages without horses shall go.

But Mother Shipton's long-range vision not only caught a glimpse of the automobile, but of the railroad, telegraph, telephone, submarine boat and steel ships, as if evidenced in the following:

> Around the world thought shall fly
> In the twinkling of an eye;
> Through the hills men shall ride,
> And neither horse nor ass bestride;
> Under water men shall walk,
> Shall ride, shall sleep, shall talk;
> Iron in the water shall float,
> As easily as a wooden boat.

This is no ambiguous oracular prediction, but a plainly expressed announcement of future happenings. Even the "new woman" with her bangs, bloomers and diamond-framed flyer was foretold by Mother Shipton, and here again the word-picture is remarkably truthful:

> Women shall get a strange, odd craze.
> To dress like men, and breeches wear,
> And cut off their beautiful locks of hair,
> And ride astride with brazen brow,
> As witches do on broomsticks now.

The feminine scorcher may consider this description of her overdrawn, but the prescience of the prophetess is beyond cavil.

Post Office Savings Banks.

SOME time ago there was an earnest agitation in this country as to the advisability of establishing a post office savings bank system, and no doubt the matter will again be brought to public notice during the forthcoming session of Congress. In view of this probability it is interesting to learn something of the working of the system in Great Britain. An article in one of the magazines informs us that there is nothing comparable with it in the world as a savings institution. It was founded only thirty-eight years ago, and it now has 7,000,000 depositors and holds in trust over $600,000,000. The business of the central administrative department in London has grown to such enormous proportions that an area of five acres has recently been purchased at West Kensington, in the outskirts of London, wherein new buildings will be erected for its accommodation. The corner-stone of the main structure was laid in June by the Prince of Wales. Every post office in the United Kingdom is a branch of this bank, and there are 1200 branches. The institution has been popular with the masses from the beginning, and its benefits in the encouragement of thrift and providence have been beyond estimation. One in every five persons in England and Wales is said to have an account in these banks, and one in every fourteen in Scotland and Ireland. The institution catches the small savings, the average sum on deposit by the 7,000,000 depositors being about $8. Every device is employed to encourage the making of deposits and to render the banking process simple and convenient. The elementary schools of the country co-operate with the banks, and the children form a large percentage of the depositors. Penny stamp slips are provided whereby children are enabled to begin an account with a minimum deposit of one shilling. An interest rate of 2½ per cent. is paid.

A savings system which works so satisfactorily in Great Britain certainly deserves the serious consideration of our legislators.

Falling Off in Failures and Liabilities.

A wonderful story of prosperity is told by the statistics of failures for the first nine months of the present year. We learn from *Bradstreet's* that the total number of failures for the nine months was only 7075, a falling off of 20 per cent. from last year, of 28 per cent. from 1897 and of 37 per cent. from 1896, which year held the record for most numerous nine months' failures, exceeding even the panic year 1893. As regards liabilities, the total for the period under review—$65,855,218—is 35 per cent. smaller than in 1897, 61 per cent. smaller than in 1896, 80 per cent. smaller than in 1893, the panic year; 14 per cent. smaller than 1892 and, in fact, is the smallest aggregate of liabilities for the period mentioned that there is any record of. Assets show an even greater shrinkage, being 44 per cent. less than last year, less than half what they were in 1897, 1895 or in 1894; only one-third of those of 1896 and only one-seventh of what they were in 1893. It is not strange, therefore, to find that the percentage of assets to liabilities is only 44 per cent. this year, against 51 last year, 55 in 1897, 58 in 1896 and 70 in 1893.

Railroads Overwhelmed With Business.

THE railroads are enjoying a phenomenal prosperity. In fact, many of the lines are absolutely unable to handle the business that is coming to them, and the New York Central last month voted to increase its capital stock $15,000,000, most of which is actually to be expended in buying new freight cars. The eastbound traffic from Chicago in the past month has been more than double that reported in the same period a year ago, and nearly twice as large as that reported in

October of 1897, a record period of good trade. But most significant of all is the announcement from Pittsburg that the railroads have placed orders for 1,500,000 tons of streel rails for next year's delivery, the order aggregating nearly $50,000,000. We are told, too, that the purchasing agents of the railroads fairly tumbled over each other in their efforts to get their orders for rails entered at the prevailing price of $33 per ton; yet a couple of years ago, or even less, the selling agents of the makers were vainly offering rails to these same consumers at $17 a ton, a startling illustration of the changed conditions. The price is to be further raised to $35 per ton, over twice what it was a few years ago. The railroads are confident that the present prosperity will be by no means short lived.

Another Triumph of American Genius.

INTERNATIONAL yacht racing is one of those regal sports in which only millionaires can indulge, nevertheless such contests as that recently decided in our waters have an interest for all who take pride in the constructive genius for which our country is world-famed. There have been no better tests of the relative skill of the contesting countries than have been afforded by the efforts of the English to recapture and of the Americans to hold the America cup. The best talent that money could purchase was availed of in both countries, and the natural result of persistent effort and experience manifested itself in continued progress on both sides. But each succeeding contest showed the American ahead, and the cup is still safe. The latest contest was a clear-cut triumph for the American boat in all sorts of weather, a triumph probably more signal and satisfactory than any heretofore achieved. The cup was won by the *America* on August 22, 1851, and every effort since made by the British to recapture the trophy has failed. Our latest victory is a glorious tribute to American progressiveness, genius and skill.

Did our British cousins foresee a half century ago the long list of defeats in store for them the America cup would probably never have existed. It was back in 1850 that the rumor reached England that the New York Yacht Club contemplated building a clipper schooner-yacht to contest with the British flyers. In virtue of this rumor Lord Wilton, the commodore of the Royal Yacht Squadron, in February, 1851, addressed a letter to John C. Stevens, the commodore of the New York Yacht Club, inviting the members of the latter to cross the ocean and share in the contests. "Our yachtmen," he wrote, "will gladly avail themselves of any improvement in ship building that the industry and skill of your nation have enabled you to elaborate." The New Yorkers replied in kind, and the result was that the Englishmen agreed to give a cup of the value of £100, open to yachts belonging to the clubs of all nations, subject to the sailing regulations of the Royal Yacht Squadron. The *America* was built to contest for this cup, and on August 22, 1851, she won the prize. This is the cup which the English have since spent so much effort, gray matter and millions to recapture, but all in vain.

In our write-up elsewhere of the marvels of the century our readers will notice with pride that the biggest share of the triumphs belong to the Americans, and the leadership is likely to be more than maintained, for the native genius has increased with population and resources.

The Anglo-Transvaal War.

THE Anglo-Transvaal war is being waged furiously at this writing, and, notwithstanding the great difference in strength and resources of the contending nations, the conflict promises to be one of the most bloody and expensive in modern times. Extraordinary bravery and dash are being exhibited by the men in both armies, and generalship of a high order has marked the management of the contending forces in the field. Realizing that their opportunity lies in energetic action before reinforcements for the foe arrive from Great Britain, the Boers have thus far made a vigorous, well-planned campaign, and have, at this writing, advantages in position as well as in numbers. In fact, the British forces seem to be critically hemmed in, and hopes for their victory or safety lie wholly on their great bravery and intelligent and resourceful generalship. The conflict thus far is war in the most blood-curdling

Paul Kruger, President of the South African Republic.

sense of the term, and the Boer death struggle promises to be one of the noblest and most glorious in all history.

If other nations do not interfere, and there is as yet no probability that they will, the outcome of the war is a foregone conclusion. Whatever initial victories the Boers may achieve, they are doomed to ultimate defeat. England has sent to South Africa an expedition of 60,000 men well equipped, officered and generaled, and the war subsequent to their arrival will be an unequal conflict that can have but one ending. As this vast army, however, will not be ready for offensive operations till about the new year, the Boer opportunity is an extended one, and the happenings in the interval would be difficult to conjecture.

The European Powers in Africa.

WHILE there is only the remotest possibility of the interference of any other nation or nations in the Anglo-Transvaal trouble, it is not unnatural that the other powers should regard with jealousy England's gradual absorption of the Dark Continent. The total area in Africa claimed by Great Britain is at present computed at 2,300,000 square miles, but to this 1,200,000 square miles should be added if we include Egypt, which may be safely reckoned as British territory. The British possessions in Africa may be briefly described as all of the continent at present worth having. These possessions are, besides, capable of great commercial development and comprise practically all the African territory that has thus far paid a profit to the owners. France has wide, but worthless, territory in Africa. Including Madagascar, French territory in Africa is estimated at 3,300,000 square miles, but almost half of this is in the desert land of the Sahara and much of the remainder is a source of expense rather than profit. Germany has annexed 925,000 square miles, but more than a third of this is desert land on the southwest coast, which is said to contain more officials than colonists. Portugal retains 750,000 square miles, but much of this consists of malarial marshes. Italy, which originally claimed 420,000 square miles, has been obliged to renounce her protectorate over Abyssinia and now claims only a narrow strip on the Red Sea.

Golden Wealth of the Transvaal.

THE Director of the Mint has just issued final statistics of the world's gold production for the calendar year 1898. The total production of gold for the year is put at 13,904,363 ounces fine of the value of $287,428,600. This represents an increase over the product of 1897 of not far from $50,000,000. In view of the Anglo-Transvaal war it is interesting to learn that among the gold-producing countries of the world last year the South African Republic held the first rank, with a production of 3,831,975 ounces fine of the value of $79,213,953. Australasia took second place by a narrow margin over the United States, producing 3,137,644 ounces of the value of $64,860,800, as compared with 3,118,398 ounces of the value of $64,463,000 produced in the latter country. The three countries mentioned are the great leaders in the gold production of the world.

The growing importance of the Transvaal may be inferred from the following statistics of its gold production since 1885:

1885	29,149	1892	22,024,194
1886	168,343	1893	26,580,415
1887	821,590	1894	37,185,687
1888	4,691,988	1895	41,562,341
1889	7,229,264	1896	41,728,531
1890	9,067,802	1897	55,659,861
1891	14,182,903	1898	79,213,953

As the entire gold production of the world last year was $287,428,600, and the Transvaal's nearly 80,000,000, its relative importance among nations is far beyond what its area and population would lead one to believe. Besides, the gold in sight in the little Boer republic is estimated at a fabulous amount. Not often, indeed, in the history of warfare did victory offer a more tempting prize.

The War and the Diamond Market.

OUR readers have a business as well as a sentimental interest in the Anglo-Boer war, in that the conflict is likely to seriously affect the diamond industry. Even before the war the prices of diamonds had been advancing, and now that the source of supply is effectively cut off and mining suspended the skyward trend of prices is certain to continue. It is said that the syndicate which controlled the output in the past has been selling the rough as quickly as received. If this is so the source of supply is likely soon to dry up, unless the war is suddenly ended, which does not seem probable. This would mean the serious suspension of a great industry in this country, for the United States import about $20,000,000 worth of diamonds every year, and the demand this season is greater than ever before. As our readers are aware, the diamond production of the world is practically limited to that of British South Africa and the Orange Free State, and in the serious condition of affairs there at present the immediate future of the diamond business is in serious peril.

Some Examples of Mistakes.

A Record of Observations.

(CONTINUED.)

X.

"The Knight of the Rueful Countenance."

JACOB S—— enjoyed a monopoly of the jewelry business in the little town of N——, with the prosperous farming territory surrounding it. He inherited the business from his father, and inherited with it a good reputation for honorable methods and straightforward dealing. Never was a business better established in popular favor, when it came into his hands, and never were prospects more favorable for the continuance of prosperity in a "going" trade—as our English cousins would have called it.

But Jacob, unfortunately, was one of those despondent creatures who persistently look on the dark side of things and refuse to be comforted by favorable appearances. If the sky was clear it only presaged the cloudy days to come; if his digestion was good to-day he lamented the possibility that dyspepsia might find him on the morrow; if he had an exceptionally good day at the counter he grew melancholy at the thought of the prospective dull days in the next mid-summer. His despondency was expressed in his habitual solemn countenance—he looked more like an undertaker than a dealer in things beautiful; he was the living portrayal of "The Knight of the Rueful Countenance." A smile was never seen upon his lips; a laugh would have dislocated his jaw and ruined the outlines of his granite features irreparably. He was typified gloom; he was despondency made manifest in living tissue. He was a graduate of the School of Despair, but had never advanced even to the alphabet in the School of Good Cheer and Hope.

When he lost a sale he lost his appetite for the next meal; when he lost two sales in the same day he lost his sleep on the night following; and on the single occasion that he lost three successive sales he meditated on the ethics of suicide. Once, when a customer showed him the advertisement of a department-store, in which a particular watch was offered at a price which was the actual net cost of one like it in Jacob's stock, that sad-faced gentleman went into a two-days' melancholy and exclusion, and wife and children were answered in grudging monosyllables. He even discounted the expressions of appreciation. "What a lovely diamond sunburst!" "Yes, but I had to tie up an awful lot of money in that lot of diamond jewelry." "Your store is always so clean, and your goods always look so bright, Mr. S——." "Well, it takes a heap of work to keep it looking so, and you're the only person that has ever seemed to notice it." "I believe I'll take that silver set that you showed me yesterday, for it certainly seems reasonable in price." "Yes, too reasonable—but I've got to mark things down to almost no profit, or I'd *never* sell them in this 'cheap' town." "You seem to have a good thing of it here, Jake. Why, there have been at least a dozen people in here while I've been reading your morning paper." "No, I haven't a good thing at all, for half of those people only came to price things, and none of the others bought anything *big*. I have to take an awful lot of trouble for nothing. The jewelry business is the worst I know of—you've got to listen to a lot of cranks who don't know what they want, and are not willing to pay a fair price when they *do* know what they want. Don't speak to me of 'a good thing!' I'd get out of it to-morrow, if I knew anything about any other trade."

In consequence of this surrounding atmosphere of gloom, a visit to Jacob's store was a most depressing experience. "It is like coming away from a funeral," said a visitor to her school-chum, home from a vacation, when the two got out on the sidewalk, after having left a piece of jewelry for repair. "My! why, I could no more have laughed in there than in a burial-vault!"

In course of time the little town grew larger; and an ambitious young watchmaker, looking for a location, decided to venture there. His little store could have been set bodily into one corner of Jacob S——'s store without much inconveniencing the latter in the space remaining; and his slender stock was ridiculously inadequate, measured on the basis of Jacob's provision. The competition was grotesque, in point of stock; but the newcomer brought something to his business that Jacob never owned. It was cheerfulness, good humor, sunshine; and it was capital that brought good returns. For the good nature which lies in most human dispositions soon discovered fellowship in the cheery heart which shone out from the beaming countenance of the newcomer; and the spirit of comradeship that goes out between sympathetic souls joined the good-will of the community to the hopes of this bright-faced young man. The old lady who stopped in to have her spectacles repaired was refreshed by his cordial greeting and pleasant manner; the surly bank president who had his watch set to correct time found himself smiling at a funny incident which the young fellow related, concerning a man who once set his watch by the wooden clock which served for a sign outside on the pavement; two young ladies who looked through his meager stock without buying anything vowed to their friends that he seemed more pleased at their profitless call than ever had Jacob S—— at their purchases, and they "intended to let him get what they wanted, on selection from the manufacturer, as he had suggested, when they were ready to buy the present for the Sunday School superintendent, rather than get it of old Jakey." So the word went through the community that young Hodges was everlasting obliging, prompt, reasonable in price, and above all delightfully good-natured and cheerful; and his future was assured. To-day he is prosperous; has a store nearly as large as Jacob S——, and does a larger business. Jacob S—— is more gloomy than ever, and surly to a degree in the face of his rival's successful competition.

Young Hodges is a fine workman and has fair business capacity; Jacob S—— is as good a workman, with better native business endowment. The success of the newcomer undoubtedly lay in the added advantage which he enjoyed of possessing a cheery presence, an overflowing good-nature, and a courageous hope. The one was the prophet of despair; the other the disciple of faith. The latter appealed to that element in universal human nature which turns to the sunshine of good cheer, as in vegetable nature a flower twists on its stalk to seek the light. There is no such capital in business as cheerfulness—a capital which costs nothing but the training of the heart and mind, and which returns to the investor rich harvest of profits. The Knight of the Rueful Countenance can never compete, in the long run, with The Man Who Laughs.

Of course, in this, as in other things, the happy medium must be struck. The cheerfulness must be the infectiously exhiliarating kind, not the annoyingly hysterical.

"I Promise to Pay."

IT is a very singular thing that honest men should come to distinguish between the obligations of different kinds of promises. The old-fashioned business proverb, "A promise is a promise," seems to have fallen into desuetude. There is a kind of modern merchant, with no whit less honest instincts than his forefathers, who differentiates in the degree of obligation which rests upon him in the making of a promise—and a promise. Such a one will hold to the terms of a spoken promise though the heavens fall: his conscience holds him to its fulfillment, his self-respect is involved in its strict observance; but the written promise which he makes—well, as Rudyard Kipling would observe, "That is another story." And yet the written promise is more binding, if possible, upon him than the spoken one; for while there may be some question as to memory of exact details in the spoken promise, or some difference of opinion as to shadings of meaning, between him who utters it and him who hears, there can be no possible misinterpretation in the written promise. It is present in visible form; it is specific; and it lives in tangible record to plague its utterer by evidence of his bad faith. Yet, strange to say, a very considerable number of honest men who would scorn the imputation that their promises were worthless and not to be relied on, deliberately fail to keep their written promises time and time again, and thus stultefy their claims to recognition as honorable men. "My word is as good as my bond," is the proud boast of men who know themselves to be honest, and whom the community recognizes as such. Alas! in many cases the word of such is *better* than their bond—or better than their note at sixty days!

A promissory note is merely a written promise to pay a specified sum at a stipulated time. The man who gives it signs his name to a promise, and the value of the paper to the receiver lies in his faith in the integrity of the signer and in his estimate of the good faith and good morals of the man who thus makes a promise. "I promise to pay, in sixty days, at the bank, fifty dollars, to John Smith;" and the promise is signed; and when the paper is passed over to Smith, the signer has pledged his honor to the fulfillment of a promise in a way more binding than by any spoken promise that he could utter—for he deliberately provides against the *possibility* of misunderstanding the spoken word by *writing* the promise, so that it can be referred to at any time before the promise is due for confirmation of the exact letter of the promise. He gives the most solemn pledge of his good faith possible, outside of a pledge sworn to on the Sacred Word.

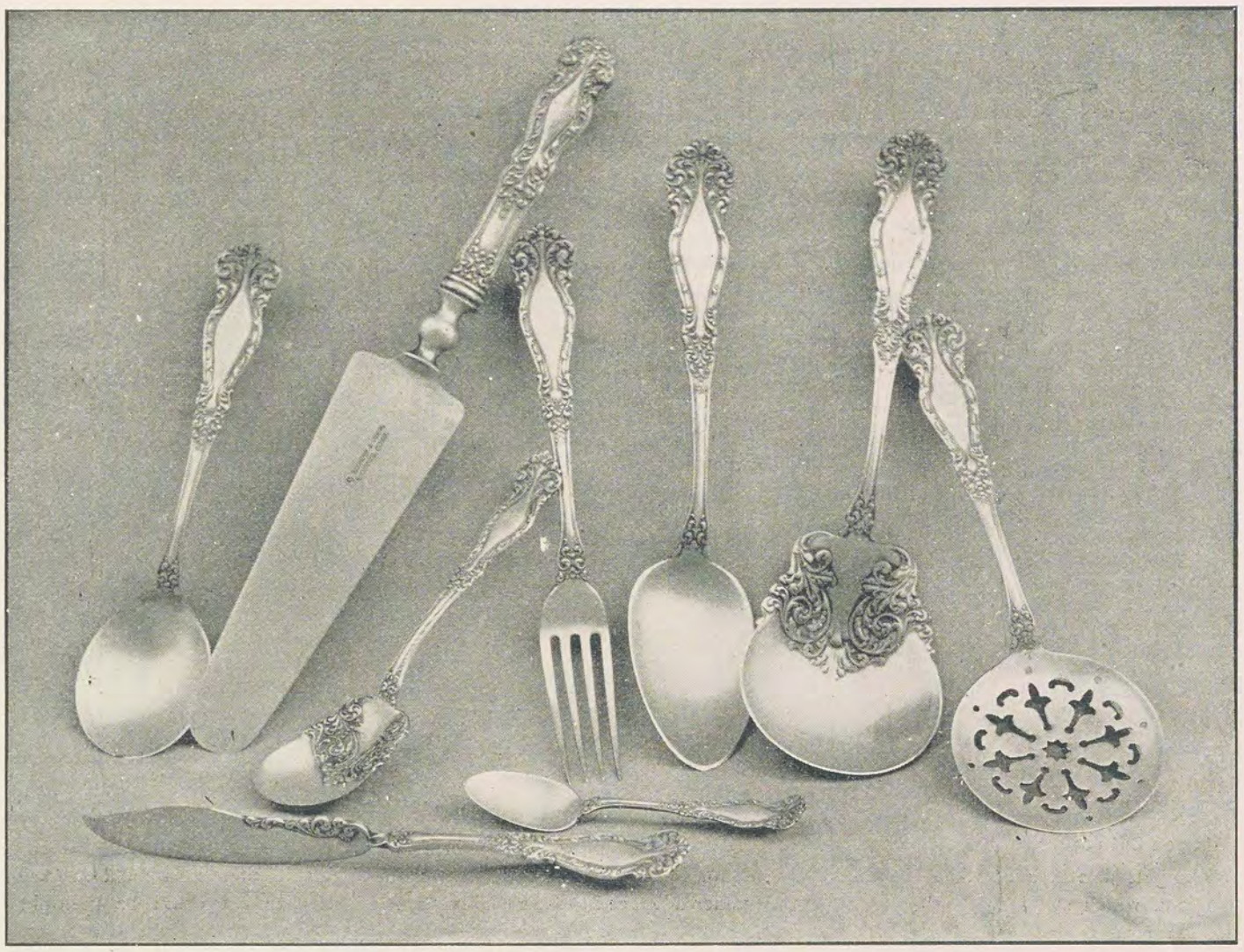
What follows? One would think that a promise, thus signed in unmerciful autograph, would be held in supreme respect by its maker, if he were unyieldingly honest; and even if his honesty was not of invulnerable quality—if, for instance, he was of the kind who would avail himself of the chance of a "misunderstanding," in a spoken promise, when his "recollection" of the terms would be "as good as" his hearer's—he would be most careful in fulfilling this *written* promise, to avoid the condemnation of the testifying signature, with its unavoidable witness to his bad faith. But, marvelous to relate, the man of questionable integrity, and he whose honesty is transparent as crystal, alike are indifferent to the fulfillment of the promise when it has matured—and usually it is the unquestionably honest man who is the more indifferent of the two. It is one

(*Continued on page 1104.*)

"NOT IN THE TRUST"

C. ROGERS & BROS., OF MERIDEN, CONN.

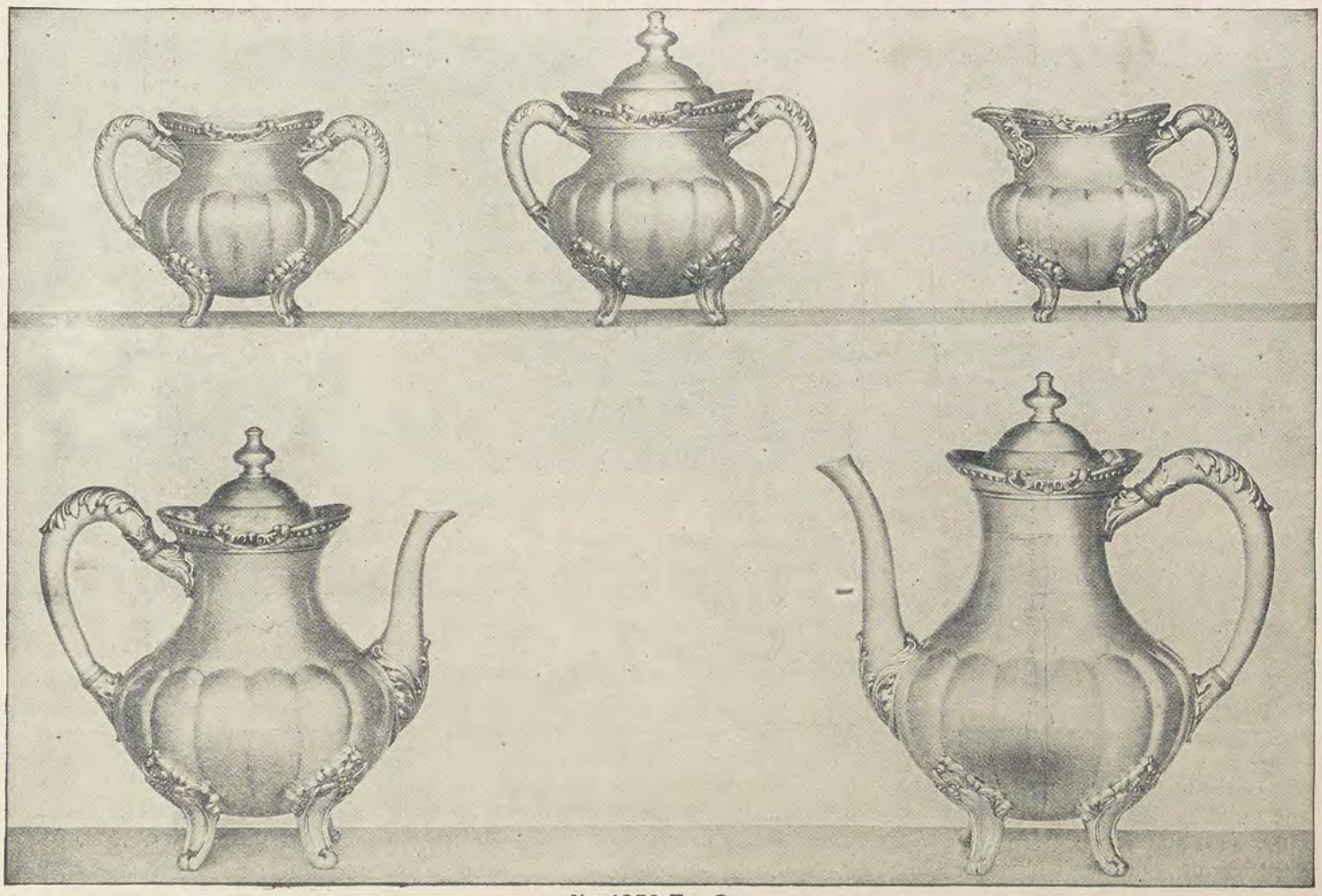
FINEST QUALITY OF SILVER-PLATED WARE



TRADE-MARK FOR SPOONS, FORKS, KNIVES, ETC.
C. ROGERS & BROS. A1

THE NEWTON

TRADE-MARK FOR HOLLOW-WARE
C. ROGERS & BROS. GUARANTEED



No. 1256 TEA SET

FACTORIES:
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SALESROOMS:
3 Maiden Lane, New York. 121 Wabash Ave., Chicago.
715 Austell Building, Atlanta.

"I Promise to Pay."

(*Continued from page 1102.*)

of the paradoxes in the history of credit, but it is an undeniable fact. The written promise—the note—falls due, and is returned by the bank to the creditor; in such good time as may be convenient to him, after one or more appeals have been made to him, the note is renewed—another solemn written promise is given; and possibly when it again matures the same programme of broken faith is gone through with.

Of course, the whole fault lies in the fact that the giving of notes is so frequent a practice that the full significance of the promise contained in the note is not considered; the import of the pledge thus given has been dulled to the appreciation through repetition. But the debtor should remember that a promise is absolutely binding upon one's honor, unless he who to whom the promise is given agrees to release the maker from its obligation; and this release must be asked for before the promise is due, not after. Consequently a debtor who wishes to keep good faith must arrange *before* his note falls due for its renewal in part or whole; otherwise he stultifies his claim to a place among the company of honorable gentlemen on whom a promise is binding and whose boast is that their word may be relied on.

The ethics of note-giving need closer consideration by the man who writes "I promise to pay" and signs his name to that deliberate pledge.

Looking on Both Sides.

IN the story, two knights met at a crossing of roads, in the angle of which stood a beautiul statue of the king in armor. "How brave a figure, with its shield of gold!" said the one knight. "A brave figure indeed, Sir Knight," said the other, "but the shield is silver." "Silver? Where are your eyes, sir? The shield is gold; i' faith, methinks you know not gold. Silver? Ho, ho!" laughed the first knight. "I pledge you my word the shield is silver," answered the other, "and you must deny it with your sword, if you dare."

The two knights engaged in a fierce duel, in which both were mortally wounded and fell from their horses. In the struggle their relative positions were changed, so that the one that faced the front of the statue before the fight now lay on the ground behind it. Looking up to the statue he saw that which surprised him; and calling to the other knight, who lay dying also, he said, "Ah, brother, the shield is silver on the one side and gold on the other. Had we each looked on both sides before we quarrelled we would not now be bleeding to our deaths."

"Look on both sides, before you fight!" is the pleading appeal of Justice to the quarrelsome, the world over. There is scarcely any question that does not present two points of view; and if the respective observers on each of the two points of view would but change places for a time, and divorce themselves of their former prejudices during their new contemplation of the question, what bitterness of speech would be spared, what hard struggle and wracking effort would be avoided, what after-remorse would be done away with, in the sad experiences of humanity! How the comprehension of human fallibility would broaden the perceptions, and how the evils which issue from half-knowledge and narrow information would give way to "the charities that heal and sooth and bless"!

The merchant would profit his undertakings if he habitually looked on both sides of the numerous questions which arise between him and those with whom he has to do. Let him put himself, in imagination, in the place of the drummer who visits him to sell him goods, and he will ever after blush for his previous want of consideration for the Knight of the Telescope. He will thereafter commend the zeal which is inspired by duty to the house which employs the drummer, instead of taking the persistence as an offence. Let him change places with his clerk, and he will come to realize the immeasurable longing, the hindered ambition, the sense of inefficiency and awkwardness which weighs on the mind of the young man, and will show charity where now he shows indifference; will understand that an office-boy has hopes and aspirations, pride and sensitiveness, gratitude and love and good-will, in a virgin strength which the grown man knows not of, and which responds to the sympathetic touch like a harp-string; and looking at the side of the shield which fronts these subordinates, he will blush at the harsh judgments which passed his lips in the prejudiced days of the one-view point of vision. Let him imagine himself outside the counter, instead of behind it, among the public which is ignorant of values and many-times swindled, and he will thereafter cultivate a patience for the doubting Thomas who comes to buy his wares.

The world has grown more generous in its habit of judging, but it has still far to go before humanity observes the universal practice of justice. Time was when men incontinently killed the man who opposed their point of view. Later, when killing went out of fashion as the means of pressing an opinion, men advanced to the social boycott as the instrument of punishment for the insurgent who rebelled against the concensus of belief. To-day, prejudice has left to it only the recourse of individual scorn. But the world still expresses its opinion from the point of view before, or behind, the shield, and the merchant is yet "of the earth, earthy." Speed the day when he walks all around the statue of the king before he gives judgment as to the metal in the shield.

"No Chance for Me."

The Discordant Note in the Chorus of Exultant Hope at the Close of the Century.

THE Twentieth Century opens with promise of great achievements in every direction of human activity. Science goes forward to new discoveries by leaps and bounds; literature and art are radiant with prospective crownings of glory; trade looks ahead with confident anticipations that are born of tangible present facts. The optimistic spirit obtains everywhere; and everywhere the jubilant chorus shouts the paean of rejoicing, and humanity is glad in the promise of great forward movements that will make life better worth the living than ever before in the history of human experience.

In this universal chorus is heard, here and there, the note of doubt, of despair, of narrow faith and pessimistic unbelief. With all the world glad of hope there sits in sullen silence, here and there, a man dumb with the fear of the future and skeptical of the prospect that he will personally share in the uplift of conditions. "Every one is pushing ahead, but I cannot advance," he gloomily mutters; "every field is fully covered, and there is no chance for me;" and he sits by the wayside, in the apathy of despair.

Shame upon such craven hearts! Shame that the will cannot be roused to point the way, in this hour of universal determination!

There was never such "chance" for every willing and hearty worker as here in the United States of America, and now. There never was such opportunity for talent to display itself, for ambition to work out its determination, for plodding effort to assert its claim, for average man to mount the ladder of success. It is not the "chance" that is lacking: it is the courage which should grasp the chance, that lacks.

"No chance for me!" has been the despairing moan of the weak-hearted since time began. It was doubtless heard among the busy throngs that crowded ancient Carthage, that builded the pyramids in the dim dawn of history, that surged through Athens and busied in the Rome of Cæsar, that lifted cloud piercing towers on the old cathedrals of France, and laid the foundations of English pre-eminence in the Isle of Britain. And there may have been some ground for discouragement for the common citizen in those times and countries where absolutism held sway, and where the obstacles to advancement seemed invincible and invulnerable. But here in this free democracy of ours, where every man is given equal opportunity to succeed in life, the moan "No chance for me!" is as unworthy as it is untrue. A thousand examples of its untruth rise to the memory of every one who gives thought to the question. M. E. Ingalls, who has just been chosen arbitrator of the Eastern railroad lines, at a salary of $75,000 per annum, was once a brakeman on a freight train; President Hill, of the Northern Pacific Railroad, entered manhood on wages of a dollar a day. The list could be multiplied to cover a KEYSTONE page. In this country, at least, men are not advanced to positions of great responsibility because they are sons of somebodies. The "chance" is seized by him who wills—and who is prepared for the opportunity.

After all, the essential thing, next to having the will and resolving to attain, is *to be prepared* against the opportunity for asserting one's place. The fault of failure, in most cases, is lack of complete knowledge of the fundamentals of success—unpreparedness for the exigencies that arise, inexperience, ignorance of details of the business in hand, the untrained mind guided by the unobservant eye. There *is* "no chance" for the slipshod theorist; nor for the half-informed clerk; nor for the ill-taught and unpracticed workman; nor for the indifferent, shiftless and unmethodical merchant. Such are not *prepared* for the chance that offers, howsoever they may have the will or the wish to seize it. They have not been schooled to the task; and they lament, with the thousands of the shiftless that border the path of the successful, "there is no chance for me."

There *is* a chance for you, young man, if you determine to win the prize. Intense desire transforms possibilities into realities. Our wishes are but prophecies of the things we are capable of performing; *possunt quia posse videntur*—to resolve upon attainment is often attainment itself. But before you resolve, see that you are sufficiently prepared to sustain your resolution by a just comprehension of the difficulties to be encountered, and as ample a training for the task as your opportunities permit. So shall you be qualified to confidently join the chorus of those who welcome the century ahead, and those who look with pitying scorn on the forlorn wretches dropped by the wayside who lament "There's no chance for me!"

NO. 257 Almond Dish and six Individual Dishes is one of the most popular combinations offered this season. These dishes are of good weight and are put up in attractive style in handsome silk or leatherette cases in several combinations, as follows: One Almond Dish; One Almond Dish and six Individual Dishes; One Almond Dish and twelve Individual Dishes; One Individual Dish; Two Individual Dishes; Six Individual Dishes and twelve Individual Dishes. The prices at which the above combinations are sold make them very desirable as leaders. Write us for prices.

R. Wallace & Sons Mfg. Company

Silversmiths

SALESROOMS: 226 Fifth Avenue, *New York:* 109 Wabash Avenue, *Chicago:* 120 Sutter Street, *San Francisco:* 63 Basinghall Street, *London, E. C.*

Main Office and Factory: *Wallingford, Connecticut.*

A few of the 1899 Productions of the Mauser Mfg. Co.

Dealers interested in up-to-date goods will be paid by an inspection of our line. Showroom and factory, 15th Street, between Broadway and 5th Avenue, New York.

TRADE MARK

"Watch Our Ads."

The Mauser Mfg. Co.

Silversmiths,

15th Street, between Broadway and 5th Avenue,

NEW YORK.

Toilet Ware

STERLING SILVER, $\frac{925}{1000}$ fine.
14 K. GOLD FILLED.
TWENTY COMPLETE SETS to select from.

Extra Large and Regular Size Handle and Ring Mirrors.
Large, Regular and Small Size Hair Brushes.

Don't lose the advantage to be gained by buying from **Complete Sets.**
Complete line always in stock.

Toilet Ware is selling now as never before. This department of yours is strongly called to your attention; therefore, order early to insure receiving the goods when you want them.

We are the largest exclusive Toilet Ware Manufacturers in this country.

We give special and prompt attention to mail orders.

A FULL DISPLAY OF THESE GOODS AT OUR NEW YORK SALESROOMS,
111 FIFTH AVENUE.

W. J. BRAITSCH & CO.

Silversmiths

111 Fifth Avenue,
New York

W J B & Co
TRADE MARK

Works,
Providence, R. I.

Buy Now

Delay and you Lose Profit

We Manufacture the Highest Grade American Cut Glass

The Holiday Trade this year will be a RECORD BREAKER

PITKIN AND BROOKS

MANUFACTURERS AND WHOLESALERS

CHICAGO—STATE AND LAKE STS.

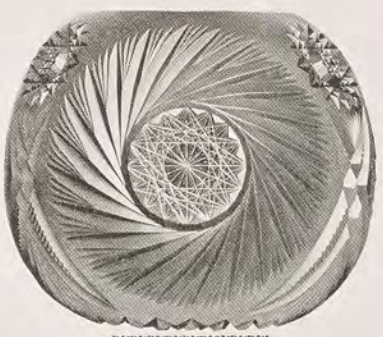
BEAUTIFUL AND ARTISTIC CUT GLASS

BELMONT PATTERN.

Our own make. Perfect in workmanship, unequalled in brilliancy.

Without doubt, the best selling pattern designed in the last five years.

Carafe, Quart
Each $12.00.

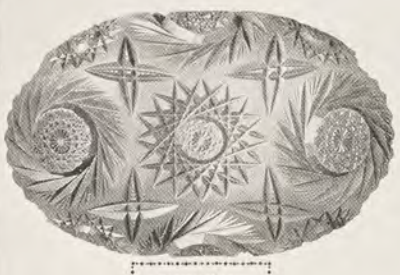


Rose Bowl, 7 inch
Each $18.00.

Oil, each $8.00.

Champagne Jug, 13 inch
Each $27.00.

Tumblers, Half Pint
Per Doz. $36.00.



Spoon Tray
Each $9.00.

Ice Tub, each $18.00.

No. 48. Bonbon
Each $5.50.

PRICES SUBJECT TO 50 PER CENT. DISCOUNT.

TERMS 60 DAYS NET. 2 PER CENT. DISCOUNT 10 DAYS.

We are Leaders

in

Fine China
Fine Lamps
Art Pottery
Bric=a=Brac
and
Novelties
For
Jewelers

A New Idea
A Novelty
A Quick Seller

The **BELMONT**

Designed and manufactured in our own establishment, is the

"SUCCESS OF THE SEASON 1899–1900"

Dazzlingly Brilliant
Perfect in Workmanship and Finish

A Sample Page, reduced in size, of our NEW

Half=Tone Catalogue

is shown above.

Full of Good Things At Right Prices

Send for it

The J. D. Bergen Co.

Office and Salesroom,
38 Murray St., New York.
(Factory—Meriden, Conn.)

AMERICAN CUT GLASS

Bowl, "Imperial."
Made in 7, 8, 9, 10, 12 and 14 inch.

Bowl, "Premier."
Made in 7, 8, 9, 10, 12 and 14 inch.

Bowl, "Superb."
Made in 7, 8, 9, 10, 12 and 14 inch.

Bowl, "Crown."
Made in 7, 8, 9, 10, 12 and 14 inch.

Bowl, "Climax."
Made in 7, 8, 9, 10, 12 and 14 inch.

LEADS THE WORLD
IN
CHARACTER, QUALITY AND PRICE

IN the last decade, this country has made enormous forward strides in nearly every industry.

To those acquainted with the old style (Foreign) CUT GLASS, it is an undisputed fact that

AMERICA HAS FAR
OUTSTRIPPED
ALL COMPETITORS.

NOT content to follow the old ruts in quality, shapes and designs, we have CREATED a DISTINCTIVELY AMERICAN STYLE, largely responsible for the present unprecedented demand for

CUT GLASS

DEALERS who buy of us, save a middleman's profit.
WE ARE MANUFACTURERS,
not manufacturers' agents.

They should also avoid those concerns that still produce "old fashioned" CUT GLASS, and buy only from bona fide, live, up-to-date Manufacturers, producing

THE MOST ARTISTIC
THE MOST BEAUTIFUL
and
THE MOST POPULAR-PRICED LINE

BERGEN CUT GLASS

Send for Catalogue "E"

Electros. furnished for advertising

HOMAN HOLLOW=WARE

IT WEARS, AND WEARS, AND WEARS— BUT IS NEVER SHOP-WORN.

WE TAKE FOR GRANTED—

Every dealer wants plated-ware that sells rapidly at a round profit. Homan Plate always does:

That he wants goods bright and attractive to the eye, and serviceable to the user. This is Homan Plate to the dot:

That he is anxious for goods that tempt the pocket book by beauty of outline and perfection of finish. This is Homan Plate in a nut shell:

And last, but not least, he wants the best goods on the market at the least cost. This is the essence of Homan Plate, and the basis of its universal popularity.

FOR THE DEALERS' BENEFIT, we have just issued a comprehensive CATALOGUE OF 160 PAGES, illustrating our line in all its strength and splendor. A whole host of new patterns were added this year as bright as a spring morning and as crisp as a hoar-frost. Write to your jobber for a copy. If he cannot supply it, we will be glad to give you the name of one who will—with pleasure.

THE HOMAN SILVER PLATE CO.

NEW YORK SALESROOM,
32 PARK PLACE.

CINCINNATI, OHIO,
U. S. A.

Established 1847.

No. 2290 Toilet Set

(ACTUAL SIZE)

Frank M. Whiting & Co.

Silversmiths

TRADE W MARK

North Attleboro, Mass.

1128 Broadway, New York.
220 Sutter Street, San Francisco.

Sterling Silver Goods only

One of our latest productions
in Toilet Goods. We have others just as handsome.
Our line of Bowls, Dishes, Tea Sets, Loving Cups, Compotes, etc., this season
is far more extensive than any we have ever produced, and in design they cannot be excelled.

York Rose Berry Spoon

York Rose

$1.00

for this handsome

BERRY SPOON

TRADE ◀ S ▶ MARK

High-Grade Quality Only

The Season's Seller! Wide-awake dealers have found this pattern a very profitable investment.
DO YOU HANDLE THE GOODS? ***Send $1.00 and let us mail you a Berry Spoon in this pattern, in satin-lined box.***

WRITE FOR FOLDER "K." It tells some truths about standard selling prices for Silver-plated Flatware.

SMITH'S PATENT
"STEEL EDGE" TABLE KNIFE.

Patented in United States and foreign countries.

This Knife has attracted more attention than any other product in silver-plated ware since that industry was born.

Because { IT STAYS SHARP.
WILL NOT PIT OR STRIP.
CANNOT RUST OR BLACKEN.

Made entirely of German silver, except for a steel strip five thousandths of an inch in thickness inserted within the blade. Thus it never requires resharpening, and when plated on a German silver base the plating STICKS.

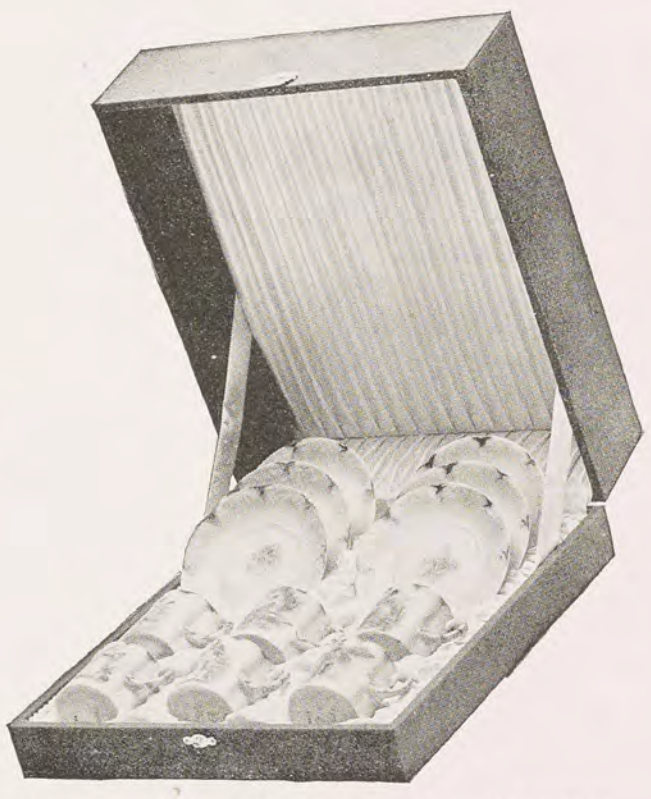
Why continue to sell common plated knives when this new knife can be had at the same price?

Write your Jobber, or ***E. H. H. SMITH,*** *Manufacturer,*

Full Line of Plated Flatware.

38 Murray Street, NEW YORK.

"FATME." 21 inches high.
Plastic Replica of Vienna Terra Cotta Bust. Elaborately Decorated.
Retails for $6.75.



Cases containing 6 A. D. Coffees, to retail complete at $3.75.
Case, 12¾ inches long, 10⅝ inches wide, 4¾ inches deep.

"KLEO." 21 inches high.
Plastic Replica of Vienna Terra Cotta Bust. Elaborately Decorated.
Retails for $6.75.

Want Lots of Holiday Business?

The majority of jewelers in the larger cities have long since realized the trade-drawing influence of an assortment of choice China and Bric-a-Brac displayed prominently about Holiday times. Have you?

If you buy Ceramics regularly, or intend to do so this year for the first time, we can help you to a selection for the approaching season as can no other house in the country. We have received within a few days some choice pieces of Art Pottery never before shown, and will not be shown this season by any other house. Then, besides, we have hundreds of things which we control absolutely—some to sell for a mere trifle, others more costly. Goods to suit the clientele of every jeweler are here—and aplenty.

Cut Glass is another thing of interest to jewelers. We have complete lines, in desirable patterns, of the kind whose brilliancy doesn't fade. Guaranteed. Prices low for the kind. Mail orders for general assortments, for any amount, filled promptly.

BAWO & DOTTER

ORIGINATORS OF FASHIONS IN CERAMICS

26 TO 32 BARCLAY ST., NEW YORK CITY

Diamonds and Precious Stones:

We purchased our Diamonds and Precious Stones far in advance of the season in anticipation of the splendid holiday business which is now so positively assured. As long as they last we can offer the jeweler his choice from *a most beautiful line of loose and mounted stones*—and of the latter we have not an unattractive piece in stock.

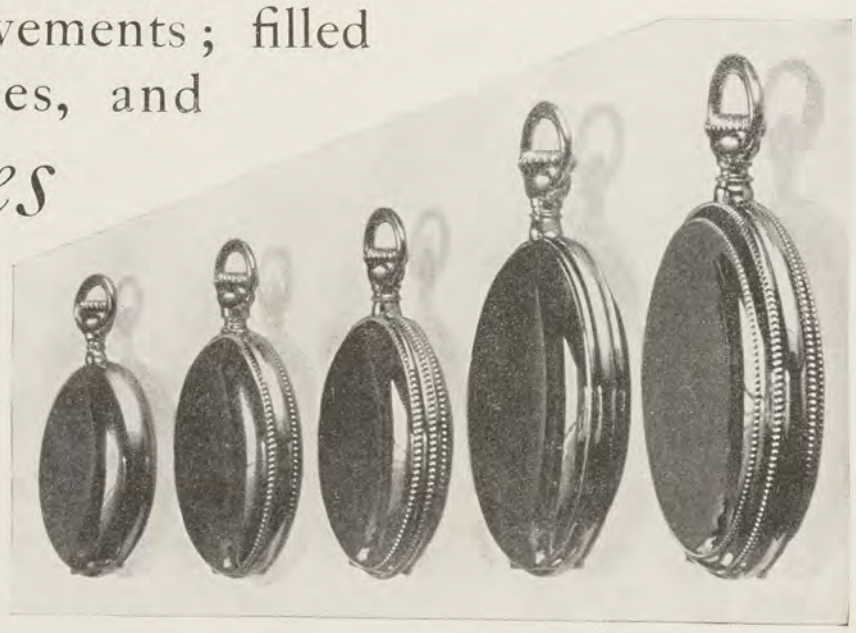
Good judgment suggests the imperative need of immediate ordering, for though our stock is large it cannot last long in the face of a rising market.

American Watches:

We maintain that concentration of effort on a few things produces a larger stock and better assortment of the latest goods; this is the case with our watch stock. Waltham and Elgin movements; filled and silver cases, and

Gold Cases

in great variety, from the finest to the more moderate priced—all well made and *hand engraved*



Hayden W. Wheeler & Co.

2 *Maiden Lane, New York*

POSTAL PROGRESS OF THE CENTURY

OF the institutions which have contributed most largely to the progress of the present century the postal system has been one of the most important, and a brief review of its wonderful development is necessary to any complete account of the achievements of the past hundred years. During the present year there was unveiled on the plaza of the post office building at Philadelphia a magnificent statue of Benjamin Franklin, who, among his other claims to immortality, may be justly styled the father of the American postal system. Franklin was appointed postmaster at Philadelphia in 1737, and was commissioned Deputy Postmaster General for the Colonies in 1753. Under his administration were inaugurated the delivery of mail matter at the residences of persons addressed, advertising of unclaimed letters in newspapers, tri-weekly mail between New York and Philadelphia, weekly mail between Philadelphia and New England, and the stage mail service. In 1789 the control of the entire postal system, as then established, passed from the continental to the constitutional government, and by act of Congress, May 8, 1794, the Post Office Department became one of the executive branches of the government.

When the present century began there was no such institution as a postage stamp, and the modern postal facilities were still undreamt of. Many years of the century had elapsed before the postal system finally revolutionized by the adoption of a uniform low rate of postage, a charge by weight and prepayment. Facilities for the prepayment were afforded by the introduction of postage stamps, and since then the perfecting of our postal system has been continuous and rapid.

Statue of Benjamin Franklin, at Philadelphia.

GREATEST BUSINESS CONCERN IN THE WORLD

The immensity of the present service and its perfection are equally marvelous. In an article which appeared in a recent issue of the *Cosmopolitan*, the present Postmaster-General, Charles Emory Smith, stated that the "postal establishment of the United States is the greatest business concern in the world. It handles more pieces, employs more men, spends more money, brings more revenue, uses more agencies, reaches more homes, involves more details and touches more interests than any other human organization, public or private, governmental or corporate. These clauses are deliberately chosen. There are other nations that number more people. But there is none whose intercommunication, in area of sweep and magnitude of proportions, approaches the United States. Our postal system is the minute, intricate, all-pervasive ganglia, the ever-alert nerve-life, of the great people who are the heirs of all the ages in the foremost files of time."

The Post Office Department directs 73,570 post offices, musters an army of 200,000 employees, spends this year $105,000,000, and counts receipts of nearly the same amount. It handled last year 6,214,447,000 pieces of mail-matter, of which 2,825,767,000 were letters. It manufactured and delivered 3,623,821,608 postage stamps, with a value of $71,788,333. It carried 2,069,742,000 newspapers.

GROWTH OF THE POSTAL SYSTEM

The growth of the postal business is phenomenal. When Timothy Pickering served as Postmaster-General in Washington's administration, his balance-sheet of expenditures and receipts for a whole quarter of a year showed an aggregate of $63,000, which is the expenditure of every six hours now. Since 1880 our population has increased about one-half; the postal business has increased threefold. The great development of the postal service as we now see it has come within a single generation. Thirty-five years ago there was no free delivery; now one-third of the people of the country have their mail brought directly to their doors. A generation ago there was no such thing as the traveling post office, and no distribution upon the rail; every piece of mail, instead of going directly from sender to receiver, went to a central distributing office to be redistributed and recarried. There was no uniform foreign postage. There were no fast mails, no letter-carriers, no railway mail force, no special deliveries, and no money order system.

Mail Carrier a Hundred Years Ago.

The post-offices are of every rank, from that of New York, with its revenue of more than $8,000,000, and its net profit of more than $5,000,000, to the little cross roads office, the receipts of which do not exceed $25. What are called presidential offices are those where the annual salary of the postmaster is not less than $1,000, and in these cases the President makes the appointment. The number of such offices is over 3,800. The fourth-class offices, with salaries of less than $1,000, where the appointment is nominally made by the Postmaster-General, number nearly 70,000.

MAIL DELIVERY SYSTEM

The delivery of the mails is the visible token to the individual. The delivery system has been carried to a high state of perfection. The city and borough residents, who accept as a matter of course the visits of the alert and steadfast gray-coated messengers of the post office from three to eight times a day, find it difficult to recall that prior to 1863 the letter-carrier service had no existence in the United States. Now it is represented by a compact army of 14,000 men, with a pay-roll of $14,000,000 a year. Other notable innovations are the placing of collection letter-boxes on street-cars, and the attachment of postal collection and distributing cars to the electric street lines. Until three years ago the free delivery system was limited to cities and populous communities. Within that time the movement has been started to extend its advantages to country districts. Under this plan routes have been laid through farming communities, sometimes stretching for a distance of twenty miles, on which delivery and collection are made from house to house. This plan has met with great favor.

THE RAILWAY POST OFFICE

The railway post office is the artery of the whole system. It was started in 1864, and the force of employees now reaches more than 8100. The number of miles of railroad covered by the service last year was 174,777, and the total mileage of the postal cars was 281,585,612. The growth in the handling of matter has been prodigious. In 1884 there were distributed in railway post offices 4,519,661,900 pieces of mail; in 1898 the number had grown to 12,225,706,220. The old system of distributing offices has been abandoned, and the mails are now handled, sorted, pouched and delivered in the postal car, and the former delay is avoided. The railway postal clerks must know every post office in their whole range of territory as they know the alphabet; their memory within the necessary scope must be without a flaw; and in throwing their letters to the right boxes across the car they become as expert as Herrmann in handling cards upon the stage. And so perfect is the system that only one error is made to every 10,429 pieces distributed. With the advance of the railway postal service have come fast mails. The department first required the railway companies to carry the postal cars on their fastest trains. This put the mails upon a par with the passengers. Then each railway post office made up mails direct for other railway post offices with which it connected and to which they were transferred without any intermediary. The next step was to establish exclusive mail trains going faster than any passenger train. These were introduced on the main lines, and have been carried to the highest point of speed and efficiency.

THE MONEY-ORDER DIVISION

The money-order division of the postal system is one of the greatest of international clearing-houses. Through its machinery remittances may be sent all over the world at the smallest expense and in the safest manner. The number of money-orders issued last year was about 29,000,000, covering an amount in the aggregate of $205,000,000. The adjustment of the accounts of this system is an undertaking of vast magnitude, 350 clerks being constantly employed in nothing but adding the interminable columns of figures and testing their correctness. So close is the scrutiny maintained that in these transactions of over $200,000,000 last year, the actual loss by fraud was only $40.

THE DEAD-LETTER OFFICE

The dead-letter office is the safe depository of the secrets of a large proportion of the people. It opens, reads and returns to the writers, or forwards to the intended recipients, 20,000 misdirected, unaddressed or unclaimed letters for every business day of the year. Many of these contain inclosures of value. The money, drafts, commercial paper and stamps thus found last year amounted to nearly $1,000,000. The sacredness of correspondence is respected. No letter is opened until the ingenuity of the best experts is applied to deciphering the address. Last year there were nearly 50,000 letters and parcels without any address at all.

Well may our country feel proud of its marvelously excellent postal service, in which all have personal interest.

THE STRAUS AMERICAN CUT GLASS

TRADE STRAUS CUT GLASS MARK

THE highest possible standard of excellence has always been maintained, and it ever will be. No matter how small the price, the quality will be the best. For this reason dealers appreciate it as a quick seller and good profit producer.

Bowl—"Planeta"
(Des. pat. pending)

Wine Jug—"Palace"

TO originate shapes and cuttings entirely different from the commonplace is one of our strong points. To have not only the best, but also the latest and newest, you must buy our line.

FOR the convenience of dealers unable to make personal selections we have put up assorted packages at $50.00, $75.00 and $100.00. Illustrated sheets on application.

Bowl—"Hermione"

Our Motto: No fancy prices

Bowl—"Goldemar"

L. Straus & Sons

Manufacturers

42-46 Warren St., New York

Factory: 59th Street and North River, New York

Limoges, France — Paris, 21 Rue de l'Echiquier
Carlsbad, Bohemia — Steinschoenau, Bohemia
Rudolstadt, Thuringia

Providence and Attleboro.

All the local firms making goods suitable for holiday trade are quite busy, and some express themselves as overwhelmed with orders. Overtime is the rule at the factories, and there is every evidence of a record-breaking season. The demand is for a better class of goods than for many years past, and the entire situation is very satisfactory. All are alive to the opportunity, and there is earnest effort to make the most of it.

The Massachusetts labor laws, which have been a source of trouble to manufacturers ever since their enactment, and a vexatious brake on the wheels of our industrial progress, caused some commotion in the Attleboros last month. The cause of the threatened trouble was the provision relative to the employment of women beyond the stipulated number of hours. A petition has been signed by the manufacturers praying for the repeal of the law relative to the employment of women in jewelry factories, and the matter will come before the General Court in December. Beyond warnings, the factory inspectors did not show any disposition to make trouble, and none is anticipated.

The name of James E. Blake, of the James E. Blake Co., was recently added to the board of directors of the United States Automobile Truck Co.

Among the members of the Providence Municipal League are many prominent members of the trade. Charles F. Irons, of Irons & Russell, was recently elected a member of the executive committee and the committee on taxation. J. F. P. Lawton, of the Gorham Manufacturing Co., was elected a member of the committee on taxation and the membership committee.

A new electric light plant has been installed in the factory of W. N. Fisher & Co., Attleboro Falls.

Pawtucket is enjoying a boom, as a result of the rush in the jewelry and kindred factories.

The work of installing electric light in the Plainville jewelry factories was begun last month.

Fontneau & Cook, Attleboro Falls, are busy getting out a fine line of samples.

Field & Briggs, Attleboro, have moved across the street to the Bushee factory, 37 County Street.

Horace E. Remington, of Horace Remington & Sons, Providence, was married last month to Miss Mabel Chase.

Walter S. Hough, of the Wightman & Hough Co., Providence, has been elected a member of the Providence Board of Trade.

The Chase Manufacturing Co. has purchased the plant of Chappell & Cabot, Providence. Walter W. Chase, the business manager of the new concern, was many years with Hancock, Becker & Co.

William H. Hall and Howard A. Wilmarth, of Attleboro, have dissolved the firm of Hall & Wilmarth, and the business will be continued under the style of W. H. Hall & Co.

E. I. Richards and J. F. Mackinson represented North Attleboro at the Republican State Convention. E. S. Horton, A. R. Crosby and G. A. Dean attended in like capacity from Attleboro.

A. H. Sweet has built an addition to his factory at Norton.

J. F. Sturdy's Sons contemplate erecting an addition to their factory in Attleboro Falls.

The Attleboro Young Men's Christian Association celebrated its tenth anniversary last month. The committee of arrangements comprised John M. Fisher, of J. M. Fisher & Co.; A. Vinton Cobb, of W. R. Cobb & Co.; Herman T. Regnell, of Regnell, Bigney & Co.; Fred. W. Lincoln, of J. M. Fisher & Co.; Ernest D. Gilmore, and Edgar A. Remington, of Carter, Qvarnstrom & Remington.

George H. Sykes, foreman for Smith & Crosby, and W. H. Goff, recently received medals from the State for service in the Spanish war. George Crosby, a son of A. R. Crosby, was selected to be the last carrier of the colors of the Fifth Regiment before their surrender to the State last month.

The term of Alfred R. Crosby, of Smith & Crosby, Attleboro, as representative to the General Court, expires with the coming election. Mr. Crosby retires in accordance with an agreement that the next representative hail from North Attleboro. Mr. Crosby was chosen to preside at the recent convention of the First Representative District. He was later elected chairman of the Republican district committee for a year.

The Codding & Heilborn Co., of North Attleboro, say "it is almost impossible to keep up with our orders, and all the factories in North Attleboro are the same. There is no danger of any strike in this section."

Clarence L. Watson, of the Watson & Newell Co., is about to erect a new business block on Bank Street, Attleboro.

George H. Herrick, of G. H. Herrick & Co., and Everett S. Horton, of the Horton & Angell Co., are said to have made extensive purchases of land last month.

The quarterly report of the Collector of Customs of the Port of Providence shows that for the quarter ended September 30th the value of the jewelry, precious and imitation stones that came through the local Custom House was over $140,000, the largest ever known in the importation of these goods.

Christopher L. Cabot, formerly of Chappell & Cabot, of this city, has accepted a position as salesman for an Attleboro manufacturing jeweler.

Lewis L. Rose, who some time ago swindled a number of Providence firms by representing himself as a nephew of O. R. Orswell, of Pawtucket, was sentenced to five years in State prison. He purchased various articles of jewelry and paid by forged check, receiving the change in cash.

Representatives of the New York Jewelers' Union visited Providence and Attleboro last month and formed organizations of the working jewelers. It is not likely, however, that any labor trouble will materialize. The employees seem to be satisfied with their treatment, and there has so far been little, if any, manifestation of the spirit of discontent, though some claim that it exists.

The First Emblem Finding Co., of Providence, R. I., are furnishing to the trade parts and findings for emblems, pins and buttons; also emblems for yacht clubs, etc.

Geo. E. Darling, Providence, has issued a handsome illustrated catalogue and price-list of his products. The goods are such as are suitable for holiday trade, and are specially interesting to the jewelers at this season. The catalogue is entitled "Selected Sellers for '99," and our readers will find a copy of it useful.

It is understood that E. E. Richardson, F. E. Bodman and F. H. Carpenter will sever their connection with the chain house of R. F. Simmons & Co., Attleboro, on January 1, 1900, and associate themselves with J. G. Fuller, of Providence, R. I. The style of the new firm will be Fuller Carpenter & Co.

Columbus and Central Ohio.

There is not a store in all this section of the country that does not expect to do a much larger and more satisfactory business this winter than last. The holiday business the dealers expect to be exceptionally good. Conditions all point to this end, and if business men have calculated wrong there will be an immense amount of first-class goods left on the shelves in the spring to be disposed of in some way. They are buying heavily, with the expectation of having a season something after the kind enjoyed in 1890 and 1891.

L. V. Stone, of Conneaut, has put a new front in his store and made other important improvements.

A. Aron, of Springfield, underwent a surgical operation some time ago and is now able to be on the street again.

William Oberer, of Haines & Oberer, is receiving congratulations over the recent arrival of a nine-pound baby girl at his home. It's the first.

Chief-of-Police Tyler is endeavoring to compel Columbus pawnbrokers to cease buying stolen property of all kinds.

F. R. Cross & Co. have completed their first general inspection of employees' watches on the Norfolk and Western Railroad. Some radical changes in the grade of watches were made, which will no doubt result in an improvement in the service.

H. L. Cock, of Mount Sterling, was in the city buying goods on October 14th.

Ed. J. Goodman, of Goodman Bros., has returned from the East, where he purchased a large line of goods for the season's trade.

Enrique C. Miller, an Indianapolis jeweler, was the guest of friends in Columbus last month.

The New Columbus Watch Co.'s factory is now running full time and is putting out an immense amount of goods. Manager William Riel has just returned from a successful business trip through the Northwest.

The Class of 1900 in the Circleville High School will wear class pins this year. T. K. Brunner & Sons, of that city, have received the order for them.

Harry F. Crecelius, engraver, with Bancroft Bros., has just recovered from very severe burns on the face, neck and head, as the result of an explosion of boiling alcohol. The accident came nearly resulting in the loss of his eyes.

Frank F. and Albert H. Bonnet were in the East buying goods the early part of last month.

Mr. J. B. White has employed an expert lens grinder and general optician, and will now begin to do work for the trade. He will in a few months put in a general jobber's line of optical goods.

R. S. Wood has succeeded the firm of Wood & McKee, at Painesville.

E. B. Scott & Son, of Batavia, have made important improvements in their business room, which improves its appearance very much.

Joseph Kleeman, now insane, has been removed as assignee of the Union Jewelry Co., and Isaac Kleeman has been appointed trustee to settle up the business.

A. Newsalt, of Dayton, made a business trip East early in the month.

Burglars entered the store of John Zarle, at Akron, on the night of September 24th and secured $300 worth of goods.

R. J. Van Buren has opened a jewelry store at Metamora.

Unique Whittling Feat by a Jeweler.

Again we are pleased to present to our readers one of the unique works of art from the knife of our old friend, Simon Straus, who was formerly of Belleville, Ill., but now of Chicago.

This time it is a miniature model of a United States signal station near Santiago de Cuba, which the artist represents in every detail. There are no less than one hundred articles, all whittled true to nature and proportion; these consist of an observation tower, signal tree, captive balloon, cannon, signal rockets, tent, suspended camp kettle, block-house, shed, bridge, hammock, plow, horses, yacht, wheel-barrow, skiff, guns, tables, chairs, pick-axes, shovels, flags, arms, axes, camp stools, etc., besides the trees, foliage, lake, and a great many other objects. The scene covers a space of twelve by twenty-four inches, and is covered by a case fifteen inches high.

As was recorded in THE KEYSTONE at the time, Mr. Straus (who is a practical watchmaker and jeweler, and an expert whittler by vocation) was awarded a World's Fair medal and diploma for the production of a miniature model of Columbus's caraval, the material of which is wood that was taken from every one of the structures that were located within the confines of the Columbian Exposition grounds. This work is now on exhibition at Field's Columbian Museum (Jackson Park) as the official souvenir of the World's Fair.

Census of the Century

AS growth in population is one of the most unmistakable measures of the progress of a new country, a history of the century would be incomplete without a brief review of the censuses of the United States during the period. One small volume of fifty-two pages comprised the entire first census of the United States. It consisted on'y of a return from the whole number of persons within the several districts of the United States, and was prepared at a total cost of $44,377.18. The population of the young republic, according to this census, was 3,929,214. The enumeration was taken in 1790, and the one volume was issued in 1792.

The eleventh census, taken just 100 years later, consisted of thirty large volumes, including an elaborate atlas, and covering every subject of possible public interest. The population was shown to be 62,622,250, and the cost of gathering and publishing the information secured was $11,271,500. It was nine years after the work began that the last volumes were put in circulation.

The growth of the population and various industries of the country is strikingly shown in the evolution of the census from the beginning. From a small start the taking of the census has grown to its present gigantic proportions, as follows: In 1800, one volume of 78 pages; cost, $66,609.04; population, 5,308,483. In 1810, two volumes, 260 pages; cost, $178,444.67; population, 7,239,881. In 1820, two volumes, 264 pages; cost, $208,525.99; population, 9,633,822. In 1830, one volume, 163 pages; cost, $378,543.13; population, 12,866,020. The printing of this census was so wretchedly done that Congress required a republication, which greatly enhanced the cost. In 1840, four volumes, 1455 pages; cost, $833,370.95; population, 17,069,453. In 1850, four volumes, 1869 pages; cost, $1,329,027; population, 23,191,876. In 1860, four volumes, 2316 pages; cost, $1,922,272; population, 31,443,321. In 1870, four volumes, 3268 pages; cost, $3,336,511; population, 38,558,371. In 1880, twenty-two volumes, 9993 pages: cost, $5,862,750.24; population, 50,155,783. In 1890, thirty volumes, over 12,000 pages; cost, $11,271,500; population, 62,622,250.

As the census has increased in cost and the country in population, so have the number of topics dealt with grown, especially since 1870. The tenth and eleventh censuses were the only ones that really sought to bring out general information concerning the development of our country. The first effort to gather statistics relative to manufacturing and agricultural products was in 1810, but the method was crude and unsatisfactory. These results were compiled from the reports of marshals and secretaries of the territories, and down to 1860 all reports concerning manufactures and agricultural products consisted of a brief digest, which gave little information that was accurate or of value. The sixth census, that of 1840, contained a census of pensioners for revolutionary and military service, with their names, ages and places of residence. The crudeness of the methods in vogue as late as 1870 is noticed from the fact that everything devoted to wealth, industry, manufactures and agriculture is contained in one volume of a little more than 800 pages.

It was in 1880 that the census began to assume its present proportions. Jumping, as it did, from four to twenty-two volumes, the government first undertook an exhaustive inquiry into such subjects as transportation, cotton production, taxation and public indebtedness, newspapers and shipbuilding, forest trees of North America, petroleum, coke and building stones, statistics and technology of the precious metals, mining laws and mining industries, water power, special statistics of cites, wages, prices of necessaries of life, trades societies, strikes and lockouts, power and machinery employed in manufactures and the ice industry.

Experience proved that many of these topics were not practicable in the work of taking a census, and their subsequent investigation was turned over to the Labor Bureau, which was created for that purpose. The eleventh census was divorced from many of these subjects and the inquiry conducted along more legitimate lines of census work, with results that were of practical benefit.

Congress has provided for a somewhat similar investigation in connection with the twelfth census, and Director Merriam has declared his determination of pushing the work to as speedy a conclusion as possible and getting the published volumes before the public at a much earlier period than has been the custom in the past. It was nine years after the census of 1850 that the data in connection with manufactures was issued by the department. Eight of the volumes of the tenth census did not appear until after 1885, and two of these were eight years in being issued from the press. It is expected that all the volumes of the twelfth census, save a few dealing with special lines of investigation, will be ready for distribution within three years from the beginning of the work in the field. The cost of the next census, it is estimated, will run up into the neighborhood of $16,000,000.

Remember Our Presidents

Our Country's Father, Washington,
  The first in every heart.
John Adams; Thomas Jefferson:
  Each doing well his part.
With Madison in eighteen twelve,
  Again to war we go,
Remembered by his Doctrine sage,
  Now follows James Monroe.
John Quincy Adams, unbeloved,
  Yet prudent, wise and firm.
The abolitionists arise,
  In Andrew Jackson's term.
Van Buren's days of wild cat banks,
  Then Harrison who dies.
John Tyler, called "Chance President,"
  His cabinet defies.
Next comes James Polk, who forces
  Our war with Mexico.
Bluff Taylor dies. In Fillmore's rule
  The slavery questions grow.
In Pierce's term, Japan her ports
  Throws open to our trade.
Buchanan sees secession rise,
  And Harper's Ferry raid.
With Lincoln war is fought and won:
  His martyr's blood is shed.
In Johnson's term the cable's stretched,
  Across the ocean's bed.
Grant's time sees the Centennial.
  Hayes, specie payment makes.
And murdered Garfield's empty chair,
  The stately Arthur takes.
The Civil Service Act's enforced
  By Grover Cleveland's hand.
Australian ballots introduced
  In Harrison's command.
In Cleveland's second term we see,
  The greatest of World's Fairs.
McKinley of high tariff fame,
  Our war with Spain declares.
This is the list of Presidents
  From first inaugural date,
In seventeen hundred and eighty-nine
  To eighteen ninety-eight.

—Mary E. Mitchell, in *Life*.

San Francisco Letter.

Business on the Pacific Slope continues good in all lines, and in watches, jewelry and kindred commodities is "booming"—no other word seems to quite describe it. North and South alike seem to share in the general good times which have come to California, and for many years there has been no such fall. Stocks bought early for the Christmas trade have depleted so fast that much larger purchases had to be made, and it begins to look as though 1900 will indeed have to get a "move on" to go ahead or even equal this prosperous 1899. Good business men, however, seem to think that we are experiencing but the commencement, the advance guard, as it were, of prosperous times.

There are very few jewelers, indeed, who even begin to realize the exceedingly great richness of the gold-bearing district of California, which are steadily yielding, so it is said, $17,000,000 in gold a year. Away back in 1849, and for many years afterward, miners were content to scratch away the surface of the earth and to let it go at that; but those old placer mining days are long since passed, and except a little here and there done by an individual content with slight returns, we see none of it; instead, we have a number of well organized stock companies, with large capitals, who, with the proper tools, directed by experienced hands and bright minds, are penetrating into the deep, underlying deposits by a system of deep shafts and long, narrow, diverging avenues, and while those not engaged in it hear very little indeed of this industry, it is a fact that this kind of gold mining has become a systematic, well-paying industry.

Entenmann & Borst, wholesale jewelers of Los Angeles, Cal., were victimized recently, so it is said, by a very clever swindler, who succeeded in selling them for $100 a bag brass filings, supposed to be gold dust. The trick was worked by substituting base metal for the precious after the bargain had been closed. It seems that the man who worked the swindle was slightly known to the jewelers by the name of Madden, who claimed to be a miner, and occasionally dropped into the office to chat about metallurgy. He told them that he had worked in the gold mines of Australia and had also been to the Klondike. His manner was gentlemanly and quiet, and not such as to attract any particular attention, so that when he appeared with some sixteen ounces of gold dust, which he wanted to deposit as security for $100, which he desired to borrow for a couple of days, the money was loaned him without a question, after Mr. Entenmann had tested the gold and found it to be of good quality and worth probably some $200 or more. After testing the gold he requested Mr. Borst, his partner, to advance the money, as the security was all O. K., and having an engagement, left the store. Borst stepped into the back room to get some wax to seal the bag of gold dust, and while he was gone the swindler substituted the bag of brass filings in place of the gold, and the fact was not discovered for some several hours afterward. Later in the afternoon the same man called at the assaying rooms of James Irving & Co. and made another attempt to get an advance of $100 on his gold dust, but was unsuccessful, as they refused to let him have any money. The swindler at this writing had not been apprehended.

Two burglars, who attempted to rob the jewelry store of A. O. Gott, at 1363 Park Street, Alameda, Cal., by opening a rear window that had been left unfastened, ran into a large-sized hornet's nest. After being chased by five or six policemen, headed by City Marshal John Conrad and ten or twelve citizens armed to the teeth, they were finally captured, but not until after a desperate fight in which Marshal Conrad came very near losing his life, receiving a bullet which just missed the jugular vein; one of the policemen was also shot in the hand. Excited citizens took shots at the two men running through the darkness, and the whole town seemed wide awake and banging away with pistols. Finally, after a most exciting chase and desperate resistance, one burglar was captured and the other killed.

J. M. Wilder, of St. Louis, Mo., was in San Francisco recently, arriving from Los Angeles, Cal., where he spent a most enjoyable six months.

S. O. Weger, formerly with Ukiah Jewelry Co., has bought out the business of O. A. St. John, at Fort Bragg, Cal., and will engage in business there. His many friends are wishing him every success.

J. W. Babcock, of our "capital city," was seen in 'Frisco recently buying goods—gladening the hearts of our wholesalers, as it were.

J. L. Sale & Co., Dawson City, Canada, have succeeded L. Pond & Co., of that far northern city.

The meeting of the Masonic Grand Lodge, held in 'Frisco, was well attended, the familiar faces of our brother jewelers, F. F. Barss, of Placerville; Ray Edwards, of Ferndale, and E. Mayben, of Chico, Cal., bobbing up serenely amongst the many noted business men present.

J. C. Whalen and daughter, of Petaluma, were in 'Frisco recently.

C. F. Richards, Seattle, Wash., stopped off at 'Frisco on his way home from Santa Barbara, where his wife is spending some time for her health.

George Daunt run in from Petaluma, Cal., to attend the meeting of the California Association of Opticians, where it is needless to say he met many brothers in the craft bent on the same mission.

J. G. McCabe, of Gilroy, Cal., was seen nodding to his many friends in 'Frisco the other day.

Mr. Brackett, one of Oakland's many pleasant fellows in the trade, has accepted a position with F. T. Keeler, Skagway, Alaska.

Otto Herz, of Richard Herz & Bro., Reno, Nevada, spent, we regret to say, some time in 'Frisco under the care of his physician. His very many friends extend their sympathy and best wishes for a speedy recovery.

W. B. Clifton, John Caldwell and Egell, of the Washington Regiment of Volunteers, and Bert Condy, of the fighting First California's, recently returned from Manila, are a unit in declaring that "Home Again" is far sweeter music than is "The Girl I Left Behind Me."

E. W. Wright, Bakersfield, Cal., did the 'Frisco Kearny Street promenade recently.

Frank Dobrowsky was in 'Frisco with his wife during the meeting of the optical association, which, it is needless to say, he attended. The best of our California opticians are finding their way into the charming little company whose future looks so bright.

John Caldwell, of Waitsburg, Wash., who recently returned with the Washington Volunteers, had his home coming shorn of its happiness by the passing away of his partner, Mr. Thorn, who died while Caldwell was at the front.

W. J. B. Schmeid, Napa, Cal., was in 'Frisco not long since.

Z. F. Vaughn, Tulare, Cal., was in 'Frisco recently, buying pretty little novelties and sich for the Christmas trade.

W. Wilmot has accepted a position with that well-known jeweler, Emile Pfund, Aberdeen, Wash.

Mr. Friedlander, son of Wm. Friedlander, Portland, Oregon, was in the gay metropolis of the Pacific coast not long since.

When the Montana boys came marching up Market Street, 'Frisco, the jewelers who stood along the cheering line noticed that well-known watchmaker and jeweler, W. J. Roberts, who, like all the rest of that fine regiment, looked somewhat the worse for wear. Sleeping in Manila trenches is not conducive to a "dude-like appearance."

W. E. Bemis, Livermore, Cal., was in 'Frisco this month.

The twentieth century catalogue of Armer & Weinshenk is now ready for distribution. It numbers some 746 pages and is said to be one of the most complete books of its kind ever published. No jeweler should be without one.

D. A. Woodward, of Hanford, Cal., was in 'Frisco last month. "A hale fellow well met."

A. Isaacs, 335 Kearny Street, 'Frisco, has now taken that entire store and has fitted it up in an exceptionally handsome manner.

H. C. Zapf, of Grass Valley, Cal., and incidentally one of the finest fellows who ever breathed, was greeting and being greeted by his many friends in 'Frisco recently.

W. H. Hunt, of San Jose, and his son, of Sacramento, Cal., two of our leading opticians, and the former the well-known treasurer of the California Association of Opticians, were in 'Frisco last month—an example of "like father, like son," and both exceptionally well liked by everybody.

Herman Hadenfeldt, the great big son of Charles Hadenfeldt, of Rothschild & Hadenfeldt, the 'Frisco wholesalers, was noticed on the side lines at the Olympic-Berkley game recently giving points to the husky babies of the former team. Neither side won.

F. C. Chinn, Sacramento, and G. L. Schneider, of Stockton, Cal., the genial president and secretary of the California Association of Opticians, were down attending the October meeting, and were both pleased at the good "turn out" to same. Get in quick you fellows who are on the outside, else you will regret it.

H. A. Zackendorf, for many years in business in Arizona, has come to San Francisco to engage in business.

The old salesroom of Nordman Bros., in the Levinson Block, has undergone a transformation. One would not know he was in the same place. All along one side a gallery has been built, reached from the rear of the salesroom by an ornamental iron spiral staircase. Against the wall of this gallery has been erected a most magnificent material cabinet, thoroughly enclosed, which is said to be one of the largest in the country. Underneath the gallery has also been erected a magnificent cabinet for material of upwards of a thousand drawers. In front of this cabinet are the show-cases for material and the tables for waiting on the material customers, making in its entirety a model wholesale material store, in which this branch of the business does not conflict with the other departments of this firm's large business. To the rear of the store and in the center are long tables filled with clocks, which department is an important part of their business. To the right of the entrance to salesroom is the watch and jewelry department, where a number of experienced clerks are kept busy all the year, while at this season they are simply rushed. At the front of the salesrooms are the book-keeping rooms and private offices, while on the floor above are the store-rooms, packing-rooms, shipping department, etc., making on the whole a model, up-to-date in every particular, strictly wholesale house of watches, jewelry, material, clocks and kindred lines.

L. A. Beretta and R. Bruce Magee, of Oakland and San Jose respectively, journeyed to 'Frisco to be on hand at the third meeting of the California Association of Opticians, the former being second vice-president and the latter of the executive committee, and both known all over the State as leading opticians.

A. M. Armer, of Armer & Weinshenk, is in the Northwest, and, as usual, is sending in—perhaps "bundling in" would be a better expression—many orders.

E. S. Wachhorst, of Sacramento, and G. Williams, of Los Angeles, Cal., spent some time in 'Frisco recently.

L. Katz, of Sutter Creek, and B. M. Jenney, of Weiser, Cal., also wandered into town.

J. W. Davis, of the California Optical Co., is up North, finding considerable business and pushing in many orders.

Fred. Eversole, son of that well-known jeweler and optician, H. Clay Eversole, of Seattle, is about to open a fine store in Spokane. Fred. is a fine optician from the floor up.

Emile Hirschfeld & Co. have removed from the Crocker Building to 22 Sutter Street, where they have large and handsome quarters.

Sidney Weinshenk, representing A. Judis, the well-known 'Frisco jobber, has just returned from a prosperous trip, but says time is too precious to waste at this season of the year, and so expects to be out again in a very few days.

The Trouble with the Watch.

The following amusing colloquy was recently reported:

"I wish you would tell me what is the matter with this watch," said the customer, passing it over the counter.

"It stops occasionally, and you have to shake it hard to make it go, don't you?" inquired the watchmaker, after he had examined the timepiece with the aid of an eye glass.

"Yes."

"Sometimes you have to open it and start the balance wheel with a toothpick or something of that kind?"

"Yes."

"Perhaps you don't blow through the works to get the dust out as often as you should."

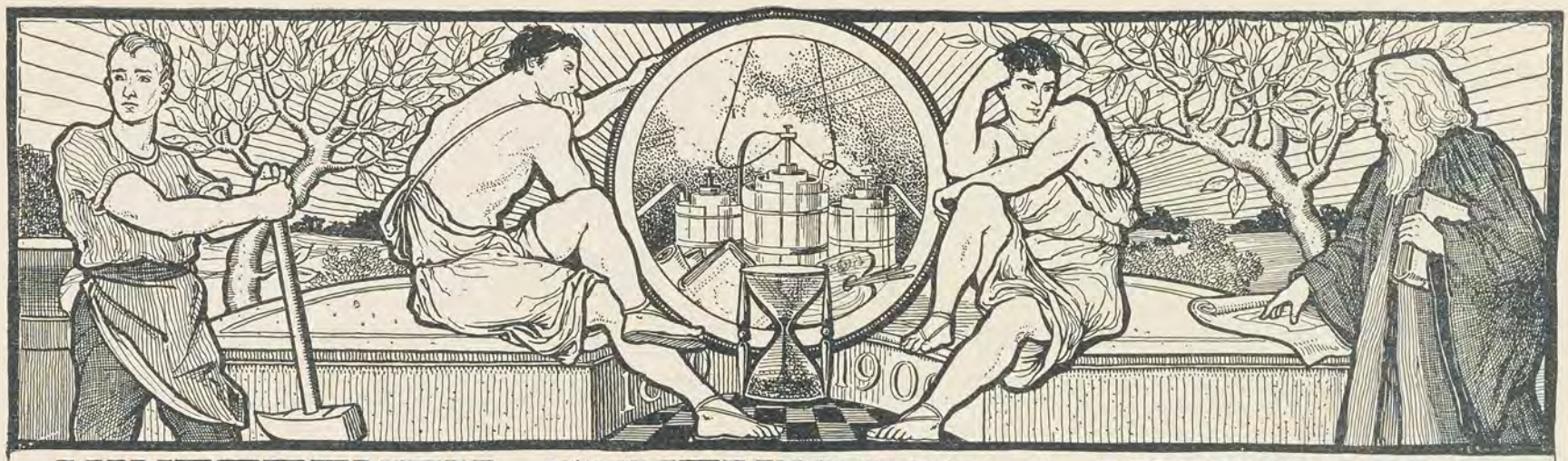
"I've done that dozens of times and it doesn't seem to do any good."

"Well, what really ails the watch is that it has a fool for an owner," said the watchmaker.

This, however, was the remark he made to himself. What he said to the customer was that it needed about four dollars' worth of repairs.

The Country Merchant.

The principal reason why country merchants fail to advertise profitably is that in their advert sements they do not talk specifically about the article they want to sell, nor do they give prices. They must learn the Wanamaker system. If the reader is at all interested in the article he wants to know its good points. If these are favorable he wants to know the price. If this is satisfactory he becomes a buyer, and the advertisement has served both seller and buyer. If no misrepresentation has been made the sale of this article may have created a steady customer, the profit on whose trade may become large enough to pay for the advertising necessary to secure one hundred more customers like him.



NINETEENTH CENTURY IN A NUTSHELL

I

THE Nineteenth Century goes far beyond all preceding centuries put together in the achievements which it can boast. It has not only added enormously to the moral and intellectual capital of humanity, but in its development of the mechanical and commercial arts, and in the resultant human happiness which has grown out of its creative genius, it is unique, beneficent and glorious in the story of the ages.

It has been the era of emancipation from bigotry and prejudice, from class distinctions and inequalities in law, from shackles upon the limbs and padlocks upon the lips of mankind. It has been conspicuously the century of civilization, humanity and liberty. The race has advanced, in the hundred years, to better living, higher thinking and larger appreciation in preaching and in practice of the universal brotherhood of man.

But however glorious the achievements of the century in the direction of humanitarian effort, it is in the realm of invention and scientific discovery that is peculiarly pre-eminent in the world's history. The Nineteenth Century celebrates harvests in inventions and discoveries where before existed only Saharas. In the field of mechanical art it is the benefactor of all future ages, in respect of making two blades of grass grow where only one grew before.

II.

The Rip Van Winkle of 1799, falling asleep in his day and waking in ours, would be a pathetic picture of hopeless despair, in his attempt to realize the wonders in his present environment. When he went into his sleep of a hundred years he had been accustomed to journey from place to place on horseback or by stage. He would now be stunned by the apparition ef a hugh wheeled monster, belching smoke and fire, dragging after it a whole village population in gorgeous wheeled parlors, at a speed of a mile each minute; or at the sight of miles of trestled track above the roof-lines of the houses in crowded cities; or at the spectacle of close-following cars hurrying along the street, moved by some invisible and mysterious power; or at the bewildering wonder of ten thousand men and women moving noiselessly hither and thither on swift-moving machines propelled by themselves. He had been accustomed to going to bed by candle-light, after having been shown through the street by a boy with a torch; picture his consternation to see a room lighted by a touch of a button, and streets flooded with noon-day brightness with no lamp-lighter in sight! When he would communicate with a distant friend he had to give thought to the project; for the carrying was expensive and slow, and the likelihood of delivery doubtful. Imagine him seated in a modern office and given a postal card for a penny, with promise that it would be delivered a thousand miles away and answered in two days; or sent to Europe and he would have the answer in less than a month; or his message could be sent by dots and dashes for a thousand, or ten thousand, miles, and answered in an hour, or before he slept; or he could talk in person to his correspondent and hear his voice, although a thousand miles apart! And similarly, he could transmit money to his distant friend, without the sending of the actual coin, through the agency of the Government; and if he wished, he could have his letter written on a machine as rapidly as he could put his thoughts into words; or he could talk into another machine, and the message could be delivered to his great-great-grandchild in the exact tones and inflections of the speaker, after that remote descendant had come into existence. He would stand bewildered in gazing up to the twenty-seventh story of a building, after remembering structures in his own day which were distinguished as seven-storied; and the swift elevator would take his breath, and his reason would totter in endeavoring to comprehend the pneumatic letter-delivery and all the wonders of the modern office-building. He would be mystified to find houses heated by hot air, or by steam, remembering only the open hearths and blazing logs of his own day; would not understand the utility of rubber shoes without an explanation; would look with surprise at the spectacle of men going about the hot streets in hats made of straw; his eyes would stretch wide if he saw canned corn, or tomatoes, or oysters, and was told that the provisions were eatable; he would marvel at a fire-proof safe; his heart would come into his mouth when the fire-alarm was explained to him and its utility verified by the swift coming of a steam fire-engine, propelled by an invisible electric or gasoline motor; he would be paralyzed in his dawning realization of the scope and plan of a pork-packing establishment, or a great department-store, or a railway system; and, finally, he would likely fall over in a faint when his guide produced fire to light his cigar by rubbing a splinter of wood against a convenient wall, removed his artificial teeth to wash them, "rang up" a friend three hundred miles away to tell him he would run over to take breakfast with him on the morning, before going to London on the day following for a few hours' business and a two-weeks' absence!

III.

To us living witnesses, to whom these marvels of invention come one by one, after the mind has been taught to be expectant of greater wonders from the wonder just achieved, the whole value of living in this year of grace is not, can not, be perfectly measured. The facts are not external to us; they are a part of our lives. The whole atmosphere is surcharged with the electric forces of accumulated wit in invention, and we breathe the spirit of a swift progress unconscious of its tremendous vitality. But the Rip Van Winkle of 1799, though he cannot comprehend the full significance of the prodigious advance in human thought, in respect of the inventions and discoveries, must at least be vaguely conscious of the fact that his year, though measured by the calendar as a century earlier than this, is, in relation to its practical and potential values, a full thousand years before our time—a world-age earlier. In no thousand years of the world's history has so much been accomplished for human good and human happiness, through the agency of invention in mechanical arts and in scientific discovery, as in this Nineteenth Century, and in this country of ours. The first locomotive, the *Rocket,* used on the Carbondale (Pa.), Railroad in 1829, drew in its train results more momentous to human destiny than any motive force the world has ever known. The application of electricity to the practical uses of man—by Morse, in 1844, in the telegraph; by Bell, in 1877, in the telephone; by Sprague, in 1888, in the street-car; in lighting streets and houses, in mining, in refining metals, in moving boats and carriages and elevators and locomotives, and in its thousand diversified uses in every direction of every-day life—has revolutionized the processes of all activities; and if, as Emerson declares, "steam is half an Englishman," it may be said with equal felicity that electricity is nine-tenths an American. The whole vast range of invention in agricultural implements—Jethro Wood's plow with interchangeable parts, patented in 1819, the seed-drill of 1851, the reaper of Cyrus McCormick, whom the French Academy of Science, in 1878, declared had "done more for the cause of agriculture than any other living man," and a multitude of other wonderful devices—has directly advanced the cause of "the most noble and most useful employment of man" (so George Washington said of agriculture) to a degree that Rip Van Winkle of 1799 never dreamed of, and lifted it from the treadmill round of drudgery to the table lands of thought.

IV.

We need not pursue the demonstration further. The fact of our prodigious progress in all that makes for labor-saving and profit is so apparent to him that reads the signs as he runs that its utterance becomes a commonplace of speech. Our own country is the epitome of the century's development. We present to the world in this closing Nineteenth Century the most complete example of the working out under favorable conditions of the principles and opportunities of civil and religious liberty. Every industry whose birth and growth are herein chronicled is the expression and witness of the beneficent principles of the freedom of individual action. Europe, with the accumulated capital of over a thousand years and the accretion of the skill of all the centuries, is being left behind in the race. She is outstripped at the close of the century by this infant of its beginning, in agricultural production, in manufactured products, in miles of telegraph and railway, and in every element of industrial and material wealth.

In the very closing years of the hundred comes the opportunity for still greater development of the virile forces in our national life, in our entrance as a world-power into the great East; and that opportunity carries with it potential increase in invention and scientific discovery in the direction of all the industries that profit and all the arts that adorn. The close of the century marks the opening of wondrous possibilities to us as a nation.

But whatever radiance waits to crown us in the Twentieth Century, we have had glory, and to spare, in the Nineteenth. "The past, at least, is secure." We have lived to witness the close of a century unexampled in the total of permanent good which it has yielded for humanity.

A HOUSE FULL OF IDEAS
WE LIVE IN IT

CHAINS BRACELETS HONEST GOODS P.J.C.&CO. HONEST PRICES RINGS NOVELTIES

HONEST GOODS WAR-RANTED FOR P.J.C.&CO. 5 YEARS WEAR. HONEST PRICES

"HONEST GOODS AT HONEST PRICES"

(THE ABOVE IS AN ESTABLISHED FACT)

A GOOD WEARING CHAIN, RING OR BRACELET MAKES CUSTOMERS AND FRIENDS • OUR GOODS CAN BE PURCHASED ONLY THROUGH THE JOBBING JEWELERS

P. J. CUMMINGS & CO.

OFFICE & FACTORY ATTLEBORO, MASS.

OUR NEW FACTORY

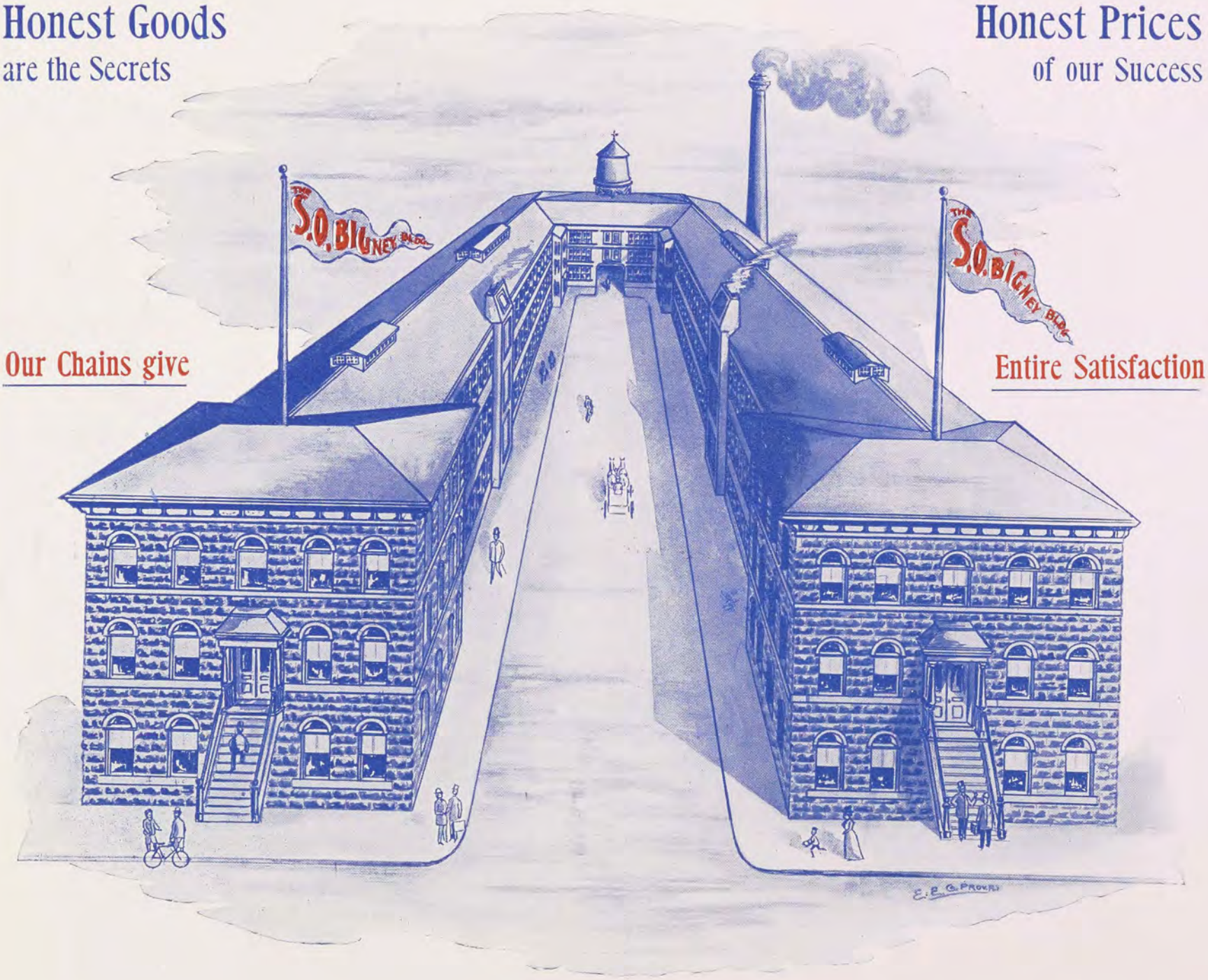
which we shall occupy about January 1, 1900

Honest Goods
are the Secrets

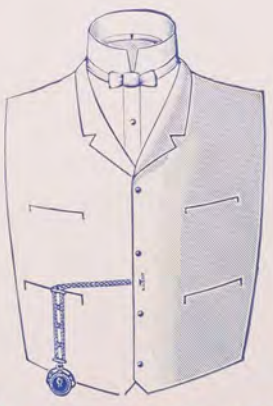
Honest Prices
of our Success

Our Chains give

Entire Satisfaction



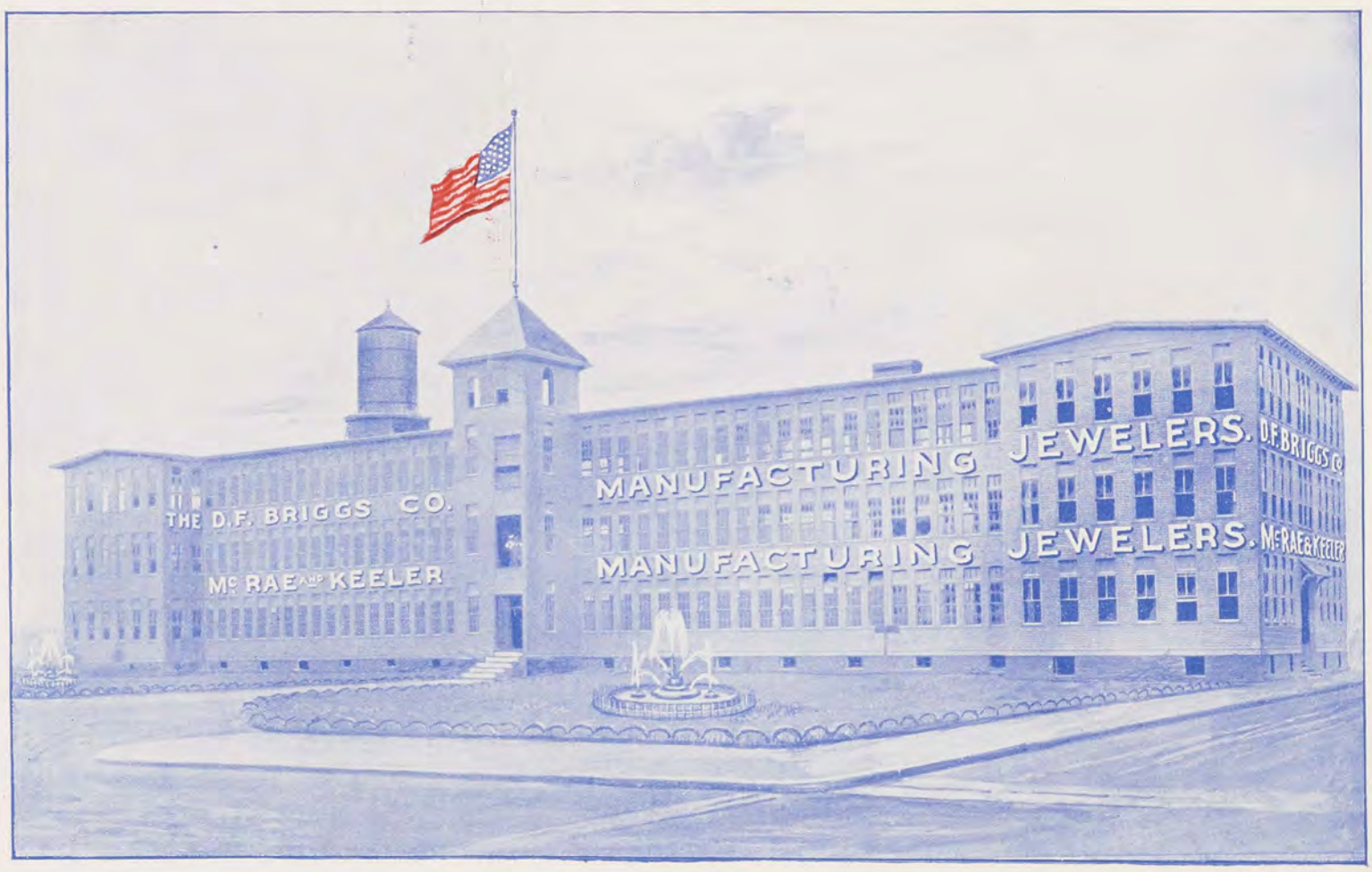
THE above illustration represents our new factory, containing twenty-five thousand more available square feet than any other jewelry plant in the Attleboros. It is being constructed with fire and water-proof floors, and equipped with a complete system of sprinklers and electric gongs, which will easily make it the most modern and up-to-date plant in the jewelry industry.



The Bigney Vest Fob
(Patented Sept. 12, 1899)
IS A HUMMER!

S. O. BIGNEY & CO.

The Largest Jewelry Factory in the World



"Nuf sed!"

GOOD TIMES | R. F. S. & CO. | CHAIN STOCK

THE GREATEST CHAIN-SELLING SEASON OF THE CENTURY

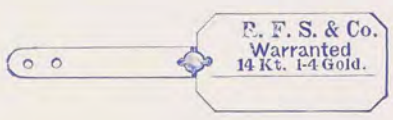
now confronts you. And it is strictly a good goods season. Money is plentiful and buyers critical. Quality and style are quite as much of a consideration as price. ALL THREE TO SUIT is the sale-making combination the jewelers have in the celebrated **R. F. S. & CO.** product of

GENTS' AND LADIES' CHAINS CHAIN BRACELETS, ETC. LOCKETS AND SEALS

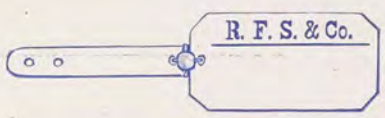
IN GOLD AND GOLD FILLED.

By way of making sure you are right before going ahead, take a few moments and learn by rote

The Story of the Tags



These Tags speak for themselves



This Tag is used on all our regular quality goods $\frac{1}{10}$ 12 K.

SOLD BY ALL LEADING JOBBERS.

R. F. SIMMONS & CO.

NEW YORK SALESROOMS,
9, 11 and 13 Maiden Lane.

Factory and Main Office,
ATTLEBORO, MASS.

The limited supply and great demand for fine turquoises would have placed these gems among the most costly of the precious stones were it not for the fact that turquoises have rarely retained their beautiful color.

An experience of eight years has demonstrated that among the products of various turquoise mines, Persian, Egyptian and American, the stones of the Azure Mines have been unique.

None of the "Azure" stones has changed color, and it is as safe for a jeweler to sell a turquoise from the the Azure Mining Company as it would be to sell a ruby or an emerald.

To protect the trade against fraud and to emphasize our "guarantee," we mark every "Azure" turquoise by engraving a ring or circle on the back of the stone.

None is genuine without this ring, which is a trade-mark registered in the United States and Europe.

The AZURE MINING COMPANY will prosecute all parties who imitate its trade-mark or who make or use a colorable imitation of the same. The trade is therefore respectfully cautioned to refrain from buying or selling any turquoises so imitated.

THE STELLA MUSIC BOX

is the only music box with smooth steel tune sheets, no pins to bend or break off. It is an ideal music box for the home, having a SWEETNESS, HARMONY and VOLUME of tone found in no other, Its construction is simple and durable, and the cost of new tunes is trifling.

$16.00 and Upward.

IDEAL

SWISS CYLINDER MUSIC BOXES

Playing 6 to 600 tunes, and changing tunes automatically,

from $19.00 to $2000.

Write for catalogue.

JACOT & SON,

39 UNION SQUARE
NEW YORK

MOROCCINE WATCH BOX.
SOLID VELV. COVERED BLOCK.

RING BOX. VELVET COVERED.
VELV. LINED.

Manufacturers
and
Importers

S. A. Borgfinner,

NEW YORK

82 and 84 Nassau Street

Fine Cases

...for...

Watches, Jewelry and Silverware

of every description

TRAYS ~ SAMPLE CASES ~ PAPER BOXES

REGENT BRAND SPECIALTIES

FOR AMERICAN WATCHES

$1.00 per dozen $10.50 per gross.	$ .75 per dozen. $7.50 per gross.	$ .75 per dozen. $7.50 per gross.	$ .15 per dozen. $1.50 per gross.	$ .20 per dozen pairs. $2.00 per gross pairs.	$ .10 per dozen. $1.00 per gross.

DISCOUNT—6 PER CENT. OFF FOR CASH.

A HANDSOME SOLID OAK CABINET FREE WITH YOUR FIRST ORDER FOR ONE GROSS MAINSPRINGS.

CROSS & BEGUELIN,

Importers, Exporters and Manufacturers,
Watches, Diamonds, Jewelry,
Silver-Plated Ware, Etc.,

17 Maiden Lane, New York.

F. H.
Sadler & Co.

are the makers of the

PATENT TRADE S MARK RING

The old style rings are made by soldering.
Our rings by swedging; by so doing, the gold is left equally distributed, showing no composition edges.
The trade-mark is a guarantee that every ring is Gold Filled Seamless.
They are retailed at the popular price—25 and 50 cents each.
Put up in fancy cases, containing 1 doz., 2 doz., 3 doz., 6 doz., 12 doz., 18 doz.

FOR SALE BY ALL JOBBERS.

New York Office, 3 Maiden Lane.

Factory, **Attleboro, Mass.**

Wightman & Hough Co.

ESTABLISHED 1856.

TRADE-MARK
W & H Co

INCORPORATED 1893.

New York Office:
3 Maiden Lane.

Factory:
Providence, R. I.


1521


1211


2480

Largest and Oldest Makers of Fine

LOCKETS

in America.


1747

Solid Gold
Gold Filled
Rolled-Plate
Sterling Silver

3000 Patterns


1221


1989

JOBBING TRADE ONLY

Gold, Silver and Rolled-Plate Lockets and Charms.
Big Line Sterling Silver Enamel "Friendship Hearts."

NO story of the past hundred years will be complete without some account of the origin and progress of the American patent system, which has been practically co-temporaneous with the century. Of all the great government bureaus at Washington there is none so deeply interesting to KEYSTONE readers as the United States Patent Office. Our illustration shows the magnificent Patent Office Building, under the vast roof of which are housed the trophies of the inventive genius of the country for more than a hundred years, besides copies of thousands of devices that were made beyond the seas. We are proud to say that not a few of the trophies are the work of readers of this journal.

Founded by Jefferson

THE American patent system was founded in 1790, through the efforts of Thomas Jefferson, then Secretary of State, and who during his residence abroad had seen the encouragement and protection which other countries extended to inventive skill. The system adopted was modeled after the ones in vogue in Europe. It originally provided for a "Tribunal of Three," which became, later, the "Board of Commissioners," consisting of the Secretary of State, the Secretary of War, and the Attorney-General. This "Tribunal" was empowered to grant patents for any "such useful art, manufacture, engine, machine or device as they should deem sufficiently useful and important," and was also given power to refuse patents for "want of novelty of invention, and insufficiency of utility and importance,"—a discriminating power which they exercised so freely that in the first year of the system only three patents were granted. This made it exceedingly unpopular with patentees, and in 1793 another act was passed which modified their power of discrimination.

Some Early Inventions

FROM 1790 to 1802, the entire work of the Patent Office was performed by one clerk in the State Department, and its records did not fill a dozen pigeonholes. However, the business of the new bureau was broadening, and, in 1802, a Doctor Thornton was appointed its superintendent. History describes Doctor Thornton as a "gentleman of scientific attainments," and, like some gentlemen of that distinction at the present time, he was erratic in the extreme. He had views of his own, and one of them was that the patent law was made solely for the encouragement of authors and inventors, and that the little matter of financial return to the government was of such minor importance as to require small attention from him. For twenty-six years he held autocratic control of the office, and although after his death there was found to be a deficit in the treasury of the amount that should have been to the credit of the Patent Office, no one thought of impugning his personal honor, but accredited it to his known liberality with patentees, and his lack of system. His devotion to the work of the office was unbounded. During the War of 1812, when the British captured Washington and destroyed the Capitol and other public buildings, a loaded cannon was trained on the Patent Office. Doctor Thornton is said to have rushed out, and, in a frenzy of excitement, to have thrown himself in front of it, crying: "Are you Englishmen, or only Goths and Vandals? This is the Patent Office, a depository of the ingenuity of the American nation, in which the whole civilized world is interested. Would you destroy it? If so, fire away, but let the charge pass through my body!" The effect of such heroism was magical, and the office was saved from destruction.

During the early years of the century, the Patent Office was located in the old War Department Building; but, in 1812, Congress purchased, "for the General Post Office and Keeper of the Patents," a big barn-like structure that stood on the southwest corner of what is now Post Office Block, and there it remained until the fire of 1836, although it had to be enlarged several times during the interim. In 1836, Congress passed a law reorganizing the entire system of patents, and inaugurating practically the one now in force. It was still combined with the Department of State, but was made a separate bureau, and its chief was designated the Commissioner of Patents, and given a force of eight men,—which was characterized as "a reckless piece of extravagance in clerk-hire" by some of the economical statesmen of that time. Hardly had the reorganized bureau begun operations when, on the night of the fifteenth of December, 1836, there occurred the fire which swept out of existence almost everything connected with the Patent Office. There were destroyed 7,000 models, 168 volumes of records, 9,000 drawings, 10,000 original descriptions and specifications, and 230 volumes belonging to the scientific library. The loss which was perhaps of the most historical importance, was that of the drawings, made by the inventor, Robert Fulton, of the machinery of his steamboat, and the illustrations of its initial trip up the Hudson, in 1807.

An Irreparable Loss

IN many respects the loss from this fire was irreparable, but Congress enacted that no patent granted prior to the fire could be given in evidence without being recorded anew. In this way the return of the most important was secured, and an index was compiled of the early transactions of the office. A temporary place was provided for the bureau, and $108,000, then standing in the United States Treasury to the credit of inventors, was appropriated by Congress for the construction of a building for the exclusive use of the Patent Office. The site selected was the public reservation of the four acres which L'Enfant, the French engineer who made the original plan of the city of Washington, set aside for a "National Church." The south wing was completed and occupied in 1840; the other three wings were erected as necessity demanded, the last to be finished being the north one, in 1867. In 1877, the bureau suffered from another fire, which caused a far greater money loss than the first, but the actual loss was comparatively light, as the perfect system of records, and photo-lithography, prevented an hour's disturbance to the business of the bureau.

Government Revenues from Patents

THE Interior Department was created in 1849, and the Patent Office was transferred from the State Department and made the most important bureau of the new department. Since then the increase of its business has been little short of marvelous. Some idea of this increase is obtained from the fact that, up to 1849, there had been issued only 5993 patents, while at the end of last year there had been granted 574,369. During the twelve months of 1897 alone, there were 23,794 patents granted. The financial return to the government from these patents is very large. The balance in the United States Treasury to the credit of the Patent Office, January 1, 1898, was $4,971,438.06. The total receipts for 1897 were $1,375,641.72, and the expenses of the bureau were $1,122,843.15, so that the excess of the receipts over the expenditures was $252,798.57—figures which demonstrate that the Patent Office brings into the general treasury something over three thousand dollars each day, quite a respectable return for this department.

This money comes from the fees of the patentees, from the sale of copies of the records of the office, the recording assignments of patents, the sale of the "Official Gazette," and one or two other sources of revenue. The Patent Office fee on each patent issued is thirty-five dollars.

The care and work each patent requires is little realized outside of the office. From the time an application for a patent reaches the office until it receives the signature of the First Assistant Secretary of the Interior, it passes through a very large number of hands. There is a clerk to receive the letter of application, another to receive the first fee, while the drawings and papers go to another, and a fourth makes an alphabetical record of it. All of this is simply preliminary, for the real work begins when the papers are placed in the hands of the examiners.

United States Patent Office, Washington, D. C.

CASH BUYERS

will find it to their advantage to write me before buying their HOLIDAY STOCK.

I wish to announce to the **Northwestern Trade** that my stock of **WATCHES** and **GOOD JEWELRY** is more complete than ever, and that I am still looking for increased favors from them, and will promptly and carefully attend to any orders entrusted to me.

ORDERS FILLED FROM ANY CATALOGUE. SELECTION PACKAGES SENT TO RESPONSIBLE PARTIES.

LEWIS FINKLESTEIN

The Northwestern Watch Jobber, **Manhattan Bldg., ST. PAUL, MINN.**

LIQUID AMBER

TRADE MARK

THE JEWELERS CEMENT

COLORLESS TRANSPARENT

"It lightens the cares of the watchmaker,
and causes his face to be wreathed with smiles."

When you want to cement a ruby pin or pallet jewel,
Or a pearl in a ring,
Or tighten a loose watch glass,
Or any one of a dozen other things requiring
a little good cement,
Use **LIQUID AMBER,**
It is better than shellac,
It is easier to apply,
It takes less time,
It makes a better job.

LIQUID AMBER is sold by every material dealer in America,
Price, **25c.**; full directions with each bottle.

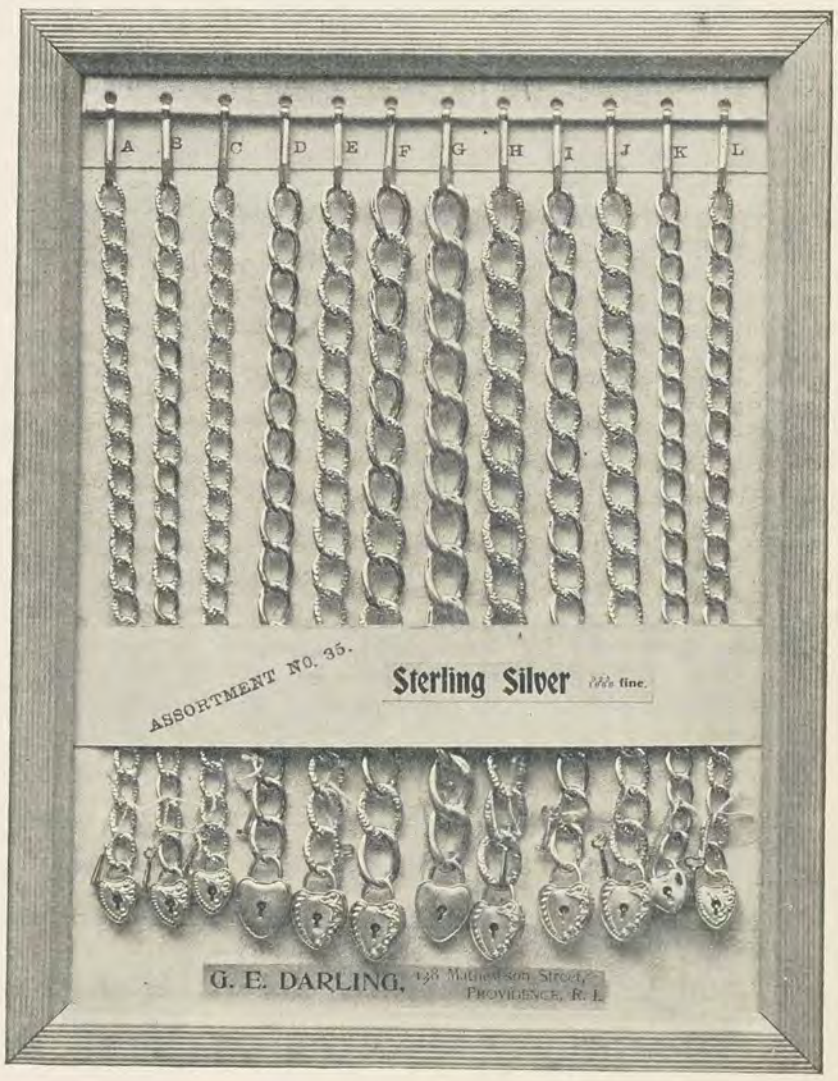
SUSSFELD, LORSCH & CO.

37 Maiden Lane,

NEW YORK,

Wholesale Agents.

These Bracelets have solderless locks and links; they are sterling silver, 925-1000 fine. The illustration shows one-half their actual length. Price for one dozen, on neat pad for display, as illustrated, **$9.60.** The different styles cost—A, B, C, K and L, **$8.40** dozen; D, E, I and J, **$10.20** dozen; F and H, **$11.40** dozen; and G, **$12.00** dozen. All prices subject to spot cash discount 10 per cent. I will send sample dozen for inspection to any responsible jeweler, to be returned at once if not more than satisfactory. Have you received my new catalogue? If not, send postal.



CUCKOO CLOCKS

as we make them, are

UNIQUE, ORNAMENTAL AND RELIABLE TIMEKEEPERS.

The Greatest Holiday Sellers you can handle. Get a sample line, hang 'em in your store or window, and see how they'll **speak for themselves.** They attract attention; you mention the price and you'll nearly always make a sale. Get our illustrations and prices before placing your orders.

AMERICAN CUCKOO CLOCK CO.,

THE ONLY MANUFACTURERS AND LARGEST IMPORTERS OF CUCKOOS IN AMERICA.

PHILADELPHIA, PA.

News from the Northwest.

There has been no decided changes to notice the past month in the business situation. The conditions of last month continued through this. The return of the volunteers from the Philippines and the visit of President McKinley during the month has created no little excitement, and this entire section has had its celebrations, which have caused the massing of dense crowds of people to the larger cities and the natural spending of money for souvenirs, which jewelers had taken advantage to place on sale, has all helped, and now every one is talking and buying holiday goods. Jobbers report business keeping up to their full capacity; their only trouble seems to be to get goods enough to fill orders, and already orders are placed for December 1st shipment, for, unless placed early, there is sure to be disappointment. Collections are good, and prospects never were brighter.

Stone & Donahue, Grand Forks, N. Dak., have dissolved partnership. H. A. Stone continues at the old stand, and J. E. Donahue has opened a new store for himself.

Merrill C. Meeker has bought out J. C. Hamil, Farmington, Minn.

Hill & Bradshaw, White Rock, S. Dak., have added an optical line.

J. E. Smith, formerly at West Superior, Wis., is now located at Fargo, N. Dak.

Otto Nelson is the new jeweler at Amery, Wis.

J. J. Bruckbauer, Sleepy Eye, Minn., was married September 26th to Mathilda E. Schmid. After a short wedding trip to the Twin Cities the young couple are now "at home" just like old married folks. THE KEYSTONE'S best wishes to you, J. J.

A. L. Haman, St. Paul, mourns the death of an infant son, who died September 26th.

J. A. Gartland, Rock Valley, Iowa, has bought the store, building, fixtures and part of the stock of Geo. P. Drew, who is now out of business entirely.

L. J. Outen, of A. H. Simon, St. Paul, Minn., has returned from a four-months' visit to the Eastern coast, and is once more to be seen behind the counter in his usual place.

Zebulon S. Skinner, for some years a clerk for Eustis Bros., Minneapolis, was arrested October 7th by detectives on a charge of grand larceny. Eustis Bros. report their loss at $1500. Skinner has confessed the crime and implicated a broker named "Jim" Brady, who is also under arrest.

Fred. Willman, Stillwater, spent a few days hunting the past month.

E. Lytle has re-opened his diamond parlors at 411 Robert Street, St. Paul, Minn.

A. Swenningsen, Moorhead, Minn., lost $1000 worth of tools and fixtures by fire last month. Covered by insurance.

H. W. Fintzell, Minneiska, Minn., has his new store building completed and is now nicely situated.

Florello B. Sweet and Lydia E. Lavocet were married at St. Paul October 16th. Flo furnished his friends a decided surprise, but nevertheless we wish for all manner of happiness.

Geo. J. Preston, of Sischo & Beard, St. Paul, is still confined at home with typhoid fever, but says he will get to work this month barring accidents.

Lewis Finklestein, the St. Paul watch jobber, reports business the best since he has been in business. He will have to put on additional help to keep up with increase in business.

Ernest, the youngest son of E. Schmalz, St. Paul, was so badly burned by gasoline fire that he died October 17th. Our sympathy to the bereaved parents.

Botsford Bros., Altoona, Wis., lost $100.00 worth of jewelry by burglars October 16th.

A. L. Bolsta, lately in business at Madison, Minn., is now located at Ortonville, Minn.

Charles Heidbrink, of L. C. Ervin, St. Paul, has been confined to his bed the past month with a severe attack of typhoid fever.

Chas C. Staacke, lately in business at St. Peter, Minn., passed through the Twin Cities last month, with his family, for St. Croix Falls, Wis., where he has opened a new store.

The St. Paul Jewelry Mfg. Co. have begun business at 406 Kendrick Block. Chas. F. Zinn, lately in the employ of Geo. W. Wooley, is manager.

Rueben Nystrom, lately with The Golden Rule is now with Geo. W. Wooley, St. Paul.

Chas. W. Spickler, Wyoming, Minn., has returned from a lengthy trrip of inspection, and has decided to locate permanently at his old stand.

William Seng, of Schuneman & Evans, St. Paul, is confined at home by severe illness.

Sischo & Beard report the best business in the history of the firm, and are obliged to put in extra long hours to fill orders promptly. They are sending out their optical catalogue, and also their tool and material catalogue, which any jeweler can get a copy of on request.

W. E. White, lately with J. E. Reeves & Co., Groton, S. Dak., will soon go in business at De Smet, S. Dak.

F. H. Boehaer, Durand, Wis., spent three weeks the past month visiting relatives in New York and Pennsylvania.

L. P. Sandberg, Red Wing, Minn., has moved to a larger and better store, No. 316 Third Street.

Oscar W. Heiseman, West Union, Iowa, spent a short vacation hunting in Montana.

Henry Bockstruck, St. Paul, has greatly improved the appearance of his store room by putting in a new ceiling and frescoing the walls.

N. G. Whitney, Gray Eagle, Minn., passed through the Twin Cities on his way to Southern Minnesota, where he attended the annual convention of The United Brethren.

F. L. Husby, Red Wing, Minn., has moved to 311 Plum Street, and added a bicycle department.

Flo B. Sweet has left the employ of S. H. Clausin & Co., Minneapolis, and is now working at "The New Store."

A. F. Steenstrup, Kenyon, Minn., was married at Caledonia, Minn., to Miss Shuber, September 22nd. THE KEYSTONE'S congratulations are extended.

I. R. Bunker, of S. H. Clausin & Co., Minneapolis, is in North Wisconsin and Michigan doing his best and looking pleasant.

Henry Berkenhauer & Co., Minneapolis, reports business growing better with them.

Rentz Bros., Minneapolis, report business more than they can handle as promptly as they would like to, but are doing the best they can, and hope the trade will excuse a little delay.

The Reed-Bennett Co., Minneapolis, report extra hands put on to take care of orders.

D. Marx Sons, St. Paul, say business is away ahead of anything they have ever had, but are keeping up with orders nicely.

F. A. Upham, St. Paul, manufacturer of the great French eye water, reports the demand double the quantity of last year. A good sign of quality.

Benjamin Levy, Stillwater, Minn., has received his discharge in bankruptcy from the United States Court.

S. C. Hone, Prairie Farm, Wis., has moved to Barron, Wisconsin.

E. E. Finch, of Sischo & Beard, St. Paul, was married at Clinton Falls, Minn., to Miss Ella A. White, September 25th. THE KEYSTONE'S congratulations to the happy young couple.

A. Wilton, uncle of A. M. Wilton, Alexandria, Minn., and for fourteen years in business there, has returned from a three-years' visit to Europe, and says America is good enough for him. He is now with his nephew.

C. A. Nelson, with C. G. Wennerlund, Willmar, Minn., fell from his bicycle last month and broke his shoulder-bone. He is now able to be about the store and improving.

F. C. Banfil, formerly watchmaker, is now manager of jewelry department for S. E. Olsen, Minneapolis.

C. H. Anderson, Willmar, Minn., was married October 7th to Miss Agnes Lindblad. C. H. says married life beats single cussedness all hollow. Here's to your future happiness.

J. J. Allen, formerly at London, Ontario, is now at the bench in Alexandria, Minn.

The following jewelers from outside towns visited Twin City jobbers the past month: C. W. Logan, Clara City, Minn.; T. J. Thompson, Cameron, Wis.; A. C. Peterson, Gibbon, Minn.; John C. Marx, Shakopee, Minn.; C. H. Todd, New Richmond, Wis.; A. Swenningsen, Moorhead, Minn.; Clyde B. Ayers, Osceola, Wis.; F. Shopera, Little Falls, Minn.; Theo. Schaal, Hastings, Minn.; E. M. Schwenke, New Richland, Minn.; L. E. Bryant, Belle Plaine, Minn.; H. Jorgenson, West Superior, Wis.; A. J. Lee, Hudson, Wis.; Fred. Giehler, Norwood, Minn.; Chas. W. Spickler, Wyoming, Minn.; N. G. Whitney, Gray Eagle, Minn.; L. J. Fifield, Oronocco, Minn.; Herman Fredell, Center City, Minn.; A. L. Bolsta, Ortonville, Minn.; J. J. Bruckbauer, Sleepy Eye, Minn.; W. W. McGuire, Northfield, Minn.; J. E. Smith, Fargo, N. Dak.; George W. Staacke, St. Peter, Minn.; F. C. Taylor, Hastings, Minn.; Wm. Krohn, Annandale, Minn.; Chas. C. Staacke, St. Croix, Falls, Wis.; J. C. Hamil and Merrill C. Meeker, Farmington, Minn.; F. M. Malenberg, Lindstrom, Minn; J. L. Moody, Ellsworth, Wis.

Pittsburg and Vicinity.

John Dwyer, for many years in the employ of J. C. Hanna & Son, of New Castle, Pa., has opened a new store in that city. He was in the city several times lately making additions to his stock.

M. Mazer, of Federal Street, Allegheny, Pa., has improved the appearance of his store by the addition of an entirely new front.

John Schaefer, of Fifth Avenue, Oakland, has sold out his store to Charles Wiley, who will continue the business.

On October 1st the store of George V. Brady, of Washington, Pa., was entered by thieves, who stole diamonds, silverware and rings, amounting to over $600 in value. The trays were found next morning in the yard in the rear of the store. An entrance was gained by breaking off the shutter in the rear of the store.

Joseph P. Lange, one of the best watchmakers in the city, and for many years with E. P. Roberts & Sons, is now in the employ of Hardy & Hayes.

Harry C. Morrison, of Mt. Pleasant, Pa., has been in the city for the past ten days serving on the Grand Jury.

Barney Aarons has returned to his store after an extended summer vacation on his farm at Avondale-on-Lake-Erie.

Louis VanUllem, a prominent pawnbroker, was fined $100 by Alderman Toole for not complying with the city ordinunce, which demands that pawnbrokers must make a daily report to the police officials of daily loans made. This is the first suit of its kind to be entered. The information was made by Supt. A. H. Leslie.

Spandan Bros. opened their new store on October 1st. They recently engaged in business at 522 Smithfield Street.

The increase in the volume of business necessitated A. H. Gerwig, of the Verner Building, taking on a new man —J. G. Corbett, a former jeweler of Rochester, Pa.

R. E. Hall, for many years engaged in business in Braddock, Pa., has just closed a deal with John Myers to purchase his store. Mr. Hall will reopen in the spring, with his son, Frank Hall, as a partner.

Louis Evans, an old-time watchmaker of this city, and lately with A. E. Siviter, of the Verner Building, has gone to work for Merrill & Bauman, of Jeannette, Pa.

Boniface I. Wehrle, a jeweler of Indiana, Pa., died in that town during the week of October 7th. He was a prominent citizen of that town, and had been engaged in the jewelry business for over thirty years. He is a brother of R. W. Wehrle, the optician, and E. N. Wehrle, a jeweler of Punxsutawney, Pa. THE KEYSTONE extends sincere sympathy to the bereaved family.

J. W. Kemple has opened a branch store at Penn Avenue and Fortieth Street.

J. I. Buser has opened a new store at Freedom, Pa. He was formerly with John Linnenbrink, of Rochester, Pa.

W. J. Blair, who was formerly in business at Buckhannon, W.Va., has opened a new store at Belle Vernon, Pa.

John E. Wilson, who was formerly with M. G. Cohen, of Fifth Avenue, has opened a new store in West End, this city. He is located on Main Street.

A. H. Gerwig, of the Verner Building, has just issued a new 750-page catalogue of all his lines.

W. Sparling, formerly of Monaca, Pa., has disposed of his business, and will engage in the oil business.

A. I. DeRoy, of the well-known firm of Israel DeRoy & Son, has returned from the East after purchasing a large stock of diamonds, watches and jewelry for fall and holiday trade. The store is undergoing a number of repairs and when finished will be one of the most modern in town. They then will be able to take care of their trade, which has grown so extensively within the past forty years.

The following out-of-town buyers called on the trade in this city: H. B. Cubbison, New Castle, Pa.; Mr. Allebach, Emlenton, Pa.; F. H. Hayes, Washington, Pa.; Wm. Hunt, Uniontown, Pa.; A. V. Johnston, Evans City, Pa.; E. Grieb, Butler, Pa.; E. H. Kennerdell, Tarentum, Pa.; Chas. Kennerdell, Salem, Ohio; J. F. Murphy, Dawson, Pa.; R. H. Wolf, Smithton, Pa.; Harvey Wallace, Smith's Ferry, Pa.; A. C. Guth, East Brady, Pa.; C. E. Hart, Sharon, Pa.; Bert McFarland, Burgettstown, Pa.; F. M. Benner, New Lisbon, Ohio; G. Metzgar, Leetonia, Ohio; W. E. Ralston, Butler, Pa.; J. W. Caler, Beaver, Pa.; E. H. Shafer, Beaver Falls, Pa.; Emil Jonas, Youngstown, Ohio; M. J. Samuels, Youngstown, Ohio; John Linnenbrink, Rochester, Pa.; A. H. Fisher, Greensburg, Pa.; E. N. Wehrle, Punxsutawney, Pa.; H. Hartman, Wapakoneta, Ohio; Mr. Casbeer, Somerset, Pa.; Bert Kurtz, Dawson, Pa.; F. W. Poland, East Liverpool, Ohio; F. Laban, Toronto, Ohio; A. Merz, Sewickley, Pa.; C. Scharbach, Chicora, Pa.; J. P. McDonald, Sewickley, Pa.

It does not require genius to make a successful merchant

but

an eye to see and a mind to act are necessary qualifications of progress. To many possessing them, we are old acquaintances. . . . Hence our query to the rest is,

Have you seen our line?

Our New

Elk Ring

(PATENTED)

An Instant Success

CORRESPONDENCE SOLICITED.

LOUIS KAUFMAN & CO.

ESTABLISHED 1885

MAKERS OF SET RINGS

54 Maiden Lane,
NEW YORK

2500 Varieties

The Century's Best Achievements.

BY JOHN TWEEZER.

Elsewhere in this sumptuous number of THE KEYSTONE is recorded the marvelous progress of invention and discovery in the Nineteeth Century —a record which justifies the Century in that beatific self-esteem which Coleridge observed in a German whom he encountered at Frankfurt-on-the-Main, in 1798, who always took off his hat when he spoke of himself. The amazing achievements of the past hundred years, in all that makes for the material happiness of the race, warrants the Nineteenth Century in taking off its hat to itself with profound self-respect—in throwing bouquets at itself, and shouting "Bravo!"

And yet the phenomenal total of invention and discovery does not represent the whole of the gains that have accrued to humanity in this wonderful span of time—nor the most valuable; for beyond these tangible and measurable assets of the race are vast accretions whose value cannot be told in dollars nor checked off by the expert accountant. The greatest gain has been in the broadening of the mind and the enlarging of the soul of man; in the development of "the charities that soothe and heal and bless," and the growth of the sentiment of universal brotherhood.

The evidences of this humanitarian progress are present in multiplied instances. There was a time when the insane were believed to be possessed of the devil; were chained to posts and scourged and starved. Now they are made the wards of the State, and science is lavishing her best effort to the remedying of their unhappy condition. There was a time when the honest debtor was sent to jail; and the horrors of the Fleet Street prison are familiar to all readers of the English history of that unhappy time. The treatment of prisoners has immensely changed, to the honor of courts and the credit of the law. The indigent and the orphaned have gathered to themselves a splendid sympathy which is expressed in every county of every civilized state. The notable spread of the sentiment of charity, intelligently directed, is one of the proudest monuments which the Century has builded to its own honor.

The hygienic efforts of all countries have resulted in systems of sanitation that have saved the lives of millions of human beings. The plague is no longer known among civilized peoples. The death-rate is steadily going lower, year by year, while the recent studies and researches into primary causes of disease promise an average longer life to all sorts and conditions of men, wherever these beneficent efforts are operative.

But it is especially in the direction of social, intellectual and moral *toleration* that the real glory of the Nineteenth Century shines brightest and best. The status of woman has been immensely improved in the past hundred years. From being a subordinate she has been lifted to an equal with her brother. The field of earnings is shared with her. The domain of medicine and law may be traversed by her without fear of contumelious criticism. She has come to have a potent voice in the consensus of opinion. She walks erect where once she crept. She is a unit now where once she was a cipher. In the contentions of religious faith, also, men have thrown off the hard shell of exclusion and prejudice, and a generous liberality is joining erstwhile foes. "The thoughts of men have widened with the process of the suns." Those who hold opposite opinions on matters of governmental policy, on questions of belief, on problems of science and art and literature, are no longer regarded as outcasts from the respect of those with whom they contend. In one direction only does the Century seem to halt in its advances to the highest level of toleration and large charity—and that is, the recognition of the ethical and moral claims of the Jew in the social, economical and political equations of composite humanity. Germany, Russia and all Latin Europe are shamefully laggard, America is more advanced, but the civilized world as a whole is stultefying its own boasts of progress, in continuing the persecution of this victim of the ages. We Gentiles of the Nineteenth Century have need to blush for our universal barbarity of thought and word and deed, in contemplation of the question of the Jew. When the Century takes off its hat to itself, in complacent self-esteem, it would do well to hold it in such a way as to hide this blot on its escutcheon.

The final glory of the hundred years is the lifting up of the common man, the making distinct individualities out of the mob—in other words, the spread of the gospel of personal liberty. To America the world owes this crowning blessing to the race. Its progress has been marked by the universal abolishment of slavery among all Christian peoples; by the dignifying of labor; by the inspiring of ambition and self-respect among millions the world over; by the nurturing of the belief that "a man's a man, for a' that"; and by the invincible tendency, everywhere, toward a democracy in government, in society, and in the operation of the things that concern the common weal. This tendency, sooner or later, will exhibit itself in the demand that wars shall cease, and so will come the dawning of the day of recognition of the brotherhood of man and the fatherhood of God.

The Nineteenth Century is glorious for what it has already achieved for humanity, but more glorious for the nurturing of the great ideas which have struck root in its soil, and which will blossom in the century ahead.

The Nineteenth Century in Letters.

The citizen of 1899 need have no qualm of conscience in asserting that the intellectual level of the century in which he lives, as measured by the quality and the quantity of the literary output, is higher than any century before has reached. We can boast no such surpassing genius as "the myriad-minded Shakespeare," who glorified the Elizabethen era of English literature; but the elevation above the sea-level of flat dullness is not measured by the single cloud-piercing peak; and the table-land of thought and literary expression in the Nineteenth Century looks down upon the foot-hills that stretch behind it into the blue horizon. The past hundred years is thick-starred with suns of dazzling brilliancy in the firmament of letters. Germany points to Gœthe and Heine; Italy to Leopardi; Spain to Castelar; France to Victor Hugo, the elder Dumas, Balzac and Daudet; Russia to Gogol, Tolstoi and Tourgenieff. But it is especially the literature of England and America in this hundred-year period that is preeminently glorious. One is embarrassed by the riches of great names at his pen's point waiting for mention. Verse exults in the proud array of her votaries—Shelley, with his subtle delicacy, aerial footstep and flame-like motion; Hood, the poet of laughter and of tears; Walt Whitman, whose poems have the rhymth of the tides, the swing of a planet; Bryant, "who in the love of Nature holds communion with her visible forms;" Byron, with his amplitude, sweep and passion, his strength and beauty, his courage and royal recklessness; the gentle Keats, the serene Wadsworth, the tender and humane Whittier; Tennyson, the master of word-musicians; Coleridge, Campbell, Longfellow, Tom Moore and Riley, Lowell and Kipling and Edgar Allen Poe.

Prose lays the laurel on the brows of a glorious brotherhood—the mighty Sir Walter, beloved of all who love romance; the inimitable Charles Lamb; the Autocrat of the Breakfast Table, and the absolute ruler of our affections; Cooper, who transfigured the American Indian; exquisite De Quincey, and delightful Thackeray; the shy Hawthorne, the polished Irving; the gifted women, Charlotte Broute, George Eliot, Margaret Fuller, Harriet Beecher Stowe, Jane Austen and Mrs. Oliphant; Dickens, "the Shakespeare of English prose"; Sidney Smith and Charles Kingsley; the versatile Bulwer and the invincible D'Israeli; Howells and James and Cable and Curtis and Bret Harte and Harris and Bayard Taylor and Mark Twain. History was masterly recorded by Macauley, Bancroft, Froude and Fiske. Philosophy was uttered in print by Darwin, Spencer, Huxley and Emerson; belles-lettres were adorned by Thoreau, Gladstone, Ruskin, Arnold and Landor; Mill and Hugh Miller, the grim Carlyle, and fearless Tom Paine, each left his ineffacable mark upon the historic record. One must stop while the long roster of "names not born to die" is but half called.

Truly, a glorious showing of literary values for the century. And a larger proportion of these than can be shown in any previous century will live in fame as long as speech "doth syllable men's names"—or will deserve to live; for I venture the statement of my candid belief that many of the poets and prose writers of the Seventeenth and Eighteenth Centuries whose names are used to conjure with in our literary workshops would be swept off the scroll of fame on any just and true estimate of their essential worth. Some of these authors have achieved conventional immortality through the accident of circumstance. Some literary fames are among the legacies left by preceding centuries to the present one to account for and explain. I trust I am no iconoclast; but I believe that the value of many of the earlier poems and novels is enormously overestimated, both in regard to their intrinsic merit and in respect of their values in the furtherance of present right literary forms. We must remember that printing was expensive in the earlier days, and the output of the press was infinitesmal compared to now, when "of making many books there is no end;" consequently, the comparatively few that were printed lived in spite of their mediocrity, because of their rarity. But it seems most unfortunate that there should be a conventional adulation given to these early efforts merely because they were early—unfortunate that we should tie to the tradition of praise, without having the courage to bring to it the scalpel of the individual judgment in the light of modern examples. I believe that any one of a dozen authors living to-day deserves better of Fame than many past writers who are always in mention—and nevermore read; and the Nineteenth Century may confidently blazon the names of her great authors on the scroll in letters of gold, and challenge the critic of the future for reason why they should not stand forever, if some of those *earlier* names may also stand! J. T.

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Our make of Rings have been in the market for 30 years. We are the largest **Ring House** in Western New York. We attribute our success to

1. **QUALITY,** which is unquestioned.
2. **STYLES,** always up to date.
3. **FINISH,** only the best.

Don't be satisfied with "Good enough." Get the Best. Selections sent to responsible parties.

Attention!

Our Specialties:

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Diamond Mountings.
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KING & EISELE,

Ring Makers—Diamond Importers,

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} BUFFALO, N. Y.

LEADERS IN JEWELERS AND WATCHMAKERS TOOLS AND MATERIAL

THE LARGEST SHOP IN THE WEST.

WE DO NOT EMPLOY TRAVELERS:- THE KEYSTONE, OUR PROMPTNESS AND THE RIGHT PRICES IS WHAT HAS MADE OUR FIRM ONE OF THE LEADERS OF THE WEST. IN THE MNF'G. JEWELRY TRADE AND IMPORTERS OF DIAMONDS AND PRECIOUS STONES WE LEAD.

REPAIRING OF JEWELRY OUR SPECIALTY

FINE WATCH REPAIRING

MEYER JEWELRY Co.

DIAMOND IMPORTERS AND ENGRAVERS

1016-1018 MAIN ST.

KANSAS CITY, MO.

P. S. McCARTY.

CARLTON & ROSE ENG. K.C.

Kansas City and the Great Southwest.

Crowds of visitors were in this market the early part of last month; in fact, there has been an unusually large number of trade visitors in town all through October. Both our retailers and wholesalers have done a fine business—larger than ever before at this season of the year. It is true that many of our visitors came to town to see the sights, more than they came to buy jewelry. Nevertheless, the past month's business in jewelry and allied lines has been larger than ever. The prospects for a busy season during November and December never were better, and the outlook is most encouraging from every point of view.

W. M. Blakeney, of Abilene, Kans., spent several days at his old home in Grand Haven, Mich., attending his father's and mother's golden wedding, and stopped over in Kansas City on his home trip.

G. Goff, formerly of Iola, Kans., has opened a store on West Ninth Street.

Edwards & Sloane Jewelry Co. are very busy, and find it necessary to work nights in order to keep up with the many special orders they are receiving.

J. L. Orear, with the Edwards & Sloane Jewelry Co., spent several days in Louisiana, Mexico and other Missouri towns during the past month in the interest of his firm.

The sympathy of the trade will go out to Andrew Manifold, the pioneer and highly respected jeweler of Beloit, Kans., who last month buried his son Harry, whose death was sudden and unexpected. Young Manifold had only lately attained manhood's estate and was a bright and promising lad, the idol of his parents. He had recently returned from a six-months' course of instruction at the Bradley Horological Institute, in Peoria, Ill., and was expecting to take an active interest in his father's business. THE KEYSTONE extends sincere condolence to Mr. Manifold in his great loss.

Miss M. Kerr, who has charge of the decorations of C. S. Raymond's Sons, the "Petticoat Lane" jewelers, will be remembered as formerly being connected with various jewelry firms of Omaha, Nebr., for a number of years past.

J. R. Mercer, the Eleventh Street jeweler, has returned from the East with many striking novelties that he expects to display for the holiday trade.

Fred. Chamberlin, formerly with J. R. Mercer, but now located in the Keith & Perry Building, was awarded the contract for making the medals for the Twentieth Kansas Volunteers, of Kansas City, Kans., which are to be presented by the citizens of Kansas City, Kans., and the Meyer Jewelry Co. are completing the same for Fred., which necessitates working nights, as business is constantly on the increase with this firm, they already having several large orders of similar nature.

H. M. Siglock, Keytesville, Mo., had an auction sale recently, which was successfully conducted by Chas. E. Manor, the well-known jewelers' auctioneer.

A. R. Blackstone, of Jefferson City, Mo., is now in the employ of the Meyer Jewelry Co. as watchmaker. E. Morrotto, of the Meyer Jewelry Co., was one of the chorus in the recent Lambardi Italian Opera.

Don R. Dix, of C. A. Kiger & Co., has not fully recovered from his recent illness so as to enable him to resume his work on the road.

E. H. Snow, Woodstock-Hoefer & Co.'s popular traveler, was in during Carnival week, assisting in the entertainment of their friends and customers, and it goes without saying that Edgar is an artist in this line.

Will. C. Avery, formerly of Chicago, will represent the C. L. Merry Optical Co. on the road the ensuing year. Will. is a hustler, and THE KEYSTONE wishes him great success with his new firm.

Geo. F. Merry, the well and favorably known optician of Dayton, Ohio, was the guest of his brother C. L. Merry during the carnival.

Mrs. Frank Shinn, who has been visiting her mother and sisters during the past two months, left several days ago to join her husband on his trip through Minnesota and Wisconsin, who travels that territory for a Chicago firm.

Arnold Megede, of the office force of the C. L. Merry Optical Co., was on the sick list last month, but is again at his desk. Mr. Megede is a brother of the pioneer jewelers (L. Megede's Sons) of Richmond, Mo., they having but recently celebrated their forty-first anniversary, that number of years having elapsed since their father L. Megede embarked in business in Richmond.

H. W. Faragher, Sabetha, Kans., moved into a new store room last month, and now has one of the nicest arranged stores in Northern Kansas.

Oliver H. Gerry, who has been with the C. L. Merry Optical Co. since the business was established here, has resigned his position on account of ill health, and gone to Albuquerque, N. M., where he expects to recover his health.

Jeweler W. Calvet and wife, of Washington, Kans., who recently returned from Europe, where they spent the summer, were in the city during the carnival festivities.

W. S. Evans, of Hiawatha, Kans., has returned from the Klondike.

Jules A. Bourquin, of Horton, Kans., recently added a Prentice retinoscope to his optical department. Mr. Bourquin now has a very neat and up-to-date optical parlor.

J. H. Baker Jewelry Co. is a new jewelry firm at Horton, Kans. Mr. Baker was formerly manager of the W. H. Steele business at that place.

S. J. Strickler, of Salina, Kans., was the leader of the Street Fair held at Salina, September 25th to 28th.

C. H. Morrison, of Topeka, Kans., who has been spending the spring and summer in California returned home last month, and his brother W. M. Morrison was in Chicago the first of October buying fall stock.

O. R. Wilson, for a number of years connected with L. J. Baker, Muskogee, I. T., recently bought Mr. Baker out and will continue the business under his own name.

Fred. Chamberlin, formerly with J. R. Mercer, the "Petticoat Lane" jeweler, has gone into the diamond brokerage business.

P. J. Monk, Pawhuska, Okla. Ter., was visiting Fred. C. Merry during the carnival.

J. C. Diss, formerly in business at Horton, Kans., but now traveling for himself, spent carnival week in the city.

Miss Mary Livers, with the Edwards & Sloane Jewelry Co., who has been laid up for several weeks with a sprained ankle, has returned to her desk.

McIlvain & Harris, of Grand Island, Nebr., held an auction sale during the past month, which was conducted by D. O. Herndon.

J. A. Norton & Son say that they have already began to feel the increased labor and business this year's holiday season will produce, as they have been working nights for three weeks past.

Jeweler S. J. Huey and wife, of Excelsior Springs, Mo., spent several weeks in Hastings, Nebr., last month.

Among recent trade visitors in this market, we note the following: G. W. Ellis, Butler, Mo.; A. W. Thistlewaite, Tongonoxie, Kans.; G. R. Terry, Neosho, Mo.; A. B. Phinney, of A. B. Phinney & Co., Overbrook, Kans.; J. O. VanVoorhis and wife, Osawatomie, Kans.; A. H. Love, Laclede, Mo.; R. C. Libby, Weir City, Kans.; J. W. Phillips, Chanute, Kans.; H. E. Conklin, Chanute, Kans.; D. P. Smisor, Sterling, Kans.; H. A. Phillips, Fairfield, Neb.; G. W. Lewis, Carbondale, Kans.; J. E. Johnston, Frederick, Kans.; J. T. Houseman, Alta Vista, Kans.; Isador Eller, Richmond, Mo.; George L. Marquis, Pond Creek, Okla.; E. W. Cady, Browning, Mo.; C. A. Thomas, Norborne, Mo.; M. L. Gibson, Linneus, Mo.; C. F. Jennish, Tarkio, Mo.; E. Michelin, Madison, Kans.: P. D. Bonebrake, Holton, Kans.; A. Zeller, Longton, Kans.; J. A. Selby, Caney, Kans.; B. F. Chapman, Osceola, Iowa; Fred. Powell, of Powell Bros., Fort Scott, Kans.; J. L. Potts, Marceline, Mo.; G. F. Haskins, Kiowa, Kans.; E. D. Dunning, Concordia, Kans.; A. C. Simpson, Hamilton, Mo.; W. J. Fowler, Eudora, Kans.; B. Parks, Bonner Springs, Kans.; W. F. Ash, Haven, Kans.; J. H. Riffe, Craig, Mo.; Mrs. S. F. Powers, Kincaid, Kans.; Sam Friedberg, Topeka, Kan.; M. R. Waggoner, Weston, Mo.; E. R. Welker, Liberal, Mo.; W. C. Sellers, Medicine Lodge, Kans.; H. R. Stevens, Nevada, Mo.; Mr. Smith, of Gruelich, Huber Jewelry Co., Boonville, Mo.; C. E. VanVoorhis, Yates Center, Kans.; G. Goff, Iola, Kans.; John Rupp and wife (of the Bliss Jewelry Co.), Atchison, Kans.; Geo. Hudson and wife, Winfield, Kans.; J. H. Whiteside, Liberty, Mo.; Fred. Essig, Plattsburg, Mo.; S. A. Pence, Kearney, Mo.; Chas. H. Seiler, Galena, Kans.; Frank Wuerth, of J. H. Wuerth & Son, Leavenworth, Kans.; Emil Ludwigs, Lexington, Mo.; Walter Starcke, Junction City, Kans.; T. Kolstad, Pleasant Hill, Mo.; G. L. Samuels, Ft. Scott, Kans.; C. A. Clement, Springfield, Mo.; M. F. Kohler, Parsons, Kans.; Jas. A. Turner, of Turner & Turner, Mound City, Kans.; W. H. Meyer, Lawson, Mo.; C. C. Stevenson, Pittsburg, Kans.; J. F. M. Lloyd, Smithville, Mo.; J. F. Christian, Springfield, Mo.; G. A. Young, Moberly, Mo.; N. W. Frantz, Conway Springs, Kans.; J. A. Hart, Oskaloosa, Kans.; T. S. Terry, Downs, Kans.; F. A. Beeler, with E. Hays, Wellington, Kans.; H. W. Nunamaker, Ellsworth, Kans.; G. S. Peck, Nardin, Okla. Ter.; K. A. Mott, Avalon, Mo.; M. S. Swisher, Emporia, Kans.; A. L. Neuenschwander, Lowry City, Mo.; E. Hostetler, Garden City, Mo.; L. Hoffman and daughters, Leavenworth, Kans.; Z. A. Meredith, Tahlequah, Indian Territory; W. K. Grady, Lee's Summit, Mo.; W. M. Woolard, Olathe, Kans.; Sol. Marks, Lawrence, Kans.; L. Megede, of L. Megede's Sons, Richmond, Mo.; John J. Stott, Paola Kans.; Emil Bichsel, of Bichsel Bros., Sedalia, Mo.; Ward Combs, of Combs Jewelry Co., Billings, Mo.; C. W. Curteman, Mountain Grove, Mo.

The Spirit of Accommodation.

Would that we might impress upon every merchant and salesman the priceless value of the spirit of accommodation. Strive to give satisfaction in the case of small orders, and the large ones will take care of themselves. Place yourself in sympathy with the feelings and needs of every customer. This line of policy persisted in and reinforced by all the necessary requirements of stock and price and assortment, will give any man his full measure of business success.

How to Succeed.

The man who is making his own capital must know how to buy carefully and well. He must understand the value of money and get equivalent for every cent expended, but he should be broad minded enough to know that equivalent is not always immediately apparent—in such matters as advertising, for instance. He must be master in his store and keep careful watch upon every detail until the business grows sufficiently to warrant securing a suitable partner or a capable assistant to whom matters of detail can be safely trusted, leaving the proprietor free to manage the larger matters, which the growth of the business will bring to the front. He will gladly seize every legitimate means in the right direction, and as quickly repudiate any schemes which in any way will affect his credit, his reputation and his honor.

A Significant Motto.

Whoever was the author of the motto, "Selling below cost closes the store; pretending to do so cheats the customer," was a person of wide discernment. It is a motto that should at all times be borne in mind by retailers, particularly when clearance sales are the order of the day. To use the most euphemistic expression possible under the circumstances, it is utter nonsense to inform the public that you are "selling below cost." They ascribe the statement to one of two things: Either that the person making it is an advanced edition of Ananias, or that he is a fool of the first water. The world is too advanced nowadays to believe that people embark in business simply for the pleasure of ruining themselves. In such announcements, therefore, it is better to confine one's self within the bounds of reason than have recourse to such gross exaggeration.

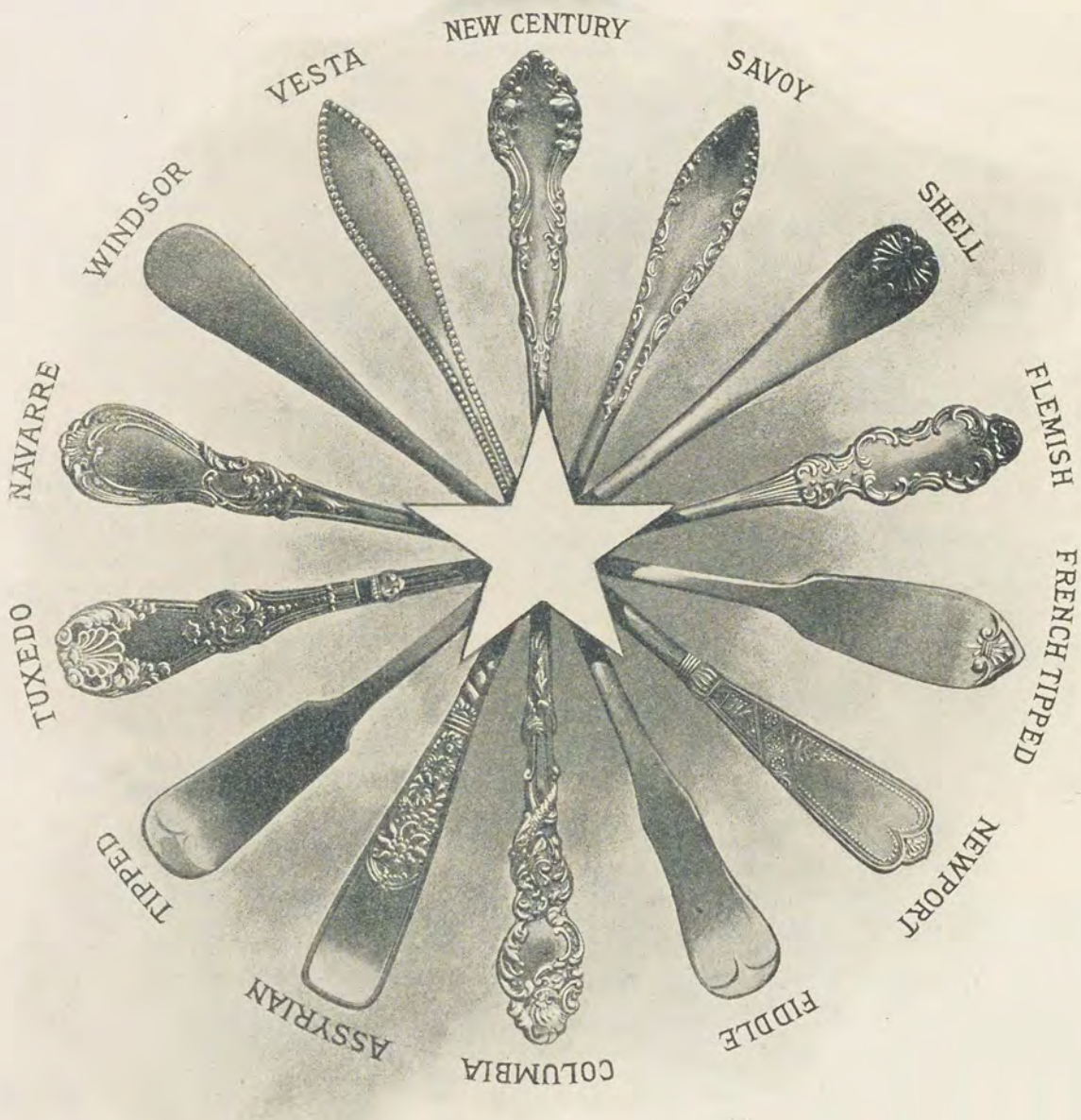
The Harvest Home.

FOURTEEN LEADING PATTERNS MADE IN

THE "OLD RELIABLE" STAR ★ BRAND

SEND FOR
CATALOGUE
No. 49

SEND FOR
"NEW CENTURY"
BOOKLET



★ ROGERS & BRO., A. 1.

TRADE-MARK.

ELECTRO SILVER PLATE

SPOONS, FORKS, KNIVES, ETC.

have been manufactured continuously for more than Half a Century, and have given universal satisfaction and made the name of Rogers famous. Buy the "OLD RELIABLE" STAR ★ BRAND, which will satisfy your customers and maintain your reputation as a reliable dealer. Every article is fully guaranteed.

INTERNATIONAL SILVER COMPANY,
Successor to

MADE
EXCLUSIVELY BY **ROGERS & BROTHER,** WATERBURY, CONN.

Warerooms—9, 11, 13 Maiden Lane, NEW YORK.

New Goods and Inventions.

[The illustration and description of new goods and inventions as hereunder is a *permanent* feature of THE KEYSTONE, our twofold object being to keep the *merchant* jeweler thoroughly posted on the very latest and most salable goods, and the *practical* jeweler equally well posted on the newest inventions and improvements in tools and appliances used at the bench. For the benefit of the optician, we also illustrate and describe new optical goods and instruments in this department.]

An Attractive Display Figure.

The figure shown in our illustration may be made to serve many purposes, but would seem to be especially adapted for use in the store window. The figure is eighteen inches high and the decorations are in appropriate colors. The tray is hollow and may be used to excellent advantage to show goods. The figure can be procured from L. W. Levy & Co., 194 Broadway, New York. As part of a window display with the tray filled with jewelry or other goods it could not fail to be the center of attraction. It makes, besides, a novel card receiver and is very salable for this purpose.

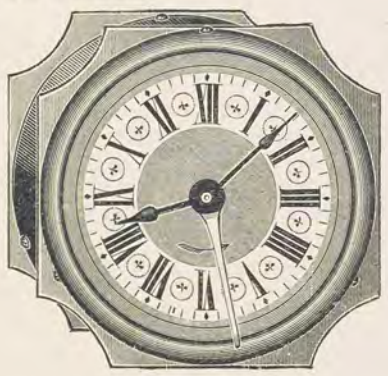
An Attractive Sign.

Every aid to effective advertising has an interest for the trade nowadays. A sign that will force the attention of the public and impress them is a very valuable aid to advertising, in fact, it is a good advertisement in itself. A sign of this character may be procured from the Prismatic Electric Sign Co., Williamsport, Pa. This concern is making a special offer to jewelers and opticians of their artistic signs, which are described as producing continuously changing color effects—flashing red, white, green and violet lights, which illuminate the glass sides of the design and make the effect beautiful and attractive. A sign of this description cannot fail to be effective.

A Novelty in Clocks.

The season is prolific in clock novelties. One of these which is new in character, construction and motive power is the clock made by the Automatic Electric Clock Co., Chicago, Ill. The clock needs no winding and never runs down. Once started it is like the brooklet—"goes on forever." In this age of progress it would seem, indeed, as if the duty of "winding the clock," which so affected Tristram Shandy's existence, promises to become a reminiscence of "ye olden time." The product of the Automatic Clock Co. has the distinction of being extensively used by the United States Government, proof positive of the merit of the clocks.

A Rotary Hammar Alarm Clock.



Our illustration shows one of the now widely-known rotary hammer alarm clocks made by the Parker Clock Co., Meriden, Conn. These alarms are loud and distinct and a valuable feature is that they cannot grow weaker from usage. The great ease with which the clocks are repaired commends them to the trade. No part of the train may be disturbed to remove the mainsprings. The clocks are made with enameled dials or metal dials, silver or gilt. An assortment of them should form part of every up-to-date clock stock.

A Desirable New Collar Button.

We show in our illustration the Dover rigid, solderless collar button, made by Geo. W. Dover, Providence, R. I. The stock used is 12 K. rolled-plate, the post runs up through to the upper part of the head, thence a convex plate is rolled over the head, meeting a concave cup, bringing the greater force of resistance fully one sixteenth inch below the top of the post. This, the manufacturers claim, makes it the most rigid button yet made. A guarantee is printed on the card on which the buttons are mounted which states that "a new one will be sent in exchange for every button that does not prove satisfactory either to the dealer or consumer." The buttons are mounted on transparent celluloid. This firm also makes a cheaper button, named the "Dover perfect collar button," for which a large sale seems assured.

A Patent Ring Adjuster.

Among the exhibits that attracted attention at the Chicago Watch and Clock Trades Exhibition, held last month, were the ring adjusters invented by Chester H. Wells, Meshoppen, Pa. The adjuster holds the top of the ring in the desired position. It is made in gold or metal, does not wear or injure the ring, cannot spring up or lose out, yet may be removed instantly. If the ring goes over the joint hard, this adjuster can be taken off and replaced very easily while the ring is on the finger.

A Memo-Book Cover Spectacle Case.

Our illustration shows a very convenient and useful novelty. It is a memo-book cover spectacle case. The same can be had with eye-glass case. These goods are being

furnished to the trade by J. M. & A. C. Johnston, Chicago. The combination of eye-glass or spectacle case with memo-book is a convenient and desirable one, economizes in space and affords greater security than when both are carried separate. This novelty has all the qualifications of a good seller and the popular price makes it a desirable addition to optical stock.

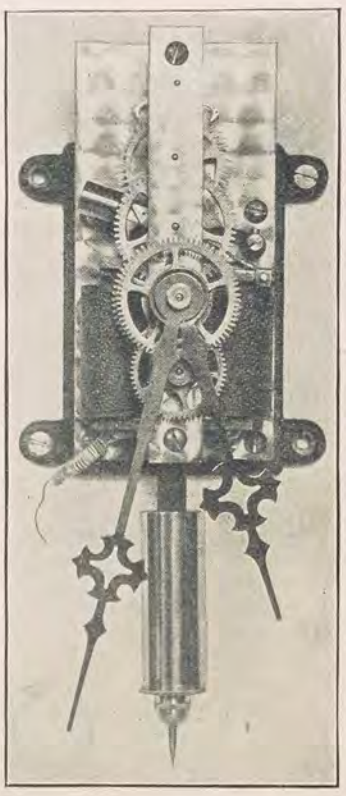
Ribbon Engraving and Initials.

We show in our illustration a specimen of ribbon engraving, a much desired class of work of which Freeman J. Finley, 866 Broadway, New York, makes a specialty. Mr. Finley also manufactures sterling silver initials, beveled, ribbon style. These have pins, and are for use on ebony ware on which they show up very handsomely. The trade can make profitable use of this class of goods, especially during the holiday season.

A Valuable Monogram Book.

A book of great practical service to the trade is the "Imperial" Encyclopedia of Monograms, which may be procured from Green Bros., 6 Maiden Lane, New York. It contains 130 plates with nearly 6000 examples of two, three and four-letter combinations of monograms, letters, crests, etc., ranging in size from a quarter to four inches, with handsome designs in plain, fancy, Oriental, antique, old English, French and German styles. The book is bound in half morocco and printed on heavy, glazed, drawing paper.

The New Grav-Elec Clock.



The new species of clock here illustrated is entitled the grav-elec, and is manufactured by the Grav-Elec Clock Co., 177–79 Broadway, New York. The distinctive feature of this clock is that it is guaranteed to run continuously for two years on one set of dry batteries and keep time without other attention than ordinary regulation. Gravity is the motive power that drives the clock, the electricity merely lifting the small driving weight to a gravitating position every two minutes by a slight and instantaneous contact. The clock requires no winding and has no wiring from the outside. It is an interesting and salable novelty in the clock line.

Illuminated Show Cases.

John Phillips & Co., Detroit, Mich., makers of the well-known "silent salesman" show cases, have invented a device for illuminating their cases that will still further enhance their value. By an original and ingenious device the electric bulbs are concealed from view, while all their brightness and reflective power is thrown upon the contents of the case. It does away with the unpleasant glare that the ordinary lighted case throws in the eyes of customers and clerks, and at the same time it shows up the goods to the best possible advantage. The makers wire the case so that on its arrival it is ready to be connected with the electric light. As plentiful and appropriately-placed light is the chief factor in display, this new invention will be a boon to the trade. It will greatly add to the attractiveness of the stock in the cases and to the brilliancy of the store generally. Those who have used it commend it very highly for convenience and efficiency.

Do Not Be Fooled by Discounts

but get at the net results. If you will do this you will find that

Our New 1900 Catalogue

is the book to order from. It contains everything needed by jewelers, but money, and if you will buy the goods shown therein from us, **YOU WILL MAKE MONEY,** as our **net prices,** quality considered, are lower than those of any of our competitors.

For the Best Line of

Watches, Movements and Cases ever shown,

see our 1900 Book, pages 3 to 88. See index, page 3. See bargain pages in back of book. If you are not familiar with our discounts, prices, etc., write us and we will advise you fully.

Our Clock Department

Pages 89 to 146. (See index, page 89.) Contains only the best selling Clocks and Bronzes, we have no old stock to work off, consequently can give you new and fresh goods at all times.

For the Newest in

Canes, Umbrellas, Pens, Pencils, Picks, etc.

see pages 147 to 163.

Our Silverware Department cannot be excelled.

See pages 164 to 310. See index, page 310, for the largest variety ever shown of Trays, Show Cases, Oak Boxes, Sterling Silver and Silver-Plated Ware, Cut Glass Ware and Leather Goods.

Please remember that we show only **reputable makes** of Silverware, and that all goods are warranted exactly as described.

Some articles of Silver-Plated Ware **advanced in price** after our book was printed. See corrected prices of same in back of book.

Our Display of Novelties is better than ever.

See pages 311 to 362. See index, page 311. In this line we have endeavored to show only such articles as will find ready sale, and have avoided all cheap, thin and trashy makes, the sale of which invariably proves injurious to the jeweler.

We can save you money if you will buy from

Yours truly,

OTTO YOUNG & CO.

149 TO 153 STATE STREET, CHICAGO

We Have Made Large Additions

to our line of Jewelry, Bracelets, Chain Mountings, Charms, Lockets, Rings, etc. See pages 363 to 515. See index, page 363.

See Our New Arrangement of Bracelets

Pages 461 to 463.

We Are Headquarters for Emblem Goods

Having in stock everything desirable in Charms, Badges, Medals, Pins, Buttons, Rings, Etc. See our 1900 Catalogue, pages 450, 480 to 501. See index, page 480.

Notice our Chain Department

Pages 413 to 460. See index, page 413. Only good sellers shown, and every article warranted exactly as represented.

See Our Display of Thimbles

Page 412. Every style shown kept in stock, from sizes 5 to 10.

Our Diamond Department

See pages 517 to 525. Shows the right goods at the right prices, and we not only guarantee the quality but the weight as well.

It will pay you to order your Diamonds from us.

Last, but not least, we beg to call your attention to our

Tool and Material and Optical Departments

These lines have grown to such magnitude that we were compelled to issue separate catalogues for them. Please refer to same when in need of goods in these lines, as you can save money by so doing, besides, you will get what you pay for.

We do Trade Work of all kinds. We make to order any article of Jewelry desired.
We take Old Gold and Silver in trade from our customers and allow highest market value.

WE AIM TO PLEASE OUR CUSTOMERS, and fill all orders, whether large or small, promptly and carefully.

Please send in your orders as early as possible and avoid the rush, as goods are scarce now and conditions will not improve as trade increases.

Wishing you a Prosperous Holiday Trade, and hoping to receive a liberal share of your patronage, we are

Respectfully,

OTTO YOUNG & CO.

149 TO 153 STATE STREET, CHICAGO

Two rises again last month—

WAR TO MAKE DIAMONDS DEAR.

Special to The New York Times.

"The Boers," it is said, to-day, "have threatened to destroy the diamond mines, and there is no telling how long it would take to get them in working shape again. Diamond mines are from 800 to 1,100 feet deep, and can be ruined by the explosion of a bomb. To put them back into a condition so that they can be worked again would require an outlay of from £1,000,000 to £3,000,000, and then it would be a question whether the English investors would care to go to such an expense to relieve their properties. The stock of diamonds will not last more than a year, and should the mines be destroyed the values may double within a year."

HATTON GARDEN, London, Eng., Oct. 16, 1899.

Information has just reached me from a leading firm of American buyers that the price of rough diamonds has been advanced 5 per cent. (This I cabled THE CIRCULAR to-day.) The advance has been expected for some days and has been discounted by the wholesale houses supplying cut stones. "Circular," Oct. 25"

when, and how much? don't wait!

An advance in price of 30% on the rough, in Europe, since Jany 1st, which means

LONDON, Eng., Oct. 7.—The syndicate has increased the price of rough another 5 per cent The raise goes into effect to-day (Saturday) Cablegram to "Circular"

RISE IN EFFECT SEPT. 2.

Diamond importers of New York announced to THE CIRCULAR Saturday, Sept. 2, that the rise referred to above, namely 5 per cent, was put into effect that day by the Diamond Syndicate. "Circular," Sep. 6"

60% on the finished stones in this country. Buy what you need NOW. Get your customers to put their money in Diamonds. Put your money in Diamonds. We'll send anything you want—loose or mounted—"ON MEMO."

"Circular's" LONDON News.

Buyers of cut stones report that they are paying 20 per cent to 30 per cent more than they did a couple of months ago. It is generally believed that the syndicate will put the price up immediately war is declared.

This brings the total direct advance this year up to 30 per cent, 20 per cent of which has been put on during the last six months. The increase in cut and polished stones is probably nearly 50 per cent in the last six months.

If the Boers do this, diamonds may jump 25% in a day. Then what will your holiday goods cost you?

July 15=5% rise

May 19=5% rise

Jan 31=5% rise

Where prices were Jany 1st

CROSS & BEGUELIN

Importers and Cutters of Diamonds and Precious Stones

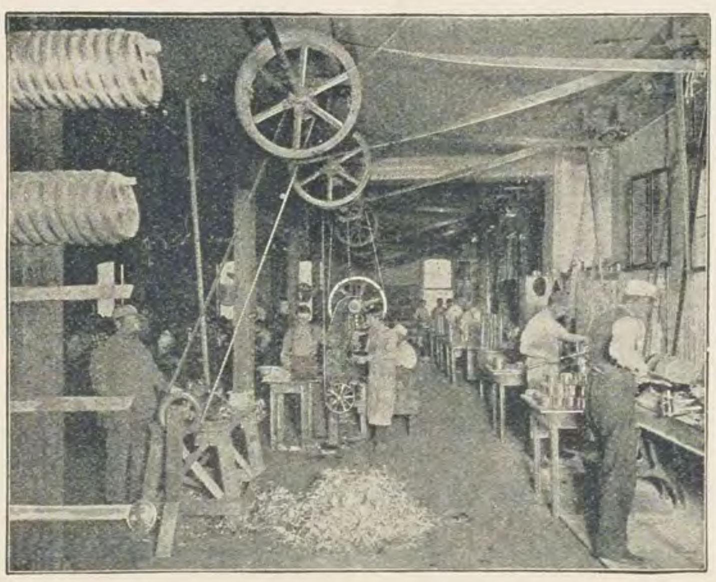
49 Rue de Meslay, PARIS — *17 Maiden Lane, NEW YORK*

V. WARING, N.Y.

M. S. Benedict Mfg. Co.

Makers of

SILVER-PLATED WARES AND NOVELTIES



The above illustration shows a busy corner in our factory.

Write for our Artistic Catalogue and Price-List. Illustrated in colors.

Complete stock carried and goods shipped from Chicago or factory, East Syracuse, N. Y.

109-111 Wabash Ave., Chicago 409 Broadway, New York
40 Yonge Street, Toronto, Ont.

Manasseh Levy

Direct Importer of **Watches**

172 Broadway, *Corner Maiden Lane,* *NEW YORK*

Owing to the unprecedented demand for Watches, it is unnecessary for us to single out any of our well-known importations for special mention.

Sterling Silver Initials

BEVELED, RIBBON STYLE.
PINS ON FOR EBONY.

PRICES	1½ inch,	.	$4.00 per dozen.	
	1 "	.	3.50	"
	¾ "	.	3.25	"
	⅝ "	.	2.40	"
	½ "	.	2.00	"

SEND FOR CATALOGUE.

FREEMAN J. FINLEY,

Maker of Sterling Initials, Importer of Ebony Goods,

866 Broadway, NEW YORK.

We also have a large and well-equipped engraving department. Monograms, Inscriptions, Crests and Coats of Arms.

RIBBON ENGRAVING A SPECIALTY.

New York Letter.

The business situation here is exceptionally satisfactory, and all symptoms indicate that the extra efforts of the jobbing trade will be rewarded by a holiday business of unprecedented dimensions. Even now pressure of orders calls for an extra force, and a large number of wholesale establishments are working overtime in the effort to keep ahead of the rush. Voluminous as the holiday business promises to be, the jobbers are well prepared to meet it, for never were so large and select aggregations of stock placed at the service of the trade. All over the Lane time has been taken by the forelock, and the retailers can rely on the promptest and most satisfactory service, though, of course, there will be advantages for the trade in early ordering. It will be well, indeed, for the jewelers to realize the situation in this great supply center so that they may hasten their orders, and prevent the possibility of disappointment later, when such disappointment would mean loss to them.

In speaking of present trade conditions, Max Averbeck, of Averbeck & Averbeck, stated that their present rush of orders was unprecedented in the history of their firm. The great difficulty, Mr. Averbeck stated, was to get sufficient goods from the manufacturers. The stringency which was expected in a month or so later, has already been felt. Mr. Averbeck stated that he had foreseen the indications of an unusually brisk trade, and had consequently ordered very heavily, and so in most lines he was able to meet the demands. In looking back over the business of the past few month, Mr. Averbeck stated that he was surprised how he had managed to get along in their old quarters, which were so much smaller than the present big salesroom. He is congratulating himself on getting such a large room, and having it fitted up with an eye to meet such heavy demands as are now being made upon them to get out orders promptly. His increased facilities are aptly timed for what promises to be the greatest holiday season in the history of the trade.

Wm. I. Rosenfeld is another one of the Maiden Lane jobbers who is experiencing an unusually brisk trade for this season of the year. The only drawback is the shortage of of watches; and had it not been that he had a big stock on hand, he would have been inconvenienced to have filled orders as promptly as his rule requires. Dealing almost exclusively in watches, and being a large dealer, he was fortunate enough to make some big deals early in the season.

The Adolph J. Grinberg Co. has moved its office to 8 Maiden Lane. From 1875 until about a year ago Mr. Grinberg was at 32 Maiden Lane.

A recent dispatch from London announced that Mrs. Marie Louise Stockwell, widow of Chas. B. Stockwell, who was a member of the firm of Tiffany & Co., New York, had been robbed of jewels valued at $50,000. The dispatch said that the robbery took place at the Savoy Hotel, London, where the room of Mrs. Stockwell was entered. It is understood that the burglar or burglars obtained jewelry valued at £10,000 ($50,000), and bank notes and other negotiable currency to the amount of £5000 ($25,000). Mrs. Stockwell and her nephew had been guests at the hotel for some weeks. The apartment was entered while they were at dinner. On returning to her room Mrs. Stockwell found the door locked on the inside. The hotel detective forced the door. The room had been thoroughly ransacked. The manager of the hotel closed all the doors of the building, summoned detectives, and searched all strangers and servants. Nothing, however, was recovered. Another dispatch places the amount stolen at $10,000.

Lissauer & Co., of this city, have brought two suits in the United States Circuit Court at Boston against A. H. Bliss & Co., North Attleboro, Mass. The bill in one charges infringement of the design patent for their "Marcella" chain, and in the second charges the defendants with unfair competition in trade. Both bills pray for an injunction and damages.

George Cook, counsel for Lissauer & Co., stated that the object of these suits was to prevent any further infringement of the design patent, and also to enjoin several concerns who are now placing upon the market chains similar in appearance to the "Marcella," and bearing a trade name in confusion thereon. They were also intended to prevent the further use of the card and manner of draping the chain thereof by the defendants, alleging that such was the result of experiments made by the complainants. In order to bring the matter to a speedy hearing motion papers were filed for a temporary injunction.

Miss Belle Kahn, daughter of Moses Kahn, of L. & M. Kahn & Co., was married last month to Louis H. Nordlinger.

The Century's Greatest Achievement in the Retail Jewelry and Stationery Business.

Probably the most notable success of the century in the retail jewelry business is that of Charles L. Tiffany, of Tiffany & Co., who will soon celebrate his eighty-eighth birthday. As the career of this world-famed jeweler runs through the greater part of the past hundred years, a brief story of his life comes aptly within the sphere of this issue:

Tiffany's Early Life

Mr. Tiffany was born in Danielsonville, Windham County, Conn., in 1812, and received his primary education at the "little red school-house" in that town. Later he spent two years at the Plainfield (Connecticut) Academy. When only fifteen years old he made his entree into commercial life by taking charge of a little country store, and though this was successful, the boy, already self-confident, instinctively longed for a wider and more promising field. The yearning soon became too strong to resist, and in 1837 he arrived in New York City.

Charles L. Tiffany.

This was the year Queen Victoria was crowned, but the youth had probably no idea at that time that one day he would be, by appointment, gold and silversmith to Her Majesty.

His neighbor, friend and schoolmate, John B. Young, had gone to New York six months before him and was employed in a stationery and fancy goods store. Mr. Tiffany followed early in September of 1837. New York was then in the throes of perhaps the greatest commercial crisis of its history. Many well-established concerns were on the verge of ruin. Mr. Tiffany's ambition, however, was not to be daunted by this grave state of affairs. He and his former schoolmate went carefully over the field together, and concluded to unite Mr. Young's limited stock of experience with whatever capital could be advanced by Mr. Tiffany's father, and to open a fancy goods and stationery store. The elder Tiffany being appealed to, he consented to loan the young men a thousand dollars, five hundred dollars to be assumed by each partner. The young men entered into partnership under the firm-name of Tiffany & Young, and thus was laid the foundation of the present house of Tiffany & Co.

The little store was opened to the public on the morning of September 18, 1837. The total sales for the first three days amounted to $4.98. With this they opened their first cash-book. The next day $2.77 was added. But the high character of the stock soon became generally known; patronage increased, and new features were added.

The following year marked a steady though uneventful growth; but on the morning of January 1, 1839, the young firm was robbed of nearly all it possessed. Their loss amounted to nearly $4,000; but they quickly recovered themselves, and the business continued to prosper to such an extent that early in 1841 it was found necessary to rent the adjoining corner store. From that time their success has been continuous. Before the close of the first ten years the continued growth necessitated another removal, which took place in 1847. A much larger and more modern store was secured at 271 Broadway, corner of Chambers Street, and the business rapidily expanded in every direction. In 1870 another removal was made, this time to the corner of Union Square and Fifteenth Street. As far back as 1850 Tiffany & Co. established a branch house in Paris, and in 1866 another in London. The New York house is the greatest retail jewelry establishment in the world, and Mr. Tiffany's wealth is estimated by millions.

The triumphs of the firm of Tiffany & Co., in gold and silversmithing, have been many. In 1883 Mr. Tiffany received from the Emperor of Russia the gold medal, "*praemia digno*," and was honored with the "grand prix" and Legion of Honor, in Paris, in 1878. Among the patrons of the firm are the royal families of all nations, and Tiffany & Co. are now, by appointment, gold and silversmiths to the Queen of England, the Prince and Princess of Wales, Duke of Edinburgh, Emperor and Empress of Russia, Grand Duke Vladimer, Grand Duke Alexis, Grand Duke Paul, Grand Duke Sergius, Emperor of Austria, King of Prussia, King of the Belgians, King of Italy, King of Denmark, King of Greece, King of Spain, King of Portugal, Khedive of Egypt, and Shah of Persia.

The Jewelers' League.

The regular monthly meeting of the executive committee of the Jewelers' League was held in New York on October 6th. There were present President Hayes, Vice-Presidents Greason and Bardel, Chairman Van Deventer, Messrs. Karsch and Lissauer and L. Stevens, Jr., secretary.

The report of the treasurer was presented and approved. The requests for change of beneficiary were received and upon motion granted, and the following applicants were admitted to membership: Edward A. Krull, Louisville, Ky., recommended by B. F. Rodgers and T. J. Pottinger; M. W. Halferty, Anderson, Ind., recommended by G. C. A. Greyer and W. T. Cohenour; J. C. Farris, Somerville, Tenn., recommended by F. Goosman and T. L. Dickinson; Paul E. Kunz, New York, recommended by C. F. Boleschka and Wm. L. Sexton.

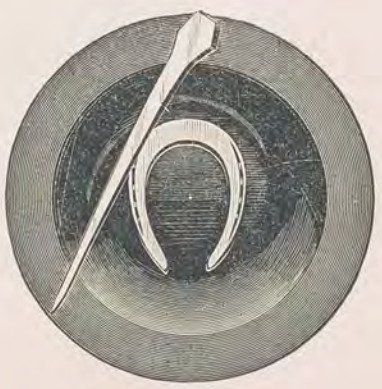
The Jewelers' Security Alliance.

The regular monthly meeting of the executive committee of the Jewelers' Security Alliance was held at its offices, 170 Broadway, New York, on October 13th. Chairman H. H. Butts, Treasurer Bernard Karsch, Secretary James H. Noyes and W. H. Ball, Henry Abbott, David Untermeyer and Leopold Stern, of the committee, being present.

The following new members were received: John Hood, Santa Rosa, Cal.; Chas. A. Daunt, Modesto, Cal.; Daniel Hyman, Sacramento, Cal.; the Mechanics' Loan Co., Providence, R. I.; Otto Roggenkamp, Elizabeth, N. J.; C. R. Smith & Son, Philadelphia, Pa.; W. M. Stone, Minneapolis, Minn.; W. W. Fisher, Sunbury, Pa.; R. A. Knight, Sibley, Iowa; E. H. Lane, Genoa, Ill.; Fred. Strauss, Bismarck, N. Dak.; W. J. Jenkins & Co., Thornburg, Iowa; E. M. Timpane, Troy, N. Y.; Wise Jewelry Co., Elmira, N. Y.; Freudenheim, Levy & Lande, Elmira, N. Y.; Albert A. Abbott, Chicago, Ill.; Arch. L. Coleman, South Omaha, Nebr.; Ernest Eimer, Maskegon, Mich.; J. D. Daniels, Albion, N.Y.; the Streicher Watch and Jewelry Co., Kansas City, Mo., and Geo. P. Ways, Davis, W. Va.

Silver Decorated Ebony Ware.

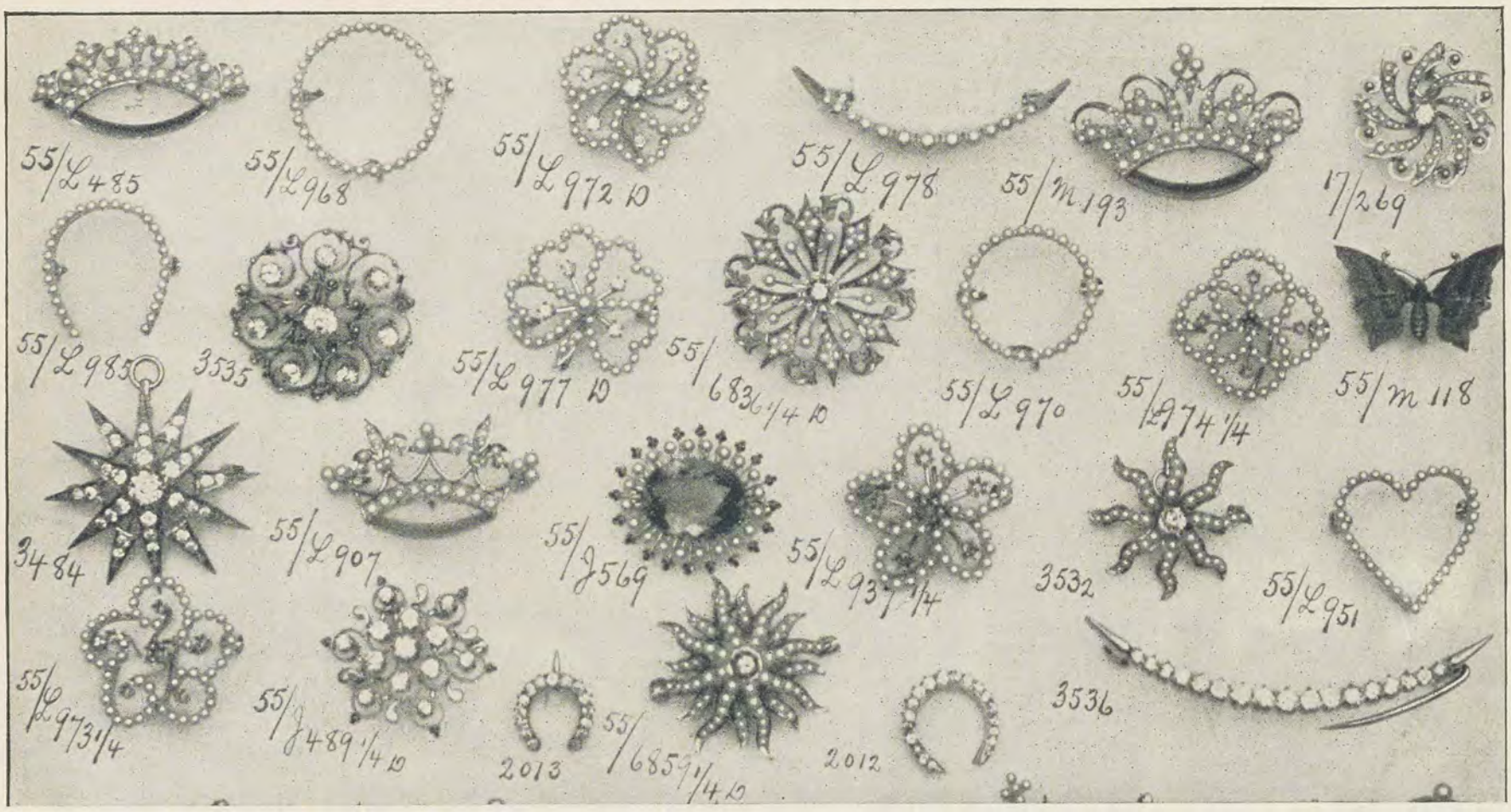
Our illustration shows a novelty in silver decorated ebony ware, now so fashionable. The popular predilection for this ware is founded on good taste, the articles being very beautiful as well as serviceable. The cut here



shown is an ash tray decorated, as the illustration shows, with a silver horseshoe and nail. This is one of the great variety of goods in this ware now being furnished the trade by Leys, Christie & Co., 65 Nassau Street, New York. The goods are specially adapted for holiday stock and promise to be leading favorites with gift purchasers.

DIAMOND AND PEARL BROOCHES, 14 K. MOUNTINGS.

The best line in the market. STANDARD QUALITY. High grade of workmanship and finish.
Diamonds are white and practically perfect. Pearls are white and round. Prices will not be advanced until our present stock is sold.



		EACH.			EACH.			EACH.			EACH.
55/L485.	Crown of all real pearls, . . .	$ 15.00	55/L977D.	Real pearls and 4 diamonds, .	$ 27.00	55/L907.	Crown, all pearls, ...	$ 24.00	55/973¼.	All real pearls, ...	$ 21.00
55/L968.	Wreath of all real pearls, . .	10.00	55/6836¼D.	Set with pearls, diamond center,	17.75	55/J569.	Amethysts and pearls, ...	15.75	55/J489¼ D.	Scroll, with 13 diamonds, . . .	80.00
55/L972D.	Whole pearls and 7 diamonds,	31.00	55/L970.	All real pearls, ...	9.00	55/L937½ D.	Pearls and 6 diamonds, . . .	42.00	55/6859¼ D.	Set with pearls, diamonds in center,	19.00
55/L978.	All real pearls, ...	21.00	55/L974¼.	All real pearls, ...	21.00	55/L93¾.	All pearls, ...	24.00	55/6859¼.	All pearls, ...	15.00
55/M193.	Crown, all real pearls, ...	24.00	55/L974¼.	Dia. with pearls and 5diamonds,	31.50	3532.	Set with pearls, diamond center,	30.00	3536.	All diamonds, ...	100.00
17/269.	All pearls, diamond in center,	12.00	55/M118.	Enameled butterfly, ...	5.00	55/L951.	Heart, all real pearls, ...	10.00	2013.	Scarf Pin, set with diamonds,	24.00
55/L985.	Horseshoe, all real pearls, . .	9.00	3484.	All diamonds, ...	110.00	55/L973¼.	Dia. set with pearls and 6 dia.,	30.00	2012.	Scarf Pin, set with diamonds,	33.00
3535.	Fancy scroll with 8 diamonds,	104.00									

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Standard quality. Workmanship the best. Our prices are very low, considering price of labor and material. Illustrations full size.

		PER DOZ.			PER DOZ.			PER DOZ.			PER DOZ.
92/469.	Green enamel, 17 pearls, ...	$67.50	94/403.	15 half pearls and 5 whole pearls, opal center, ...	$72.00	19/5192O.A.	10 opals and 10 amethysts, . .	$36.00	x8/5410.	Enamel, set with opal, ...	$33.00
55/6831.	Green enamel, 8 pearls, red stone eyes,	60.00				18/9904.	Roman finish, fleur-de-lis, . . .	33 00	18/7763.	6 doublets, one opal, ...	21.00
92/487.	21 Half pearls, ...	27.00	19/5192P.T.	Im. pearl and turk wreath, . .	27.00	19/5643A.M.	Wreath of green gold leaves and 8 amethysts, and horseshoe of white stones, ...	45.00	71/154.	12 half pearls, coral center, . .	33.00
73/650.	Green gold leaves, ...	18.00	19/5396O.P.	Half pearls, opal center, . . .	54.00				19/5566P.Alm.	16 half pearls and 5 almadines,	54.00
x8/6035P.	Enameled, with pearls, ...	30.00	19/5578P.	Green and brown enamel, 4 pearls,	54.00				55/8755.	Butterfly, dark brown and green enamel, pearl in body, . .	36.00
55/8748.	En'd, 1 opal, 4 pearls, red stone eyes	84.00	19/5390P.O.	18 half pearls, opal center, . .	54.00	20/4024½.	Enameled, amethyst center, . .	24.00			
x8/643O.	Enameled, 1 opal, ...	33.00	55/7999P.	Green gold leaves, 6 whole pearls,	27.00	18/7727O.	Wreath of 6 enamel leaves and 6 opals, ...	36.00	19/5429P.Alm.	12 half pearls, almadine in cen.,	42.00
x71/146.	Coral center, 16 half pearls, . . .	36.00	92/467.	9 opals and 2 pearls, ...	72.00	71/97.	Polished gold, red stone center,	19.50	19/5586A.	Polished bead edge, amethyst in center, ...	16.50
94/353.	24 half pearls and 8 whole pearls, opal center, ...	72.00	71/46O.P.	32 pearls, opal center, ...	72.00						

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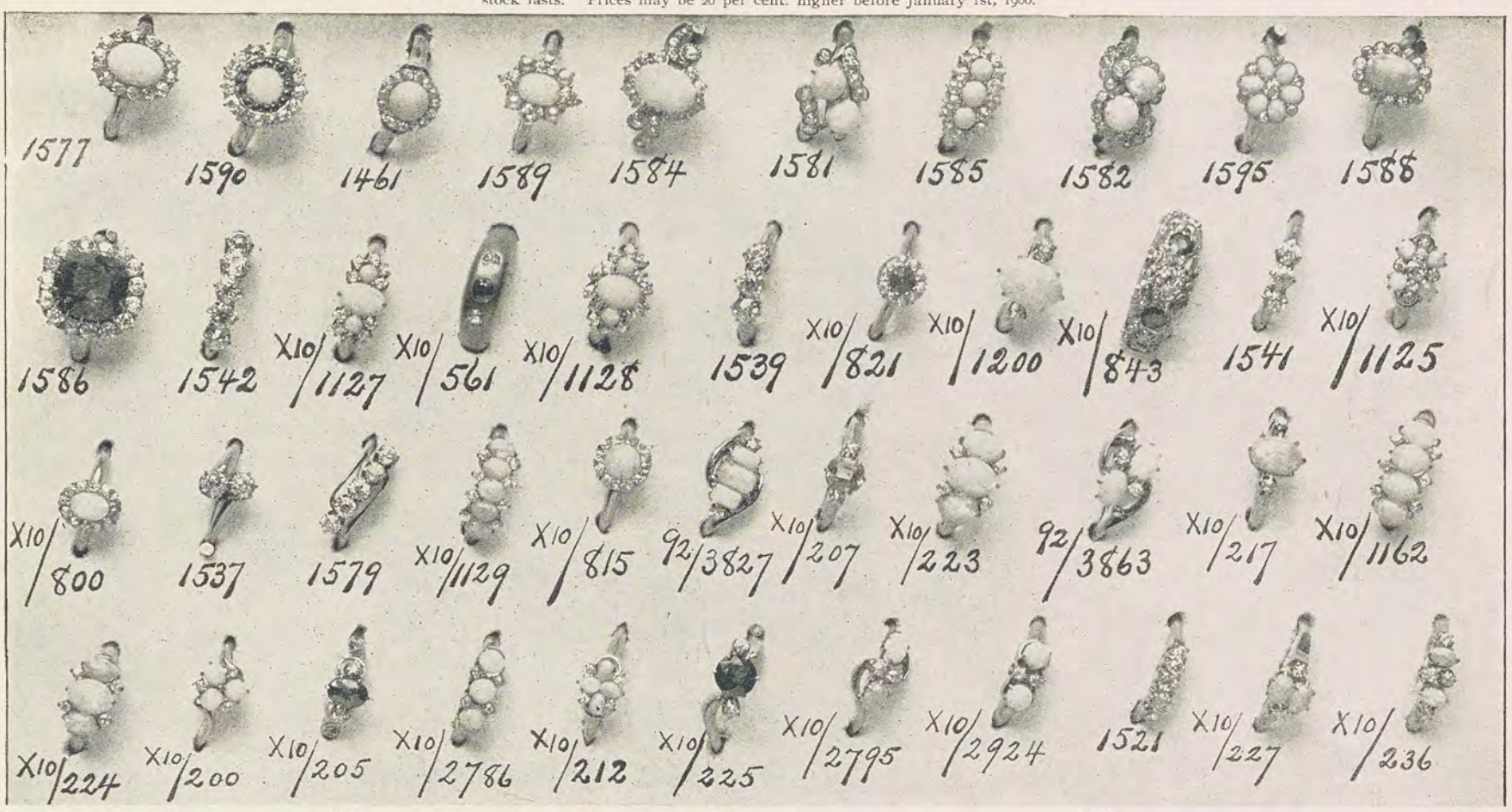

		EACH.
1577.	Fire opal and 14 diamonds	$50.00
1590.	1 fire opal, 15 olivenes and 15 dinmonds	60.00
1461.	1 turquoise and 15 diamonds	40.00
1589.	1 fire opal, 12 diamonds and 4 pearls	35.00
1584.	1 fire opal and 20 diamonds	67.50
1581.	2 fire opals and 10 diamonds	45.00
1585.	3 turquoise and 16 diamonds	36.50
1582.	2 fire opals and 26 diamonds	47.50
1595.	6 fire opals and 7 diamonds	21.00
1588.	Fire opal and 14 diamonds	33.00
1586.	1 amethyst and 15 diamonds	75.00
1542.	5 diamonds, 1½ 11/32	85.00
x10/1127.	3 fire opals and 10 diamonds.	$32.00
x10/561.	1 emerald doublet and 2 diamonds, Roman finish	16.50
x10/1128.	3 fire opals and 14 diamonds	40.00
1539.	3 diamonds, ⅞ kt.	48.00
x10/821.	1 amethyst and 10 diamonds.	19.50
x10/1200.	Fire opal and 2 diamonds	25.00
x10/843.	2 emerald doublets and 1 diamond	27.00
1541.	3 diamonds, ½, 1/16 kt.	33.00
x10/1125.	4 fire opals and 7 diamonds	27.00
x10/800.	1 fire opal and 12 diamonds	27.00
1537.	2 diamonds, ½ kt.	30.00
1579.	5 diamonds, ⅝ 11/30 kt	$45.00
x10/1129.	5 fire opals and 8 diamonds	22.50
x10/815.	1 fire opal and 12 diamonds.	30.00
92/3827.	3 fire opals and 2 diamonds	10.50
x10/207.	Emerald, ruby or sapphire doublet, and 2 diamonds	8.00
x10/223.	3 fire opals and 4 diamonds	25.00
92/3863.	2 fire opals and 2 diamonds	10.00
x10/217.	1 fire opal and 2 diamonds.	14.00
x10/1162.	4 fire opals and 6 diamonds	21.00
x10/224.	3 fire opals and 4 diamonds	19.50
x10/200.	3 fire opals and 3 diamonds	9.00
x10/205.	Ruby, emerald or sapphire doublet and 2 diamonds.	$ 8.00
x10/2786.	3 fire opals and 4 diamonds	10.00
x10/212.	4 fire opals and 4 diamonds	12.00
x10/225.	Ruby, emerald or sapphire doublet and 2 diamonds.	12.00
x10/2795.	2 fire opals and 2 diamonds	8.00
x10/2924.	2 fire opals and 2 diamonds	8.00
1521.	5 diamonds, ½ kt.	30.00
x10/227.	2 fire opals and 2 diamonds	8.00
x10/236.	2 fire opals and 4 diamonds	12.00

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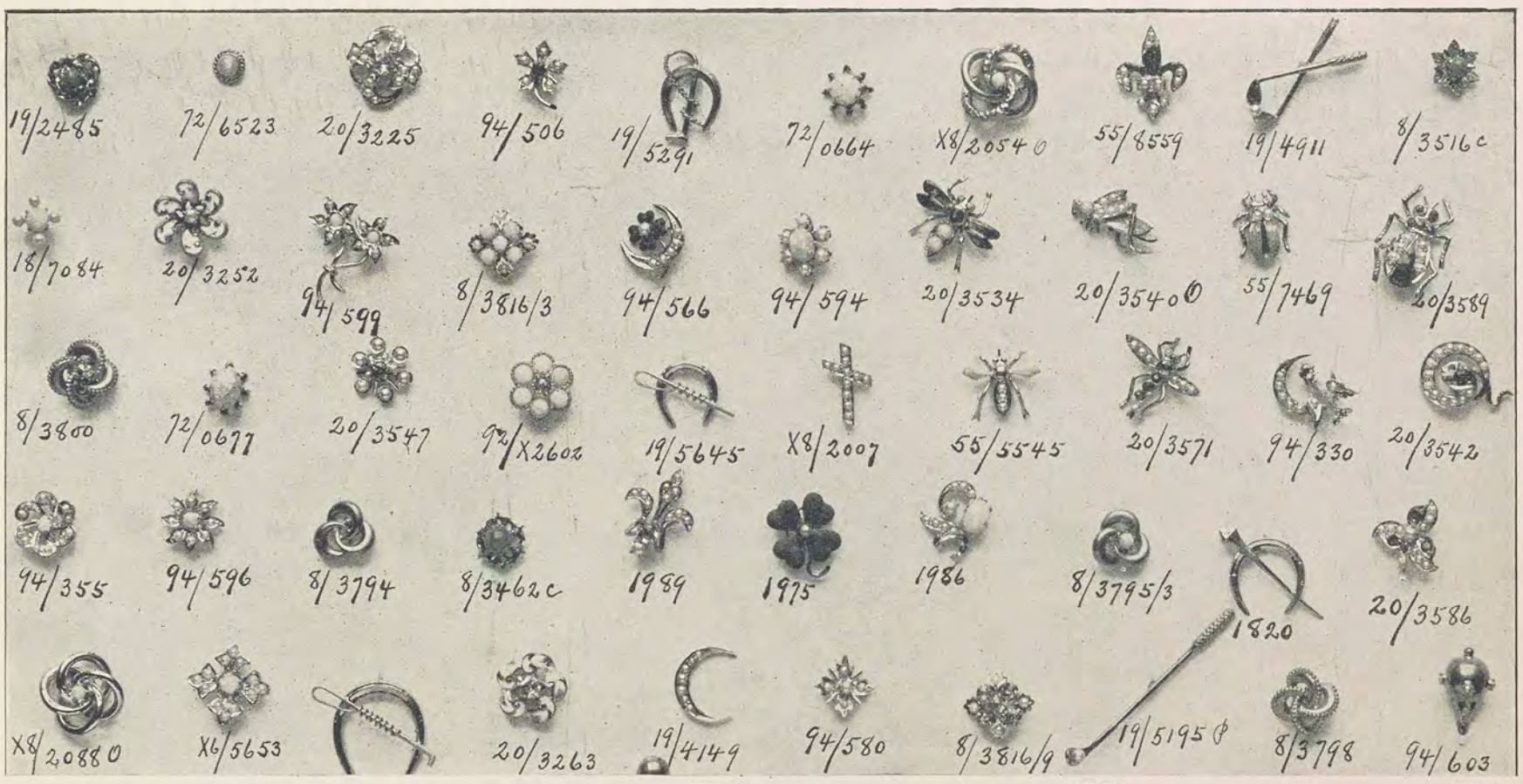
STANDARD QUALITY AND FINISH. Illustrations full size. We have a new line of 14 Karat Whole Pearl Scarf Pins. Very salable goods at moderate prices.



		PER DOZ.
19/2485P.	Roman finish knot, pearl in center	$12.00
18/7084.	Opal and 4 whole pearls	13.50
8/3800.	Bead edge knot rose, dia. center	18.00
94/355.	Opal center, 12 half pearls	21.00
x8/2088O.	Polished knot, opal center	12.00
72/6523.	Opal, gold bead edge	9.00
20/3252.	Blue enameled pearl center	15.00
72/0677.	Opal	15.00
94/596.	8 half pearls, opal center	21.00
x6/5653.	12 half pearls, opal center	24.00
20/3225.	16 half pearls, amethyst center	31.50
94/599.	10 half pearls, 2 opals	24.00
20/3547.	6 half pearls, red stone center	[25.50
8/3794.	Plain Roman knot	9.00
19/3614.	Polished	18.00
94/506.	5 half pearls, olivene in center	15.00
8/3816/3.	4 half pearls and 5 opals	24.00
92/x2602.	6 opals, amethyst in center	27.00
8/3462C.	Coral, fancy gold border	10.50
20/3263.	Blue enamel, amethyst in center	15.00
19/5291.	Horseshoe, with whip	19.50
94/566.	Enameled clover leaf and 6 pearls	18.00
19/5645.	Roman finish	10.50
1989.	Amethyst center, 1 whole pearl and 10 half pearls	30.00
19/4149.	Crescent, 7 half pearls	13.50
72/0664.	Opal	12.00
94/594.	Opal center, 6 whole pearls	33.00
x8/2007.	11 half pearls	18.00
1975.	Green enameled, pearl center	16.50
94/580.	4 half pearls, whole pearl in center,	15.00
x8/2054O.	2 plain and 2 chased loops, opal in center	12.00
20/3534.	Bug, with enamel wings and 2 opals and red stone	27.00
55/5545.	Fly, with enamel wings and 3 pearls	18.00
1986.	1 opal, 1 whole pearl and 7 half pearls	32.00
8/3816/9.	5 almadines and 4 half pearls	21.00
55/8559.	Dark red enamel fleur-de-lis, 11 half pearls	30.00
20/3540O.	6 half pearls, 1 opal, green gold wings	25.50
20/3571.	1 red stone, 3 green stones and 6 half pearls	25.00
8/3795/3.	Plain Roman, opal center	$13.50
19/5195P.	Pearl on end of stick	15.00
19/4911P.	1 whole pearl.	18.00
55/7469.	Bug, with 2 pearls, green enamel	18.00
94/330.	7 half pearls and amethyst in bird's mouth	18.00
1820.	Polished horseshoe with nail	6.00
8/3798.	Bead edge knot	12.00
8/3516C.	Coral center	9.00
20/3589.	Bug, with 2 red stones, 2 green stones and 6 half pearls, brown and green en.	36.00
20/3542.	2 red and 1 green stones, 14 half pearls	39.00
20/3586.	3 green stones and 9 half pearls	28.50
94/603.	5 half pearls	18.00

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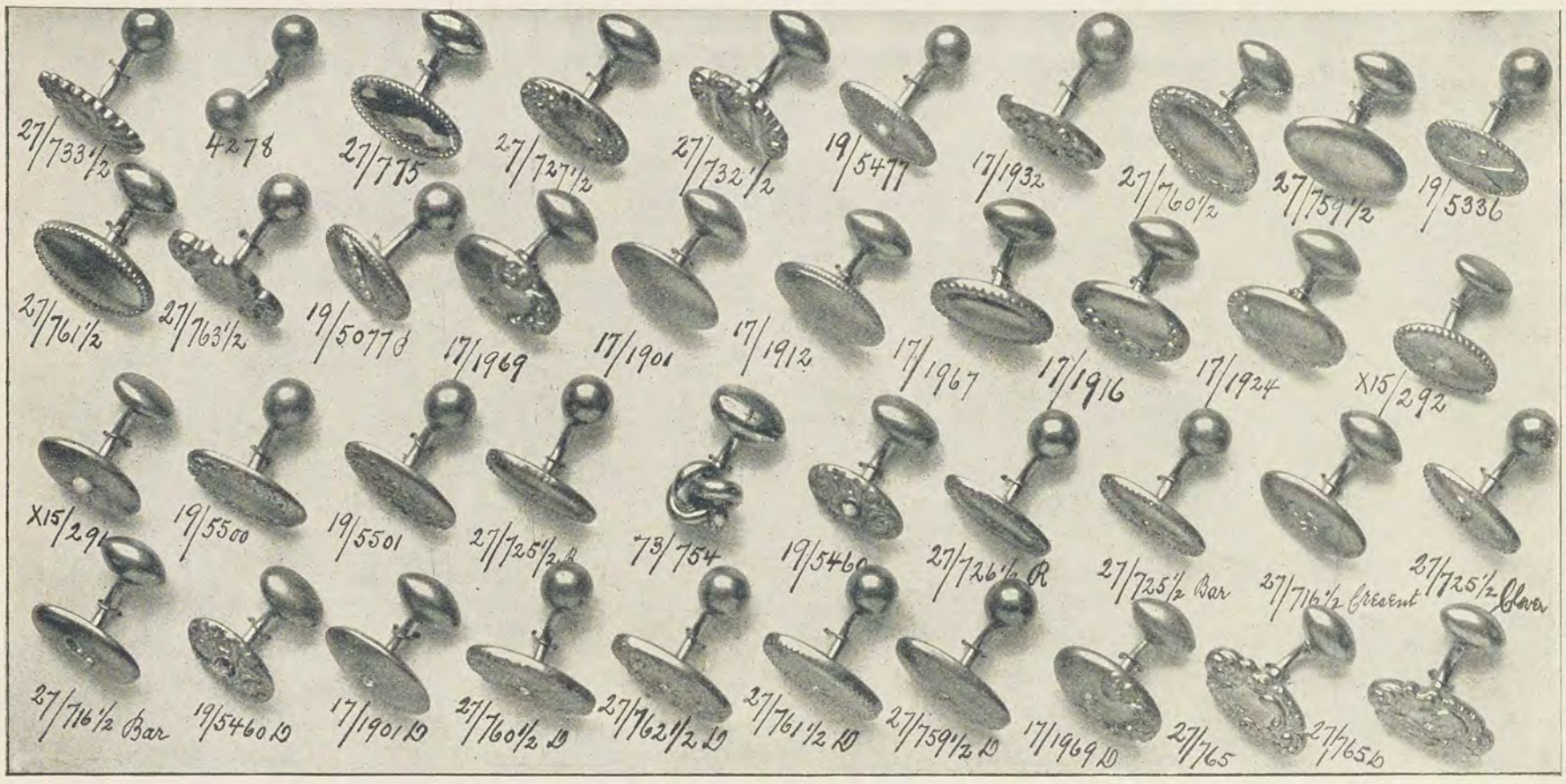
1120 *h*

DUMB=BELL LINKS.

Roman and Polished, Plain and Set with Diamonds. Fine White and Snappy Opals, etc. Unequaled for Strength, Durability and Fine Finish. 10 Karat Gold.

Send for a dozen pair, assorted. They will sell. Almost as cheap as a first-class gold filled button. Prices may go higher before Xmas.



		PER DOZ.
27/733½.	Roman finish	$21.00
4278.	Plain Roman finish or polished	21.00
27/775.	Faceted	24.00
27/727½.	Roman finish or polished	21.00
27/732½.	Roman finish or polished	21.00
19/5477.	Bead edge with opal	27.00
17/1932.	Embossed pattern	27.00
27/760½.	Rococo border	31.50
27/759½.	Plain Roman finish or polished	31.50
19/5336.	Roman or polished golf sticks and balls	30.00
27/761½.	Bead edge	31.50
27/763½.	Embossed ends	$31.50
19/5077.	P. Bead edge with six pearls	33.00
17/1969.	Embossed pattern	31.50
17/1901.	Plain Roman finish or polished	31.50
17/1912.	Bead edge	31.50
17/1967.	Rococo border	31.50
17/1916.	Embossed pattern	31.50
17/1924.	Embossed pattern	31.50
x15/292.	Bead edge with opal	36.00
x15/291.	Plain edge with opal	36.00
19/5500.	Onlaid wire edge	36.00
19/5501.	Onlaid wire edge	$36.00
27/725½.	R. Bead edge with rose diamond	33.00
73/754.	Polished or Roman finish	36.00
19/5460.	Chased with opals	36.00
27/726½.	R. Rococo border with rose diamond	33.00
27/725½.	Bar, Bead edge with rose diamond, Sapphire and ruby doublets	39.00
27/716½.	Crescent, 4 doublets and 1 rose diamond	45.00
27/725½.	Clover, rose diamond and ruby and sapphire doublets	39.00
27/716½.	Bar=Ruby and sapphire doublets and rose diamonds	$39.00
19/5460.	D=Chased with regular cut diamond	90.00
17/1901.	D=Plain with regular cut diamond	90.00
27/760½.	D=Rococo border with regular cut dia.	90.00
27/762½.	D=Embossed border with regular cut dia.	90.00
27/761½.	D=Bead edge with regular cut diamond	90.00
27/759½.	D=Plain edge with regular cut diamond	90.00
17/1969.	D=Embossed with regular cut diamond	90.00
27/765.	=Embossed border	31.50
27/765.	D=Embossed border with regular cut dia.	90.00

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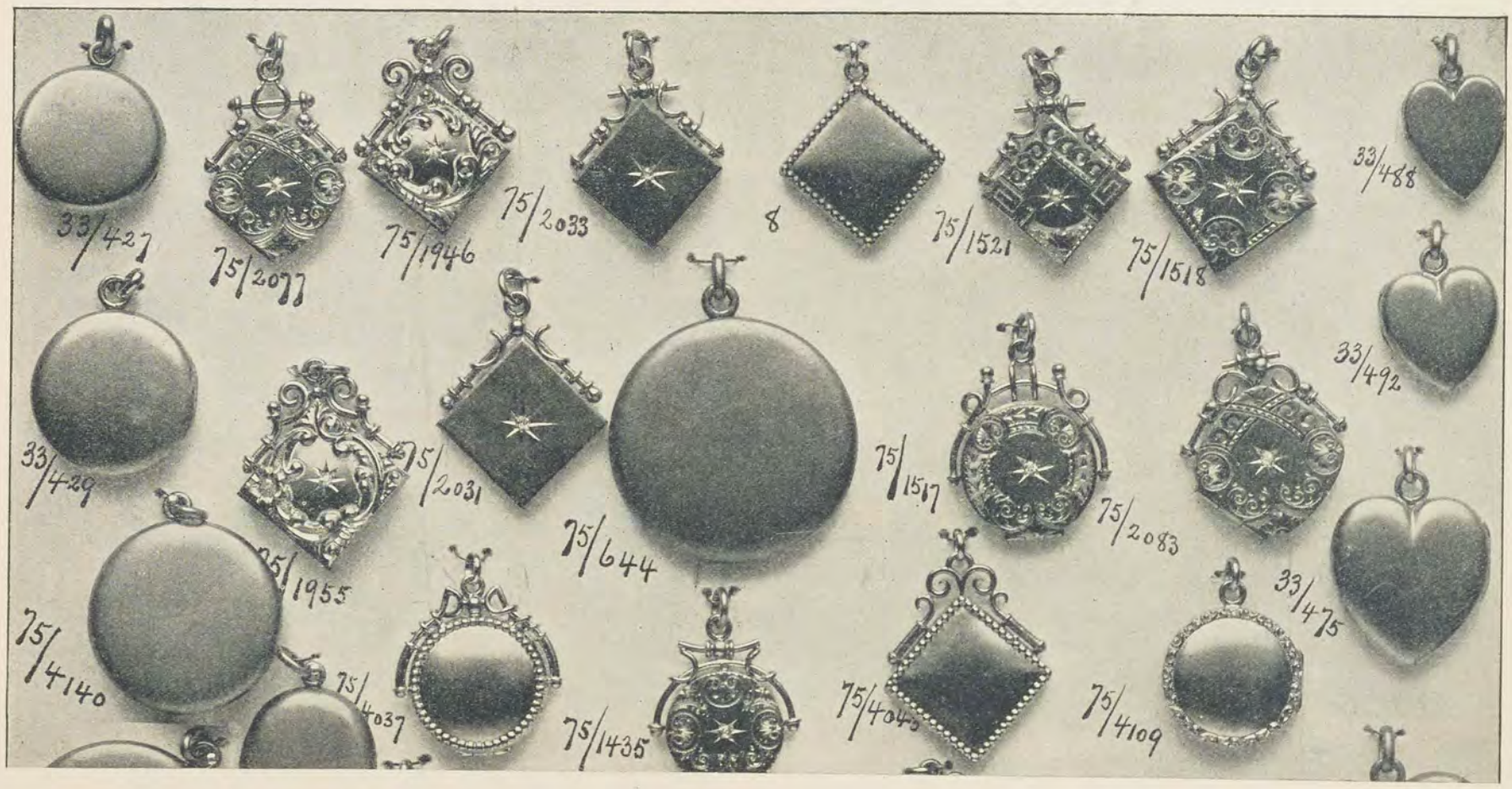
Our Lockets are all 10 Karat. Hold two photos. Workmanship and finish first-class.



		PER DOZ.
33/427.	Plain on both sides	$48.00
33/429.	Plain on both sides	60.00
75/4140.	Plain on both sides	120.00
75/2077.	Fancy, with regular cut diamond	57.00
75/1955.	Fancy, with regular cut diamond	72.00
75/1946.	Fancy, with regular cut diamond	$57.00
75/2031.	Plain, with regular cut diamond	72.00
75/4037.	Plain, with bead edge	60.00
75/2033.	Plain, with regular cut diamond	57.00
75/644.	Plain on both sides	144.00
75/1435.	Fancy, with regular cut diamond	57.00
8.	Plain, with bead edge	$51.00
75/1521.	Fancy, with regular cut diamond	57.00
75/1517.	Fancy, with regular cut diamond	72.00
75/4043.	Plain, with bead edge	60.00
75/1518.	Fancy, with regular cut diamond	72.00
75/2083.	Fancy, with regular cut diamond	$72.00
75/4109.	Plain, with Rococo border	51.00
33/488.	Plain on both sides	31.50
33/492.	Plain on both sides	36.00
33/475.	Plain on both sides	54.00

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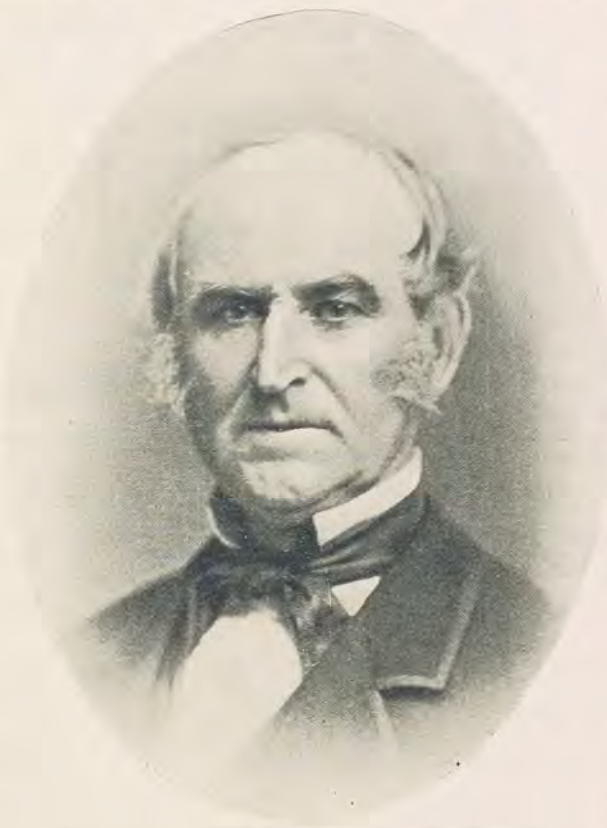
The Silverware Industry

Early Workers in Silver—Great Advance in the Present Century—Electro-Deposition.

OF all the metals there is none so adapted as silver for the skillful manipulation of the ingenious artificer. It is not surprising, therefore, that this metal has furnished the material for some of the most beautiful products of human genius, and we record with pride the fact that our country during the century has outshone the world in the magnificence of its silverware product. A fertile originality and audacious departure from conventional designing have been notable features of the silversmith's art in America, and the world has benefited immeasurably thereby.

SOLID SILVERWARE.

Silversmithing in the United States is as old as the New England colony. Boston was the nursery of the art. From an interesting work entitled "Old Plate," by J. H. Buck, of the Gorham Manufacturing Co., we learn that when, in 1652, Massachusetts undertook to supply the deficiency of specie by a silver coinage, the money was coined by John Hull, a gold and silversmith, and Rober Sanderson, of Boston. The annals of silversmithing from that time contain a long line of silversmiths of more or less eminence. None of the silversmiths of colonial times seem to have depended for a living on his art alone. The field and resources were probably too limited. One of the gold and silversmiths of that period, whom we must not pass over in silence, is Paul Revere, who was born in Boston in 1735. Paul's father, who was a French Huguenot, came to Boston when only thirteen years old and learned the trade of goldsmith. The son followed in the father's footsteps, and was aided by a natural taste for drawing, at which he displayed great proficiency.



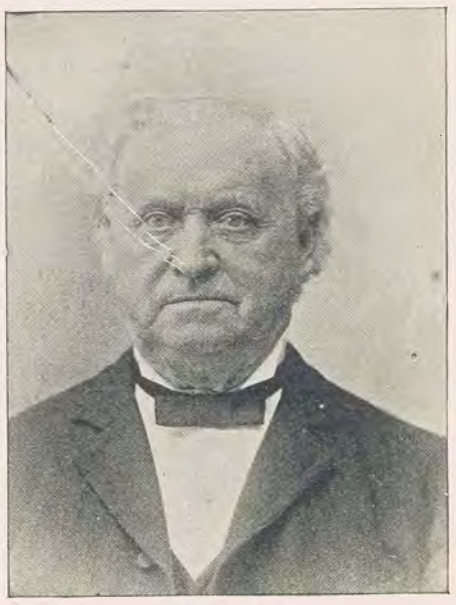
Robert Wallace,
Founder of R. Wallace & Sons Mfg. Co.

THE great triumphs of this country, however, in the solid silverware field belong to the present century, and in any record of these triumphs first place must be accorded to the Gorham Manufacturing Co., which has a history that dates well nigh back to the beginning of the century. Jabez Gorham, the founder of the business, was born in 1792. In the early years of the present century young Gorham became apprenticed to Nehemiah Dodge, a manufacturing jeweler, and remained in his employ until reaching his majority. He then started for himself, forming a partnership with Christopher Burr, William Hadwen, George G. Clark and H. G. Mulford. The partnership continued for five years, when it was dissolved, Jabez Gorham continuing the business alone until 1831. The original line made by Mr. Gorham consisted of gold beads, ear rings, breast pins, finger rings and a peculiar kind of gold chain, celebrated at that time and known as the Gorham chain. In 1831 was laid the foundation of the silverware manufacturing business since so successfully conducted by the Gorham Company. Previous to this time all silver spoons had been made in England, and were of a crude, clumsy form. Gorham associated with him Henry L. Webster, and the firm-name became Gorham & Webster, and for nine years they made nothing but spoons, thimbles, silver combs and occasionally a napkin ring and fork. At the age of fifty Jabez Gorham retired and his son John succeeded him. The elder Gorham died March 24, 1860, in the seventy-seventh year of his age. In 1865 the concern was formed into a corporation, with John Gorham as president, Gorham Therber as treasurer and J.F. P. Lawton as secretary. When John Gorham died Wm. Cerino was made president.

George Wilkinson.

We show herewith a portrait of George Wilkinson, the great artist and worker in silver, who was for many years superintendent of the Gorham Manufacturing Co. and who deserves much of the credit for the great progress made in the manufacture of high-grade solid silverware. Mr. Wilkinson was born in England in 1819 and educated there. In 1847 he came to this country under contract to the Ames Company, of Chicopee, Mass. There he remained 'till 1857, when he went to the Gorham Manufacturing Co.'s factory, where he remained 'till his death. Mr. Wilkinson's term of superintendency of the factory was marked by some of the greatest achievements in silverware manufacture, and he well sustained the fame of the Gorham products.

Some of the most beautiful solid silverware manufactures of recent years have been the silver services presented to the United States warships. Several of these were made by the Gorham Manufacturing Co. The list of makers also contains the Whiting Manufacturing Co., Tiffany & Co., Dominick & Haff, J. E. Caldwell & Co. and others. A recent notable triumph of the Gorham Manufacturing Co. was the monster silver loving cup presented to Admiral Dewey, which is said to be the largest loving cup ever made. The gold cup presented to the admiral was the work of Tiffany & Co.



Isaac C. Lewis,
First President Meriden Britannia Co.

The United States now lead the world in manufacture of solid silver. The wares are famous for originality of design, artistic merit and unequaled elegance of finish.

SILVER-PLATED WARE.

The history of the great silverware industry dates from the introduction of electro-plating. Early in the century it had been discovered that copper or gold held in solution might be made to settle upon the faces of objects suspended in the solution by means of a current of electricity. It was then found that metallic objects might be gilded by this process and made to appear like solid gold. The invention was at first regarded as a curiosity. It was not until 1840 that its value for gilding and silvering was realized and a great advance was made when it was suggested that prussiate of potash would hold silver in solution without oxidizing the baser metals. Subsequently it was found that the solution of cyanide of potassium would do the work better, and silver plating became available for industrial purposes. It was found that the most elaborate services could be produced by the new process coated with pure silver to any thickness and at about one-fourth the cost of solid ware. Yankee push and enterprise did the rest. A ready market was found for the new goods and iron forks, knives, etc., were soon banished from the tables of people of taste.

BEFORE proceeding to deal more definitely with the foundation of the silver-plate industry, we must digress to record an important anterior happening which will add to the interest of our story.

A name which has been identified with the silverware industry for the greater part of the century is that of Wallace, proudly preserved in the name R. Wallace & Sons Manufacturing Co., Wallingford, Conn. Robert Wallace, founder of the German silver flatware industry of the United States, was born in Prospect, Conn., November 13, 1815. The earlier part of his life he spent on his father's farm, until 1831, when he became an apprentice to the art of making britannia and pewter spoons. In 1833, when eighteen years of age, he hired an old grist mill in Cheshire, Conn., and began the manufacture of spoons on his own account. In 1834, when he had been in his small factory but about a year, he was shown by one of his patrons in New Haven, a spoon that was made of a metal new to both of them. It was called German silver. Dr. Feuchtwanger, an analytical chemist, was known to have brought a small bar of this metal from Germany. Mr. Wallace succeeded in purchasing this bar, and, carrying it to Waterbury, had it rolled, and from the sheet made four dozen spoons. While in Waterbury Mr. Wallace met a gentleman who had recently come from England and who had brought with him the receipt for making German silver. Mr. Wallace purchased this receipt and at once procured the necessary ingredients. At about this period Mr. Wallace moved his primitive factory from Cheshire to Wallingford, and there prepared to manufacture spoons and other flatware on a more extensive scale. Mr. Wallace having acquired all the ingredients required for making the German silver, and having become settled in his new quarters, at once proceeded with the compounding of the metal. Thus, at Wallingford, under the personal supervision of Mr. Wallace, was compounded the first German silver or nickel silver manufactured in this country, and thus originated the industry which has since assumed such vast proportions in the State of its birth.

The R. Wallace & Sons Manufacturing Co., therefore, dates its origin from 1835, when it was founded by Robert Wallace, the business being at that time conducted solely by himself. Later, as the business increased, a partner was taken and the firm became known as Robert Wallace & Co. The business was conducted under this name until 1865, when, it having become greatly enlarged, the capital stock, which had heretofore been very small, was increased to $100,000 and the firm-name taken was

(*Continued on page 1123.*)

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LEATHER GOODS: Traveling Bags, with and without Toilet Fittings; Pocket Books, Card Cases and Chatelaine Bags, mounted in Silver and Gold; Portfolios and Desk Pads, mounted in Silver.
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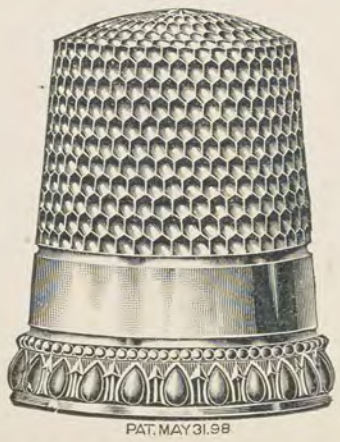
MADE IN THREE DIFFERENT SIZE LINKS——
PLAIN OR CHASED——EITHER BALL OR LOCKET

THE VERY NEWEST THING IN BRACLEETS——THE MOST STYLISH, TOO

DON'T LOSE SIGHT OF US

ON GOLD AND SILVER THIMBLES——
YOU'LL BE THE LOSER IF
YOU DO——



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Wm. Rogers.

Simeon Rogers.

Members of the original Rogers Bros., Hartford, Conn.

Asa H. Rogers.

The Silverware Industry.

(*Continued from page 1121.*)

Wallace, Simpson & Co. But, in 1871, Mr. Wallace purchased the interest of his individual partner, Mr. Simpson, and with his sons formed the new company, R. Wallace & Sons Manufacturing Co., now one of the largest factories of silver flat and hollow-ware in the country.

A name to conjure with in the silver-plated ware world during the past half century has been that of "Rogers." In hunting data for a brief account of the plated ware industry we were so frequently and persistently confronted with the name Rogers that at last we found ourselves intellectually lost in a Rogers maze from which we were with difficulty extricated. It appears that in the early forties, about the time that electro-plating became a practical art there were three Rogers brothers, William, Asa H. and Simeon. William Rogers was originally a jeweler, Asa a plater and Simeon also a practical workman. As far back as 1846 William Rogers was doing business as a jeweler in a small way at 4 State Street, Hartford, Conn. Asa, about the same time, procured a battery and began experimenting in electro-plating in the basement of his brother's store. His success attracted the attention of the brothers and a company, called the Rogers Brothers Manufacturing Co., was formed in Hartford for the manufacture of the new electro plated wares. At first German silver spoons and forks were imported from England and plated, but the firm soon began to make their own blanks. These goods found a ready sale.

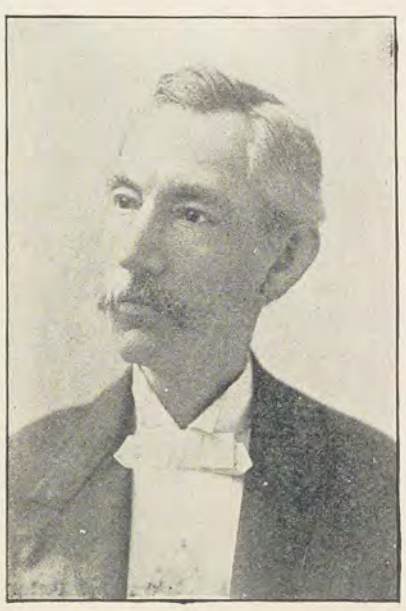
As in most new ventures many difficulties were encountered, and it was soon manifest that high quality of the wares could be profitably maintained only by the employment of greater capital and resources than the brothers had at their command. The firm dissolved. Asa and Simeon went to Waterbury, Conn., and started the firm of Rogers & Bro. William remained at Hartford, where he in 1857 established the firm of Rogers, Smith & Co., and later become associated with the Wm. Rogers Manufacturing Co. The brothers, who had started in Waterbury as Rogers & Bro., soon sold out to Green Kendrick, who continued the firm name of Rogers & Bro. Asa went to New York city about 1860 and formed a partnership with Gilbert Rogers, a cousin, under the firm name of A. H. & G. Rogers. When the war broke out the firm dissolved, and Gilbert in 1862, went with the Meriden Britannia Co., of Meriden, then engaged in the manufacture of plated ware, who thus acquired the right to use the name Rogers on their flatware. Later the Meriden Britannia Co. arranged with the other Rogers brothers for the use of their name, and released Gilbert. The latter in 1864, with his brothers Cephas and Wilbur, went into business at Meriden as C. Rogers & Bros., which is now one of the leading concerns in the silverware industry.

THE only living Rogers now engaged in the manufacture of flatware in the United States are the members of C. Rogers & Bros., Meriden, Conn. The house of C. Rogers & Bros. is an old established and responsible concern, dating its inception back to 1864, business always having been carried on under the original name and style. The co-partners, Messrs. Cephas B., Gilbert and Wilbur F. Rogers (who are brothers) began manufacturing in the above-mentioned year, upon a small scale, having only two or three workmen, but the superiority of their product early necessitated an enlargement of their facilities, and their process of growth has continued, until now some three hundred hands are employed in their immense modern works at the foot of Butler Street. The plant covers an area of 300 x 400 feet in dimensions. Cephas B. Rogers, the president and business manager, is a native of Saybrook and came to Meriden when a boy and has always been actively identified with her interests. It is under his able, skilled guidance that this industry has been developed upon such a solidly prosperous basis. Gilbert Rogers is also a native of Saybrook and thoroughly skilled and trained in this business and knows its every detail. Wilbur F. Rogers was born in Saybrook, but came to Meriden as a boy and has always been closely identified with its interests and is an energetic and practical business man.

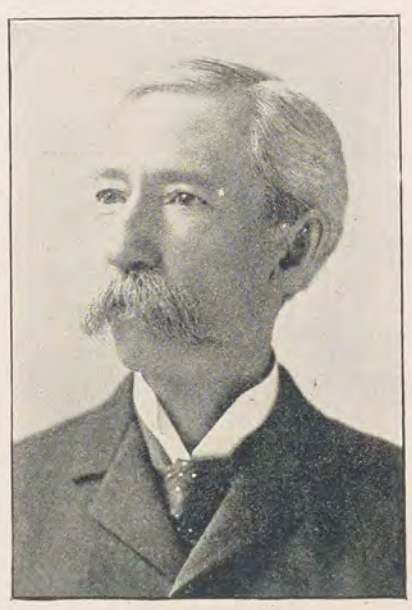
HAVING thus related briefly the connection of the Rogers family with the silver-plated ware industry, due reference must be made to a few who merit special credit for building up the industry.

We now hasten to pay tribute to the memory of Horace C. Wilcox, who probably did more than any other single individual to develop and promote silver-plated manufacture. Mr. Wilcox was born on a Connecticut farm, and assisted his father at farming until his twentieth year, when he followed the example of his brother, Dennis C. Wilcox, and engaged in the sale of tin and britannia wares. At this time Isaac C. Lewis was manufacturing britannia ware in Meriden, and so energetic and successful did Wilcox prove in his new field that he soon undertook to market Lewis's entire product. The next important event in the career of the Wilcox brothers and Lewis was the organization with others in 1852 of the Meriden Britannia Co. destined in later years to become

(*Continued on page 1125.*)



Cephas B. Rogers.



Gilbert Rogers.

Members of the firm of C. Rogers & Bros., Meriden, Conn.

Wilbur F. Rogers.

FALL ATTRACTIONS

of

Silver Plate

Latest Designs in **Shape** and **Finish**

Rich Cut Glass

Pairpoint Mfg. Co.

NEW BEDFORD, MASS.

38 Murray Street, NEW YORK.

Temple Building, MONTREAL.

STUDYING THE WANTS OF THE TIMES

As Wholesale Jewelers, we meet the demand for everything generally carried in stock in jewelry stores. With the general improvement in business, we have anticipated an increased demand for the newer and more attractive goods for Holiday trade. And we have them.

There is an advantage apparent to every buyer in selecting his goods where the assortments are most complete. Couple this with the assurance of lowest prices and liberal treatment and you have our way of doing business. We are now ready for any test you may make of our ability to supply your wants.

STEIN & ELLBOGEN COMPANY

DIAMOND CUTTERS AND WHOLESALE JEWELERS

103 STATE STREET, CHICAGO

The Silverware Industry.

(*Continued from page 1123*)

the greatest silver-plated manufacturing concern of its kind in the world. Isaac C. Lewis was president of the new company and Horace C. Wilcox was secretary and treasurer. The latter was the very presonification of enterprise, while the former was shrewdly conserative, and never, probably did a concern start with such a well-balanced aggregation of business and manufacturing talent. Under such guidance its success was rather a foregone conclusion than a speculation. In 1853, Mr. Wilcox relinquished the treasurership of the company and George R. Curtis, to whom we shall refer later, was elected in his stead. In 1866, Isaac C. Lewis declined a fourteenth election to the presidency, and Mr. Wilcox accepted the office.

Isaac C. Lewis, above referred to, whose memory is quite as intricately associated with the silver plate industry, was born in Meriden in 1812. In his fifteenth year he was apprenticed to Hiram Yale, of Wallingford, to learn the britannia trade. In 1834, he being then in his twenty-second year, he formed a co-partnership with George Cowles, under the title of Lewis & Cowles, and the firm engaged in the manufacture of britannia ware. After several changes of partners and location, Mr. Lewis purchased a house and farm near Meriden and built a shop, but business increased so rapidly that the shop soon proved insufficient, and he bought the factory wherein he first commenced business with Mr. Cowles. In 1852, the Meriden Britannia Co. was formed as before stated, and Mr. Lewis became president. Subsequently when the method of electro-doposition, first used commercially in this country by the Rogers brothers was introduced, the Meriden factory began the manufacture of silver-plated ware and acquired the right to the use of the name Rogers. The subsequent history and success of the company is a modern story.

SAMUEL SIMPSON, whose name has been previously mentioned in this narrative and whose memory is associated with the development of the silverware manufacture and name retained in Simpson, Hall, Miller & Co., was another of the chief promoters of this industry. Mr. Simpson was born in Wallingford in 1814 and when fifteen years old he was apprenticed to Charles Yale, of Yalesville, for a term of five years. In 1847 he purchased the Humiston Mills on the Quinnipiac River, which he fitted up for the manufacture of electro silver-plated ware. On January 1, 1854, this industry was merged into the Meriden Britannia Co., then a one-year-old concern. Soon after, he formed a partnership with the late Robert Wallace, under the name of R. Wallace & Co., for the manufacture of nickel-silver spoons and forks. In 1860 Mr. Simpson and Mr. Wallace formed a joint stock company, with the firm title of Wallace, Simpson & Co., with a capital of $100,000. Mr. Simpson became its president. The next year he organized a new company, with the firm title of Simpson, Hall, Miller & Co., of which he was elected president.

Another of the great galaxy of business men who founded and promoted the silver-plate industry was George R. Curtis, who was book-keeper of the Meriden Britannia Co. when it was organized and subsequently became treasurer. Mr. Curtis was clerk in a store, teacher, and clerk in a bank before connecting himself with the Meriden Britannia Co. He remained with the company until his death in 1893.

The latest important event in the history of the silverware industry was the formation this year of the International Silver Co., which is an amalgamation of the following concerns: The Meriden Britannia Co., the Wm. Rogers Manufacturing Co., Rogers & Brother, the Rogers & Hamilton Co., Simpson, Hall, Miller & Co., Holmes & Edwards Silver Co., Manhattan Silver Plate Co., the Barbour Silver Co., the Derby Silver Co., the Meriden Silver Plate Co., the Middletown Plate Co., the Wilcox Silver Plate Co., the Watrous Manufacturing Co., the Norwich Cutlery Co., the Simpson Nickel Co., and the Standard Silver Co., of Toronto. This aggregation, in itself, gives an impressive idea of the present magnitude of the industry, and it is even now enjoying an accelerated rate of progress. The fame of American silverware is as wide as civilization, and our designs lead the world in originality and beauty of execution.

SILVER is so adapted for articles of personal use and adornment that the manufactures of the metal are now of the most varied character. The silver novelty industry is an immense industry in itself, the variety and attractiveness of these goods being a most effective money-making lever for trade. Of the many manufactures of silverware there is none the memories of which are so closely intertwined with our hearts and homes as the thimble, and this brings us to a story of effort and success that covers over sixty years of the century.

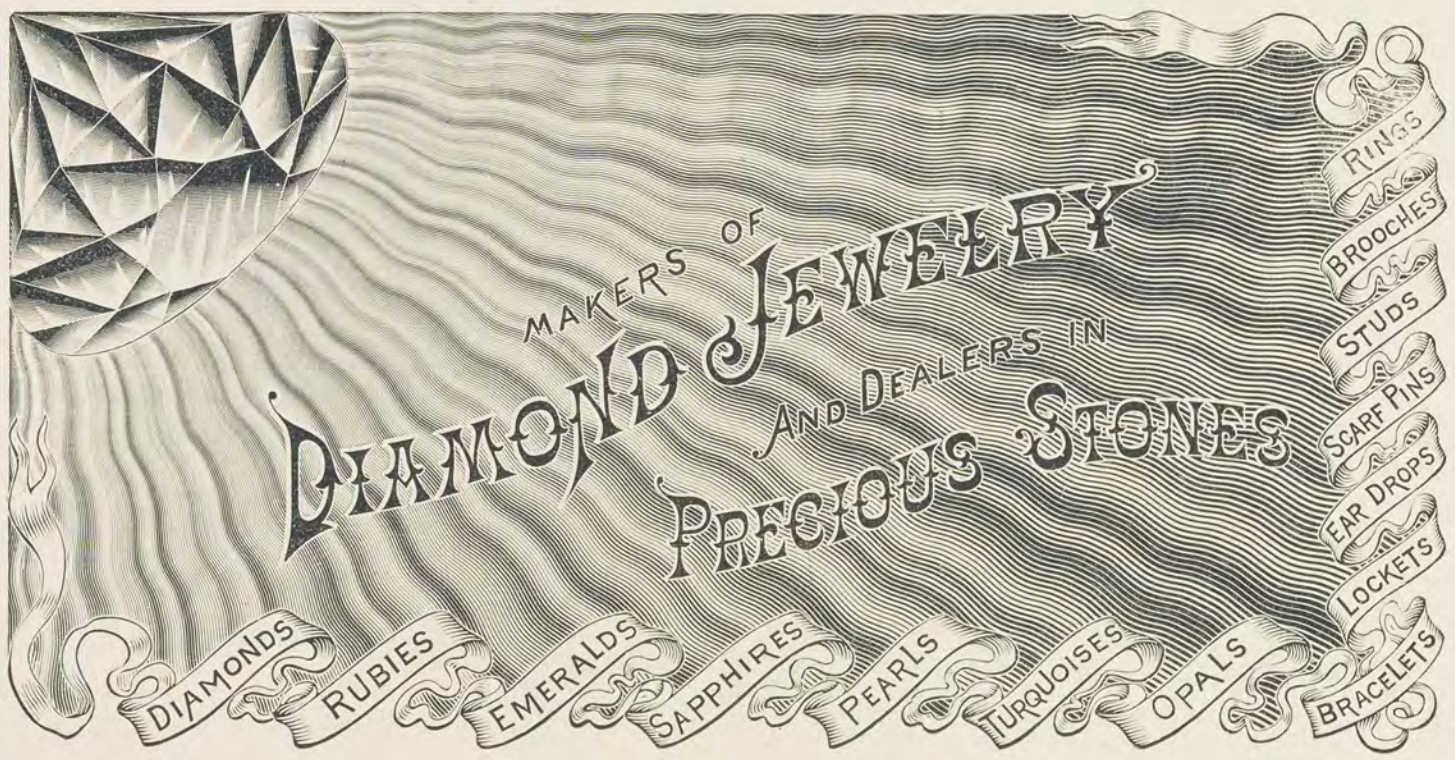
Away back in 1819 George W. Simons, the founder of the now well-known house of Simons, Bro. & Co., of Philadelphia, was born in that city. As a lad he learned the trade of making silver pencils and thimbles. In 1840 he started in business on his own account in an unpretentious factory that stood oft Chestnut Street near Fourth, then the busy part of the Quaker City. He continued, with a few employees making gold and silver thimbles and gold pencils for several years, when his brother, Peter B. Simons, who had learned the jewelry trade, become associated with him. The house of George W. Simons & Brother, as it was now called, proved rapidly successful, and it was soon found necessary to secure larger quarters, jewelry having been added to its list of manufactures. After several removals, necessitated by increasing business, Mr. Simons purchased a valuable property on Chestnut Street, and transformed it into the manufacturing and business establishment which the firm has occupied ever since: Early in the career of the house a branch was established in San Francisco of which Peter B. Simons took charge. Subsequently, the latter purchased this branch and retired from the firm. About the same time George W. Simons admitted his four sons into partnership. The story of the house has been one of continued success, and expansions were continually made until to-day their line of manufactures are very comprehensive, including gold and silver thimbles, chains, high-grade jewelry, diamond goods, silverware, etc.

THE BOWDEN RINGS

ARE
COMPLETE IN VARIETY,
CORRECT IN QUALITY AND
PERFECT IN FINISH.

WE MAKE EVERY VARIETY OF FINGER RINGS.

J. B. BOWDEN & CO., 1 Maiden Lane, New York.



Our aim is to cater for the trade of those dealers who do not carry a full assortment of Diamond goods in stock, and who send for an assortment on memorandum when they have a sale for Diamonds or Precious Stones.

When you have a prospective sale for anything in this line kindly favor us with a trial order.

S. C. SCOTT MFG. CO.

9, 11, 13 Maiden Lane, NEW YORK

SPRING.
Size, 14 inches high.

"Gessoart"

List price, per pair,
$5.00.

DISCOUNT,
50 per cent.

Send $2.50 for sample pair boxed.

Send for Illustrated Catalogue

ATALA.
Size, 14 inches high.

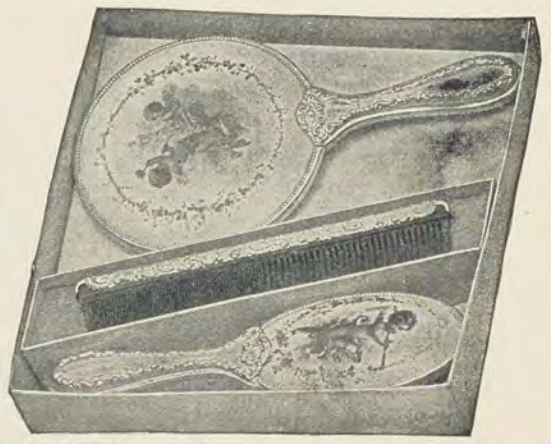
L. W. LEVY & CO., *Novelties,*

Successors to Levy, Dreyfus & Co.,

194 Broadway, New York. Near John St.

SETS

Porcelain-Back Brush and Mirror, with Comb.



Diameter of Mirror is 5 inches, Gilt or Silver-Plated Mounting,
Set complete, $3.00.

Same decoration, Gilt or Silver-Plated, with Oval Mirror, 5½ inches long,
Set complete, $2.75.

Flower decoration, Gilt or Silver-Plated, with Oval Mirror, 5½ inches long,
Set complete, $2.00.

NOVELTIES IN ART GOODS.

New York Letter.

The strike of the jewelry workers furnished the sensation of the past month in local trade circles. It appears that a few months ago there was formed in this city an organization of the jewelry workers under the auspices of the American Federation of Labor. This organization was called the Jewelers' Protective Union. It was naturally expected that the union foreboded trouble, and the expectation came true. Some weeks ago the manufacturing jewelers received a somewhat startling circular of which the following is a copy:

In conformity with the constitution of the Jewelers' Protective Union, No. 7407, A. F. of L., and in regard to the best interests of the trade and the welfare of humanity, we respectfully submit to you the following request:

1. That the working hours of this and all other jewelry shops be reduced to eight hours, with the same rate of pay per day as at present, and that the hours of labor shall be from 8 to 12 A. M. and from 1 to 5 P. M.

2. For overtime the rate of pay shall be advanced 50 per cent.

3. For work done on Sundays and legal holidays, 100 per cent. shall be added to the regular rate of pay.

4. That the Jewelers' Protective Union be recognized and union men only be employed.

This request shall be made simultaneously in all jewelry shops of New York and vicinity and such places that the Jewelers' Protective Union can reach, and shall take effect October 2, 1899.

This circular resulted in a meeting of the employers of the men, and the sentiment was that united action should be taken to resist the excessive demands. It was intimated that the manufacturing jewelers of Providence and Newark would act in union with their brethren in this city. There was much indignation at the action of employees who selected the most inopportune time of the year to make trouble, hoping that the exigencies of the season would force the employers to submit.

The strike has caused much delay and loss, but the manufacturers say that submission to the demands of the men would ultimately mean as great a loss, and the sentiment was general that yielding could not be considered.

Meanwhile the manufacturing jewelers formed themselves into an organization. This organization is styled the Manufacturing Jewelers' Association of New York, and its objects are stated in the second article of the constitution which is as follows:

That the objects for which this corporation is formed are to foster trade among its members, to secure freedom from unjust and unlawful exactions, to procure uniformity in the usages of trade, to strengthen the relationship between employers and employees, and to promote a more friendly intercourse between them. For the accomplishment of these objects the corporation seeks to insure united action whenever the interests of its members are concerned, where grievances are honest ones, and to arrange for a basis of settlement.

The work of incorporating was assigned to G. H. & F. L. Crawford, counsel for the new organization. The association has already built up a large membership.

The strikers version of the trouble was stated in a circular signed by the president and secretary of the Union and was as follows:

For a number of years the hours of labor demanded by the manufacturer have been from 7.30 A. M. to 6 P. M., with but one-half hour for lunch or dinner; in other words, ten hours constituted a day's work. From seven to eight months in the year about three-fourths of the men have been unable to procure employment at their trade. The statement that the scale of wages paid on an average has been from fifteen to sixty dollars a week is entirely outside of our experience. If any workmen have been receiving any such high rate of wages as approaches the larger figure, we have rarely, if at all, met one; that such should be the scale we cheerfully admit. The true facts are that a very large number of journeyman receive from six dollars to seven dollars a week, and even steady employment was not secured at these low figures. The work has been intermittent, and has largely been concentrated in the few months before Christmas. The result of this condition of things is, that the bulk of the workingmen in the trade do not, and cannot, make living wages. In plain English, with a pernicious system of long hours, with work extending only over short periods of time, with long seasons of idleness intervening, we cannot live decently on the amount we are able to earn by the utmost industry during working months, even when we exercise the utmost frugality in our expenditures.

We contend, and it must be admitted as an existing fact, that this state of affairs tends to lower and degrade the workingman and to place a premium on crime. We are not a body of anarchists, but citizens of this, the United States, loyal and law abiding, but demanding fair treatment and honest compensation for our labor at the hands of our employers. We believe that with a labor day reduced from ten to eight hours, viz.: twenty per cent., that an opportunity would be given either for more workmen to be employed or for the working season to be extended.

We think our position reasonable and just, and if our demands are acceded to the result will not insure to our advantage alone, but also to that of the employer.

At present writing the strike still continues. The manufacturers say the men are gradually deserting and returning to work, while the body of the strikers still refuse to yield.

The Dewey Arch.

The large optical firms in this city report an unprecedented sale of marine and field glasses during the past month. The demand began with Dewey's arrival in the harbor, and the parades that followed, but were still larger the following week when the international yacht races were on. The new binocular glasses were ready sellers, and the Maiden Lane houses were completely cleaned out for a time. Fortunately, the manufacturers were able to respond fairly well to the unusual demands made upon them, so all hands are happy over the harvest and would not mind if the big yacht races happened once a month.

An interesting visitor to this city last month was J. P. Engel, an optician of Johannesburg, South Africa. Mr. Engel left home in the spring, and, after stops at some of the noted Mediterranean ports, went to Paris, where he spent some time. London was visited next, and after a stay there and a thorough canvas of English optical goods and prices, Mr. Engel came to America to visit and inspect the product of our factories, whose announcements he had noted in THE KEYSTONE, of which he is an enthusiastic subscriber. After leaving here, Mr. Engel went to Philadelphia to see the International Exposition, after which Niagara Falls, Chicago, and perhaps San Francisco, would in turn be visited. In the struggle now going on in South Africa Mr. Engel's sympathies were with the English, as their victory meant advancement and progress.

Albert Wittnauer, the Swiss watch importer, who has been to Europe, made a short stay at Carlsbad previous to returning to this country.

L. Dietrich, enameler, has opened an office in the Knapp Building, 41 Maiden Lane.

The annual meeting of the stockholders of the Prentiss Calendar and Time Co. for the election of trustees for the ensuing year was held at the office of George Lewis Prentiss, 31 Nassau Street, on October 19th.

Woolf Green, the material jobber, received an interesting letter some days ago from his brother Michael, who resides in Bufflsdown, in the Transvaal, South Africa. Mr. Green wrote: "We are all excited over the prospects of war. All the people around us are preparing for the struggle, and it looks very much like war. We will take no part, but fear the authorities will try and force us to take sides with them or seize our possessions. Any way we have not lost any of our British pluck, come what may." Brave words to utter from the heart of the enemy's country.

Kohn & Co., who are at present on the eighth floor of the Gill Building, 9, 11, 13 Maiden Lane, will on or about the 20th of this month remove to larger quarters on the ninth floor of the same building.

William Downey, a well-known manufacturing jeweler of this city, died last month. The deceased was born in Ireland, but came to this country when a child. He started in the jewelry business as a boy with Nichols, Goodwin & Co., with whom he served his apprenticeship and learned the trade. When twenty-three years of age he formed a partnership with Peter Smith, under the name of Downey & Smith, who continued for eighteen years. After the dissolution of this partnership, he bought out the business of O. H. Kelley and continued alone under his own name as a manufacturing jeweler. For the past twenty-two years he occupied quarters at 24 John Street. He was a member of the Jewelers' League.

C. G. Alford, of C. G. Alford & Co., took a brief holiday early last month to enjoy a coaching trip in the Berkshire hills.

Aikin, Lambert & Co., manufacturers of gold pens, 19 Maiden Lane, recently received word from Richard W. Hunt, one of their traveling representatives, that his trunk and samples had been destroyed by a fire which consumed the railroad depot at Clay Center, Kans. The value of the trunk and samples was about $1200, which was fully covered by insurance. New samples were promptly forwarded to Mr. Hunt.

The twelfth annual masquerade and civic ball of the Watchmakers' and Jewelers' Benevolent Association No. 1 will be held at Terrace Garden, Fifty-eighth Street and Third Avenue, this city, Christmas eve, Sunday, December 24, 1899.

Jules H. Lecroix, selling agent for the New England Watch Co., 37 and 39 Maiden Lane, reports large sales of the new "Cruiser" and also the "Queen Mab," a new low-priced watch, 0 size, with second-hand, cased in very thin model. It will be Mr. Lecroix's pleasure to show these watches to the trade, and out-of-town jewelers are especially invited to make his office their headquarters while in New York.

Herman Marcus, one of the oldest jewelers of this city, died October 18th, of heart disease, at his residence, 15 Central Park, West, at the age of seventy-three years. The deceased was a recognized connoisseur on jewelry matters; and he was also one of the best authorities on cameos.

MILITARY INCIDENT WITH A BUSINESS MORAL

A Message to Garcia [*By all odds the most remarkable specimen of periodical literature which appeared in recent years is the now world-famous "Message to Garcia," written by Elbert Hubbard, editor of "The Philistine." The "message" is a mental treat, which we cannot allow our readers to miss.—Ed.*]

IN my recollections of the Cuban campaign there is one man stands out on the horizon of my memory like Mars at perihelion. When war broke out between Spain and the United States, it was very necessary to communicate quickly with the leader of the insurgents. Garcia was somewhere in the mountain fastnesses of Cuba—no one knew where. No mail nor telegraph message could reach him. The President must secure his co-operation, and quickly.

What to do!

Some one said to the President, "There's a fellow by the name of Rowan will find Garcia for you, if anybody can."

Rowan was sent for and given a letter to be delivered to Garcia. How "the fellow by the name of Rowan" took the letter, sealed it up in an oil-skin pouch, strapped it over his heart, in four days landed by night off the coast of Cuba from an open boat, disappeared into the jungle, and in three weeks came out on the other side of the island, having traversed a hostile country on foot, and delivered his letter to Garcia, are things I have no special desire now to tell in detail.

The point I wish to make is this: McKinley gave Rowan a letter to be delivered to Garcia; Rowan took the letter and did not ask, "Where is he at?" By the Eternal! there is a man whose form should be cast in deathless bronze and the statue placed in every college of the land. It is not book learning young men need, nor instruction about this and that, but a stiffening of the vertebræ which will cause them to be loyal to a trust, to act promptly, concentrate their energies: do the thing—"Carry a message to Garcia!"

General Garcia is dead now, but there are other Garcias.

No man who has endeavored to carry out an enterprise where many hands were needed but has been well-nigh appalled at times by the imbecility of the average man—the inability or unwillingness to concentrate on a thing and do it. Slipshod assistance, foolish inattention, dowdy indifference and half hearted work seem the rule; and no man succeeds, unless by hook or crook, or threat, he forces or bribes other men to assist him; or, mayhap, God in His goodness performs a miracle, and sends him an angel of light for an assistant. You, reader, put this matter to a test: You are sitting now in your office—six clerks are within call. Summon any one and make this request: "Please look in the encyclopedia and make a brief memorandum for me concerning the life of Correggio."

Will the clerk quietly say, "Yes, sir," and go do the task?

On your life, he will not. He will look at you out of a fishy eye and ask one or more of the following questions:

Who was he?

Which encyclopedia?

Was I hired for that?

Don't you mean Bismarck?

What's the matter with Charlie doing it?

Is there any hurry?

Shan't I bring you the book and let you look it up yourself?

What do you want to know for?

And I will lay you ten to one that after you have answered the questions, and explained how to find the information, and why you want it, the clerk will go off and get one of the other clerks to help him try to find Garcia—and then come back and tell you there is no such man. Of course, I may lose my bet, but according to the Law of Average, I will not.

Now if you are wise, you will not bother to explain to your "assistant" that Correggio is indexed under the C's, not in the K's, but you will smile sweetly and say, "Never mind," and go look it up yourself.

And this incapacity for independent action, this moral stupidity, this infirmity of the will, this unwillingness to cheerfully catch hold and lift, are the things that put pure socialism so far into the future. If men will not act for themselves, what will they do when the benefit of their effort is for all? A first mate with knotted club seems necessary, and the dread of getting "the bounce" Saturday night holds many a worker to his place.

Advertise for a stenographer, and nine out of ten who apply can neither spell nor punctuate—and do not think it necessary to.

Can such a one write a letter to Garcia?

"You see that bookkeeper," said the foreman to me in a large factory.

"Yes, what about him?"

"Well, he's a fine accountant, but if I'd send him up town on an errand, he might accomplish the errand all right, and, on the other hand, might stop at four saloons on the way, and when he got to Main Street would forget what he had been sent for."

Can such a man be entrusted to carry a message to Garcia?

We have recently been hearing much maudlin sympathy expressed for the "down-trodden denizen of the sweat-shop" and the "homeless wanderer searching for honest employment," and with it all often goes many hard words for the men in power.

Nothing is said about the employer who grows old before his time in a vain attempt to get frowzy ne'er-do-wells to do intelligent work, and his long, patient striving with "help" that does nothing but loaf when his back is turned. In every store and factory there is a constant weeding-out process going on. The employer is constantly sending away "help" that have shown their incapacity to further the interests of the business, and others are being taken on. No matter how good times are, this sorting continues, only if times are hard and work is scarce, the sorting is done finer—but out and forever out the incompetent and unworthy go. It is the survival of the fittest. Self-interest prompts every employer to keep the best—those who can carry a message to Garcia.

I know one man of really brilliant parts who has not the ability to manage a business of his own, and yet who is absolutely worthless to any one else, because he carries with him constantly the insane suspicion that his employer is oppressing or intending to oppress him. He cannot give orders, and he will not receive them. Should a message be given him to take to Garcia, his answer would probably be, "Take it yourself."

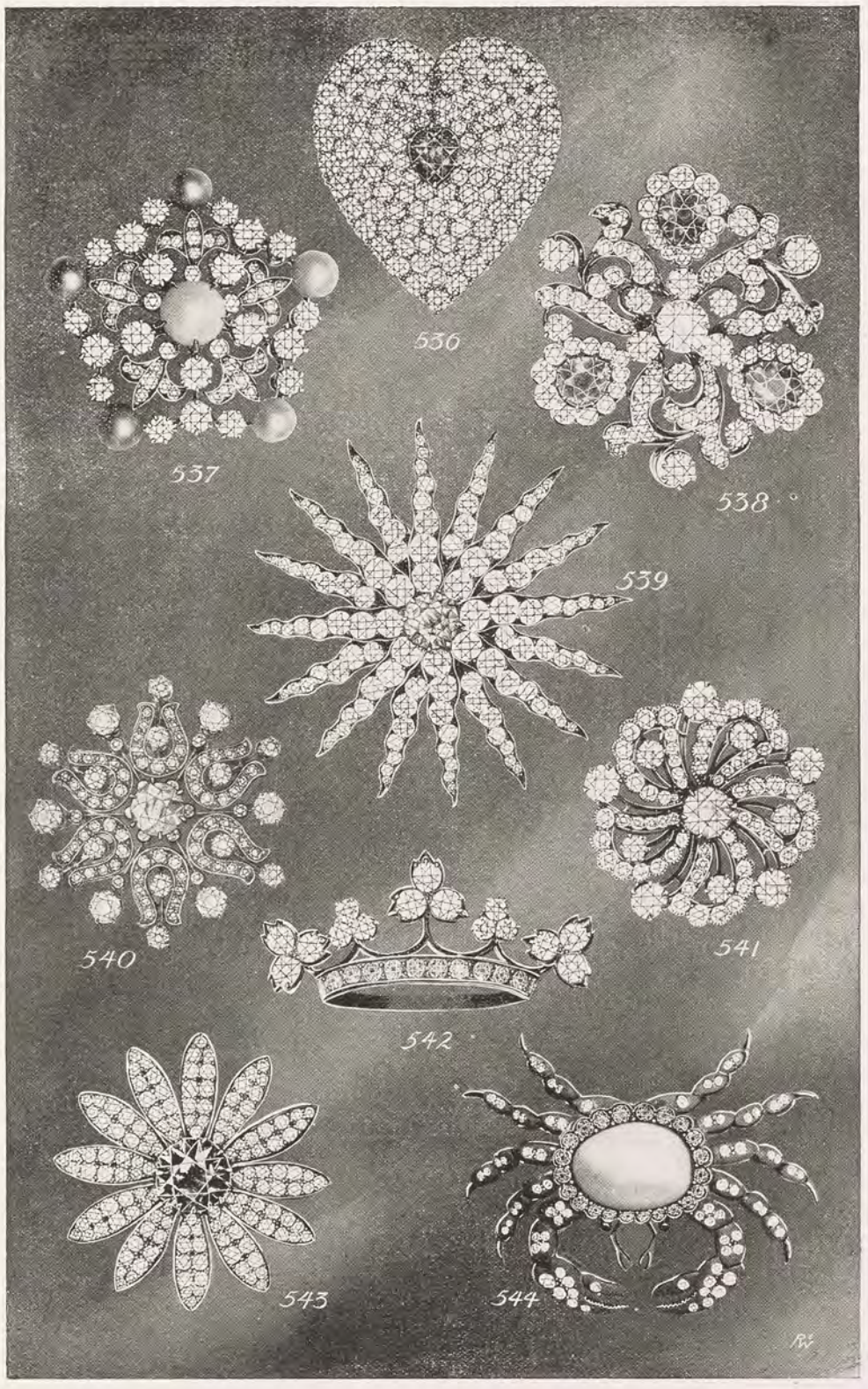
To-night this man walks the streets looking for work, the wind whistling through his thread-bare coat. No one who knows him dare employ him, for he is a regular fire-brand of discontent. He is impervious to reason, and the only thing that can impress him is the toe of a thick-soled No. 9 boot.

Of course, I know that one so morally deformed is no less to be pitied than a physical cripple; but in our pitying, let us drop a tear, too, for the men who are striving to carry on a great enterprise, whose working hours are not limited by the whistle, and whose hair is fast turning white through the struggle to hold in line dowdy indifference, slipshod imbecility, and the heartless ingratitude which, but for their enterprise, would be both hungry and homeless.

Have I put the matter too strongly? Possibly I have; but when all the world has gone a-slumming I wish to speak a word of sympathy for the man who succeeds—the man who, against great odds, has directed the efforts of others, and, having succeeded, finds there's nothing in it; nothing but bare board and clothes.

I have carried a dinner pail and worked for day's wages, and I have also been an employer of labor, and I know there is something to be said on both sides. There is no excellence *per se*, in poverty; rags are no recommendation; and all employers are not rapacious and high handed, any more than all poor men are virtuous.

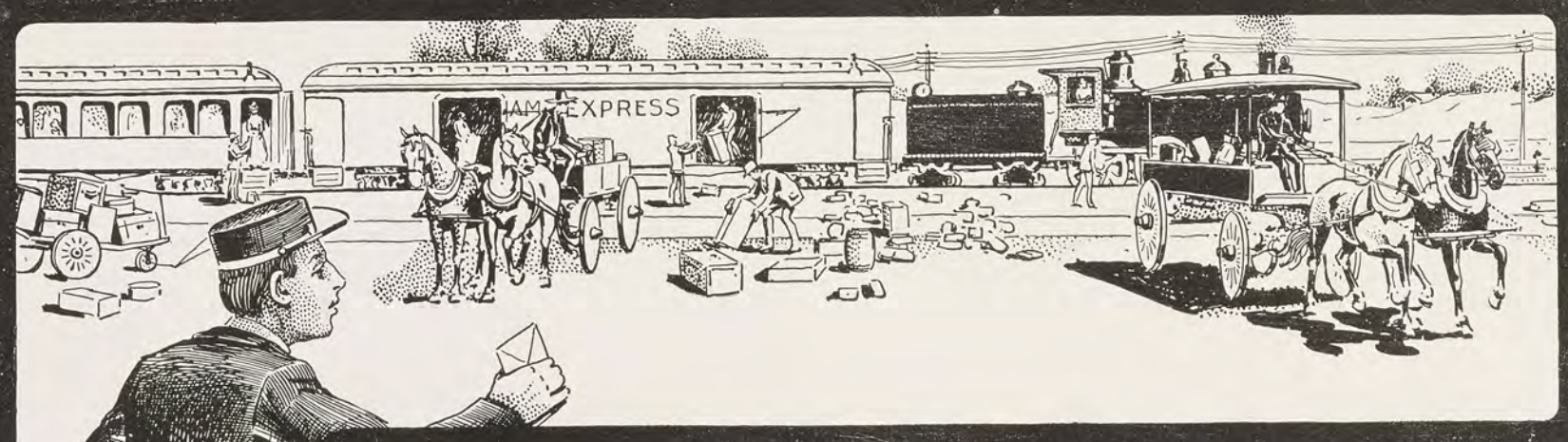
My heart goes out to the man who does his work when the "boss" is away as well as when he is at home. And the man who, when given a letter for Garcia, quietly takes the missive without asking any idiotic questions, and with no lurking intention of chucking it into the nearest sewer, or of doing aught else but deliver it, never gets "laid off," nor has to go on a strike for higher wages. Civilization is one long anxious search for just such individuals. Anything such a man asks shall be granted; his kind is so rare that no employer can afford to let him go. He is wanted in every city, town, and village—in every office, shop, store, and factory. The world cries out for such.



THE ABOVE IS A SAMPLE PAGE FROM OUR HANDSOME, NEW DIAMOND CATALOGUE which we have just sent out to the Trade. It will give you an idea of the elegance and richness of our lines, representing, as they do, the choicest and swellest designs in Diamond and Fine Jewelry. This page is an exact reproduction of our goods, directly photographed from the articles themselves, and will prove of great assistance to the dealer in interesting his customers.

JUERGENS & ANDERSEN CO.

STEWART BUILDING CHICAGO



WE ARE READY!
YOUR HOLIDAY RUSH ORDERS SHALL HAVE OUR PROMPT AND CAREFUL ATTENTION

The "Eagle" Fall Line is full of good things for the Holiday trade, and it will be to the financial advantage of every wide-awake Jeweler to carefully inspect it either when our travelers call, or when you come to the Chicago market.

We want the business of the enterprising, aggressive, wide-awake and successful retailer. An inspection of the "Eagle" Line of Fine Gold Jewelry and Diamond Mountings will convince you that we offer the proper inducements for your trade. We do not make trashy goods, but every article from low-priced to best has the stamp of individuality about it, combined with substantial make, that adds tone to your business and makes it more successful.

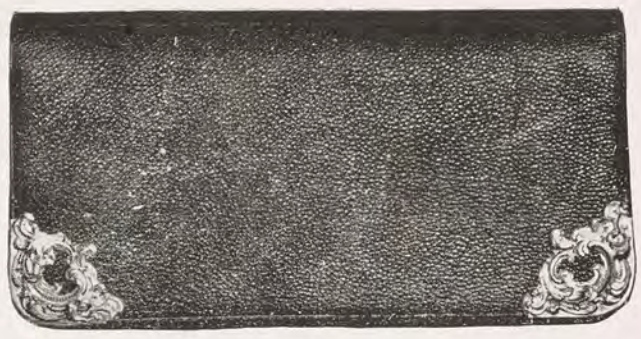
THEO. SCHRADER & CO.

DIAMOND IMPORTERS AND MAKERS OF FINE JEWELRY

100 STATE STREET, **CHICAGO**

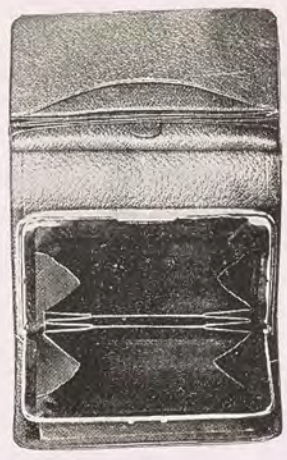
802

Genuine Mexican hand-carved, Ladies' Combination Pocket Book and Card Case. Prices range from $1.10 to $5.00 each. Our Mexican carved leather goods are, without doubt, the finest in the United States.



640

Ladies' Combination Pocket Book and Card Case; long narrow style in large assortment of leathers and silver ornamentations



777

New inside arrangement, 9 compartments. Made in all leathers. Catalogue shows other novel arrangements.

764

Genuine Alligator Telescope Match Safe; also Cigarette and Cigar made same style; leather lined; turned-over edge. Very strong.

HIGH-GRADE LEATHER GOODS

FOR THE

WIDE-AWAKE, AGGRESSIVE JEWELER

958

Send for catalogue showing complete line of gents' articles in leather.

Our line can be relied upon for Quality, Style and Price, and will prove a splendid Holiday seller.

600

A good selling design; made in all leathers; corners protected by sterling silver corners, and has sterling silver name plate in center; many designs put up in this way.

704

Genuine Java Lizard Chatelaine Bag with sterling silver frame; made in various sizes.

G. A. WEBSTER

Manufacturer

64-66 Wabash Ave. **CHICAGO**

Address All Communications to Main Office at Chicago Address

641

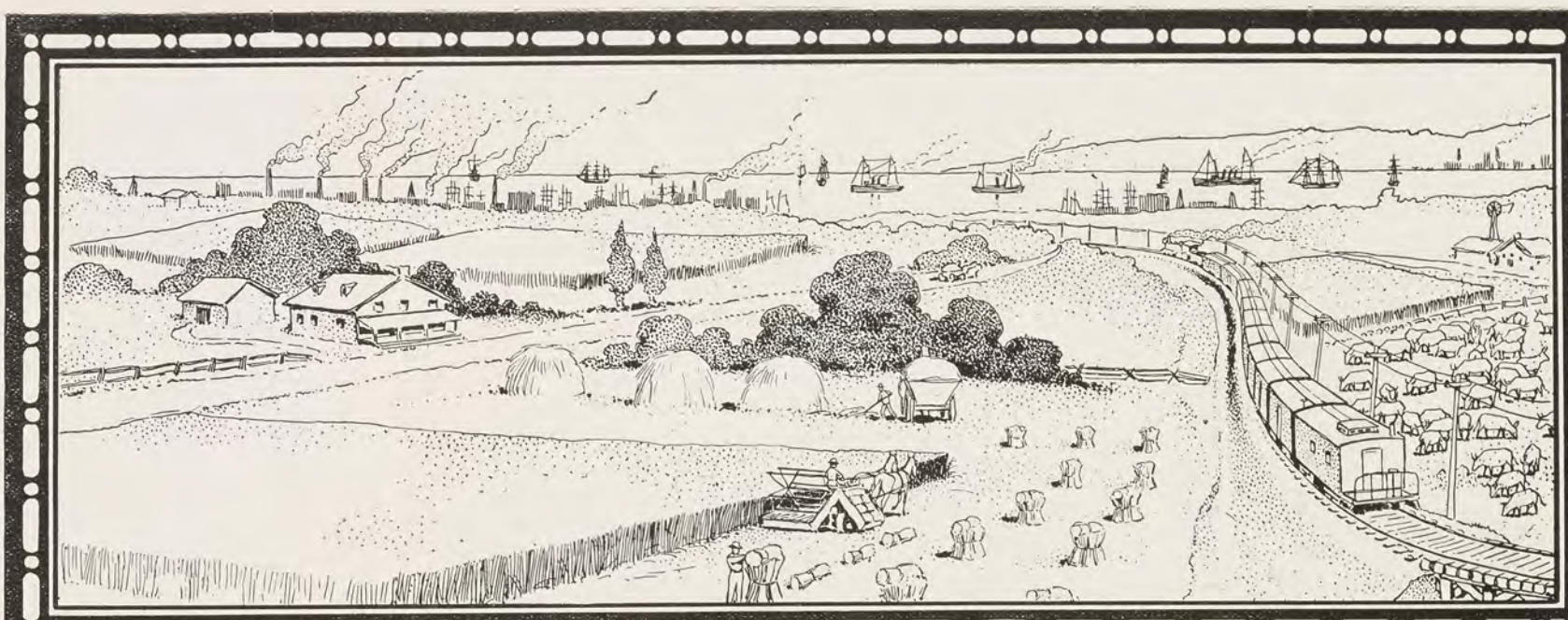
Ladies' Combination Pocket Book and Card Case; one of our best sellers. Made in all leathers; sterling silver name plate.

Write for our Illustrated Catalogue

Branch Factory
33 Union Square (Decker Building), New York City

635

Cabinet Size Photograph Holder, made to hold three photos.; leather is of the finest and beautifully lined. Other styles in stock to hold one or more photos.



The PEOPLE HAVE THE MONEY HAVE YOU THE GOODS ? ? ? ?

"ALL THINGS COME TO HIM WHO WAITS" is not true these prosperous days of Eighteen Hundred and Ninety-nine. The dealer who waits will get left in these progressive Holiday times. Being caught short of goods is about as bad as being caught short of money. Both conditions are decidedly unpleasant, yet can often be avoided by ordinary foresight. In fact, he who gets what he wants must go for it in these days of wonderful prosperity; but he need not go far to find the most up-to-date wholesale line in the market. Our stock can be relied upon for style, quality and price; hence our ability to fully supply the needs of the hour.

C. H. KNIGHTS & CO.

Diamond Merchants & Wholesale Jewelers

Columbus Memorial Building, CHICAGO

We handle everything needed by retail jewelers.

C. H. KNIGHTS & CO.,

Importers of

·DIAMONDS·

Columbus Memorial Building

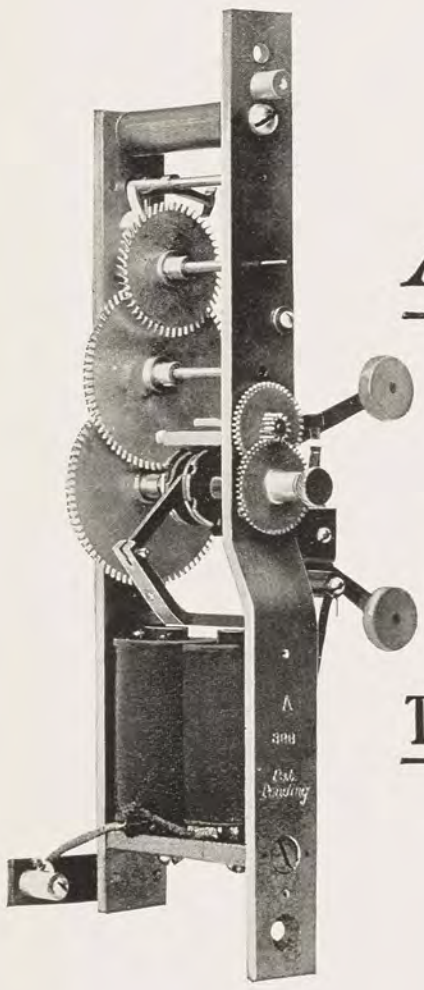
·CHICAGO·

Goods sent on approval to responsible dealers.

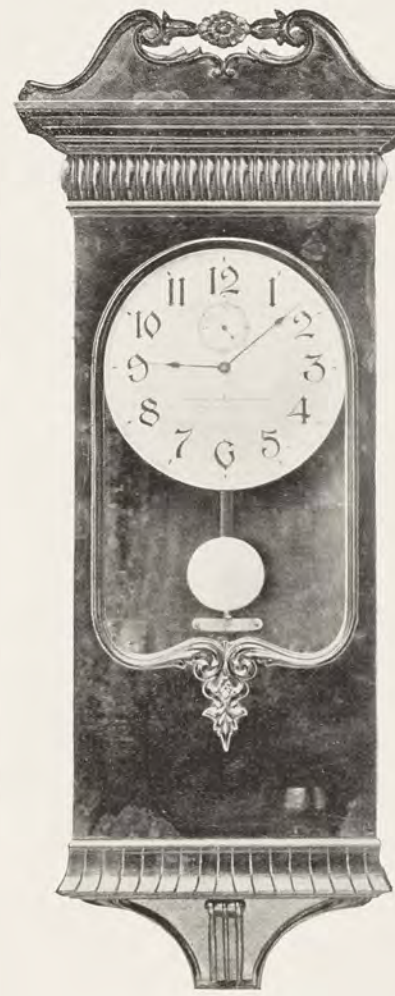
Our facilities are unequalled for filling your orders with care and promptness

SO SIMPLE

SO HANDSOME



A Marvel
A Revolution



Three Wheels
Two Gravity Weights
One Set Magnets
One Set Electric Batteries

The Climax of American Ingenuity

Upsetting all preconceived principles
of clock construction

No Winding
No Running Down
Regulated Scientifically

Once Started,
Runs Eternally.
Marvelously Accurate

TREASURY DEPARTMENT.
OFFICE OF SECRETARY.

WASHINGTON, D. C.
June 24, 1899.

AUTOMATIC ELECTRIC CLOCK CO.
231 S. Canal St., Chicago, Ill.

GENTLEMEN :—Your proposal dated June 9, 1899, received under advisement, to supply Electric Clocks as follows to United States buildings under the control of this department East of the Rocky Mountains, is hereby accepted, payable from the appropriation, "Furniture and repairs of same for public buildings for year 1900." Orders for clocks will be issued from time to time, as the requirements of the service may demand.

Please acknowledge the receipt of this letter. Respectfully yours,

H. A. TAYLOR,
Assistant Secretary
U. S. Treasury.

Jewelers

Send your name and address to us, mentioning this paper.

We have something important to say to you in time for the holidays.

This is special and will justify every reader in writing us without delay.

AUTOMATIC ELECTRIC CLOCK CO.

231 South Canal Street,
Chicago, Ill.

Our standing in the jewelry trade has been gained by long and conscientious endeavor to please our customers.

We know what the retail jeweler wants, and we know the kind of treatment he likes to receive.

We know you want jewelry that will please your customers and on which you will make a good margin of profit.

We know you want handsome, up-to-date designs, that will sell and not stay in your show-cases.

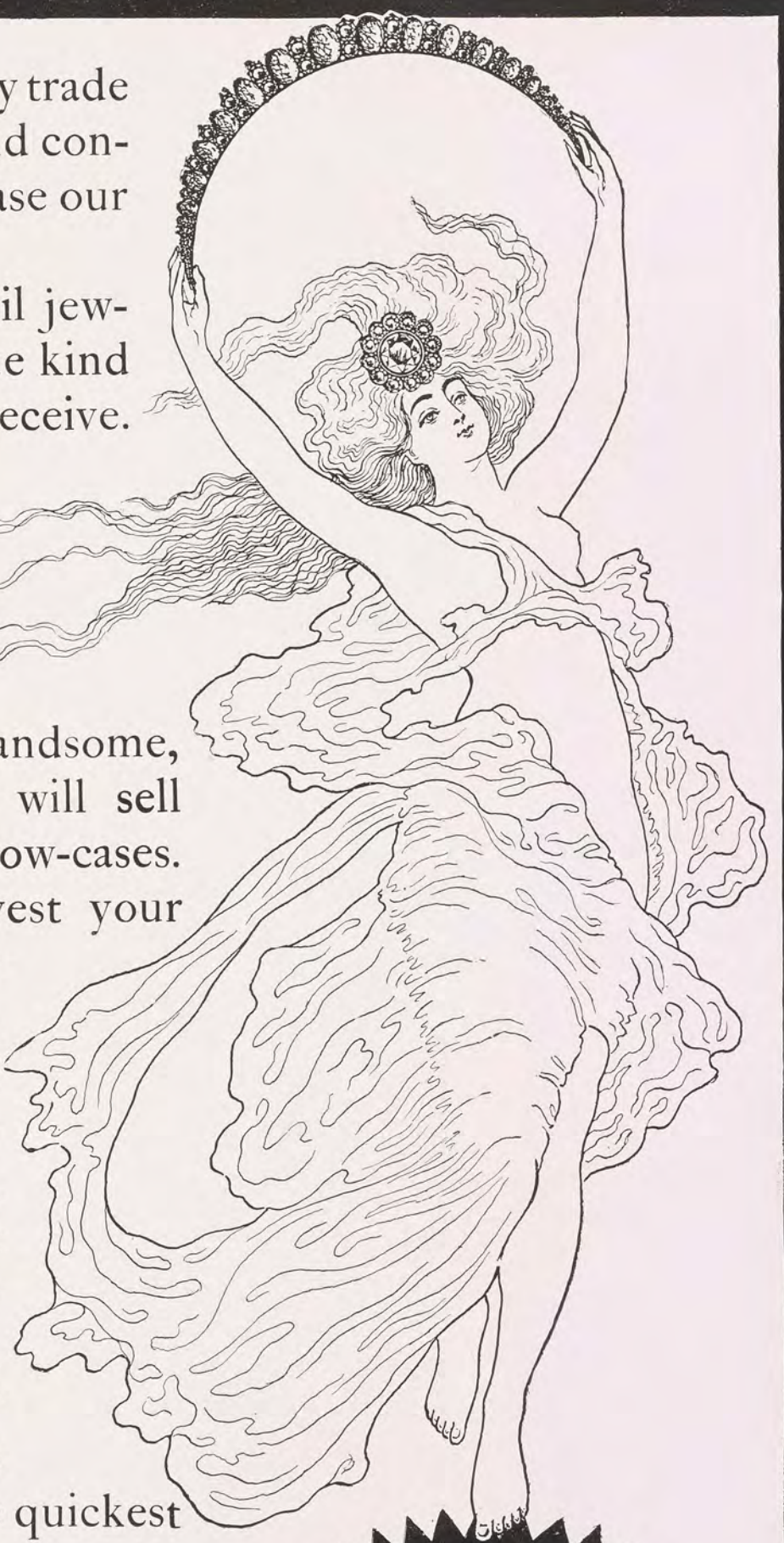
We know that you invest your money in jewelry in order to make more money.

We know that you want to get this money back as quickly as possible.

In short, we know that you are in the jewelry business to make money, and we try to sell only such goods as will help you to make money in the quickest and most satisfactory way.

That is why the name of Eisenstadt is so popular among the retail jewelry trade.

You will find it to your advantage to connect yourself with the



EISENSTADT MFG. CO.,
ST. LOUIS.

The Twentieth Century Business Man

Tribute to the Mercantile Honesty of the Time. *The Importance of the Merchant in the World.*

LET us admit that there are scamps in the mercantile profession. There are storekeepers who have too close an acquaintance with kerosene cans as applied to insurance policies. There are men who have recurrent seasons of failing, the same as other men have fits. There are shysters of finance who exhaust all the resources of knavery for all there is in it. There are dead beats who systematically establish a credit for the purpose of a grand smash and premeditated spoliation. But were you to assemble all these—the scamps, the firebugs, the intentional bankrupts, the knaves and the dead-beats—the sum of their operations, as compared with the general volume of business, would be so small as to scarcely merit mention.

It is a splendid commentary upon the average honesty of commercial life that there are so many whom one can safely trust, says James H. Kennedy, editor of the *Hardware Dealer*. In this I make no restriction in favor of your partners, your heads of departments, your cashiers and chief clerks. It takes in the $10 clerk, the girl who writes your letters and never gives away their contents (that is, if you stick to business affairs and bar personal information), the porter, the truckman and the office boy. Of the men who employ help by the hundreds, I don't believe that one of them can think of two people out of each hundred of whose honesty they have the slightest doubt. There are many of them who could steal them blind at a moment's notice—but they don't.

I was in an office in Wall Street some days ago, when an express messenger walked in, dumped down a package of $140,000 in currency, took a receipt, and walked away. He was probably in receipt of a salary of from $15 to $20 per week, and from one end of the year to the other was handling packages of great value and easy negotiation—and every package went straight upon its appointed course.

There never passes a day in that great center of cash and its equivalent that millions are not passed along by the hands of messenger boys to whom the tip of a dime assumes a financial operation of some importance. Think of the things you trust to your office boys, and the trouble and loss to which they could put you, were the prevailing sense of the day one of dishonesty, rather than the reverse. These cases are so usual as to become commonplace or trivial, but are never trivial when used to illustrate the one great fact that is the grandest possession of the commercial world of to day.

Don't take it so much for granted as to belittle this sterling honesty of business life. Teach the boys who look up to you as the sum total of business success, and as their surest guide to a like success, that indeed a good name is to be chosen even above riches.

Put it on the lowest plane of business morals, if you will. Honesty is the best policy. It pays, in the long run, in dollars and cents. It is the richest asset with which the young man can start in business life; it is the surest reliance of the business man with which to face the wearing trials of daily life; it is the best heritage he can leave behind him.

Put the taint of recognized commercial dishonesty upon a man, and one will meet him with a bow; one will say "Good morning;" all may greet him—and yet there lies an atmosphere about him that he will feel; that intangible something which shows that he is with you but not of you; that narrow line of demarkation across which you may send the friendly word, but that your soul will not pass! What amount of money is there that will requite a man for this separation from his kind.

It is not to be supposed, however, that a man shall be so guileless as to be transparent to all eyes. There are some things in which an average amount of diplomacy is needed, in almost any business. If you have a few cards up your sleeves, it is not necessary to throw them all down on the first call. There was a dear old mother out on an Ohio farm, and when the drover came along and asked her, "How much for the old cow?" she simply responded: "Pa said that I was to ask forty dollars for her, but to take thirty dollars rather than miss a sale!"

In fact, the highest form of honesty—the widest power of shrewdness—make seemly and powerful yoke-fellows in this steady pull of business. They are seen combined in their highest form, in some of the greatest and most successful commercial enterprises. It is the right of each to use to the best of his ability all the powers that have been bestowed upon him. No one should be afraid to use all the appliances and methods of modern experience and thought as aids for the accomplishment of success.

Were this addressed to a body of young men, I would say: Be as sharp, as shrewd, as hustling as you can. If you don't push on your own account, the Lord won't send a tornado to lift you along. Muscles, brain power, will power, heart power, the seeing eye, the calculating mind, the business instinct—all these were given you to use. You will have to think for yourself, to act for yourself. Each line of business must, by the law of self-preservation, look after its own fortunes. The jobber and the manufacturer are not lying awake at night in order to preserve the interests of the retailer. Make all the money you honestly can; get all the business that is within your legitimate reach; make it yield all the profit it will. You will have to do your own work, your own thinking. Despite Mrs. Hemans' opinion, the greatest fool in song or story was the boy who stood on the burning deck, whence all but him had fled. There he stood until he was blown up, simply because he did not know that the time had come when he should get a move on and do a little thinking for himself. He was too good to be successful. Like some of our sons, he depended too much on the old man.

Yet, with all that can be so strongly urged in favor of legitimate enterprise, of mercantile power, organization and push, let it be remembered that the right of one man ceases where that of another begins. I don't know whether there are more or less temptations in business life than in other forms of enterprise. I do know, however, that Solomon said something about sin lying between buying and selling, even as the mortar holds between the stones in the wall—and Solomon belonged to a people who can give us all points as to the buying and selling of goods.

Perhaps if Solomon had been discussing some of the professions, his remarks might have been even more emphatic.

Summing up the business man, I am led to the conclusion that, with the exception of a black sheep here and there, he is an honest honorable, hospitable, enterprising and patriotic member of society. He does more than the statesman and lawmaker to keep the world moving in an upward groove. He is political economy reduced to a tangible form. He is the channel of intercommunication between men and men. He is the medium by which the maker of things finds his market, by which the user of things is supplied his daily needs. He came into being when Adam began to look about for agricultural implements with which to earn his bread by the sweat of his brow; his profession was established when the first grower of fig leaves used his neighbor as a medium through which to find a ladies' tailoring establishment in need of material. He loaded those caravans of Chaldea and Ur in those early days of Abraham. His were the fleets that sailed over the unknown seas; his have been the wagons that have toiled over the hills; he has loaded the railroad trains that traverse the continent. His commercial ventures have opened new lands, and blazed the way for civilization. He has been, and is, the missionary of practical things, in a world that may do without ideals and theories, but that must have ploughshares and axes, clothing and bread. He came into being because the world could not do without him; he will be a moving factor in affairs so long as the world shall endure.

WHY NEXT YEAR WILL NOT BE A LEAP YEAR

THE year 1896 was a leap year, and the next one will be 1904, eight years later. This is on account of the ingenious device for maintaining, as nearly as can be, concordance between the civil or Gregorian calendar and the solar or astronomical calendar. Everybody knows that the time required for the earth to make a revolution around the sun is the true solar year. It is easy to see why men, in their ordinary affairs, do not give the year its exact solar time value, but employ the civil calendar they have devised instead of the solar calendar. The length of the solar year, expressed precisely, is 365.242216 days, or a little less than 365¼ days. It is obvious that in the business affairs of life it would be very inconvenient to use a time division called a year containing so many days and a fraction of a day. For ordinary purposes the year must be counted as so many days. The ordinary year is, therefore, counted as 365 days, which is nearly a fourth of a day shorter than the true year.

Of course this time difference between the solar and the civil year must be accounted for, so ner or later, and, when it is convenient so to do, the true and the artificial year must be brought into concordance as nearly as possible. The common civil year is too short by .242216 of a day. In four years this amounts to .968864 of a day, and so both in the Julian and Gregorian calendars the last of this period of four years is made a leap year, or in other words a day is added to it, making 366 days in that year. But not quite a day was required to bring the civil and solar year into concordance. The mean civil year, thus fixed, is a little too long, and in the course of a period of 400 years the calendar thus gains 3.1136 days. So another balance is struck between the true and artificial calendars by the suppression of the intercalary days in the years 1700, 1800 and 1900, which otherwise would be leap years. The suppression of leap year in 1900 leaves a gap between the two calendars since the adoption of the Gregorian calendar of only about one-ninth of a day, which is the balance on account with which to begin the next accumulation of differences for future adjustment. But the addition of the intercalary day every four years and the suppression of that day in the last year of every three out of four centuries balances the years so far that the error amounts to only one day in 3325 years.

The year 2000 will end the cycle of four centuries and will be a leap year. Then opens the next cycle, and in the years 2100, 2200 and 2300 the intercalary days will be suppressed, while the year 2400 will be a leap year. It should be mentioned that 1900 will be leap year, after all, in those nations of eastern Europe and Asia which still use the Julian calendar.

KEEPING AFTER TRADE

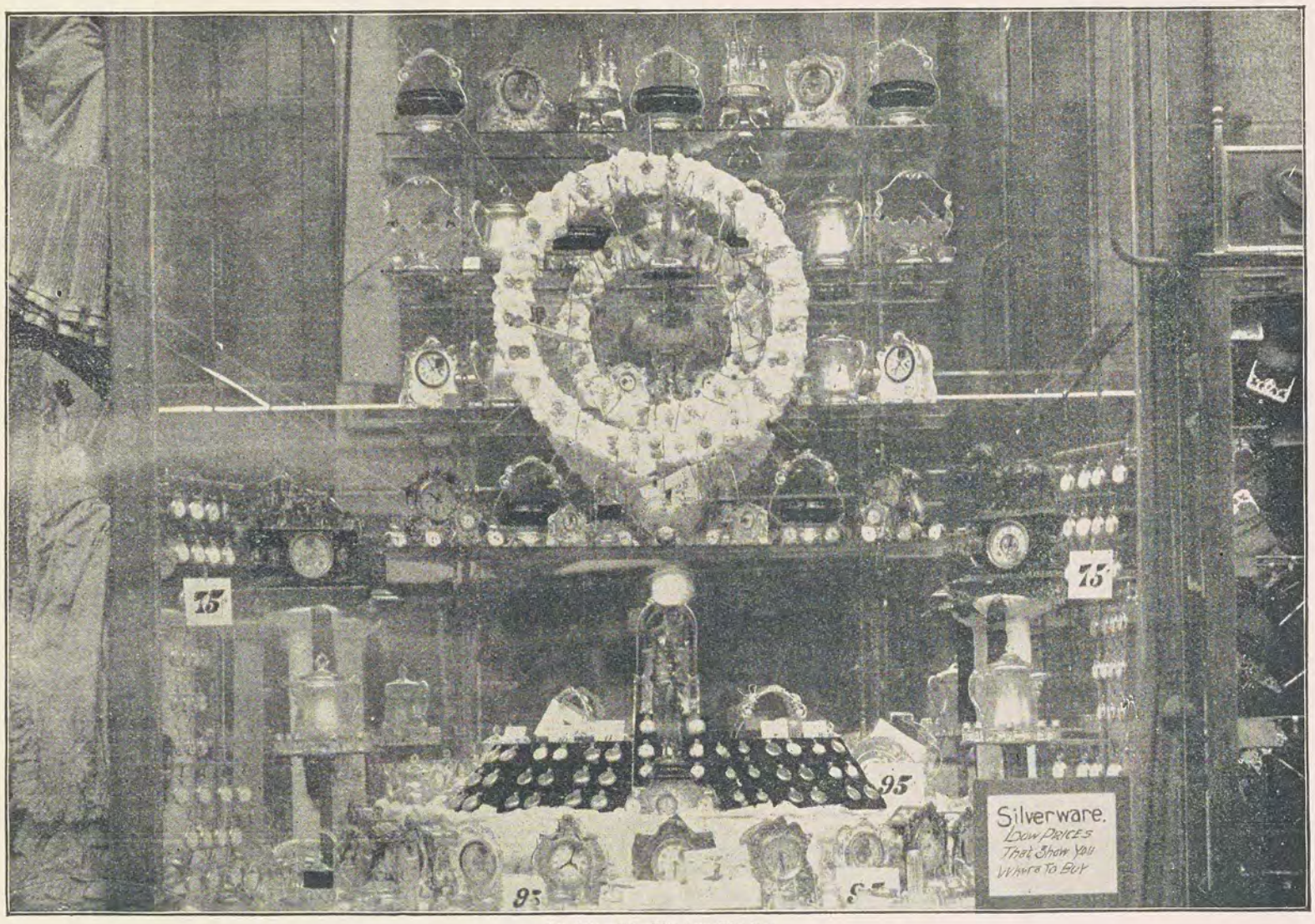
I very much admire the persistent efforts that some stores are making to please their customers, and I think the system could be advantageously applied everywhere with excellent results. I know a store which has a series of postal cards which it sends out to its customers on various occasions, all of these postal cards making inquiry as to how the store can serve the customer more satisfactorily. Whenever a complaint is made of the failure of a package to reach its destination the matter is at once looked up and corrected, but this does not end the transaction. A couple of days afterwards, in order to be sure that everything is satisfactory, a postal card is sent the person who made the complaint, asking if the correction has made the matter right. These postal cards are all printed on a double card with the return side, so as to give the party receiving it as little trouble as possible in answering. This store takes great pains to keep its stock as nearly as possible as the public would like to have it. It has postal cards that it occasionally mails to its old customers, which read very much like this:

> DEAR MADAM:—Are you always able to find what you want at our store? Are there any articles in our line which we do not carry which you wish we had?
>
> Attached, please find a return postal card, on which we trust you will kindly answer. We are very anxious to please, and are trying to find out what we lack.

This firm goes still further to find out the desires and wishes of its customers by requiring each salesperson to report every day any goods not in stock which have been called for, any remarks which have been made about merchandise in stock, and any comparisons between the goods of this store and the goods of competitors, as far as the clerks may personally find out.

—Chas. R. Jones, in *Printers' Ink*.

IT is very important to every retail merchant that he keeps his business well in hand, the details properly looked after, the stock well insured, expenses carefully guarded, his debts within easy control and his collections promptly looked after. Failure is not likely to come to those who appreciate the value of a good credit and who take the proper means of meriting and retaining it.



An Attractive Window Display.

Window Display for the Holidays.

A New Century.

WITH the approach of the holidays comes the great opportunity of the year to decorate your windows in an effective manner. In connection with the Twentieth Century Number of THE KEYSTONE it is opportune to say that the present century has marked the rise and progress of this method of advertising—now recognized by the merchant as the most successful of all methods of inducing direct trade.

In 1800.

At the beginning of this century window decoration was unknown. In fact, a window glass larger in size than 7 x 9 inches was unheard of, and the windows of a store were considered useful only as a means of admitting light. Yet the old-time merchant realized the value of displaying goods, for he hung them on pegs before his door, that they might attract attention.

The jeweler of a century ago was more a peddler than a merchant. He packed his wares into a bundle and carried them into the houses of wealthy people, where he displayed their charms to admiring feminine eyes. There were not very many wealthy people in America in those days, nor, indeed, many jewelers. But with the prosperity of the people came a demand for ornaments and table services, and no demand in this country has ever wanted enterprising and aggressive men to fill it. Gradually the jeweler became a merchant, and following the trend of trade adopted popular mercantile methods to advance his own interests.

In 1900.

The jewelry stores of to-day are among the most palatial and magnificent business establishments of America. Their proprietors are noted for strong intellectuality, perfection in taste, thorough knowledge of the best needs of the people and a high degree of enterprise and business integrity. They are, indeed, the princes of the mercantile world, and shrewd enough to apply every dignified and legitimate factor to advertising their business and furthering their interest. For this reason the jeweler's window of to-day is a handsome pane of plate glass, lending itself to the most artistic decoration and fully capable of displaying the rich wares of the proprietor in a most enticing manner.

Christmas.

While the fall season brings its invariable increase in weddings, the Christmas trade is the jeweler's real harvest. He purchases with especial reference to that holiday, and therefore takes especial pains to make his window display attractive. People do not often enter a jewelry store to see what the stock contains; they gaze into the window and if nothing there attracts them walk on to the next establishment. For this reason the success of the jeweler's business largely depends upon attracting the public through his display windows.

Most Attractive Goods.

Moreover, every class of merchandise has its tempting articles for Christmas gifts, and as every window in the street is offering something desirable for the season, it is more than ever necessary for the jeweler to make his most imposing display, in order to secure his just proportion of trade.

In the first place, have your window well lighted. This is best accomplished by a row of lights at the upper edge of the window pane, hidden from public view and having strong reflectors to throw the light down upon the goods. There is much shopping in the evenings during the weeks preceding Christmas, and the window should remain lighted every evening, whether the shop itself is open or not.

There are several methods of rendering a jewelry window attractive. One is by means of clever lighting effects. Small hoops covered with delicate colors of tissue paper and hung in the window with an incandescent light suspended behind each, are sure to catch the eye. Or you can make a dark-blue background and cut a moon in the upper part of it. Cover this space with delicate yellow tissue and put a light behind it. Across the face of the blue background run some white chiffon, gathered to imitate cloud effects. These are not only capital backings for evening, but look well by day, as most windows will bear electric effects in the daytime.

Floral Decorations.

Decorations of artificial flowers—or natural ones, either—harmonize well with a jeweler's rich wares. Garlands, wreaths and festoons against the background or floor are bright and pleasing. Potted chrysanthemums, ferns or palms afford a welcome relief to any set arrangement of goods.

Mechanical effects always arouse curiosity and induce people to study your display. A small electric motor will prove valuable at all seasons of the year, and if you have electric connections in your window you may utilize it in various ways.

Many firms have ample facilities for electrical work, but as they do not employ a house electrician many beautiful and attractive effects are barred in their windows. Even when an attempt is made to introduce electrical effects into displays the results are tame and insignificant, because of a lack of special wiring. Yet we know that the success of many windows depends largely upon their illumination.

(*Continued on page 1133.*)

WE WANT YOUR WATCH REPAIRING

We employ only Expert Watchmakers.

All jobs promptly executed.

We can save you money on your Repair Work.

M. S. Fleishman Company, Wholesale Jewelers
Masonic Temple, Chicago

The Way to Wealth

in the mechanical field is through industry and skill—principally skill. A sure way to acquire skill and thoroughness in practical horology is by learning the art at the

Waltham Horological School

WHICH IS THE OLDEST AND HAS THE BEST EQUIPMENT AND INSTRUCTORS.

Thorough instruction given in **HOROLOGY, ENGRAVING** and **OPHTHALMOLOGY.**

Every pupil has the privilege of making a watch while here, and owning it when finished, without extra cost.

E. H. SWAIN, Proprietor,
WALTHAM, MASS.

Write for our New Prospectus.

Aikin-Lambert Jewelry Co.

19 Maiden Lane, New York,

ARE FULLY PREPARED TO FILL YOUR ORDERS FOR

WATCHES DIAMONDS JEWELRY

Selection packages when requested. We only ask for a trial.

Novelties in GOLD, SILVER and PLATE.

NARDIN WATCHES

(PAUL D. NARDIN, LOCLE, SWITZERLAND.)

THOROUGHLY ADJUSTED.

400
Observatory Certificates.

70
Prizes for the best Chronometers at the Astronomical Observatories.

7
Awards at the Exhibitions.

Grand Prix, Paris, 1889.
Membre du Jury, Geneve, 1896.

Repeaters, Split-Second, Break-Circuit, also Plain Movements, from medium to highest grades.

LADIES' WATCHES IN LATEST STYLES.

Agent: ***C. A. GEISSLER,***
Successor to H. H. HEINRICH,
102 Fulton St., NEW YORK.

A. H. BLISS & CO.

MAKERS OF ALL KINDS AND STYLES OF HIGH GRADE

CHAINS

ROLLED-PLATE, STERLING SILVER, GOLD.

NORTH ATTLEBORO, MASS.

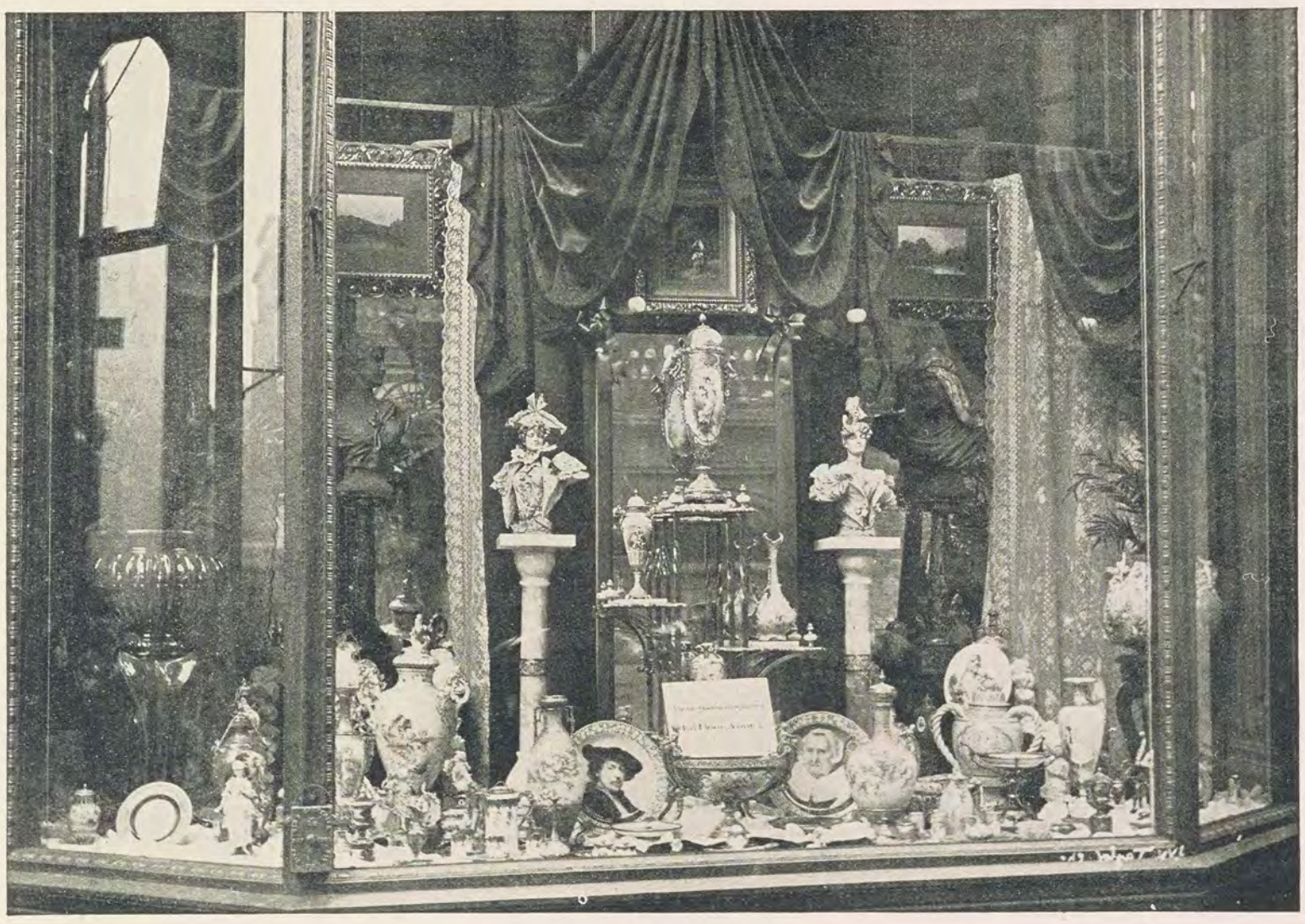
WE HAVE IT,
AN ENDLESS CHAIN,

THE CINDERELLA

A. H. BLISS & Co , No. 9 Maiden Lane, New York.
A. H. BLISS & Co., Champlain Bldg., Chicago, Ill.
GEO. GREENZWEIG & Co., 206 Kearny St., San Francisco, Cal.
GLIDDEN & TRIGG, Kansas City, Mo. (New Ridge Bldg.)
L. C. TIFFT, Boston, Mass.

A combined neck and guard chain which can be lengthened or shortened, at will.
One that is meeting with large sales as it is new and different from anything else on the market.

PAT. SEPT. 26, 1899.



A Window Display of Pottery.

Window Display for the Holidays.

(*Continued from page 1131.*)

If you know how to do your own electrical work you will find that electricity, properly applied, may be made an important factor in selling goods through the show window. No doubt your windows have permanent lights. The first thing to do is to have a switch or "cut-out" run in for special work. Any electrician will do this for you in an hour or so, and it saves you from tapping your permanent wires, which should never be done. Be sure to ascertain the voltage and amperes; or, to be plainer, find out how many lights your "cut-out" will carry. Before you begin work you must have proper tools to work with and sufficient supplies to meet any case of emergency. The following is a list of tools required:

Pair of nippers to cut and twist wire.
Brace and bit.
Screw driver.
An old pocket knife.
Burner (similar to that used by painters to burn off paint).

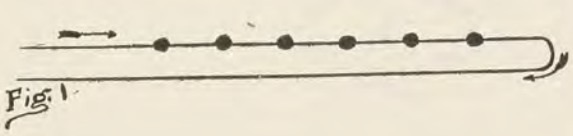


Fig. 1.

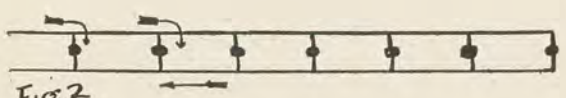


Fig. 2

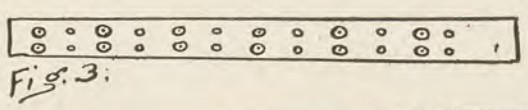


Fig. 3.

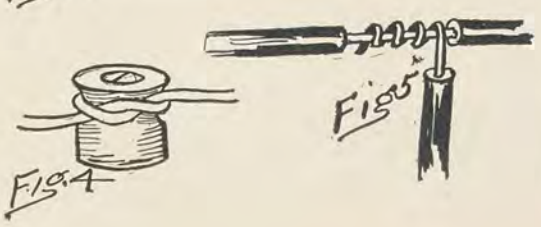


Fig. 4

Fig. 5

That is not a formidable list, nor difficult to procure; but each item is necessary. The list of supplies you should keep on hand is as follows:

No. 10 or No. 12 insulated wire.
Insulating tape.
Bushing.
Clay bushings.
Sockets.
Lamps.
Porcelain knobs.
Solder.

This last item you can get prepared with resin, and it needs no acid to make it adhere. No quantities are specified in the list. Your judgment will enable you to determine how much you will need or can use to advantage.

Perhaps I would better explain here the difference between arc and incandescent wiring. If we had a row of arc lights to put up we could run our wires as in Fig. 1. The current going to the first light passes through to the next, and so on until it reaches the last light, when it returns to the dynamo. With incandescents we run two wires parallel and make our connections as in Fig. 2. This is called "multiple arc." Each lamp is independent of the others, and if one "dies" the current passes through the others uninterrupted.

Electric Wiring.

Suppose you have a "cut out" of 110 volts, carrying sixteen or twenty lamps, and wish to run six lamps on a strip. (This is figurative and only used to demonstrate, for you can use any number up to the capacity of your switch.) You proceed as follows: Lay out the place for each lamp. Bore two holes the size of bushings and between each two lamps place two knobs, as in Fig. 3. Cut two pieces of wire long enough for all the lights, allowing enough extra to knot each knob and for the last lamp, and also leaving enough to reach the switch. Fasten the wire to the knobs nearest the last lamp, as in Fig. 4. Stretch tightly to the next knob and repeat until the wire is all laid. For each lamp remove about one and one-half inches of insulation on each wire. Take pieces of wire five inches long for connections, and remove one and one-half inches of insulation from the ends of each. Twist these ends tightly around your lead wires, as in Fig. 5, and solder them. The simplest way to solder is to heat your exposed wires until they are hot enough to melt the solder when it is held against them.

Let me say here that when I have laid out my wires and marked my connections, I then unloose the wires, making my cross connections and replace them. It takes time, but it is easier and is the proper way to work.

When the soldering is finished take your tape and carefully wrap each exposed wire. Then through each hole put a piece of bushing and run your connections through the bushings. Run the two ends through for the last lamp. No short wires are attached for these, and your work should now appear as in Fig. 6.

Then you are ready for your lamps. Turn the strip over and fasten the sockets in place, positive sides all on the same edge of your strip. Cut the connecting wires the required length and remove one-half inch of insulation from the ends. Loosen the brass screws, place the end of the wires under them and fasten down. Fig. 7 shows one side of socket connected. Attach brass hoops and rubber rings and you are

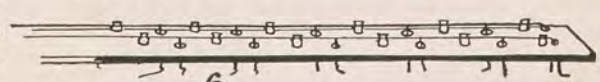


Fig. 6

Fig. 7.

(*Continued on page 1135.*)

8-37 Set. Full Burnished.

The above is characteristic of the large and varied line of hollow ware manufactured by

The Queen City Silver Co.
Cincinnati

Latest catalogue now ready for distribution.

We handle

Diamonds Pearls Precious Stones

and to please YOU is our business.
You can judge our prices when you see our goods.

Alfred H. Smith & Co.

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DIAMONDS AND PRECIOUS STONES

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THE LEADER

in **High-Grade Watches** is the

VACHERON & CONSTANTIN

GENEVA, SWITZERLAND.

VACHERON & CONSTANTIN TRADE-MARK.

THE LEADER in **Quality, Adjustment, Durability, Style.**

It Fits all Sizes of American Cases.
New Grades—New Sizes—New Improvements.
Special Grades for Railroad Men

EDMOND E. ROBERT, SOLE AGENT, 3 Maiden Lane, **New York.**

Window Display for the Holidays.

(*Continued from page 1133*)

all ready for placing and connecting. It is probably unnecessary to state that the same principles above explained will enable one to place lights in circles, horseshoes or any other designs that may be required. Once you know how to wire a window, a great field of operations is open to you.

By a little thought and ingenuity you may create many marvelous electrical effects, and as the days are often dark during November and December, these will be fully as effective by day as by night.

OUR JEWELRY ILLUSTRATION.

A very simple but novel centerpiece is shown in the picture on page 1131. Two circles are cut from heavy cardboard. One is three inches wide by two feet in diameter, the other three inches wide by eighteen inches in diameter. The face of each circle is puffed with white surah silk and then covered with brooches, pins and similar articles. They are then suspended by fine wires in the center of the window, the smaller circle behind the larger. In the center of the rear circle, supported on a glass shelf, is a handsome clock, the pendulum of which is extended to reach below the larger circle and covered with a ball of white cotton. Glass shelves at the back of the display are occupied by articles of silverware, and a low pyramid effect upon the center of the floor is used for displaying watches.

ART POTTERY.

So many jewelers carry a selection of art pottery that we illustrate a cleverly arranged window of this class of goods on page 1133. No more artistic display can be conceived than the example we print. It is true that few dealers have so large a stock of fine goods or so desirable a window for displaying them; but as an illustration of the beauty of tasteful grouping and unconventional arrangement, the picture is worthy of careful study.

To Prevent Frosting.

Very soon the old complaint will be heard that the windows are covered with frost and no display can be seen through the glass.

Frosting should be guarded against, if possible, for a frost-covered window is an expensive luxury.

The evil is caused by uneven temperature on the opposite sides of the glass. The sensible remedy is to render the temperature as even as possible. Several ways are effective in doing this. One is to keep an electric fan running at each side of your window. If the glass is not too large this will usually answer the purpose.

A better way is to box your window tightly, so that the air from the interior of the store will not reach the glass. This may be still further improved upon by running small tin tubes at intervals through the floor of your window and letting them reach the outer air just below the casing, by means of an elbow. This admits the outside air to the inside of your window and absolutely prevents frosting of the pane.

When the New Century Will Begin.

Exactly when the twentieth century will actually begin, says the editor of the *Ladies' Home Journal*, has been discussed by so many people that naturally every periodical is inundated with letters on the now popular and throbbing question. It is curious that this should be so, except for the fact that your true American likes few things better than he does his riddle, and a good arithmetical problem, even though it isn't much of a problem in itself, comes very close to his heart.

Hence, hundreds of persons contend that the twentieth century will begin with January 1, 1900, while other hundreds contend with equal positiveness that the correct date is January 1, 1901. The 1900 contingent argue that, the new century begins with its numeral date, and go on to figure out that with the last day of the year 1899 the hundred years will have run its course. They argue that if the first year ended with December 31 of the year one, the nineteenth hundredth year must, of course, end with December 31, 1899, and that the first day of January, 1900, is, therefore, the first day of the new century. And, curiously enough, this latter figure is correct, but only in a numeral sense. These statisticians overlook one very important fact, however: that it requires one hundred years to make a century, and it calls for no expert mathematician to figure it out that the full hundred years of the nineteenth century will not have run their course until twelve o'clock midnight of the thirty-first of December, 1900. Numerically, we enter the twentieth century with January 1, 1900. But, nevertheless, we must complete that entire year of 1900, and go through its three hundred and sixty-five days, before the actual nineteen hundred years shall have run their course. The problem is something like the spending of a dollar: we must spend one hundred cents before we spend an actual dollar, yet if we spend it cent by cent we shall reach the hundredth penny after having spent the ninety-ninth cent. But we must actually spend the hundredth penny before we have spent the whole dollar.

If the current discussion holds out until the end of the present year it is likely that there will be many who will choose to celebrate the going out of the century at that time, while others will prefer to keep their ardor bottled up until midnight of December 31, 1900. So we shall have two celebrations—one numeral and the other actual. And why not? The more celebrations we have, the oftener we will enjoy ourselves, the lighter of heart we will become as a people. And there's a great deal of American nervous tension which might just as well go up into the air in shout and hurrah. But if we choose to celebrate the coming of the new century intelligently, we must wait until there shall have been one hundred years to the century.

Pan-American Emblem.

The Beautiful Design which so Tastefully Typifies the Exposition's Purpose.

The beautiful emblem which the publicity committee of the Pan-American Exposition, which will be held at Buffalo, N. Y., during the summer months of the year 1901, was the work of Raphael Beck, a Lockport artist, whose design was by all conceded to be the most beautiful and comprehensive of the four hundred and odd drawings which were submitted.

The design tells the hopes and aspirations of the management of the coming Fair as no words can, for the high and noble underlying purpose of the Pan-American Exposition is to show to the world the progress that has been made by the people of the Western world during the fleeting century, and also to bring about closer trade and social relations between all the peoples of the Americas.

Nothing could more beautifully express the idea of a binding together of the people of the North, Central and Southern divisions of the Western Hemisphere than Mr. Beck's picture, which shows the sweet-faced nymph of North America smiling a welcome as she looks down and extends a snowy arm across the Isthmus of Yucatan in greeting to her sweet faced sister of the South, who, by the way, seems fully as eager to clasp the extended hand and to do her share in the effort to bind together the North and South in the holy bonds of an All American sisterhood.

Sam Martin and The Press.

The Newspaper Chorus of Praise for the Gifted Jewelry Auctioneer—His Great Talent and Popularity.

It would take a scrap book of very voluminous dimensions to hold the wealth of press notices which have been given to the celebrated jewelers' auctioneer, Sam Martin, during the past few years. And the most remarkable thing about the press notices is that their eulogistic contents evidence in every line the sincerity with which they are written. They breathe perfervid admiration for Mr. Martin as a man and an auctioneer, and are necessarily worth much to the jeweler who has been fortunate enough to secure Mr. Martin's services. The *Daily Alert*, of Jamestown, N. Dak., is one of the latest journals to succumb to the fascinating and brilliant manner of Mr. Martin. An issue of last month contained the following editorial:

Sam Martin, the celebrated jewelry auctioneer, who is conducting with great success Tellner's sale, is as witty and entertaining as he is good looking. It is a study in human nature to attend one of Martin's sales. He keeps every one on the edge of expectation all the time, and few are disappointed at the bargains he gives. He is a regular Santa Claus, although a little ahead of time at this season of the year. Mr. Martin recently attended a church fair in Indiana, and out of pure good nature, and with a charitable purpose in view, autioned off a pumpkin. He managed to get enough bids, collecting after each bid, to make the big vegetable net the church folks $87.40. The ladies were his sworn friends afterwards, as a matter of course, and the next day his sale was packed as never before. No one can fail to admire his talents as an auctioneer, and yet he conducts a sale as it ought to be—in a strictly up-to-date business way.

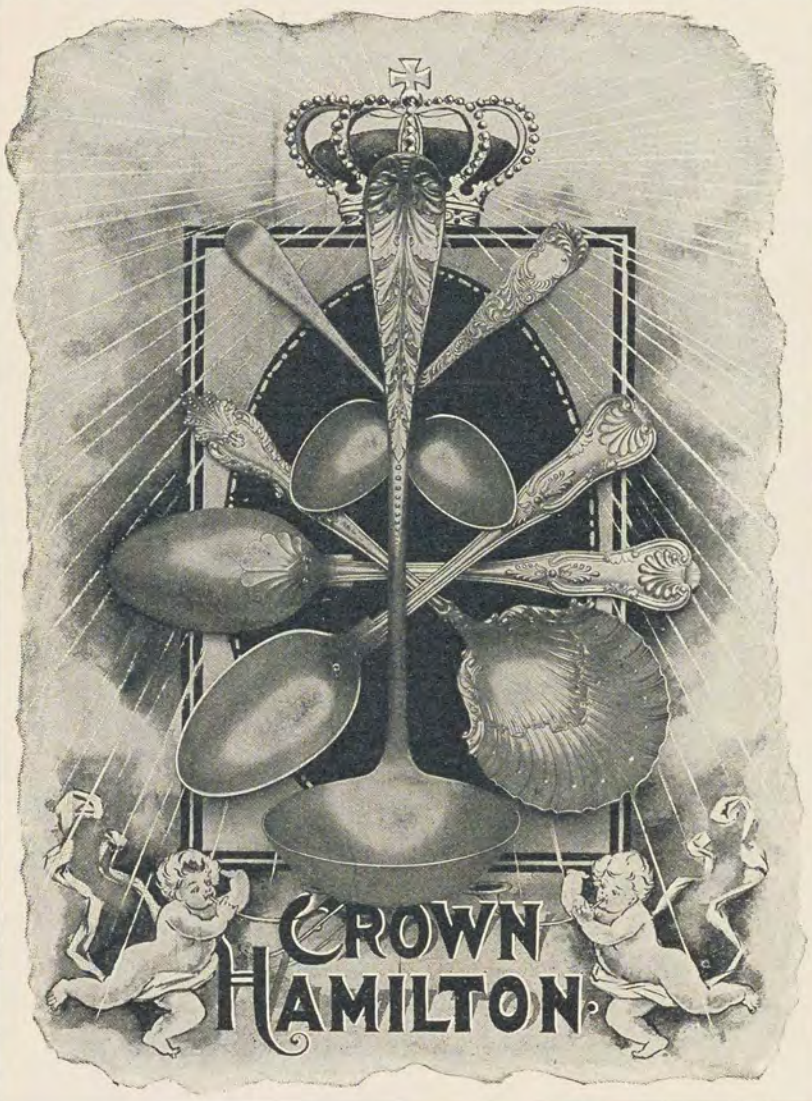
These words of praise were well deserved for, considering the resources of the town, Mr. Martin's sale in Jamestown brought results to the jeweler which seem almost incredible. Almost daily some journal or other is pouring eulogies on the head of Mr. Martin, and the unanimity of the sentiments expressed leave no doubt as to his fascinating personality and wonderful qualifications as an auctioneer. The journalistic eulogies are but a mild reflex of the praises which Mr. Martin's own clients, the jewelers, are ever ready to accord him. His fame rests on the fact that he not only gives satisfaction to the trade, but invariably surprises them with the unexpected in returns, and does so in a manner that enhances his client's reputation quite as much as his bank account. This is ideal auctioneering. —Adv.

When There will be no Darkness.

"Within the next fifty years," said a New Orleans architect, "the people of this and every other large Southern city will do most of their sleeping by day. The transformation will be effected by cheap lights. Inside of the next half century lighting will be so inexpensive, so excellent and so abundant that it will wipe out the demarkations of day and night. Darkness is one of the forces of nature against which civilization wages war. It facilitates crime, it impedes travel, it puts arbitrary limits on human exertion. The time is coming when darkness will be thoroughly conquered, and the great cities flooded from end to end with an effulgence that will make every vocation of life as easy and as practicable at one hour as another. In this latitude night is undoubtedly the best time to work—especially during our long summers. The temperature from sunset to sunrise is cool and equable, there is almost always a refreshing breeze, and as soon as darkness is abolished the people will gradually and naturally reverse the hours of toil.

I venture the prediction that noon in 1950 will see the streets of New Orleans deserted, except for a few mid-day roisterers and policemen with sunshades. Respectable folks will be abed and asleep.

—New Orleans Times-Democrat.



THE ROGERS & HAMILTON WARE

IS GOOD WARE.

IT IS GOOD FOR THE DEALER—IT IS GOOD FOR THE USER—ITS SUPERIOR BLANKS, ITS ARTISTIC AND CONVENIENT OUTLINE, THE PROCESS OF PLATING EMPLOYED UPON IT, ITS EXQUISITE FINISH, THE NEAT AND TASTY BOXING, ALL GO TOWARD MAKING IT A POPULAR, SALABLE AND DURABLE BRAND FOR THE DISCRIMINATING JEWELER TO OFFER HIS BEST TRADE.

THE IMPROVED TRADE CONDITIONS

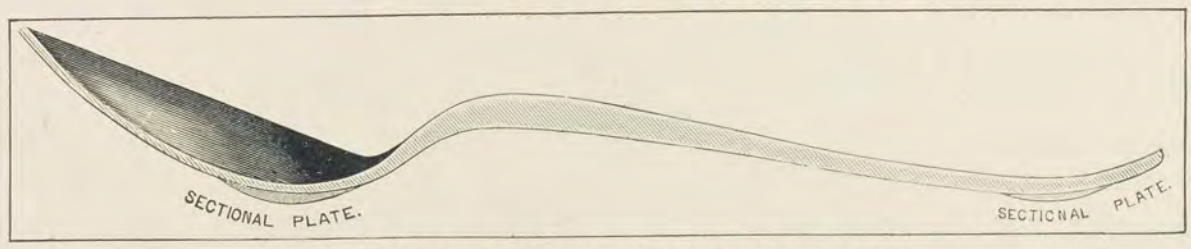
HAVE PROMPTED US TO MAKE UNUSUAL PREPARATIONS FOR THE FALL OF 1899. NO MATTER HOW GREAT THE DEMAND, WE ARE READY TO MEET IT, WITH OUR SUPERB LINES OF

ROGERS AND HAMILTON PLATED WARE

ALL **ROGERS & HAMILTON**

SPOONS AND FORKS HAVE

TWO ADDITIONAL PLATES



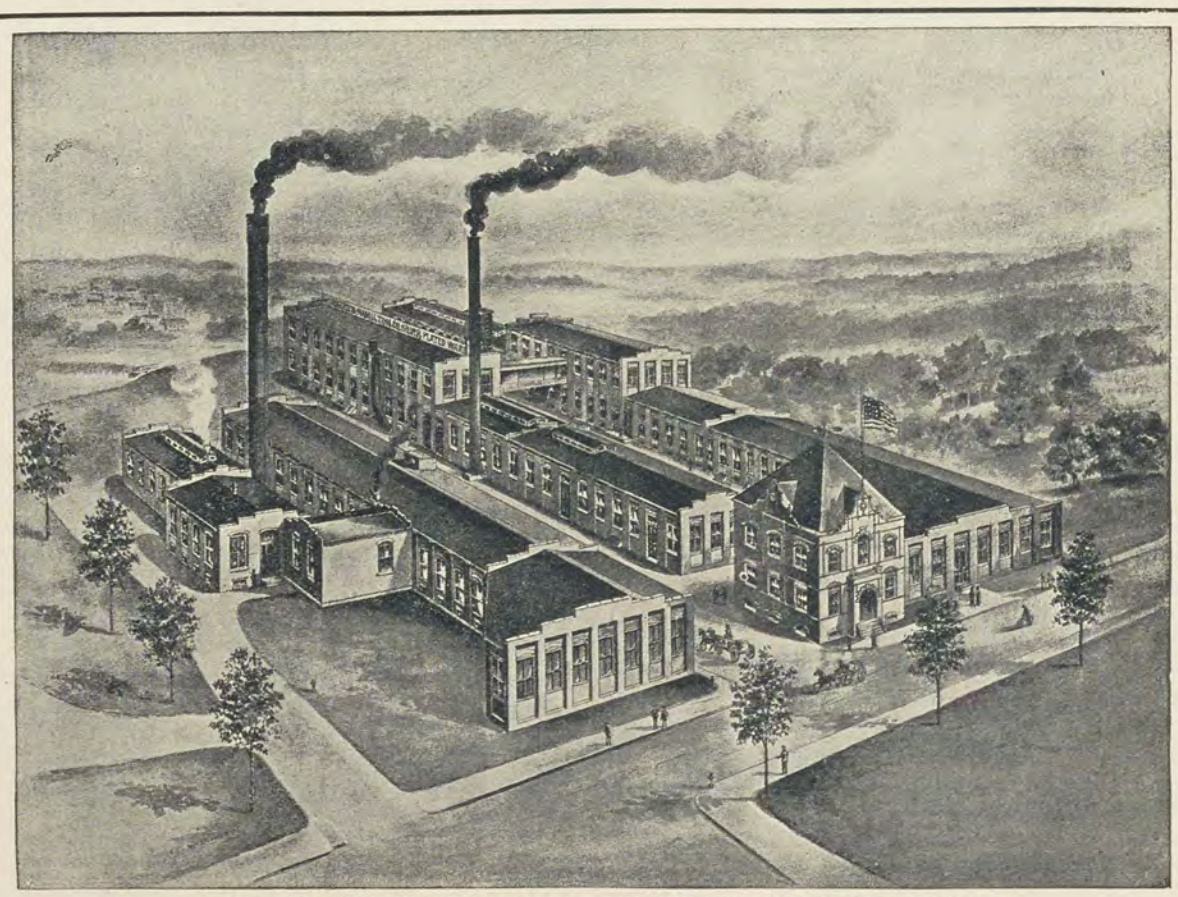
TWO ADDITIONAL PLATES

ON PARTS MOST EXPOSED TO WEAR.

WRITE FOR
ILLUSTRATIONS
PRICE-LISTS
AND DISCOUNTS

INTERNATIONAL SILVER CO.
(FACTORY "K")
SUCCESSOR TO
THE ROGERS
AND
HAMILTON CO.
WATERBURY,
CONN.

NEW YORK:
9-11-13 MAIDEN LANE.



A MODERN FLATWARE FACTORY—THE ROGERS & HAMILTON WORKS.

Benjamin Allen.

Benjamin Chauncy Allen.

One Success Coincident with Another.

The Building up of a Great City and the Building up of a Great Business—Points Wherin Each Excel.

When the history of this wonderful century is written, it will be told that in 1800 the spot where Chicago now stands was a wilderness, inhabited only by wolves, Indians and trappers; that in 1820 it was a garrison, with a few white inhabitants in the outskirts; that in 1840 it was a frontier town with but a few thousand people and one newspaper; that in 1860 it was a city with a population of 123,000; that in 1870 it had grown to 306,605; that in 1880 in spite of the great fire of 1871, its population had increased to 491,516; and that in 1890 it had more than doubled, having reached 1,208,669; and that in 1899 the last registration shows a population of over 1,900,000.

No wonder Chicago is called the wonder of the world. Since the beginning of time, so far as history reveals, Chicago stands unrivaled as a monument to the industry and enterprise of man. First incorporated as a municipality in 1837, with 700 people, fewer years than man's allotted three-score and ten sees it in 1899 a city of nearly two million inhabitants. It has been a record-breaker in about everything. In 1871, the greatest fire which ever came to devastate humanity's efforts, swept its entire business district into ashes, entailing a loss of over 17,000 buildings worth $200,000,000. In less than three years after every evidence of the ruin was obliterated and a new Chicago, a giant among the cities of the world, was born.

Right at the threshold of the Twentieth Century it seems most fitting to give the things wherein Chicago excels. First of all Chicago is the greatest railroad center in the world, with twenty eight terminal trunk lines, the number of through express and mail trains arriving and departing daily is 284; accommodation and surburban passenger trains, 694; merchandise freight trains, 288; grain, stock and lumber trains, 100, making a total of 1,366 regular trains of all classes in and out of Chicago daily by way of all railroad lines. One hundred and fifty thousand suburbanites are brought in every morning over the steam roads, and one of these lines—the Illinois Central—transports 15,000,000 suburban passengers annually over its admirably conducted system. The total tonnage of dead freight carried East in 1898 aggregated 6,000,000 tons. From the West the big trunk roads brought in nearly 270,000,000 bushels of grain, over 4,000,000 barrels of flour, 205,000,000 pounds of cut meats, 60,000,000 pounds of lard and 9,000,000 live hogs. The in and out freight amounts now to 950,000 cars annually. From the figures furnished by the respective boards of trade it has been demonstrated that Chicago handles yearly fifty-three per cent. as much wheat and corn as that received and distributed by New York, Boston, Philadelphia, Buffalo, Cincinnati, St. Louis, Omaha, St. Paul, Denver and New Orleans combined.

Chicago feeds the world. The export trade for last year proves the assertion. The value of exports of breadstuffs for the twelve months of 1898 was nearly $470,000,000, which, added to sales of provisions amounting to $170,000,000, made a total of $640,000,000. Here are a few items worth considering: The total receipts of flour and grain for the year aggregated 320,436,000 bushels, and the total shipments 288,000,000 bushels. Of butter Chicago received nearly 223,000,000 pounds, generously retaining only 20,000,000 pounds for home consumption. Upward of 325,000 cars of grain were inspected under the auspices of the Board of Trade last year. The supremacy of Chicago as the grain supplying center of the world is unquestioned.

Of course it wouldn't do to omit reference to the enormous packing interests so closely identified with the commercial growth of Chicago. Packingtown is the first attraction we show visitors, particularly those of a literary bent. Since the Union stockyards were opened thirty-three years ago, the business transacted in that region has swollen to prodigious proportions. A few statistics of Chicago's live stock traffic will give some idea of its immensity. Last year the receipts of cattle, sheep and hogs were 15,700,000 head having a total valuation of $230,000,000. Packers slaughtered over 8,000,000 head in 1898, exceeding all previous records. They paid out upward of $150,000,000 for live stock during the twelve month. One of them whose business ramifications extend to every conceivable product of cattle, hogs and sheep, does a business in excess of $100,000,000 annually. About $15,000,000 is invested in the various plants at Packingtown, and the capital employed approximates $30,000,000. Between 25,000 and 30,000 laborers find steady work in these vast interests, whose annual wages range between $20,000,000 and $25,000,000. It should not be forgotten that Chicago is also the greatest horse market in the world. 120,000 head was received in the year 1898.

In the colossal transactions of her wholesale institutions Chicago takes pardonable pride. The immense business of the dry goods, clothing and kindred lines alone amounts to $150,000,000. Of this the three leading dry goods houses do a combined business of $85,000,000. It is said their trade extends to every crossroads village west to the Pacific and east to the Alleghanies. Exclusive of her immense packing interests a conservative estimate places Chicago's wholesale trade at about $600,000,000 annually.

In her beautiful parks and boulevards Chicago takes precedence of all other cities in the United States. With a total park and boulevard system of over 2800 acres which includes nearly one hundred miles of drives and boulevard, her citizens cheerfully pay $1,000,000 a year for their maintenance, feeling the money is well expended.

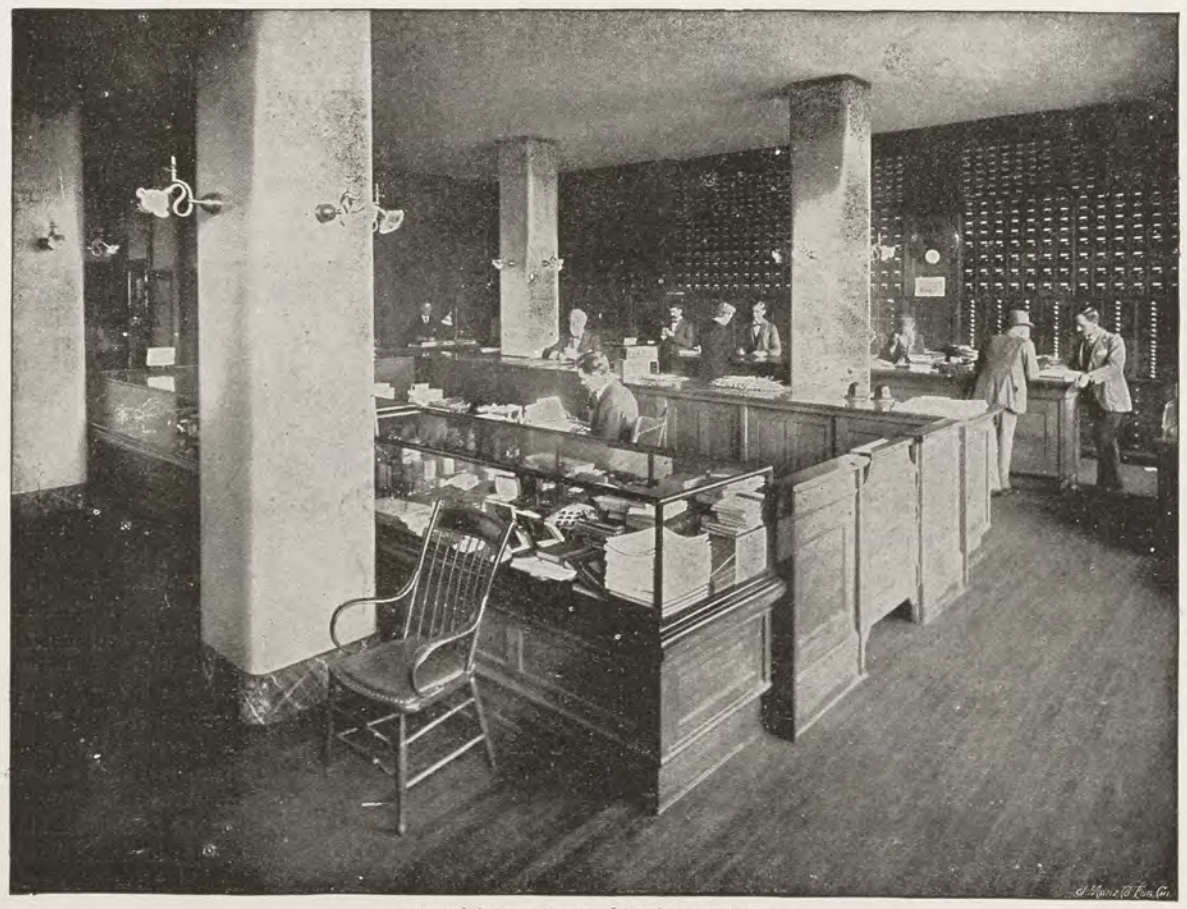
Coincident with Chicago's wonderful progress is the growth and expansion of the wholesale jewelry house of Benj. Allen & Co., of the same city. This great establishment stands to day as an imposing monument to the brilliant efforts, honesty and high worth of a man who commenced his business career in the Western metropolis at the age of sixteen as an $8.00 a week salesman. Benjamin Allen is now the head and sole owner of one of the most prominent wholesale jewelry institutions in the land. The portrait accompanying this sketch, is that of a man who occupies a unique position in the mercantile world, and who has won his way to the very front by ability, great industry, original methods, and a courage that did not permit him to be overcome by difficulties of any character. Nothing extraordinary, nothing outside the power of any man of similar natural endowments are revealed in his career. Its very dullness, lack of dramatic interest, are its most refreshing, most stimulating features.

It was in the spring of 1865 that Mr. Allen landed in Chicago, soon after the fall of Richmond, and immediately secured a position with the old time wholesale jewelry house of M. T. Quimby & Co. In this flourishing house his genuine worth was promptly recognized by his employers. He had been only three years clerk when he was admitted a

Interior view—As you enter Salesroom of Benj. Allen & Co.

partner of the firm. Two years later witnessed a reorganization. The old house was succeeded by a new firm, under the firm name of Stark & Allen. They were located at 109 Lake Street, which was then the leading street for the watch, clock and jewelry lines. One year later the firm were burned out by the great fire of 1871. While the city lay in ashes the firm hired a boarding house at Wabash Avenue and Harrison Street, on the borders of the burned district, and began to fit up for the wholesale jewelry business. Here they remained about a year, when they removed to 137–141 State Street, being the first firm in the wholesale jewelry trade to remove to the rebuilt district. This was in 1872, a period that marked another important change in the firm—Mr. Allen buying out his partner, and the firm was changed to Benj. Allen & Co. The business has been carried on under the above firm name ever since, with Mr. Allen as sole proprietor and guiding genius, the "Co." being used for commercial reasons only. For a quarter of a century the firm did business at their State Street location, enjoying unusual prosperity and expansion. Being compelled to move by the extension of a neighboring dry goods house, Mr. Allen selected a location on Wabash Avenue, near Madison Street, and in 1896 he and his associates erected the magnificent Silversmiths' Building. This structure, designed with special reference to the requirements of the jewelry business, is admirably arranged with regard to light, ventilation and the expeditious handling of business. The entire building above the ground floor is occupied by firms in the jewelry or allied trades, Messrs. Benj. Allen & Co. devoting the fifth floor, 80 x 160 feet, to their own offices and salesrooms and a large part of the tenth floor for storage and other purposes.

As might be expected in an establishment which has shown such steady and, at times, almost phenomenal growth, the business has been conducted on broad lines, and while progressive to the last degree, their policy has been tinged with that element of conservatism so necessary for safely weathering the storms that occasionally disturb the mercantile world. But the one feature which more than another has been the mainspring of their success is the fact that from the outset they have made it a cardinal principle to sell goods of exactly the quality represented and at prices that would net a living profit to all concerned. Thus their 18 K. wedding rings are full 18 K., their 14 K. gold chains are full 14 K. and their other goods are similarly right up to the standard. To no one is the reliability of his supply house so important as to the watchmaker, jeweler and optician, and thus it is that the mark "B. A. & Co." on every class of goods has become as universally recognized as the "sterling" mark on silverware. It is no wonder then that the business appears to flourish without any apparent effort, and in addition to the very perfect and highly developed system employed in the filling of orders, places the house in a position to take care of a great expansion of trade without appreciable friction or delay. Purchasing their goods in the largest quantities, oftentimes taking the entire output of a special line from a factory, they are thus enabled to get rock-bottom prices, the benefit of which in all cases is shared with their customers. Mr. Allen has always paid strict



Material Department of Benj. Allen & Co.

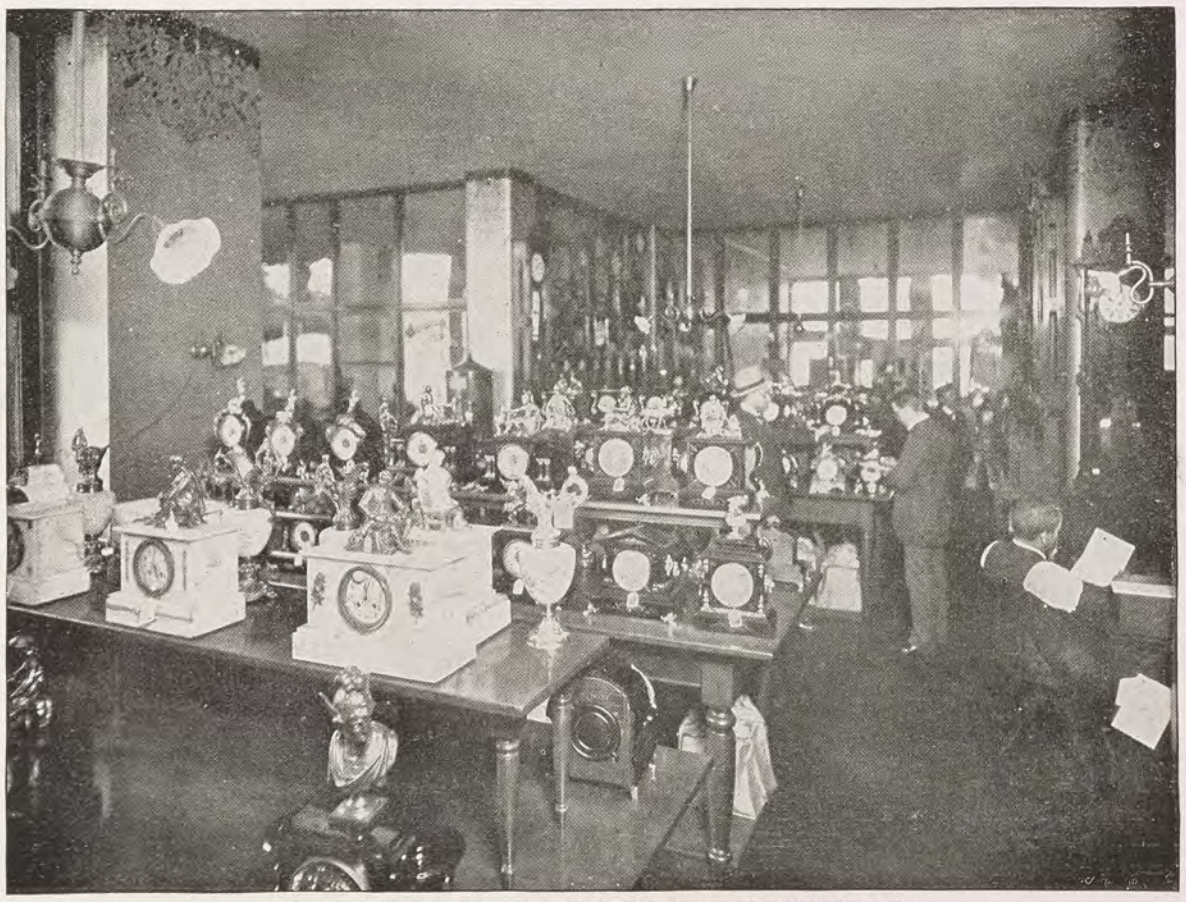
Interior view—Showing part of Office and Silver-Plated Ware Department of Benj. Allen & Co.

personal attention to the conduct of his business, being at his desk every day as regularly as clock-work, except on those rare occasions when he takes a brief vacation, and it is unquestionably his complete grasp of all the details of the various departments that is the inspiring cause of the smoothness and harmony that prevail throughout.

Aside from his interests in the jewelry business, Mr. Allen is largely interested as a stockholder in the Elgin National Watch Co., the Gorham Manufacturing Co., three of the principal Chicago banks and the local street railways—especially the Metropolitan and South Side Elevated Railroads and the Chicago City Railway Co. He is also a member of the Chicago Union League, Calumet and Glenview Golf and Polo Clubs, having been a member of the b ard of directors of the Calumet Club for a number of years as well as chairman of the finance committee.

In Benjamin Chauncy Allen, his father has an invaluable assistant. We give his portrait at the head of this article alongside that of the father. Young Allen, who has been taking an active interest in the business for four years past, is a Yale University man, class of '95, and is one of Chicago's most progressive young business men. He is his father's chief assistant in the supervision of the details of the business. Like his father, he is a hard worker and gives his close and undivided attention to the business. He has been carefully trained in every branch of the wholesale jewelry business, from the most humble work up. The experience, therefore, which is his through hard work and careful tutelage, is one which will be of the highest service to him in still further perpetuating the honored name which he bears.

We give herewith illustrations of several of the leading departments of the Allen establishment. Upon entering their salesroom, the customer faces the watch department, as will be noted in the first view given. The firm of Benj. Allen & Co. stand in the foremost rank as distributors of American watches, in the purchase, handling and distribution of which their facilities are unsurpassed. To the left, as you enter, the first department that greets you is the optical branch. Next comes the material department, which is one of the marvels of jewelrydom in the completeness of its arrangement. The north wall is here completely lined with drawers and compartments for the storing away of the firm's extensive and complete stock of tools and materials. These drawers are over 1800 in number and are so arranged that the prompt and accurate filling of orders is an easy matter. Further along in the front part of the firm's splendid salesroom is located the diamond department, which is a most important factor in the business of this firm. The clock and silverware departments are also extensive, both of which have kept pace with the general growth of the Allen establishment. In fact, in all that goes to make a leading business house, the Chicago firm of Benj. Allen & Co. are pre-eminent.



Interior view—Showing part of Clock Department of Benj. Allen & Co.

The Net List Can Bear the Light

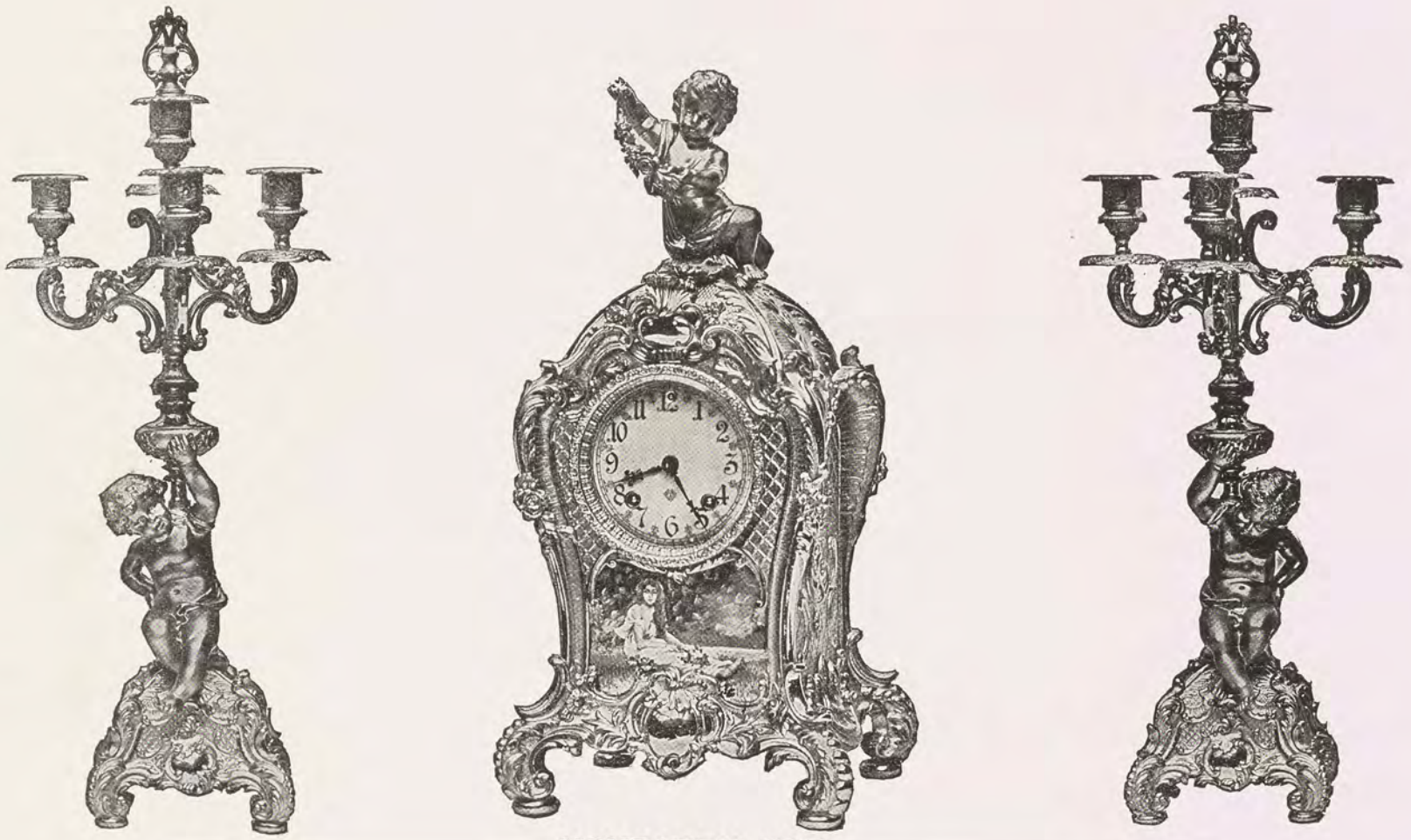
Does Trickery Impress You?

The long-list plan of marketing watch cases is, in plain English, a plausible trick to deceive the trade, a scheme to make the jeweler believe that he is getting better rates when, as a matter of fact, he is not. The long list enables the case man to offer whatever discount suits his purpose, but the net cost to the jeweler is just the same. The alleged concessions in price do not affect the net cost to the jeweler, for the so-called concession simply covers an artificial increase in the list. It is a plain attempt at imposition, and jewelers are not infrequently cajoled by it into buying inferior cases at the price of standard goods.

Jas. Boss cases are sold at a net list, subject only to the usual discounts for cash. If you are offered a "greater discount" on other cases examine the list and figure out the net cost. The Boss is always the best case at least money.

The Keystone Watch Case Co.

19th & Brown Sts., Philadelphia, Pa.

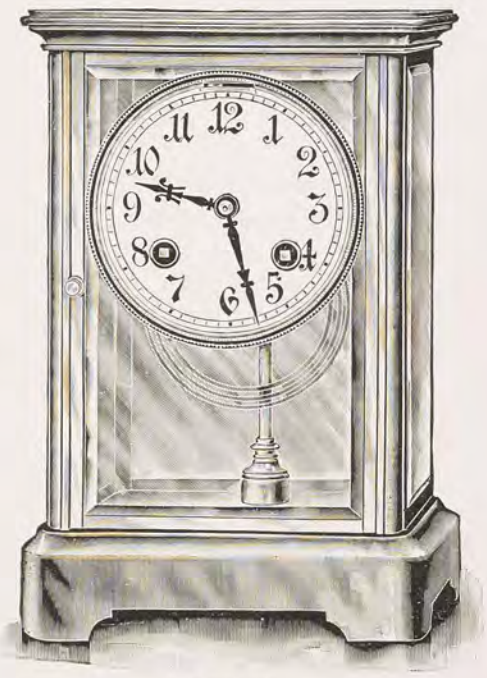


NONPAREIL SET

Rich Gold Finish

EAGLE

Onyx and Rich Gold, Jeweled



CRYSTAL

Eight-Day Lever Movement, Polished Brass

PSYCHE

Onyx and Rich Gold, Jeweled

CABLE ADDRESS "ANSONIA"

P. O. Box 2304

THE ANSONIA CLOCK COMPANY

99 JOHN STREET

NEW YORK

LONDON, 23 FORE STREET, E. C.

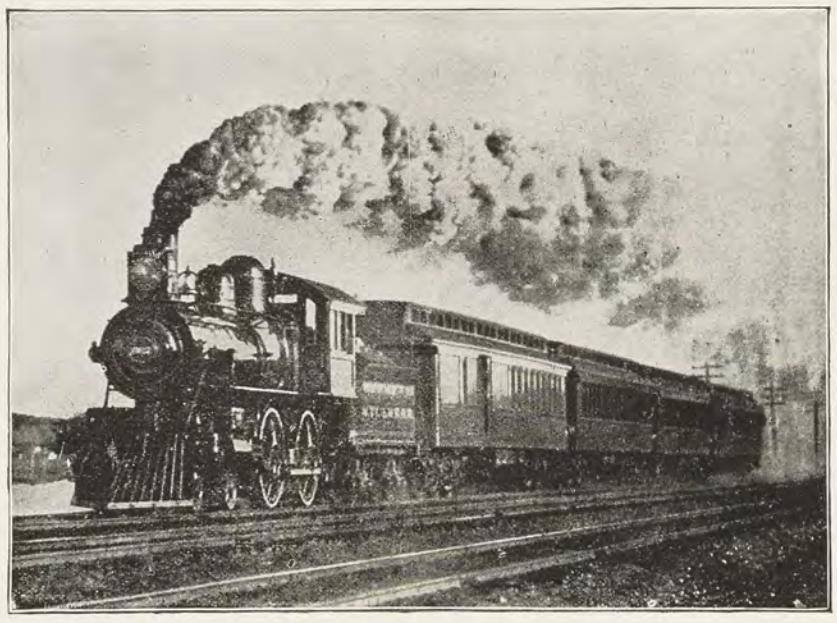
CHICAGO, 90-94 WABASH AVE.

WARNING To Retail Jewelers

Keep tabs on the Tags and Swivels.

When you buy **Blackinton** Chains the stamps on the swivels tell the story.

Each tag and stamp on swivel represents a different quality.



Empire State Express—Running Sixty Miles an Hour.

OLD RELIABLE

W.&S.B.★ Globe Filled

are extra quality and warranted to assay 1-8 gold.

EXTRA QUALITY, FILLED.

This Tag goes with this Swivel.

If your Swivels bear either of these two stamps you are sure of getting Chains that excel in

QUALITY, DESIGN and FINISH.

The greatest of virtues that combine to make a line of goods

RELIABLE AND SALABLE.

Every Jobber carries these Chains. Insist on seeing them, a careful examination will prove the above.

SECOND QUALITY.

This Tag goes with this Swivel.

OUR REGULAR

Old Reliable W.&S.B.★

are 1-10 plate, and such as we have made for thirty years.

FIRST QUALITY.

This Tag goes with this Swivel.

★ and Crescent THIS IS OUR

so stamped on Tag and Swivel

2D QUALITY

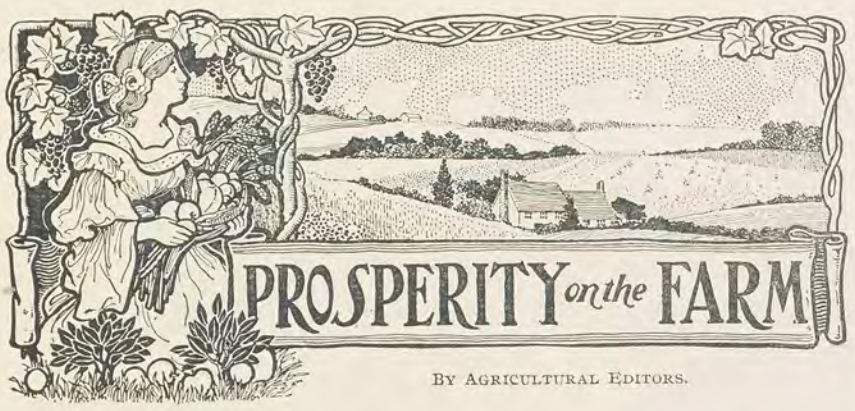
CAUTION

Retailers, when buying, should be most careful to see that Chains so stamped are not sold as either the OLD RELIABLE W. & S. B. ★ GLOBE FILLED or the OLD RELIABLE W. & S. B. ★

This is being done and has been done extensively.

W. & S. BLACKINTON

Factory, Providence, R. I. *New York, 14 Maiden Lane*



BY AGRICULTURAL EDITORS.

A RECENT issue of *Agricultural Advertising*, called the "Golden Harvest Number," contained special articles by leading agricultural editors and agriculturists on the situation in their respective sections. As no more accurately informed authorities could be quoted, we print the following instructive extracts from their articles on the conditions in various parts of the country:

* * * *

THE SOUTHEAST

By J. F. JACKSON
Editor of The Southern Planter

Within the past ten years a complete revolution in the agricultural economy of the South Atlantic States has been accomplished, and this to the manifest and great advantage of the people. Formerly these States produced cotton, tobacco and some corn and wheat. They had a very small head of live stock, and barely produced enough feed to keep these. The result of such a system was that as cotton and tobacco fell in price the land and the owners of it became poorer year by year. But this is now all changed.

Cotton and tobacco are largely surplus crops. The people now produce corn, wheat, oats, hay and wheat in the shape of beef, mutton and hog meat. Making these supplies at home, the money realized for the sale of cotton and tobacco is largely available for increasing home comforts and improvements. The production of hay alone has increased more than 100 per cent. in the past ten years. The truck or vegetable growing industry is now the largest in these States of any places in the country. Millions of dollars come into Virginia, North and South Carolina every year from the Northern States for vegetables shipped there. The fruit crop is also a large factor now in the prosperity of these States, where formerly sufficient for home use was barely produced. We have a people in these South Atlantic States who now realize that they need the best and newest of agricultural implements; they want the best-bred live stock of all kinds; they want all those conveniences and comforts which are needed to make life on the plantation happy. They want these the more because they can afford to pay for them.

THE MISSOURI VALLEY

By JAMES M. PIERCE
Editor the Iowa Homestead

Many pages devoted to the presentation of the magnitude of the farm production of Iowa and the Missouri Valley would still leave the subject unexhausted, and hence the task will not be attempted in a paragraph; but a little taste of the figures, which after all will leave nearly everything to the imagination, may be given. The territory includes Minnesota, Iowa, Missouri, Kansas, Nebraska and the Dakotas, and in these States, in 1898, three crops alone, wheat, corn and oats, were worth $416,748,475. The live stock on the farms on January 1st was valued at $583,110,287. No attempt will be made to compute the value of the annual increase of this live stock, nor of the annual output of meat, wool and dairy products from it. That is a point that is left to the imagination, yet no wild flight is required to reach the conclusion that the figures would be immense. A billion dollars as a mere partial valuation of this farm production will give a groundwork for a guess as to what it must be in its entirety.

THE NORTHWEST

By P. V. COLLINS
President and Manager Northwestern Agriculturist

From Chicago to Wyoming and Montana, there is such an empire of cultivation, matured and developed, as surpasses description. Farms uninterrupted for hundreds and hundreds of miles, and the residences are not "sod shanties" nor pioneer shacks. Disabuse your antiquated mind; smash your dream foundry and look at this great Dreamland actualized. The East, the South, Europe, the world never saw a richer scene than we have looked upon from the windows of our cars, as we passed through Illinois, Iowa and Nebraska.

Then came the Great American Desert, with its dry sands—and let me say that some day we shall spell that with a double "ss," and, while it may be served last, when that dessert gets the cream of irrigation on it, it is going to be the pudding of the whole meal. It looked a little dreary on a hot July day, until we passed over the Great Divide and found Oregon and Washington. I had heard of Oregon fish and Oregon mines, and land companies had described orchards; but, pshaw!—who ever imagined Oregon, the real Oregon? There are the Willamette Valley, the Umqua Valley (call it Yumyum Valley, if it is hard to remember Umqua), and the Rogue Valley, natural gardens, every one of them.

I came from Winnipeg to Minneapolis through the Red River Valley of Minnesota and North Dakota, and saw the limitless expanse of wheat in that wonderful "breadbasket of the world." I exclaimed that it is a fine thing to be alive, and a finer thing to live in the Northwest, where Nature is so kind and bounteous.

DOWN IN TEXAS

By A. A. PITTUCK
Of Texas Farm and Ranch

Few people have an adequate idea of the agricultural resources of Texas, or of the rapid development now in progress. Texas contains 160 000,000 acres, after deducting the area of bays, lakes and rivers, of which more than 100,000,000 acres are adapted to staple and diversified farming. Of the remaining 60,000,000 acres, more than 50,000,000 are well adapted to raising cattle and cattle feed. Texas has five times as much wheat land as the total area planted to wheat in the five States of Michigan, Wisconsin, Illinois, Iowa and Missouri, and five times as much land well suited to corn-growing as the total planted to corn in the same States. All this land Texas can plant as above and grow one third of the cotton crop of the country, and the seed from this cotton crop, fed with hay, is sufficient to fatten 2,500,000 beef steers, and Texas can now furnish the cattle as well as the feed. Swine-raising is increasing at the average rate of twenty per cent per annum; dairying is increasing about eighteen per cent.; fruit and truck farming has more than doubled within two years; and the number of farmers' organiza ons has doubled within the last twelve months. Immigrants of the very best class are coming to Texas in large numbers, and the present rapid rate of development will continue for years.

CATCHING TRADE FROM THE FARMER

There is a pointer for jewelers in the following comment on the articles above quoted, by the editor of *Agricultural Advertising*: "Prosperity does not mean to the farmer a trip to Europe to buy German or French made goods; it does not mean a protracted spree; it does not, in most cases, mean an investment in stocks and bonds. On the contrary, it means that the farmer and his family will buy those things which they have done without in hard times; it means that the merchant and the advertiser will be the first to share in the farmer's prosperity. We do not mean to intimate that the American farmer has suddenly become a millionaire, and that he is now worried about what he shall do with his money. He has not so much money that it will come to the business man without any effort on the business man's part. The farmer in his prosperity is still going to consider the How and Why of his expenditures, and as in days of old he will spend his dollars with the man who asks him the most eloquently and with greatest persistence."

FARMER'S ADVICE TO MERCHANTS

Equally interesting as the views of the editors is an article in the same journal by a farmer, who gives a word of advice to merchants. After an accurate review of the agricultural situation, he appeals to those in business to get a hustle on them and not hesitate in grasping at the opportunity. He says: "Our wives and daughters are holding out their arms to catch you, if you come their way with the right kind of inducements. The fathers and sons are ready to receive you with a hearty welcome if you can interest them. We have the coin to spend, and if you do not get it, it will be your own fault. Just think of it! The number of bushels of corn this year will take ten figures to express it. Our new crop of wheat is big, and we have lots of the good old stuff yet. There will be more oats in the country this year than we have ever had before, and enough rye to keep the whole world from suffering from thirst. The farmer will be in it for the next year."

ONE of the most talked-of poems of the year is Professor Markham's "The Man with the Hoe," founded on Millet's painting of the same name. The author represents the man with the hoe as about the lowest form of civilized life—"a thing that grieves not and never hopes, stolid and stunned, a brother to the ox." The following apt criticism of the poem recently appeared in an agricultural journal.

Say,
What's all this talk, anyway,
About the Man with the Hoe?
Don't he know
That the day
Of the hoe
Has passed away?
Put him on a riding cultivator
And show him what greater
Agriculture means!
It seems
Somebody's wasting salt tears
Over the Man with the Hoe.
Well, you needn't.
Things are coming his way
To stay.
Do you see that cornfield?
Pretty fair yield—
It'll make a
Hundred bushels or so an acre.
See those barns with their sides bursting out?
See those stacks o' hay about
As thick as you can set 'em?
Yes, and see the live stock;
Hain't that a nice array?
And, say—
See the Man,
The Man with the Hoe, himself.
Well, all this
Is his.
You don't see the hoe?
Oh, no.
That's laid on the shelf
Long ago.

You can
Hardly see the man
For his smile.
He's all smile!
Do you know why
He has that twinkle in his eye?
And why he wears that grin?
It's because of what's in
His pocket—cold, hard
Cash, and long green by the yard,
Yes, sir, and more of it at home.
Of course he smiles.
Yes, sir!
You needn't stir
Up any pathos about that fellow!
He's not seeking sympathy!
If you have tears to shed,
Go spread
'em on the turf where lies
The man who didn't advertise.
Go hunt up the men who knock
Agin Enterprise,
And try to block
The car of Progress. But spare your weeps
Over the man who keeps
The soil laughing
And the world moving.
Go dry
Your eye
And stop your fuss
And come back and smile
A while
With us.

Wolf's Point, Chicago, 1832. Divergence of the Main River into the North and South Branches, near the Present Site of Lake Street Bridge.

Chicago News.

WESTERN BUREAU OF THE KEYSTONE,
ROOM 811, COLUMBUS MEMORIAL BUILDING,
CHICAGO, October 28, 1899.

The Condition of Trade

Trade continues active in jobbing circles. The distribution of merchandise and general conditions in business show no change beyond a steady increase over the corresponding month of last year. As the fall season advances it becomes more and more apparent that the favorable predictions made in these columns earlier in the year are to be realized. The most pessimistic observer of trade conditions is unable to discover anything wrong with the commerce and industry of the country. The reports from all sections of the country have a healthy look. The bank clearances, the railroad earnings, the insignificance of commercial failures and the continued large exports tell the story of commercial prosperity. So far as one can see, no ordinary condition can check the expanding movement. Enterprise and activity go hand in hand, and when we turn to our own trade wise ones are predicting that this holiday season will, without any doubt, be the greatest in a business way the jewelers of the great West have ever enjoyed.

One of the best known traveling salesmen who is making his way back East from a trip to the Pacific coast, writes this office that he found business extra good in San Francisco in all lines. The demand for watches was tremendous, and the retail sales to returning soldiers from our new possessions were big. He also found the feeling among the trade on the coast as much better than for several years past. California expects a large tourist trade the coming winter, and with the improved train service the railroads are now giving and the favorable trade conditions prevailing, she will surely get it. Speaking of his own trade, he said: "My personal sales are several thousand dollars in advance of any trip I have ever made and I have yet a few good towns to strike."

An interesting statement is made by the bankers of the various cities to which large crowds of strangers have been attracted by recent festivals of one sort and another. The bankers agree that there has been no increase in average deposits as a result of these congregations of strangers in the large cities. Merchants also claim that their total business has shown little improvement, any increase in sales to out-of-town customers being offset by a loss in their regular trade. Our State Street retail merchants have found, to their sorrow, that the Fall Festival did not pay. They subscribed liberally to the fund, only to discover that the crowds that thronged the street came only to stare at the decorations. The money spent in creating a "court of honor" would have produced paying results if it had been expended in judicious advertising in the newspapers.

A returning traveler from the Southwest reports that the raise in the price of cotton has set things booming in Texas. This same gentleman was at Dallas when the opening of the new Linz store occurred, and says that without doubt it is the finest retail jewelry establishment in the United States. It is the talk of the trade and would do credit to State Street, Chicago, or Broadway, New York.

The Exhibition of the Watch and Clock Trades.

The watch and clock trades exhibit, with its queenly associate, the fall festival, has come and departed, leaving a creditable record and definite impressions of what may be done in this direction in the future. There is every reason for members of the allied watch, clock, jewelry and optical trades who took space and made a display at the exhibit to feel contented with the result. The exhibition room was larger, the display finer, the attendance better than last year. The Horological Society, under whose auspices the exhibit was made, is to be congratulated at the success of the enterprise. The displays may be classified under about seven different heads: (1) watches and watch cases; (2) clocks of various kinds; (3) tools and implements of the trade; (4) jewels, stones and settings; (5) manufacturing operations and methods; (6) literary and educational display; (7) optical devices and instruments. It will not be necessary to note the details of the display of each participant, as the space occupied and the goods and methods shown were not proportioned to the importance of the firms represented, and the success of the exhibit was due to its varied attractions and the taste shown in blending them into one harmonious whole, rather than to individualties. The exhibit was in effect a tiara of brilliance, in which the art of arrangement or grouping and the effect of the setting was the chief feature. To mention one of different firms who took part and to describe its display would involve us at once in a long description of no present interest, for each would demand the same courtesy. Let us consider rather the impressions left by the exhibit and what we have all learned by it. In the first place, it has tended to enlarge all of our ideas of what may be attempted and successfully carried out in this line in the future, with proper support from all the allied trades. As this and previous exhibits have been in a sense experimental, and the experiments now warrant definite conclusions, we may hope that the future will see grand things evolved from these small beginnings. A watch and clock trades exhibit is a display of very handsome lines of goods. Gold, silver and jewels, polished woods and bright metals, artistic carvings and engravings, musical chimes and the dulcet voices of thousands of clicking watches and clocks are the conspicuous features. To show them to advantage, a setting that will bring out these rich and striking features is required. The exhibition room should not only be commodious, well arranged and conveniently located, but it should be suitably decorated and furnished for the occasion. No one knows better than the jeweler the value of the setting in bringing out the beauty of the gem. So of a watch and clock trades exhibit, the exhibitors should be assigned distinct stalls and be required to furnish them suitably, and with special reference to their outer appearances to those who pass along the aisles. Hastily knocked together benches with red calico trimmings, partly concealing but still disclosing the rough pine scantling of which they are made, hardly answer the purpose. No great expense need be incurred to effectively cover and give a suitably rich background for the display. To do this each exhibitor should know in advance the precise dimensions of his space, the prescribed counter or table height, what is required for floor covering and furnishings, so that he may determine definitely what goods without crowding or overloading, he may display to the best advantage. The general fitting of the room and its interior decorations and arrangements—that is, laying off the spaces; constructing, in the rough, the stalls; prescribing the limits of and covering the floor space of the aisles—should be left to the general arrangements committee, each exhibitor being at liberty to decorate specially his own space in a manner suited to the goods he desires to show. But the general committee should also require a certain standard of richness, even in the stall furnishings, so that the indifference or waste of taste of any exhibitor should not mar the effect of neighboring displays. The above suggestions are not offered as a criticism of the management of the late exhibit, but are rather the views of the management as to future exhibits. An exhibit may be cheap, but it must not have a studied look of cheapness, and no line or lines of trade in Chicago offer more abundant material for a gorgeous display than those lately represented at the watch and clock trades exhibit. The setting of future exhibits must be harmonized with the material shown. The attendance at the exhibit was quite up to expectations. A two weeks' attraction, in the midst of other more general attractions such as the parades and displays of the fall festival, is a little long and is apt to grow wearisome toward the end. A shorter and more intense affair will be regarded with greater favor, we think. It is difficult to determine whether the incident derived greater or less benefit from being held coincident with the fall festivities. The latter certainly interfered more or less with the evening attendance, but we are inclined to think, however, that the coincidence in time of the exhibit and festival was an advantage. With respect to the trade advantages of the exhibit it was a success. In this respect it was a unique form of advertising, and stood in the same position as a quarter, a half or a full-page advertisement, in which the goods themselves, instead of half-tones or lettered descriptions, made their good points manifest. It was a good advertisement for the participating houses, and it brought business to them in every case. To show the large number of people who were either retail jewelers or connected with retail jewelry establishments who were interested visitors, we give a list of those who registered at the exhibit of the Elgin National Watch Co. during the first and second week of the exhibition:

A. Rosenthal, Toronto, Ont.; S. H. Harvey, Hanystown, Iowa; S. A. Smith, Farmington, Ill.; Fred. Trostar, Peru, Ind.; D. M. Hanslip, Toronto, Ind.; E. R. Farnsworth, Medina, Mich.; W. C. Luhrsen, Reedsburg, Wis.; H. T. Upp, Braymer, Mo.; D. A. Pontius, Mt. Vernon, Mich.; E. L. Mosher, Vicksburg, Mich.; F. D. Raynolds, Laporte, Ind.; Joe Wettstein, Milwaukee, Wis.; George A. Wentz, Milwaukee, Wis.; Louis F. Ott, Veedersburg, Ind.; J. H. Sterling, Maroa, Ill.; W. M. Waters, Richland Center, Wis.; G. G. Case, Jackson, Mich.; G. V. Sandstedt, Chicago; C. R. Rathbun, Otsego, Mich.; H. Wlansky, Chicago; A. Michael, Green Bay, Wis.; A. J. Rost (and wife), St. Peter, Minn.; Theo. Mueller, Green Bay, Wis.; A. E. Feddersen, Belle Plaine, Ia.; Charles E. Behner, Plainview, Minn.; A. R. Huebsch, St. Charles, Minn.; Charles Burris, Crestline, Ohio; B. R. Stocking, Sharon, Wis.; Wm. Platzer, Milwaukee, Wis.; George J. Platzer, Milwaukee, Wis.; Jasper W. Thompson, Danville, Ind.; Robert P. Kiep, Joliet, Ill.; E. A. Goodale, Lenox, Iowa; Frank Smith, Pontiac, Ill.; M. J. Soukup, Decorah, Ia.; R. Nicoll, with R. O. Gottfredsen jewelry store, Kenosha, Wis.;

Michigan Avenue from Lake Front Park.

Frank Minogne, Fort Dodge, Ia.; C. Willman, Deerfield, Ill.; Fred. Edgar, Eldora, Ia; A. H. Frandsen, Monmouth, Ill.; Geo. H. Johnston, West Branch, Mich.; Walter L. Seeberger, Des Moines, Ia.; O. C. Cable, Iowa Falls, Ia.; H. H. Thurlby, Creston, Ia.; George F. Lester, Arrowsmith, Ill.; George F. Long, New Richmond, Ind.; I. B. Wylie, Springfield, Ohio; J. W. Shirley, Bloomzlett, Ky.; J. F. Krumbeck, Williamston, Mich.; John Axtell, Earl Park, Ind.; W. H. Hoover, Mt. Vernon, Ia.; F. J. Baird, Mt. Vernon, Ia.; H. P. Reitz, Chicago, Ill.; Edwin Fifield, Janesville, Wis.; George B. Bement, Brodhead, Wis.; R. H. Bird, Aurora, Ill.; P. M. Ravenskilde, Cabery, Ill.; Will. H. Ricaby, St. Joseph, Mich.; E. P Culver, Belvidere, Ill.; Phil. Stackler, Chicago, Ill.; Earl Scott, Warsaw, Ind.; J. C. Outhwaite, De Pere, Wis; E. D. Wesner, South Whitley, Ind.; L. A. Hoard, Waupun, Wis.; Orris Booth, Knox, Ind.; T. J. Dale, Kenosha, Wis.; W. A. Hupp, Rensselaer, Ind.; C. C. Thoma, Battle Creek, Mich.; S. J. Ward, Michigan City, Ind.; H. M. Fetters, Herman Thiesgen, Devil's Lake, N. D.; B. D. Robinson, Albion, Mich.; James Dobbs, Geneseo, Ill.; W. L. Norberg, Bessemer, Mich.; S. H. Scatten, Mitchell, S. D.; E. S. Austin, Delevan, Wis.; J. T. Tudor, Chicago, Ill.; E. H. Colver, Stockton, Ill.; Pearl M. Jenks, of M. W. Jenks, San Diego, Cal.; Max Nassau, East Chicago, Ind.; J. T. Fields, Caruthersville, Mo.; Geo. B. Clinton, Paris, Ill.; J. E. Haep, Montpelier, Ohio; R. W. Chamberlain, Marshalltown, Ia.; J. Rumser, Jr, Rock Island, Ill.; Harvey Capron, Eaton Rapids, Mich.; J. H. Walter, Danvers, Ill.; Theodore Even, Chicago, Ill.; Morton Bros., Marshall, Ill.; F. E. Czischke, Chicago, Ill; Carl Czischke, Chicago, Ill.; Robert J. D. Patterson, Port Huron, Mich.; E. Lines, Mt. Pleasant, Ia.; H. R. Garth, Virden, Ill.; Fred. Overstreet, Paxton, Ill.; John J. Ellis, Calumet, Mich.; A. J. Kirkpatrick, Oklahoma City, Ok.; C. B. Wannemacher, Ottoville, Ohio; J. M. Whitney, Woodstock, Ont.; C. V. Conyers, Oneida, Ill.; C. H. Johnson, Marshall, Miss.; Turner Bros., Chicago, Ill.; L. Erikson, Evanston, Ill.; L. F. Klein, Chicago, Ill.; O. C. Zinn, Hastings, Nebr.; Mark Bachman, Chicago, Ill.; T. McCarlie, Chicago, Ill.; J. Fleckenstein & Co., Sioux City, Ia.; C. T. Frazee, Osage, Ia.; Will. H. Beck, Sioux City, Ia.; George F. Cohrs, with Schacht & Riordan, Spokane, Wash., Charles W. Ziegler, Oskaloosa, Ia.; C. L. Eplattenier, Chicago, Ill.; R. C. Engeleke, Lennox, S. Dak; Will. Z. Searle, Petoskey, Mich.; C. F. Smith, Chicago, Ill.; H. H. Feige, Lake City, Ia.; Charles H. Tournelle, Tomah, Wis.; F. J. Dingwall, Winnipeg, Can.; Benjamin Elder, Chicago, Ill.; John Johnson, Chicago, Ill.; A. R. Weaver, Harvard, Neb.; John B. Beit, Michigan City, Ind.; J. H. Gabatheler, Davenport, Ia.; Frank Martinek, East Jordan, Mich.; J. N. Martinek, Traverse City, Mich.; Frank House, Galva, Ill.; J. D. Siebert, Bloomington, Ill.; A. F. Hall, Janesville, Wis.; Charles Bieling, Chicago, Ill.; Mack A. Hurlbut, Ft. Dodge, Ia.; A. M. Behner, Newton, Ia.; Antonio Crinzi, Chicago, Ill.; Geo. F. Beach, Valparaiso, Ind.; J. W. Worstell, West Liberty, Ia., A. C. Wiener, Freeport, Ill.; F. S. Dahlberg, Durand, Ill.; J. R. Gordon, Houston, Minn.; D. Stein, New York City; Ed. Reinel, Streator, Ill.; Ed. Koenig, Algona, Wis.; J. F. Breitenstein, Waupaca, Wis.; Philip Seewald, Hudson, Mich.; L. Seewald, Tiffin, Ohio; A. J. Webster, Morrison, Ill.; O. Kleckner, Ithaca, Mich.; Louis Kabat, Chicago, Ill.; P. L. Gordon, Fairfield, Ia.; G. A. Donaldson, Girard, Ill.; D. D. Williams, Emporia, Kans.; W. S. Still, Delavan, Ill.; W. R. Conner, Caldwell, Kans.; J. C. Johnson, Mt. Sterling, Ill.; H. H. Howard, Lake Forest, Ill.; M. M. Walker, Bushnell, Ill.; W. A. Johnson, Tuscola, Ill.; T. J. Juzek, Elgin, Ill.; P. S. Bartlett, Elgin, Ill.; A. C. Christophersen, Menominee, Mich.; H. Blunck, Chicago, Ill.; A. M. Keck, Odon, Ind., O. E. Olson, Chicago, Ill.; A. J. Hirzy, Grand Rapids, Wis.; E. J. Schwartz, Chicago, Ill.; E. M. Cooke, Highland Park, Ill.; A. R. Chamberlain, Aurora, Ill.; G. Esterman, Marinette, Wis.; Daniel S. Jones, Independence, Ia.; Charles T. Kerr, Chicago, Ill.; Hugo Hanson, Chicago, Ill.; S. M. Clarkson, Chicago, Ill.; Wm. Gross, Delphi, Ind.; F. L. Butters, Prairie City, Ia.; Gus. Erickson, Chicago, Ill.; Hans Anderson, Chicago, Ill.; S. M. Coffman, Braymer, Mo.; J. M. Coffman, Polo, Mo.; L. M. Bennett, Traverse City, Mich.; C. D. Stroud, Ft. Dodge, Ia.; Lawrence McIntosh, Boone, Ia.; S. J. Palmquist, Greenview, Ill.; D. H. Bookins, Chicago, Ill.; O. Rose, Crown Point, Ind.; A. R. Stanley, Austin, Ill.; Lucas Hermann, Calumet, Mich.; J. C. Rouse, Mt. Pleasant, Ia.; T. W. Arnold, Laporte, Ind.; Chas. A. Allen, Chicago, Ill.; E. C. How, Laporte, Ind.; H. P. Proctor, Grinnell, Ia.; L. N. Philbin, Lafayette, Ind.; W. H. Roberts, Piper City, Ill.; H. A. Bright & Co., Kewanna, Ind.; H. G. Plordresher, Chicago, Ill.; J. E. McCourt and wife, Ludington, Mich.; G. P. Washburn, Alliance, Ohio; S. M. Johnson & Son, Carson, Ia.; U. Heffelfinger, Carroll, Ia.; G. F. Putnam, Eaton Rapids, Mich.; T. J. Woltz, Monticello, Ind.; F. J. Sullivan, New York; John C. Ranbow, Noweaqua, Ill.; Herman Turbin, Chicago, Ill.; B. Kirner, Chicago, Ill.; S. C. J. Peterson, Morris, Ill.; T. Fox, London, Ont.; E. B. Sherman, Gray's Lake, Ill.; C. R. Sherman, Libertyville, Ill.; L. M. Bird, Aurora, Ill.; Murphy Bros., Fox Lake, Wis.; A. Porter, Lake Mills, Ia.; A. F. Barstow, Oshkosh, Wis.; M. Strohm, Chicago, Ill.; E. Laubrecht, Chicago, Ill.; J. W. Bronson, Chicago, Ill.; S. W. Bramley, Chicago, Ill.; M. M. Haviland, Chicago, Ill.; B. Hoffman, Chicago, Ill.; Ben. Martin, Logansport, Ind.; H. G. Gebhart, Flandreau, S. Dak.; H. F. Doan, Blissfield, Mich.; Charles M. Waara, Hancock, Mich.; B. J. Crawford, Hancock, Mich.; J. L. Hutchinson, Laporte, Ind.; E. J. Hutchinson, Laporte, Ind.; E. Battegay, Chicago, Ill.; M. Foster, Fairfield, Ia.; Curt Ohm, Chicago, Ill.; Moyer & Barron, Shannon, Ill.; M. Stolofsky, Chicago, Ill.; M. N. Berg, Duluth, Minn.; J. Wolf, Chicago, Ill.; H. Jorgenson, West Superior, Wis.; Casper Rhodin, Chicago, Ill.; M. J. Friedenberg, Chicago, Ill.; E. Epstein, Oshkosh, Wis.; F. C. Cook, Janesville, Wis.; W. N. Morrison, Topeka, Kans.; A. J. Gardner, Ogden, Ia.; C. A. Smith, Farmington, Ill.; A. C. Parno, Greene, Ia.; Orr L. Keith, Iowa City, Ia.; Frank Hyde, Sioux Falls, S. Dak.; J. Lane, Brockville, Ont.; J. H. Stouthamer, Milwaukee, Wis.; H. Hesselbom, Chicago, Ill.; W. E. Reuling, Muscatine, Ia.; B. H. Kellogg, Clinton, Ind.; I. M. Kinney, Mt. Carroll, Ill.; Elmer Kinney, Mt. Carroll, Ill.; Joseph Steffeck, Chicago, Ill.; Charles C. Folkers, West Superior, Wis.; M. L. Jones, Fairfield, Nebr.; George J. Allen, Marshalltown, Ia.

Excursion to the Elgin Watch Factory

Of all the great throng of visitors to Chicago during the Fall Festival, no group of craftsmen were offered better entertainment than the visiting watchmakers and jewelers. They not only took in the glittering display of the court of honor, viewed the grand parades and enjoyed the general push and stir, but they were able to pay interesting visits to Chicago's leading wholesale jewelry establishments and see all of the latest novelties in those lines in which they have special pecuniary interest. The watch and clock trades exhibit also offered under one roof a fine assemblage of interesting things in their line. But the event by which their visit to Chicago will be made memorable was a trip to Elgin and an afternoon's inspection of the operation of the factory of the Elgin National Watch Co., on October 10th. The excursion and all its attendant expenses, including a special train going and returning and a sumptuous mid-day lunch at the National House in Elgin, were provided for by the Elgin Co., whose works they visited. It was a most happily conceived, successfully carried out and enjoyable affair, and the appreciation of the visiting horologists was well expressed in a resolution of thanks appearing elsewhere. The excursion was the result of an attempt to make a display of watchmaking at the watch and clock trades exhibit, which presented insurmountable difficulties until it was proposed by President Hulburd, of the Elgin Co., to transport the jewelers to a real live factory rather than to attempt to bring a part of the factory to them. President Hulburd certainly hit off the affair in the best kind of style, and the Elgin Co. were able to give the jewelers something better than a vague idea of how a great watch factory, on the American plan, is run. Visiting watchmakers received, a few days before the excursion, a handsomely-engraved invitation reading as follows:

ELGIN DAY.

You are cordially invited to participate in an inspection of our factories at Elgin, Ill., Tuesday, the 10th inst. A special train will leave the Chicago & Northwestern Station, Kinzie and Wells Streets, at 10.45 o'clock A. M., returning at 4.30 o'clock P. M. Luncheon will be served at the National House upon arrival. Your acceptance is requested, that special transportation permit may be furnished. Yours fraternally,

ELGIN NATIONAL WATCH CO.

Chicago, October 2, 1899

The results became apparent between 10.30 and 10.35 A. M. on the day appointed, at the Northwestern Depot, by the appearance of 230 craftsmen, who were soon on board the special, which at 10.45 o'clock pulled out and without stop reached Elgin at 11.50 A. M. On board the train the comfort of every one, including twenty-five ladies, was carefully seen to by G. V. Dickinson, sales agent in the Chicago office of the company, and W. H. Kinna, the well-known Elgin "missionary," and the hour's ride across Illinois prairies and through thriving villages was keenly enjoyed. As the train pulled into Elgin and unloaded its gay company the Elgin Nation Band, upon the varanda of the National House, gave a welcome greeting and soon the jolly jewelers were making themselves at home. The time of the arrival of the train was auspicious in another respect, for quickly after the unloading the 12 o'clock whistle sounded and the visitors had the opportunity of seeing the outpouring of 2500 operators from the watch factory for the noon hour. It was an impressive spectacle. The guests were then escorted to the hotel, where they were served with an abundant luncheon, after which they visited the amusement room, library and gymnasium in an annex to the hotel and were ready for the main purpose of the excursion. They were then separated into convenient parties and squadrons and escorted to the factory. The superintendents of the different departments exerted themselves to make every visitor feel at home and to explain the purpose of the different pieces of machinery and give such details as seemed of most interest in the processes of building watches and getting them ready for the market. It was natural that the visitors should be impressed with all they saw and that they should hereafter view with greater interest the finished products of this great factory, more fully realizing the tremendous amount of energy that is required to put them in the elegant marketable shape in which they come to the retailer and what a large undertaking the officers of the company have on their hands to so manage the financial affairs of the company as to enable these watches to be brought within reach of the masses who require pocket timepieces. As the hour for departure, 4.30 P. M., approached the visitors reluctantly withdrew and gathered at the station for the return trip. They were soon back in the train, which pulled out on time, for the return trip to the city. During the return trip, as an expression of the sentiments of the visiting jewelers, the following letter was circulated by W. H. Galloup, secretary of the American Horological Society, and subscribed to by the excursionists:

We, the undersigned members of the American Horological Society and the jewelry trade, appreciating the courtesy of the Elgin National Watch Co. in extending to us the pleasure of visiting your model factory on Elgin Day,

(*Continued on page 1141.*)

ALLEN'S CATALOGUE IS COMING!

Our 1900 Catalogue will make its appearance about November first.

It is the twenty-seventh annual book of this kind we have published, and, as usual, is larger than its predecessor. ⁘ It contains 736 pages of matter—indispensable to the Twentieth Century Jeweler—and is 48 pages in excess of the '99 issue. If you do not receive a copy promptly, drop us a line and we will attend to it immediately. ⁘ You are, no doubt, coming to Chicago this Fall to buy goods. It is our advice. When you do, we invite you to see our stock. Simply said — it is the richest and most artistic in the West. Symbolical of the prosperous season at hand!

BENJ. ALLEN & CO.

THE SILVERSMITHS' BUILDING, CHICAGO

Chicago News.

(*Continued from page 1139.*)

Tuesday, October 10, 1899, as your guests, wish to extend to you our hearty thanks. And we also appreciate the courtesies extended to us by your Messrs. Kinna and Dickinson, whose kindnesses will long be remembered :

Fred. Trosler, Peru. Ind.; L. Erikson, Evanston, Ill.; J. N. Martinek. Traverse City, Mich.; O. Rose, Crown Point, Ind.; S. A. Rhodes, Chicago, Ill.; A. F. Barstow, Oshkosh, Wis.; J. E. Hutchinson, Laporte, Ind.; B. H. Kellogg, Clinton, Ind.; R. C. Engelcke, Lennox, S. D.; O. F. Kleckner, Ithaca, Mich.; E. J. Collick, Ironwood, Mich.; George H. Hazlitt and wife, Chicago, Ill.; W. H. Galloupe, Chicago, Ill.; E. C. How, Laporte, Ind.; John Ryan, Chicago, Ill.; M. Milton, Laporte, Ind.; G. C. Christopherson, Menominee, Mich.; E. D. Wesner, So. Whitley, Ind.; C. H. Johnsan, Marshall, Minn.; C. R. Rathbun, Otsego, Mich.; D. H. Illick, Leesburg, Ind.; Geo. C. Olin, Chicago, Ill.; George F. Cohrs, Spokane, Wash.; Fred. Bieberbach, Baltimore, Md.; Louis F. Ott, Veedersburg, Ind.; Ben. Martin, Logansport, Ind.; W. H. Hoover, Mt. Vervon, Ia.; T. J. Baird, Mt. Vernon, Ia.; M. Van Kammerer, Chicago, Ill.; H. A. Bright, Kewanna, Ind.; John Sievers, Kewanna, Ind.; B. Redepennig, Chicago, Ill.; J. A. Coleman, Chicago, Ill.; B. C. Allen, Chicago, Ill.; Edwin Fifield, Janesville, Wis.; D. Stein, Newport News, Va.; A. R. Chamberlain, Aurora, Ill.; M. Ellbogen, Chicago, Ill; J. Fleckenstein, Sioux City, Ia.; E. B. Sherman, Gray's Lake, Ill.; C. R. Sherman, Libertyville, Ill.; L. A. Hoard, Waupun, Wis.; H. Blunck, Chicago, Ill.; J. W. Sutherland, Chicago, Ill.; Mark Bachman, Chicago, Ill.; Theo. Kuehl, Chicago, Ill.; Edwin B. Becker, Chicago, Ill.; C. L'Eplatenier, Chicago, Ill.; Louis Kobat, Chicago, Ill.; Frank Martinek, East Jordan, Mich.; A. R. Peebles, Grand Rapids, Mich.; Wm. Platzer, Milwaukee, Wis.; George Platzer, Milwaukee, Wis.; Frank Shadbolt, Chicago, Ill.; B. R. Stocking, Sharon, Wis.; P. M. Ravenskilde, Cabery, Ill.; I. B. Wylie, Springfield, Mo.; W. A. Huff, Rensselaer, Ind.; J. H. Sterling, Maroa, Ill.; A. Michael, Green Bay, Wis.; W. B. Terry, Chicago, Ill.; Edward Koenig, Algoma, Wis.; George F. Long, New Richmond, Ind.; Orris Booth, Knox, Ind.; F. D. Raynolds, Laporte, Ind.; E. L. Mosher, Vicksburg, Mich.; B. A. Kirner, Chicago, Ill.; Charles Bieling, Chicago, Ill.; E. Battegay, Chicago, Ill.; L. F. Klein, Chicago, Ill.; Theo. Gribi, Chicago, Ill.; J. A. Hesselbom, Chicago, Ill.; Joe. Wellstein, Milwaukee, Wis.; George A. Wentz, Milwaukee, Wis.; R. P. Wheeler, Chicago, Ill.; G. A. Camp, Chicago, Ill.; O. E. Hedrich, Chicago, Ill.; C. L. Hoefer, Chicago, Ill.; B. Hoffman, Chicago, Ill.; G. T. Frazee, Osage, Ia.; B. J. Crawford, Hancock, Mich.; Charles M. Waara, Hancock, Mich.; S. W. Bramley, Chicago, Ill.; Theo. Mueller, Green Bay, Wis.. H. G. Gebhart, Flandreau, S. D.; S. L. Scott, Chicago, Ill.; O. C. Cobb, Iowa Falls, Ia.; D. D. Williams, Emporia, Kans.; George Garner, Jr., Council Bluffs, Ia.; D. L. Jenkinson, Minocqua, Wis.; S. J. Ward, Michigan City, Ind.; H. F. Upp, Braymer, Mo.; Mr. and Mrs. W. N. Morrison, Topeka, Kans.; G. L. Goodale, Lenox, Ia.; A. Porter, Lake Mills, Ia.; George T. Mason, Chicago, Ill.; M. N. Berg, Duluth, Minn.; F. L. Butters, Prairie City, Ia.; T. J. Dale, Kenosha, Wis.; D. A. Portius, Laporte, Ind.; D. H. Brookins, Chicago, Ill.; Charles G. Behner, Plainview, Minn.; A. M. Behner, Newton, Ia.; A. O. Slade, Winona, Minn.; A. R. Huebsch, St. Charles, Minn.; A. C. Parno and wife, Greene, Ia.; G. G. Case and wife, Jackson, Mich.; Ed. Lambrecht, Chicago, Ill.; J. W. Shirley, Bloomfield, Ky.; J. Lane, Brockville, Ont.; C. B. Wannemacher, Ottoville, Ohio; A. M. Keck, Odon, Ind.; Mr. and Mrs. A. M. Church, Chicago, Ill.; George F. Beach, Valparaiso, Ind., George Baker, Chicago, Ill.; A. J. Gardner, Ogden, Ia.; W. B. Mason, Lancaster, Ky.; H. F. Doan, Blissfield, Mich.; Charles P. Kerr, Chicago, Ill.; J. W. Thompson, Danville, Ind.; F. W. Clark, Rensselaer, Ind.; C. C. Thoma, Battle Creek, Mich.; Hugo Hanson, Chicago, Ill.; Hans Anderson, Chicago, Ill.; A. Rosenthal, Toronto, Can.; Mrs. N. Kramer, Chicago, Ill.; Stephen Parlin, Chicago, Ill.; Pearl R. Mayer, Chicago, Ill.; Lawrence McIntosh, Boone, Ia.; C. D. Strow, Fort Dodge, Ia.; C. H. Hussey, Hampton, Ia.; W. E. Reuling, Muscatine, Ia.; Mack A. Hurlbut, Fort Dodge, Ia.; Frank Mirogene, Fort Dodge, Ia.; Otto E. Loven, Chicago, Ill.; Gus Erikson, Chicago, Ill.; John Johnson, Chicago, Ill.; D. N. Hanslip, Topeka, Ind.; G. V. Sanstedt, Chicago, Ill.; J. C. Hutchinson, Laporte, Ind.; W. D. Turner, Chicago, Ill.; H. S. Turner, Chicago, Ill.; O. C. Zinn, Hastings, Nebr.; J. D. Siebert, Bloomington, Ill.; J. H. Stouthamer and wife, Milwaukee, Wis.; Edwin B. Huddle, Chicago, Ill.; George F. Lester, Arrowsmith, Ill.; W. M. Waters, Richland Center, Wis.; H. M. Crothers, Bay City, Mich.; C. A. Smith, Farmington, Ill.; Frank Smith, Pontiac, Ill.; Fred. Edgar, Eldora, Ia.; R. Nicol, of Gottfredsen Jewelry Store, Kenosha, Wis.; H. H. Howard, Lake Forest, Ill.; W. H. Murphy, Fox Lake, Wis.; J. F. Krumbeck, Williamston, Mich.; E. R. Fransworth, Medina, Mich.; W. C. Luhrsen, Reedsburg, Wis.

We hardly think our report of this delightful affair complete without mentioning the ladies who graced the occasion, especially those outside of Chicago. We give them herewith : Mrs. A. C. Parno, Greene, Iowa ; Mrs. John H. Stouthamer, Milwaukee, Wis,; Mrs. A. J. Gardner, Ogden, Iowa ; Mrs. M. N. Berg and little daughter, Duluth, Minn.; Mrs. G. G. Case, Jackson, Mich.; Mrs. F. L. Butters, Prairie City, Iowa ; Mrs. E. Morrison, Topeka, Kans ; Mrs. C. D. Strow, Ft. Dodge, Iowa ; Mrs. Robt. Nichols, Kenosha, Wis., and sixteen ladies from Chicago.

Personal Mention.

E. C. Fitch, president of the Waltham Watch Co., was in town most of last week in the interest of his company. He was being shown around among the trade by R. A. Kettle, the Chicago agent of the company.

H. L. Roberts, treasurer and secretary of The Keystone Watch Case Co., left for Philadelphia Wednesday last, after a five days' stay in Chicago. Mr. Roberts' visit was a hurried one, but he had time to say that he was glad to see a snap and vigor about business in the West which he had not seen for a long time, and that he thought the wise jeweler would so conduct his business that adequate profits would be made while the present favorable conditions continue.

Samuel H. Bauman, president of the Bauman-Massa Jewelry Co., St. Louis, has been in town for the past two or three days trying to unearth a few hundred O size movements among the watch manufacturers. Mr. Bauman says that the serious shortage in movements is something appalling, but that he has been assured by the movement makers that a relief is now in sight, and that increased deliveries will occur in November and December.

F. B. Glover, of Eaton & Glover, New York, makers of the Eaton-Engle engraving machines, superintended the firm's exhibit of the machines at the Watch and Clock Trades Exhibit in this city. He also superintended their exhibit at the Omaha Exposition. As a consequence the machines have now a wide and enviable reputation through the West.

Mrs. Ulricke Becken, mother of A. C. Becken, died at her home in this city, on October 4th. Mrs. Becken made her home with her son, who has the sympathy of his numerous trade friends in his bereavement.

Frank Rumble, secretary of the McCormick Optical Collage has retired, and is succeeded by Miss Helen Morbeck.

Geo. Johnston, president of the Johnston Optical Co., Detroit, Mich., was a welcome caller among the wholesale optical trade of Chicago the early part of the month.

Frank Nevin, manager and buyer for the tool and material department of the Meyer Jewelry Co., Kansas City, has been in the city for several days on a business trip.

Fred. H. Smith, secretary of the Geneva Optical Co., is in the East on a short trip in the interest of his firm.

Louis Finklestein, jobber, St. Paul, Minn., was in town this week calling on the manufacturers.

Carl Weibezahn, Northwestern traveler for A. C. Becken, left this week on an extended trip over his territory. He does not expect to return to headquarters until after Christmas.

Mrs. Rich, wife of Elmer A. Rich, of the Rich & Allen Co., who has been in the Hahnemann Hospital for two months, where she had to undergo two surgical operations, is now rapidly recovering. At one time her life was despaired, but fortunately her case took a turn for the better, and ever since she has been gaining strength.

Benj. Allen is enjoying a two weeks' respite from business at White Sulphur Springs, Va. He is accompanied by Mrs. Allen.

Dr. J. B. McFatrich, president of the Northern Illinois College of Ophthalmology and Otology, is again at his post after an extended trip through the East, which included New York, Boston, Philadelphia and other Eastern cities. Mrs. McFatrich accompanied him.

The marriage of John H. Mertz, of the Rich & Allen Co., to Miss Jessie Case of this city, occurred October 24th, at the home of the bride in this city. The wedding was a quiet home affair, none but the intimate friends of the parties attending. Mr. and Mrs. Mertz immediately started on a two weeks' trip through the West.

Frank Barger, head of the wholesale firm of M. F. Barger & Co., returned yesterday from a ten days' trip up among the firm's customers in the Northwest. Mr. Barger tells us that he found an excellent feeling among the dealers. All whom he called on were already, and have been for some months, enjoying good trade. But he also found that the jeweler has been buying pretty steadily for three months past, and that he was of the opinion that November would be rather quiet with the wholesalers on this account.

J. P. Engel, ophthalmic optician, Johannesburg, South African Republic, is in Chicago for a few weeks, pursuing a course in optics at the American College of Ophthalmology. Mr. Engel was a pleasant caller at KEYSTONE headquarters this week. Of course the first question asked Mr. Engel was as to the war between the Boers and the British. He said he left Johannesburg last March, so that he knew little about the present situation save what he saw in the newspapers, so did not care to express himself on the outcome. Mr. Engel said he came to America partly on business and partly to educate himself in his profession. He was much pleased with the United States so far as he had been and seen and thought he might stay for some little time.

Morris Eisenstadt, secretary of the Eisenstadt Manufacturing Co., St. Louis, paid a hurried business trip to Chicago Wednesday of this week. Mr. Eisenstadt is looking and feeling well, and told us that the wholesale trade of the Southwestern metropolis was keeping up wonderfully well, each month's business showing a healthy increase over the same month of last year.

The marriage of Mr. Mortimer M. Cloudman to Miss Maud Hamlin, of Elgin, Ill., took place Wednesday evening, October 26th, at 8 o'clock in the Congregational Church, Elgin. Mr. Cloudman is assistant cashier at the Elgin Watch Factory, and is the oldest son of Wm. H. Cloudman, the assistant superintendant of the same factory. The affair was largely attended as the bride and groom are popular young people in the "watch city." A reception followed at the residence of the bride's parents, where over 300 friends gathered to congratulate Mr. and Mrs. Cloudman, and wish them a long and happy married life.

Gossip Among the Trade.

F. S. Scott, engraver, has opened an office in room 805, Columbus Memorial Building.

J. Floersheim, Kunstadter & Co., wholesale jewelers, have leased a part of the third floor of the building at the northwest corner of Market and Adams Streets.

The Benedict-McFarlane Co., is now a new corporation located at Bridgeport, Conn., for the manufacture of silver-plated table ware. The new concern is capitalized at $150,000, and employs 150 people. The promoters are F. H. McFarlane, of the Bridgeport Silver Plate Co., and M. S. and H. L. Benedict, of the M. S. Benedict Manufacturing Co., of East Syracuse, N. Y. The new company, however, will be entirely separate from these concerns.

H. G. Bradford, for several years a traveling salesman for A. H. Bonnet, Columbus, Ohio, has engaged with J. W. Forsinger, as traveler, and will cover Northwestern territory. He is now out on his initial trip.

The Jewelers' School of Engraving last month finished its tenth year and this month enters upon its eleventh successful year. Prof. R. O. Kandler, its chief instructor and proprietor, well deserves his success, for he is a hard and faithful worker and an earnest and capable teacher. He has lately enrolled the following new students: George Durner, Jr., Milwaukee, Wis.; M. R. Janney, Marshall, Ill.; E. J. Collick, Ironwood, Mich.; H. B. Arnold, London, England; Geo. F. Scheer, Rochester, N. Y., and L. Fisher, A. J. Ording and A. W. Smith, Chicago.

The new retail house of Milwaukee—the Alstead-Kasten Co.—expect to open their new establishment to the public on November 1st. The new firm have fitted up the old stand of Bunde & Uppmeyer in thoroughly modern style, and will have one of the really handsome stores of the Northwest. The gentlemen who compose the new firm are well and favorably known in Milwaukee from their long connection with the Chris. Pruesser Jewelry Co., and will undoubtedly make a success of the new enterprise. The fixtures are right-up-to-the-minute, and were put in by the Union Show Case Co., of Chicago.

The Hoyt Metal Co., successors to the Chicago & Aurora Smelting & Refining Co., have moved from the Woman's Temple to more commodious quarters on the fourth floor of the Stewart Building, northwest corner of State and Washington Streets. H. H. DeLoss, manager of the smelting and refining department, would be pleased to meet the many friends of the old and new companies at the new headquarters, which were necessitated by their prosperous and rapidly growing business.

Dr. J. B. McFatrich, president of the Northern Illinois College of Ophthalmology and Otology, was elected Eminent Grand Commander of the Grand Commandery of Knight's Templar of Illinois this week, at the forty-third annual conclave in the Masonic Temple. Dr. McFatrich has been prominent in Masonic circles for a long time, and is deserving of the honor.

F. H. Jacobson & Co., the watch case repairers at 88 State Street, have been thirteen years in business in Chicago. Five years of this time they were located at 96 State Street, the remainder of the period at their present location. They have recently doubled their space, enlarged their facilities, refurnished their office and otherwise improved their plant. All of this was necessitated by their constantly increasing business.

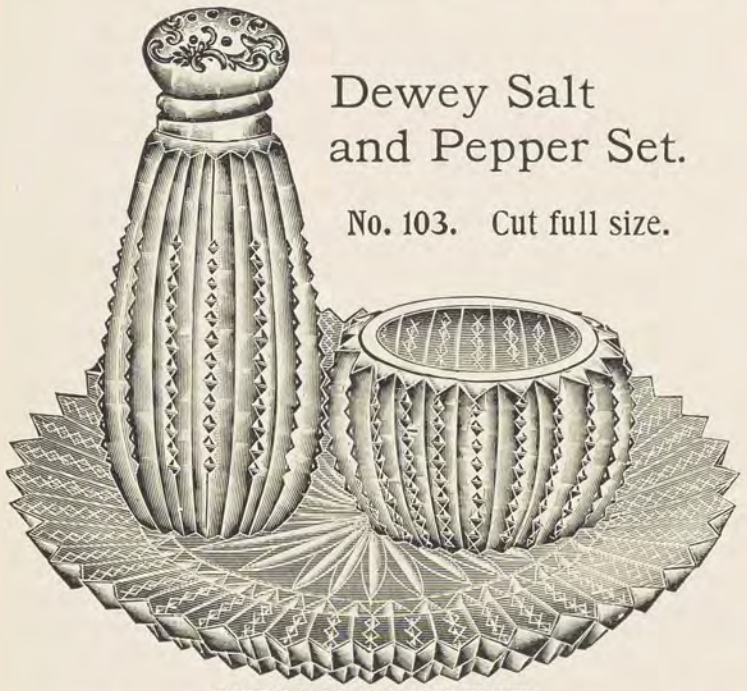
B. R. Ford is just starting up in the jewelry business at Reedsville, Wis. He purchased his opening stock in this market.

(*Continued on page 1143.*)

Don't Be Deceived ON YOUR WANTS IN NOVELTIES for your Holiday Trade

Don't delay your orders. Buy in liberal quantities. At our prices you can do a land office business.

Prices Quoted Are Net Cash



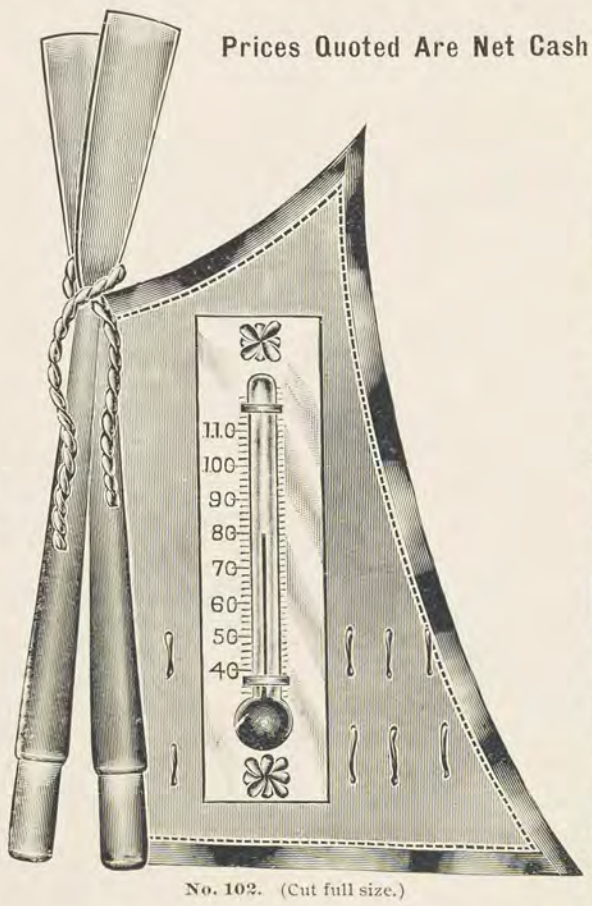
Dewey Salt and Pepper Set.

No. 103. Cut full size.

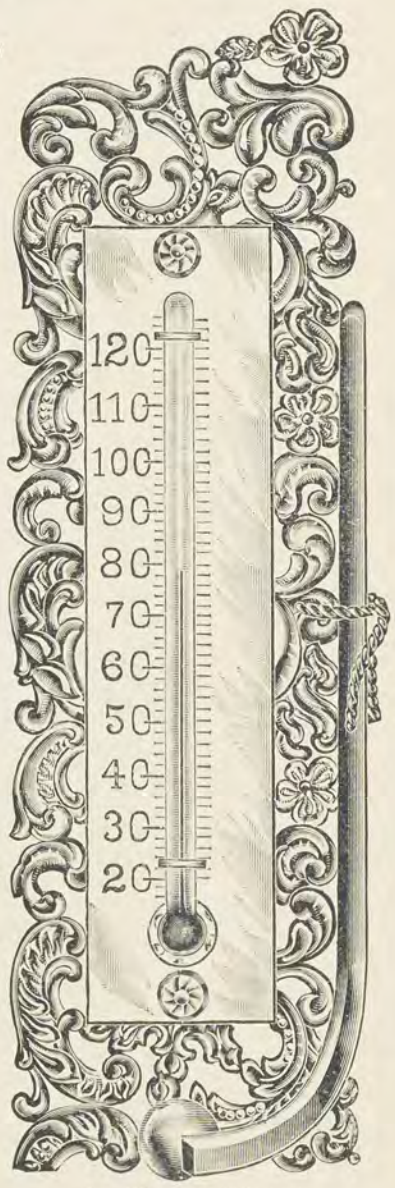
DEWEY SALT AND PEPPER SET.

(Cut full size.) Cut Glass effect; Salt Dish, Tray and Pepper Shaker, with Sterling Silver Screw Top. The most beautiful, striking and useful article ever put on the market. Having but a limited quantity on hand, we respectfully urge you in placing orders early to insure prompt delivery.

No. 103. Price per dozen sets **$2.50**
Sample set, **25c.**



No. 102. (Cut full size.)



No. 101. (Cut full size.)

A Line of FANCY THERMOMETERS at less than cost to manufacture.

Having purchased the entire line of Thermometers from the Pairpoint Mfg. Co., at a closing out sale, we are going to give our customers an opportunity to avail themselves of this extraordinary bargain. These goods are all made of the finest quadruple silver-plated and finished white metal in either gold or silver. An assortment of patterns to suit the most fastidious.

Style **No. 101** comes ornamented with golf stick (as shown in cut) base ball bat, ax, lawn tennis racket, oars, gun and game bag, etc.

Style **No. 102,** representing sail boat with oars, furnished in either gold or silver.

All Thermometers guaranteed accurate and reliable. Illustrating these goods does not do them justice. They must be seen to be appreciated. Just the thing for Holiday attractions. They are exceptional bargains, many of these patterns sold from $1.00 to $2.00 each. Don't miss taking advantage of this offer, and send your order at once, anticipating your Christmas wants, as we quote these prices while the stock lasts. No more after these are sold.

No. 101 or **102** . . . . . Each **55c.**
Per dozen, assorted, **$6.00**

TWO HOT SELLERS!

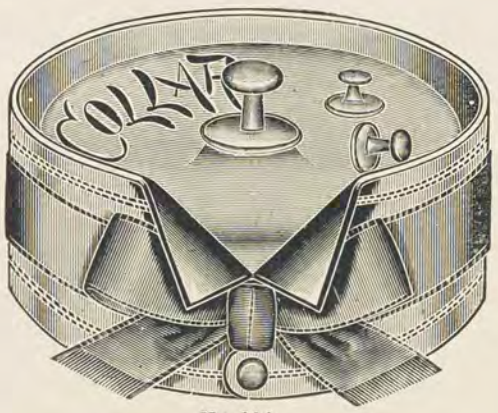
We purchased all the Pairpoint Mfg. Co. had of these Jewel and Collar Button Boxes. Take advantage of the Cut Prices by ordering early. No more after these are sold.

No. 105.

STAMP BOX.

(Cut full size.) Stamp Box. Quadruple silver-plated, on fine, hard white metal, satin finish, raised ornaments both sides. Regular price, 15c.

No. 105. Our closing out price while they last **9c.** each, or **$1.00** per dozen, net cash.

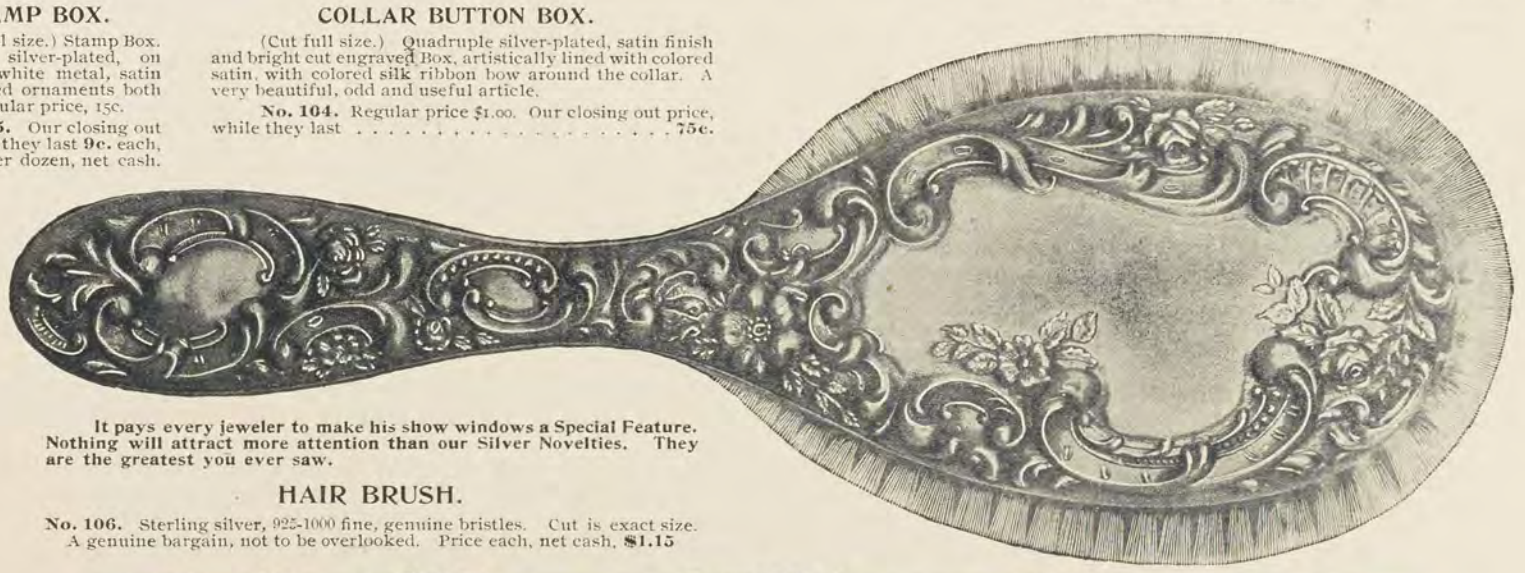


No. 104.

COLLAR BUTTON BOX.

(Cut full size.) Quadruple silver-plated, satin finish and bright cut engraved Box, artistically lined with colored satin, with colored silk ribbon bow around the collar. A very beautiful, odd and useful article.

No. 104. Regular price $1.00. Our closing out price, while they last . . . . . **75c.**



It pays every jeweler to make his show windows a Special Feature. Nothing will attract more attention than our Silver Novelties. They are the greatest you ever saw.

HAIR BRUSH.

No. 106. Sterling silver, 925-1000 fine, genuine bristles. Cut is exact size. A genuine bargain, not to be overlooked. Price each, net cash, **$1.15**

No. 107. The best yet. Fine sterling mounted comb, 925-1000 fine, guaranteed best comb in the market for the price. Cut full size. Each, net cash . . . . . **33c.**
The above two pieces, put up in a satin-lined, white glazed paper box, **15c** extra.

A. C. BECKEN

103 State Street, CHICAGO, ILL.

Chicago News.

(*Continued from page 1141*).

C. C. Abbey and Mr. Medland, who have been studying optics at the Chicago Ophthalmic College, graduated in the last class of this school. They bought a stock of optical goods before leaving the city for the purpose of opening up a retail optical business at Dallas, Tex.

C. H. Knights & Co. did the hospitable thing by their guests on Chicago day. Their offices on the third floor of the Columbus Memorial Building command an exceptionally fine view of the parade. They issued an attractively printed invitation to their customers to accept their hospitality on that day, and to make their pleasant offices their headquarters. Over a hundred of them came to enjoy the big parade but the house's hospitality did not end here. At the noon hour after their guests had gathered, lunch was announced. The menu was not elaborate but it was just what hungry people could appreciate, and consisted of hot boullion, sandwiches and hot chocolate. It was a fine lunch and everyone present voted it a most happy thought, happily carried out.

Chambers, Inskeep & Co. are now in their new location at 88–90 Wabash Avenue. They have twice the space they had in their former quarters and much greater facilities for attending to their increased business.

When in New York City recently, Mr. M. S. Benedict of the M. S. Benedict Manufacturing Co., ran across a piece of bric-a-brac which he thought would be just the thing for a novel office ornament so he purchased it and now has it installed near the door of the company's Chicago office. It is a life-size young darkey statue which sits there as life-like as can be, attracting attention from everyone happening in.

The Automatic Electric Clock Co., recently incorporated, are manufacturers of a new patented automatic electric clock at their factory, 231 South Canal Street, which they claim to be superior to any clock of the kind ever put on the market. The line is a general one, though this company are making a specialty of office, factory and store clocks. Their display at the Watch and Clock Trades Exhibit, though a hurried one, was creditable and attracted no little attention from the visiting jewelers. W. C. Bryan, well-known among the retail trade from his former connection with Hymen, Berg & Co., is the general manager of the above company.

S. J. Gardner, of San Diego, Cal., and R. W. Doig, of Sacremento, Cal., both students of the Chicago Ophthalmic College, graduated with last month's class at this institution with honor, and have returned to the Pacific coast with the intention of embarking in the retail optical business in their respective towns.

Out-of-Town Visitors.

P. H. Young, of Dodge City, Kans., spent several days in Chicago recently, accompanied by Mrs. Young. They were on their return from a fortnight's trip of pleasure and sight-seeing in the East. Mr. Young was a congenial caller at KEYSTONE headquarters, and said when asked about trade generally in Southwest Kansas, that conditions were better than ever before. "The retailers of the Sunflower State will undoubtedly do the greatest business they have ever done judging conditions elsewhere by those prevailing in Dodge City, and they are similar. Crops are just as good as they possibly can be. Our trade has kept up well all summer, and I see no reason why it should not grow better and better from now until Christmas."

W. L. Coppernoll, of Warren, Ill., was in the city recently on a business trip.

F. A. Averbeck, jeweler-optician of Clarksville, Tenn., was in town recently in company with Mrs. Averbeck, visiting at the home of her parents in this city. Mr. Averbeck, of course, calls frequently at KEYSTONE headquarters during his stay in Chicago to renew old acquaintances and recount "old road experiences" with the writer. We are always glad to meet our old friend, and glad to know that life is bright and prosperous with him in his Southern home.

W. H. Beck, of Sioux City, Ia., a familiar and always welcome visitor in Chicago, was seen among the trade last week.

J. B. Hudson, of Minneapolis, Minn., one of the prominent retailers of the Northwest, was here during the week of our autumn festival combining business with pleasure.

Dan. S. Jones, of Independence, Ia., always a welcome trade visitor here, took in the fall carnival and bought goods for the home store, all at the same time.

C. D. Strow, of Strow Bros., well-known jewelers of Fort Dodge, Ia., was in Chicago the week of the fall festivities, accompanied by Mrs. Strow. Mr. Strow was a congenial caller at THE KEYSTONE's western headquarters, and remarked that Iowa was all right this year, never better, and that Fort Dodge was beyond dispute the second best town in the State. He allowed that the other fellows could all have the "best town" in the State but that his town was the second best in the State, and no mistake.

The firm of Barstow & Phillips, Oshkosh, Wis., was represented in this market the early part of the month by Mr. Bartsow, who made a pleasant call at KEYSTONE headquarters while in town.

G. S. Pennington, of Milton, Ia., was a recent trade visitor in this market.

G. W. Kernahen, of New London, Ia., was in the city recently, and made a pleasant call at KEYSTONE headquarters. He remarked that trade conditions were excellent in his section, much better than last fall.

F. H. Tamblyn, who has succeeded to the business of J. C. Dick, at Manteno, Ill., was in the city last week on a business trip. He was accompanied by Mr. Dick who will remain with him as a watchmaker.

A. W. Crawford, of the firm of Geo. H. Cook & Co., the well-known Arizona jewelers, who have stores at Phoenix, Prescott, Tuscon and Jerome in that territory, spent several weeks in Chicago combining business with pleasure. He was a liberal buyer, as he nearly always is when he comes here, much to the delight of some of our wholesalers. Mr. Crawford dropped in at KEYSTONE headquarters during his stay.

H. B. Showalter, optician with C. A. McGregor, Pontiac, Ill., was in town taking in our Autumn Festival.

Herman Huesgen, of Devil'sLake, N. Dak., was met in one of our wholesale houses recently, where he was making liberal purchases for the home store. Mr. Huesgen said that he was enjoying his visit in Chicago very much, and was delighted with the western metropolis as a market and for sight-seeing and pleasure as well.

G. E. Sibert, jeweler-optician, of Reinbeck, Iowa, was in the city last month taking a post-graduate course in optics at the Northern Illinois College of Ophthalmology and Otology. He was also scanning the market for new things for his holiday trade.

C. H. Morrison, of Topeka, Kans., was represented in this market festival week by his brother, W. N. Morrison, who was accompanied by his wife. Mr. Morrison was buying liberally for the reason that their fall trade was demanding it.

J. Paul Duffin, jeweler-optician, of Morrison, Ill., was in the city during Festival week combining sight-seeing with purchasing late novelties for his home trade.

L. M. Bennett, of Traverse City, Mich., took in our Autumn Festival, and did holiday buying at the same time.

L. Seewald, of Tiffin, O., was among the throng of jewelers who were here Festival week. He was combining buying with sight-seeing, and expressed himself as pleased with our festivities.

H. A. Johnson & Co., Sioux Rapids, Iowa, were represented in this market recently by their buyer, Pearl Cilly, who was making liberal selections for the home store.

Will. Pitt, of Oelwein, Iowa, was a welcome trade visitor and liberal buyer in the Chicago market recently.

J. A. Cain, for a number of years past with the combination drug and jewelry store of M. C. Wilson, at Estherville, Iowa, was in Chicago early in the month buying an opening stock for the new store he and his brother have just opened at the above point. The new business will be conducted under the firm name of Cain Bros.

Bullard Bros., the well-known jewelers of St. Paul, Minn., were represented in this market recently by John Bullard, who was accompanied by Mrs. Bullard. He was selecting late novelties for their holiday stock.

W. R. Conner, of Caldwell, Kans., was in the city last week, making liberal purchases for his fall trade.

O. C. Balliett, of Waterloo, Iowa, was in town last week on a business trip.

(*Continued on page 1144a.*)

Husking Corn in Kansas.

The accompanying scene, showing how they "husk corn" out in Kansas these fine Indian summer days, is the most striking and yet the most practical illustration of the prosperity that now prevails throughout the corn belt of the West. It is a picture from life, taken in a corn field near Salina, Kans., for which we are indebted to Editor Tomlinson, of the *Chicago Dry Goods Reporter*, and take pleasure in acknowledging the courtesy. It is a fine object lesson and tells the story of the greatness of Kansas and her corn crop at a glance. As the world knows, the corn crop of Kansas is a record breaker this year. The total yield of the State is variously estimated at from 300,000,000 to 400,000,000 bushels. The wheat crop was not quite up to the average, oats were a splendid crop and hay excellent. The cattle and hog industry are making the farmers rich. In fact, prosperity envelopes the whole State as never before. The same may be said of her neighboring State, Nebraska. A conservative estimate of her corn crop is 300,000,000 bushels. Storekeepers in all lines are having and have been having a fine trade, with every prospect of the biggest holiday trade ever known in that country. The value of goods asked for and bought by the farmer is of a better class. The tiller of the soil is really becoming master of the situation. It is hard for the mind to grasp what the above figures mean. Take, for illustration, Nebraska's corn crop of 300,000,000 bushels. Counting 60 bushels of shelled corn to the load, it would take five million teams to haul the crop to market, a caravan that would reach around the world. It will take an army of 80,000 men over two months to husk it if they husk 60 bushels a day each. If loaded into cars of 30,000 capacity it would take 600,000 cars to haul the crop, a train over 4000 miles long. At no time within the past ten years has there been such a tendency on the part of farmers to look for new locations, either to better themselves or to provide homes for their children. Many sections in the East are overcrowded, while thousands of acres of rich, well watered lands can still be had in Nebraska and Northern Kansas at comparatively low prices. These States will naturally look for a large immigration, as the harvest excursions that began October 3d and lasted until October 17th hauled thousands of home-seekers into these States from the East.

Workshop Notes.

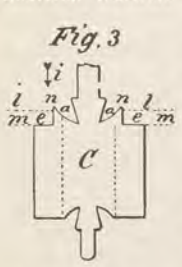
Subscribers wishing inquiries answered in this department must send name and address—not for publication, but as an evidence of good faith. No attention will be paid to anonymous communications. Questions will be answered in the order in which they are received.

"*Changeable.*"—(1) *I have a ten-karat gold ring which in cloudy damp weather turns black, and in clear weather resumes its natural color. Will you please explain the cause?*—We hold there is nothing occurs in nature which cannot be rationally accounted for, but sometimes it is extremely difficult to obtain all the facts which bear on the subject. Very frequently the real cause, being somewhat obscure, escapes our attention. It is a well-known fact that perspiration will stain low karat gold, hence it may readily be conceived that in gloomy weather when the thermometer ranges perhaps only moderately high, but with great humidity of the atmosphere which produces a strong tendency to sweat, that a low karat ring would darken. It is, however, much more likely that we are deceiving ourselves than for an unusual and unaccountable phenomenon to present itself.

(2) *Do they ever solder by electricity?*—Yes, there are two processes for soldering by an electric current: (*a*) To deposit metal between the severed ends by electro-deposition; (*b*) to fuse solder at the joint on a plan similar to that pursued in electric welding. Neither method, however, has so far assumed a practical form.

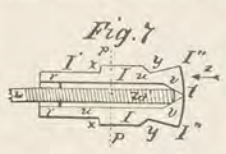
"*Guard Pin.*"—(1) *Should the leaves of watch pinions be oiled?*—Not to lubricate them. It is a good plan, however, to sharpen a pegwood to a sort of wedge-shape, so that it will fit the space between the leaves, and then dip it in melted vaseline, wiping away all you conveniently can, and then go through all the leaves, rubbing the pegwood back and forth lengthwise of the leaves. Such plan cleans out all adhering dirt and preserves the pinion from rusting, and, no doubt, to a certain degree lubricates the contact surfaces of the teeth and pinion leaves.

(2) *How to set a leaved pinion in a wheel correctly?*—In the olden days of watchmaking handicraft it was held as one of the jobs which demanded the highest technical skill to execute in a workmanlike manner The construction of cheap watches by the million, where machinery and low-priced labor ruled the day, such matters as finish were overlooked, and wheels were set on hubs which were staked on the arbor of the staff. We have noticed, however, that the American factories have gone back to the more elegant practice of setting the wheel directly on to the leaves of the pinion. We show at Fig. 3 a vertical section of a pinion on which the wheel is set directly on the leaves. In the cut at Fig. 3 the dotted lines *l m* represent the thickness of the wheel. The pinion is turned with a shoulder at *e* on which the wheel rests. The pinion leaves as they are cut back to form the seat for the wheel are shaped so that each leaf forms a projecting point as shown at *n n*. The ends of the leaves are also cupped out at *a* so as to form a highly polished concave inside the wheel at its center. The points *n* rise above the upper surface of the wheel, and in the operation of staking on these ends are folded or clinched down on the brass wheel with a hollow punch highly polished on its face, after which the wheel and ends of the leaves at *n* are lapped off dead flat and polished. The inside hollow cone at *a* is also touched up in polish. In old time practice all this had to be done by hand, but in modern practice delicate machinery supplants the old handicraft skill. But in either case the methods are about the same, the great care being to shape the seat at *e* properly, and leave the angle at *n* only long enough to fold over with a slight clinch on the wheel.



(3) *How to temper brass, that is, to harden it?*—There is no known way to harden brass except by compression produced by hammering or rolling.

(4) *The best cement to fasten a brass back on a pearl button?*—What is usually required is the reverse of this, that is, to fasten a pearl back on a brass button. But the same policy holds in either case. There is no secure way except to force the brass into an undercut recess in the pearl, or to wrap brass or other metal over the pearl. We show at Fig. 4 an inside view of a pearl button back. At *E* is cut a recess to receive the metal part of the button. The shape of this recess is better shown at *E*, Fig. 5, where we show a section of the button on the line *g*, Fig. 4, seen in the direction of the arrow *b*. It will be seen that the recess is slightly concave at *h* and undercut at *c c*. We can readily understand what would be the effect if we placed the foot of a metal button shaped as shown at Fig. 6, where the foot *I* is convex on the upper side; but the idea is, the foot will just enter the recess *E*, in which position, with suitable dies, the foot *I* is first flattened and then given a concave shape as indicated at the dotted lines *d d*, Fig. 6. A button back so put on needs no cement. In fact, no cement made will hold securely any parts subjected to such stress as a button. It is an easy matter to undercut a recess like *E* by placing a rose drill of the proper shape in the lathe. The idea is, a convex end drill first cuts the recess *E*, and the second drill expands, instead of cutting deeper, and undercuts at *c*, Fig. 5. To make such a drill take a piece of steel wire a trifle larger than the diameter of the recess *E*, Fig. 5. The piece should be about 1″ long, and have one end turned to such a size as will go into a large wire chuck. We show such a longitudinal section of such a drill at Fig. 7. At the end *I′* the wire is turned to fit a large split chuck. The outer end *I I″* is turned to the shape shown, that is, conical, and so the base of such cone is outward. From the rear the piece *I* is drilled out as indicated by the lines *u u*. This hole has a taper ending at *v v*. The idea is, there is a wire which extends from the hand wheel of the drawing-in-spindle to the nose *I″* of the chuck *I*. This wire *w* has a screw cut on the end which enters *I*, said screw passing through a brass nut soft soldered in *I′* as shown at *r*, Fig. 7. For better understanding we show the wire *w* separate at Fig. 8. This wire should be long enough to reach through the spindle to the front end of the piece *I*, and at the back extend out from the hand wheel, say ½″, and be provided with a knurled head as shown at *w″*, Fig. 8. It will be seen that as we force the thick nose of the screw *w′* forward it will expand the end *I′*, from the fact that the end *I* is split into four parts as shown at *s s s s*, Fig. 9, said cut being a view of Fig. 8, seen in the direction of the arrow *z*. The outer edge of *I″* is cut into teeth with a graver and then hardened. The splits in *I″* extend back to the line *p*, Fig. 7.



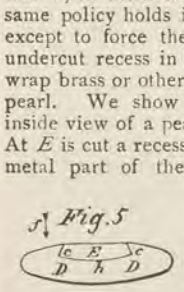
(5) *What kind of stain and varnish is used on violins and where can I get them?*—The stain for violins is easy to get, that is, if the old varnish is removed down to the wood, in which case the stain is made by some coloring substance dissolved in water. Most of the stains applied to old wood was watery decoctions of vegetable matter according to the taste or whim of the violin-maker. The so-called diamond dies afford an endless choice of color. The varnish for violins is something which violin-makers are as choice about as an old maid is about the color of her ribbons. You had better write to the violin-maker, Mr. Albrecht, Ninth Street, below Walnut, Philadelphia, as regards varnish.

(6) *How to open a hypodermic needle which has become clogged?*—There is but little that can be done for such a needle except to pass a wire through the opening. In case of emergency the stoppage can be removed by heating red-hot and rehardening, which operation burns out the obstruction.

"*Negative.*"—*Please tell me how to fix a negative so as to print a bust picture with light background?*—There are a great number of ways for producing "vignette" effects in printing so as to have either light or dark background. If you desire a light background paint over the back of the negative with India ink washes to give cloud effects which vanish from transparent glass in the center to inpenetrable black at the margin. It is not necessary that the shading should be very perfect as the thickness of the glass softens the effect in printing. The plan usually adopted by professional photograpers is to cut irregular openings in two or three thicknesses of dark paper such as negatives come wrapped in, placing these so they shield the margin of the negative in the printing frame. Where a dark margin is wanted, the picture is printed first and then the center is protected from the light, while the surrounding surface of the paper is allowed to darken.

"*Bismuth.*"—(1) *Please give formula for plating spoons by the dipping process.*—The alloy for "dip plating" is composed of tin 90 parts, lead 9, silver 1 part. The tin is first melted, and when the surface has a lustrous white color, the lead is added in a granulated state and stirred with a pine stick. The silver is added in the melted state and the alloy again well stirred, continuing the heat until the melted metal has a light yellow color. Stirr again and cast into bars. To plate with this alloy melt it in a deep crucible in order that the articles to be coated can be dipped endwise into it. To prepare the articles, say knives, for plating they are first dipped into diluted hydrochloric acid, then rinsed with clear water and afterward dried and rubbed with soft leather, then exposed in a muffle to a temperature of 160° to 175° F. for five minutes, when they are ready for dipping in the melted alloy above described, which should be kept melted at a moderate heat and stirred occasionally with a pine or poplar stick. The knives should remain in the melted alloy for a minute or two, after which they are removed and dipped into cold water, from which they are taken and rubbed dry without heat.

(2) *What is used as a quicking solution to remove rust, grease, etc.?*—So-called quicking baths are not used for the purpose you name. Quicking baths are made by dissolving an ounce of nitrate of mercury in a gallon of water, in which brass, German silver and copper articles are dipped to cause silver and gold electro-plating to adhere better. For removing rust a dilute mixture of sulphuric or hydrochloric acid is employed. The mixture varying from fifteen to twenty parts of water to one of acid—mixing by weight. To remove grease hot solutions of caustic potash or soda in water are made use of.



"*Front Back.*"—(1) *How to raise the front lid of, say an O-size, so as to take a higher glass and prevent hands from catching?*—Watch case makers never speak of the "lid" to a watch case—they say "front back" and "back back." There is no practical method for a workman with no more facilities than are usually to be found in a repair shop to raise a back; and to fit up the necessary appliances for doing so would cost more than it would to send such extra jobs to the case makers for twenty years.

(2) *How can I make a nickel-plating solution to deposit with a single battery?*—In order to decompose the only really reliable nickel-plating solution, and by this we mean one made up of the double sulphate of nickel and ammonium, an electric pressure of at least four volts is required, which can be compared to the force of two Bunsen cells. There is a method by which iron or steel articles can be nickel-plated by boiling, but the coating of nickel is very thin and practically of but little use. The process is as follows: To a five or ten per cent. solution of chloride of zinc add enough nickel sulphate to give the solution a deep green color. The articles to be coated are placed so as to not touch each other in a porcelain-lined vessel and boiled for half an hour. After which they can be taken out and well rinsed and subsequently polished with chalk.

(3) *How are zinc solutions made to deposit with single battery?*—Electro-plating with zinc has never been satisfactory. The so-called galvanized iron coated with zinc is done by dipping the iron in melted zinc. All the truly electro-processes for depositing zinc require above three volts electric pressure, consequently no single cell battery will work them. A boiling process can be resorted to to give a slight coating of zinc to copper and brass articles. It is conducted as follows: Pour over finely divided zinc a strong solution of sal ammoniac and heat to the boiling point. The mixture should be made and heated in a porcelain-lined vessel. Copper or brass articles freed from grease and oxide, and boiled in this solution, are quickly coated with a bright deposit of zinc. Iron articles, if first coated with copper from an alkaline solution by electricity, can be zinc coated in this way, and if placed in oil and heated to about 284° F. will assume a golden color similar to tombac.

"*Chronometer.*"—(1) *A young man opening the watch and jewelry business in a seaport town of considerable importance would like to know where to buy nautical goods and chronometer material and other goods such as a trade of that kind would call for?*—Riggs & Brother, 310 Market Street, Philadelphia, can supply you with about everything you require.

(2) *Is there any regular system for comparing chronometers with a clock when rating in order that the slightest fraction of time may not be lost? I mean in getting an absolutely correct rating.*—There is no special method pursued for such comparison. Close rates are only obtained by repeated comparisons, that is, day after day and an average is taken.

(3) *Please name the chief articles which would be called for in a place catering to the nautical trade.*—Our advice would be to start with such things as your judgment tells you will sell, and then add to the stock as you have inquiries made.

"*Achromatic.*"—*Will you kindly tell me where I can procure flint glass such as is employed for making achromatic lenses for cameras? I understand that crown glass such as is used for spectacles is used in connection with flint glass for such purposes. Will you please give proportionate power and arrangement of crown and flint glass lenses for making an achromatic combination?*—You can procure glass for achromatic lenses of Emer & Amend, 205 Third Avenue, New York City. The principles on which achromatic lenses for photographic cameras are made are much too complicated for explanation in this department. You can get a very good idea of the proper arrangement of such lenses from the *Scientific American Supplement*, No. 691; price, 10 cents. Address, Munn & Co., 361 Broadway, New York City.

"*Balance Truing.*"—*I would like to have your opinion about the Hardinge Bros'. balance chuck, and is it really as useful as they claim it to be? Is it possible to true up a balance while it is in a chuck?*—We think you are mistaken about the Hardinge Bros. making a chuck which they claim can be used for truing a balance. They make a chuck in which a balance can be placed without removing the hairspring or roller for touching up the pivots, but they make no claim for it as regards its being adapted to aid in truing a balance. We do not think a balance truing device could, to advantage, be combined with a chuck. To get satisfactory results in truing a balance the staff should be supported at both ends.

"*Show-Windows.*"—*What material must one use, and the modus operandi for painting on the outside of show-windows so that it cannot be washed off?*—Any oil color painted on the outside of glass will, after it is dry, stand washing. The usual plan with such outside lettering was to employ some sort of oil size or varnish and mix with it bronze powder which, when first done, had a semblance of gold, but the action of the air soon changed the gold look to somber brown, and then to a dirty green. By mixing such bronze powder with transparent celluloid lacquer the gold luster of the bronze can be maintained even in the open air for a long time. The druggists who sell the diamond dies have the bronze powders and the varnish to mix them with.

Chicago News.

(*Continued from page 1143.*)

The firm of L. M. Bassett & Son, Coldwater, Mich., was represented in this market recently by Harry Bassett, who was here making purchases for the holiday trade.

Mell Crews, of Arcolla, Ill., was represented in this market recently by Mr. Barenderk, who bought liberally for the home store.

Among the throng of trade visitors who were in Chicago during the Autumn Festival season were the following: J. W. Neasham, Ottumwa, Iowa; Mrs. O. K. Glimme, Whitewater, Wis.; F. Witter, Storm Lake, Iowa; A. Gluck, Dodge City, Kans.; W. H. O'Connell, Audubon, Iowa; P. F. O'Connell, Atlantic, Iowa; Wilmer D. Nelson, Pierre, S. Dak.; C. J. Clies, South Bend, Ind.; E. G. Gifford, Hannibal, Mo.; Geo. D. McCammon, Oxford, Iowa; N. C. Larson, Batavia, Ill.; J. W. Veitch, Rossville, Ill.; T. H. Reid, Perry, Iowa; E. W. Thatcher, Milwaukee, Wis.; C. D. Gardner, Manistee, Mich.; F. H. House, Galva, Ill.; Louis Cronan, Kewaunee, Ill.; A. T. Allen, Valparaiso, Ind.; Geo. Quirk, Houghton, Mich.; W. A. Johnson, Tuscola, Ill.; J. Schneider, McHenry, Ill.; A. L. Norberg, Bessemer, Mich.; C. H. Tourville, Tomah, Wis.; W. S. Still, Delevan, Ill.; N. R. Combstock, Rockton, Ill.; H. Schwartz, Monticello, Ill.; C. F. Dunbar, Wausau, Wis.; F. M. Keely, Forest, Ill.; Mr. and Mrs. Nicholls, Kenosha, Wis.; Mrs. R. O. Gottfredson, Kenosha, Wis.; H. Griffith and wife, Rushville, Ill.; A. H. Nash and wife, Elizabeth, Ill.; L. O. Gale, Mitchell, S. Dak.; W. H. Greenut, Green Bay, Wis.; O. Nelson, Prestigo, Wis.; Gus. Huber, West Superior, Minn.; Harry D. Oldham, Urbana, Ill.; W. K. Gibbs, Hannibal, Mo.; A. C. Sweet, Buda, Ill.; R. J. Kewin, Griswold, Iowa; C. R. Underwood, Racine, Wis.; W. H. Clawsen, Monocqua, Wis.; J. T. Bosweck, Port Washington, Wis.; Frank Thayer, Rockford, Ill., and N. E. Benoit, Rockford, Ill.

Fred. Overstreet, of Paxton, Ill., and Mrs. Overstreet were here Festival week, taking in the sights and making purchases for the home store.

Anthony Rost, of St. Peter, Minn., and Mrs. Rost, were interested and delighted visitors here during our Autumn Festival. They were combining business with pleasure.

Mrs. Turner, wife of Jeweler Dan. Turner, Sarnia, Canada, was here during Festival week, enjoying the gala season.

Geo. B. Bement, of Broadhead, Wis., was in the city during the Autumn Festival season, buying holiday goods and watching the processions and the State Street push.

Will. H. Richaby, a well-known Michigan jeweler, for a number of years located at Belding but recently having moved to St. Joseph, the same State, where he has opened up in good style, was here several days of the Festival season buying goods for the new store.

T. H. Hollister, of Freeport, Ill., a former traveling salesman but now a prosperous jeweler at the above point, was a welcome trade caller here last week.

H. V. Taylor, of Waterloo, Iowa, was here last week, on a purchasing errand.

F. L. Butters, of Prairie City, Iowa; was here buying and seeing the attractions of the Western metropolis during the season of Fall Festivities.

E. R. Von Seutter, of Meridian, Miss., was a welcome trade visitor here during our Fall Festival season and was buying liberally for the home trade.

Ezra Nuckolls, of Eldora, Iowa, was in the city last week selecting his holiday goods.

L. W. Otto, of Crawfordsville, Ind., was in the city for a few days during the Festival season, combining business with pleasure.

Martin & Hoerr, of Mankato, Minn., were represented in this market last week by Frank Hoerr, who was here on a purchasing trip.

W. C. Abbott, of Birmingham, Ala., was a graduate of the last class at the Chicago Ophthalmic College, Before returning to his home, he bought an opening stock of optical goods, and will open up in the above city as the Birmingham Optical Co.

J. H. Stouthamer, of Milwaukee, Wis., accompanied by Mrs. Stouthamer, were here several days during the Fall Festivities, taking in the sights and scenes of that gala occasion.

R. W. Chamberlain, jeweler-optician, of Marshalltown, Ia., was among the throng of buyers here Festival week. Mr. Chamberlain found time to call at THE KEYSTONE'S western headquarters, and say that he never before had enjoyed a better business and that his section of the Hawk-eye State was anticipating a big holiday trade.

H. J. Bird, of Aurora, Ill., a frequent trade visitor in this market, was seen among the throng of Festival week.

M. L. Jones, of Fairfield, Nebr., came here to see the gala times of Festival week, and do his holiday purchasing.

Mrs. F. C. Toepp, wife of Jeweler Toepp, of South Bend, Ind., was an interested visitor here during our Fall Festival celebration.

H. H. Feige, Lake City, Iowa, was a trade caller here during Festival week.

H. G. Gebhardt, of Flandreau, S. D., was among the throng of out-of-town jewelers here during the Autumn Festival. When met by THE KEYSTONE representative, he remarked that he was enjoying the sights and the crowds immensely, and that he was buying liberally for the reason that he was anticipating a fine fall and holiday trade.

E. H. McKee, of Sun Prairie, Wis., was in the city Festival week making purchases for the home store and enjoying the processions and the big crowds that were here.

J. W. Hamilton, of Danville, Ill., was a visiting buyer in this market yesterday.

M. Hainer, of McComb City, Miss., has been a liberal buyer in the Chicago market the past few days. Mr. Hainer is the time inspector at the above point, and enjoys a large railroad trade.

Frank R. Cross, of F. R. Cross & Co., Columbus, Ohio, is in town to-day shaking hands with old friends in the trade. Mr. Cross is the former well-known sales agent of the Columbus Watch Co., but at present a prosperous retail jeweler at the Ohio capital.

P. A. Peterson, of Cannon Falls, Minn., was here Festival week combining business with pleasure.

T. L. Combs, of T. L. Combs & Co., Omaha, Nebr., was in the city Festival week making fall purchases and enjoying the sights of the Western metropolis during her gala week.

W. G. Fay, the well-known optician of Springfield, Ohio, was in the city Festival week calling on the trade and seeing the sights of the Western metropolis.

Jeweler Jas. F. Lukens, of Union City, Tenn., was represented in this market during the week of our Autumn Festival by his jeweler and optician, L. T. Little.

Chas. H. Johnson, of Marshall, Minn., was in Chicago during her gala Festival week, combining business with pleasure.

Will. J. Searle, of Petosky, Mich., was among the throng and push here during Festival week.

Herman Hiss & Co., of Bay City, Mich., were represented in this market during Festival week by their watchmaker, Herbert M. Crothers.

E. H. Holter, of Oberlin, Ohio, was a welcome visiting buyer among the throng of Festival week.

We are not often addicted to printing poetry, but we have been handed the following by Fred. Sheridan, of the Horton-Angell Co. He says the stanzas are the muse of Gus. Rodenberg, of S. & B. Lederer, and Rodenberg returns the compliment by saying that Sheridan is the author. The fact of the matter is we never before heard of these gentlemen as writers of poetry—they sing the song of business every day; we do not believe either Sheridan or Rodenberg were ever accused of being poets. It must be a mistake or a huge joke. But let these men of business settle this little matter of authorship among themselves—we will read the poetry, which, by the way, is not bad:

We've got the finest summer weather,
The best lake breezes altogether,
In Chicago.
The greatest parks and boulevards,
The tallest men for crossing guards,
And the loudest smelling cattle yards,
In Chicago.

The sky is that of Italy,
The girls can ride their bikes quite prettily,
In Chicago.
The women have the smallest feet,
We beat the world in packing meat,
And we can show the dirtiest street,
In Chicago.

The office buildings are the tallest,
The death percentage is the smallest,
In Chicago.
No other town is fit to mention
To hold a national convention,
And thieves retire on a pension,
In Chicago.

We've got the most evangelists—
Our specialty is philanthropists,
In Chicago.
We send more soldiers to the war
Than any city near or far,
And crowd more passengers in a car,
In Chicago.

The air is full of health—and dust—
'Tis not controlled by a trust,
In Chicago.
We've got the cleanest chimneys yet,
The biggest surplus, the smallest debt,
And purest water—all to get—
In Chicago.

Origin of Our State Names.

Alabama—An Indian name, meaning "Here we rest."

Arkansas—From the Indian kansas, "smoky water," with the French prefix ark, "a bow."

California—For an island of the name where gold was found, in a Spanish romance.

The Carolinas—In honor of Charles II, the Latin version of whose name is Carolus.

Colorado—Name means red or ruddy, from the color of the water of the Colorado River.

Connecticut—Indian name, "a long river."

The Dakotas—For the Dakota Indians.

Florida—A Spanish word meaning "blooming," flowery.

Georgia—In honor of George II.

Idaho—An Indian name.

Illinois—From the Indian "illini," men, and the French affix, "ois," making "tribe of men."

Indiana—From the word "Indian."

Iowa—Indian word meaning "drowsy ones."

Kansas—In Indian means "smoky water."

Kentucky—Indian "kaln-tuck-ee," at the head of the river.

Louisiana—In honor of Louis XIV.

Maine—So called to distinguish from the islands along the coast.

Maryland—In honor of Menrietta Maria, Queen of Charles I.

Massachusetts—Indian, "country about the great hills."

Michigan—Indian, "great lake."

Minnesota—Indian, "cloudy water."

Mississippi—Named for the river, name meaning "the great father of waters."

Missouri—Name means "muddy water," said in reference to the muddiness of the Missouri," a tribe of Indians.

Montana—Spanish word, meaning "mountain."

Nebraska—Indian, meaning "shallow water."

Nevada—A Spanish name, meaning "snowy."

New Hampshire—In honor of Hampshire, England.

New Jersey—For the Island of Jersey, in the British Channel.

New York—For the Duke of York, brother of Charles II.

Ohio—The Shawnee for "the beautiful river."

Oregon—From the Indian, meaning "river of the west," or the Spanish word oregano, "wild thyme," which is abundant on the coast.

Pennsylvania—"Penn's Woods," in honor of William Penn, and the Latin word sylvania, meaning woods.

Rhode Island—From its fancied resemblance to Rhodes in the ancient Levant.

Tennessee—In Indian means "river with the great bend."

Texas—Probably a Spanish name.

Utah—An Indian name.

Vermont—From the French "verb mont," green mountain.

The Virginias—In honor of Queen Elizabeth, the "Virgin Queen."

Washington—For George Washington.

Wisconsin—Indian for "kild and rushing channel."

Wyoming—An Indian name.

The Sunshine of Business.

There is some cause for the skepticism of the semi-occasional advertiser as to the good results of advertising. He has spent money for the publication of business announcements, and has had at the most merely a spurt of appreciable returns therefrom, after which his trade again stagnated. For this reason he is prone to jump at the conclusion that advertising does not make business grow. Naturally, in his case it does not. If the sun should shine only about six times a year Nature's great scheme of development would be checked. It is that marvelous and never-ending regularity of the great orb of day which produces the comforts and luxuries of mankind. In like manner persistent advertising stimulates and renders profitable the tradesman's business. But good, live advertising is an absolute essential of this season. Competition makes it imperative if the jeweler desires a fair share of the holiday trade.

"Can't do without The Keystone. Every number is worth double the price of a year's subscription, so here is your old lead dollar. Just keep sending it along and don't let me miss a single number. Long may The Keystone live."—I. D. Davis, jeweler, Narka, Kansas.

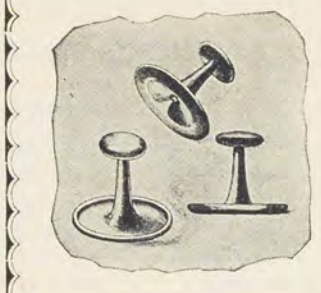
A SAMPLE

of our

Dover Rigid, Solderless Collar Button

Mounted on Circular, as below,

SENT FREE to any Responsible Merchant in the World



Buy of the Maker.

"MONEY SAVED is MONEY EARNED"

Price, $12.00 per gross.

For Pearl Backs, $1.50 per gross extra.

Terms: 6 per cent. 10 days.
5 " 30 "
or Net 60 "

F. O. B. Providence.

Patent Allowed.

MADE ON HONOR AND MADE TO WEAR.

The Dover Rigid, Solderless Collar Buttons.

GENTLEMEN:

We present for your careful consideration a sample of our new Dover Rigid, Solderless Collar Button, which we believe we are justified in claiming to be the best made button in the world for the price. Careful examination of buttons at this price (samples of which we keep constantly before us) have enabled us to avoid their weak points and bring our button up to a **Standard** of **Excellence** only obtained by application of scientific principles in the matter of construction.

The Stock used is **12 K. Rolled-Plate,** the post runs up through to the upper part of the head, thence a convex plate is rolled over the head, meeting a concave cup bringing the greater force of resistance fully 1-16 inch below the top of the post. This we claim makes it the most **Rigid Button** extant. If we have had faith enough in the mercantile possibilities of this button to invest Thousands of Dollars in its production and in advertising it extensively, we believe you are justified in sending us a trial order.

This guarantee will be printed on every card upon which they are mounted:

> "The Dover Rigid, Solderless Collar Button is perfectly made, rigid in construction and should not collapse. As exception proves the rule a new one will be sent in exchange for every button that does not prove satisfactory either to the dealer or consumer."

Unless otherwise ordered they will be mounted on transparent celluloid same as this card which is an entirely new feature and original with us.

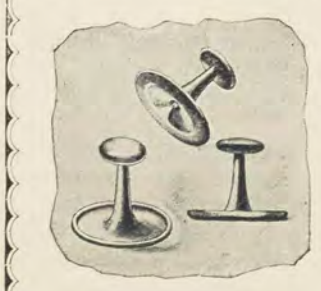
Awaiting your commands, we are,

Yours truly,

GEO. W. DOVER,
Manufacturer of
Jewelers' Findings, Collar Buttons, Settings, Etc.
PROVIDENCE, R. I, U. S. A.

Reference,
R. G. Dun & Co.

Cable address, "Dover."



Philadelphia Notes.

Business continues satisfactory, and an unusually voluminous and remunerative holiday trade is anticipated. The Exposition is attracting large crowds, and many of the visitors take advantage of the opportunity to make needful purchases in jewelry and other stores. The local factories are quite busy and employing the full quota of hands. In fact, there is employment at good wages for all, so that much cash will be available for gift-purchasing during the holidays.

The wholesale trade are overwhelmed with business, and even so early as this some of the concerns find it necessary to work overtime to fill orders. All report that the bulk of the demand is for a better class of goods than for many years past.

The establishing of the Commercial Museums, the successful organizing of the National Export Exposition, the recent great celebrations, the Commercial Congress, and the many other means devised to bring trade and advance the prestige and interests of Philadelphia, are arousing the admiration of other cities. The New York *Press* says: "Philadelphia never was a sleepy town, and where she got the name is not quite clear. She had the first bank in America, the first savings bank, manufactured the first brooms, was the first to export cotton, had the first city directory, was the first to use gas in a theater, had the first insurance company, published the first newspaper in a foreign tongue, had the first literary journal and the first daily newspaper, was the first to number residences and business houses, had the first paper mill, built the first turnpike road, organized the first anti-slavery society and constructed the first steam engine used in America. Anything slow and pokey about that?" Of course not, and she is still taking the initiative in the march of progress.

Chester had a centennial celebration last month, and it was a great success. Many relics of a century ago were on exhibition, one being a grandfather's clock, formerly the property of Benjamin Franklin. It is in a good state of preservation and continues to tell the time faithfully.

The Pennsylvania, Reading and Baltimore and Ohio Railroads have arranged for a series of low-rate excursions to the National Export Exposition during November from points within their respective territories. In addition to the low-rate tickets, good only on day of issue, the railroads have arranged special rates for a series of excursions to the Exposition with a ten-day limit.

Percival Roberts, president of the Pencoyd Iron Works, presented a gold watch to each of the men who superintended the erection of the Atbara bridge, in the Sudan, Africa.

H. O. Hurlburt, of H. O. Hurlburt & Sons, returned from Europe on October 10th, on the Red Star liner *Westernland*. He spent the summer in England and Holland, visiting places of interest.

The executive committee of the Philadelphia branch of the Jewelers' League held a meeting on the evening of October 19th at the Manufacturers' Club, and decided to call a general meeting of the Philadelphia members on November 14th, to which the officials of the New York Society will be invited, and some propositions offered to facilitate getting new members, and for the general welfare of the league.

J. E. Caldwell & Co. were awarded the contract for making the prizes for the United States golf championship contest, held last month.

Howard Thornton, traveler for McIntire, Magee & Brown, was married on September 20th to Miss Reifsnyder. The honeymoon was spent at the seashore. Mr. and Mrs. Thornton have the best wishes of a host of friends, THE KEYSTONE among the number.

Harry Hamilton, son of Matthew Hamilton, who recently retired from Hamilton & Diesinger, has started in business as a silversmith at Thirteenth and Sansom Streets.

The contract for the prizes to be given to the successful contestants at the annual boxing tournament of the Philadelphia Athletic Club was awarded to Simons, Bro. & Co.

Jules Levy, formerly of Bernard Levy & Son, and latterly of the Ajax Metal Co., is now with F. W. Gesswein Co., New York.

Daniel G. Langendorf, of Camden, a well-known jeweler, died last month. He was a member of Camden Lodge, No. 15, F. and A. M; Cyrene Commandery, No. 7; Siloam Chapter, No. 19; the A. O. U. W.; a trustee of Centenary M. E. Church; treasurer of the Mutual Building and Loan Association; director of the Central Trust Co., and a large land owner at Island Heights, N. J. He was highly respected and had a host of friends.

J. E. Limeburner & Co., opticians, have moved from Chestnut Street, near Broad Street, to 1702 Chestnut Street.

Gabriel H. Mayer, of Geo. Mayer & Co., who returned from Europe early last month, reports business good in France, Switzerland, Germany, Holland and England. He made extensive purchases for the firm, and had a splendid time hobnobbing with many celebrities and sight seeing.

W. H. and J. C. Dotter, who for a number of years have conducted a jewelry store at 1837 Columbia Avenue, have dissolved partnership by mutual consent. W. H. Dotter has retired and J. C. Dotter will continue the business at the same location.

November 7th will be "Jewelers' Day" at the Exposition. On that day the members of the Philadelphia Jewelers' Club will visit the Exposition in a body and be formally received by the officials. The suggestion was made by President J. Warner Hutchins, and met with unanimous approval. The club has changed the date of the regular monthly meeting of the board of directors from the first Tuesday of every month to the second Tuesday of every month.

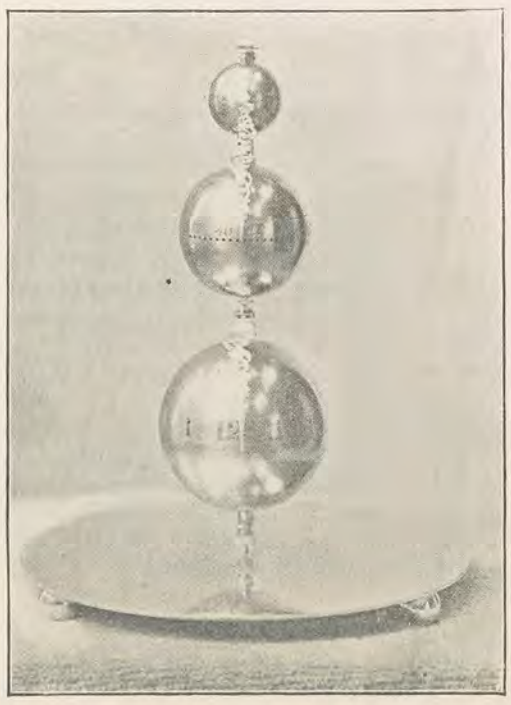
G. F. Kolb's Sons, manufacturers of jewelry and silverware cases, trays, chests, etc., at 732 Sansom Street, were recently honored by the city with the contract for the case wherein reposes the album presented in behalf of Philadelphia to Admiral Dewey. The case was made from wood taken from the beam in Independence Hall on which the Liberty Bell was hung. When the contract was filled, Kolb's Sons were further honored by the special thanks and felicitations of the city on the extreme beauty of the case, which was, indeed, a work of art and a triumph of skillful workmanship.

The annual meeting of the Pennsylvania Optical Society brought quite a number of the optical fraternity to this city last month. They took advantage of the occasion to visit the Exposition and make purchases of stock. A report of the annual meeting will be found in the optical department.

Charles Borch, a retired jeweler and watchmaker, died suddenly, on October 25th, of what his physician said was paralysis. He was sitting in a comfortable arm-chair reading the Bible at the home of his son, Otto Schymik, 2229 Huntingdon Street, when his head dropped forward and he was dead. Mr. Borch had suffered for several years from asthma and had been blind in one eye for five years, as a result of a paralytic stroke. He was eighty-two years old.

A Horological Curiosity.

The above timepiece is a curiosity in globe clocks. Single globe clocks are not uncommon, but one consisting of three revolving globes is a decided novelty. The largest globe records the hours, the middle one the minutes and the smallest one the seconds. The clock was made by G. Jeager, of Philadelphia, and the secret of its workings has puzzled many of the craft who examined it. It is very prettily constructed and has excellent time-keeping qualities. As a mechanical curio or window attraction it ranks high, and evidences mechanical genius of a high order in the maker.



Cincinnati Letter.

Trade in the jewelry lines continues to improve over that of last year, both in the retailing and jobbing lines. One of the most welcome trade events in Cincinnati's territory is the betterment of the price of cotton—the great staple of the South. There is an active movement in grain and corn, indicating continued prosperity for the farmers of the West and Northwest. The enormous production, consumption and exportation of agricultural products and manufactured articles is shown by the reports of the great carrying companies. The fall festivals and celebrations that have been held in several of the large cities proved a great stimulus to the retail trade in almost all lines. This year the influx of country visitors was larger than ever before and, owing to the fact that labor is well employed, the crowds that thronged the streets were buyers as well as spectators. The cotton market has been firm and even at the higher prices prevailing of late considerable business is being done. Receipts at interior points are quite large, but at the shipping points a much smaller amount of cotton is coming to hand and it is evident there is a tendency on the part of planters to hold for even better prices. As compared with a year ago, present prices indicate an average increase of over five dollars a bale, which will be a very material addition to the wealth of the South. The chief item of strength is the unusually large business which is being done not only by cotton manufacturers in this country but abroad, and the heavy demand for cotton which must follow.

The Chamber of Commerce has appointed a committee on industrial affairs, who will employ a competent man to give his whole time to carrying out the plans of the committee for booming Cincinnati. W. S. P. Okamp, of Oskamp, Nolting & Co., is on the committee.

The Homan Silver Plate Co. is now running day and night, trying to make goods to fill the orders that are coming in with a rush that cannot be kept up with. This concern is doing a large foreign business as well as a domestic trade that is very gratifying.

The Cincinnati Credit Men's Association has met with success in its effort to enlist the co-operation and support of the banks, and at the next meeting a number of the leading local bankers will become members of the association. It is believed that a close affiliation of the credit men and the bankers will result in a material mutual advantage, as at times their interests are identical.

Within the past month Cincinnati has entertained not less than 100,000 visitors, who came here to attend various gatherings and conventions of national bodies. The middle of last month we had the Grand Conclave of the Knights Templar of Ohio and for the past ten days the city has had the care of over 35,000 people in attendanee at the International Convention of the Christian Missionary Societies. These crowds have brought to the city thousands of buyers in all lines and the jewelers have reaped their share of the trade. That the stores have felt the presence of this great number of strangers is evidenced by the general opinions of the leading houses.

Lusky & Lowenheim, well-known in this market, have recently opened up a swell retail jewelry establishment in Nashville, Tenn.

Young Mr. Wittlig, son of jeweler Jacob Wittlig, Marietta, Ohio, was married early in October, and came to Cincinnati with his bride to spend his honeymoon.

H. J. Homrich, of Huntington, W. Va., was in town last month buying goods.

Clay Henry, well known in this market as a visiting buyer, has sold out his jewelry business at Ironton, Ohio, to H. D. Barnett & Bro.

Ives L. Lake, of the Chicago office of the Waltham Watch Co., was a pleasant caller among our wholesale houses early in October. Mr. Lake was returning West from a month's vacation spent at his old home in the East.

John C. Daller, manager for Clemens Oskamp, has been out on the road, calling on his old customers of late, and reports a kindly reception and some good business.

W. H. Beck, the well-known and prominent Iowa jeweler, for a number of years located at Sioux City, was here for a few days the early part of last month, accompanied by Mrs. Beck. Mr. and Mrs. Beck were returning from an Eastern trip and stopped off in Cincinnati to visit some of their friends in the trade.

W. G. Patterson, of Lewisburg, Tenn., was a visiting buyer in this market last month.

J. C. Thompson, of Lancaster, Ky., was in Cincinnati on a business trip last month. He reports good prospects for holiday business.

New Watch Inspection System on Norfolk and Western Railway.

The Norfolk and Western Railway Co. has inaugurated a system of clock and watch inspection, and employees are now required to submit their watches for quarterly examination and weekly comparison with standard time, to the various local inspectors who have been appointed for this purpose and who will be under the general supervision of J. W. Forsinger, Chicago, who has been appointed general inspector. The names and locations of local inspectors are as follows :

Frank Cross & Co., Columbus, O.
Columbus Cole, Ceredo, W. Va.
C. M. Wallace, Huntington, W. Va.
C. J. Kinzer, Bluefield, W. Va.
L. W. Clark, East Radford, Va.
R. J. Carter, Bristol, Tenn.
Theo. Dilger, Pulaski, Va.
E. Hibarger, Roanoke, Va.
Ryland & Rankin, Lynchburg, Va.
O. L. Crampton, Crewe, Va.
A. D. Harding, Petersburg, Va.
W. H. Reisner, Hagerstown, Md.
F. H. Gale, Norfolk, Va.

The minimum standard of excellence adopted by this company for watches is a grade equal to what is known among American movements as "nickel, 17 jewel, patent regulator, adjusted to heat and cold, and three positions," the variations of which must not exceed thirty seconds per week. The grade names and numbers are specified in a circular issued by the company. It is announced in the same circular that "no watch epecially made and named by or for any jeweler will be accepted on this company's lines. The intention of jewelers in offering watches specially made is generally understood to be for the purpose of removing the regular factory grade and name, thus enabling them to charge employees a higher price for same." No watch is admitted in service the manufacturer of which has failed or gone out of business. Some 2500 men are affected by the new rules and each employee coming under the rules is required to provide himself with a standard watch by November 1st.

Mexico.

The Interoceanic Railway Adopts a Watch Inspection Service.

The Interoceanic Railway Co. has inaugurated a time and watch inspection service on its entire system, patterned after the most approved methods. The service is under the supervision of E. Sommer, First Plateros, No. 11, City of Mexico, who is general watch inspector and who holds the same position on the Mexican Central Railway. A traveling inspector goes over the system at stated periods to inspect watches of employees, thus disposing with local inspectors. Rule 4 of the general time circular reads :

After careful investigation and selection of the best practical watches for the exacting requirements of railway service, the standard of watches adopted by this company is : Elgin, B. W. Raymond, nickel, 17 jewels, and Elgin, 21 jewels, open-face and to have Arabic dial with heavy figures and hands and wind at figure 12.

The Interoceanic Railway is one of the most progressive and popular railways in the Republic and runs from the City of Mexico to Vera Cruz, on the Gulf, a drop of nearly 800 feet, passing through the cities of Pueblo and Jalapa. The entire line traversed is extremly picturesque and passes through the tropical regions through plantations of bananas and forests of cocoanut palms. It is largely patronized by tourists, and in addition to its superb passenger service, the management, by the adoption of its new watch inspection service, affords the greatest protection to life and property.

The progressive spirit of Superintendent Ramsey and his official associates is never lacking, especially when the comfort and safety of the patrons of their road is concerned.

Timely Advice.

The business man who "wears" best is he who keeps his business to himself.

Holiday trade is right at everybody's door. All that is necessary now is to make the store so attractive that folks can't help going in.

Originality in business was never at so high a premium as now. The dealer who slavishly copies others might as well close his place of business first as last.

Confidence is one of the prime requisites of a successful business man. The individual who has confidence in himself inspires his associates and customers with the same quality.

"If we should forget to send you the one dollar when due, don't fail to send us The Keystone, for one number is often worth the price you ask for the twelve."—Wilson Bros., jewelers, Greenfield, Ohio.

Cleveland and Northern Ohio.

The volume of business continues as great as during the past few months and in some lines is greater. A prominent jobber in this city summed up the financial condition among jewelers by these words: "We have not had a single failure or loss during the past year."

In spite of the large advance in precious stones, the dealers report large sales over the counters and promises of larger before the year closes.

A. F. Hubbard is in the East for several weeks, picking up all the new novelties for the coming season.

Capt. R. E. Burdick spent part of last month in the East, on business for his firm, visiting among the jobbers and manufacturers.

Henry Kaplinger, of the Webb C. Ball Co., will take the road about November 1st in the interest of Ball's railway watches. Mr. Kaplinger has been for many years in charge of the watch repair department.

F. H. Kramer, jeweler in the Y. M. C. A. Building, has purchased the stock and good will of R. Winzenreid, Ontario and Prospect Streets. Mr. Winzenreid will retire from the jewelry business after being actively engaged for a quarter of a century.

F. B. Anderson, of Smiths Road, Ohio, has entered the employ of Ettinger, the Ontario Street jeweler.

J. L. Zesiger, 344 Jennings Avenue, has invented a device for holding doors open, which is so simple in construction as to give it commercial value. A stock company has been organized to place it on the market.

Mr. Adolph Nunvar, of Sigler Bros. Co., has just returned from a trip to the East, where he took in the Dewey "hero worship" as well as the yacht races of the week following.

Ralph Winzenried, son of R. Winzenreid, has entered the employ of Bowler & Burdick Co.

Chas. Krause, with F. B. Strawn, is back from a short trip to New York.

The local jewelers recently offered a number of prizes for the city lawn tennis tournament. The Cowell & Hubbard Co. gave a silver loving cup, Webb C. Ball Co. a cup, Bowler & Burdick Co. a cup, and Scribner & Lohr a cup for the ladies.

The past week the wholesale board of the Chamber of Commerce conducted an excursion through Eastern Ohio, Western New York and Pennsylvania. The jobbing jewelers were represented.

The police recently unearthed a lot of jewelry in one of the vacant lots in the East End. The jewelry was undoubtedly stolen, but is of cheap quality. The police are awaiting its identification.

Chas. Whittlesey, with Grant Whittlesey Optical Co., has returned from a trip to Zoar, Ohio, one of the quaintest towns in the State, from its peculiar environments.

C. W. Wells, of American Optical Co., was in town last week, renewing old acquaintances and keeping an eye out for business.

C. B. Edgar has recently entered the employ of Scribner & Loehr.

John Nielsen, son of H. P. Nielsen, of Lorain, was in town last week buying stock for a new store, which he will open in Vermillion, Ohio. Mr. Nielsen will have an optical department and up-to-date store.

John Dwyer, for the past eighteen years with Hanna & Eroe, New Castle, Pa., will open a new store in the same town about November 1st. Mr. Dwyer was in this city last month buying a stock of goods.

Edwin V. Smith, son of E. T. Smith, Glenville, Ohio, died last month at Peninsula, Ohio. His death was due to injuries received by a wagon running over him about a year ago.

F. M. Powers, Youngstown, Ohio, was in New York the first of last month, buying for the coming season.

The following out-of-town buyers in the past week were: G. L. Guenther, Bellevue, Ohio; Davis & Ewing, Kent, Ohio; J. C. Joss, New Philadelphia, Ohio; J. B. Avery, North Amherst, Ohio; John McClintock, Chagrin Falls, Ohio; Frank Dyer, Caro, Mich.; D. Leonheiser, Huron, Ohio; W. J. Higgins, Shelby, Ohio; Frank Fobes, of Birrell & Fobes, Kinsman, Ohio; Harry Downs, Bellevue, Ohio; Ed. Nolf, Wadsworth, Ohio; E. E. Critz, Elyria, Ohio; F. F. Beckwith, Oberlin, Ohio.

You Have All Seen Him.

The man in business who finds more time to hang on the awning rope than he does to hang on to the end of a dusting brush, or something as useful, will find out some day that he was hanging on to the wrong thing.

BM.

Christmas is Coming

Every one knows this. But **ARE YOU PREPARED** for the greatest Holiday trade ever known? Scarcity of goods and labor is rapidly advancing prices. We solicit your favors, and have adequate facilities. We feel confident we can satisfy your requirements and save you money.

Our Holiday Bulletin of NOVELTIES, DIAMONDS, JEWELRY, Etc.

will be out in ten days. WAIT FOR IT. It contains only select pickings from the latest productions, and we feel sure are just what is wanted at this season. Below we show a sample of what we have to offer.

No. 15. MANICURE SET. 6 pieces, sterling silver, good weight handles, in Silk-Lined Leatherette Case. Each set, **$2.25**, net.

BAUMAN-MASSA JEWELRY CO.

Commercial Building
ST. LOUIS

St. Louis Letter.

Wholesale trade conditions generally are most satisfactory. St. Louis jewelry jobbers and manufacturers report trade as holding up wonderfully well for the past month. Brightness and activity are to be seen everywhere. A large number of buyers from the country took advantage of the low railroad rates last month to visit this city, and have brightened up things in the jewelry and allied trades considerably. The number of new stocks being sold is an encouraging sign as to the future. The visiting buyers are still fairly numerous. The city retailers complain of dull business, but things are already beginning to brighten up with them.

Among the well-known and prominent jewelers who visited this market last month on a purchasing and sight-seeing trip was C. S. Stifft, of Little Rock, Ark. Mr. Stifft reports a good trade and an excellent feeling in his section, and says the people have ready money this fall and are spending it with the storekeepers.

William A. Gill, retail, is now nicely located in his handsome new store, at the corner of Olive and Eighth Streets.

Extensive improvements have been made on the store room at the corner of Sixth and Locust Streets, which was formerly used for banking purposes, and it is now one of the most modern and elegant rooms in St. Louis. It has been fitted up for Hess & Culbertson, our well-known retailers, and they are now nicely located in their new establishment. They are to be congratulated upon having one of the really fine and high-grade stores of the town.

Fred. Patzer, formerly with Paul Flucks, has opened a retail store at 3422 Chouteau Avenue.

Herman Mauch, the well-known Franklin Avenue retailer, was recently presented with a life-size oil painting of himself by the members of the Shepard School Association, of which he has been president for ten years past.

V. P. Pond, of Durant, Miss., was here last month buying an opening stock for the new store he is just opening up at that point.

The inventory of the estate of the late D. Constant Jaccard, of the Mermod & Jaccard Jewelry Co., filed last month, values the personal property at $198,177.35.

Joseph Baum, of Alton, Ill., has accepted a position as watchmaker with A. K. Jobe, Water Valley, Miss.

T. K. Smith, of the T. K. Smith Jewelry House, Oskaloosa, Iowa, was among the throng of visiting jewelers in this market last month.

M. G. Wolff, of Chester, Ill., was met in one of our wholesale offices last month, where he was selecting goods for the home store. He said he felt much encouraged over the outlook for the holiday trade, and he believed it would be the best he had ever enjoyed.

A. Hollins, of Lake Charles, La., was a visiting buyer in this market the early part of October.

Gene Thomas, the well-known jeweler of Kirksville, Mo., spent most of Fair week in town last month seeing the sights and making purchases for the home market. Mr. Thomas says trade is already pretty lively with them, and that they anticipate a prosperous holiday trade.

M. Miesch, of Clarksville, Texas, was here last month selecting goods for his holiday trade.

S. W. White, of Hope, Ark., was among the throng of buyers here during Fair week. He was buying goods and seeing the sights of the great Southwestern metropolis.

G. R. Ellis, of Greenville, Texas, visited this market the early part of last month on a purchasing trip.

J. L. Wolff, of Paducah, Ky., was met in one of our wholesale houses during Fair week, and said that he was expecting an extra good fall and holiday trade, and was buying accordingly.

J. R. Shaeffer & Son, of Bloomfield, Iowa, were represented in the St. Louis market the early part of last month by Mr. Davis.

Earl Underwood, of Arkansas City, Kans., was a visiting buyer here the early part of last month.

C. H. Bard, of Sedalia, Mo., was in town last month on a purchasing trip.

L. B. Moore, of Dennison, Texas, was a welcome buyer here last month.

W. E. Sams, of Clinton, Mo., was among the throng of buyers in this market during Fair week last month.

Eugene Hyke, of Joseph Linz & Bro., Dallas, Texas, was here a few days last month.

The firm of Buck & Holder, of Jackson, Miss., were represented in this market last month by Mr. Buck.

G. P. Whitside, of New Albany, Miss., was a welcome visiting buyer here last month.

E. Von Seutter, of Meridian, Miss., was here during Fair week last month, combining pleasure with business.

O. E. Der Werthern, of Columbia, Mo., was a welcome visiting buyer in this market last month.

L. Herbert, of Trenton, Tenn., was a welcome buyer here last month.

Clarence Schnack, of Alexandria, La., was here last month making a selection of late fall novelties for his home trade.

E. D. Mathews, of Baldwin, Miss., was a trade visitor here last month.

Sam. Bauman, of the Bauman-Massa Co., is a great believer in the luck of rabbit's feet, and has their lore down to a fine point. When Fred. Carpenter, the well-known chain salesman, was here last he informed Sam. that he was about to embark in business for himself. Mr. Bauman immediately looked up a rabbit's foot and made his friend Carpenter a present of it, with the following little speech: "Our rabbit's feet are all hind feet, taken from rabbits killed at midnight in a country churchyard by a cross-eyed, red-headed negro, and warranted to cure all ills, accomplish all good purposes, and to fill a long-felt want."

The handsome and complete 900-page catalogue of the L. Bauman Jewelry Co. has just been sent out to the trade. Already orders are coming in nicely from it, showing that it has come just at the right time to fill a long-felt want in the St. Louis market. The first 36 pages are devoted to optical goods, the next 10 pages to silk guards and cheap chains, the next 65 pages to clocks; then comes 5 pages that show up the firm's line of onyx tables, etc., they are followed by 35 pages devoted to silver-plated ware; the next 5 pages are devoted to cut glass; followed by 20 pages devoted to silver and gilt novelties, next follows 3 pages devoted to pocket-books, and 3 pages to fine table cutlery. This ends this department of the catalogue. The next 704 pages are devoted to jewelers' and watchmakers' supplies and findings of all kinds. Altogether, the book is most creditable and should be in the hands of every jeweler. If you have not already received it, write the above firm and they will send it to you prepaid.

Captain Klein, of Klein & Fink, Fort Smith, Ark., one of the most prominent and best-known jewelers of the Southwestern country, was a welcome visitor here during Fair week last month.

Mark Eiseman, the new Southern man for the L. Bauman Jewelry Co., left the middle of last month for an extended trip over his territory.

Jeweler Johnson Ater, of Aberdeen, Miss., well known in this market, was married October 3d. Mr. Ater and his bride came to St. Louis to spend their honeymoon and take in the sights of Fair week in the great Southwestern metropolis. Mr. Ater was warmly congratulated upon the event by his friends in the trade.

W. P. Armstrong, of Dyersburg, Tenn., was here on a purchasing trip last month.

H. M. Heckert, of Springfield, Mo., was in St. Louis last month on a business trip.

J. N. Haff, of Dalton, Ga., was a visiting buyer in this market last month.

Fair week brought a large number of buyers to the St. Louis market the early part of last month. We did not get them all, but we give a list below of the out-of-town jewelers who were here that week and a number who have been here since. We mention J. J. Bleich, Paducah, Ky.; P. Ziegle, Nashville, Ill.; M. B. Smith, of Breckenridge, Mo.; Fred. Simon, of Collinsville, Ill.; Levi Cook, Marion, Ky.; G. W. Kennan, Springdale, Ark.; R. R. Green, Salem, Mo.; Wm. Stahlberg, Mt. Vernon, Ill.; Aug. Vogel, Herman, Mo.; W. S. Pritchard, Summer, Ill.; Lewis Bros., McFall, Mo.; Jno. Wick, Highland, Ill.; M. R. Crum, Palmyra, Ill.; G. Benz, Eureka Springs, Ark; J. A. Buckmaster, Rolla, Mo.; W. H. J. Ahring, Okawville, Ill.; M. A. Hooton, Jonesboro, Ark.; W. H. Finke, High Point, Mo.; W. C. Ran, Chamois, Mo.; M. B. Smith, La Plata, Mo.; T. J. Walker, Eureka Springs, Ark.; Hy Bergfeld, Moscow Mills, Mo.; C. B. McNabb, Latty, Mo.; C. F. Ran, New Haven, Mo.; F. S. Bricker, De Sota, Mo.; Tim Munsch, Manchester, Mo.; E. L. Bershe, Columbia, Ill.; A. L. Wood, Nevada, Mo.; J. C. Pilcher, Vandalia, Mo.; W. H. James, Marshfield, Mo; I. B. Morris, Perry, Mo.; W. B. Kerns, Buncton, Mo.; John Roark, Winchester, Ill.; L. A. Holdener, Greenville, Ill.; H. R. Stevens, Nevada, Mo.; W. J. Graber, Dennison, Texas; W. J. Krug, Staunton, Ill.; A. G. Brewer, Pittsburg, Kans.; M. Zeigler, Kimmswick, Mo.

"Send current number, as I wouldn't be without one number of The Keystone for the price of a whole year."
—A. Y. Boswell, jeweler, Fairland, Indian Territory.

Workshop Notes.

Subscribers wishing inquiries answered in this department must send name and address—not for publication, but as an evidence of good faith. No attention will be paid to anonymous communications. Questions will be answered in the order in which they are received.

"*Screw Bezel.*"—*I want to know the best way to remove a screw bezel to a watch case?*—Procure some pure sheet rubber and cut two pieces about 4″ square, and taking a piece in the palm of each hand, press on each side and twist. We never saw a case that this plan would not loosen. Ordinary sheet rubber will not do it; the sheet must be pure gum. You can procure such rubber of M. Mackellar & Co., P. O. Box 2674, Philadelphia, Pa.

"*Setting Pearls.*"—*How can I remove pearls and half pearls from rings for hard soldering, and replace them again. What sort of tool is used to form the grips which hold them in besides the graver?*—There are no repair jobs which come to the jeweler which embarras him more than such as are set with pearls, particulary half pearls. The method of setting half pearls most in use is accomplished by closing down a "clinch" by a beading tool over the edge of the half pearl, such clinch or "grains," as they are usually termed are next to impossible to raise. A point of a knife cannot be interposed between the pearl and the gold grain to raise the clinch, because a knife blade so used would crush the pearl. A lozenge graver seems to be about the only tool that can safely be employed to cut away the clinch. By a lozenge graver we mean one shaped in transverse section as shown at *A*, Fig. 1. The acute cutting angle at *z* being used to cut away the clinch formed by the beading tool. Beading tools are made by taking a piece of steel wire about 1/16″ diameter and 2″ long, and placing it in a wire chuck, turn the end taper as in Fig. 2, where *A* represents the piece of steel wire, the curve *y* the end of the wire chuck, and *B′* the end of the wire turned taper. In the end *B′*, of the wire *B*, a concave recess is turned which forms the "bead" on the gold. There are several of these tools made to form beads of different sizes. The handle to an ordinary pin push makes a good holder for such tools. The *modus operandi* of removing and resetting pearls can be condensed by saying: Cut away the clinches which hold the pearls with a lozenge graver, then lifting the pearl out with the point of a knife. After the ring has been hard soldered and the job refinished, the pearls are replaced and the clinch restored with the beading tool shown at Fig. 3. Where a bead is broken, or so cut away that it cannot be made to hold, the ring can be drilled and a gold screw set in to replace the bead. The idea is illustrated at Fig. 4, where *D* represents a piece of gold wire with a screw at *w*. A hole is drilled and tapped into the ring, and the screw *w* run in, which presents a beaded head. A little practice will soon enable one to use such screws with success and eminent satisfaction.

Fig. 1

Fig. 2

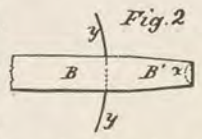


Fig. 3

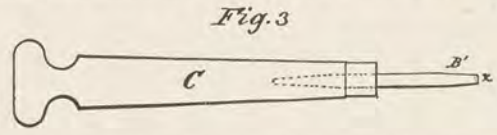
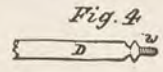


Fig. 4



"*Brass Cases.*"—*Please let me know how cheap brass watch cases are made to hold their color and polish for a short time?*—These cases are actually gilded; of course the coating is very light, and on such gilding is placed a coating of hard celluloid lacquer.

"*Photographer.*"—(1) *Cannot orthochromatic plates be produced by the application of some color to the regular dry plates? It seems to me that plates so prepared would be very desirable since orthochromatic plates have only very limited keeping qualities.*—It is generally understood that the so-called orthochromatic plates are now prepared as you suggest. We have had no cause for complaint in plates of this kind which we have had on hand for two years or more. Many people are careless about keeping their plates. Ordinary plate boxes can hardly be conceived to be perfectly light-proof. Neither are plates as carefully guarded from the humidity of the atmosphere as they should be. It is to be supposed that every year will bring about improvements in the plates both as to sensitiveness and keeping qualities.

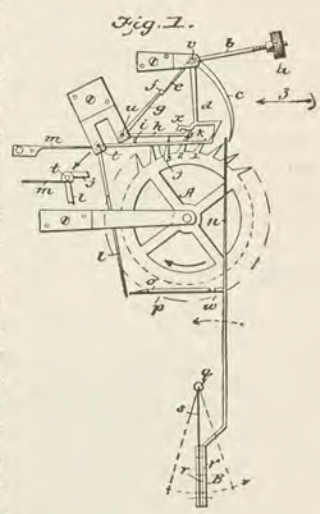
(2) *Where can I procure the most suitable paper for photographic purposes?*—This is something hardly any two photographers would agree on. Some would prefer one paper to another. The Aristo papers are good, and can be had of any dealer in photographic supplies. The paper is made by the Aristotype Co., Jamestown, N. Y.

(3) *I always like to know of what a thing is made of; can you give me the chemical combination in hydrochinon metol and eikonogen?*—The symbol of hydrochinon is $C_6 H_6 O_2$. Eikonogen and metol, we think, are proprietary preparations, and their composition as far as we can ascertain are unknown.

An Improvement in Spring Clock Escapements.

The progressive tendency of the age leads people to demand better peformance of both watches and clocks than would have satisfied them a few years ago. Clocks propelled by mainsprings have grown in favor chiefly from their taking up less room, and also being more portable, as there were no heavy weights to bang around in the case when moved. The chief drawback to spring clocks lies in the irregular propelling power, producing irregular timekeeping. That is, when a spring clock is first wound the power is in excess and the clock gains, and when the spring is nearly run down it loses, the consequence of which is, the clock is only right once a week—if it is then. To remedy this defect much inventive genius has been expended, conspicuous among such efforts is the recent invention of C. T. E. Zimmerman, of Cumberland, Wisconsin, in which he converts the escapement of an ordinary spring clock into a gravity escapement with constant propelling power of equal mechanical value. The cut at Fig. 1 will serve to render the action of this escapement understood by all persons conversant with clock construction.

Fig. 1.



FORECAST of the TWENTIETH CENTURY

WHAT does the Twentieth Century hold in store for humanity? Surely triumphs of invention and science beyond the ken of mortal living wit, achievements of the mind and the heart that will make for enormous advance in all sympathetic movements for the uplifting of the race, and such vast modifications in the present physical boundaries of nations as will make necessary a re-mapping of the world with each passing of the ten decades of the century.

THE Nineteenth Century has been one of experiment; the Twentieth will be the century of fruition. The last fifty years have been the most remarkable of recorded time, in respect of the achievements of invention; but just as the Nineteenth Century surpassed, in this direction, the total of accumulated discoveries in all the centuries that had gone before, so it is reasonably safe to aver that the close of the Twentieth Century will make the year 1899 seem to be as far removed into "the dark background and abysm of time" as the First Century now is to us who live to-day. He is a rash man who would venture to predict the specific progress of invention in the next hundred years, but one may essay the confident prophecy, at least, that the waste of power in the making of steam by burning coal will be corrected by the universal use of electricity as a motive power, thus conserving our fuel supplies and accelerating the progress of the race to its final destiny. Transportation by land and sea, mills, furnaces and factories, all the processes of domestic life, will be run by this power, the possibilities of which are now only vaguely dreamed of. The atmosphere above us will be the trackless path of numberless aerial express trains, and every man will speak to whom he will, though seas and continents stretch between—and he will *see* his ten-thousand-mile-distant companion while he talks with him. One year of human life, in the year 1999, will condense a century of energy; one life will embrace in its three-score and ten years the present possibilities of a thousand human activities.

IT is the peculiarity of each generation that it accepts as a matter of course that which was the astonishment and wonder of its predecessor. The antiseptic principle, which has made possible the science of surgery, has become the commonplace of our day. We may predict that the hospitals of the future will become the very sources of life, in which the scientists will produce the germicides which will destroy the living principles of consumption, cancer, of heart and nerve troubles, and of all the now unknown and incalculable enemies which give misery and destroy life. One of the most beneficent of the results of future science will be the prolongation of human life in health.

THE coming century will witness a liberalizing of all human creeds, and a broadening of the concepts which are now held close in the confines of prejudice. Religious faiths will outgrow their present bounds. The whole theory of education will be re-written. The socialistic idea will be developed, and the tendency will be for a full and complete experiment of the principles of State paternalism and municipal communism. There will be an equitable adjustment of the mighty forces which have so deranged the relations of capital and labor, of trades and occupations, of markets and highways. Continuing concentration and centralization of capital in great enterprises and in every field of production will be compelled by small margins of profits and the competition of instantaneous and world-wide communication. The science of Trade has only been read to the primer, and the future will show marvelous achievements as yet undreamed of.

IN the direction of art and literature one pauses as he prophecies. The Nineteenth century could not produce a sculptor like Phidias, a painter like Raphael—will the Twentieth? In our age we cannot even copy the marvels of Greek art—cannot give the breath of life to stone and make the marble feel and think and say. In these closing years of the century we have no musician to compare with Wagner, who changed all passions, longings, memories and aspirations into tones, and with subtile harmonies wove tapestries of sound whereon were pictured the history and prophecy of the human heart. The Nineteenth Century has never produced a genius like Shakespeare, and it is a question whether ever again such an intelligence will be known to the human race. It is a question whether the art of poetry itself will be present to the reader of the year 1999—whether the intensely commercial spirit of that day, and the pulsing material activities which will absorb the attention of its cotemporary citizen, will not relegate to the past the poetic form of literary composition—possibly wipe out the whole romantic literary avowal as with a sponge.

IN affairs of government and statecraft the Twentieth Century is pregnant with great events. The map of the world will show great and rapid changes, and the status of existing nations will alter with each decade. The Turk will be driven out of Europe, and his empire will largely be absorbed by Russia, after great clamor by the other powers. France will continue to degenerate until she falls to the rank of Italy and Spain, and the middle of the century will see Europe resolved into three great powers—England, Russia and Germany. The final armed struggle in the history of civilization—the last serious wars that will ever be recorded in the story of the race—will come about in the contention of the white-skinned nations for the two present uncivilized continents, Africa and Asia. Germany and England will cross swords in Africa, and the continent will eventually be divided between them, with the lion's share falling to England. But the great struggle of the century will be in Asia, when Russia challenges England to the supreme conflict for the possession of China—a conflict between the autocratic and the democratic ideas of government, no less than for gain of territory, and as such fraught with enormous consequences to unborn millions. Because of this conflict of fundamental ideas the United States will be inevitably joined in alliance with England, and the struggle will be racial between Anglo-Saxon and Slav. The former will win, and the United States, by reason of her geographical position, her natural resources, the elasticity of her institutions, and the vital principle in her governmental system, which makes for the individual development of the citizen, will advance by leaps and bounds to the first place among the nations of the world, and to the leadership of that humanitarian civilization which is to be perfected by the English-speaking race.

THE war between England and Russia will be the last war of civilization; for militarism, which is crushing the life out of the great nations of Europe, will break down through the burdens it imposes and the conditions it exacts. The peoples of Europe, groaning under this ever-increasing and eventually intolerable load, will revolt. They will teach their rulers that peace is not worth the price which they pay for it, since that peace is determined by an equilibrium of trained soldiers, and an increase of force on one side is quickly met by an increase on the other. And with the disarmament of the nations will come their enlightenment as to the real sources of power, and the idea of democracy will grow in the minds of men. The end of the Twentieth Century will witness the ending of all absolute monarchial power, and the common people in every civilized nation will themselves determine the laws which govern them.

(*Continued on page 1147.*)

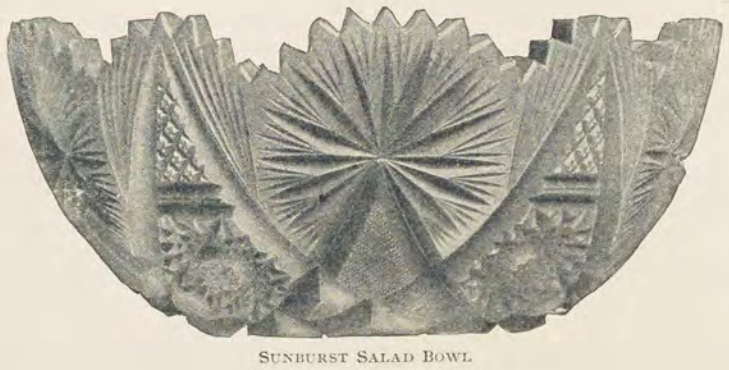
REGENT OIL
No. 800 Each, $2.50

Rich American Cut Glass

PRICES QUOTED ARE SUBJECT TO THE USUAL CASH DISCOUNT

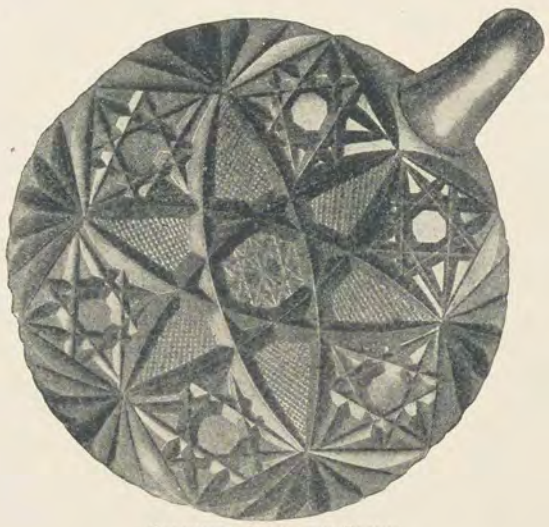
BEVERLY WATER BOTTLE
Each, $2.75

BEVERLY TABLE TUMBLERS
Dozen, $10.00



SUNBURST SALAD BOWL
7-inch, No. 115, each, $ 6.00
8- " No. 116, " 8.00
9- " No. 117, " 10.50

These Goods Should Be Seen To Be Appreciated



COLUMBIA HANDLED OLIVE
5-inch, No. 300, each, $1.50
6- " No. 300, " $1.75

SUNBURST FRUIT NAPPY
7-inch, No. 107, each, $5.00
8- " No. No. 108, " 6.00
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NASSAU SUGAR AND CREAM
$5.00 per pair

These New, Bright Cuttings
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Can't we send you one?

WALDORF SALAD BOWL
7-inch, each, $4.25 8-inch, each, $5.00 9-inch, each, $7.50

WALDORF FRUIT NAPPY
7-inch, each, $4.00 8-inch, each, $4.75 9-inch, each, $7.00

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Burley & Tyrrell, *42-44 Lake Street, CHICAGO*

FORECAST of the TWENTIETH CENTURY

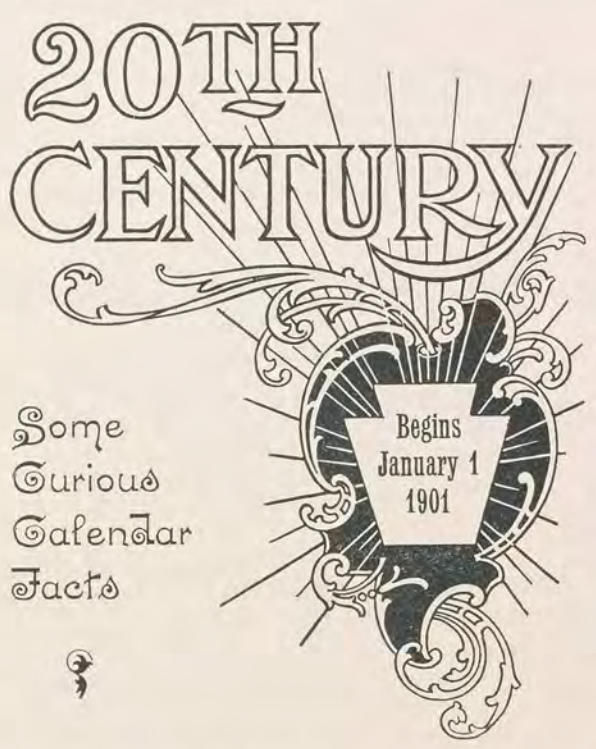
(*Continued from page 1145.*)

THE actual monarch of the Twentieth Century—the real power that will move the nations in the path of progress—will be the merchant. The destinies of the world will be decided in the counting house, not in the council chamber of kings. The syndicate will supercede the dynasty. History will be written in ledgers and on check stubs. Government will be a matter of balance sheets and bookkeeping. The wars of the future, peaceful or bloody, will be for trade, and not for traditions. Civilization, dependent upon commerce for its exaltation and extension, has reached the epoch in which gunpowder must become obsolescent; and long before the close of the Twentieth Century it will be obsolete.

THE patriotic American may look with special hopefulness and proud anticipation to the prospective glory of his country in the century which is dawning. The eventual sovereignty of the United States over the whole Western Hemisphere is already a commonplace of thought—a few generations will witness the accomplished fact. It will begin with a confederation of the present American republics; it will progress under the dominance of the masterful central power, and will end in the gathering of all these national items into one, for the economic and trade advantages of such centralization. For the great law of all national growth, as of all commercial growth, in the century ahead, will be *expansion through contraction*—the elimination of diversified processes and duplicated operations, and the larger product and resultant wider distribution that will be afforded by the economies thereby effected. Europe, with its difficult and almost unsolvable problems concerning class distinctions, and the limitations imposed upon development and opportunity by its overcrowded territories, can only advance in material prosperity and the improvement of the condition of the masses by destructive revolutions or by halting and uncertain processes. The hope of humanity lies in this Home of the Free. With a country capable of supporting a population ten times in excess of that with which this century closes, with systems of transportation so perfected that they can be extended to any degree that necessity requires, with "institutions so elastic that expansion strengthens instead of weakens the powers of the government and the cohesion of its States," we stand in position to welcome any upturning of thought or tradition in other civilized nations, because we must be the beneficiary of any disturbance which causes men to think, to measure and compare. Our position as the arbiter of nations will strengthen with each advancing year; and when we stop to realize the immense potentialities of power which are coming to us as the neutral and just judge in the court of last appeal of all the national sovereignties, the pulse stirs with new throb of patriotic fervor and the mind rises to higher conceptions of our destiny. The Twentieth Century faces to the West. The star of empire shines directly over us. Whatever of good we have done for humanity in the century which is passing away, in lifting the minds of overruled men to the concept of personal rights by the demonstration of personal liberty, and in establishing the humanitarian principle in government, that good will only be an earnest of the greater good which will be done for the race of men in the century which is to come when the United States finally demonstrates the possibilities of a national conscience in the presence of international responsibilities. The future beckons to us, and we go forward with glad faith and hope.

20TH CENTURY

Some Curious Calendar Facts



WHEN will the Twentieth Century begin? Why there should be different answers to this question is a little puzzling to know. A few fundamental facts disposed of, ought to easily settle the controversy. Of course, the first century began with the year 1 and closed with the year 100. The second century, then, began with the year 101, and closed with the year 200. Now, following this method to the present time, there can be but one answer to the above question. The Nineteenth Century closes with the year 1900, and the year 1900 closes December 31. Immediately after midnight, therefore, of December 31, 1900, is when the Twentieth Century begins. In other words, it begins with the first second of the first hour of the first day of January, 1901.

Just at the very nick of time when the Twentieth Century begins at the international date line, the Nineteenth will still be enveloping, as it were, the entire globe; but twelve hours afterward it will be the Twentieth Century on half the earth and the Nineteenth on the other half; twelve hours later the Nineteenth will have entirely passed, and the Twentieth will have made its first circuit around this ball on which we live. Thus it takes a century a full day's time to get complete possession of affairs, and from the time of its very beginning to the point where its last trace disappears, occupies just 100 years and 1 day. This is evident from the fact that after a new century has begun on the earth, it still takes the preceding century full twenty-four hours to give way entirely to the new.

* * *

Leap Years and Festival Dates The Twentieth Century will open on Tuesday and close on Sunday. It will have the greatest number of leap years possible for a century—twenty-five. The year 1904 will be the first one, then every fourth year after that, to and including the year 2000. February will three times have five Sundays: in 1920, 1948 and 1976. In 1901, Decoration Day, Fourth of July and Thanksgiving Day will occur the same day in the week. Then, after that, the same thing will happen at the following interva's: 6, 11, 11, 6, 11, 11, and so on, years; or in 1907, 1918, 1929, 1935, and so on. In the years 1912, 1940, 1969 and 1996, there are four holidays that will fall on the same day in the week: the three already mentioned and Washington's Birthday anniversary, as also the 29th of February. Thanksgiving Day and Christmas will occur on the same day in the week in 1906, and then at successive intervals of 11, 6, 11, 11, 6, 11 years, and so on; also in 1928, 1956 and 1984. March 4 falls on Sunday in 1917, 1945 and 1973.

The same yearly calendar that was used in 1895 can be used again in 1901, after which, at successive intervals of 6, 11, 11 years throughout the century; that for 1890 again in 1902 and at intervals of 11, 6, 11 years; 1891, again in 1903 and at intervals of 11, 11, 6 years; 1892, in 1904 and at intervals of 28 years; 1899, in 1905 and at intervals of 6, 11, 11 years; 1894, in 1906 and at intervals of 11, 6, 11 years; 1896, in 1908 and every 28th year thereafter; 1897, in 1909 and at intervals of 6, 11, 11 years; 1898, in 1910 and at intervals of 11, 6, 11 years.

* * *

The Dates of Easter The following are, in order, beginning with 1901, the dates of Easter for the first twenty-five years of the century: April 7, March 30, April 12, 3, 23, 15, March 31, April 19, 11, March 27, April 16, 7, March 23, April 12, 4, 23, 8, March 31, April 20, 4, March 27, April 16, 1, 20, 12. The earliest possible date on which Easter can occur is March 22. The last time it occurred on this date was in 1818, but it will not occur again till after the Twentieth Century. The latest Easter can occur is April 25, and it will thus occur but once in the coming century, in 1943. Whenever Easter occurs on March 27 or April 3, 10, 17 or 24, Christmas also occurs on Sunday. Though one of the objects aimed at by the church authorities who fixed upon the method of determining the date of Easter was to prevent its occurrence on the same day as the Jewish Passover, the two events will occur together four times in the Twentieth Century—April 12, 1903, April 1, 1923, April 17, 1927, April 19, 1981.

The Twentieth Century will contain 36,525 days, which lacks but one day of being exactly 5,218 weeks. The middle day of the century will be January 1, 1951. The day of the week that will not occur as often as each of the others is Monday. Fifteen out of the hundred years will begin on Wednesday and the same number on Friday. Fourteen will begin on each of the other days in the week.

* * *

Russia will Adopt a New Calendar Several announcements are made of changes to be inaugurated with the opening of the new century. The first is that Russia will adopt the Gregorian calendar. This will be done by omitting thirteen days, the error that will have accumulated after the close of February, 1900. Russians will then write January 1, 1900, instead of December 19, 1900, or rather instead of $\frac{\text{December 19, 1900}}{\text{January 1, 1901}}$ the dual system now in vogue in that country and in Greece. The other important announcement is that it is not at all unlikely that the astronomical day, which now begins at noon of the civil day, will begin with the civil day, at midnight. The present method of having the astronomical day begin twelve hours after the beginning of the civil day is apt to be confusing.

* * *

The Eclipses of the Century As to eclipses in the coming century, there will be about 380 of them, the number of solar being to the number of lunar in about the ratio of 4 to 3. What is of very rare occurrence in a calendar year will happen in 1935, the first time since 1823, viz., seven eclipses, the largest possible number that can happen in a year. There are eight solar eclipses predicted to occur, visible in the United States, in 1918, 1923, 1925, 1945, 1954, 1979, 1984, 1994. There will also occur twelve transits of Mercury, on the following dates: November 12, 1907; November 6, 1914; May 7, 1924; November 8, 1927; May 10, 1937; November 12, 1940; November 13, 1953; November 6, 1960; May 9, 1970; November 9, 1973; November 12, 1986; November 14, 1999. The first, second, ninth and tenth will be wholly visible in the United States; the seventh and eighth only partially so.

—Benjamin F. Yanney, in the *Scientific American*.

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Containing one dozen **FOUNTAIN PENS, assorted,** plain, chased and gold bands.
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- ⅙ doz. No. 4,
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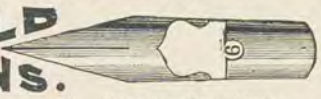

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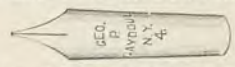

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Gold Pens Repaired, Repointed and **returned the day received.**

All makes Gold, Fountain, Stylographic Pens, Pencil Cases, promptly and carefully repaired.

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We reproduce from anything.

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Masonic Temple, Chicago.

FREE—a catalogue and a display card for four cents postage.

GET THE BEST—THE **"RIVAL"** FOUNTAIN PEN.

$8.00 per dozen, plain holder,
8.50 per dozen, chased holder, } NET CASH.

All pens are 14 K. gold.
Every pen guaranteed.
Gold pens repointed.

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The Stationery Department in Jewelry Stores

(CONTINUED.)

Visiting Cards.

Who has not speculated on the origin of the prevailing fashions? Who creates the new fads in engraving, sizes, tints and texture of visiting cards that make their appearance from year to year? One year it will be the old English lettering, another year script is all the vogue only to be superseded with the plain Roman the next. This is certainly a profitable state of affairs for the stationer but somewhat expensive for the public, who desire to be up to date. To keep up with competitors the stationer must keep alive to all changes and developments in styles and goods, and the more frequent the changes the better for him.

The same evolution is noticeable in the sizes and texture of cards. One year they are extremely large, necessitating the purchase of a new card case; the color a pearl-white, and heavy, such as is known as a three-sheet card. Another year they are exceedingly small and thin—almost paper—to be again changed to a gray-white card, the thickness known as two-sheet, meaning the card is made of two sheets of paper pasted by the manufacturer in such a way as to almost defy the expert to tell the number of sheets so pasted. This, however, may easily be discovered by burning a corner, when the charred part will separate in three or two equal portions of uniform thickness; if the card does not so separate, it is made of a single sheet only, simply paper or a cheap grade of one-thickness card.

History, like the calendar, repeats itself, and this holds good with the fashions: many styles in vogue at the time of our grandparents are resurrected and predominate as the "very latest" of the present day. By what agency they are revived it is impossible to say; they often spring into being involuntarily, as the flowers from fallen seeds of last year's bloom. Many of our fashions, however, originate abroad and both France and England are largely copied here. In many large cities, like New York and Philadelphia, the large stationers adopt styles of their own, which are copied by their smaller brethren.

Fashion, at the present time, decrees that visiting cards should be engraved in the plain Roman lettering on a thin card known as two-sheet of a gray-white color. Script, however, is still used by many, on account of its cheapness and the difficulty of imitating engraving in type printing.

Until recently the card "Mr. and Mrs." was used for social purposes only the first year after marriage, and it is permissible to engrave the reception day in the lower left-hand corner. It is also indispensable in acknowledgment of gifts and purposes of congratulation and condolence; it is also used with P. p. c. (to take leave) written or engraved in one corner and sent out upon leaving town for a long absence.

Mr. and Mrs. John Paul Jones

Tuesdays in November. *100 Fifth Street.*

Size, $3\frac{7}{16}$ x $2\frac{7}{16}$.

In England the fashion of using the card "Mr. and Mrs." for social purposes has been revived and is being introduced here.

Mr. and Mrs. John Paul Jones

P. p. c. *100 Fifth Avenue.*

Size, $3\frac{7}{16}$ x $2\frac{7}{16}$.

The card "Mrs." is often engraved with the name of the daughter or daughters below it when they visit with the mother. If there be more than one daughter "The Misses" is used.

Mrs. John Paul Jones
The Misses Jones

100 Fifth Street.

Size, $3\frac{1}{4}$ x $2\frac{3}{8}$.

Mrs. John Paul Jones

Tuesdays. *100 Fifth Street.*

Size, $3\frac{1}{4}$ x $2\frac{3}{8}$.

Reception days are always engraved in the lower left-hand corner of the lady's card and the address in lower right-hand corner. The prefix "Mrs." or "Miss" should appear in every case and the full name engraved when possible.

A young lady's name is engraved beneath that of her mother during the first season in society, after which time she has a separate card. If she is the eldest daughter, her name reads simply "Miss Jones"; the younger daughters use their Christian names, "Miss Florence Jones."

Miss Florence Jones

Size, 2 x 3.

The address is seldom engraved on a young lady's card, but usually on that of the mother's. Names of small towns are engraved, but for cities the street and number is sufficient. A widow uses her own Christian name or that of her deceased husband, as she may elect; she has no legal right to the latter, however.

The cards of the older branch of a family are often engraved without the Christian name, as "Mrs. Jones."

Turning down the upper right-hand corner of visiting cards indicates a call in person, and turning down the whole right end denotes the card is left for more than one person. The custom of turning corners is no longer fashionable.

Gentlemen's cards now follow the English custom of having the prefix "Mr." The address, when used, appears in the lower right-hand corner of the card; names of clubs always in the lower left-hand corner. Professional or official titles are allowed, such as "Rev.", "Dr.", "Capt.", "Col.", "Gen'l," "Jr.", "Sen." (Sr.), etc., but complimentary titles are never engraved. The titles, when possible, should be engraved in full.

General John Paul Jones

United States Army.

Size, 3 x $1\frac{1}{2}$.

John Paul Jones

Lieutenant-Commander,
United States Navy.

Size, $3\frac{1}{8}$ x $1\frac{5}{8}$.

Mr. John Paul Jones

United States Navy.

Size, $2\frac{3}{4}$ x $1\frac{3}{8}$.

Right Rev. Thomas Jones, D. D.

Size, $2\frac{3}{4}$ x $1\frac{3}{8}$.

Children's cards are engraved in small script on small cards, the prefix "Master" or "Miss" is usually omitted.

John Paul Jones

Size, $1\frac{3}{4}$ x $1\frac{3}{8}$.

Florence Jones

Size, $2\frac{3}{8}$ x $1\frac{9}{16}$.

One of the leading stationers in New York has introduced recently a gray-white card. He uses no punctuation whatever on visiting cards. The general custom, however, is to place a period after the reception day and at the end of the address. No punctuation is used after the name, unless followed by "Jr.", "Sr." or professional title, as "M. D.", in which case a comma is inserted after the name. The words "Junior" or "Senior" are now engraved in full and not abbreviated, as has been the custom heretofore.

(*Continued on page 1151.*)

The Stationery Department in Jewelry Stores.

(*Continued from page 1149.*)

The Latest Fashions in Wedding Stationery.

The article on visiting cards on page 1151 should be read in connection with our article in the May, 1899, KEYSTONE, entitled "The Latest Fashions in Wedding Stationery." In that very exhaustive article the matter of wedding invitations, betrothal announcements and wedding anniversary invitations was fully discussed and samples given. A still later form of wedding announcement than any given in that article is the following:

Mr. and Mrs. John Paul Jones
have the honor of announcing to

the marriage of their daughter,
Frances Clara,
to
Mr. Thomas Arthur Brown,
on Tuesday, September the ninth,
eighteen hundred and ninety-nine, at
St. Peter's Church
Philadelphia, Pa.

The latest form of wedding anniversary invitation is as follows:

1849 (*Monogram*) *1899*

You are cordially invited to be present at the
Fiftieth Anniversary
of the marriage of
John Paul Jones,
to
Emily May Brown,
on Thursday, June the tenth,
eighteen hundred and ninety-nine,
from three until six o'clock,
at the residence of
Mr. and Mrs. John Paul Jones, Jr.
Philadelphia, Pa.

An unusual innovation in an announcement of a wedding anniversary is as follows:

1849 (*Monogram*) *1899*

Mr. and Mrs. John Paul Jones
announce the
Fiftieth Anniversary
of their wedding
Thursday, September the Fifth.
Philadelphia, Pa.

Or,

1848 (*Monogram*) *1898*

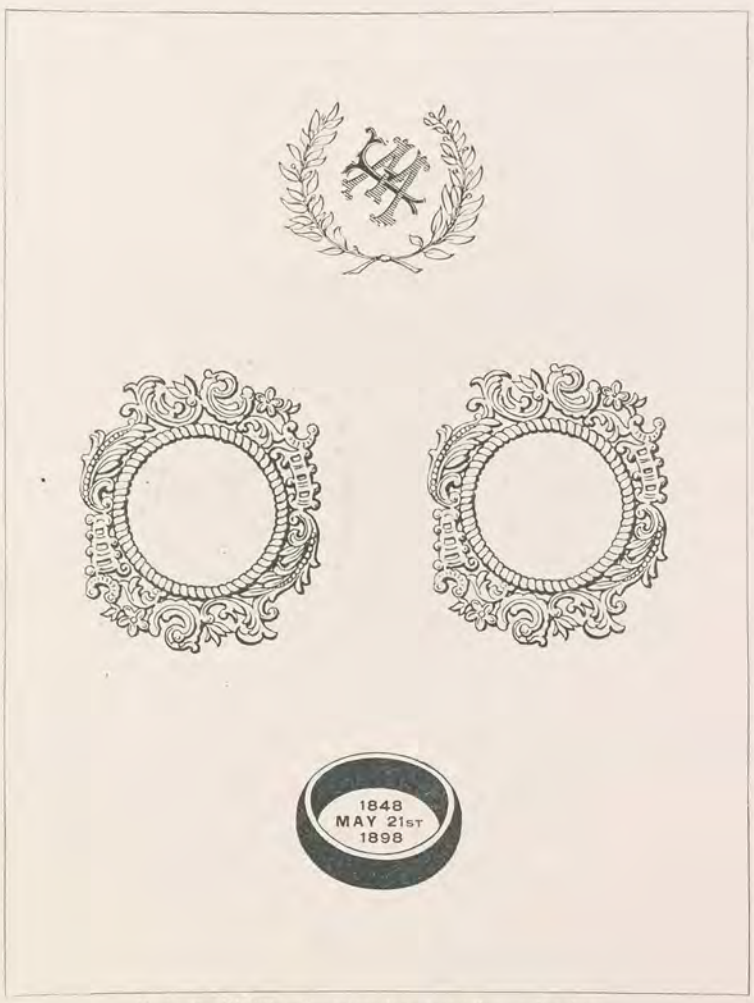
Mr. John Paul Jones,
Miss Gertrude Alice Brown,
Married
Tuesday, October the tenth.
Philadelphia, Pa.

200 Maple Grove Avenue.

They are printed in gold, silver or black ink and enclosed in two envelopes.

Our illustration shows a unique design for a reverse cover for a golden wedding anniversary. Photographs of the couple should be set in the two center frames. The monogram and wreath, picture frames, ring and date should be embossed in gold. For a silver wedding anniversary the embossing would be appropriately in silver.

(TO BE CONTINUED.)



Design for Wedding Anniversaries—center frames for photos.

Stationery Novelties in Paris.

I notice that the sealing wax with a stick on it seems to have "caught on," as the Americans say, writes the London correspondent of the *Stationery Trades Journal*, and is not only on sale by every stationer, but is advertised on every boarding by one of those artistic posters for which Parisian artists are famous. I gather from the advertisement that the inventor, or at least the manufacturer, is M. Lambert, Rue de Lanery, Paris. I rather expect that he has made a good thing out of the "wax with a wick," which is just the sort of a thing to catch the Parisian taste.

Pictorial post cards multiply at such an amazing rate that a collector would require dozens of huge albums to accommodate even a tithe of them. Not many of these post cards are artistic and most of them are meretricious in every sense of the word, and vulgar.

That reminds me that we are just now suffering from an infliction which I hope you will be spared in England. We are overrun with portfolios which sell at about sixpence each, and which contain a dozen or so photogravures of groups of pretty young women bathing, or fishing, or playing music, or having a picnic, etc. So far there is no great harm, but, unfortunately, all the pictures have been "built up." Photographs of the young women have been cut out and pasted on, and they have no connection with one another, indeed, they are not always on the same scale and the effect is most unnatural and ridiculous. Incongruity is pushed to the height of absurdity, as, for instance, in one sense, in which a girl in a sleigh is being pushed along the ice by another girl. That the one who is pushing should not wear skates is perhaps a trifling matter and may pass, but I refuse to believe that two young women would go on the ice in very low-necked ball dresses unless they wished to commit suicide, and even in that case there must surely be more pleasant ways of attaining that end. Moreover, by some mystery connected with the "process," which I am not learned enough to be able to solve, none of the young women appear to have any bones, and their well-rounded limbs seem to be formed of glove kid, stuffed with cotton wool. I do not know why this should be so—I only know that it so.

The only novelty I have to record in the way of note paper is called Copenhagen Blue. It is a close imitation of the ground of the celebrated Copenhagen Porcelain. It is a pretty color, as is doubtless well known, and lends itself easily to decorative purposes.

Menus show no particular novelty. The steeple with the tower "cut out" and a real bell hanging inside it, cannot be called new, but there are some fresh applications of it which are decidedly pretty. There is another set of menus which I have forgotten to mention, consisting of dinner party scenes. The cards are white with a gold scroll border, but a broad band of red runs across the top and on this are silhouettes of the different types of guest one meets at dinner parties. They are certainly bold and striking and not well suited for the delicate style of decoration which is usual at swell dinners in England.

Optimism in Business.

Optimism is a splendid thing in business, because the one who possesses it is almost certain to overcome obstacles which would deter the ordinary individual from ever making an effort, and thus absolutely precluding the possibility of success. The line of demarkation between success and failure is often a narrow one, and it only requires such a comparatively little more effort to be successful than to fail, that the possession of an intense enthusiam and belief in the possibilities of the future is a happy trait, which is worth more to the ordinary individual than a fortune of a considerable size to begin with. Enthusiasm is an American characteristic and has been possessed by the majority of business men who have made marked success in business. Emerson says that without enthusiasm nothing of importance is accomplished, and surely whether the business be a large or a small one, enthusiasm is a powerful factor in pushing it along. Take the factory or the store where there is an atmosphere of thrift, and you find that the salespeople are obliging and the proprietor does not hesitate to take hold of anything with his own hands which needs straightening out. Certainly he is never too busy to answer a civil question, either from his employees or customers. The public naturally likes men of this kind, because good nature and a characteristic for hustling, like the measles, are contagious.

Knowledge of the line is, of course, absolutely necessary, but it has comparatively little weight if not accompanied by the other quality referred to. Did you ever stop to think that this is the reason why new goods sell best even to people who do not know the difference between the old and the new? The average salesman has lost his enthusiasm for the old stock and preaches its merits less than when it was new. Customers notice the difference and buy the new goods, while likely they would have bought the old stock had it been as vigorously recommended. —Ex.

ON Thanksgiving Day, this month, our people will return thanks for the greatest measure of prosperity—agricultural, industrial and commercial—ever vouchsafed by a kind Providence to this or any other country. Thus happily, if not luxuriously, circumstanced, it will be found chastening to the spirit to recall briefly the first humble and fervent thanksgiving of the Pilgrim Fathers on the bleak New England coast several centuries ago.

The incidents which preceded that first thanksgiving were pathetic in the extreme, and yet they furnish the material for one of the noblest chapters in American history. The stormy voyage of the *Mayflower* left the sturdy hundred voyagers in poor physical condition. "Being pestered nine weeks," wrote Winslow, "in this leaking, unwholesome ship, lying wet in their cabins, most of them grew very wet and weary of the sea." On November 11, 1620, the *Mayflower* found a harbor, but the outlook was desperately discouraging. "Being thus past the vast ocean," writes the chronicler, "which way so ever they turned their eye, save upwards to the heavens, they could have little solace or content in respect of any outward objects. For summer being done all things stared them with a weather-beaten face. . . . . If they looked behind them, there was the mighty ocean which they had passed, and was now as a main bar and gulf to separate them from all the civil parts of the world." Under these discouraging circumstances volunteers were permitted "to travaile by land into the country, with no means to carry provisions but upon their backes, to see whether it would be a fit place to seat in, or no." Thus we may picture to ourselves sixteen men, "single file, with every man his musket, sword and corselet," setting forth under the conduct of their leader, Captain Miles Standish, watched, as we may well believe, by a silent, anxious company, crowding the deck of the *Mayflower*.

The Old Fort and First Meeting-House.

The Beginning of New England

AT last, much to their delight, they found a place suitable for settlement, and New England began. Men came on shore daily to hew down trees, build huts, find material for thatching, returning at night, weather and tide permitting; if not, seeking lodgment as best they could. The company was divided into nineteen families, the men of each building their own cabins. These were placed in two rows, beginning near the Rock. The people are now all ashore, and we may think of them, in midwinter, grouped separately in their rude huts built of logs filled in with clay, the roofs thatched with dry grass and rushes, the windows of oiled paper. Such were the New Englanders in December, 1620—a rude band, housed in a cluster of makeshift hamlets, with four threatening enemies, storm, famine, sickness and the Indians.

So passed the winter, and on April 5, 1621, the *Mayflower* hoisted sail to return. Think of them as they watched the parting ship, not as the one hundred and one who, "trusting to hope and sustained by religion," had set sail in the *Mayflower*; for, owing to hardship and exposure, death had been busy among them and nearly half their number lay buried on that leveled cliff-top, close by, overlooking the landing-place.

Long with straining eye
They watch the lessening speck; heard ye no shriek
Of anguish when that bitter loneliness
Struck down into their bosoms? No! They turn
Back to their dreary, famished huts, and pray!

The Foundation of the Republic

WITH characteristic forethought a simple form of government was the first thing devised, for ere yet the *Mayflower* cast anchor an agreement was made, says the record, "that we should combine together in one body and submit to such government and governor as we should by common consent agree to make and choose." This was the first model of a constitution of a civil state framed in the new world. "There, already, in the *Mayflower* cabin, was republican government. . . . . There, already, were the securities of conservatism and the germ of progress, the congregational church, the free school, the trial by jury, the exemplification of elementary democracy."

Our illustration shows the primitive old fort and meeting house. This meeting-house is described in a letter of the time, written home from the Dutch colony of Manhattan: "Upon the hill they have a large square house with a flat roof, ... upon the top of which they have six cannons. . . . . The lower part they use for their church. . . . . They assemble by beat of drum, each with his musket, ... in front of the captain's door. They have their cloaks on, and place themselves in order, three abreast, and are led be a sergeant, without beat of drum."

Harvest time came in due course, when, we are told, "they began to gather in ye small harvest, and to fitte up their houses against ye winter, having all things in plenty. . . . And now, the provisions being secured, their governor set apart a day for public Thanksgiving." Accordingly, the thankful feast was prepared, the first Thanksgiving in our history.

The Pilgrims' Exalted Life

SUCH were the humble builders of this great Republic, and even the "precepts" hung on their dwellings indicated the exalted life in these lowly huts. Some of these were: "Profane no Divine ordinance; Pick no quarrels; Encourage no vice; Cherish no grievances; Reveal no secrets; Maintain no ill opinion; Keep no bad company; Lay no wagers." It was this devotion to the right, and the absorption of self-interest in the general welfare, which caused the little settlement to prosper amid seemingly impossible surroundings. Union of effort is integrating, and keeps the whole intact; self-seeking is disintegrating, and pulls apart. This could never have preserved the colony, and could never have established our Republic. Moral grandeur made these possible. Choate speaks of "the embarkation of the Pilgrims and the lone path of the *Mayflower* upon the astonished seas," as being a grander sight than navies of mightiest admirals. "You will find nothing nobler at their source than the motives and hopes of that ever memorable voyage, . . . the sacred sentiments of duty, religious trust, the spirit of liberty."

In the semi-millennial conditions surrounding us this Thanksgiving Day we may cultivate a meet chastening of spirit by recalling that first humble thanksgiving and the pathetic events preceding it. Never in the history of our country have we had more reason for thanksgiving than on November 30th in this year of grace. The blessings of Providence have been showered on us in almost lavish abundance. Prosperity overruns the land, and in every sphere of life conditions are favorable. Crops are plentiful, prices satisfactory, labor is in seemingly exhaustless demand, and wages are high. We would be, indeed, an unworthy people did not our hearts well out with gratitude to the beneficent Providence who has been so propitious to us in war and peace. The thankful spirit of the Pilgrim Father is a sacred inheritance, and our guardianship should be evidenced in a becoming celebration of the approaching festival.

Uncle Cy's Thanksgiving Turkey

The prosperous times has come at last, that's promist us so long,
I've sold my corn an' taters for a mighty, thumpin' price.
My! when I used to sell my stuff it only brought a song,
But fortune's comin' our way now, an' things is on the rise.
I've bought a new silk dress for Ma, a watch for me—I swow,
'Pears like we're getting rich enough to have a turkey now!

W've hed to eat the tough old hens thro' many years gone by,
An' bile 'em for a week or more to make 'em tender, too;
Fur chickens was too rich fur us, an' turkeys sold too high—
'N ducks 'n geese were too high priced for Ma 'n me to chew.
W've lived on pork 'n taters 'n on skim milk from our cow,
Till it seems 's if we're entitled to this whoppin' turkey now.

Ain't he a fine 'n fat old chap, the biggest 'n the best
O' all the flock I've raised this year, the king-bolt o' the drove;
N when he's picked 'n singed 'n stuffed with yarbs 'n all the rest,
With trimmins in the drippin' pan a-sizzlin' on the stove—

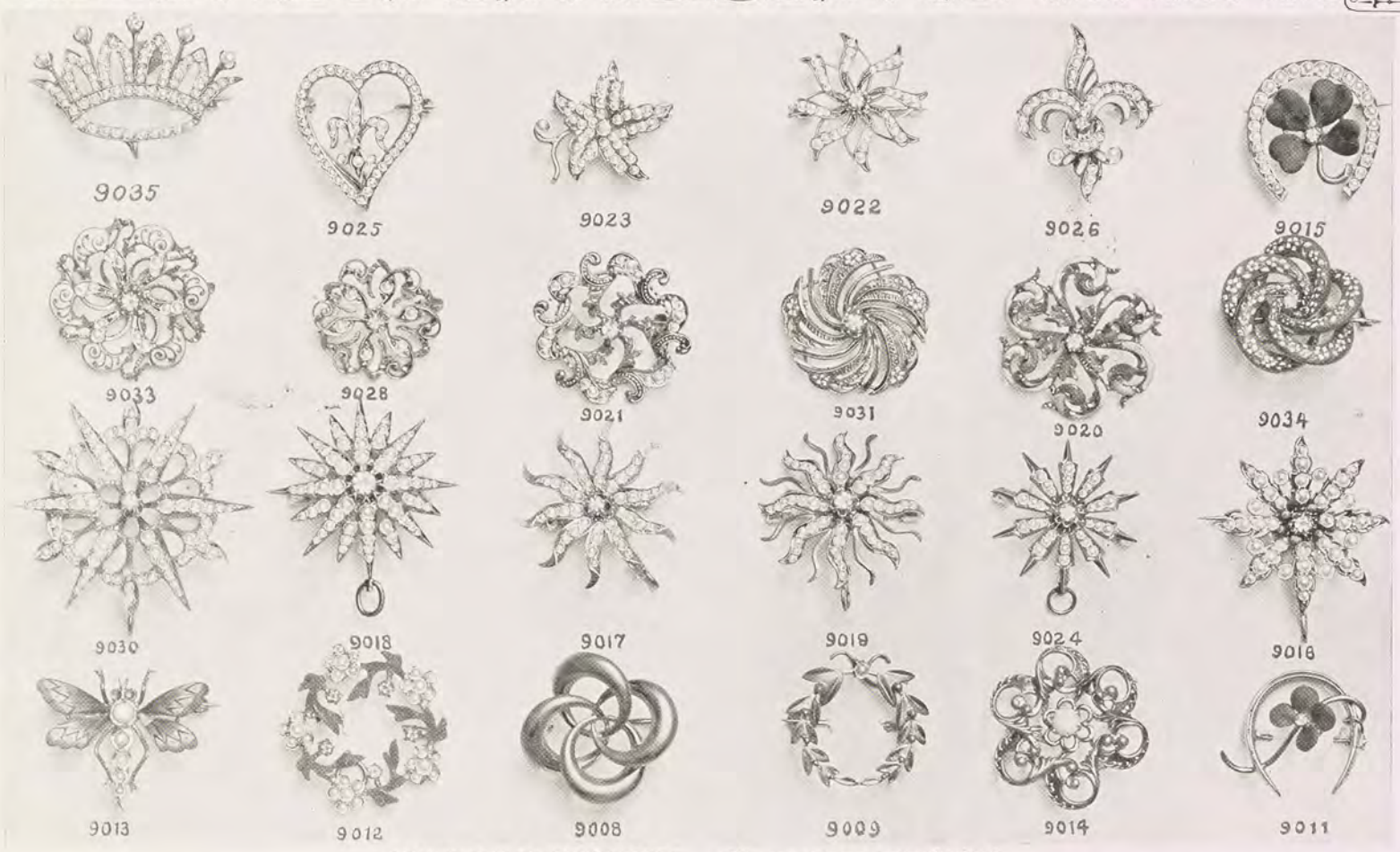
With juice an' gravy runnin' out, I guess that you'll allow
It ain't the worst thing in the world to hev a turkey now.

I've writ to Cousin Zebulon 'n Sister Caroline,
'N sent an invite out o' town to jolly old Aunt Lize,
I've hinted somethin's goin' on in this old house o' mine,
'N if they come here Thanksgiving Day, they'd find a big surprise;
There'd be a layout waitin' that 'ud make 'em work their chins,
'N this old bird is big enough to make 'em bust the'r skins.

I thank the blessed Lord to-day that prosperous times is here,
Fur the squashes 'n the pun'kins 'n the haystacks that you see,
Fur all the many blessings that He showers on us here,
Fur the comfort that it gives us jest to feel the farm is free,
I paid the mor'gige yisterday I owed to old Judge Gray,
'N mebby we won't have a feast on this Thanksgiving Day!

—Ex.

Our Bid for Patronage is Price and Quality



SOLID GOLD BROOCHES. (Illustrations actual size).

9035.	Lace pin, pearls, whole pearls, diamond,	$20.00
9025.	Lace pin, pearls, diamond center,	11.50
9023.	Lace pin, 14 K., pearls, diamond,	12.50
9022.	Lace pin, bright, pearls, diamond,	8.00
9026.	Lace pin, bright, enameled, pearls, diamond,	10.00
9015.	Lace pin, enameled, pearls, diamond,	11.50
9033.	Lace pin, Roman, enameled, pearls, diamond,	9.25
9028.	Lace pin, Roman, pearls, diamond,	5.75
9021.	Lace pin, Roman, pearls, diamond,	$10.00
9031.	Lace pin, Roman, enameled, diamond,	9.50
9020.	Lace pin, Roman, enameled, diamond,	9.00
9034.	Lace pin, Roman, enameled, diamond,	7.13
9030.	Lace pin, pearls, diamond,	18.00
9018.	Lace pin, 14 K. bright, pearls, diamond,	27.50
9017.	Lace pin, pearls, diamond,	10.50
9019.	Lace pin, bright, pearls, diamond,	14.00
9024.	Lace pin, bright, pearls, diamond,	$10.87
9016.	Lace pin, 14 K., bright, pearls, diamond,	23.00
9013.	Lace pin, enameled, pearls, rubies, opal,	6.00
9012.	Lace pin, green gold, pearls, amethysts,	4.50
9008.	Lace pin, bright finish,	1.87
9009.	Lace pin, Roman, pearl,	2.25
9014.	Lace pin, Roman, opal,	4.87
9011.	Lace pin, bright, enameled, pearl,	3.00

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9200.	Seal, 13 pieces, manicure line, same handle, per doz.,	6.00
9202.	Pipe cleaner, satin,	.67
9213.	Stamp box, bright, per doz.,	4.25
9208.	Corkscrew, pearl handle, silver trimmed,	1.00
9215.	Polisher, bright,	1.00
9201.	Pocket comb, bright silver trimmed, per doz.,	2.75
9203.	Needle case, satin,	.35
9210.	Match safe, rose gold,	1.25
9211.	Match safe, satin,	1.63
9207.	Needle case, holds 6 sizes	2.00
9214.	Stamp box, bright	.60
9219.	Menthol case doz.,	4.25
9217.	Emery in case, bright	.78
9205.	Rattle, bright	.75
9218.	Knife and cigar cutter, satin	2.13
9212.	Match safe, bright	.68
9216.	Shaving brush, bright	1.38
9209.	Smoking set, match safe, cigar cutter and holder	1.75

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Santa Claus carries more watches

into American homes than anything else—this year he will carry more than ever before. The New England Watch Company is his special factory—above all others he is the ruling spirit of the organization. *The factory makes just what Santa Claus wants*—no "shelf goods"—every jeweler knows this—knows that there is everything about New England Company watches that makes them sell quickly—accuracy, durability, style, finish, shape, size, price—all just ahead of others in up-to-dateness. You can't sell the watches if you haven't got them. *Don't wait until the eleventh hour and be dissappointed as some of you were last year.*

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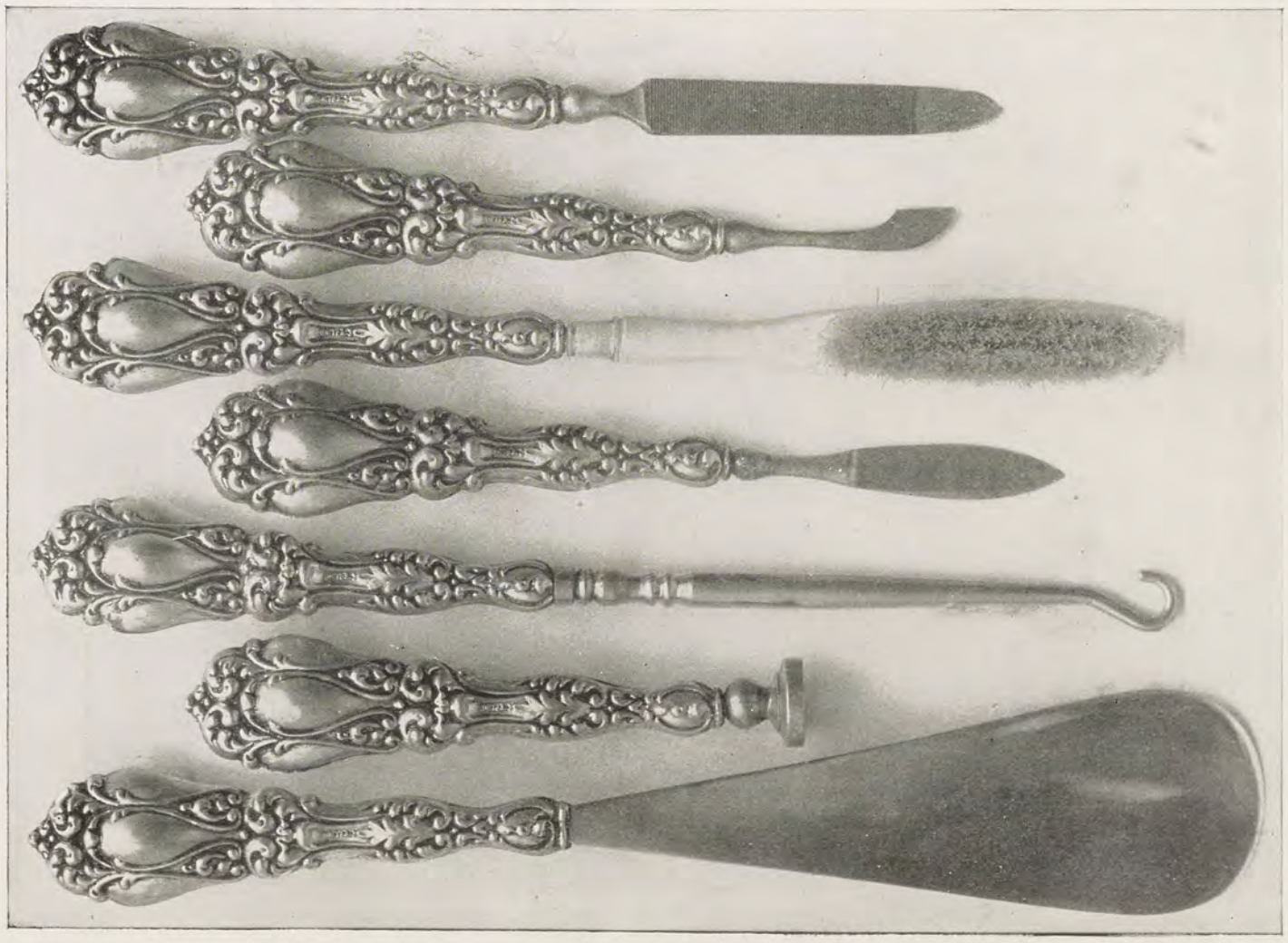

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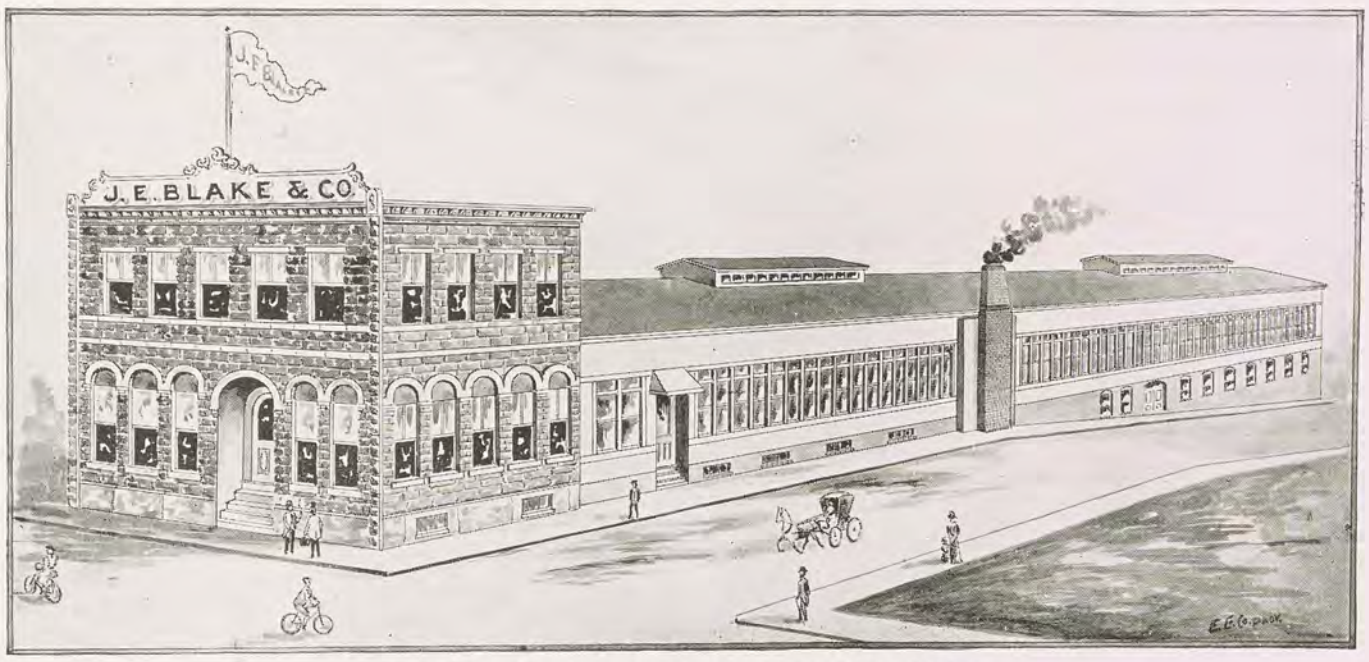


FACTORY OF JAS. E. BLAKE CO., ATTLEBORO MASS.

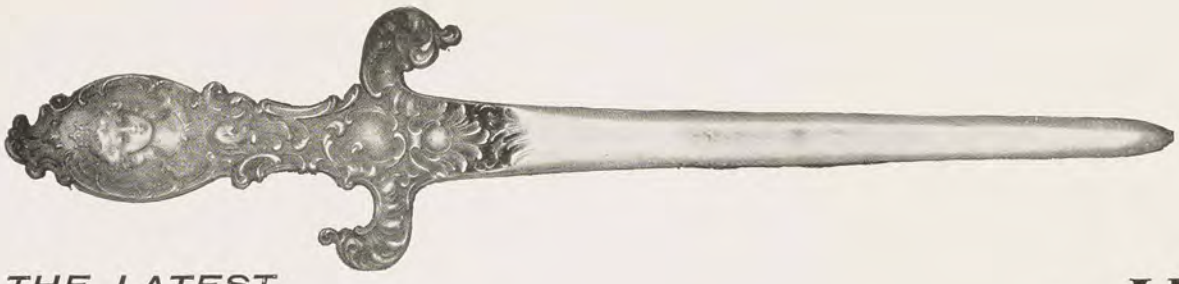
IN this age of competition there are three great essentials of success—business capability, honest goods and honest methods. These, together with enterprise and energy, are the magic combination that accounts for the phenomenal progress of Jas. E. Blake Co., Attleboro, Mass., and its rapid stride to the front in the field of jewelry and silver novelty manufacturing.

"There's a tide in the affairs of men which, when taken at the flood, leads on to fortune." The Jas. E. Blake concern took the tide at the flood. Some years ago, when the price of silver bullion reached such a point that with the aid of improved machinery and a voluminous output, beautiful silver novelties could be sold at a popular price, the predecessors of the Jas. E. Blake Co. were equal to the opportunity, and then began the handsome line of novelties in silver which at once captivated trade and public, and is now the most extensive and popular in the country.

The trade at large are indebted to the concern for the enormous volume of trade created for them by the silver novelty innovation. These goods are now the most popular of all the specialties handled by the trade, and their still increasing beauty, artistic merit and greater adaptation as articles of utility and ornament make them the money-makers-in-chief of the jewelry stock. The products of the Blake concern in all classes of silver novelties, from such beautiful and useful little articles as match safes and stamp boxes, to the most pretentious toilet articles, manicure sets, etc., are noted for their superiority in quality, design and finish. They have an individuality and exclusiveness that are emphasized by comparison with other makes, and this accounts for their leadership in sales.

The great success of the Jas. E. Blake Co. crystallized some months ago in the erection of the magnificent new factory, shown above. Located on South Main Street, Attleboro, in the business center of the town, the location is an ideal one. It is on the banks of the river, from which is secured an independent and adequate water supply. The buildings are equipped with the latest and most improved devices in the way of fire protection and automatic fire alarm system, with all the arrangements for the convenient and speedy transaction of business both in the factory and offices. It is, as has been said, an ideal factory, packing, shipping and office building, and is a fitting monument to the push, honesty and integrity that has put the firm where it stands to-day, at the head of houses in this line of manufacture.

Attleboro is proud of the wonderful success of the Jas. E. Blake Co., which has done so much to spread its fame and advance its reputation for standard goods. The anticipation of the greatest holiday season in the history of the trade has been a special inspiration to the company, and their lines specially prepared for jewelers' holiday stock are unprecidentedly extensive and beautiful. The trade at large are gratified at the position of leadership attained in the field of jewelry and novelty manufacturing by the Jas. E. Blake Co., for no other concern has been so potential in making business for the entire craft.



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VERY ATTRACTIVE. Must be seen to be appreciated.

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Our *HELENA*

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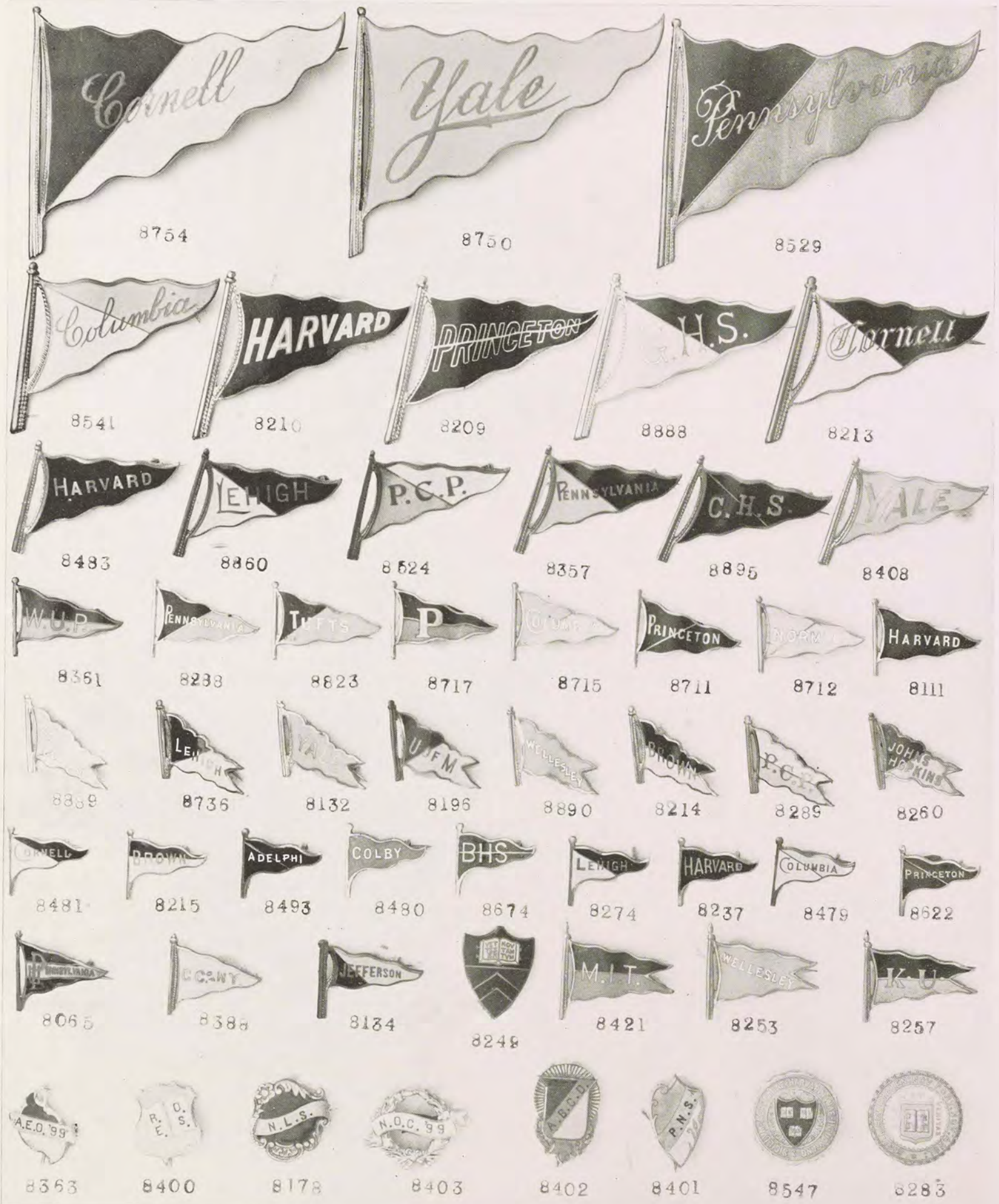

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THE LAND OF GOLD AND DIAMONDS

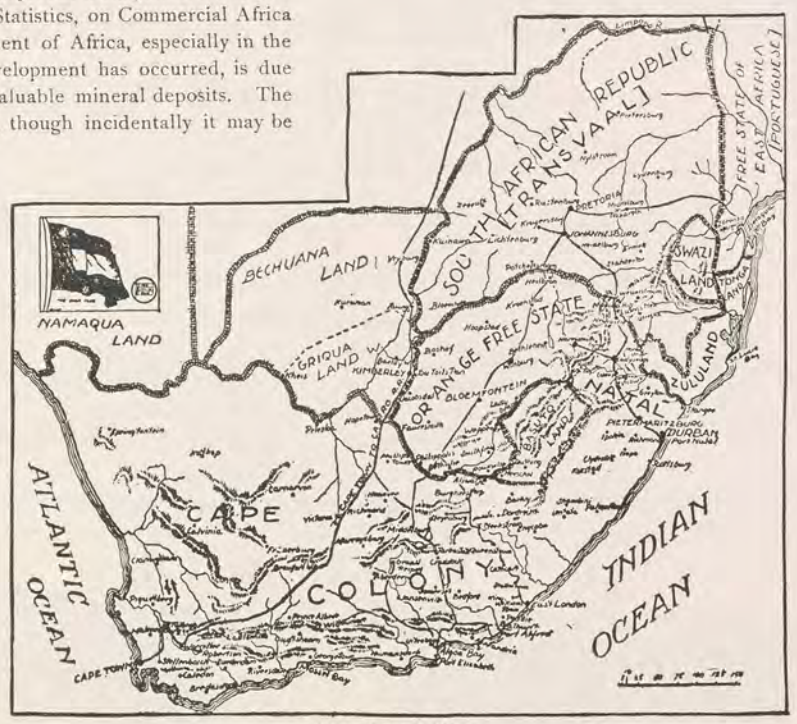
SCENE OF THE ANGLO-BOER WAR—
GREAT NATURAL RESOURCES OF SOUTH AFRICA—
$350,000,000 WORTH OF ROUGH DIAMONDS AND $300,000,000 OF GOLD ALREADY TAKEN OUT.

As gold and diamonds are two of the chief commodities that go to make up the jewelry business and as South Africa is the leading gold and diamond producing country of the world, the jewelers have more than an average interest in the scene of the present Anglo-Boer war, while a special interest arises from the fact that the conflict may possibly have a sensational effect on the diamond market, though at this writing there is no very forceful reason for dreading any such eventuality.

THE WORLD-FAMED DIAMOND MINES.

The mining interests of Africa, especially the wonderful gold and diamond mines which have attracted so much attention, are the subject of a chapter in the monograph just prepared by the Treasury Bureau of Statistics, on Commercial Africa in 1899. Much of the recently rapid development of Africa, especially in the southern part where the greatest rapidity of development has occurred, is due to the discovery and development of extremely valuable mineral deposits. The most valuable of these are gold and diamonds, though incidentally it may be mentioned that the iron, coal and other mineral deposits of South and Southeast Africa give promise of great value when wealth-seeking man has time to turn his attention from the gold mines to those which promise less rapid, but perhaps equally certain, profits.

That the gold and diamond mines of South Africa have been, and still are, wonderfully profitable, however, is beyond question. The Kimberley diamond mines, which are located in British territory, just outside the boundaries of the Orange Free State and about 600 miles from Cape Town, now supply 98 per cent. of the diamonds of commerce, although their existence was unknown prior to 1867 and the mines have thus been in operation about thirty years only. It is estimated that $350,000,000 worth of rough diamonds, worth double that sum after cutting, have been produced from the Kimberley mines since their opening in 1868–69, and this enormous production would have been greatly increased but for the fact that the owners of the various mines in this vicinity formed an agreement by which the annual output was so limited as to meet, but not materially exceed, the annual consumption of the world's diamond markets. So plentiful is the supply and so comparatively inexpensive the work of production, that diamond digging in other parts of the world has almost ceased since the South African mines entered the field of precious stone production.



Map of South Africa.

GOLD MINES OF THE RAND.

Equally wonderful and equally promising are the great "Witwatersrand" gold fields of South Africa, located in the South African Republic, better known as the "Johannesburg" mines. The Dutch word "Witwatersrand" means literally "White Water range," and the strip of territory, a few hundred miles long and a few miles in width, to which it is applied, was but a few years ago considered a nearly worthless range, useful only for the pasturage of cattle and sheep, and for even this comparatively valueless. In 1883, however, gold was discovered, and in 1884 the value of the gold production was about $50,000. It increased with startling rapidity, the production of 1888 being about $5,000,000; that of 1890, $10,000,000; 1892, over $20,000,000; 1895, over $40,000,000, and 1897 and 1898 about $55,000,000 in each year. This wonderful development has attracted great attention to South Africa and drawn thither thousands of people in the hope of realizing quick fortunes. Development, however, showed that the mines could only be successfully worked by the use of costly machinery, and while they have been extremely productive where machinery has been used, they were not of such character as to make hand or placer mining profitable, as was the case in California. The gold production in the "Rand" since 1884 has been over $300,000,000, and careful surveys of the field by the use of drills and other processes of experts show beyond question that the "in sight" probably amounts to $3,500,000,000, while the large number of mines which have been located in adjacent territory, particularly in parts of Rhodesia, give promise of additional supplies, so that it seems probable that South Africa will for many years continue to be, as it now is, the largest gold-producing section of the world. Recent discoveries lead to the belief that these wonderfully rich mines are the long-lost "gold of Ophir," from which Solomon obtained his supplies, making "a navy of ships in Ezion-Geber, which is opposite Eloth, on the shore of the Red Sea in the land of Edom; and Hiram sent in the navy his servants, shipmen that had knowledge of the sea, with the servants of Solomon; and they came to Ophir and fetched from thence gold and brought it to King Solomon."

THE TRANSVAAL, ITS GOVERNMENT AND PEOPLE.

The foregoing facts give a unique distinction to the scene of the Anglo-Boer war, and a few facts in regard to the Transvaal country, its people and government, will, no doubt, interest our readers. The conformation, relative dimensions and boundary may be inferred from the map here shown. The native Boers are of Dutch descent and have in the past been driven from pillar to post by their more aggressive neighbors until they finally settled, in security as they thought, in the Transvaal. But fate decreed otherwise. The discovery of gold in their country resulted in a rush of foreigners or outlanders, and these at present far outclass the Boers in numbers, wealth and education. While these outlanders pay almost all the taxes they have no right of suffrage and practically no voice in the government. This condition and the persistent refusal of the Boers to allow them even a minority representation is at least the ostensible ground for the present war.

TRANSVAAL FRANCHISE AND GOVERNMENT.

These facts about the Transvaal Republic are gleaned from the "Statesmen's Year Book" for 1899: There are two parliamentary chambers. Bills passed by the second become laws only when accepted by the first. Members of both chambers must be thirty years old, possess fixed property and be Protestants. There are two classes of citizens—the first-class burgers and the second-class burgers. Only first-class burgers are eligible to the upper chamber, and only first-class burgers may vote for them. Both classes of burgers choose the members of the second chamber, and a burger of either class is eligible to election.

The first-class burgers comprise all male whites resident in the Republic before May 29, 1876, or who took an active part in the war of independence in 1881, the Merlenbach war in 1894, the Jameson raid in 1895–96, the Swazi expedition of 1894, and all the other wars against native tribes, and the sons of such persons upwards of sixteen years of age.

Second class burgers are the naturalized males and their sons from the age of sixteen. Naturalization may be obtained after two years residence, registration, both of allegiance and payment of ten dollars, and renders liable the person naturalized to military service. Second-class burgers may become first-class burgers after a naturalization of twelve years by special resolution of the upper chamber. Sons of aliens, though born in the Republic, have no political rights. If they register at sixteen they may become second-class burgers at eighteen, but they cannot become first-class burgers till they are forty, and they must be elected by the upper chamber. The President and the general of the army are elected by the first-class burgers only.

An uncertain quantity in the Anglo-Boer conflict is the course which may be adopted by the native blacks who hate intensely both Boers and British. Their numbers and fighting qualities make them an important factor in the situation. In Cape Colony the negroes number 1,150,000 to 375,000 whites. In Natal there are 45,000 whites to 450,000 negroes. The Transvaal contains 300,000 whites and 650,000 Kaffirs. In the Orange Free State the whites number 80,000 and the blacks 130,000. Rhodesia has a white population of 13,000 in the midst of a half million well armed, discontented and warlike Matabele negroes. Then there are the large native populations of Bechuanaland, Basutoland and Swaziland, where few white men have made settlements. This unruly aggregation could make it decidedly unpleasant for the white combatants.

Paul Kruger.

Deep, mournful eyes that seek the ground the devious path to trace;
The giant form of Lincoln, crowned by Cromwell's grosser face;
Coarse, rustic garb, of uncouth cut, that masks each mighty limb;
Its shapeless folds the ready butt of Europe's jesters trim.

So much the crowd can see; the rest asks critics clearer-eyed;
So rough a scabbard leaves unguessed how keen the blade inside;
The trenchant will, the subtle brain so strangely doomed to wage
With Destiny's still climbing main the hopeless war of Age.

His kindred are a rugged brood that nurse a dying fire;
The sons of Calvin's bitter mood, and sterner than their sire.
By faith through trackless deserts steered, lost miles of lonely sand,
Far from the intruding world they feared, they found their Promised Land.

By such grim guardians tutored well his Spartan childhood grew;
The wind-trail of the fleet gazelle, the lion's path he knew;
The camp surprised at dawn, the rush of feet, the crackling smoke,
When on the sleeping laager's hush the sudden Kaffir broke.

Nay, once, 'tis said, when Vaal in flood had barred the hunter's way,
And 'mid its swollen current stood a wounded buck at bay,
While some before the brute drew back, and some before the wave,
Striding that torrent's foaming track, the mercy stroke he gave.

A stream more rapid and more wide his strength has stemmed since then—
Called from the plodding team to guide the starker wills of men—
Chance-prenticed to so new a trade, unlettered and unschooled,
The cloud-bred clownish peasant made, no less, a realm, and ruled.

Yet, though that realm he still sustains, against an empire's might,
And with untiring skill maintains the so unequal fight.
He buys his victories all too dear, whose foes have Time for friend;
Each fatal triumph brings more near the inevitable end.

Dynamos.

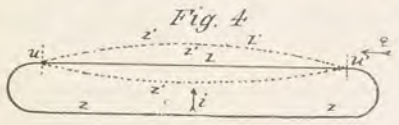
(CONTINUED.)

II.

An Electric Current Produced by Magnetic Influence.

THE principle involved in a dynamo is illustrated at Fig. 4. Here we have the same closed circuit as we illustrated at Fig. 1. Now let us suppose that we give the wire z, between the points $u\ u$, a circular motion precisely like a skipping rope, and the wire so swung around

Fig. 4



passed through a magnetic field, such a magnetic influence would produce an electrical disturbance in the atoms composing circuit z, which we term an electrical current. Now, as far as results go, it makes no difference from what source we derive the magnetism which influences the wire z', as to whether the "magnetic field" through which the wire passes is one produced by a loadstone, a permanent magnet or magnetism arising from electrical excitement. The resulting current in the wire z' depends on two factors: (a) the intensity of the magnetic field; (b) the rapidity with which the wire z' passes through such magnetic field.

At this point we come to the true key to successful dynamo construction. To aid in our explanation we refer to Fig. 5, where we show at E a typical magnetic field and at the small circles $z'z'z'z'$ the wire of the circuit z', Fig. 4, passing through it. Now it has been clearly demonstrated by carefully conducted experiments, that the magnetic flux or flow of magnetism is in a circle, as shown at o, Fig. 6, where we show at F a magnet of the common U-type with its keeper or armature. A magnet of this kind, with the keeper or armature removed, would still have the magnetic flux flowing through it, as illustrated at Fig. 7, but the "gap" between the poles $F\ F'$ would have to be overcome at the expense of the magnetic current or flux.

Fig. 5

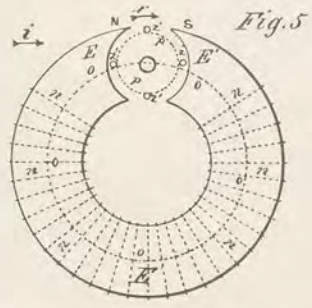


Fig. 6

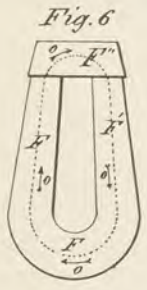
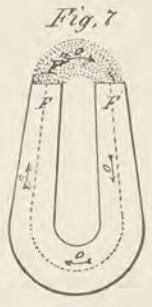


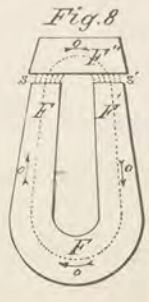
Fig. 7



Magnetic Flux Illustrated

We can reduce this gap resistance by placing a magnetic conductor in the space intervening between the two poles, as illustrated at Fig. 8, where we show the keeper F'' as being separated by a slight gap at $s\ s'$ from the poles $F\ F'$. The magnetic intensity is greatly enhanced by this arrangement. We secure practically the same position indicated by the dotted circle $p\ p$, Fig. 5. This intervening iron bridge (armature core) should offer no more resistance than the rest of the magnetic circuit; in fact, the only resistance in the magnetic circuit o, Fig. 5, is the gap of space between the fields $F\ F'$ and the armature core represented by the dotted circle p.

Fig. 8



We have now settled two important points in practical dynamo building, which are: (a) to have the magnetic circuit, represented by the dotted line o, Fig. 5, as short as possible and have the iron forming the fields hold the necessary insulated wire for exciting it; (b) to have the gap space between the armature and fields no wider than is absolutely necessary for the passage of wires z' between the core of the armature and the tunnel of the fields.

We have spoken of the iron core of the armature, represented by the circle p, as if it was stationary. In actual construction this core is made to turn with the wire z, although repeated attempts have been made to have the core remain stationary and the wire z pass between it and the field; but mechanical obstacles have so far debarred satisfactory results. Where wrought iron is used for armature cores—and it is always well to do so—the sectional area of such armatures may be one-third less than the sectional area of the fields when they are made of cast iron.

We spoke some few paragraphs back of the intensity of the electric current generated in the wire z. Let us, in illustration, suppose the field magnet E, Fig. 5, to be a permanent magnet under this condition; the only means we would have of increasing the output of our dynamo would be to increase the velocity with which the wires z' Fig. 5, passed through the magnetic field.

We also stated we could also increase the electrical excitement in the wires z' by increasing the intensity of the magnetic field. This can be readily done by winding the field E with insulated copper wire, as indicated by the dotted lines n. Now it is evident that we can easily arrange so that a portion of the wire $z\ z$, Fig. 4, will pass, like n, Fig. 5, around the field magnet and thereby stimulate the intensity of the magnetism and consequently increase the intensity of the electric current in the circuit. With early dynamo builders all this was much a matter of trial for best results, but carefully conducted experiments have furnished the dynamo builders of to-day with data which renders results almost certain. Still we feel that very few intelligent mechanics would be satisfied to build a machine without having a knowledge of "how and why" such results were secured.

We shall carefully avoid all long, wordy dissertations and confine ourselves to such explanations as are absolutely necessary to know to enable a good mechanic to construct a dynamo intelligently and with a good knowledge of the elementary principles involved. We request our readers to follow carefully our descriptions, especially as relate to commutating the electric currents as they are generated in the wire which passes through the magnetic field.

In the cut at Fig. 4 we illustrate the electricity generating principle involved in almost all dynamos, which principle can be given in words by saying: *The rapid passage of a portion of a closed electric circuit, like the one shown at z, Figs. 1 and 4, through a magnetic field of force—also called magnetic flux—produces in such closed circuit molecular disturbances we name an electric current.*

In the above italicized sentence we say "a portion of the closed electric circuit." Now it is not to be inferred that the electrical excitation of such circuit could not be enhanced by subjecting the whole of such circuit to magnetic influence; but for obtaining desirable results it has been demonstrated that the portion of the circuit subjected to magnetic influence should represent, as measured by its electrical resistance, about one-twentieth of the entire circuit.

(TO BE CONTINUED.)

Some Store Mottoes.

One of the best store mottoes I have seen recently, says a writer in the *Merchant's Journal*, is, "We are not satisfied unless you are." This was hung in a prominent place just inside the street door of a general store in a country town. It was printed in large stencil letters on a sheet of manila paper about 25 x 50 inches. It was so suspended from the ceiling that it could be read very easily by any one entering the store. It is a good business motto. Another motto I saw not long ago read, "We never try to sell goods you do not want." Many merchants make the mistake of having their clerks force goods upon customers, whether the customer really wants the goods or not, and whether the goods are really satisfactory or not. I have seen customers take goods they knew they did not want, and the clerk knew it, and the probability is the proprietor also knew it. The clerk or the proprietor was more persistent than the customer, and they forced the customer to buy. I do not believe it ever pays to force a customer to take things he does not want. Another motto displayed in a Kansas City department store reads, "We carry nothing beyond its season." If the merchant really does business in this way, and has no out-of-date goods, and carries nothing in stock longer than its season, he is quite sure to draw trade with such a motto. However, if he puts up a sign of that kind, inviting customers to examine his goods, and they find the goods are not strictly in season, and are not exactly as represented by the sign, the merchant will be the loser, Store mottoes are good things, and should be used plentifully in all country stores. They should be neat and attractive, neither too large nor small, and there should be no pretense at fancy lettering. Above all other considerations, they should be truthful.

Only One Fault.

I was riding through a country town in Vermont, when I noticed a concourse of people in a churchyard, encircling an open grave.

It was a warm day, and I had ridden ten miles, so I drew the rein under some trees to allow the horse to rest.

Presently a villager came toward me, and I said, "There's a funeral to-day in your town."

"Yes—Stephen. He was one of the largest hearted men I ever knew. He had great abilities. We sent him to the legislature three times. They thought of nominating him for governor. But," he said sadly, "Stephen had only one fault."

I made no answer; I was tired, and watched the people disperse, leaving the sexton to his solitary work.

"A generous man Stephen was. Always visited the sick. The old people all liked him. Even the children used to follow him on the streets."

"A good man, indeed," I said indifferently.

"Yes, he had only one fault."

"What was that?" I asked.

"Only intemperance."

"Did it harm him?"

"Yes, somewhat. He didn't seem to have any power to resist it at last. He got behindhand, had to mortgage his farm, and finally had to sell it. His wife died on account of the reverse—kind of crushed, disappointed. Then his children turned out badly. His intemperance seemed to mortify them, and take away their spirit. He had to leave politics; 'twouldn't do, you see. Then we had to set him aside from the church; and at last his habits brought on paralysis, and we had to take him to the poorhouse. He died there—only forty-five. Poor man, he had only one fault."

"Only one fault!" The ship had only one leak, but it sank.

"Only one fault!" The temple had but one decaying pillar, but it fell.

"Only one fault!" Home gone, wife lost, family ruined, honor forfeited, social and religious privileges abandoned, broken health, poverty, paralysis and the poorhouse.

Only one fault! Only one! —The Home Guard.

POINTS ABOUT TRAVELING MEN

A successful drummer writes: "I let the merchant get the very best joke he can on me, and after a while he will be so pleased with the way he wound me up, and got the laugh on me, that he will turn around and give me a good order." If a man tells you that he will not look at your samples, and means it, and is a square man, it will be just as well to take your hat and leave. Let the leave-taking be gentlemanly and kindly on your part, and perhaps you have opened the way for your next call.

Do not be afraid to approach a merchant when the store is full of customers. Congratulate him upon the amount of business he is doing. Tell him that he is cleaning out his goods so fast that he will need a fresh supply very soon. Give him a hint in a single graphic word about some peculiarly desirable goods that you have that will soon be taken up, and you would like to give him a chance. If you put the matter just right he will do more business with you in five minutes than he would in five hours, when there was no trade in the store.

Drummers, drummers, drummers, is the tune you hear from the Western retailers. An old-time traveler said to THE KEYSTONE's Chicago representative the other day that he had never seen the like of it in twenty years' experience on the road. "Why," said he, "the West has been simply floooded with jewelry drummers, who hail from all points of the compass, a majority of whom are new faces. I was in a town down in Oklahoma one day early in September and found ten other travelers there besides myself and only five dealers in the town. You may know we did not all do a land-office business that day, nor in that town." "Still," he continued, "though there are a good many drummers out this fall in jewelry, as well as all other lines, they all seem to be doing business, and the traveler's life is once more somewhat of an easy one.

Charles A. Garlick and H. G. Schramm, of Theo. Schrader & Co., will be out over their respective territories all through November and up to December 15th, hustling for business. What's more, they propose to get it.

Fred. H. Carpenter, the well-known chain salesman, who has represented the R. F. Simmons & Co. line in the Western territory for the last six years, was met in Chicago recently, and when asked by THE KEYSTONE representative as to the truth of the rumor that he had resigned his position with the above firm and was about to form a new combination to enter the field as chainmakers, he made no secret of the matter, and said it was a fact that he had sent in his resignation and that it had been accepted; that the new firm will be made up of the following gentlemen: J. G. Fuller, of J. G. Fuller & Co.; Providence; Fred. H. Carpenter, Western salesman for R. F. Simmons & Co.; E. E. Richardson and F. E. Bodman, of the same house. The style of the new firm will be Fuller, Carpenter & Co., the co-partnership beginning with the opening of the new year. The new firm will succeed to the business of J. G. Fuller & Co.

J. H. McCormick, who was in the employ of the Waterbury Clock Co. for over thirty years, died at West Union, Iowa, on Sunday morning, September 17th, after an illness of two months, from cancer of the liver. He was taken sick early in July with what then was diagnosed as rheumatism, and was in a considerably weakened condition after he had been sick for a month. He rallied later, and was then thought to be in a fair way to recovery; still later, he went out to Iowa, where his wife's relatives live, to recuperate. After he reached there, the extreme warm weather affected him badly, and he grew steadily weaker. Still there was no intimation up to within a week of his death that the issue would be fatal, so that the announcement of his death came as a great shock. During the last twenty-five years he filled the position of traveling salesman. During this time he has at one time or other covered almost all the territory under the care of the Chicago office. Latterly his route comprised the larger towns in Illinois, Iowa, Nebraska, Kansas, Colorado, Utah and Montana. His first position was that of book-keeper, when he also occasionally waited on customers, and in this way demonstrated his ability as a salesman to such an extent that he was given the first opening on the road. He has steadily grown in his usefulness and value to those who employed him. He was exceedingly popular with the trade and had a firm hold on same. In his death the Waterbury Clock Co. feel that they lose one of their most efficient men, and that it will be hard to replace him.

R. N. Hull in *Ohio Merchant:* "When a merchant reads the doleful tales in the public press of the great number of tourists that have been withdrawn from the road through the machinations of so-called trusts, he smiles in derision and simply says he 'doesn't believe it.' They are thicker or more numerous than ever. The corporations that have made the experiment of dispensing with this necessary auxiliary of trade soon discover the mistake and hasten to install the usual number and move to regain lost ground that has been captured by the enemy. Any commercial traveler who can sell goods, and does not desire to pose as a moving ornament for the house, is in demand and ever will be. It is useless to waste any talk or sentiment over this plain proposition. Business is not, and never was, carried on for the benefit of the knight of the grip or to philanthropically furnish him a job to keep him employed, any more than people conveniently cultivate sickness for the purpose of extending the fees of doctors. The citizens do not engage in litigation that the lawyers may wax fat at their expense. All these men are simply needed to fill a place that society demands. Hence in the field of commerce no firm was ever so generous as to suggest the calling of selling goods on the road for the express purpose of supplying a class with something to do. But the occupation has grown out of the intense desire of American people to become the greatest traders of the world, and if this could be accomplished in any other possible way without the services of the man of samples, it would have prevailed from the beginning. For every one of the craft relegated to the rear by any circumstances beyond his control the way opens up for a hundred others, not only to push the sale of multiplied products in this country, but around the globe. The dawning of a new era that sees the coming demand for our staples in all climes is bright and radiant with promise. Therefore, I adjure the faint-hearted ones to take courage and press on to victory."

An experienced traveler says that most of the fatigue of a long journey is quite unnecessary, and comes from an unconscious effort to carry the train instead of letting the train carry us. He advises always resting the feet on the rail of the seat in front, if such is provided, as to keep the feet off the floor lessens the vibration that is conveyed to the body and prevents just that much strain. A bag will do as well for a footstool, if nothing else is to be had. The body, while sitting in a car, should be as completely relaxed as possible. Until one attempts this relaxation in a railway car it is not discovered how tense is the effort to resist the motion—all of which is in direct accordance with modern physical culture, which has discovered that true repose goes further than mere non-action.

The St. Louis *Drygoodsman* thus discourses on the modern traveling salesman: The evolutions of the traveling salesman (and his only true prototype is indigenous to this country) has been rapid, effectual and inspiring. To-day there is perhaps no set of men more representative of the best there is in American business life than the man who represents the great business concerns of this country on the road. When the business of the country was largely in the hands of a comparatively few houses, the fortunate man who visited the trade in the interests of one of the favored few was something of an autocrat. His customers were, or thought they were, practically dependent upon him, and the ease with which he gathered in business had a tendency to make him lax in his methods, just as his facility in rounding up commissions made him prodigal with his substance. The same lack of competition in the wholesale line, extended, in a slightly modified form, to the retail field, and the dealer, untrammeled by the shackles of a hot competition, was inclined to buy goods more on the personal qualities of the agent than the actual worth of his line. The multiplication of houses, both wholesale and retail, and the sharp demands of business rivalry, cutting profits to the narrowest margin, has changed all this. To-day, there is no class of men who have less time for frivolity and more time for work than the man on the road When he packs his samples and shakes hands with the boss he is on as much of a strain as the locomotive engineer with a record-breaking run before him. Not a slip can be made, the slighest error or neglect gives his watchful rival an opening. He can't let his guard fall for a minute or he's over the ropes and counted out. Personality, of course, counts for much, but it has become secondary to nearly every other consideration. It is the personality of truth, energy and manliness that counts, and not that of good fellowship pure and simple. As the business of the house now depends largely upon the road salesmen, those men are selected with the greatest care. Experience, of course, is desirable, but the *sine qua non* are sobriety, good sense and the ability to stand sustained effort. The salesman who is successful to-day on the road has every qualification which would make him successful at the head of the business. In fact, a large proportion of the men who are active heads of large houses in the country obtained the training which fitted them for their trust in the hard school of active service on the road.

American Artisan: The calling of the commercial traveler is most honorable, and it would be an impossibility to-day to do the commercial business without him. Once he gains your confidence, he always retains it by honorable dealings. No one factor of business is closer in sympathy or has a deeper earnestness in the welfare of the retailer than the commercial traveler. He comes seeking your business upon honorable measures, with honorable ambition, and from him you can always secure equitable treatment. It will be a cold day for the business world if competition shall eventually drive him out and suspend his labors. The manufacturer or wholesaler who shall try to dispense with his services will experience long waits between his going and the orders coming should he or they essay to do the work without him. A clean-cut commercial traveler controls much of the business he canvasses.

The English Board of Trade have received through the Foreign Office a copy of a despatch from the British Ambassador at St. Petersburg, forwarding a memorandum respecting a law which came into operation on January 1st (13th) last, on the subject of the licenses required by all commercial travelers pursuing their vocation in Russia. This law (which supersedes the temporary regulations previously in force) requires commercial travelers, both native and foreign, to provide themselves with a license at the cost of fifty rubles (about £5 5s. 6d.), and to obtain, at a further cost of 500 roubles (£53 4s.), a trading license for the firm or company which they represent. To enable British commercial travelers to take out this latter license they must produce a power of attorney or letter of authority from their employers, and must also possess a "certificate of license to trade," issued by a British Chamber of Commerce. These licenses, which are issued for a period of one year from January 1st, and are renewable during November and December, are to be procured on entering Russia from the nearest local treasury, town council, municipal body or collector of taxes, and commercial travelers found pursuing their vocation without having provided themselves with the requisite licenses will be liable to a fine of treble the amount payable thereon, or 1650 roubles (about £175). Commercial travelers of the Jewish persuasion can only obtain these licenses and engage in business in Russia by special sanction of the Ministers of the Interior, Finance and Foreign Affairs, and this sanction is procurable only on behalf of firms who carry on "wholesale dealings in goods, industrial and commercial enterprises and mining operations of the first-class, or retail commercial and trading pursuits of the first three classes, with established warehouses."

The Minneapolis *Commercial Bulletin* makes the following timely remarks under the head "Where Principle Counts:" "It is not always the fault of a traveling man if he fails to get a fair share of business in his territory, but it usually is. It is a pretty safe rule to lay down that no one ever loses business on the road by being decent; sometimes business is lost by practices that many merchants think are not decent. The argument that one must drink whisky and smoke countless cigars to get business in legitimate calling is a fallacy. The man who wishes to be temperate as a matter of principle and is temperate, will get more business year in and year out than two men who believe as he does, but lack in courage to carry it out. A commercial traveler of sixteen years' experience and known to the writer, did not drink a glass of whisky or smoke a cigar in that time, or "treat" a man to either, and yet at the end of sixteen years he was without competition in his territory, having complete monopoly of the trade because of his known honesty and reliability. Some men argue that to be "a good fellow" it is necessary to drink whisky and carouse. This isn't true. Such a man is not a good fellow, he is an ass. The thing for every traveling man to do is to cultivate the instincts that are common to every man—the instincts of a gentleman. These never offend and they often give pleasure.

Workshop Notes.

Subscribers wishing inquiries answered in this department must send name and address—not for publication, but as an evidence of good faith. No attention will be paid to anonymous communications. Questions will be answered in the order in which they are received.

An **Index** to the questions answered in Workshop Notes department for each year accompanies each December number. Subscribers are requested to preserve these indexes, and, before mailing questions, to refer to them as similar questions may have been answered in previous issues. The indexes are arranged alphabetically, according to subject covered in each answer, and tell the issue and page on which the information may be found.

"Toothpick."—Please tell me how I can know the different sizes of American movements which come in for repairs.—All American movements except the Howards are based on the English Lancastershire sizes, which are based on the idea of dividing the English inch into thirty parts, five of which are allowed for "fall," that is, when a watch movement is jointed to the case, as used to be considered the "proper thing" with English watches. Thus, suppose we are dealing with an O-size movement, we take 1″ to start with and add $\frac{5}{30}$″ for fall, and the main plate would be 1″ and $\frac{5}{30}$″ in diameter, which expressed in decimals of an inch would be 1.166.″ For all larger sizes we add the number of thirtieths the size calls for and the $\frac{5}{30}$ for fall—thus a sixteen-size movement would be $1'' + \frac{5}{30} + \frac{18}{30} = 1\frac{23}{30}''$, which expressed in decimals of an inch would be 1.700″. Here are the usual American sizes in decimals of an inch. O = 1.166″; 6 = 1.366″; 8 = 1.433″; 10 = 1.500″; 12 = 1.566″; 14 = 1.633″; 16 = 1.700″; 18 = 1.766. A steel rule graduated to $\frac{1}{100}$″ will enable you to arrive at the size number of the movement

"Coffin Plates."—I have some trouble when engraving coffin plates to avoid getting them scratched. They are made of soft metal and scratch very readily. How can this be avoided?—Native gamboge comes in cylindrical sticks from $\frac{3}{4}$″ to 1½″ in diameter. Get a piece of one of these sticks about 1″ in diameter and 1″ or 2″ long. Wet the end of the middle finger with water and rub on the end of the gamboge stick until you form a yellow paste, with which you "pat" the surface of the plate. Do not rub the paste on or you will produce scratches. In the operation of "patting" you simply press the finger on to the surface of the plate without any sliding motion, and consequently do not scratch it. After the gamboge coating is dry it can be drawn upon with a lead-pencil. Such coating in no way interferes with the operation of engraving. After the engraving is executed, soak the plate in water and wash without rubbing. In case you cannot procure gamboge in sticks, the pulverized will answer by placing it in a large homeopathic bottle and adding water and shaking the bottle until the composition is of the proper consistency to be readily applied by patting as directed.

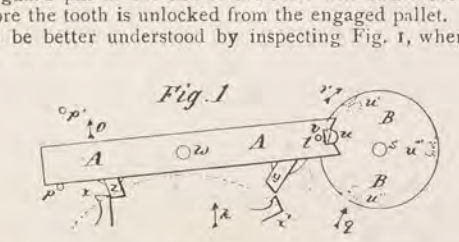
"Hard Drills."—Will you tell me why a Mascot pivot drill will not drill even a cheap Ohio watch balance staff? It seems to me they ought to drill any balance staff or pinion made without drawing the temper.—The temper of an American staff is intended to be about equivalent to that obtained by drawing to a golden brown, at which temper steel is understood to be the strongest and stand the greatest strain, consequently rendering the best service. This is about the temper to which Morse twist drills are brought. Steel so tempered can be cut with a good file, but the piece to be filed must be held perfectly rigid, and the file pressed firmly down. Such work is extremely hard on a file, and no file will stand to do much of it. In fact, steel so tempered cannot be successfully worked with a file. A drill to stand the stress of service must be tough as well as hard. A drill left file-hard would break and crumble. It is a hopeless task to seek for a drill to cut some material as hard as itself. The true policy to pursue when pivoting is to have the proper appliances for softening (annealing) a staff, and after doing so your Mascot drill will cut all right. See also our reply to "Annealing to Drill," page 1033, October, 1899, KEYSTONE.

"Anti-Oxidizer" – What is the best way to make anti-oxidizer for preserving the color and polish of gold while passing through fire? A preparation which will not prevent the gold solder from flowing?—The mixture mostly used by practical gold workers is composed of yellow ochre 4 parts, boracic acid 1 part. These ingredients are mixed with enough water to form a thin paste and boiled for one hour. The article to be protected from oxidizing is painted over with this and then allowed to dry before heating. But as you say, a coating of this substance prevents gold or silver solder from flowing. This trouble can, to a great extent, be remedied by the manner of using. That is, if we apply the borax paste, first confining its application to the parts where the solder is to flow and then painting over the other parts with the yellow ochre and boracic acid. To use borax properly get one of those little ground glass slates which come with drawings in them for children to copy the outline with a lead-pencil, and select a good, hard lump of borax as large as a hickory nut and shake a few drops of water on the glass slate, rub the borax round and round until you produce a thin borax paste. Dip a small camel's-hair pencil brush in this paste and smear a piece of gold solder with it and apply to the place where the solder is to flow. Let this dry, or gently heat until it does dry, and then apply the ochre and boracic acid paste, and dry this before heating to solder. The glass slate should be covered with a glass cover to protect the borax paste from dust when not in use. A mixture of boracic acid and talc (pulverized mica) also makes a good anti-oxidizer. It is prepared and used the same as the yellow ochre and boracic acid formula given above.

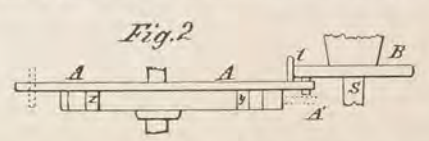
"Water Motor, alias Keystone Reader."—Our city water works has a pressure of about fifty-five pounds to the square inch, and they charge twenty-five cents per 1000 cubic feet, and I would like to put in about half a horse-power water motor for running a lathe and plating dynamo. How many cubic feet of water of that pressure would it require to run a half-horse-power motor? Which would be the most practical—a water motor at those rates or an electric motor and storage cells as described on page 888, September, 1899, KEYSTONE?—It is not by any means a difficult operation to compute the horse-power of water after we know the pressure or head, and if a man will charge his mind with a few facts and data he will always be able to compute the horse-power of any water-power. Really, all that a man need know is the weight of a cubic foot of water at 60° F., which is 62.4491 pounds, the rest of the factors are supplied by the question under consideration. In your case you do not give the head or height from which the water is derived, but you give what will serve our purpose just as well, that is, the pressure per square inch. Now, to produce a pressure of one pound to the inch we require 2.3′, and to determine the head or height of a column of water of known pressure we make a statement in proportion thus: 1 : 2.3 :: 55 to the required head. On working out the problem we find the head to be 126.5′. The mechanical force of 1000 cubic feet of water falling through 126.5′ of space is found by multiplying this sum by 1000, and again by 62.3, the weight in pounds of a cubic foot of water, which gives in round numbers 7,880,000 foot-pounds, and is equal to 238 horse-power for one minute, or 3.9 horse-power for one hour. These are theoretical horse-powers, but practically you would easily get 2½ horse-power for one hour, or half horse-power for five hours, which would be about five cents per hour. The electric motor you refer to is not more than $\frac{1}{8}$ of a horse-power, and will cost about eighty cents a month to run it. Small water motors give back about 65 or 70 per cent. of power; the larger motors run as high as 80 per cent. In England, in many of the larger towns, water is supplied for power under pressures as high as 1500 pounds to the square inch, and with this system, when piston motors are made use of, as high as 92 per cent. of power is realized.

"Ruby Pin."—(1) *Where can I buy needles for all kinds of sewing machines?*—You can get sewing machine needles of Excelsior Supply Co., 250 Wabash Avenue, Chicago.

(2) *What is the remedy for ruby pin jumping out of the fork?*—The jewel (ruby) pin, if the watch is in proper order, can no more jump or get out of the fork than the movement jump out of the case. With the "table roller" the guard pin in the end of the lever will strike the table before the tooth is unlocked from the engaged pallet. This will be better understood by inspecting Fig. 1, where we



show an enlarged view of a lever and roller, in which the roller is moving in the direction of the arrow *r*. It will be seen that if we move the lever *A* toward the roller *B* the guard pin *t* will strike the roller *B*, and do it before the tooth *x* is unlocked from the pallet stone *z*. In the practical construction of the lever escapement of the ordinary grades it is the usual practice to allow the locking face of the pallet to act for 1½°. To ensure freedom of motion to the roller as regards contact with the guard pin it is set so the lever *A* can be moved through 1° of angular motion, and the escape wheel tooth which is engaged with a pallet cannot unlock. There is a further factor to be considered in this problem, which is the "draw" of the locking face of the pallet stone. This draw of the pallet stones keeps the guard pin drawn away from the roller, and it is one of the special points to be looked to in examining a lever escapement to determine if the "draw" of both the pallet stones is as it should be. To make this examination wind the watch two or three turns to get power on the train, then put a tinsel friction spring under the balance rim and turn in the banking screws so the jewel pin will just pass free out of the fork on each side—we mean when the lever rests alternately on each banking pin. Now, after the jewel pin is well out of the fork try the guard pin to see if it is just free of the roller, and also, if after you have pressed the guard pin lightly against the roller with a hair broach or an oiling tool, the action of the draw of the tooth will bring the lever promptly back to the banking pin. The engaged tooth, say *x*, Fig. 1, must not pass off of the locking face so as to rest on the impulse face of the pallet *z*, except when the jewel pin is in the slot of the fork. This sort of examination should be applied to both banking pins. If these instructions are carried out there can be no such thing as the jewel pin getting out of the fork except the trouble exists which is illustrated at Fig. 2, said view



showing the same parts as Fig. 1, seen in the direction of the arrow *k*. The trouble to which we refer is, that the parts are so badly set, and the end shake so much that the jewel pin passes over the fork as shown at the dotted outline *A′*. A frequent cause of over-banking, or getting out of the fork as you put it is, the roller being out of true either from faulty construction or a staff badly pivoted so it was not true. We have seen many instances where the guard pin showed the proper side shake when the jewel pin was in the vicinity of the fork, but if the balance was turned through half a revolution, so the part of the roller opposite *q*, Fig. 1, was at the guard pin, the roller was sufficiently out of round to permit the guard pin to pass and throw the jewel pin out of the fork. The mode of testing for such faulty condition is, while the tinsel friction spring is under the rim of the balance turn the balance half a revolution each way from the point of rest in the slot of the fork, and try the safety action of the guard pin each way for every 10° of roller movement. If, under such trials, the guard pin has only a slight side motion and returns promptly to the banking after the guard pin has touched the roller, there will be no danger of the guard pin getting out of the fork.

"Diamond Setting."—(1) *Did you ever get out a book containing your "Workshop Notes" replies in book form, and if so, what is the price?*—Not yet; what we may do in the future can hardly be surmised as yet.

(2) *We wish you would give us through* THE KEYSTONE *some idea how the diamond-setter puts the stone in the mounting, and what tools he uses to get that nice polish on the prongs?*—The skilled diamond-setter uses but very few tools—the skill being almost entirely a matter of handicraft. The bright, flat surfaces on the prongs is produced by cutting with a flat-bottomed highly polished graver.

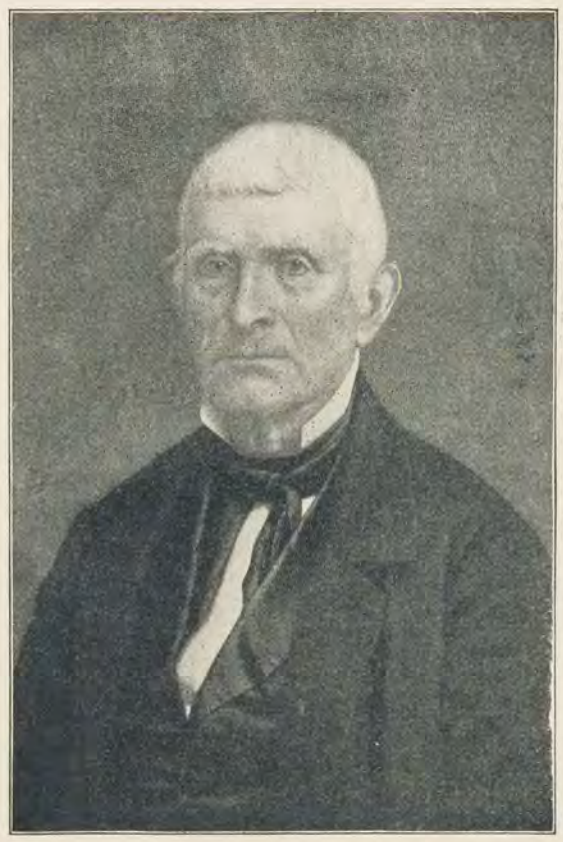
"Gold Printing."—How can I print my name on leather in gold. I have a copper cut for the purpose?—Printing with gold leaf on leather requires a good deal of skill and experience. In real gold leaf the gold is very thin; in fact, gold leaf is, as we may say, but a network of gold as can be proved by holding to the light when the sheet seems green, not from transparency but because it is filled with innumerable fissures, so that you can see that in pressing down the gold leaf with type in the operation of printing, if any excess of adhesive matter is present, it will find its way through the gold leaf and smear the face of the type. To describe the operation of producing gold letters on leather would say, that it requires a much harder impression than for printing on paper, and the type should be entirely of copper so as to stand heating to about 600° F. We do not say but what the operation can be performed with ordinary electrotypes, but we know book-binders in doing gold work insist on this temperature. The usual substance employed by book-binders for gilding on morocco leather is the white of an egg beat into froth, dried and then ground into dust. This is applied with a rag so as to leave but the slightest trace of dust on the surface of the leather, and even then if the type gets to sticking to the gold the professional book-binder has no end of trouble. Perhaps you would have better success by using Dutch leaf, a composition metal of good color, but much thicker and not so liable to adhere to the type. In using this kind of leaf it is the usual practice to varnish the leather with some hard varnish, applying but a very thin coating and letting it dry perfectly before printing on it with the hot type and Dutch leaf. White shellac dissolved in wood alcohol makes a good varnish for such purposes. A coating of the same varnish over the Dutch leaf letters will prevent them turning black by the action of the air.

"Hektograph."—Will you give instructions for making a hektograph?—Procure, or have made, a flat, tin vessel somewhat larger than the paper you propose to use and ½″ deep. To make the composition: Take 1 ounce of the best gelatin and soak it over night in cold water. In the morning pour off all the water not absorbed by the swelled gelatin. Next take 6½ fluid ounces of glycerine and heat it to about 200° F. This operation is best effected by placing the glycerine in a dish setting in a vessel of boiling water and keeping the water boiling while the softened gelatin is dissolving. It is well to maintain the gelatin and glycerine composition at this temperature for several hours in order to expel as much as possible of the water taken up by the gelatin in the process of swelling, thus rendering the composition harder and more elastic. When the heated mixture is in the right condition it is poured, while hot, into the flat tin vessel mentioned. On cooling, the composition is ready for use. The ink used for writing with on paper for transferring to the gelatin pad is made as follows: Analine violet ½ ounce, hot water 3½ ounces, glycerine ⅛ ounce and 1 drop of carbolic acid. After the analine is dissolved, put the ink in a bottle and cork well for use. To copy, write with the above ink in a steel pen on smooth surface paper, using a full pen to ensure a liberal supply of the ink on the paper. Light hair lines should be avoided, and all lines to be copied should present a full green look after drying. To prepare the gelatin pad for taking a copy go over the surface with a moist sponge, and when the surface is nearly dry lay the paper, with the written surface down, on the gelatin pad, and, after laying an extra sheet on the back, go over the back with the finger tips, pressing gently down and rubbing. After about a minute's time take the written sheet by one corner and gently pulling the paper peel it away, leaving the greater portion of the analine color. On laying a clean sheet of paper on the gelatin surface, and lightly rubbing it down with the finger tips as before, on removal will be found a perfectly legible copy of the original writing.

CLOCKMAKING IN THE UNITED STATES

SUNDRY devices have been employed from the earliest times to record the passing hours, and we find the occurrence of certain events given with remarkable accuracy, which date back to the earliest authentic history. The day was early divided into equal periods, and some accuracy in their measurement was obtained by a vertical pole whose shadow marked upon a plain the designated hours. The clepsydra, or water clock, appears to have been the first contrivance for measuring spaces of time independent of the motion of the earth. Although men are named with confidence, from Archimedes to Gerbert (the latter a monk who lived at the end of the Tenth Century) as inventors of clocks, the earliest clock worthy of the name of which we have any authentic record was made by Henry de Wick for Charles V. of France, on the tower of whose palace it was placed about the year 1368. In 1631 the clockmakers of London were incorporated as a company, which furnishes evidence of a business of some extent at that time. At the beginning of the present century clockmaking was an extensive business in several European countries, and the demand in this country was chiefly supplied by importation.

Clockmaking as an industry in the United States may be said to be contemporaneous with this century, though there were clockmakers earlier, one of whom, Eli Terry, was a clockmaker of distinction and patented an equation clock in 1797. He was born in South Windsor, Conn., April 13, 1772. He learned the art of clock and watchmaking and the art of engraving on metal of Daniel Burnap, in the city of Hartford; he also received instruction from Thomas Harland, a noted clock and watchmaker, a resident of Norwich and native of London. In the year 1793 he settled in Plymouth, Conn., engaged in the business of repairing clocks and watches, engraving on metal, and selling spectacles, spectacles being the only goods he kept for sale. In his early residence in Plymouth he did nothing at clockmaking worthy of mention, but in the year 1807 he obtained a contract from a clockmaker in the neighboring town of Waterbury for making four thousand thirty-hour wood clocks with seconds pendulum, the dial and hands included, at four dollars apiece. At this date the manufacturers of clocks in this country made the eight-day English brass clocks and thirty-hour wood clocks, both kinds of clocks having pendulums beating seconds, or seconds pendulums, as they were called, with three exceptions. In that part of Plymouth now Thomaston there was a manufacturer of brass clocks, and also a manufacturer of brass clocks at Salem Bridge, now Naugatuck. These clocks were the English brass clocks with sixty teeth in the escapement wheel instead of thirty, to adapt them to a half seconds pendulum, the cord passing upward and over a pulley on the inside of the top of the case and attached to the weight, the weight moving the whole length of the inside of the case. These were the substantial differences. The plates for the frames of these clocks and the blanks for the wheels and other parts were cast metal, and the pinions were of cast steel, the same as in the English clocks. The length of cases required for half seconds clocks bears about the some ratio to the length of the cases for clocks with seconds pendulums that the lengths of the pendulums bear to each other. These clocks were popularly called "shelf clocks," and were thus distinguished from clocks with seconds pendulums, the cases of which stood on the floor. At Roxbury, near Boston, a timepiece was made called Willard's timepiece. This timepiece consisted of the time train of the English brass clock, with the omission of one leaf in the pinion on the escapement wheel arbor, the escapement wheel having an additional number of teeth and was thus adapted to a pendulum shorter than the seconds and longer than the half seconds pendulums. This brass timepiece and the half seconds brass clock before mentioned were excellent timepieces. Such was the state of the clockmaker's art in our country, so far as relates to clocks for general use, in the year 1807.



Seth Thomas

To complete the contract mentioned, Mr. Terry was allowed three years. During the time he conceived the idea of making a thirty-hour wood clock with half seconds pendulum for general use, which would be much less expensive than the half seconds clock of cast brass. His first effort in this direction was an unsatisfastory success, the clock was substantially the movement of the thirty-hour wood clock with a seconds pendulum, the escapement wheel having sixty teeth instead of thirty to adapt it to a short half seconds pendulum. The cord passed upward and over a pulley on the inside of the top of the case and down around a pulley attached to the weight and back to the top of the case, where it was fastened. The front plate of the frame was an open plate, and the clock had no dial, but the figures to indicate the time were painted on the glass in the sash of the case. This clock did not suit Mr. Terry's aspirations, though he made and sold several hundred of them, and other manufacturers made and sold more than he did.

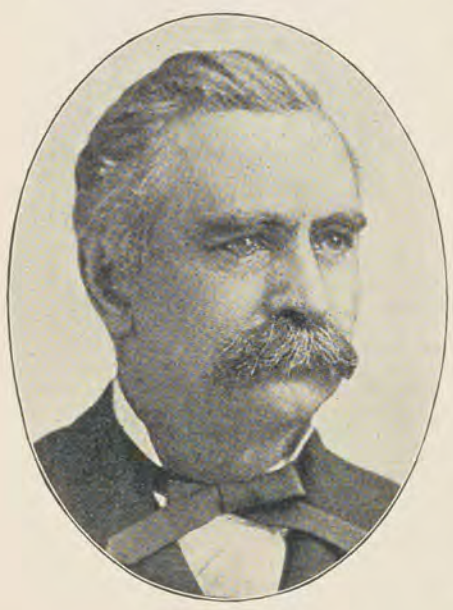
In the year 1814 he perfected a thirty-hour wood clock of a construction entirely new, both the time and striking trains having a greater number of wheels, and the clock being so radically different that it was really a new manufacture. Aside from the ingenuity as shown in the general construction of this clock, *there were two notable inventions:* the one consisted in arranging the dial works between the plates of the frame, instead of between the front plate and dial, and the other consisted in mounting the verge on a steel pin inserted in one end of a short arm, a screw passing through the other end and into the front plate. In wood clocks the pin was inserted in a button midway between the center and the periphery. By turning the button or arm, the verge was adjusted to the escapement wheel. In the manufacture of this newly constructed thirty-hour wood clock the numerous manufacturers of clocks at once engaged, and it became a very extensive industry, Mr. Terry making a very small fraction of the number made and sold.

The pioneer of this industry was the late Seth Thomas, born in 1786, in Wolcott, Conn. He was by trade a carpenter and builder, but commenced clockmaking with Silas Hoadley in the eastern part of Plymouth, in 1811. In 1813 this partnership was dissolved, and Seth Thomas began business in the western part of the town of Plymouth, known as Plymouth Hollow. At that time the place contained but two or three houses. The name Plymouth Hollow was continued until after his death, which occurred in 1859. At this date it had become a large and flourishing village, and was named Thomaston in honor of him who was its real founder and for so long its animating spirit. The village was set off as a new township, and named Thomaston, by act of Legislature in 1875. It had grown to be a place of 2200 inhabitants. In 1880 the census returns showed the population to be 3300, largely made up of the families of workmen employed in the clock works. The other manufactories consisted chiefly of brass works and a knife factory. The leading industry is the manufacture of clocks by the Seth Thomas Clock Co., whose works give employment to about 1000 hands. The aggregate sale of clocks produced by this company amounts to about $1,000,000 annually.

This business was changed to an incorporated company in 1853, and has been conducted by the sons and grandsons of Seth Thomas to the present time. After the death of his father, Aaron Thomas, his son, was president and manager of the company for more than thirty years. He died June 28th of the present year and was succeeded by William T. Woodruff, a grandson of Seth Thomas. The secretary was Seth Thomas, Jr., who died April 28, 1888. Seth E. Thomas, treasurer and manager of sales, resides in New York.

The main office of the company is at 49 Maiden Lane, New York City. A store is also located at 144 Wabash Avenue, Chicago; also one in London, England, which supplies the foreign markets, the company having business relations with all civilized nations.

The enormous productions of this company are shown from the following figures: Annual manufacture about 400,000 clocks, which gives about 33,000 monthly, upwards of 1000 a day, and over two a minute of the working hours. We can state with equal confidence that no manufactory in this country or Europe produces better work.



Aaron Thomas.

(*Continued on page 1161.*)

Seth Edward Thomas.

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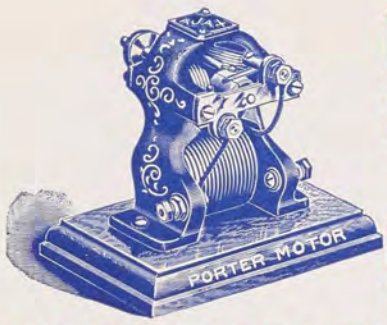

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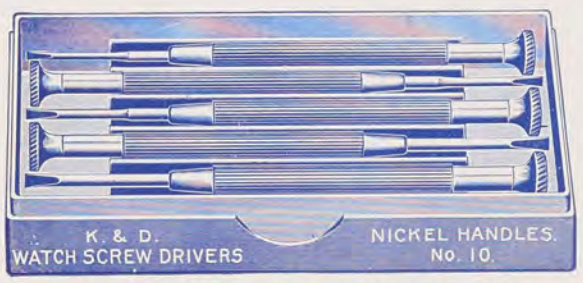
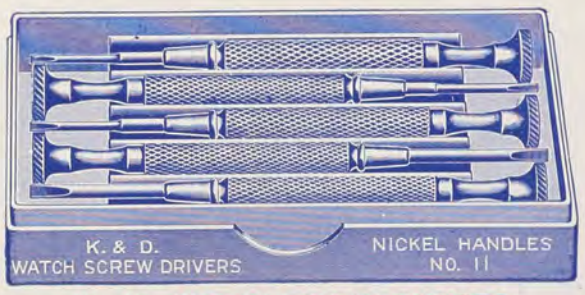
No. 10. PIN VISE

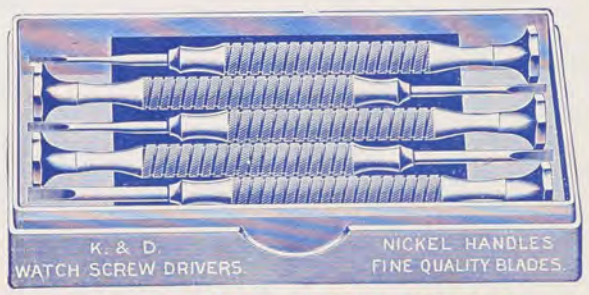


No. 10. WATCH SCREW DRIVERS

ROUND STAKING BLOCK
WITH HUB

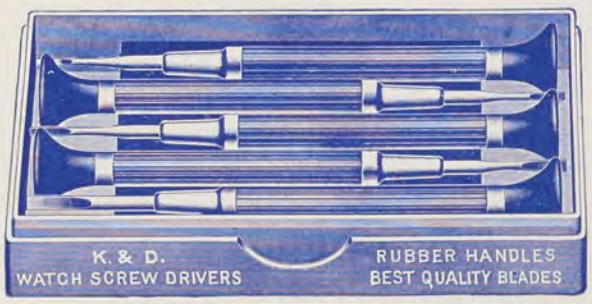


No. 11. WATCH SCREW DRIVERS



No. 2. WATCH SCREW DRIVERS

V-SHAPE STAKING BLOCK



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Very respectfully,
F. H. Buxton,
Granville, Ohio.

Mar. 27, '99.
Check rec'd, and found O.K. Accept thanks for promptness. Promptest people I ever dealt with.
O. Borresen,
Hancock, Mich.

Sept. 18, '99.
Keep the Klondike gold dust. The price was very satisfactory.
Yours truly,
J. H. Hutchinson & Co.,
Portsmouth, N. H.

Check for sweeps received, and is satisfactory.
Very resp'y,
Julius King Optical Co.

Returns for sweeps within 3 to 5 days of receipt

We pay 4 cents per karat for old gold

Sep. 27, '99.
We are in receipt of check for $24.40 for 18 K. gold case sent you. Entirely satisfactory, and we thank you.
Crane Bros.,
Lake City, Minn.

Your shipment back at our expense if you are not satisfied with our estimate

July 27, '99
Check for $4.16 rec'd, and is entirely satisfactory.
B. A. McElwain,
Plattsmouth, Neb

We pay 50 cents per ounce for old silver

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Your check $27.29 for metal rec'd. Thank you.
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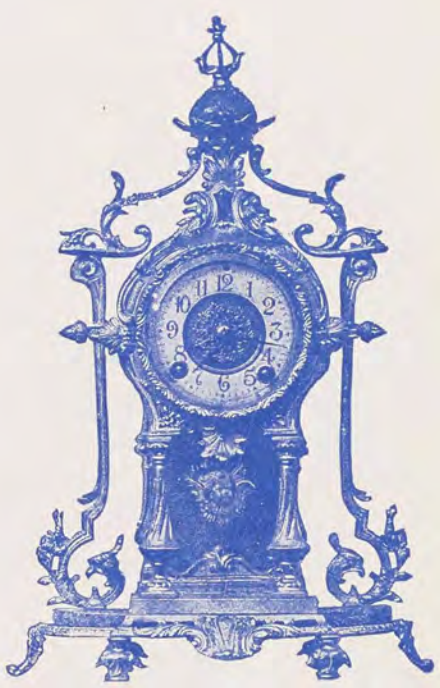

REPUBLIC—Rich Gold—Satin Finish.

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No. 977—Rich Gold—Satin Finish.

PORCELAIN—No. 418—Rich Color.

CORONA—Marbleized Iron.

MAY—Porcelain Alarm.

ARLINGTON—Enameled Iron.

AVOCA—Blackwood.

PORCELAIN—No. 5542—Rich Color.

CLOCKMAKING IN THE UNITED STATES.

(*Continued from page 1160.*)

The growth of this business has been rapid and the manufacture of clocks has attained a prominent place among the great industries of this country. When first carried on by Seth Thomas in 1813, in a small building, the manufacture of 500 clocks annually was considered a large business. Machinery has since been extensively introduced, and the inventive talent of this country has added very many improvements. Manufacturers can produce them at a much less cost than an age ago. The artistic designs and elaborate workmanship of the higher grade of clocks display a refinement of mechanical skill not excelled in any department of manufacture.

The Seth Thomas Clock Co. manufacture clocks of almost endless patterns and designs, which range in price from a little over a dollar to turret clocks costing from $200 to $6000. They include the ordinary one and eight day timepieces, accurate and reliable, and probably more widely and favorably known than any others made; levers, with and without striking apparatus and alarm attachment; spring and weight striking clocks, which wholesale at from $3.00 to $18.00 each; calendars, regulators and office clocks, both spring and weight, of the finest make, ranging in price from $10 to $200.

The calendar clocks are not only reliable timekeepers, but furnish at the same time a perpetual calendar, showing the day of the week, the month and day of the month, and only require regular winding of the time movement. This style is furnished in French, Spanish and German.

Tower clocks, now in such extensive use, are one of the best-known specialties of this company. The perfect mechanism of these large clocks is one of the greatest achievements of inventive genius, and their capability to tell the time with such absolute correctness is truly marvelous. A great number of the cities of the Union, small and large, have Seth Thomas tower clocks, and their wonderful timekeeping qualities are their best advertisement. Fine mantel clocks are another widely known specialty of the company.

In the advancement of the times, the increase of wealth and the rush of business have created a demand for the most perfect timekeepers that mechanical skill can devise. To the business world time is money; and delays, losses and inconveniences are frequently attendant upon imperfect timekeepers. This truth has always been kept in view by American clockmakers, whose product, from the highest to the lowest priced clocks, are marvels of horological exactness. At the Centennial Exhibition at Philadelphia this company was given the award for tower clocks and clocks of commerce, and the company also received the highest award allotted to this class of goods at the Paris Exposition Universal, 1878, and at the American Institute Fair held in New York.

William L. Gilbert.

Another clock manufacturing concern which dates its beginning back to well nigh the opening of the century is the now well-known Wm. L. Gilbert Clock Co., of Winsted, Conn. The business was established by Samuel Hoadley, Luther Hoadley and Riley Whiting in 1807, making one-day clocks with wooden movements. In 1825 Riley Whiting continued the business alone and built the brick factory which was burned in 1871. He died in 1835, and in 1841 Lucius Clarke, Wm. L. Gilbert and Ezra Baldwin took the business, under the firm name of Clarke, Gilbert & Co., making one-day brass weight clocks. This company continued, with few changes, until about 1850, when Wm. L. Gilbert bought out Clarke, Gilbert & Co., and took into partnership his brother-in-law, Isaac B. Woodruff, under the firm-name of Wm. L. Gilbert & Co., which company continued with little change until September 26, 1866, when Wm. L. Gilbert, Geo. B. Owen, Isaac B. Woodruff and Noah S. Pond organized a joint stock corporation under the name of Gilbert Manufacturing Co., which company carried forward the manufacture of eight-day and one-day brass clocks and timepieces until the loss of their factory by fire, April 2, 1871. August 8, 1871, Wm. L. Gilbert, Isaac B. Woodruff, John P. Norton, Geo. B. Owen, Henry Gay and Soloman Sackett organized the Wm. L. Gilbert Clock Co. under special charter from the State of Connecticut, and built the present brick factory building on the site of the original Riley Whiting clock shop. Wm. L. Gilbert died June 29, 1890, aged eighty three years and six months. We learn from a personal memorandum still preserved that he commenced making clocks December 10, 1828.

The Wm. L. Gilbert Clock Co. is now one of the most widely known clock manufacturing concern in the world, the product being no less remarkable for its volume than for its great variety, beauty and excellence. The goods are distributed through salesrooms in New York, Philadelphia, Boston, Chicago and San Francisco.

Yet another clock manufacturing concern of world-wide renown is the Waterbury Clock Co. This concern was incorporated back in 1857. The factories are located at Waterbury, Conn., and are among the largest of their kind in the world. The experience of this company has been one of continued growth and prosperity from its inception, and the character of the goods produced are such that they are appreciated and sought after more and more each year. The officers of the company at the present time are, H. L. Wade, president and treasurer, and Irving H. Chase, secretary, both residents of Waterbury, Conn. The company's goods are marketed through sales depots at 10 Cortlandt Street, New York; 151 and 153 Wabash Avenue, Chicago; 528 and 530 Market Street, San Francisco; 53 Franklin Street, Boston; 31 and 33 Wellington Street, East, Toronto, Canada, and 121 Stockwell Street, Glasgow, Scotland, through whom the large and varied output of the company are marketed.

Our country boasts of many other highly successful clock companies, all of which are most favorably known to the trade through their products. The fame of the Ansonia Clock Co. is co-extensive with civilization. There is the New Haven Clock Co., New Haven, Conn.; the E. N. Welch Manufacturing Co., Bristol, Conn.; the E. Ingraham Clock Co., Bristol, Conn.; the Parker Clock Co., Meriden, Conn., and the F. Kroeber Clock Co., of New York, all of which are well known to the trade through the beauty, variety, excellence and marketable qualities of their products. In fact, our country is quite as far ahead of the world in clock manufacture as in watch manufacture and the rate of progress is being yearly accelerated.

Weight Clocks.

So many vague and contradictory records exist as to the invention of clocks composed of an assemblage of wheels actuated by a weight, that any attempt to fix the exact date of their introduction would be mere guess work.

It is claimed that Pacificus, Archdeacon of Verona, who died in the middle of the ninth century, devised a clock which Bailly, in his "History of Modern Astronomy," considers was furnished with an escapement; but this is not substantiated, and other authorities decided that it was a water clock. Charlemagne's clepsydra which sounded the hours is also sometimes erroneously referred to as a weight clock.

In Stow's Chronicles, under date 606, it is stated: "This year dyed St. Gregory; he commanded clocks and dials to be set up in churches to distinguish the houres of the day." These were probably sun-dials, and Stow's introduction of the word clocks is therefore unwarranted.

The Latin "horologium" or the Italian "orologio" was used indiscriminately for sun-dials, clepsydræ and other timekeepers. Clocks other than sun-dials were also designated nocturnal dials to distinguish them from those which showed the hour by the solar shadow only.

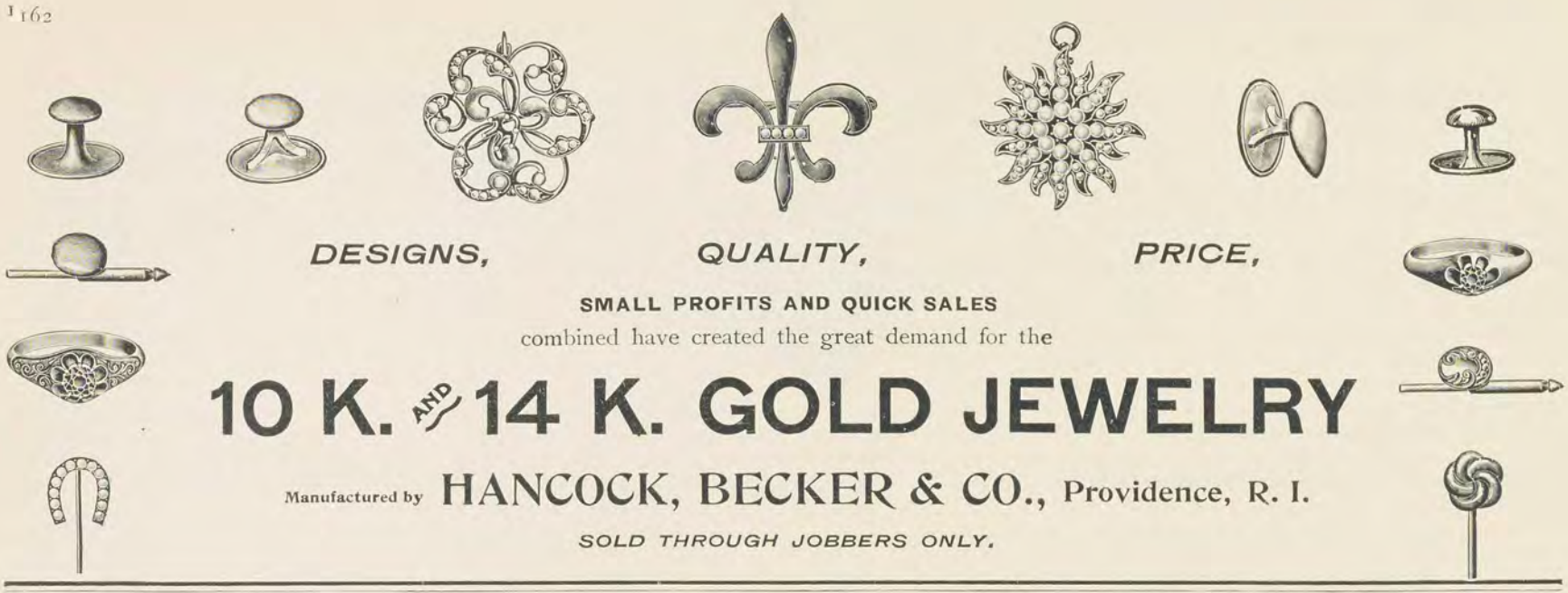
Gerbert, a monk, afterwards Pope Sylvester II., placed a clock in Magdeburg Cathedral at the end of the tenth century; but Dithmar declares it was only a kind of sun-dial; other writers consider Gerbert to be the originator of the escapement. Whatever may be inferred, there is no absolute proof that an escapement was constructed for more than two centuries after Gerbert's time, though it is pretty certain that clocks of some sort existed in cathedrals and monasteries during the twelfth and thirteenth centuries.

The word "clock," whether derived from the Saxon *clugga*, the Teutonic *glocke*, the Latin *glocio*, or the French *cloche*, signified "a bell," and there is reason to suppose that many of the early efforts consisted merely of a bell sounded at regular intervals by hand, the instant of ringing being determined by a sun-dial or sand-glass.

In monasteries prayers were recited at certain fixed hours of the night as well as of the day, and as the monks were not always unfettered by sleep at the needful moment, this horologe or alarum was probably invented to arouse the drowsy *religieux* to a due sense of his duties. In the "rule" of the monks of Citeaux, drawn up about 1120, and quoted by Calmet, the duty is prescribed to the sacristan of so adjusting the abbey clock that it may strike and awake the monks for matins. Durandus, in the thirteenth century, alludes to the clock as one of the essential features of a church. Dante, who was born in 1265 and died in 1321, mentions an "orologia" which struck the hours; and Chaucer, who was born in 1328 and died in 1400, speaks of the cock crowing as regularly as clock or abbey horologe. Berthoud considered it likely that a revolving fly was used as a controller prior to the invention of an escapement. Captain Smyth, R. N. (*Archæologia*, vol. xxxiii.), suggests that John Megestein, of Cologne, who is spoken of as having improved clocks in the fourteenth century, was possibly the inventor of the escapement. Still it is only surmise.

An early hour clock often referred to is the one which was presented by Saladin of Egypt to the Emporor Frederick II, of Germany, in the year 1232. It is described as resembling internally a celestial globe, in which the figures of the sun, moon, and other planets, formed with the greatest skill, moved, being impelled by weights and wheels. There were also the twelve signs of the Zodiac, with appropriate characters, which moved with the firmament.

There was, prior to 1298, a clock at St. Paul's Cathedral which struck the hours on a bell by means of mechanical figures; and Decker, in his "Gull's Hornbook," calls them "Paul's Jacks." In the accounts of the cathedral for the year 1286 the allowances to Bartholomo Orologiario the clock-keeper are entered, namely, of bread at the rate of a loaf daily. In 1344 the dean and chapter entered into a contract with Walter the Orgoner of Southwark to supply and fix a dial. It is suggested that the clock previously struck the hours, but had no dial. In Dugdale's history of the old cathedral the dial is referred to as follows: "Somewhat above the stonework of the steeple was a fine dial, for which there was order taken in the 18th of Edward III., that it should be made with all splendour imaginable, which was accordingly done; having the image of an angel pointing to the hours both of the day and night." The dial was placed below the "Jacks," who were not ousted from office, but continued to strike the hour with their accustomed regularity. Decker says "the time of St. Paul's goes truer by five notes than St. Sepulchre's chimes." There appears but little doubt that dials were absent from most of the early clocks. M. Viollet le Duc observes that from the twelfth to the fifteenth century no space was arranged in the towers of churches for dials. —Britten.



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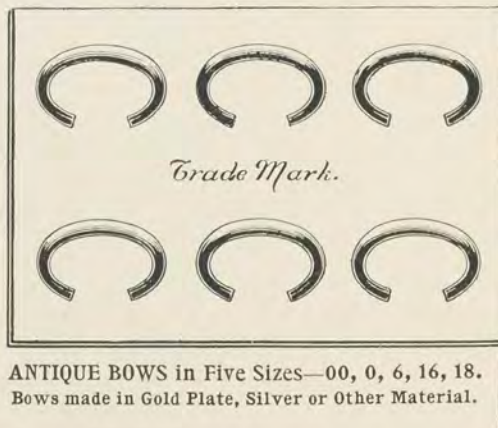
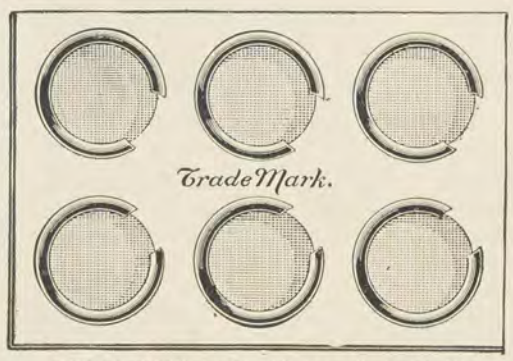
A NEW METHOD OF CARDING WATCH BOWS.



ANTIQUE BOWS in Five Sizes—00, 0, 6, 16, 18.
Bows made in Gold Plate, Silver or Other Material.



ROUND BOWS in Four Sizes—0, 6, 16, 18.

PATENTED JUNE 7, 1898.

PATENTED JUNE 7, 1898.

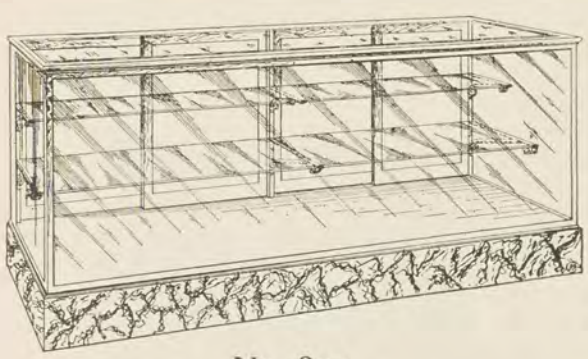
This form of carding helps to prevent tarnishing.
One or more Bows can be removed without disturbing the others.

We make Joint Tubing for Watch Cases, in any metal desired.

All these Bows are made from Seamless Wire. Ask your Jobber for these Goods.

Standard Seamless Wire Co.

PAWTUCKET, R. I.



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COMBINATION FLOOR CASE,

WITH MARBLE BASE.

Case made 42 to 44 inches high.
Send for circulars of our Eight Latest Designs, with description and price.
Large Catalogue, 12 x 18, of High-Grade Drug and Jewelers' Fixtures, sent free.

JEWELERS' WALL CASES

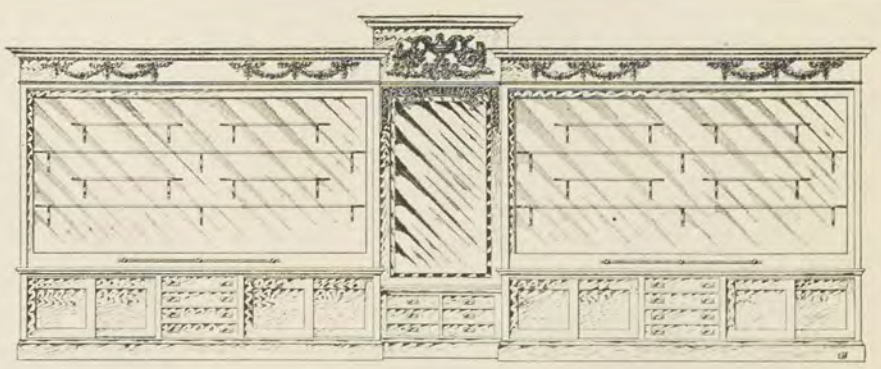
of every description.

Eight foot lengths low as $48.00.

Catalogue No. 10 of COUNTER and FLOOR CASES, illustrating over 100 styles.

Catalogue No. 20 of STORE FIXTURES.

Catalogue No. 26 BANK and OFFICE FIXTURES.



ONE OF OUR LATEST. No. 2 Wall Case.

Base, 30 inches high; 30 inches deep. Upper case, 20 inches deep; 60 inches inside. Shelves arranged to suit. 8 and 10 ft. cases, D. S. A. glass, have doors. Inside felt lined.
Made at from **$6.50** per foot and upwards. Write for catalogues.
State lengths and how many wanted.

The Quincy Show Case Works, Quincy, Ill., U. S. A.

Electro-Metallurgy.

(CONTINUED.)

XXI.

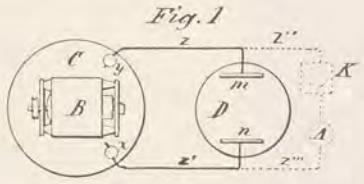
How to Measure Electric Currents.

THE MANNER of making this little instrument that will measure volts or amperes, which we stated last month we would describe in our next article, will now be taken up. Now let us see how we are going to make the one instrument perform the functions of both. In the start we will conceive that we have a little galvanometer reading accurately up to 1½ amperes. Or in other words the instrument is an ampermeter of 1½ amperes capacity. How this instrument is made will be fully described later on. We will first consider how we can apply the measurements so as to make practical use of them in connection with our little dynamo of about 10 volts.

Resistance Coils How Used

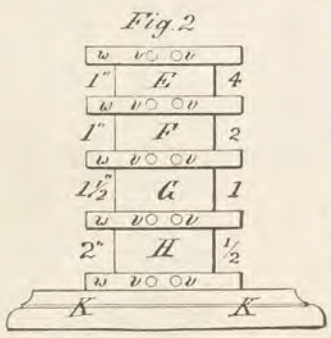
To aid us in our investigations, we will have to make use of resistance coils. These are usually made of German silver, but for our purpose it will be both better and cheaper to use copper, because we can obtain cotton-covered magnet wire of known resistance to a definite length. We will suppose that our ampermeter reads correctly by tenths to 1½ amperes; and we will further suppose that we are going to first make use of it for determining the voltage of our little dynamo.

Fig. 1



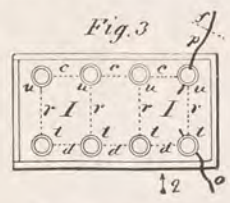
To aid in our explanation we refer to Fig. 1, where the dynamo *B C* is connected by the wire *z* to the plating bath *D*. To help us out we build a resistance column, which is a spool of wood about 4″ in diameter and 9 25″ high. We show such a column at Fig. 2. Such columns are made of some nice hard wood turned in a lathe. The recesses *H G F E* are turned in to receive the wire forming the resistance coils. The recess *H* is 2″ wide and deep enough to hold about 4.4 pounds of No. 13 cotton-covered magnet wire. The length of the wire is the important point and should be exactly 239′. Recess *G* is 1½″ wide and deep enough to hold 239′ of No. 16 cotton-covered magnet wire. This coil will weigh about 2¾ pounds. Recess *F* is 1″ wide and deep enough to hold 300′ of No. 18 magnet wire. This coil will weigh about 1¾ pounds. Recess *E* is 1′ wide and deep enough to hold 378′ of No. 20 cotton-covered magnet wire, which will weigh about 1.3 pounds. The weight of such wire varies somewhat, owing to the covering. The lengths should be the guide, and rigidly adhered to.

Fig. 2



The end of the wire forming each coil should be attached to the binding posts, shown at *v*. It will be seen that by properly connecting these coils we can get a resistance in the circuit varying from ½ to 7½ ohms. One more home-made instrument and we are ready to commence our electric measurements. This instrument is a piece of hard wood board 12″ long, 6″ wide and 1″ thick. We show such a board at Fig. 3. It is hardly necessary to say that all the wood parts we are describing should be nicely finished with shellac varnish, made by dissolving gum shellac in wood alcohol. This is done both for looks and to ensure perfect insulation. For giving stability to the resistance column, we mount it on a wood base 1″ thick and 9″ square, as shown at *K*, Fig. 2.

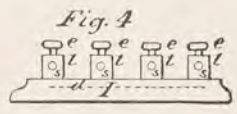
Fig. 3



A New Electrical Measuring Instrument

The device shown at Fig. 3 can well be termed a division board, as it divides the electric current. It is to be understood that the binding screws *u u u u* are connected together by a wire attached on the lower side of the board *I*, as indicated by the dotted lines *c*. A similar connection is made between the posts *t t t t*.

Fig. 4



We show at Fig, 4 a side view of Fig. 3, as if seen in the direction of the arrow *q*. If we connect all the binding posts *u t* with four wires of the same resistance one-fourth of the current will pass through each wire *r*. Hence it follows that if five amperes of current are passing through the wires *p o* only one and a quarter will pass through each of the wires *r*, such current being within the scope of our little ampermeter.

Now let us see how we can use our little ampermeter to get at the voltage of the dynamo *C B*, shown at Fig. 1. Suppose we extend the wires *z z*, as shown at the dotted lines *z′ z″*, and place in this outside circuit the resistance column *K*. Now the current would divide and a part would go through the plating bath and a part through the resistance column *K*. Let us imagine that we place our little ampermeter in the circuit at the dotted circle *A*.

We connect the several coils on the resistance column, so they are all in the circuit, consequently we have 4 + 2 + 1 + .5 = 7.5 ohms resistance in the circuit, and under these conditions the little ampermeter shows 1.2 amperes. To arrive at the voltage, we multiply the amperes, as indicated by the ampermeter *A*, by the resistance in ohms, and find that our dynamo is giving 9 volts. If the ampermeter at *A* had only indicated $\frac{6}{10}$ of an ampere we would still have multiplied the resistance by the number of amperes indicated. Now 7.5 multiplied by .6 gives 4.5 volts. The equation given in the text book for indicating current strength is $\frac{E}{R} = C$. To read this out we would say current strength equals the electromotive force divided by the resistance. Hence it follows that if we multiply the current strength, as expressed in amperes, by the resistance expressed in ohms we know the voltage.

We stated in former article that with a dynamo we got the best results when the outside circuit was about twenty times the resistance of the armature. Hence it is desirable to keep the resistance of the circuit between the connecting wires *z z′* as near 1.3 ohms as possible. Now if our dynamo gives 9 volts, we divide the 9 volts by 1.3 resistance, and we should have 6.9 amperes of current. But as our little ampermeter only measures 1.5 amperes, we must resort to some plan to make it do our work.

Large Work from a Small Machine

One way to get at our measurement is to introduce the division board, shown at Fig. 3, into the circuit and connect the four pairs of binding posts *t u* with wires of the same resistance as the ampermeter We should perhaps have said three wires like *r*, Fig. 3, the fourth being the ampermeter. Now the resistance of the three wires and the ampermeter being alike, an equal quantity of current will pass through each; hence if we multiply the reading of the ampermeter by 4 we will be very close to the amperage of the current passing through the main wire *p o*, Fig. 3.

A little practice will soon enable us to get at the amount of work a dynamo is doing, or should be doing in a given time, if we measure the voltage our machine gives and we know the resistance in the circuit Suppose in explanation that we are using a silver-plating solution. Now if this solution is all right and the dynamo sends the proper current through it we should have deposited on the work an ounce of silver every hour for 8 amperes of current. It is not to be understood by this that an ounce of silver can be deposited on one or a dozen spoons or forks in one hour. The strength of the electric current should be proportioned to the surface to be deposited upon, and also on the solution, which should contain from 1½ to 4 ounces of fine silver to the gallon.

(TO BE CONTINUED.)

"We get value received when we send one dollar for The Keystone and do not want to miss a number."—W. Smith & Son, jewelers, Union, Pennsylvania.

Clerks Should Read Trade Journals.

Every clerk should read a good trade journal, and he will find it very profitable to him. If he is ambitious to improve, and without such ambition he will meet with no success, the knowledge he will glean from a good trade journal is indispensable. He has plenty of leisure for such reading, and it will result in a fund of useful and practical knowledge, which he will be able to turn to material value to him. Good trade journals mirror the trade in its every feature, are full of its valuable suggestions and are devoting the best effort, which careful study and careful observation will afford, to the promotion of the interests they represent. Their perusal will arouse new interest in his work, will give him new energy and cultivate an ambition, which must be to his advantage.

The Tale of a Man.

A man there was and he thought a think,
And he said to himself, said he,
As he lowered the lid of his eye in a wink:
"A millionaire I will be!
They say that a fortune is quickly got
By people who advertise;
And I can do that as easy as not;
Just watch your old uncle rise!"

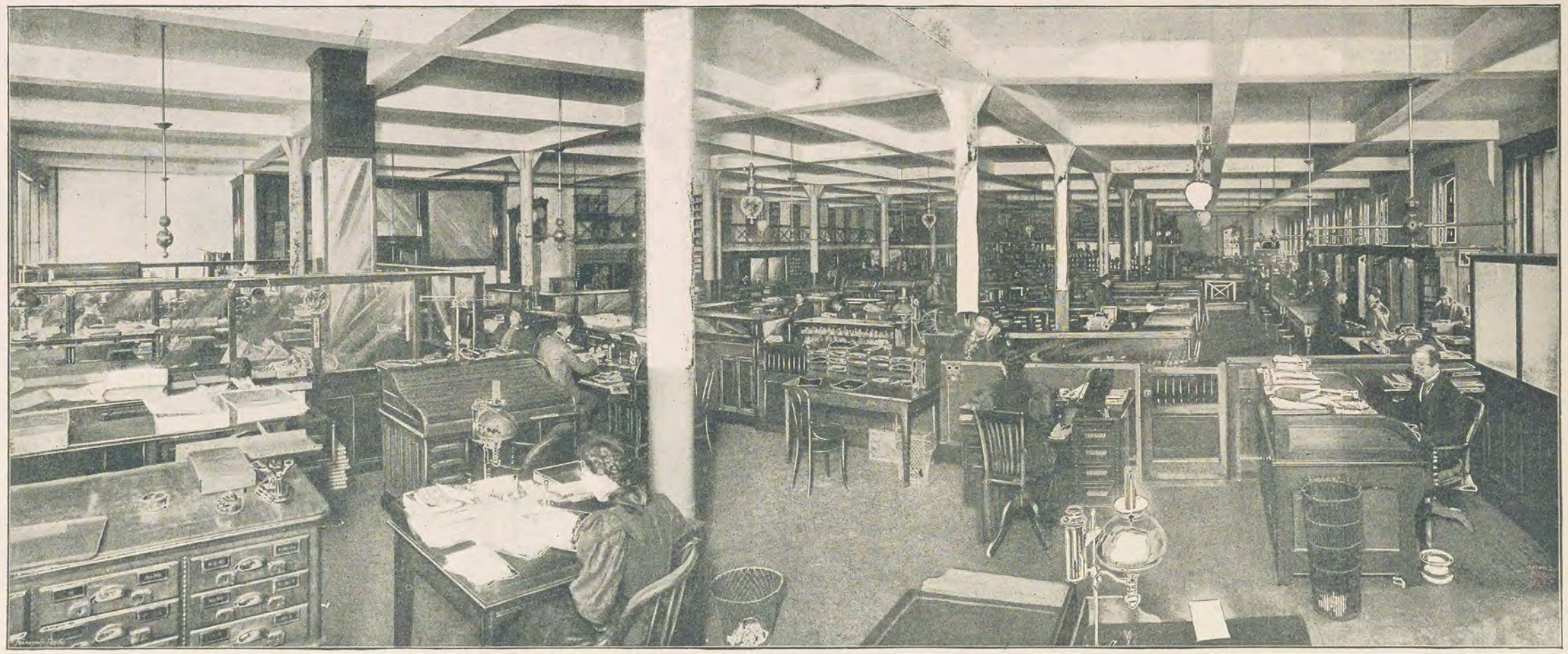
So he picked up a pen and paper pad,
And jauntily went to work,
And wrote him a roaring, screaming ad.
"That'll fetch 'em," he said, "with a jerk!
I'll show the slow codgers a thing or two,
I'll make 'em open their eyes!"
And he shoveled in with a knowing grin
More adjectives and more lies.

Then he put the thing in the papers he read,
And smiled as he scanned it o'er.
"I reckon next week," he joyously said,
"I'll have to enlarge my store!"
But alas for the man and alas for his trade,
The people were up to snuff,
And they only smiled as they read his wild,
Extravagant, puffed-up stuff.

Alas for the man, for his money was spent,
And never a customer came;
His blustering ad. brought him nary a cent,
And damaged his former good name.
The moral of this little story of mine
Is as plain as the plainest daylight.
It does you no good to advertise
Unless you advertise right. —Ex.

NOTICE

Our Illustrated Catalogue of Diamonds, Jewelry, Watches, Clocks, Sterling Silver and Plated Tableware and Novelties; Sterling, Plated and Ebony Toilet Ware; Cut Glass, Canes, Umbrellas, Gold Pens, Optical Goods, etc., etc., etc., for 1900 was shipped to Retail Jewelers on our list during October. As we print a limited number, we are very careful in their distribution. Retail Jewelers not on our list, who wish a copy, can have one by application with business card.



INTERIOR VIEW OF OUR STORE, 75 X 150 FEET.

With the Largest Store, Largest Stock, Greatest Facilities and Lowest Prices we are prepared to fill orders for "Everything Needed by Jewelers."

LAPP & FLERSHEM

Established 1876.

195, 197, 199 STATE STREET,
PALMER HOUSE BLOCK,

CHICAGO, ILL.


136


144


143


155


153


136 EG


SEWING SHIELD


STYLE B


149


108


129 B


109


114


140

Hairsprings and How to Apply Them.

(CONTINUED.)

IV.

New Methods of Truing in the Flat and in the Round.

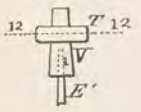
AFTER this manner we test the new spring until we find the proper length to match an old spring we are duplicating. It is always the better policy, in putting in a new hairspring, to have it time a little slow—say three or four minutes per day—because we can then bring the watch to almost exact time by once taking up the spring. It is a golden rule to adopt, in putting in hairsprings, to work on the plan that you are never to let out a hairspring.

A few words on gauging hairsprings into the compartment boxes, one of which is shown at Fig 1, page 768 *l*, August, 1899, KEYSTONE. In gauging these springs they are all clamped in the center, as described, with the holder shown at Fig. 2, page 768 *l*, August, 1899, KEYSTONE, and the grip for the outer end set is shown at Fig. 17; that is, so that about one-fourth of a coil extends beyond the clamps *n n*. The springs are then distributed by the number the index hand *I*, Fig. 4, reads to.

How to Buy Hairsprings

It is well in buying hairsprings to fill up your boxes, to buy of different dealers, in order to secure an assortment; and a workman will never know what an assortment of hairsprings really is until he gauges them off into compartment boxes, as we have described. Neither will he ever know what a satisfaction it is to be able to find exactly the spring he wants instantly until he has such a gauge and his hairsprings assorted into compartments as described. For gauging old hairsprings that are already colleted, it is necessary to provide two cones, shaped as shown at Fig. 18. These cones are made of steel wire and are drilled as shown at the dotted lines *1*, so as to go tight on the pivot *E'*, Fig. 5. These cones are made so that any size of hairspring collet will go on and hold while the old hairspring is being gauged. We show a hairspring collet at *T*, with a supposed hairspring at the dotted line *12*. A badly bent and misshapen hairspring will gauge very near to its true strength.

Fig. 18



To aid the inexperienced workman in truing a hairspring in the round and in the flat, we show a little device at Fig. 19. We would beg to add, however, that the tool is not on the market, but is so simple in construction that any ingenious workman who has a slide rest can readily make it. To make the tool, take a brass disk about $\frac{5}{8}''$ in diameter and $\frac{1}{10}''$ thick. Such a disk is shown as if seen edgewise at Fig. 19. The hub *W'* can be made of a piece of heavy brass wire, which should be about $\frac{1}{4}''$ in diameter and (counting the thickness of the disk *W'*) $\frac{3}{8}''$ long. Axially through the center is drilled a hole about $\frac{1}{40}''$ in diameter, as shown at the dotted lines *c*, Fig. 19. The face of the disk *W'* is turned dead flat and at right angles to the axis of the hole. To this hole is fitted a spring-tempered steel bolt, the cylindrical part of which exactly fits the axial hole *c* in the parts *W' W*. We show such a bolt at *U*, Fig. 20. At *U'* is turned a conical head with a taper of about 20°. The entire bolt is carefully turned so that the taper head *U'* will exactly center a hairspring collet. In the lower end of the hub *W* is a bush tapped out to fit the screw *U''*, shown at Fig. 20. The idea of the device is, the head *U''* of the bolt *U* exactly centers a hairspring collet through which it passes and at the same time holds said collet down on the disk *W*. The action will be evident on inspection of the cut at Fig. 21, where we show the hairspring collet *T* as drawn down to the disk *W* by the bolt head *U'*. The heavy line *12*, Fig. 21, indicates the hairspring seen edgewise. We show at Fig. 22 a plan or face view of the disk *W* seen in the direction of the arrow *14*, Fig. 21. In the face of the disk *W*, Fig. 22, are turned a series of concentric circles, as shown, said circles aiding greatly in truing a hairspring in the round and by truing a hairspring so as to be parallel. This device is also highly useful in putting in a new hairspring. To give details, we place the hairspring collet on the disk *W* and, putting the bolt *U* in place, tighten upon the screw *U''* until the collet sets firm on the face of the disk *W*. Now the lower face of the collet *T* rests dead flat on the disk.

Fig. 20

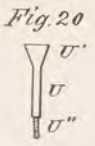


Fig. 21

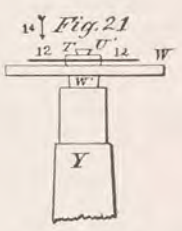
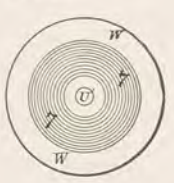


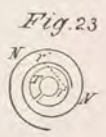
Fig 22



Fitting a Hairspring Collet

If necessary, we break out a central coil or two of the hairspring, so the collet will be free of the inner coil all around. This will be understood by inspecting Fig. 23. Here the full line *N* represents the inner coil of the hairspring. Such inner coil should be free of the collet *T*, as shown at the full spiral line *N*. After the inner end of the hairspring is bent so as to enter the hole in the collet, as indicated at the dotted line *r*, the hairspring and collet should maintain about the relations shown in the cut. The elbow of the spring at *r'* should carry the inner coil free of the collet, but the space between the collet and spring should not exceed the space between the coils. The concentric circles on the face of *W* enable the workman to true a hairspring almost perfectly in the round, and when trued to be parallel to the face of *W*, it will be true in the flat. After a spring is colleted it should be gauged to the proper length—make it a trifle slow, as before suggested.

Fig. 23



(TO BE CONTINUED.)

Civility as a Business Asset.

There's an object lesson for all business people in the following general notice to station agents and trainmen issued by General Manager Underwood, of the Baltimore and Ohio Railroad:

Your especial attention is directed to the treatment of patrons by employees of the company. Complaints have been made from various sources of discourtesy to freight and passenger patrons on the part of our agents, or their representatives, at several of our stations, and also inattention of conductors and brakemen to properly care for the comfort of passengers. There should be no cause for such complaints. It is a part of your duty to see that our patrons are treated at all times with politeness and courtesy not only by yourself, but by employees under your charge. One of the valuable assets of a railroad company is uniform politeness and courtesy from all of its employes to its patrons, and this capital must not be encroached upon. It is proper for you to understand that advancement does not depend wholly on your efficiency, but in other directions also, and will be measured in a great degree by the treatment accorded to patrons.

Hunt for Ideas.

In these days, it is the man who is always ready to exchange views and absorb the ideas of others who gets to the front and keeps there. Your hard-shell delegate who runs his business on the principle that he is all-sufficient and needs to know no more than he already does, is a marked man and has started for the rear. Fate has "got him on her list" and will presently stow him away in the roomy cold-storage department of obscurity, which she reserves for the "has-beens" of business life.

Ideas may be gleaned from most unexpected sources if a man is on the watch for them. Probably the man who will miss more ideas than any other is the one who relies entirely upon his own brain as the source of supply. Successful men have learned—and that has helped them to succeed—that ideas of the most valuable character can be picked up in the rough from people whom one would never suspect of having such a thing about them. Your clerks, if you could draw them out, would be able to suggest many things which would prove of real value. Endeavor to stand in such relation to them, then, that they will feel free to approach you and propose ideas which occur to them.

"I consider The Keystone perfection, and as that is the highest degree, I have no suggestion."—R. W. Kelly, jeweler, Milton Junction, Wisconsin.

The Irishman, the Monkey and the Italian Nobleman.

Dennis Reagan is now living in a flat which overlooks the Lackawanna tracks. Across the street lives an Italian nobleman in reduced circumstances who ekes out his poor existence with the aid of a poor monkey, and a worse hand organ. To Garibaldi comes Dennis one evening, and, after passing the time of day, warms up to the subject in hand.

"Av ye plaze, Mister Garrybaldi," says Dennis in his most unctuous and wheedling tone, "wud ye have any objections to loanin' me yer munkey fer an hour or two ivery mornin'?"

"What-a for you want-a munk?" inquired the Count.

"Niver ye mind," replied Dennis. "What wud ye charge a mornin' for the use av him?"

The Count suggested that ten cents an hour would be the proper figure, after vainly attempting to find out what Dennis was going to do with the monkey. Dennis haggled and tried to beat the Italian down, but Garibaldi wouldn't have it that way, and the deal was closed at his figure.

Everything went beautifully for a few days. The money was paid promptly and the monkey was returned regularly in time not to interfere with the requirements of the Count's profession. To be sure the animal looked a little hollow-eyed and care-worn, but in the main was in good condition.

Finally, however, the Italian's curiosity got the better of his avarice, and he told Dennis that the monkey would not be loaned any more. This announcement had a most depressing effect on Dennis. His megatherian intellect rose to the emergency, though, and he proceeded to effect one of those masterly financial *coups* which dazzle people who are not familiar with the workings of the capitalistic mind.

"Garrybaldi," said Dennis, "av ye'll promise to act square and not give the racket away I'll be after takin' ye into pardnership, and give ye half the profits fer the use of the munkey."

"All-a right-a," said the Italian.

At this the new partners shook hands, and each took another pull out of the can of beer which Dennis had warily provided to lubricate the negotiation. Then Dennis, in his customary lordly manner put his arm through the Italian's, and together they sauntered over to the back yard of the house where Dennis lived.

"D'ye see that there pole, Garry?" inquired Dennis, pointing to a pole some fifteen feet high, surmounted by a cross-piece.

The Italian couldn't very well help seeing it, and remarked that it was within the range of his vision.

"D'ye know phat ther is beyant the fence?" said Dennis. "Thim's the railroad thracks. Now thin, Garry, this is the snap: Early in the mornin' whin the coal trains begins to come in I put the munkey on the pole. The brakesmin is all out on the cars riddy to go up the thristles. Ivery mother's son of them flings two or three pieces of coal at the munkey. I've laid tin tons away in the cellar, and divil a wan o' thim's hit the munkey yet."

Workshop Notes.

Subscribers wishing inquiries answered in this department must send name and address—not for publication, but as an evidence of good faith. No attention will be paid to anonymous communications. Questions will be answered in the order in which they are received.

"Steel Polish."—Will you kindly inform me how to polish steel nicely? I have a high-grade Swiss movement the winding wheels and screws of which were badly rusted. I removed the rust with oilstone-dust and oil, but would like to know how to restore the high polish?

All About Steel Polishing

To obtain a good polish on steel it is necessary to have considerable manual skill in such matters, and also the proper tools and materials for polishing. Such skill only comes like all other kinds of skill, from well directed practice. The most perfect polish on steel is obtained by using properly prepared crocus, all the details of preparing and using which would fill a by no means small volume, and for such reasons it is well for the artisan who has only occasional jobs of this kind to seek some polishing material other than crocus. Diamontine is an an excellent substitute for crocus if a good specimen can be obtained, but for some reason our experience is against being able to find it. Vienna lime is, taken all in all, the most desirable steel polishing material the artisan can employ. The only drawback to Vienna lime is it will not keep as it soon air-slacks and falls to pieces, when it is worthless for polishing steel. As purchased from dealers it is put up in tin boxes containing from one to ten pounds. To use it, take a lump and shave off with a knife as much dust as you imagine you will require. Now, this lime-dust or powder can be used either with alcohol or water, the former being the best medium. In addition to the material and the fluid mentioned, we require a lap of some kind. Usually, such lap is a flat surface, by preference made of some kind of metal; the choice for polishing steel lying between block tin and pure zinc. To make such a block tin lap make a wood pattern ½″ thick and 3″ by 3″, and have a soft gray iron casting made from it. After such casting is made you can have one side planed off dead flat in a metal planer such as can be found in almost any machine shop. Such an iron plate, however, can best be flattened by hand finishing. To carry out the idea procure a ground glass slab, or make one by grinding the side of a piece of thick plate glass with coarse emery and water until perfectly depolished. Such plate glass is very near dead flat; in fact, quite near enough for all ordinary polishing operations.

Test Surface Plates, How Made

But in case any of our readers should desire a ground glass surface plate of absolute truth they can produce such accuracy by grinding the surfaces of three glass slabs together. To give details procure three pieces of very heavy plate glass 9″ square. We will name these plates as A, B, C, and proceed to grind one side of each with the other in the following order, say we commence by grinding the flat face of one side of A and B together with medium coarse emery, say No. 70; using but very little emery and a liberal supply of water. The perfect grinding of such a set of glass test plates is a nice job and requires a good deal of care, but they will amply repay anyone who has a taste for accuracy and nice work. A person inexperienced in such matters would scarcely believe that a plate of glass 9″ square and nearly ½″ thick would spring perceptibly, but such is the case as we will discover as we progress in the operation of making our three plate glass surface plates. To aid in establishing stability there should be a cast-iron frame provided for each glass slab or plate. To make such cast-iron backing take a piece ⅛″ pine board a trifle larger than the plate glass pieces, and around the margin of such board attach a strip of wood about ¼″ thick and 1½″ wide. The piece of thin board applied at the edge is so disposed as to form a recess on one side of a depth nearly equal to the thickness of the glass slab we are preparing to strengthen and support. A good idea will be got of what we are trying to do by inspecting Figs. 1 and 2.

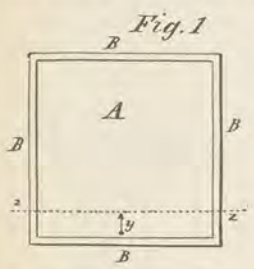


Fig. 1

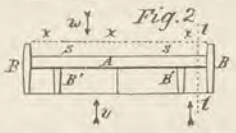


Fig. 2

The cut at Fig. 1 shows a front view of the glass slab and edge of iron support. At Fig. 2 we show a section of the same on the line *z* as if seen in the direction of the arrow *y*. It will be seen that the ¼″ strip around the edge of the board *A* is so disposed as to form a recess on top of a depth nearly as great as the thickness of the glass slab, the surface of which is represented by the dotted line *x*, Fig. 2. We show at Fig. 3 a view of the back of the device. The cross bars *B′ B′* are arranged as shown. These bars are designed to support and strengthen the iron support. The pieces *B′* are thinned a little at the edges to facilitate drawing from the sand. This will probably be better understood by an inspection of Fig. 4, which is an enlarged view of that part of Fig. 2 to the right of the line *t t*. There should be three castings made, that is, one for each of the glass slabs to be ground. Each of the three glass slabs mentioned above are set in the upper recess *s s*, Fig. 2, with plaster of paris made up with water to a paste like thick cream. A thin layer of such plaster is placed in the recess and a glass slab pressed down as far as it will go. The glass slabs so set are allowed to harden and dry for at least a week in a warm place where the temperature is not less than 100° F., or more than 200° F. After the glass slabs are so seasoned the raw edges of the plaster are painted over with melted parafine to prevent the absorption of water during the grinding of the faces of the glass slabs. As previously stated we grind the surfaces of say A and B together with water and No. 70 emery until the faces of the two slabs coincide. We then grind B and C together until they coincide, then A C. The grinding is continued until the surfaces of the three plates coincide perfectly, at which time we have three perfect surface plates. We will now go back to the ½″ thick cast-iron piece we started at making, as we have now the means of finishing the surface of it dead flat. To test the surface of the iron mix some oil with red lead and smear the face of one of the glass test plates—not a thick coating but just enough to give color to it. The face of the iron we are flattening is now rubbed on the glass, and all the high places will blacken by the contact of the red lead. For the final flattening of the iron surface we should not use a file, but a scraper made from an old worn out 5″ bench file. To make such a scraper we will grind the file teeth from both sides of the old file near the end, and then grind the end square across. We show such a scraper at *D*, Fig. 5, in the operation of smoothing the cast-iron piece *C*. The scraping is done by pushing the scraper forward in the direction of the arrow *p*. A little practice is required to use such a scraper properly, but good sense and experience will soon enable one to produce a surface on metal much nearer to a perfect plane than can be made with any metal planer in existence. Of course, it is to be understood that as the scraping is carried on, the iron or other metal surface being scraped, is tested by rubbing on the glass test plate, the spots where the red lead stains the metal are to be scraped off, continuing the scraping until the metal surface nearly all touches. It is not to be understood that the entire surface is brought to a level as in grinding, but so the general surface is dead flat. The three glass test plates are not to be used for any grinding other than with each other. For surface grinding, that is, grinding steel pieces on a glass slab, have a separate piece of ground plate glass kept for this purpose.

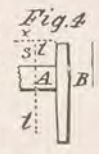


Fig. 4

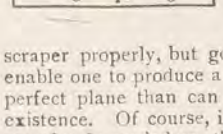


Fig. 5

Tin Laps for Polishing Steel—How Made

After the iron piece *C*, Fig. 5, is scraped dead flat, prepare a wood frame to enclose it. We show the iron block so enclosed at Fig. 6, where *C* represents the iron block and *D* the wood frame. At Fig. 7 we show a view of Fig. 6, seen in the direction of the arrow *l*. The wood frame *D* rises about ⅝″ above the upper surface of the iron, which is represented by the line *n*. The scraped surface of the iron should be smoked a little over a candle to prevent the melted tin from adhering. We next melt some pure metallic tin and pour into the space *E*, filling said space at least ½″ deep. The iron *C* should be heated up to near the melting point of tin, which can be approximately determined by making a bright spot on the back and heating the iron until the surface of the brightened spot takes a brassy brown. To determine how much tin by weight it will require to fill the recess *E*, Fig. 7, ½″ deep, we multiply 3″ by 3″, which is the size of the surface of the iron piece *C*. We find the result to be 9″, but as the tin is to be only ½″ deep, we only require 4½″, cubic, of tin for our polishing lap. Now the decimal for the weight of a cubic inch of tin is .2637. We drop one of the figures and multiply .263 by 4.5, and find that we require 1.183 pounds of tin for making one lap. Pure tin can be had of Bullock & Crenshaw, 528 Arch Street, Philadelphia, for forty cents per pound. A tin lap so cast will usually be found quite flat enough for a polishing lap. If such should not be the case, it can be tested and scraped precisely as we did with the iron block *C*. We need another tool before commencing to polish steel; this tool is called a polishing frame. This is a well-known tool, but for better explanation we show a cut of it at Figs. 8 and 9. It consists of a T-shaped piece of brass about ¼″ thick shaped as shown. It is provided with a loose bar at *G* which is clamped to *F′* by two screws shown at *k k*. The use of this clamping bar is to hold pieces for grinding and polishing of different forms. We will, for illustration sake, take samples of different kinds of work and refinish them. Let us for example take some screws with rusted heads and refinish them. How this will be done will depend much on the original finish of the screwheads. If the screwheads are slightly rounded on top, we put a piece of pegwood in a large wire chuck and turn a piece to fit another wire chuck a trifle smaller than itself, and after it is in such chuck center and drill the end so as to hold the screw to be finished. We show at *L*, Fig. 10, such a piece of pegwood, and at *d* a screwhead to be polished. The dotted arc at *b* indicating the face of the wire chuck. It will be seen that by this arrangement we can hold a screw and not mar the threads, and also expose the head for grinding off the rust. For smoothing with oilstone powder and oil a strip of heavy sheet copper can be employed, and after all rust erosions are removed the head is cleaned with a piece of pith, using a slip of pegwood cut to a knife-edge for cleaning the slot. This is not the best way of cleaning work for polishing, but it will do, as the polish on screws is never very perfect, except when finished with a flat top as will be explained later on. The polish is produced with Vienna lime, which is best applied with a strip of heavy sheet zinc, using alcohol to wet the zinc slip and lime. We may as well say what we have to say about this substance now as anytime. It can be had of Bullock & Crenshaw, 528 Arch Street, Philadelphia, at twenty-five cents per pound, in pound cans—the can costs five cents extra.

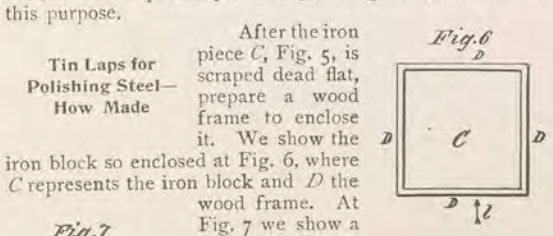


Fig. 6

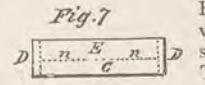


Fig. 7

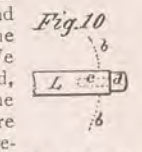


Fig. 10

Preserving Vienna Lime for Use

As we explained a little back, this substance air slacks and becomes useless for polishing, but by getting a dozen small wide-mouthed bottles the pound of lime can be divided up into twelve parts, corked and sealed up in these bottles, one of which can be opened each month, and in this way keep fresh lime for a year—and thirty cents a year is not a great extravagance to enable one to do fine polished steel work. If the screws are finished with dead flat heads they are first freed of rust as shown at Fig. 10 then the screw is clamped between *G* and *F′* by the screws *k k*, Fig. 8, and by means of the screws *m m* the polishing frame is leveled so the screwhead to be polished rests dead level, first on the glass slab for grinding with oilstone dust to remove rust marks, and after this is done the screwhead is cleaned perfectly of all grit from the oilstone-dust which is best done with the soft part of bread worked with the fingers to a mass like putty, cleaning out the slot with a knife-edge stick as before. After the screwhead is ground dead flat and cleaned perfectly it is ready for polishing. To do this we take the screw while still in the polishing frame, and put some Vienna lime shaved into dust with a knife on the flat face of the tin lap, wet it with alcohol and proceed to polishing the flat face of the screw on the tin lap with the Vienna lime and alcohol, rubbing the screwhead around and around in a circle, say 1″ in diameter, on the tin lap. The screws *m m* also resting on the lap to preserve the perfect level of the polishing frame. It is the usual practice to make the screws *m m*, Figs. 8 and 9, of steel and harden them, but a better material is bone and round the ends where they rest on the glass grinding slab or on the tin polishing lap. In grinding and polishing the screws *m m* should never touch the grinding or polishing material as it is spread on the glass slab or tin lap; this policy will prevent the contact ends from becoming contaminated with grit and conveying it to the polishing lap. Vienna lime is very rapid in its action, a few seconds effecting a polish if the grinding with oilstone powder and oil has been properly done.

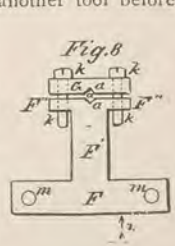


Fig. 8

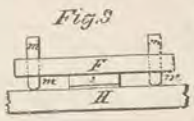


Fig. 9

Polishing the Steel Parts of Watches

For polishing steel wheels, end stone plates, regulator bars and the like, we require pieces of different shapes to cement them fast to. Suppose, for example, we wish to polish the face of a click spring shaped as shown at Fig. 11. To make or refinish such a spring we provide a flat-faced piece of iron shaped as shown at Figs. 12 and 13; the first is a side, and the second an end view of the holder. A top view is represented by the dotted outline *b*, Fig. 11. The piece to be ground and polished is cemented to *N* with black lathe cement, after which the holder *N* has the part *N′* placed in the grip *G*, Fig. 8, and the screws *k k* set up to hold it in the polishing frame *F*, after which the face of the spring *I*, Fig. 11, is ground and polished as has been described. The edges of such springs are seldom square, but rounded. To understand this matter we refer to Fig. 13, where we show a section of Fig. 11, on the line *e*, seen in the direction of the arrow *g*. The edges of springs for fine watches are usually hand-finished, and after careful filing are stoned and a polish produced by a steel burnish. The spring is then cemented to the piece *I* with black lathe cement, allowing the cement to rise on each side of the spring until flush with the upper face. The idea is, we wish the cement to protect the polished edges of the spring from being acted upon by the oilstone-dust. When lathe cement is used for holding a piece during the operation of polishing we cannot use alcohol with the Vienna lime, but most employ water which does nearly as well.

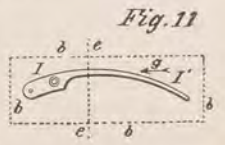


Fig. 11

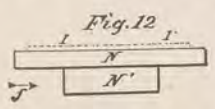


Fig. 12

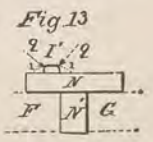


Fig. 13

Information Wanted.—Can any of our readers inform us of the present location of the model in imitation of the celebrated Strasberg clock which was exhibited in this country in 1876?

"We would subscribe for The Keystone if it took the last dollar we had."—L. L. Almutt, jeweler, Chillicothe, Mo.

PRENTICE RETINOSCOPE, the Instrument of the Hour

Patents pending in the United States, Great Britain and Canada.

Price, complete, with lighting attachment, $45.00

Extra for Chin Rest C, . . . 5.00

Extra for Duplex Base, . . . 22.50

Subject to usual cash discount of 6 per cent.

Unsolicited Testimonial:

AUSTIN, TEXAS, Oct. 4, 1899.

GENEVA OPTICAL CO., Chicago, Ill.

GENTLEMEN:—Enclosed please find check for $45.00, less a cash discount of six per cent. in full for Prentice Retinoscope. We are highly pleased with the retinoscope, as we find that the ultimate results of the tests made with it are eminently satisfactory. Down here, during the summer months, where a ten minutes' seance in the dark room is equivalent to taking a turkish bath, the pleasure and advantage of being able to do dark-room work, with plenty of air, and in range of an electric fan, is of inestimable value to the operator as well as the patient.

Very truly yours,
THE G. A. BAHN OPTICAL & DIA. CO.

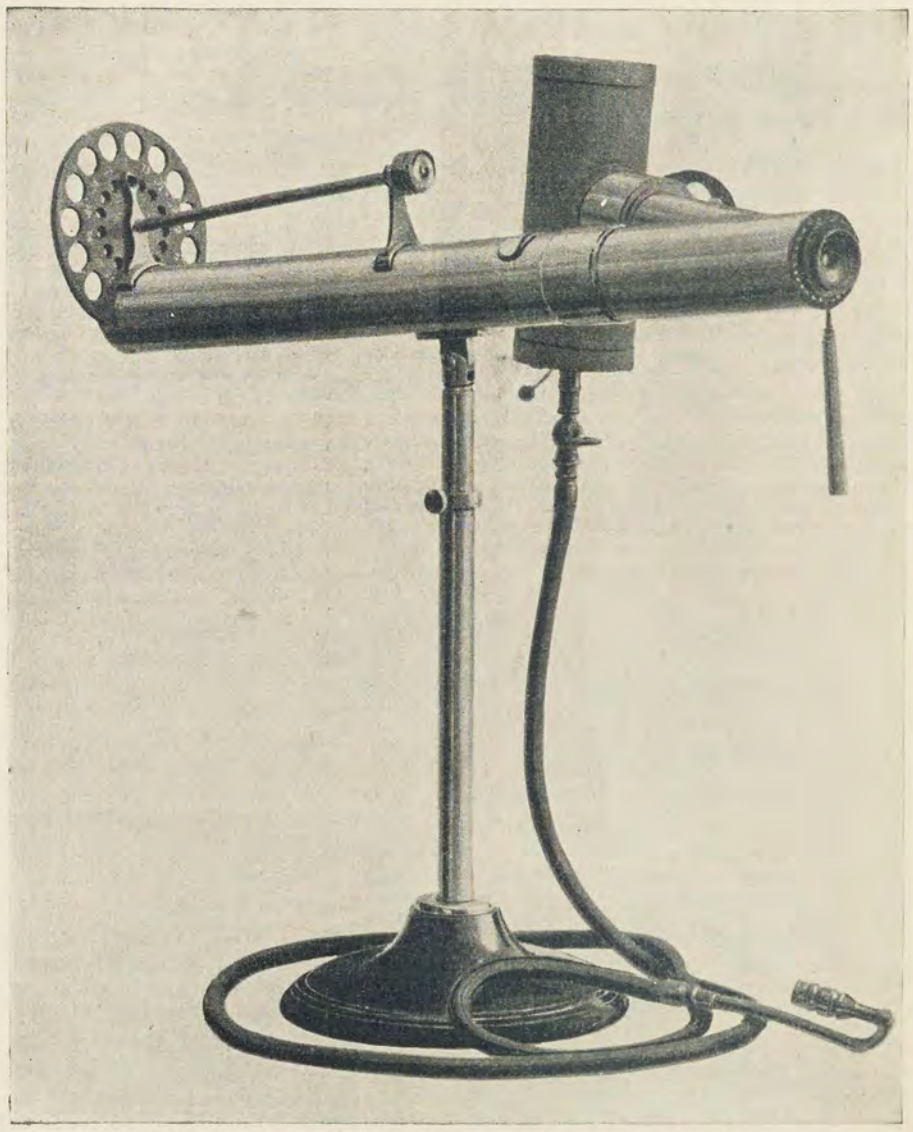


Illustration A, with base COMPLETE.

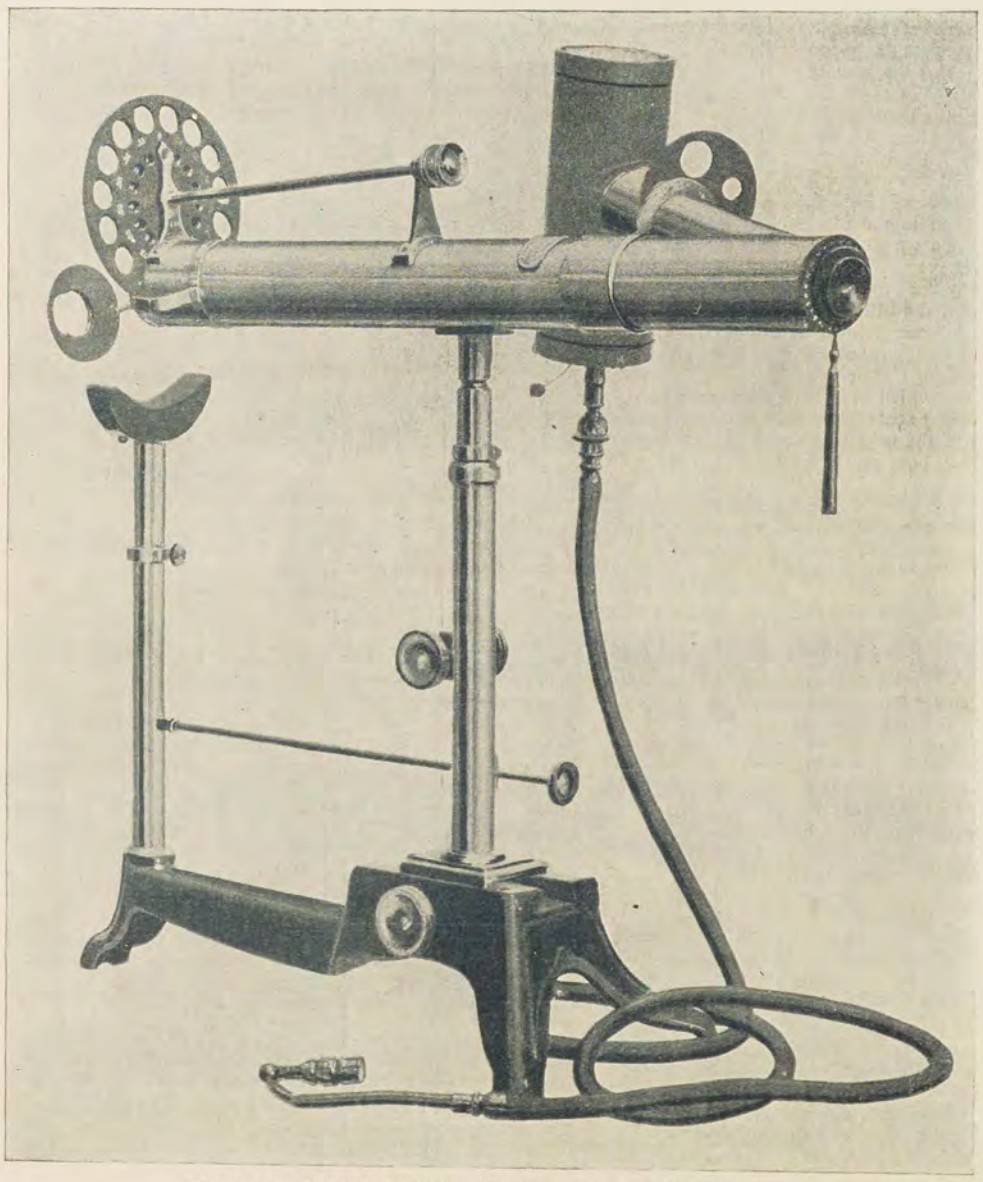


Illustration B, showing Adjustable Duplex Base and Chin Rest.

Illustration A shows instrument arranged for gas attachment complete and ready for use. It also shows mechanism for using light on either side or top of instrument, thus enabling the patient to fix on some distant object with the eye not under examination and receive full benefit of the relaxation of the ciliary muscles.

A New Feature

We have designed an Adjustable Duplex Base, as per illustration B, upon which can be mounted a Prentice Retinoscope.

For this base we charge $22.50 extra. The Duplex Base carries rack and pinion adjustments to raise and lower the chin rest, also to raise and lower the instrument, and to shift it forward and back. Every desired position is readily controlled by the Duplex Base.

For further particulars and specific instructions, see booklet, which is sent free on application.

Chin Rest C.

Geneva Optical Co.

Sole Manufacturers,

63 & 65 Washington St., Chicago, Ill.

OPTICAL DEPARTMENT

Reviews of Current Ophthalmological Literature of the World.

The Theory of Accommodation.

Frequently we have called attention to the new theory of accommodation proposed by Tscherning, who does not believe that, as Helmholtz thought, the act of accommodation is caused by a relaxation of the suspensory ligament, which relaxation being induced by the contraction of the ciliary muscle allows the crystalline to assume a more globular form and thus to increase its refractive power. Tscherning, on the contrary, assumes that accommodation can only be explained by an actual tightening of the suspensory ligament supplemented by internal resistance at the pole of the lens, and he draws this theory from the observation, first made by him, that during accommodation the anterior surface of the lens changes from a spherical to a hyperboloid form. Against Tscherning's view, however, many anatomical, clinical and experimental facts have been adduced, especially by Hess, of Germany, who found that during a strong effort of accommodation the lens was often tremulous and displaced downward by gravity, showing, therefore, a relaxation of the suspensory ligament during the act. Last year Priestley Smith came forward with a paper at the meeting of the Ophthalmological Society of the United Kingdom, in which he endeavored to show that the peculiar changes in the shape of the crystalline, as observed by Tscherning, could be explained equally well by a slackening of the suspensory ligament. This he demonstrated by a model in which elastic strips of iron were arranged in a peculiar way. He said, in conclusion, "that he would not theorize about a similar arrangement of the lens fibres. What he desired to show was that the changes, which Tscherning had demonstrated with such admirable skill and ingenuity, were not incompatible with the theory of Helmholtz. To his mind they were explained more satisfactorily by this theory than by any other."

Against this view Dr. Tscherning, in the *Ophthalmic Review*, now states that "If Priestley Smith's views were correct, we should expect, upon opening a dead eye, to find the anterior surface of the lens presenting a conical form. But the contrary is the case: the curvature of the anterior surface is flattened in the middle and considerably increased toward the periphery." This he found experimentally by fitting the dead eye in a small cup and observing, after removal of cornea and iris, the images reflected from the center and the periphery of the anterior lens surface.

But against these observations of Tscherning we must adduce the researches of Dr. Heine, of the University of Marburg, Germany, who reported his results to the Ophthalmological Society of Heidelberg. He performed experiments on the eyes of cadavers, in order to observe the effect of the relaxation of the suspensory ligament on the form of the crystalline. After removing cornea and iris he found the anterior surface of the lens to have a radius of 13 to 14 millimeters, whilst after cutting out the zonula or suspensory ligament the radius of the same surface was reduced to 8 or 10 millimeters. Thus he showed that the capsule of the cadaveric lens was flatter, when compressed by the suspensory ligament, but more convex when liberated from its compression.

These latter experiments then seem to be in flat contradiction to those of Tscherning and we have to wait for further researches before this vexed question can be regarded as definitely settled.

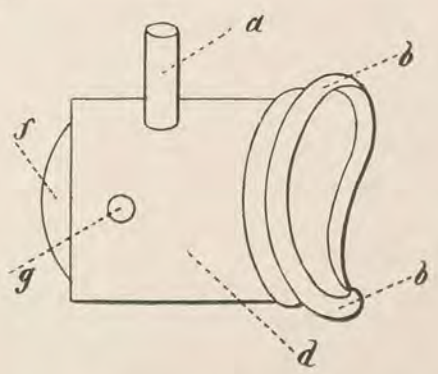
A New Treatment for Cases of High Keratoconus And Irregular Astigmatism by the Hydro-diascope (Water-Spectacles).

Most of our readers certainly have seen cases in which the cornea was perfectly clear but bulging out like a cone. They may have tried long to improve vision by glasses, but probably were little satisfied with the result in the end. And, indeed, such cases are very trying; for, though the corneal tissue is perfectly transparent, the conical shape prevents any regular refraction and makes vision very imperfect. Many remedies have been tried for this condition. In those cases in which the conical form is not yet very pronounced, high cylinders or spheres have often been employed successfully; but in the higher forms the usual glasses of the test case have been of no use. The stenopaic apparatus often improves vision, but on account of the limitation of field and other inconveniences, patients cannot wear them like ordinary spectacles. Then there have been proposed hyperbolic glasses by Raehlmann and contact glasses by Fick, but neither contrivance has been found of practical value. Operative procedures also have been advocated, but as far as vision is concerned, no improvement of any account has followed.

A few years ago a new treatment was proposed by Dr. Lohnstein, of Germany, who has tried it on his own eyes with great success. The principle of the treatment consists in the idea to abolish, as it were, the deformed cornea and to replace it by one of glass without any operation. This has been done already more than ninety years ago by Th. Young, who held a little tube with a lens at one end and a little wax at the other against the orbit. This tube was filled with water. He found that by the water outside the cornea the light passed the cornea practically unrefracted and that he had to use a strong lens, in order to replace the effect of the cornea and to see again distinctly. The same principle is used in Czermak's orthoscope, by means of which objects in the anterior chamber of the eye can be seen directly, as if they were not in the eye at all. But no practical use had been made of this knowledge in the treatment of keratoconus. Lohnstein now endeavored to solve the following problem:

(1) To produce a really water-tight and comfortable apparatus, and
(2) to decide whether the eye could stand for hours a day the influence of a suitably-selected fluid.

The apparatus was made for him by the optician Sydow, Berlin, N. W. Germany, and will be understood by reference to the following sketch:



Here *d* is a small tube about 15 mm. long, *b b'* is the rim made of soft rubber and so shaped that it fits to the region around the eye. At *a* we see a little tube by which the apparatus is filled with the fluid and at *f* the lens which replaces the cornea, while *g* indicates a little knob to which a ribbon is fastened, which, when tied at the other side to a knob *g'*, holds the whole apparatus to the eye. For filling the fluid, Lohnstein took warm water of about 95° to 104° F., in which he had dissolved enough salt to make the solution 0.85 per cent. in strength. The index of refraction of this solution is practically the same as that of the aqueous humor of the eye, so that here the cornea is almost eliminated. It was replaced in Lohnstein's eye by a plano-convex lens of about 37 mm. focus, but the reader will understand that this lens must differ in different cases or that other lenses must be added in front of the 27 D. lens to correct the axial ametropia. This apparatus, which he called *hydro-diascope* (water-spectacles), could finally be worn by him for seven hours a day and improved his vision up to normal, while without it glasses gave him no improvement.

Lately, in the *Klin. Monatsbl. f. Augenhlk.* (May, 1899), Dr. Majewski, of Krakau, describes his modification of Lohnstein's hydro-diascope. It is shaped more like an ordinary pair of spectacles and is much lighter and more comfortable than the original instrument. He gives several cases, in every one of which an effort was first made to improve vision with glasses.

In the first case there was irregular corneal astigmatism with vision $\frac{6}{18}$ in both eyes and no visual improvement with glasses. The hydro-diascope brought the vision at once up to $\frac{6}{6}$.

The second case is also very interesting. A woman with marked keratoconus and nebulae of the cornea, the result of trachoma or granular lids, could only count fingers at two meters. No improvement could be obtained by test lenses, though with the hydro-diascope her vision increased to $\frac{6}{9}$.

The reviewer knows of no case in this country ever having been treated in this way, though it would seem by these reports that this treatment well deserves to be tried here also.

More Uniform Tests for Vision, Color Sense and Hearing—Glasses for Railroad Men.

At the last meeting of the American Ophthalmological Society, Dr. C. H. Williams, of Boston, read a paper of the above-mentioned title. In testing eyes and ears for the New England railroads he found it necessary to have a new set of test letters made, not only in order to obtain the correct standard visual angle of 5 minutes for each letter, but also to have the cards in a portable form of 3½ by 9 inches. In this shape they can be readily placed in an envelope that will go into the coat pocket. Only one line of letters was printed on each card, and, of course, a different arrangement of letters for each of the required distances of 20, 30 and more feet was adopted for each card in order to guard against memorizing. As an entirely new feature of this series, he added three cards on which are printed representations of the ordinary semaphore arm signals, the length and width of the arms being the same as the height and width of the letters on the 20-foot card. These figures, when seen at a distance of 20 feet, correspond in size to the apparent size of a standard semaphore arm 46 inches long and 7 inches wide, when seen at a distance of half a mile.

He then spoke of the need of greater uniformity in the tests used for the examination of the color sense, and he stated, as a general proposition, "that no test for color perception is satisfactory unless it includes, first, a test by comparison of colors, the Holmgren worsted test being perhaps the best, and second, a test with colored lights, in which the intensity of the lights can be varied and in which the names of the colors shown should be given by the person examined."

The reviewer must remark that, although there is nothing new in these propositions, they ought to be acted upon by the railroad officials. Lately the importance of testing the color sense in the central area of the retina has been more and more emphasized. The reason for this lies in the fact that sometimes people are found who show good color perception by Holmgren's wool test, but who are unable to recognize the colors of small lights of such a size that they correspond to those used in the railroad service, when viewed from a greater distance.

(Continued on page 1187.)

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OPTICAL PROGRESS IN THE NINETEENTH CENTURY

"HERE lies Silvanus Amatus, the inventor of spectacles—may God pardon his sins." This charitable epitaph is inscribed on a tomb in Florence, and the date of Sylvanus's invention is said to be 1285. Roger Bacon is credited with a like invention at the same time. The Nineteenth Century is the limit of this article, but we could not refrain from recalling such an important fact as the invention of spectacles. We regret, indeed, that we cannot begin at the beginning of optical history, for truly great were the optical luminaries of previous centuries. There was Al Hazan, in the Eleventh Century, who found that light existed independently of the eye, discovered refraction, explained the mirage, made a simple microscope, found the relation of conjugate foci, and described the effect of lenses when placed before the eyes. There was Galileo, who, by means of an old organ pipe, a convex objective and a concave eye-piece, contrived to make a telescope which magnified eight times; and Kepler, who, by replacing the concave by a convex lens, constructed the first astronomical telescope, and obtained greater magnifying power. There was Newton, the master mind of his age, who crystallized into a scientific form that which had been done by the great ones who went before him. There were others in abundance—Ballista Porta, the inventor of the camera obscura; Snellius, who propounded the law of refraction; Drehelius, who made the first compound microscope; Descartes, of prism fame; and Huyghens, who first attributed light to wave vibrations—but we must keep within the limits of our subject.

⁂

IT would seem as if the beginning of the present century found quite a number of brilliant geniuses devoting their time and talent to the investigation of light phenomena. In the first year of the century Thomas Young, an Englishman, noticed that when two converging pencils of light were thrown on a screen in a dark room, dark bands appeared where they overlapped. He and Fresnel, a celebrated French physicist, continued investigations as to this phenomenon, known as the interference of light, and the outcome of their work resulted in Newton's emission theory being finally abandoned; and the wave theory of light, first expounded by Huyghens, became established. In 1801 Young noticed that vertical lines appeared more distinct than horizontal, and on further investigation found that this was due to his eyesight. In 1827 the British Astronomer Royal, Sir George Airy, who suffered from the same defect, now known as astigmatism, set to work to correct it. He ground a piece of glass along one axis only, so as to form a kind of wide and exceedingly shallow trough, so that the curve of the glass made up for the want of curve of his cornea in one direction. These glasses, known as cylinders, were scientifically adapted for astigmatism by Donders in 1856.

Prof. Donders, Father of Practical Ophthalmology.

Prof. Hermann von Helmholtz,
Inventor of the Ophthalmometer and Ophthalmoscope.

⁂

IN 1808 Malus, a French engineer officer, discovered that light could be polarized by reflection, Sir David Brewster determining the relation between reflection and polarization. Arago found that the blue of the sky was due to polarized light. Biot discovered that two different kinds of quartz and a number of other substances cause the ray of polarized light to be turned to the right or the left; and Faraday, in 1846, found that most transparent substances, when brought within the action of a magnet, acquire the power of similarly rotating the polarized ray. Nicol, by cementing two prisms of Iceland spar, succeeded in isolating one of the two polarized rays due to double refraction. Polarizing apparatus constructed with Nicol's prisms and reflecting polarizers have greatly advanced our knowledge in mineralogy, and a polarizing instrument attached to a telescope has made us certain of the existence of ice and water on the planet Mars. Polarimeters for measuring the circular polarization are constantly used by chemists, and led Pasteur to make one of his most brilliant discoveries.

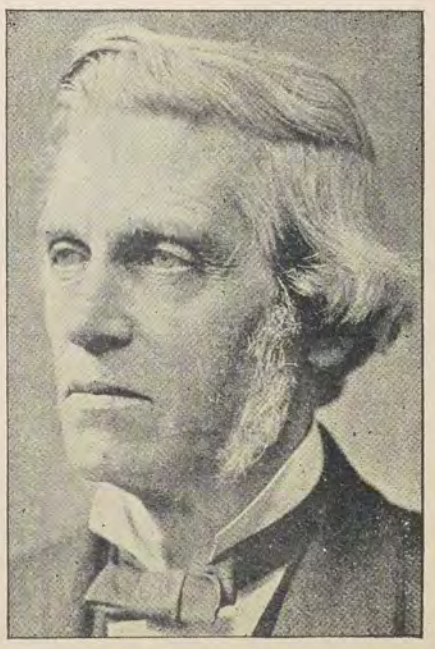
⁂

IN 1802 Wollaston observed that the sun's spectrum, produced by passing the light through a slit before it fell on the prism, was not a simple band of color, but was crossed by a number of dark lines. Joseph Fraunhofer, the son of a Bavarian glazier, carefully examined and determined the position of these lines, which bear his name. In 1822, Sir John Herschel first suggested that by reducing substances to incandescent gases in the flame, and observing the effect of the light when passed through a prism, the bright bands seen could be used to determine the presence of minute quantities of the substance in question. Kirchoff and Bunsen, making further researches regarding these colored bands, and comparing them with Fraunhofer's lines in the solar spectrum, found them to correspond in position. They thus established the science of spectrum analysis, which revealed new elementary bodies and enabled us to examine the constitution of sun, stars and comets.

⁂

AT the end of the Eighteenth Century, Scheele, a Danish chemist, first noticed that light darkened chloride of silver. In 1800, Herschel found invisible heat rays at the red end of the spectrum, now known as infra-red rays; and a year later Ritter found chemically active invisible rays beyond the violet end of the spectrum—these are known as ultra-violet rays. Following on the researches of these men the first photographs were produced. Ultimately, in 1839, Daguerre in France and Talbot in England, by focusing the image by means of Porta's camera, and finding out how to fix the pictures obtained, laid the foundation of photography.

(*Continued on page 1175.*)



Sir William Paget Bowman,
Discoverer of the Skiascopic Test.

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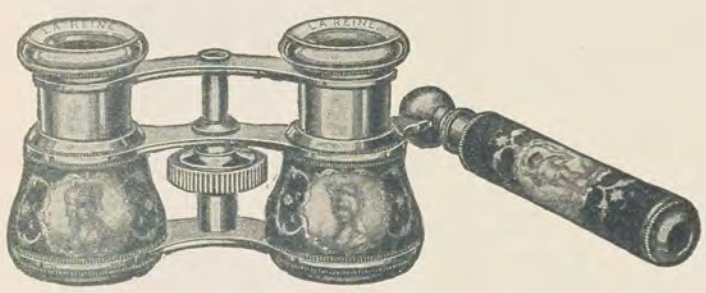

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OPTICAL PROGRESS in the NINETEENTH CENTURY

(*Continued from page 1173.*)

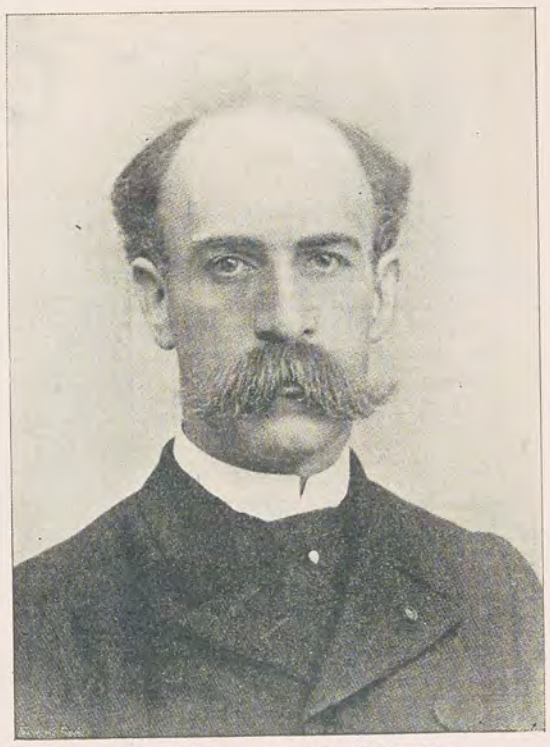
TURNING from the more general field of optical research to that which bears directly on the work of refraction and practical ophthalmology, the record of the century has been a marvelous one. In fact, the refractionist, as a specialist of high scientific attainments and recognized professional standing, is practically a creation of our generation. During the half century now ending, remarkable progress in optics, as in other applied sciences, has been made on the basis laid by Helmholtz, Donders and other ophthalmological luminaries.

⁘

THE OPHTHALMOSCOPE AND OPHTHALMOMETER

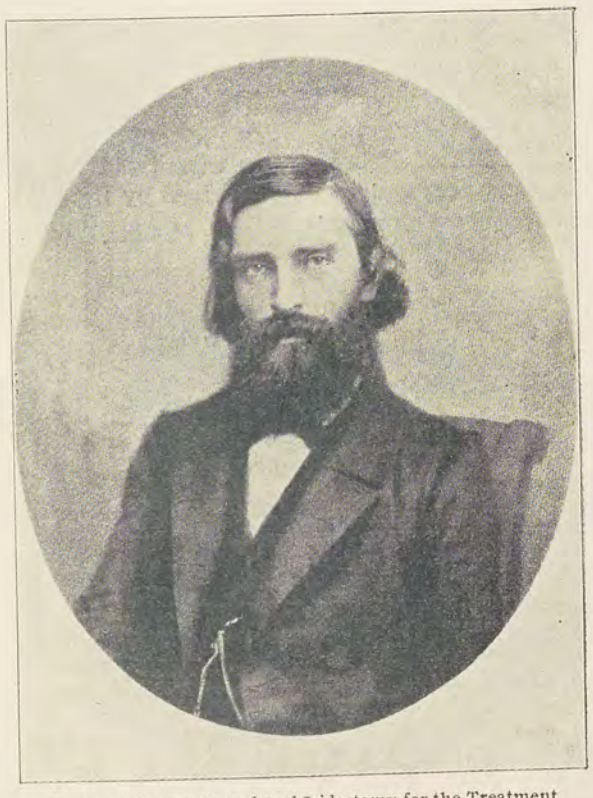
Among the men who laid the foundation stones to the modern science of ophthalmology, Helmholtz undoubtedly must be given the first rank. This remarkable man, who is the peer of Lord Kelvin in the domain of abstract physics, has no one that can be compared with him in the field of physiological optics. Hermann von Helmholtz was born in 1821, and took his degree of doctor of medicine at Berlin in 1842. He served as a military surgeon until 1847, during which time he published his important article on the conservation of energy. In 1850 he went to the University of Koenigsberg as professor of physiology and general pathology, and here it was where in 1851 he announced his invention of the ophthalmoscope, which has revolutionized ophthalmology. He was called to Heidelberg in 1858, and devoted here a great deal of study to physiological optics, as a result of which his celebrated "Handbook of Physiological Optics" appeared during the ten years from 1856 to 1866, a book which in regard to the depth of original investigation and historical research stands unchallenged in this field even up to our time. A second edition of it has appeared during the decade of 1885 to 1896 Helmholtz was then called to Berlin in 1871 as professor of physics and director of the physica laboratory at the University of Berlin, and remained there until 1887, when he became director of the great Physico-technical Institute at Charlottenburg. He died there September 8, 1894.

It would be impossible here to give all his important contributions to physiological optics and ophthalmology. Undoubtedly the most important gift of his genius is the ophthalmoscope, which at once cleared up many obscure diseases and was the first means to determine the refraction of the eye objectively. Another great help to ophthalmology is his ophthalmometer, though its form has been superseded by the modification of it introduced by Javal and Schiötz. He first gave a complete dioptrics of the human eye mathematically and experimentally, and described minutely the act of accommodation, giving also a theory of it which is the most accepted one up to the present. He accepted and much elaborated Young's theory of three primary color-perceptions, and analyzed all the important facts of color perception and color blindness, being the first to use pure spectral colors in his experiments. He fully described the physiology of the movement of the eyes and demonstrated conclusively that these movements are not dependent entirely on the anatomical arrangement of the muscles, but that they depend a great deal on the use to which we put our eyes. In short, there is no important field in the wide realm of physiological optics where he did not leave his imprint. Everywhere he either mastered the whole subject himself or put up finger posts pointing in the direction in which future investigators have to march. Great is the debt which opticians owe him.



Dr. Landolt, Inventor of the Strabometer.

Prof. Charcot, who Hypnotizes Patients.



Prof. Graefe, who Introduced Iridectomy for the Treatment of Glaucoma.

DEVELOPMENT OF PRACTICAL OPHTHALMOLOGY

No name is more familiar and dearer to the practical worker in ophthalmology and refraction than that of Donders. For he was the first who applied the results of the purely scientific researches of Helmholtz and others to the practical work of the busy practitioner, and who clearly set forth the main principles in the treatment of the optical defects of the human eye. Frans Cornelis Donders was born at Tilburg, in Holland, in 1818. He studied medicine and afterwards became professor of pyhsiology at the University of Utrecht, where he also practiced ophthalmology up to his death. He published his physiological and ophthalmological researches in many articles, especially in Dutch and German journals of ophthalmology; but his main work, in which he collected all his important results, undoubtedly is his book entitled: "On the Anomalies of Accommodation and Refraction of the Eye," which was published by the New Sydenham Society, in 1864. He begins it with an exposition of the dioptrics of the eye, and he gives here the whole theory of the cardinal points of compound dioptric systems in a clear and elementary manner, which, though being a much longer and less elegant method than that employed by Helmholtz, at least has the great advantage that it can be understood by all. He then clearly sets forth the accurate distinction between anomalies of refraction and those of accommodation, which conditions had been much confounded by the older ophthalmologists. This at once cleared up many obscure types of disease. He further gives accurate tables of the gradual loss of the accommodation in presbyopic people, thus affording a scientific basis for the treatment of presbyopia. Very clearly then he sets forth the relation between asthenopia and hypermetropia, and shows that the asthenopia may be accommodative, from excessive strain on the ciliary muscles, or muscular, from a too great strain on the weakened muscles of the eye-ball. With regard to the subject of strabismus, or squint, he expressed the result of his investigation in these two propositions: "(1) Strabismus convergens almost always depends upon hypermetropia; and (2) Strabismus divergens is usually the result of myopia." That these refractive conditions are not the only cause for squint he frankly admits, for he mentions a number of auxiliary causes which have to be present also. But at any rate he shows the great importance of the refraction of the eye for all the other anomalies of the eye, and thus is the originator of our modern treatment of the eyes, the main principle of which is: Look first carefully after the refraction, and after its correction turn to the other difficulties, if necessary. Prof. Donders was undoubtedly among the greatest optical luminaries of the century, and opticians and optical science are much indebted to him.

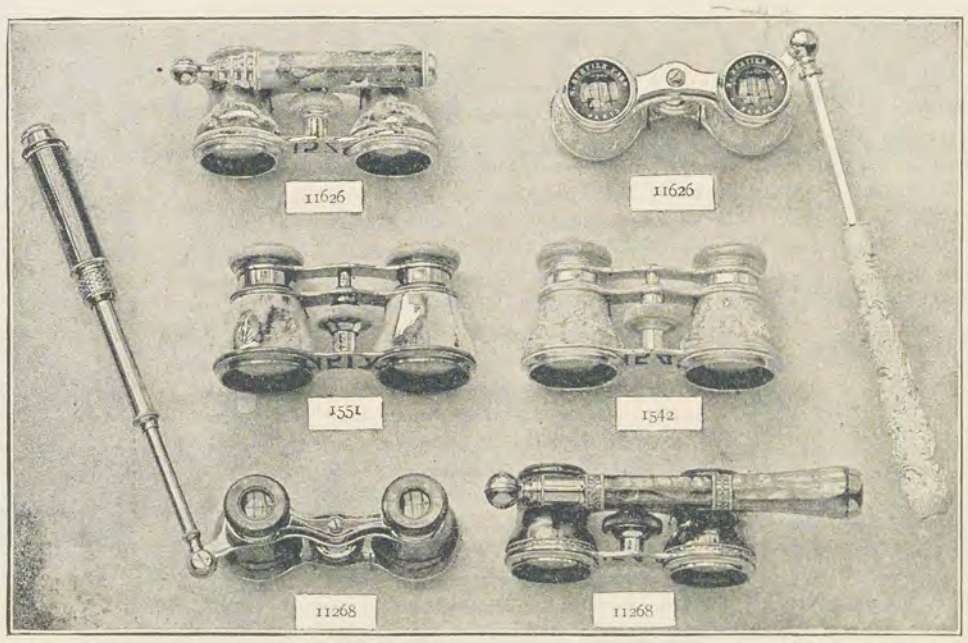
⁘

EVOLUTION OF SKIASCOPY

It should be expected that soon after the ophthalmoscopic examination came into general vogue, one or the other observer would notice a movement of light in the pupil of the patient when the doctor happened to throw light into the eye while being a few feet off. And indeed this movement of light was observed as early as 1862. Dr. Bowman, of England, even used this method in looking for astigmatism, as is shown by the following words of Donders: "My friend Bowman recently informs me that 'he has been sometimes led to the discovery of regular astigmatism of the cornea and the direction of the chief meridians, by using the mirror of the ophthalmoscope much in the same way as for slight degrees of conical cornea. The observation is more easy if the optic disk is in the line of sight and the pupil large. The mirror is to be held at two feet distance and its inclination rapidly varied, so as to throw light on the eye at small angles to the perpendicular, and from opposite sides in succession, in successive meridians. The area of the pupil then exhibits a somewhat linear shadow in some meridians rather than in others.'" Here we undoubtedly have the germ of skiascopy; but it was not until 1873, when Cuignet, in France, began to show the scientific value of it. In 1880 Parent demonstrated fully the optical basis of this test. It was then described and developed by Charnley, Forbes, Fitzgerald and Story, in England; Chibret, Loiseau, Wecker and Leroy, in France; Pflüger, in Germany; and Jackson, in America.

(*Continued on page 1177.*)

20TH CENTURY OPERAS



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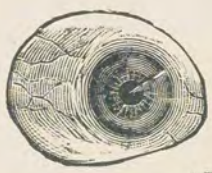

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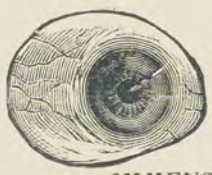

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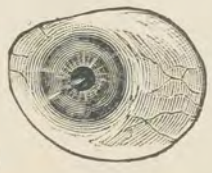

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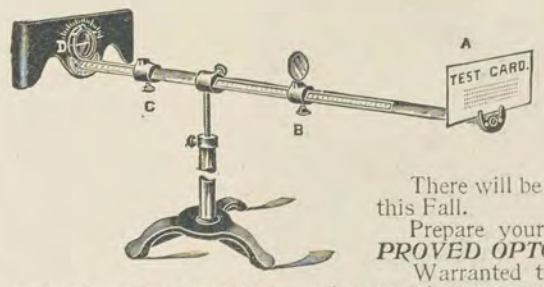

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Chas. A. Spencer.

OPTICAL PROGRESS in the NINETEENTH CENTURY

(*Continued from page 1175.*)

Robert B. Tolles.

THE United States has figured prominently in the optical achievements of the century, and at least a few of her sons were stars of the first magnitude in the optical firmament, having attained world-wide fame in their respective fields.

⁂

A PIONEER IN SCIENTIFIC OPTICS

Chas. A. Spencer, who was born in Lennox, N. Y., is considered the pioneer of scientific optics in this country. He received a classical education at different colleges, but his attention was soon drawn to more practical study and experiment by himself. In 1831, he settled in Canastota, N. Y., as a manufacturer of telescopes and microscopes. He issued a descriptive catalogue, "Optical, Philosophical, Mathematical, Chemical and other Instruments and Apparatus," which contained a list of prices of various sized reflecting telescopes, chiefly of the Newtonian and Gregorian construction; only a few small achromatic telescopes and microscopes were mentioned. He commenced to construct objectives of a considerable larger angle of aperture than in the European instruments. He first used some of Guinand's improved flint glass, but afterwards made extended and costly experiments in the attempt to produce a glass of higher dispersive and refractive power, and was to a certain extent successful; although his chief success was his skill in giving his lenses such curves which nicely balanced the aberrations. Every microscope was accompanied by some fine object-slides to show its power, and which gradually became so fine that the English microscopists could not resolve them with their instruments. The first microscope that attracted attention was made for Dr. Gilman in 1847. Instead of following up this special branch, he diverted his attention to the study of astronomy, which was particularly fascinating to him, and his fondness for the telescope and telescopic pursuits never diminished, though he found in the development of the microscopical objective a more promising field for his genius. About the year 1854, he formed a partnership with A. K. Eaton, and in addition to the microscopical work, they completed various achromatic telescopes, among them the large Equatorial for Hamilton College, having an object glass of 13½ inches in diameter, and a focal length of 16 feet. This was then the largest telescope in this country, and in its performance it compared favorably with the best Munich instruments; its price was $10,000. The partnership between Spencer and Eaton was dissolved after a few years; he, with the aid of his sons, still carried on the business, until the year 1873. In 1875, they moved to Geneva, N. Y., and for two years were connected with the Geneva Optical Works. From 1877, the business was conducted under the name of C. A. Spencer & Sons. During this period they received, at the Paris Exposition, the highest award, a beautiful, large gold medal, for excellence of their microscopical objectives.

⁂

GREATEST OPTICIAN OF HIS TIME

Robert B. Tolles was born in 1823, in Winsted, Conn. His father, Elisha Tolles, a farmer, spent a good deal of his time with mechanical inventions, several of which he patented. His youthful son, Robert, was his diligent assistant, and early showed a decided inclination for all kinds of mechanical work. He made, while attending school, a very good violin, on which he played for years. At the age of twenty-one, without knowing a particular trade, he was thrown upon his own resources with three sisters younger than he looking to him for support. In his helplessness he went to an uncle in western New York, but, disappointed in his expectation of assistance, he by chance stopped at Canastota, and visited the shop of Chas. A. Spencer, where he found employment. Under the direction of such a teacher he developed phenomenally his mechanical gifts, and soon was able to execute the great ideas of his older friend. Many of Spencer's great achievements, later on, were due to the skill of Tolles. But when Spencer gradually enlarged his business, and associated himself with A. K. Eaton, for Spencer and Zentmayer; he was not accustomed to figure out his formulæ with pencil and paper, but he got the greatest results by experimenting and by his unsurpassed mechanical skill. His greatest achievement was the ⅞ objective, somewhere about 1874, the only one in the world. Tolles's education was somewhat neglected. He therefore took to reading, and soon acquired a general knowledge of the arts and sciences as well as of the writings of the poets and select writers. He was well known in London and Paris, and received the degree of A. B. from Colby University, of Maine. In 1872 he had a lively controversy with F. H. Wenham, an optician of London, about the measurements of the angle of microscopic objectives. He died in Boston, November 17, 1883, and was buried in Mount Auburn Cemetery, where recently a monument was erected to his memory through the efforts of the New England Association of Opticians, to whom is due the credit for having collected the funds to thus fittingly honor the memory of this eminent optician.

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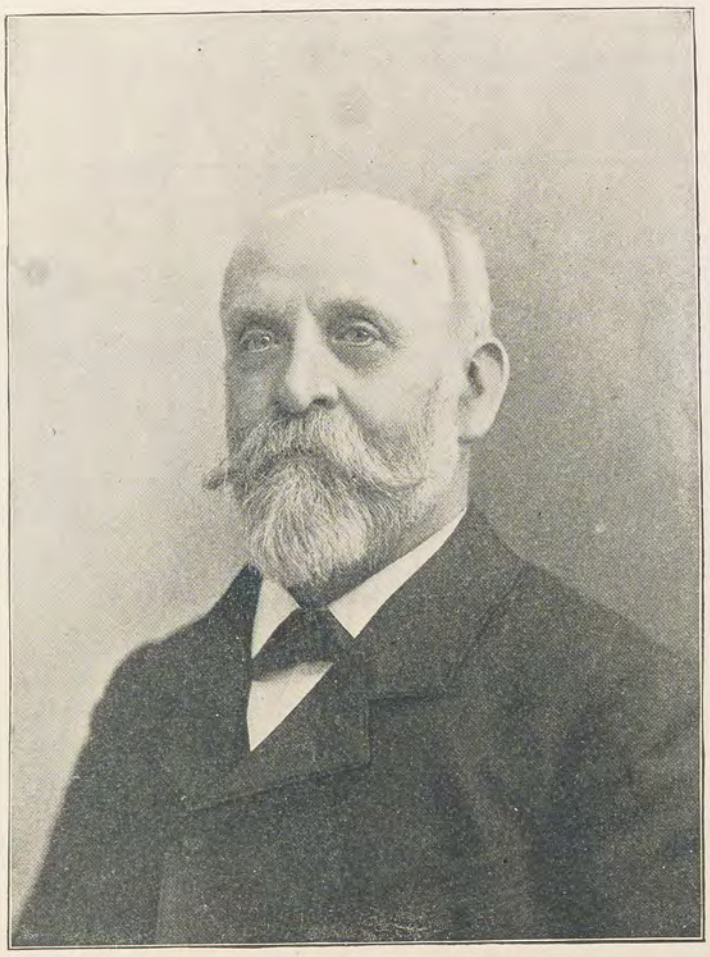
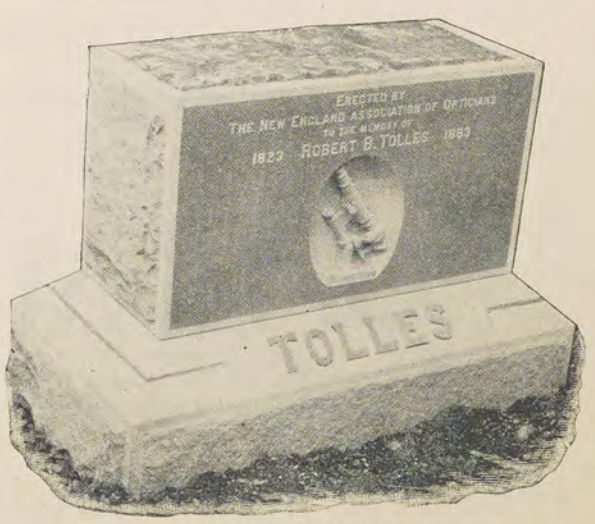


Alvan Graham Clark.

MOST FAMOUS MANUFACTURER OF TELESCOPIC OBJECTIVES

One of the most noted and gifted personages in the optical field during the century was Alvan Graham Clark, the world famed manufacturer of telescope objectives. Mr. Clark was born in Fall River, July 10, 1832. His brother, George, while a student at Andover, attempted the construction of a small reflecting telescope. In this way the attention of the father was first directed to optical pursuits, and about 1850 the firm of Alvan Clark & Sons was founded. The superiority of their lenses soon attracted the attention of astronomers, especially that of the Rev. W. R. Dawes, who introduced several of their larger productions abroad. Their instruments gradually increased in size, until, in 1861, all former attainments were surpassed by the construction of one of 18¾ inches aperture for the Northwestern University, now located at Evanston, Ill. While testing this glass at Cambridge, Mr. Clark discovered the companion to Sirius, for which he was awarded the Lalande prize of the French Academy of Sciences. The Princeton University refractor, of 23 inches aperture, marked the next increase in size, after which two lenses of 26 inches diameter were made, one for the United States Naval Observatory at Washington, the other for the Leander McCormick Observatory of the University of Virginia. Then came the 30-inch refractor for the Imperial Observatory at Pulkowa, for which a gold medal was awarded by the Russian government. Finally, in 1887, the famous Lick telescope was constructed, which ended the joint productions of the Clarks. During the last five years, Mr. Clark executed with his own hands the 20 inch lens for the Denver Observatory; one of 24 inches aperture for Mr. Percival Lowell; the 24-inch Bruce photographic objective, for the Harvard Observatory Station at Arequipa, Peru; and finally, as a crowning triumph, the great Yerkes lens, 40 inches in diameter. This last he accompanied to its destination, and superintended its final mounting only a few days before his death. In addition to his optical work, he was a member of several governmental eclipse expeditions, and, like his father, the discoverer of a number of close double stars.

Mr. Clark was fond of the companionship of intelligent men, interested in all that pertained to science and delighting in travel and reminiscence, he had a storehouse of facts from which to draw. These he invested with a peculiar charm, as he shared them not only with personal friends, but the welcome visitor. An hour at his workshop was an unusual pleasure, both for the scientific man as well as the ordinary individual.



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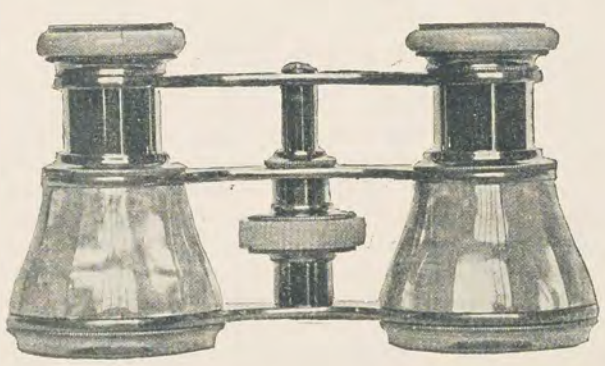

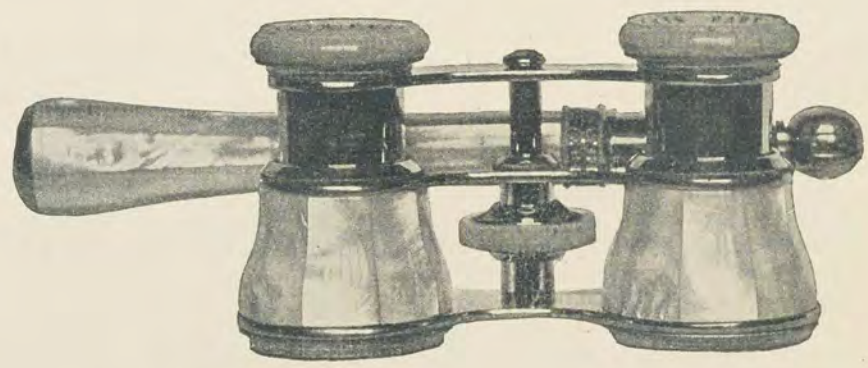

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The first ten chapters of "The Optician's Manual," as published in THE KEYSTONE from May, 1890, to November, 1896, in the order mentioned hereunder, have been republished in book form with additional matter, illustrations and colored plates. A copy of the book will be sent, prepaid, from this office on receipt of $2.00; or can be had for 8/6 from the following agencies: Anglo-American Optical Co., 94 Hatton Garden, London, E. C.; Bosch, Barthel & Co., 196 Pitt Street, Sydney, N. S. W.

CHAPTER XIII.

ASTIGMATISM.

This subject has always been a bugbear and stumbling block to the average optician. The word conveys to his mind the idea of some complicated defect shrouded in great mystery, difficult or impossible of explanation and comprehension, refusing to be discovered or corrected except by the expert touch of the oculist, and therefore the jeweler-optician concludes it is beyond his reach. While it must be admitted that this defect is more complicated and difficult of study than those which have so far been described, yet the same laws and principles are applicable in both cases, and a close study will rob the subject of much of its mystery and make it plain and easily understood, so that we feel like assuring the student that its difficulties lie rather on the surface and in the imagination.

At the same time we would add that the detection and correction of astigmatism will be a severe test of the optician's knowledge and understanding of the subject, as well as of his patience and forbearance. But experience is the great teacher and assistant in refraction work, as in many other things, and in connection with a proper knowledge of the defect, soon enables the educated optician to accurately adjust the necessary combination of glasses for its correction.

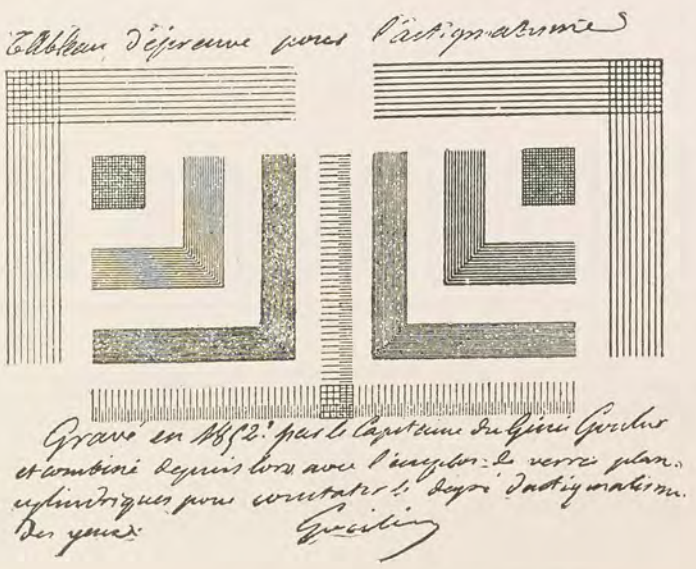
HISTORY OF ASTIGMATISM.

The discovery of this defect dates back a hundred years and more, the credit for which is unanimously given to Thomas Young, but the exact date is somewhat a matter of dispute, some authors placing it at 1793, others at 1800, and still others at 1801. His own description of his case is as follows: "His eye in the state of relaxation collected to a focus on the retina those rays which diverge vertically from an object at the distance of ten inches from the cornea, and the rays which diverge horizontally from an object at seven inches distance." This would indicate a case of compound myopic astigmatism, the refraction of the vertical meridian being — 4. D. and of the horizontal meridian — 5.50 D. It is recorded that the astigmatism in this case was *lental*, that it was due to an irregularity in the curvature of the crystalline lens, and that while Young stated his observations and described the condition of his sight, he does not seem to have discovered or had the means at hand for its correction.

The next case reported appears to have been in 1827, when a Mr. Airy published an account of a similar condition in his own eye, in which the farthest point of distinct vision for vertical rays was 3½ inches and for horizontal ones 6 inches, showing an astigmatism of 4.50 D. engrafted on a myopia of 6.50 D., which is a very considerable degree of defect and markedly impairs the acuteness of vision. This observer proved that his cornea was not a perfect surface of revolution, but that the curvature was greater in the vertical meridian than in the horizontal, and that both meridians were more convex than normal. This gentleman is given the credit for being the first to apply cylindrical lenses for the correction of astigmatism.

Although the history of this defect dates back a whole century, it was not understood nor did its correction become common until within the past thirty-five years, until after Donders had completed his investigations and published his views on the nature and causes of astigmatism. This was in 1862, and the statement is made that up to that date only eleven cases of astigmatism had been recorded, the strict correctness of which we are inclined to question.

At any rate the credit for the preparation of the first charts for the detection and correction of astigmatism, is given to a certain Colonel Goulier, professor of topography at the Military School of Metz, who noticed the frequency of the defect among the soldiers under his command. He ordered cylindrical glasses to be made for them and reported the result of his observations to the Academy of Sciences in 1852. This was about the time that Donders was pursuing his investigations, of which Goulier seems to have known nothing. A fac-simile is given of the diagram which the latter used in the measurement of astigmatism, the value of which is enhanced by the lines which he wrote upon it when placing it in the hands of the illustrious Javal.



DEFINITION OF ASTIGMATISM.

The term Astigmatism is a combination of the letter *a* and the word *stigma*. The latter means "a point" and the addition of the letter *a* gives it a negative significance, or, in other words, "without a point," which practically means seeing in lines. In a symmetrical eye the rays of light are brought to a focus in a point from the union of the rays from a given point of the object, the visibility of which depends upon the impressions of these points being carried to the brain. A number of these points causes an accurate reproduction of the object. In astigmatic vision the rays of light proceeding from the points of an object cannot be re-united in points, but instead, are extended in the form of lines, causing blurred vision. The points are distorted by being spread out. A series of such distorted points adjacent to each other gives the impression of a blurred line.

Every point of light throws out diverging rays in the form of a cone, which, by the action of the refracting media of the eye, are again united in a point. Thus we have a divergent cone and a convergent one with their bases together, when the eye is symmetrical and emmetropic. In asymmetry of the eye, on the other hand, when there is a difference in the curvature of the several meridians, the second or convergent cone will be altered in shape and will no longer form a simple point, but an extended one or a blurred line. This makes the difference between the image formed in a normal eye and one affected with astigmatism, which will be more fully described and illustrated later on.

De Schweinitz defines astigmatism as follows: "The term Astigmatism is applied to that refractive condition of the eye in which a luminous point, for example a star, forms an image on the retina, the shape of which image is a line, an oval or a circle, according to the situation of the retina, but never a point."

SEAT OF ASTIGMATISM.

Usually the seat of astigmatism is located in the cornea, which then differs from the normal in that it is no longer spherical in shape, but the curvature of one meridian is greater or less than another at right angles to it. The emmetropic cornea is assumed to be a surface of revolution about the visual axis; but this is not strictly exact, as the use of a keratoscopic disc shows it to have an ovoid configuration, the radius of curvature being less at the center than towards the periphery.

THE KERATOSCOPE.

The simplest and quickest way of determining the curvatures of the cornea is by the use of the method devised by Placido, who advised a disc of cardboard or metal about nine inches in diameter, with a central aperture of one quarter of an inch, to which is attached a handle of suitable size. On one surface of the disc is painted a series of concentric circles, alternately black and white. Out of compliment to its inventor this keratoscope is known as *Placido's Disc*.

In the use of this instrument the patient is placed with his back to the window where a good light is entering room, and the optician facing him with the keratoscope in his hand reflects the light from the window into the eye under examination, when the images of the circles can be seen upon the cornea by looking through the central aperature, which is usually supplied with a convex lens of 4. D. refractive power.

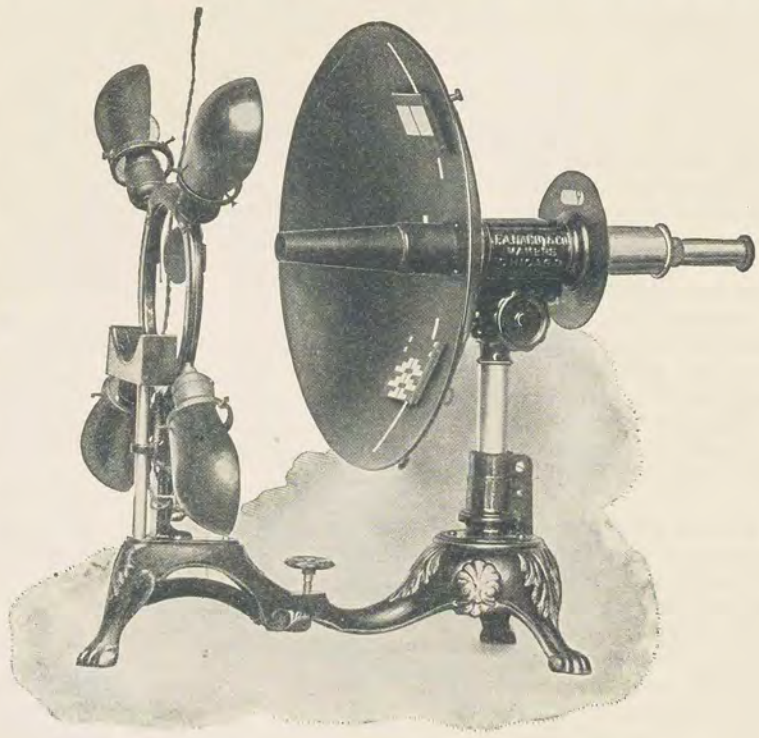
If the curvatures of the cornea are normal, the reflected rings will be perfectly circular and of regular shape; but if astigmatism be present, that is if the curvature of the cornea be greater in one meridian than another, the rings will appear of oval shape, with the longest diameter in the meridian having the longest radius. If the cornea be the seat of irregular astigmatism, the rings will appear very much distorted and out of shape, and portions of them will even be entirely invisible.

While we cannot recommend the keratoscope as an instrument of precision in the detection and correction of astigmatism, because it does not definitely locate the impaired meridian, nor does it indicate the degree of defect, yet it forms an interesting method of examination and affords instant information of any departure of the cornea from its normal curves.

But astigmatism may also be located in any other of the refractive media, especially the crystalline lens, and this naturally leads to the division of astigmatism into *corneal* and *lental*, the total being the sum of the two.

The horizontal meridian of the cornea is normally a little flatter than the vertical on account of the pressure exerted in this direction by the closure of the eye-lids, which affect slightly the former meridian, while the latter is free from any such pressure.

This will explain the significance of the terms "astigmatism according to (or with) the rule" and "astigmatism contrary to (or against) the rule." In the first case the vertical meridian has the sharper curvature, which condition would be corrected by a + cyl. axis 90°, or a — cyl. axis 180°. In the second condition the excess of curvature is in the horizontal meridian, and then the correcting cylinder must be placed axis at 180° if convex, and axis at 90° if concave.



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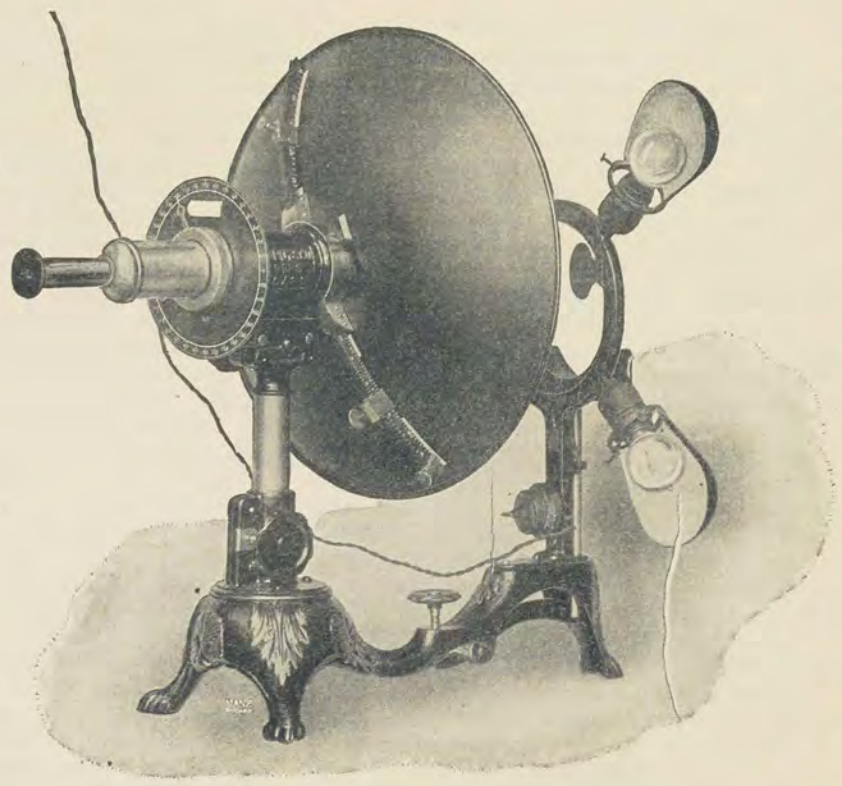


Optical Questions and Answers.

Subscribers wishing inquiries answered in this department must send name and address—not for publication, but as an evidence of good faith. Questions will be answered in the order in which they are received. No attention will be paid to anonymous communications.

To enable us to answer questions satisfactorily and give proper advice in the management of cases submitted to us, it is essential that we be furnished with a complete history of each case and accurate information on the following points:

1. Age. (If not possible to give exact age, always approximate.)
2. Have glasses been previously worn? How long and what number?
3. Visual acuteness of each eye, and what improvement glasses afford.
4. Range of accommodation (without glasses and with them).
5. Evidence of astigmatism (as shown by radiating lines).
6. Test for muscular insufficiency.

"*S. F. C.*"—(1) *Barber, aged twenty-nine years. Has worn glasses before and lost them and don't know strength. Test without mydriatic showed R. V.* = $\frac{6}{18}$; *with* — 0.25 ⊂ — 1.50 *Cyl. ax. 180°* $\frac{6}{9}$. *L. V.* $\frac{6}{36}$; *with* — 0.50 ⊂ — 1.50 *Cyl. ax. 165°* = $\frac{6}{9}$. *1° R. H., 2° exophoria. Test under atropine: R.* $\frac{6}{18}$, + 0.75 ⊂ — 1.25 *Cyl. ax. 180°* = $\frac{6}{9}$; *L.* = $\frac{6}{36}$, + 0.75 ⊂ — 1.25 *Cyl. ax. 165°* = $\frac{6}{9}$; + 0.25 *over both at once was just as good. Showed no muscular insufficiency. Gave him, R.,* + 0.50 ⊂ — 1.25 *Cyl. ax. 180°; L.,* + 0.50 ⊂ — 1.75 *Cyl. ax. 165°. He can see to read with these, but not at a distance, and they seem to draw his eyes and in a short time has to discard them. What change should be made?*

(2) *What is alumnico? Such as spectacle frames are made of.*

(3) *In what respect, if any, are American lenses superior to imported ones?*

(1) The effect of the atropine was to develop some latent hypermetropia, or rather to change an apparent myopia into a hypermetropia, which, however, the eyes will not suffer to be corrected, as the sequel shows. This is almost invariably the case, and the writer has seen many cases fitted under atropine by oculists in private practice and at hospital dispensaries, where the glasses were uncomfortable, and although the physician insisted on their use, the patient was unable to wear them. This forms one of the strongest arguments against the use of atropine, because, after all, the average eye will bear a correction of only its manifest defect, and the optician can solace himself with the thought that his refraction work will not suffer by a non-use of the drug. The proper thing for our correspondent to do under the circumstances is to prescribe the concave cylinders without the spherical addition.

(2) The word "Alumnico" is the trade name for a certain composition metal used for making spectacle frames; it is a high grade of German silver, with some composition in it to make it look like aluminum.

(3) The superiority of American lenses over imported ones lies in the fact that the stock from which they are made is selected for its hardness and brilliancy, and it is quite a little harder than the foreign stock. The system which the American manufacturers have adopted in their curves make the lenses preferable in fitting up cemented bifocals.

In order that a correct and definite understanding may be had of each case submitted, it is necessary that correspondents should give *all* the particulars asked for at the heading of this page.

"*T. H. T.*"—*Girl, aged fourteen years. Has been wearing* + .25 *Cyl. ax. 180°, both eyes, prescribed a year ago. Complains that she cannot see blackboard at school and that her eyes tire when reading. Vision,* = $\frac{20}{50}$ *each eye. Her glasses blur this some. With a* — .50 *each eye vision* = $\frac{20}{30}$. *Fan lines all clear. Now here is where I am puzzled: on giving her the near type, fine print cannot be seen; without glasses, the same. With a* + .50 *over each eye she can read fine print at ten inches nicely. Did not test the muscles.*

The fact that a concave lens improves distance vision in a child must not be taken as conclusive evidence of the existence of myopia. The fact is, in youth we are always suspicious of spasm of accommodation, which causes an apparent or false myopia. It is really not myopia at all, but may be even hypermetropia, and if concave lenses are prescribed in such a case they only increase the tax on the already over-burdened accommodation. This seems to be the condition in the case of this little girl; and while at first sight a vision of $\frac{20}{50}$'s which is raised to $\frac{20}{20}$'s by — .50 D. would indicate myopia, yet in view of what has been said above, such a hasty conclusion is probably erroneous, and beside the diagnosis of myopia is contraindicated by the fact that fine print cannot be seen except with convex lenses; therefore we are inclined to regard this case as one either of hypermetropia or hypermetropic astigmatism; and keeping this thought in view we would advise our correspondent to re-examine the case with convex-sphericals and cylinders repeated on several different days. If he can have a convex lens accepted this is proof positive that the refraction is hypermetropic, in which case concave lenses should not be allowed to come near the eye, else they would be accepted and then the case would be confused and the diagnosis be in doubt. We feel sure that these remarks will lead to a proper correction of the trouble if the optician will do his part faithfully, although we admit that sometimes in cases of this kind the use of atropine becomes necessary in order to clear up the case.

"*B. R. K.*"—*Girl, fourteen years old, complains of an almost constant headache, which seems to be more severe after studying or other near work. Without glasses she could read only the line marked D–120 (Snellen's test type) with each eye and the only glass she would accept was* — *1.50 right eye and* — *1.75 left eye. With Maddox rod it required a three-degree prism base in to make the streak pass through the flame, and with this correction she read D–30. Could not get any satisfactory results with the retinoscope. She would accept nothing besides the above lenses. If I would put on anything weaker or stronger, or a plus or a cylindrical lens, she would at once object, and just as soon as I would get back to the original lenses again she would say that they were the best; so I concluded that they must be near right, even though the retinoscope did not show any myopia. She came in again later and at once, without hesitation, read the D–30 without glasses, and I could make her accept nothing of any strength to speak of; so took her into the dark room and found that a* + *1.25 would make the shadow go with the mirror on the left eye and a* + *.75 on the right eye. Then tried her at the distant type with a* + *.25 on the left eye and* — *.25 on the right, and she said that with that she was able to pick out a few letters on the next line, and it still required the three-degree prism to make the streak pass through the flame. Why should she accept minus lenses when I tested her eyes two days before, and see so much better and not accept them now? Do you think that giving her the correction that I found satisfactory to-day would relieve her of her headache or help her in her studies enough to make it advisable for her to wear them, or would you put her under atropine before prescribing glasses (she objects to having anything put into her eyes)?*

This seems to be one of those cases that is apt to mislead an optician unless he is constantly on his guard. As we have frequently stated before on these pages, the acceptance of a concave lens by a young person does not by any means prove the presence of myopia. In this girl's case the improved acuteness of vision shown by the second examination would at once disprove the possibility of myopia. We think, therefore, it is safe to entirely exclude myopia, and we would regard the apparent myopia of the first examination as due to a spasmodic condition of the accommodation, which quite possibly masks an hypermetropia or hypermetropic astigmatism, which supposition would be strengthened by the symptom of constant headache aggravated by study or other near work. Our correspondent has failed to give us the amplitude of accommodation, which often is of great assistance in enabling us to determine the presence of hypermetropia in a latent form. But even with this omission we feel safe in classing the case as hypermetropia, and we would advise our correspondent to repeat the examination several times with this thought in view. We would suggest a trial of the "fogging" method of examination, which is conducted by means of a strong convex lens placed before the eyes and gradually reduced by concaves. There seems to be some exophoria, but we would disregard this for the present and pay particular attention to the condition of the refraction, as this is where we think the difficulty lies. It may become necessary to take the girl away from her books and studies, in order to favor a relaxation of the accommodation, as this is the element in the case that masks its true nature and causes confusion.

"*E. H. K.*"—*Married woman, aged thirty-seven years; no children. Vision, O. D.,* $\frac{20}{120}$; *O. S.,* $\frac{20}{80}$. *Skiascopy—point of reversal at 2 m., O. D.,* — *1. S.* ⊂ + *3.50, ax. 115°; O. S.,* — *1. S.* ⊂ *3.50, ax. 70°. Subtracting* + *.50 for the two meters leaves* — *1.50 S.* ⊂ + *3.50 Cyl., both. Vision, O. D.,* $\frac{20}{25}$, *with* + *3.50, Cyl. ax. 115°; O. S.,* $\frac{20}{25}$, *with* + *3.50, Cyl. ax. 70°. The concave Sph. cuts down vision to about* $\frac{20}{80}$. *Tried to use simple cylinders, but makes her head swim. Is now using* + *1. Cyl. with axes as above, with some satisfaction, but poor vision.*

The history of this case is wanting, and this is sometimes important in enabling one to come to a thorough understanding of the case. In astigmatism the defect should be corrected early in life, in order that the growing eye may conform and adapt itself to the correcting lens. Otherwise, if the eye attains its full growth and goes on to middle age and becomes accustomed to a certain kind of vision, no matter how defective, it resents any interference with what has become to it a habit and a fixed condition. Hence, the difficulty in deferring the correction of astigmatism until middle age. We presume this lady has never worn glasses, and if this presumption be correct it is no wonder that she is unable to wear the indicated cylinders. The difficulty is intensified in this case on account of the high degree of astigmatism, which is much above the average usually found. The important point is to verify the correction that has been found by all the methods of examination that are at hand. Not only as regards the degree of the defect, but especially as to the location of the axis of the correcting cylinders. In lenses so strong as these mentioned, the slightest variation in the position of the axis produces a notable effect on vision and, hence, we would advise our correspondent not to depend on the retinoscope alone for ascertaining the location of the defective meridians. Having determined this, if the glasses are uncomfortable there is no other course to pursue than to reduce them until they come within the comfort of the eye, with the expectation that as these organs become accustomed to them the glasses may be changed from time to time for stronger ones, until finally the full correction is reached.

"*A. E. S.*"—*Gentleman, aged fifty years. Plus lenses have been previously worn for reading. Is now wearing* + *1.50 D. on O. D.,* + *1.50 D. on O. S. He takes a* — *1.25 D. on O. D. and* — *.75 on O. S. to bring distant vision to* $\frac{20}{20}$. *Muscles are O. K. as far as I can tell. Range of accommodation when fitted for reading, 4 to 18 inches. No astigmatism. Both corrections bring him to* $\frac{20}{20}$, *and seems to appreciate both. Can he wear this correction very long?*

We scarcely know what information or assistance our correspondent desires in this case. It looks to us like a case of simple myopia complicated with presbyopia. If the concave lenses mentioned are necessary to raise the acuteness of vision to normal, myopia is proven to be present. And at this age certainly the presbyopic changes have begun to make their appearance, which the amount of myopia present is perhaps too slight to neutralize. Naturally the myopia tends to decrease slightly and the presbyopia to increase, so that the concave glasses may perhaps be slightly weakened and the convex glasses strengthened. There is one point about this case, however, that does not seem to be just exactly right, and that is the range of accommodation from 4 to 18 inches. This makes both the near point and the far point too close, and would indicate that the glasses are too strong. It will be remembered that the rule for the correction of presbyopia is to restore the receded near point to 8 inches; therefore, a glass which would approach the near point as close as 4 inches would certainly be too strong. The indications tend almost to the fact that he might be able to read without any glasses, which, of course, is quite possible in myopia, although the degree present in this case seems scarcely sufficient to accomplish this result; of course this is a matter which can be quickly determined by our correspondent in his examination of the case. These are the kind of cases that often get along without any glasses at all, because the distant vision is not very greatly impaired while the near vision is benefited by the presence of myopia.

"*J. E. L.*"—*Young man, aged about nineteen years. Has never worn glasses except once in a while, when he used an old pair that some of the folks at home had used, but not constantly; I do not know what number. Can hardly see card at 20 feet with either eye. Vision better some times than at others. With* + *3.00 can bring vision* $\frac{20}{40}$ *each eye. Astigmatic card looks dark and all right, but can see some letters plainer than others. Prisms as high as three have but little effect on either eye. Eyes have been hurting him for about five years. He wants to start in college next week. Would you advise him to go?*

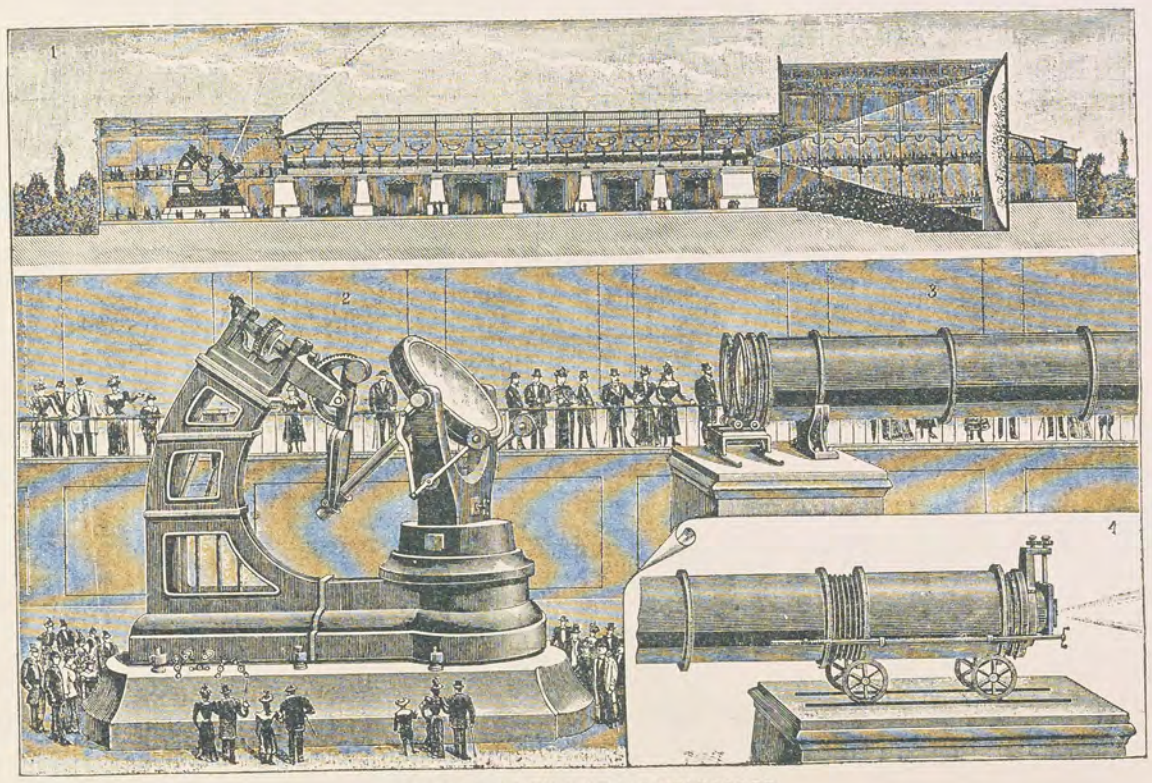
We presume this young man and his family are people of more or less intelligence, and yet it is hard to reconcile this thought with the fact that eyes so defective as his should be so neglected. It is hard to conceive of such a thing in these days, when the value of glasses is being more and more recognized. We certainly think that some blame should be attached to his parents, although he is approaching the age when he must assume the responsibility himself. In the light of the somewhat imperfect history we have, we are inclined to consider the case as one of high hypermetropia, perhaps complicated with some astigmatism. But the case needs to be re-examined on several different days by all the methods of examination available, in order that the proper glasses may be arrived at with some degree of certainty. We feel like using the opportunity to express an opinion of one person wearing another one's glasses: as well might he take medicine which had been prescribed for some other member of the family without knowing the ailment for which it was given. We are confident that the proper convex glasses (with perhaps the addition of convex cylinders) will benefit this young man's eyes and enable him to see better than he perhaps ever did in his life; but still his eyes are far from perfect and it may take him some time to get accustomed to the glasses, and therefore we scarcely think it advisable for him to start in to college just now.

"*J. W. P.*"—*Lady, aged forty-six years. Health fair, except is nervous. Vision, R. E.* $\frac{20}{40}$; *L. E.* $\frac{20}{18}$. *R. E.* + *.25* ⊂ *Cyl.* + *.50 ax. 155°* = $\frac{20}{20}$; *L. E.* + *.25* ⊂ *Cyl.* + *.75 ax. 15°* = $\frac{20}{20}$. *Maddox rod test at 20 feet calls for 6° prism base in. Three years ago an optician gave the lady* + *2.75 O. U. for reading and told her she was very far-sighted. These glasses were satisfactory for some time. As she was just recovering from a sick spell at the time the* + *2.75 glasses were given her, my opinion is that she was suffering from paralysis of accommodation, and how the man who prescribed them could mistake paralysis for far-sight is beyond me. I gave patient lens as above* ⊂ *1° prism base in for distance and* + *2.25 for reading and propose trying the experiment of reducing strength of reading glasses as fast as possible. Also recommend tonic treatment.*

As we commence reading the history of this case we are impressed with it as one of compound hypermetropic astigmatism, which is completely corrected by the proper sphero-cylinders, as indicated by the normal acuteness of vision which they afford. In addition we find 6° of exophoria, but we are at loss to account for the fact that + 2.25 is required for reading, except on the presumption that there is a weakness (scarcely paralysis) of the accommodation, or a latent hypermetropia; the latter is scarcely possible, however, as at this age latent defects become manifest. In prescribing for this case we would order the sphero cylinders mentioned for constant wear and combine with them the necessary glasses for reading, leaving prisms out of the combination at present.

Greatest Optical Achievement of the Century.

THE great telescope which is to figure at the Paris Exposition of 1900 will surpass the most powerful instruments of the kind that have ever been constructed. The greatest telescope that exists at present is that of the Yerkes Observatory, Chicago, the objective of which is 3.28 feet in diameter, and the focal distance about 65 feet. The telescope of 1900 has an objective of 4.1 feet in diameter and a focal distance of 65 feet, and its weight exceeds 44,000 pounds. This instrument, says the *Scientific American*, consists essentially of a movable plane mirror actuated by a clockwork that causes it to move in such a way that the luminous rays thrown upon it by a star are, after their reflection, sent in a fixed and absolutely invariable direction. If the axis of the telescope be placed in such a direction, the observer, upon putting his eye to the eye-piece, will see the image constantly during the entire time in which the star remains above the horizon, and will be able to study it at his leisure and to make drawings and photographs of it.



DETAILS OF THE GREAT TELESCOPE.

1. General View. 2. The Siderostat. 3. The Telescope. 4. The Ocular.

Fig. 1 shows the apparatus in its entirity. The siderostat is at the north, with the mirror placed upon the movable support. The declination circle is seen, as well as the horary axis, resting upon a stone base. The ocular, with its movable part, is at the south.

This magnificent instrument, when mounted, will be the optical and mechanical chef-d'œuvre of the nineteenth century.

The siderostat under consideration comprises a circular mirror 2 meters (6½ feet) in diameter, absolutely plane and giving excellent images, and of a 196-foot telescope placed horizontally in a line running north and south. The telescope forms the images to its focus, where they may be examined by means of an eye-piece, or be received upon a sensitized plate, or be projected upon a screen placed in a hall in which they will be exposed to the view of numerous spectators.

Let us now pass to the details. The mirror consists of a glass cylinder, 6½ feet in diameter and 10⅓ inches in thickness and weighs 7920 pounds. It is arranged in a 6820-pound tube and is kept in equilibrium through a system of levers and counterpoises. All this part is fixed in a mounting of which the total weight is 33,000 pounds. The base of this mounting floats on mercury contained in a tank, and the thrust of which eases it of $\frac{9}{10}$ of its weight. Hence the clockwork that directs the apparatus has merely to displace a mass of 33,000 pounds, and its motive weight is but 220 pounds.

The siderostat (Fig. 2) comprises: (1) A cast-iron base 34 feet in height, of which the southern part supports the horary axles, parallel with the line of the poles, and its toothed rings; (2) the declination circle; (3) the clockwork movement, connected with the circle and its weight; (4) the cranks which serve respectively for the tangent screw, for the displacements of the horary circle, for the declination circle, and for the winding up of the clockwork. The part situated at the south comprises: (1) The support of the mirror, mounted in the tube and resting upon the breech, with the screw that permits of displacing it; (2) the axis of direction of the mirror, which slides in a tube, fixed upon the diameter of the declination circle; (3) the counterpoise of the mirror; (4) the mercury reservoir; (5) the windlass, designed to raise the receptacle for the silvering mirror; (6) the rollers of the support, and finally (7) the regulating screws of the siderostat. Fig. 3 gives the arrangement of the objectives, 4.1 feet in diameter, one of which is designed for visual observations and the other for photographic work. They are mounted together upon the same carriage, the base of which rolls upon the rails by means of wheels, in such a manner that one or the other can be easily adapted to the extremity of the telescope which is in the vicinity of the siderostat. The tubes that carry the crown and flint glass lenses are mounted upon the rails. The flint and crown glasses may be separated from each other in order to permit of wiping off any dust that may settle upon them. Fig. 4 gives a lateral elevation of the ocular.

HARVARD'S NEW TELESCOPE—A NOVEL DESIGN.

For some years the leading astronomers, and through them the greatest astronomical observatories of America, have been vying with each other to secure the largest telescope. The orders for the lenses of all of these have been given to Alvan Clark, of Cambridge, who has thus been called upon to break his own record no less than six times. The progress in lens grinding is shown by the following list, giving the sizes of the apertures in what were successively the largest telescopes in the world, all made by Alvan Clark: Old University of Chicago, 18 inches; Princeton, 23 inches; Washington Observatory, 26 inches; Pulcowa (Russia) Observatory, 30 inches; Lick Observatory, 36 inches; Yerkes, Chicago, 40 inches. All these telescopes are of similar form and adapted to a comparatively limited kind of work, and all are located near the universities of which they form a part. But for the most successful astronomical work, atmospheric conditions are no less important than the size of the telescope used, and the vicinity of large cities is never the best place to secure clear air.

In the size of its telescopes the Harvard Observatory is not among the first; but it is now the ambition of its directors to secure pre-eminence by erecting, in the most favorable location this planet can afford, a telescope which shall be made in a new way, and capable of doing a work different from any other. The $250,000 left to the University by Mr. Boyden, the inventor of the turbine water-wheel, has been partly used to send out expeditions to find the best places for astronomical work, and to locate therein stations and observatories. In this way California, Mexico, Peru and Chili have been planted with Harvard astronomical stations, and regular reports come into the great archive rooms at Cambridge from Arequipa, Molledo, LaJoya, Cuzco and Echarati.

When Miss Catherine Bruce, of New York, gave the Harvard Observatory $50,000, it was employed in placing in Arequipa, a telescope much shorter than any other with the same size of objective that have ever been constructed.

In an interview with Professor Pickering, at the Harvard Observatory, he said that the lenses are to be ground by Alvan Clark, who has already procured desirable rough glass for the purpose from the famous Parisian makers. But before proceeding with the construction, said Professor Pickering, we want to find some one who will furnish the money to pay the bills. This will require only $5000 or $10,000, but it will be an experiment of lasting importance to science.

The special use of the new telescope will be the taking of astral photographs. It will probably be placed horizontally and the image reflected into it by means of mirrors, counteracting the motion of the earth by means of clockwork attached to the photographic dry plate.

Skiascopy.

(CONTINUED.)

Our new book on Skiascopy is now ready. It contains over 200 pages, with numerous illustrations and several colored plates. No practicing optician can afford to be without a copy of this treatise, which far excels in comprehensiveness and practical value any work heretofore published on the subject. It not only explains the shadow test in its practical application to the work of refraction, but expounds fully and explicitly the optical principles underlying it. In depth of research, wealth of illustration and scientific completeness the work is unique. The price of the book is $1.50.

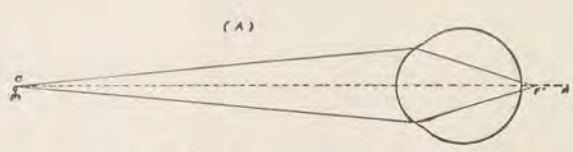
The work will continue to appear in serial form, as hereunder, in this journal. The first installment was published in the September, 1899, issue.

CHAPTER I. (*Continued.*)

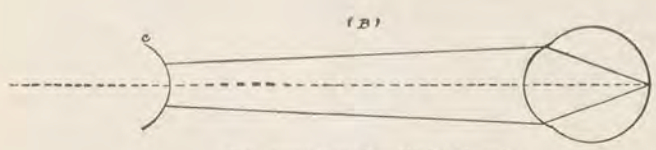
Subject Defined and Outlined. Elementary Principles of the Test and their Application in Skiascopic Examinations.

Fig. 3 A represents an incident pencil of light being refracted by a myopic eye. The myopia is slight, for the potential focus is between *F* (the focal point of emmetropia) and the retina, or at *F'*. Fig. 3 B represents an emergent pencil refracted by this myopic eye. As the pencil is a little more than neutralized by the refraction of the dioptric media, it emerges as a slightly convergent pencil, composed of waves the least bit concave, and therefore having a potential real focus anterior to the cornea of the observed eye. But this focus, if the eye is less than 1 D. myopic—which it must be in the case shown with the light at one meter or more—is posterior to the observed eye at one meter's distance, or to its cornea, *C*, in the figure. In other words, with both the light and the observing eye at one meter its degree of myopia is indicated by the position of the potential focus of the incident pencil forward of *F*, and by the position of the potential anterior focus beyond one meter from the cornea of the observed eye, and posterior to cornea of observing eye. Fig. 4 A represents a case of myopia in which the focus of the incident pencil is at the retina, although only the static power of the eye is in use. A system of pencils such as this would produce a perfect image of the candle flame upon the retina if the candle flame were at one meter. This eye would show, by such result, 1 D. of myopia, for with its static power it would focus a pencil of light from one meter. Fig. 4 B represents its refraction of an emergent pencil. The emergent pencil is refracted to the same extent as the incident pencil, and is therefore focused at the same distance in front of the cornea as the light is, or one meter. If the light were a little further away the focus of the incident pencil would be a little forward of the retina, but the focus of the emergent pencil would be no different—that is, for an eye 1 D. myopic. The focus of the emergent pencil will be at the cornea of the observing eye, *C*, if it is one meter in front of the observed eye. As all incident pencils from the candle flame, and all emergent pencils from the retinal image of that flame, are refracted in that way, there will be in such case a true image of the preceding retinal image at the cornea of the observing eye, or would be if it were possible to have the light and the observing eye each at one meter from the observed eye. It is the impossibility of obtaintaining these conditions that classifies the pencils into incident and emergent in skiascopy, for they cannot coincide as in direct vision, where the eye is accommodated for the object.

Fig. 3.

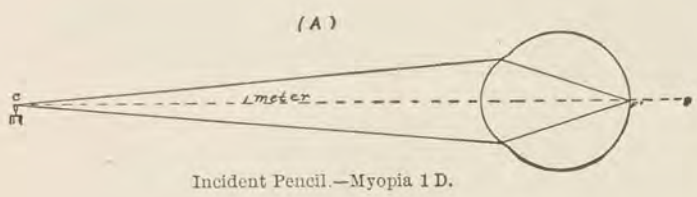


Incident Pencil.—Slight Myopia.

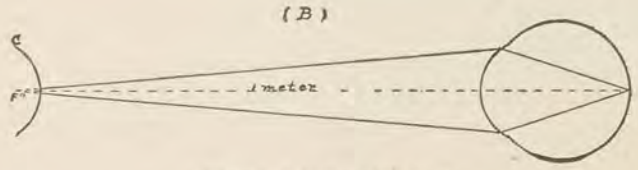


Emergent Pencil.—Slight Myopia.

Fig. 4.

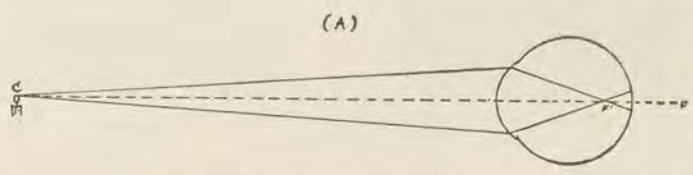


Incident Pencil.—Myopia 1 D.

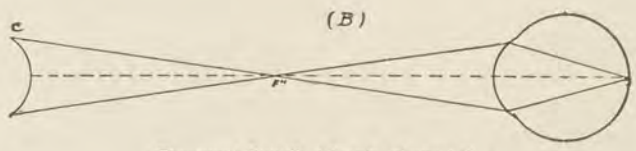


Emergent Pencil.—Myopia 1 D.

Fig. 5.



Incident Pencil.—Myopia, above 1 D.



Emergent Pencil—Myopia, above 1 D.

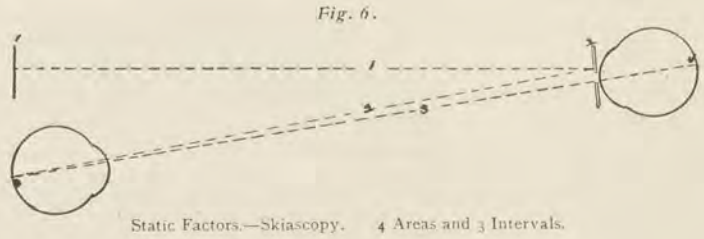
Fig. 5 A represents the pencil of light as being focused forward of the retina at *F'*. This eye is more than 1 D. myopic. The image at the retina will not be perfect, for it will be formed of diffusion circles, the same as the image in Fig. 3 A, only, in this case, the foci of the pencils are forward of the retina instead of back of it. To place the foci of the incident pencil upon the retina, the eye must be myopic to that precise degree represented by the distance of light. If the light is 2 meters distant and the eye is ½ D. myopic, the image on the retina will be perfect. If the light is ½ meter distant and the eye is 2 D. myopic, the same result will be obtained. But, in either of these cases, or in any case of myopia, the emergent pencils will be convergent. Fig. 5 B represents the refraction of a pencil of light emerging from the eye in Fig. 5 A. As the eye is more than 1 D. myopic the anterior focus of this pencil is nearer than one meter, or forward of the observing eye if at one meter, or between the observed and observing eye. As all pencils of light, whether incident or emergent, will follow the same rule as these pencils, there will be, between the observed and the observing eye, all the conditions essential for the formation of a true image there. A true image will be there in fact, a real and physical image, although no screen or reacting surface displays it. It is an image *of the image* upon the retina of the observed eye. As the image upon the retina of the observed eye is inverted this "aerial" image will be erect. As the aerial image is erect, and it is from it that the observing eye receives its pencils, the image upon the retina of the observing eye will be inverted—an inverted image of the candle flame. And thus you have the refractive effects of all classes of eyes whose ametropia is symmetrical or equal in all meridians. The case represented in Fig. 4 B is of special skiascopic interest, as it shows the position at which reversal of motion takes place with the observing eye at one meter.

STATIC ELEMENTS.

It is seen that skiascopy presents seven static factors or elements for study. These factors consist of four areas and three intervals. The four areas are as follows:

1. The luminous area.
2. The mirror.

Fig. 6.



Static Factors.—Skiascopy. 4 Areas and 3 Intervals.

3. The retina of the observed eye.
4. The retina of the observing eye.

And the intervals consist of spaces as follows:

1. The space from area 1 to area 2.
2. The space from area 2 to area 3.
3. The space from area 3 to area 4.

As area 1, though in front of the mirror, has the effect, by the reflection, of being behind it, intervals 1 and 2 together form the space in which the incident pencils are developed before reaching the cornea of the observed eye, and area 1 is eliminated. But as area 2 and area 4 are practically coincident in position, intervals 2 and 3 are practically equal in extent. As pencils of light, in passing across these spaces, are in homogeneous air only prior to entering or subsequent to emerging from a cornea, the corneas of the observed and observing eye are the real limits in which the pencils may be developed naturally, and intervals 2 and 3 are shortened by a space equal, in the former case, to the diameter of the observed eye, and in the latter by the diameters of both the observed and the observing eye. These spaces are trifling in themselves; but are noted, that accurate conclusions may be drawn. We shall have occasion to deal with these static factors more completely in a subsequent chapter. Fig. 6 illustrates the four areas and three intervals.

DYNAMIC FACTORS.

By a dynamic principle in optics those phenomena that result from and during the change of a static factor are meant. Dynamic factors result from motion of static factors. The mere shift from one static foundation to another, as the shortening or lengthening of an interval, is not dynamic except in the phenomena that result from and during the change of position. If any of the areas above is given motion and the observing eye studies the effects or optical phenomena resulting from such motion during the motion, dynamic phenomena appear. This may be accomplished by motion of the luminous area, by lateral motion of the observed eye, by lateral mation of the observing eye, by shortening or lengthening intervals, or by motion of the mirror. The latter is the mode ordinarily employed in skiascopy to evolve dynamic phenomena.

(TO BE CONTINUED.)

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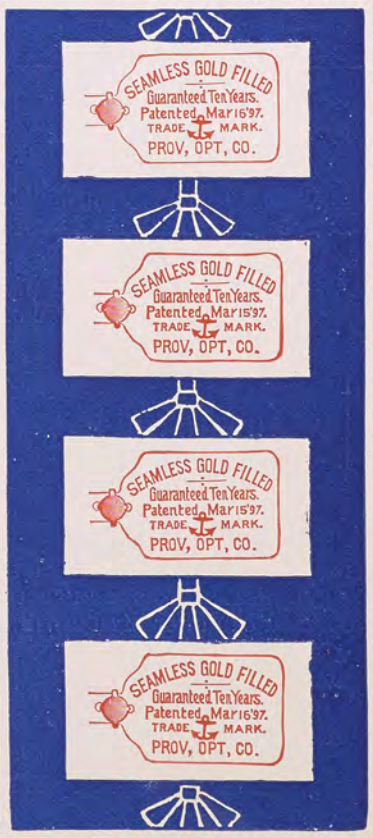

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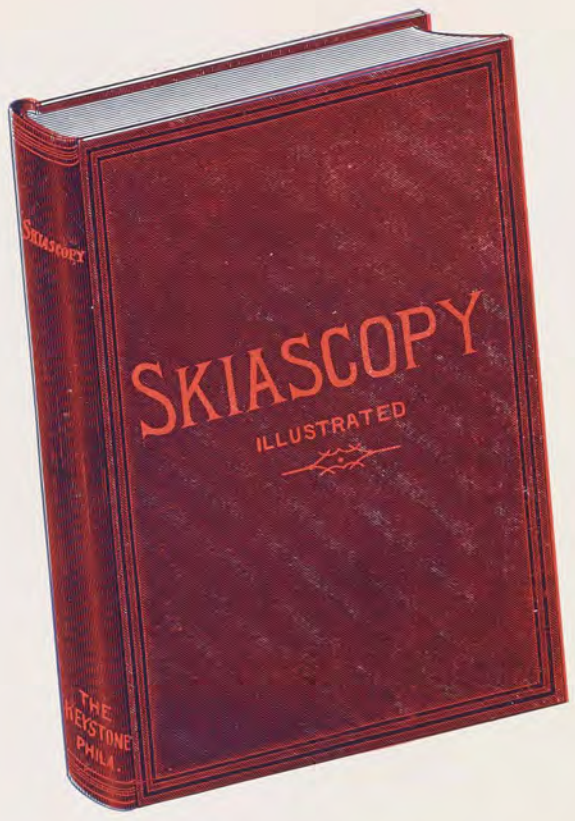

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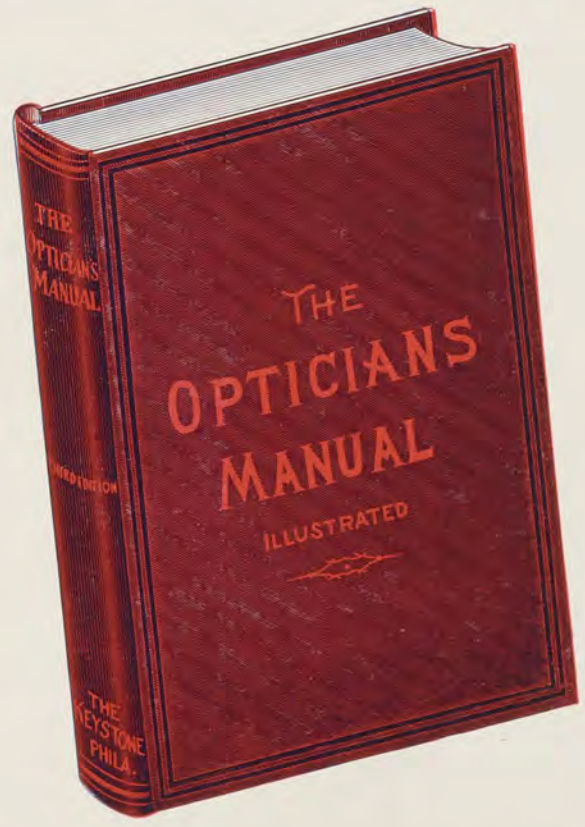

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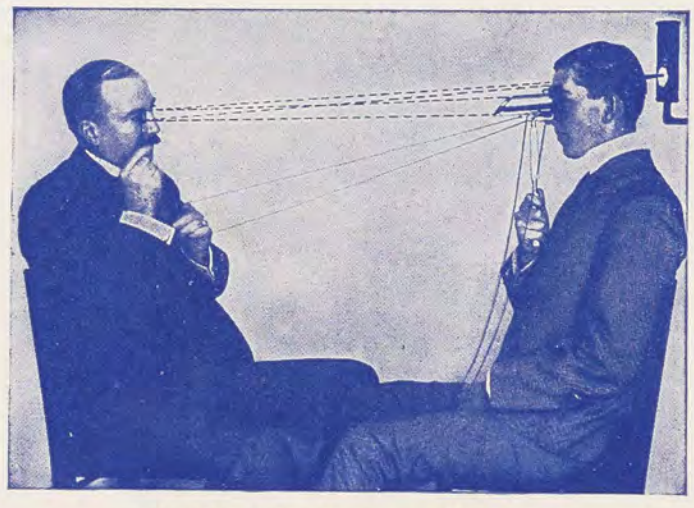

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IN writing the story of the optical industry of the United States, which means the story of the optical industry during the present century, we are confronted by the remarkable fact that the name of the founder of the industry has been continued in the optical business through consecutive generations of the family up to the present time. John McAllister was born in Scotland in 1753 and emigrated to this country in 1775. In 1781 he came to Philadelphia, and in 1783 rented a store and started the making of whips and canes. In the spring of 1799 he commenced selling spectacles and eye-glasses in connection with the whips and canes, and such was the unpretentious beginning of the now enormous optical industry of the United States.

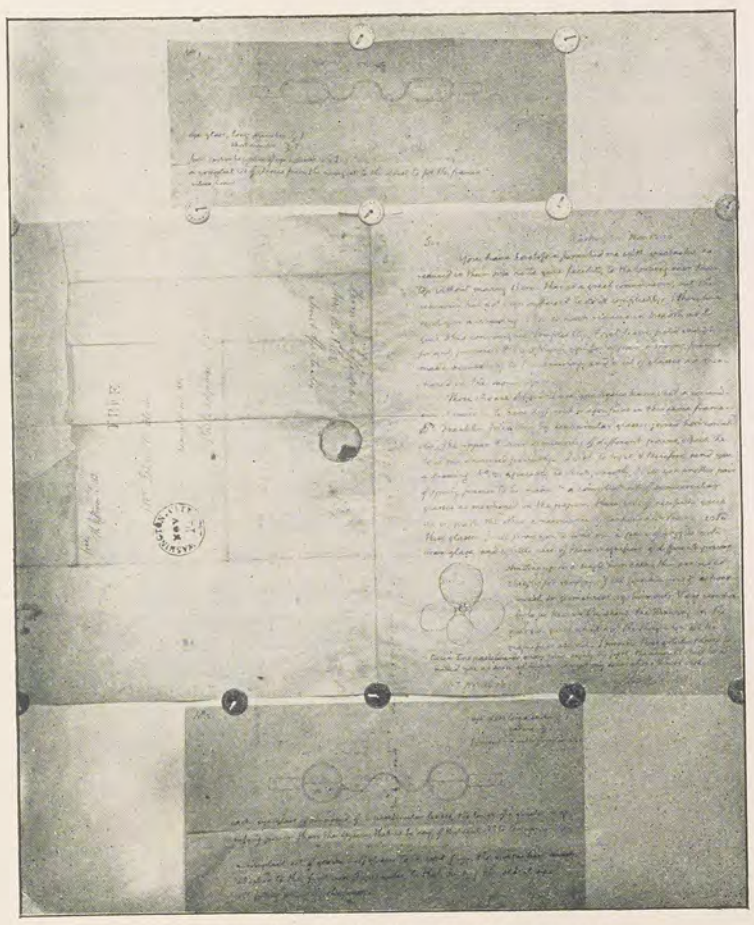
In 1800 Mr. McAllister formed a partnership with James Matthews, and they rented a store at 50 Chestnut Street, Philadelphia. This partnership terminated in 1803. He then moved into 48 Chestnut Street, and here the business was continued until 1856. Back in 1810 the demand for the whips and canes had so increased that he started a factory near Mt. Airy, and the manufacture of gold and silver spectacles was carried on there. Spectacles and eye-glasses manufactured by this house gained wide reputation.

On April 1, 1811, Mr. McAllister's son, John McAllister, Jr., became his father's partner, the firm name becoming John McAllister & Son. In 1820 plano-cylindrical lenses were first imported. The books record the sale on December 14, 1822, of a pair of gold spectacles with concave plano cylindrical lenses about — 2.75 D. They were purchased by Nicholas Biddle, of Philadelphia. An important event during the continuance of the firm was the successful correction of astigmatism by John McAllister, Jr. In 1828 he made a pair of spectacles and fitted them with cylindrical lenses for C. E. Goodrich, of Princeton, N.J.

On the death of Mr. McAllister, *pere*, in 1830, the business was continued by John McAllister, Jr., under the name of John McAllister, Jr., & Co. In 1836 this firm was succeeded by McAllister & Co., the partners being William Y. McAllister, James W. Queen and Walter B. Dick, and this firm was succeeded in turn, in 1853, by McAllister & Bro., Thos. H. McAllister and John A. McAllister. In 1865 this partnership was dissolved, Wm. Y. McAllister continuing the business alone until his retirement in December, 1882. Thos. H. McAllister went to New York, where he started in the optical business at 627 Broadway, removing later to 49 Nassau Street. He died some months ago and was succeeded by his son, Caldwell W. McAllister. In 1879 F. W. McAllister, son of W. Y. McAllister, opened an optical store in Baltimore, Md., and has been most successful. He is at present president of the Maryland Optical Society and a director of the American Association of Opticians. W. Y. McAllister's business in Philadelphia was continued by his sons W. M. & J. C. McAllister, who took charge of the optical departments and Oswald McAllister, who took the mathematical branch. W. M. & J. C. McAllister dissolved partnership in 1883, J. C. McAllister removing to 1226 Chestnut Street and later to 9 South Sixteenth Street, the present location. Few families in the United States can point to such an unbroken connection with a particular branch of business. And an interesting fact in regard to it is that the continuity seems to be indefinitely provided for, for we have now no less than three McAllisters in as many different cities, all descendants of the original proprietor and all opticians.

Benj. Franklin.

Through the kindness of Mr. F. W. McAllister, of F. W. McAllister & Co., Baltimore, Md., we are enabled to reproduce herewith a reduced fac simile of a letter to Mr. John McAllister, Sr., from Thomas Jefferson, ordering glasses. This interesting communication from the distinguished author of the Declaration of Independence shows that he had an accurate conception of his requirements, the directions to the optician being very "compleat." The reference to Dr. Franklin's invention of bifocal glasses is most interesting. As our reproduction is too small for easy perusal we here print the letter:



Letter from Thomas Jefferson to John McAllister.

SIR WASHINGTON Nov. 12, 06.

You have heretofore furnished me with spectacles so reduced in their size as to give facility to the looking over their top without moving them. This is a great convenience; but the reduction has not been sufficient to do it compleatly. I therefore send you a drawing No. 1. so much reduced in breadth as to give this convenience compleatly, and yet leave field enough for any purpose; and I will thank you for a pair of spring frames made accurately to the drawing, and a set of glasses as mentioned in the same paper.

Those who are obliged to wear spectacles know what a convenience it would be to have different magnifiers in the same frame. Dr. Franklin tried this by semicircular glasses joined horizontally, the upper and lower semicircles of different powers, which he told me answered perfectly. I wish to try it, and therefore send you a drawing No. 2. agreeably to which, exactly, I will ask another pair of spring frames to be made, & a compleat set of semicircular glasses as mentioned in the paper. These will of necessity give up in part the other convenience of looking over them. With these glasses I will pray you to send me a pair of goggles with clear glass, and a little case of three magnifiers of different powers shutting up in a single horn case. They are used chiefly for reading off the fine divisions of astronomical or geometrical instruments, & are commonly to be had in the shops. The drawing in the margin gives an idea of the thing when all three magnifiers are out. I presume these articles placed between two pasteboards may come safely by post. The amount shall be remitted you as soon as known. Accept my salutations & best wishes.

TH. JEFFERSON

Mr. McALLISTER

F. W. McAllister, of Baltimore, Md.

The instructions accompanying the illustrations of spectacles shown in the fac-simile are as follows:

No 1
eye-glass, long diameter 7/8 I.
short diameter 3/8 I.
from center to center of eye-glasses 2½.
a compleat set of glasses from the youngest to the oldest to fit the frames, silver frames.

No 2
eye-glass long diameter ¾ I.
radius 3/8 I.
from center to center of eye-glass 2½ I.
each eye-glass is composed of 2 semicircular lenses, the lower of a greater magnifying power than the upper, that is to say, of the next No. to the upper one.
a compleat set of half glasses to be sent from the magnifier adapted to the first use of spectacles to that suiting the oldest eyes, all fitting exactly, the frames

We may add that the spectacles in use nowadays are almost as different from the spectacles of a century ago as are the optical methods now in use from those of that time. The spectacles then were marvels of roughness and heaviness, and were indeed a clumsy load for the face. To illustrate the crude ideas of the merchants of the early years of this century, an amusing incident is related of an attempt of the spectacle seller to purchase a lot of these spectacles which were in the hands of the merchant, Samuel R. Fisher, a noted Quaker of that day. After a careful examination of the goods the spectacle seller concluded that they were all right and could be sold at a profit on the price the merchant asked for them. He therefore said: "I will take the whole lot." The merchant then said: "I sell the spoons (German silver) at so much a dozen." In amazement the spectacle seller replied: "Oh, I don't want spoons; I don't sell them." "But I do not sell spectacles without spoons; a dozen spectacles and a dozen spoons," answered the merchant. To get the spectacles the spoons, too, had to be bought and then sold to some retailer who dealt in spoons. Thus early were the optical and jewelry businesses associated, though both were conducted in a crude way compared with our own time.

Great as has been the progress in optical science, as applied to refraction, during the present century, there are unmistakable grounds for the belief that even greater progress will be made during the next century. There are still some phases of this work which are imperfectiy understood, and many minds are even now engaged in such research as will clear up remaining difficulties. The public are only just awakening to the importance of attention to the eyes, and a luminous future awaits the members of the optical profession. "Educate and advertise" will be the optical slogan of the future, and it is a good principle for every optician of the present to act upon.

We may here state the interesting fact that James W. Queen, the founder of the well-known optical house of Queen & Co., of Philadelphia, worked, when a boy, for the elder McAllister. Mr. Queen was the pioneer as well as the actual builder up of the optical and scientific instrument industry, an interesting fact which shall be treated at some length in an article in our December issue.

Among the Opticians.

— W. D. McGloghlon, formerly of Dover, Del., and president of the Delaware Optical Society, has moved to Seattle, Wash.

— Julius King Optical Co. now occupies the whole State Street front of the Champlain Building, Chicago, thus doubling their former capacity. Manager Brayton reports business as very good, especially in the prescription department.

— There is a new prospective optical jobber in the field, in the person of Walter G. King, Jr. He is the second child of W. G. King, of the Julius King Optical Co. and made his entry into the King family last month. Visitors should not fail to tap the proud father's cigar box while in New York City.

— Fred. Hamilton, president of the New York State Association of Opticians, formerly of Owego, N. Y., has moved to Syracuse, N. Y., and is now connected with the Syracuse School of Optics. This school has been reorganized and is now under new management. Their new prospectus will be ready for distribution next month.

— F. G. Burgess, the well-known representave of the Standard Optical Co., Geneva, N. Y., will leave in a few days on a Western trip. He will go as far west as Omaha, making all the leading points on the way. Mr. Burgess is one of the best optical salesmen in the traveling fraternity and is building up a fine trade for the Standard Co.

— "Tom" Huteson, well known in the optical trade from years of service as traveler for several leading j bbing houses, was married last month to a prominent society belle of Boston. Tom is now a dealer in precious stones and is the same Beau Brummel as of yore, being noted as one of the best dressed men in Boston or New York, in which cities he divides his time. His brother, J. C. Huteson, one of Omaha's leading opticians, and also a former knight of the grip, came east to attend the wedding.

— The Geneva Optical Co., of Denver, Colo., has just completed a thoroughly up-to-date optical plant. The store and eye-testing departments are models in equipment, the apparatus including the very latest improvements. Frank J. Kirschner, owner and manager, has had twelve years' experience at the business, and his managerial capability and thorough knowledge of the details are evidenced all over the establishment.

— Among the optical students noticed in Philadelphia during September (in attendance at the Philadelphia Optical College) were, Leonard Sisman, Evansville, Ind.; Mrs. Regina Roth, Washington, D. C.; Frank J. Adam, Waco, Texas; Max Harris, Mt. Olive, N. C.; Dr. H. J. Cook, Knoxville, Tenn.; Dr. C. R. Fowler, Columbus, Ohio; T. V. Murray, Caldwell, Texas; Chas. R. Shanar, Knox, Pa.; L. W. Betts, Cambridge, Md., and Mrs. A. E. Galbraith, Enosburg Falls, Vt.; Chas. A. Crook, Nelsonville, Ohio.

Reviews of Current Ophthalmological Literature.

(*Continued from page 1171.*)

Donders' apparatus allows the testing of the central color sense in a perfectly satisfactory manner, and it is more than twenty-two years ago that it was described by our old master of ophthalmology in "Graefe's Archives." In Holland the government, indeed, demands such an examination to guard against such central color-scotoma, as it is called. But such a central color-scotoma is only induced by disease, and for this reason the committee of the Ophthalmological Society of England, who investigated this subject most thoroughly some years ago, remarks that "special tests for color-blindness, induced by disease, will very rarely be necessary if, as should always be the case, every examination for color vision is preceded by one for form." The committee would "rely rather on the form-test being stringently carried out than on instituting another color-test for this particular class of color-blindness." To this view, however, Drs. Thomson and Weiland, in their article on Detection of Color-Blindness, in the "System of Diseases of the Eye," by Norris and Oliver, justly reply not only that after an accident, concussion of the brain, etc., the color sense alone may become affected, the visual acuity remaining perfectly normal, but that also—and this is more important—the term visual acuity is a rather relative term. The line $\frac{20}{20}$, the usual standard, may, in a good light, be read by a young person with reduced visual acuity when his real normal acuity is $\frac{20}{15}$, or even $\frac{20}{10}$. This person, therefore, may have $\frac{20}{20}$ and still have a small central color-scotoma, as has been reported by Dr. MacGillivray. For this reason it would seem advisable, as Dr. Williams remarks, to test also the central color sense, and he exhibited at the session a lantern specially devised for this purpose. It cannot be denied, however, that in most cases the defective acuity of vision alone would betray such examinees.

In regard to the use of spectacles by trained engine or yard men, he thought that there can be no objection to their use for reading train orders, etc., but he questioned whether they ought to be permitted to be worn for distant vision, as in rough weather often moisture would condense on the glasses. Thus they would at times be rather a hindrance than a help to vision, and there would be a tendency to remove them and to depend upon unaided sight. Although he admits that it may be a hardship in some cases, he justly remarks that it will be safer to require for the re-examination of men in the service a vision of not less than $\frac{20}{30}$, with both eyes open without glasses, for engine men and firemen, and a vision of not less than $\frac{20}{40}$, under the same conditions for others engaged in operating trains.

A Great Optical Factory.

OUR story of optical progress during the century would be imcomplete without some account of the immense factories of the Bausch & Lomb Optical Co., Rochester, N. Y., which factories, in themselves, convey an impressive idea of the present magnitude of the optical business.

Like most big hives of industry, the Bausch & Lomb factories are a monument to individual effort. Mr. J. J. Bausch's own account of his early struggles in establishing the industry is at once pathetic and inspiring, like that of most of our industrial pioneers. "When I first came to Rochester," he said recently, "there was no optician nearer than New York City, four hundred miles away, and the people hardly knew what an optician was. After being unable to establish myself as an optician, I turned my attention to wood turning, but an accident which caused the loss of two fingers ended my career as a turner. Meanwhile I was experimenting and looking for an opening. The people, however, preferred to go to a jeweler, rather than to the struggling young optician, for their glasses, so that for quite a while after starting again I only sold one or two pairs of glasses in a whole week. Despite all the push and energy I put in the business it would not pay. I picked up a piece of rubber from a corset and made from it the first pair of rubber eye-glass frames that were made in this country. The war then came on, prices went up and a great demand sprang up for rubber eye-glasses. For fifteen years we worked day and night, but could not fill orders. My first apprentice was Henry Lomb (my present associate), who proffered me what little savings he had. Little as was the sum, it was a great big amount in my eyes at that time. Thus started the partnership that has existed ever since, and it was the foundation of the present Bausch & Lomb Optical Co. Things kept improving for the young firm, and I am surprised to-day to know what I have been able to accomplish, in view of our modest beginning." This story is not unlike many told by those who first established our great industries, but not all survived to see and enjoy to the full the fruition of their hopes as did Mr. Bausch. That both he and Mr. Lomb may live to enjoy their success for many lustra of years to come is the sincere wish of their host of friends in the trade.

J. J. Bausch.

Henry Lomb.

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ANY optician would consider a visit to the Bausch & Lomb factories an event in his life. It would certainly give him ideas of the greatness of his profession that he could get in no other way. To those opticians who have never had an opportunity of visiting this immense hive of industry we can give some idea of its dimensions in this way: It gives continuous employment to over one thousand employees Among the list of departments are the following: the shutter department, lens cementing room, filled glasses, objective grinding, lens centering, buffing, edge grinding, rubber eye-glass, lens stock room, rimless department, grinding room, milling room, plating room, screw room, brass room, microscope room, lacquering room, objective mounting, micro-inspecting, publication, screw machine room, lens grinding, cylindrical grinding, machine shop, engine room, assembly room. The telephone plant of the factory requires fifty miles of wire to make the necessary connections between the various departments. The mechanical equipment uses the energy of a seven-hundred horse-power double engine. It requires over seven miles of pipe to distribute through the big buildings the steam, gas, compressed air and water requisite for the enormous plant. Over five thousand gallons of chilled water are required per day for washing lenses, and over seven hundred gallons of ice water for drinking purposes in the same time. An eighteen-ton ice machine is in constant operation. To provide against dark days and early twilight, and for night labor, a complete electric lighting plant has been installed, with engine and dynamos for two thousand incandescent and one hundred arc lights, which are fed through ten miles of insulated wire. By means of the fifty miles of telephone wire above referred to, all departments can be put in instant communication with one another, thus greatly facilitating the operation of the plant as a whole. The above few calculations will give our readers an idea of the magnitude of the factories.

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THE optical products of the factories are as varied as voluminous. The manufacture of complete microscopes has been a specialty of the company for a quarter of a century, but they have manufactured lenses for full twice that period. Their lens product is enormous in quantity and variety, embracing as it does every conceivable form of lens, from the smallest used in the microscope objective to the huge thirty-six-inch lenses which serve as reflectors for the searchlights of the modern man-o'-war. The factories are complete within themselves, that is to say, the company produces in its entirety and all its parts every article which it places on the market. This is one of the reasons for the excellence of the entire product.

To attain the wonderful success which has been achieved by this company presupposes, of course, extraordinary capability on the part of those responsible—the possession of all the qualities that go to make ideal business men, natural aptitude, self-confidence, indomitable perseverence, enterprise and well-directed effort. One of the things characteristic of the management that attracts the attention of every visitor to the factories, is an announcement on the blackboard in the assembly room headed "Suggestions." The announcement is as follows: "How to start a bank account. Study closely the work you are doing. If you think it can be done cheaper, better, quicker, or if you think the article can be changed for the better, make a suggestion. There is a grand prize of $100 for the best suggestion of the year." One of the secrets of the success of the concern is revealed in these "suggestions." With the thousand employees, as with the management, it is a continuous campaign of improvement, a tireless march towards the goal of perfection in ways, means and product. The secret of the success of the Bausch & Lomb concern is the same as that of all successful industrial enterprises. It is due to the painstaking, accurate and conscientious work which has been bestowed upon each individual one of their products, coupled with a never-tiring vigilance in securing for the works the most improved mechanical equipment, the best raw materials and every advance which science has made in constructive formulæ.

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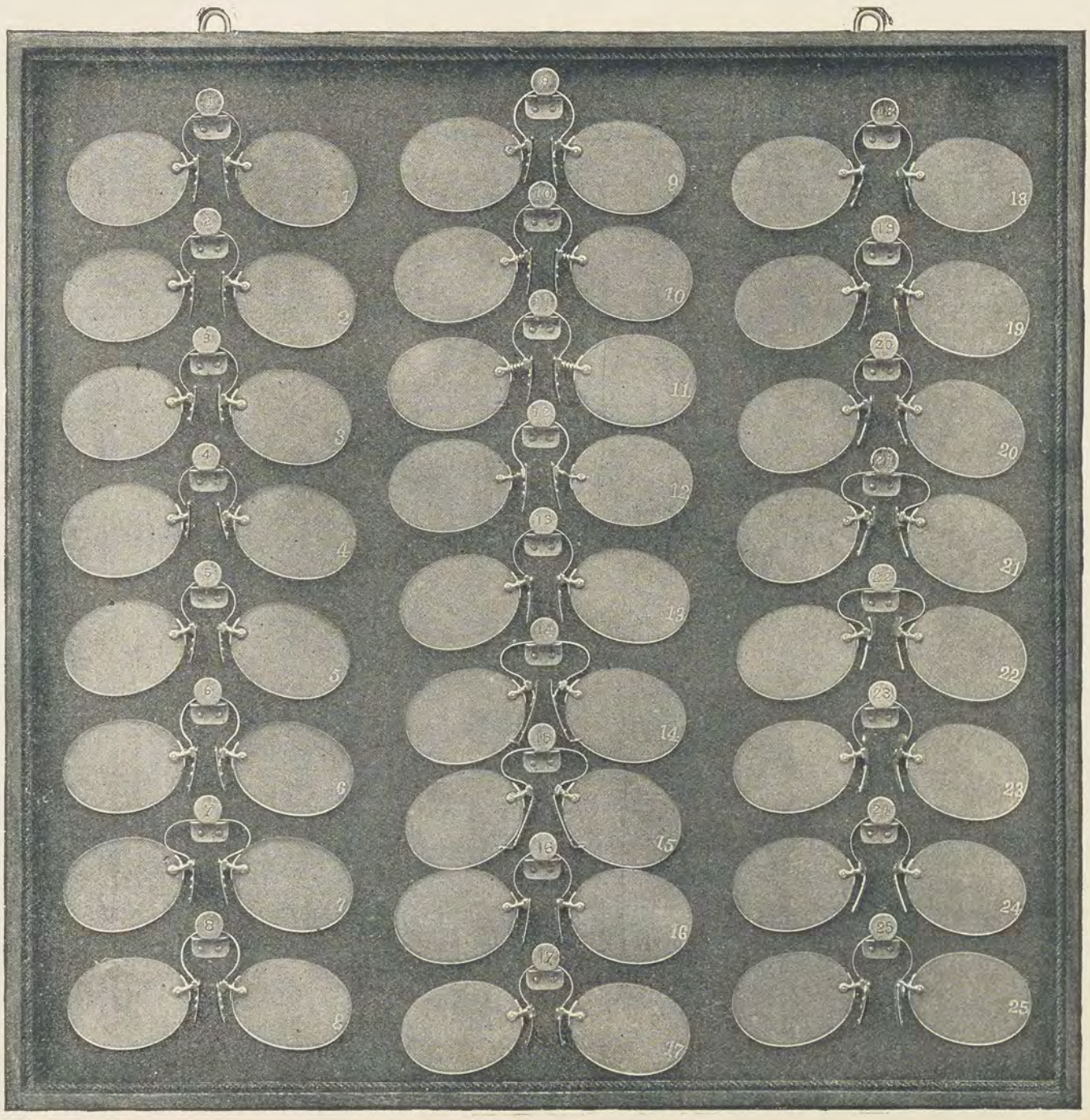
HOW many users of a lens realize the number of skilled hands and the number of operations through which the various parts have passed on the way from the rough material to the perfected objective? Only by a visit to a lens factory such as this can one get anything like a just idea of the requisite operatives and operations. The glass vaults are one of the sights of the factory. They contain in enormous quantity the choicest glass obtainable from all the best glass works of the world, German, French, English—the justly famous Jena glass preponderating. To compare the finished product with the raw material, and then to examine the many and complicated processes of transformation, is a revelation of human ingenuity that may be justly ranked with the wonders of the century. The test-glass, which is the foundation of their lens-testing system, is a marvel in itself. By this test a variation of $\frac{1}{5\,000,000}$ of an inch is instantly detectable, a degree of delicacy in testing which the mind can scarcely conceive. It is certainly accuracy extraordinary.

INTRODUCING

OUR

$10.75



SET

Less 6 per cent.

OF

TRIAL EYE-GLASSES

This set is designed for the optician so that he can fit eye-glasses to the face conveniently and accurately. It is composed of 25 pairs, that include all the studs, springs and guards most generally used. The want of such a set has long been felt, and we feel confident that our set of Trial Eye-Glasses supplies this want. The composition of this set affords a wide range of adjusting; but where any particular guards are used that our set does not contain, such guards will be substituted **without** additional cost.

In making up this set we decided to furnish the best workmanship and material. Every purchaser will be completely satisfied of this. To insure durability and lasting service, we have constructed the body of the Tray of six pieces of wood, the grain of each running differently, effectually preventing warping and twisting. The sides of the tray are of finely polished quartered oak. The lining is of extra quality black broadcloth that will not turn gray. The hangers are solid German silver, polished, and numbered consecutively from 1 to 25. Each eye-glass has its number etched, as the illustration will show, thus preventing confusion. We are confident this set of Trial Eye-Glasses will be appreciated by all who see it. A detailed list of each eye-glass, giving the style of the guards, studs and spring, and the way they are set up, will be furnished on request.

Our line of

OPERA GLASSES

this Fall will include the most exacting demands of the Trade in Design, Quality and Price.

Jos. Friedlander & Bro.

Wholesale Opticians

8 MAIDEN LANE NEW YORK

Contributions to Optical Progress by Opticians.

Chas. F. Prentice.

As we are still in the morning of the refracting optician's day of greatness, his share of glory for the optical achievements of the century is naturally small, yet the aggregate achievements of the refractionists are by no means unimportant, and foreshadow a leading part in the work of progress before the next century is far advanced. Many refracting opticians have already taken their place in the vanguard of the procession, and each year adds to the number.

CHAS. F. PRENTICE.

A name prominent in the field of optical research is that of Chas. F. Prentice, whose contributions to optical knowledge have been very valuable. Mr. Prentice was born in Brooklyn in 1854, and early in school life developed a special taste for mechanics, physics and mathematics. To perfect him in these branches his father, an eminent optician, sent him to the Royal Polytechnicum, in Carlsruhe, Germany, and he graduated from this institution in 1874. From among Prentice's original papers, which are twelve in number, the following are selected as being of greatest importance :

"Dioptric Formulæ for Combined Lenses," 1888. This may well be considered the only complete solution as among all others, it alone fully reveals the sixteen laws which the author first disclosed to be inherent in the problem.

"A Metric System of Numbering and Measuring Prisms." Archives of Ophthalmology, 1890–91. In presenting this system, Prentice established the law that its unit, the prism-diopter, bears a direct relation to the lens-diopter, thus originating the simplest rule for decentering lenses so as to produce any desired amount of prismatic power. All prisms manufactured in this country are at present numbered in prism-diopters.

In subsequent papers Prentice was the first to show the physical advantages of the sphero-toric lens in astigmatic aphaika ; to demonstrate the reason why strong contra-generic lenses of equal power fail to neutralize each other, and under the title, "The Iris as Diaphragm and Photostat," to explain the physical cause for the manifest benefits which are known to be frequently derived from low degree lenticular corrections in corresponding states of ametropia.

H. L. DE ZENG, Jr.

H. L. De Zeng, Jr.

The invention of the refractometer was an important step in advance in refraction work, and the mention of the instrument is always associated in the optician's mind with the name of its inventor, H. L. De Zeng, Jr. Mr. De Zeng was born in Geneva, N. Y., in 1866, and gained his first practical experience in the manufacture of optical goods at the optical works in Geneva during the years 1882 to 1885. He went from there to fill a position with James Prentice & Son, New York, and after a year's experience there the position of manager in the largest optical establishment in Detroit, Mich., was secured, where he remained four years, when he was offered the management of the prescription and retail department in the Chicago house of the Geneva Optical Co. This place he filled a number of years, during which time he arranged his duties so as to attend medical lectures at the Chicago College of Physicians and Surgeons as well as special lectures on the eye at the Chicago Ophthalmic College, from which latter institution he graduated in the spring of 1890. In the fall of the same year the faculty of the Chicago College of Ophthalmology and Otology offered him the chair of Refraction, Accommodation and Optics in that institution, where he lectured until he left Chicago to go in business for himself.

The De Zeng refractometer has been previously described in our columns, and is familiar to our readers. Mr. De Zeng also worked out an ingenious compound microscope for viewing the eye which has been much praised by the medical profession. Mr. De Zeng is still a young man, and has, we trust, a long career of usefulness before him.

Skiascopy Improved.

In this number of THE KEYSTONE announcement is made that the two new optometrical instruments recently perfected by New York's well-known optician, Mr. A. Jay Cross, will soon be ready for market. Large sales are predicted for these instruments, owing to their simplicity, moderate cost and highly practical character. As will be seen by their advertisement, the A. Jay Cross Optical Co., 20 East Twenty-third Street, New York, will gladly send descriptive circulars to all who are interested in the "shadow test" and advanced optics. *

Tired Eyes.

A correspondent of *Popular Science News* tells of a party of Alpine climbers who, having spent five hours among the snows of the mountains, returned to their homes after dark. A great change had to all appearance taken place since the night before. Instead of being illuminated in the usual way, the place was supplied with green lights.

It took the travelers a little time to realize that they were suffering from Daltonism, or color-blindness, superinduced by eye fatigue. The intense light caused by the sun shining upon the snow had for the time rendered them unable to judge of colors and given rise to their curious mistake. Three hours elapsed before the eyes regained their normal condition.

Chevreul explains that the eye cannot gaze long upon a given color without tending to become insensible to it.

Optical Organizations.

American Association of Opticians.

CHAS. LEMBKE, President, New York City.
C. A. LONGSTRETH, Treasurer, Philadelphia, Pa.
F. BOGER, Secretary, 36 Maiden Lane, New York City.

Meets annually. Next meeting to be held in 1900, in Detroit, Mich.

New England Association of Opticians.

BRIGGS S. PALMER, President, Boston, Mass.
EDWIN P. WELLS, Treasurer, Boston, Mass.
W. R. DONOVAN, Secretary, 4 Province Court, Boston, Mass.

Meets third Tuesday of each month, except July and August, at the association's quarters, 252 Boylston St., Boston.

New York State Association of Opticians.

FRED. HAMILTON, President, Syracuse, N. Y.
C. B. HIBBARD, Treasurer, Pulaski, N. Y.
A. W. GOLDER, Secretary, Seneca Falls, N. Y.

Meets third Wednesday of each month at 501 and 502 Dillaye Block, South Salina Street, Syracuse, N. Y.

New York State Optical Society.

A. JAY CROSS, President, New York City.
F. L. SWART, Treasurer, Auburn, N. Y.
H. W. APPLETON, Secretary, 1361 Third Ave., N. Y. City.

Pennsylvania Optical Society.

A. MARTIN, President, Philadelphia, Pa.
T. E. LEACH, Treasurer, Philadelphia, Pa.
C. A. LONGSTRETH, Secretary, 228 Market St., Phila., Pa.

Michigan Optical Society.

F. D. FULLER, President, Grand Rapids, Mich.
C. WOLFE, Vice-President, Howard City, Mich.
E. EIMER, Sec. and Treas., 105 Western Ave., Muskegon, Mich.

Iowa Optical Society.

H. P. HOLMES, President, Des Moines, Iowa.
C. A. COLE, Vice-President, Winterset, Iowa.
J. C. CLARK, Secretary, 407 Brown Block, Sioux City, Iowa.

Illinois Optical Society.

WALTER WYATT, President, Peoria, Ill.
J. H. ROBERTSON, Treasurer, Morrison, Ill.
A. R. CHAMBERLIN, Secretary, Aurora, Ill.
L. L. BOYLE, Assistant Secretary, 103 State St., Chicago, Ill.

Maryland Optical Society.

F. W. MCALLISTER, President, Baltimore, Md.
J. H. Brandt, Treasurer.
W. H. Kettler, Secretary, 109 W. Lexington St., Baltimore, Md.

Meets at rooms of Photographic Association, Baltimore, Md.

California Optical Association.

F. C. CHINN, President, Sacramento, Cal.
S. G. MARSHUTZ, First Vice-President, Los Angeles, Cal.
G. L. SCHNEIDER, Secretary and Treasurer, Stockton, Cal.

Delaware Optical Society.

W. D. MCGLOGHLON, President, Dover, Del.
R. S. STEVENS, Secretary, Dover, Del.
G. W. BENNUM, Treasurer, Georgetown, Del.

New York City Optical Society.

L. L. FERGUSON, President.
LEO LEWIS, Treasurer.
P. A. DILWORTH, Rec. Sec., Fifty-eighth Street and Third Avenue, New York City.

Meets second Wednesday of each month at Fifth Avenue Hotel.

Rochester Optical Club.

G. R. BAUSCH, President.
W. W. BISSELL, Treasurer.
R. E. SWEETING, Secretary, Chamber of Commerce Building, Rochester, N. Y.

Doings of the Optical Societies.

Annual Meeting of the Pennsylvania Optical Society.

On Tuesday, October 10th, the Pennsylvania Optical Association held its fourth annual meeting at the Continental Hotel, Philadelphia. An exhibition of optical instruments and devices was held from 10 to 12 A. M. and 2 to 5 P. M., at which were shown various instruments for measuring errors of refraction and testing defective eyes; also new styles of nose pieces and mountings. D.V. Brown exhibited Prentice's retinoscope and Hardy's optometer, W. F. Reimold his new optometer, McIntire, Magee and Brown an extraordinary large assortment of new spectacles and eye-glass cases, both regular and chatelaine; Martin, Copeland & Co. and the Bay State Optical Co., of Providence, had fine exhibits of gold-filled goods, while Henry Kirstein, of Rochester, beside his roller-top trial cases, sprang a surprise on the assembly with his new frameless mountings, with the spring screw working from the inside, so it could neither work loose nor scratch the nose. Mr. A. Jay Cross exhibited and explained his new instruments, the dioptrometer and retino-skiameter. A large number of opticians from different parts of the State, New Jersey and Delaware attended, and the exhibition was a great success in every way.

At seven o'clock came the banquet, followed by the annual business meeting. A telegram of fraternal greeting was read from Mr. Charles Lembke, president of the American Association of Opticians. The report of the executive committee showed a vast amount of work done by the association during the past year. A special course of lectures had been delivered to the association by one of the leading oculists of Philadelphia on the "Discernment of Diseased Conditions of the Fundus by Means of the Ophthalmoscope."

An examination for the dioptrician grade had been held, of which nine members successfully passed, and one conference had been held, at which papers were read on subjects relating to our profession, followed by discussion on those papers. The treasurer's report showed the finances of the society to be in a very satisfactory condition. The following having passed their examination, were elected members of the dioptrician grade: Samuel Barry, J. F. Brinkerhoff, A. Martin, F. B. Marchand, F. C. Mumford, G. A. Lawrence, H. W. Patterson, L. A. Steinerunner and R. A. Tollinger.

The annual election was followed by short addresses by Mr. A. Jay Cross, president of the New York State Optical Society; L. L. Ferguson, president of the New York City Optical Society; H. E. Kirstein, of Rochester, N. Y., and Geo. F. Applegate, of Trenton, N. J.

The following are the officers for the ensuing year: President, A. Martin; first vice-president, H. E. Herman, of Williamsport; second vice-president, J. F. Brinkerhoff; secretary, C. A. Longstreth; treasurer, T. E. Leech, of Atlantic City. Executive committee, all the above and H. F. Freeman, West Chester; A. H. Peoples, Chester; G. F. Applegate, Trenton, N. J. Auditors, W. F. McCaffrey, R. A. Tollinger

The meeting was a success in every regard, and foreboded a future of growing utility to the profession.

American Association of Wholesale Opticians.

A special meeting of the American Association of Wholesale Opticians was held in the Continental Hotel, Philadelphia, October 16th. The object of the meeting was the discussion of trade conditions and adoption of a schedule of prices. The meeting was in every respect satisfactory. The favorable business conditions and prospects of an unusually prosperous season put the members in excellent humor, and the plans adopted were preparatory to making the most of the opportunity. The occasion was availed of by the visitors to visit the National Export Exposition, though business duties left little time for pleasure.

The California Optical Co., San Francisco, Cal., and the Toric Optical Co., of New York City, applied for membership, and the applications were referred to the executive committee, to be acted on at the annual meeting.

The New England Association of Opticians.

The regular monthly meeting of the association was held at the association rooms, 252 Boylston Street, on the evening of October 17th. President Palmer called the meeting to order promptly at 8 o'clock, after which the minutes of the previous meeting were read and approved. The examining board reported that C. M. Quimby, of Boston, had passed a satisfactory examination and on motion Mr. Quimby was elected to membership.

The chair announced that a question box would be started, in charge of Secretary Donovan. Questions of the members should be written in the order adopted by THE KEYSTONE in their "Questions and Answers" Department. It was further announced that Mr. Donovan would have the privilege of distributing the questions to be answered among the members of the association, who would be expected to answer the questions if possible, so as to be read at the following meeting.

The chair announced that he had appointed Messrs. Sanborn, Spear and Barron on the committee to investigate the Baxter matter. Mr. Baxter is the Boston oculist who proposed to fill his own prescriptions at cost price, in order to keep trade away from opticians. Messrs. Brown and Drisco had also been appointed on the committe of supplementary organization. Mr. Brown, of the committee, reported that all the jewelers he had interviewed near Manchester, N. H., were very much in favor of starting a local organization in that vicinity, and he had no doubt a good, healthy local society could be formed there.

A recess was taken at this point to listen to the lecture on "Visual Perception of Space" by Franklin T. Kurt, Ph. B., of the New England Optical Institute. The professor spoke for about half an hour and gave a very interesting and instructive address.

At the conclusion of the lecture, on the resumption of the business session, the chair announced that Dr. Capel would probably address the association later in the series of lectures. An invitation addressed to the president to attend the late annual meeting of the Pennsylvania State Optical Society, was then read. An amendment to the by-laws, providing that no salary should be paid to any of the officers of the association, was offered by Mr. Margot and was laid over until the next meeting, as provided for by the by-laws.

The committee on the Optical Institute reported that a number of fine contributions in the way of optical instruments had been made to the institute by leading manufacturing and jobbing houses. Some of the articles contributed were: a complete test case, by American Optical Co., of Southbridge, Mass.; Prentice retinoscope, by Geneva Optical Co., of Chicago; De Zeng refractometer, by Julius King Optical Co., of New York and Chicago. Several contributions were also made to the library, the latest of which was the new work on "Skiascopy," presented by THE KEYSTONE.

California Association of Opticians.

[From our special correspondent.]

SAN FRANCISCO, October 19th.

In a spacious hall in the Alcazar Building, San Francisco, on October 16th, the fourth regular quarterly meeting of the California Association of Opticians was called to order, President F. C. Chinn in the chair. On the roll call of officers all were present except First Vice-President S. G. Marshutz, of Los Angeles.

The reading of communications was then in order, and they proved to be quite interesting. A motion was carried to place correspondence under the head of unfinished business. The secretary's quarterly report was next read and approved.

A communication of the American Association of Opticians was read, and it was moved and adopted that the secretary be instructed to thank the association for their invitation to attend their next meeting and to ask if the California Society or members thereof individually can gain membership in their association, and the cost of same.

A communication of S. G. Marshutz, expressing regret for his not being able to attend, and containing suggestions in regard to amendments to the by-laws, was read and ordered filed, as was also a communication of Geo. F. Mayerle.

Amendments proposed at the Los Angeles meeting, July 12th, and presented at the meeting for action, were laid over until next meeting on account of a technical point in the by-laws.

R. Bruce Magee presented the report of the meeting of the board of directors, hereafter referred to. On motion of Mr. Kuttner it was ordered that a membership committee be appointed for the purpose of soliciting new and legitimate members, the committee to be appointed by the president.

Secretary G. L. Schneider then gave notice of amendment relative to a compensation for secretary and treasurer for their efforts and labor.

The applications for membership and reports of examining committees on same were then read. The following were admitted to membership: F. M. Taylor, Pasadena; A. P. Winslow, Ferdale; G. Du Commen, Hanford; J. F. Wooster, San Francisco, and F. W. L. Laufer and E. H. Noe, Oakland,

After some discussion, it was decided to hold the next meeting in San Jose, January, 1900.

On the day preceding the general meeting, a meeting of the directors of the association was held. Those present were: F. C. Chinn, president; I. A. Beretta, second vice-president; W. H. Hunt, treasurer; G. L. Schneider, secretary; R. Bruce Magee and W. R. Johnston, executive committee.

The subject of "State Legislation" was thoroughly discussed, aud it was unanimously decided to take no action in this direction at present.

Forms of application were considered, and the secretary was instructed to have the necessary number printed, similar to the one drafted by him.

Through an error the name and application of O. S. Wuerker, J. A. L. Masher, Fred. Detmar and F. Lee Fuller, all of Los Angeles, were left off the list of charter members, and it was decided that the secretary inform them of the error and allow them to become members of the association without the payment of initiation fees.

The California Association has had a very rapid growth. There was and is a great need for just such an organiza-

(*Continued on page 1195.*)

California Association of Opticians.

(*Continued from page 1193.*)

tion on the coast, and opticians here are showing their appreciation by joining. Only those, however, who really are opticians in every sense of the word are allowed to become members. Capable committees pass on every name, and unless the applicant comes up to every requirement he is rejected, and this is as it should be, for by no other method can the society be made just what it is. The aim of its charter members is to make it an association of capable opticians—an association of gentlemen whose purpose in coming together is to provide ways and means of improving the conditions on the Pacific coast as pertains to their chosen vocation, and to likewise have an intermingling with each other for the improvement of all, as P. S. Hunt, of Sacramento, so ably expressed it: "There are none of us so wise but that we can, if we will, learn something more."

There has been here in the West that same "stand-offish" feeling that existed in the East, but which, thanks to the optical association, is fast dying away, and it will likewise pass away here when opticians are better acquainted with one another. As the genial president, Mr. F. C. Chinn, so aptly put it, "We are not such bad fellows after all, and upon getting acquainted we are really surprised sometimes to find what a good fellow that competitor of ours in the same block really is." There is no way such a good way; no plan such a good plan, as to get together, meet one another, talk with one another, learn all we can from one another, and in order that opticians may better accomplish this they should join the association and attend its meetings. It wont be long now before there will be a lot of solid instruction at these meetings. It isn't going to be simply debate. Indeed, at the next meeting, to be held in that pretty city of San Jose, the home of the Hunts and R. Bruce Magee, the members are likely to hear some very interesting papers read.

The California Association of Opticians has a future before it, and you fellows who are only thinking of joining and letting it go at that will some day be glad that you took our advice and joined. You can't get in under cover too soon, either. It begins to look now as though the association was some long-felt want, come to stay. Too much credit cannot be given the little band of opticians who started it and who worked it up.

Illinois Optical Society.

The Illinois Optical Society met in Chicago on October 5th, but owing to the excitement and attractions of the festival then being held, the attendance was small and the time was deemed inopportune for the meeting. After an informal talk was indulged in, the meeting was postponed 'till January. The date will be fixed in the meantime and duly announced.

An Optical Society in Oregon.

Efforts are being made to form an optical society in Oregon, and a meeting was recently held in Portland for the purpose of organization. J. O. Watts, of Eugene, was the prime mover in the plan to form a society, and his efforts met with so much encouragement that an active organization is likely to result.

New York State Association of Opticians.

The October meeting of the New York State Association was held in the assembly room of the Yates Hotel, Syracuse, Wednesday afternoon, October 18th, President Fred. Hamilton in the chair. The minutes of the previous meeting were read and approved. A communication was read from John J. Smith, of Albany, asking for an application blank and requesting information in regard to the association and its aims. Dr. A. E. Johnson, who has recently located in the University Block in Syracuse, also desired an application blank. F. L. Swart reported as a member of the special committee appointed to arrange for a meeting to be held at Geneva, that the committee had definitely arranged for a meeting to be held on the third Wednesday in January. An elaborate programme will be prepared. There will be a banquet and visits of inspection to the Geneva and Standard Optical Company's works.

Under the head of new business, various communications were read and discussed. Secretary Golder was empowered to secure certificates of membership to replace those lost in transit. President Hamilton then read a pithy paper of admonition and encouragement, containing many valuable suggestions and much good advice, which was followed by remarks by F. L. Swart and A. W. Golder. The president was given a vote of thanks for his able suggestions.

On motion, the president was empowered to appoint a committee of three to prepare a programme for the next five months with the president to act as chairman of the committee. The chair appointed the following: Fred. Hamilton, of Syracuse; Miss Viola Russell, of Weedsport, and G. N. Luckey, of Baldwinsville.

John Wagner, of Utica, called the attention of the members present to glasses of his invention, called "Wagner's Improved," and a general discussion of their points followed. The meeting then became informal and numerous questions relating to optical subjects were discussed, following which the meeting adjourned until November 15th.

The meetings of the association will be held in the future at 501 and 502 Dillaye Block, South Salina Street.

New York City Optical Society.

The regular monthly meeting of the Optical Society of the City of New York was held in the Fifth Avenue Hotel on October 11th, President L. L. Ferguson in the chair. Professor Fox delivered an interesting lecture on "Reflection," at the conclusion of which he was accorded a unanimous vote of thanks for his services to the society. Then followed an address on "Direct Ophthalmoscopy," by President Ferguson.

A business session was then held. The following applications for membership were received: Daniel Rosche, Denver, Colo.; Chas. D. Mueller, Newport, R. I.; Richard Stronbel, New York City; H. Valliant, New York City; C. Irving Burbank, New York City; Mrs. Boorer, New York City. The following were elected to membership: S. Eastman, New York City; H. Bayersdorp, New York City; Leopold Stern, Bogota, United States of Colombia, S. A.; Samuel T. Koplik, New York City; Jos. H. Penny, Brooklyn. A motion was then adopted empowering the president to appoint a committee of five to report at the next meeting upon the feasibility of the Optical Society of the City of New York identifying itself with the New York State Optical Society. In connection with this motion the president said: "There are at present existing within this State four optical societies, composed exclusively of refracting opticians. These societies are unaffiliated with each other, but have been working for the attainment of the same goal. Considering this to be facts in the case and recognizing that in 'union there is strength,' it is but right and proper that if within the bounds of possibility a merging of these various societies political and scientific interests into the State organization known as the Optical Society of the State of New York would be both praiseworthy and expedient. Considering that the function of the State organization will be purely that of the safeguarding of our professional existence, whilst those of the local societies are purely educative, it can readily be observed that there exists no condition that could create friction if they affiliated with each other."

C. S. Hart, Lynn, Mass., has moved his quarters to 47 Market Street. He has given up jewelry and will hereafter devote his time and attention entirely to optics.

Wm. W. Alderdyce, for the past eight months optician for the Cowell & Hubbard Co., Cleveland, Ohio, has resigned and will return to Toledo to complete his medical course. Mr. Alderdyce has made many friends in his short residence here, who will wish him all success in his chosen profession.

It is said that Mexican and South American representatives, while attending the National Export Exposition at Philadelphia, placed a number of orders for optical goods and scientific instruments with the local optical firms.

E. S. Lichtenberger, optician, formerly in business for himself, has been engaged by G. A. Schlechter, jeweler, Reading, Pa., in the optical department. Mr. Lichtenberger is an accomplished optician and a member of the Pennsylvania Optical Society, in the affairs of which he takes a deep interest.

Nonsense Science About the Eye.

Nonsense science about the eye seems to be possessed of the proverbial nine lives of the mythical cat. However absurd, however frequently disproved, the stories reappear with a pertinacious vitality and regularity that is inexplicable. Of no other organ are these popular superstitions and fallacies so prevalent. A brief review of a few may prove interesting:

Nonsense No. 1. For centuries novelists and story-tellers have been utilizing the tale of the image of the murderer photographed upon or in the eye of the murdered man. In the last year, two novelists have repeated it, and in the newspapers it often pops up with comic innocency and solemnity. According to *variant a*, the spectator rushes to the corpse and sees the image on the cornea, or on the iris; *variant b*, requires deep gazing into "the interior of the eye" to see it; in *variant c*, the photographer is required to "develop it"; in *variant d*, the picture is on the retina and dissection is needed to reveal it to the naked-eye vision of the bystander; or, lastly, according to *variant e*, only the photographer or the microscope will show the retinal photograph. Of course, no image can be formed on or in the cornea or on the iris if the laws of optics are true, and without an ophthalmoscope no eye except that of the novelist could see the retina, and if by death there were an image fixed there (which there is not), it could not be seen by another eye aided or not by the arts of dissection, photography or microscopy.

Nonsense No. 2. A novel has recently been issued from the press of a New York publishing house, for which the professional title of the author may give authority to the pseudo-science which, somewhat like the nonsense photography mentioned, has a fairy-like ability to reveal after death. The plot of the novel turns on the absurdity that the brain-cells have the power to retain impressions like a photographic plate. We remember to have seen a comically grave account of the brain of a chess-player in which the microscope showed numerous chessboards in its texture, somewhere.

Nonsense No. 3. Even in the most serious of newspapers (perhaps also in some medical journals) there has been lately appearing a grave scientific explanation of the snakes seen by patients with delirium tremens. This consists in the fact that some oculist has reported the retinal vessels in the disease to be increased in size and tortuosity. A "jump" is then made to the supposition that the snakes are the images of these tortuous and overfilled vessels. The vessels of one's own retina are invisible except by a little device of which the drunkard knows nothing.

Nonsense No. 4. Pseudo-scientific persons are fond of rediscovering the old bit of dogmatism that the eyes, *per se*, have no "expression," *i. e.*, apart from the emotions indicated by the rest of the face. Last year one of the most self satisfied essays of one of the most self-satisfied of English essayists was devoted to showing up what she supposed the pitiable fallacy of the whole world that the eye does have power of expressing feeling. But what an utterly different expression does mydriasis give not only to the eyes but to the entire face! Pupillary diameters and mobilities are most sensitively obedient to the play of the emotions, and they who do not recognize this must be strangely inobservant.

Nonsense No. 5. Although anyone can be made to see them, so few indeed have ever observed what the oculists called muscæ, that when first they happen to catch a glimpse of the filmy dots and strings floating across a page or a cloud, they are frightened. Quacks set great store by these "black specks" and treat the poor worried patients for months with medicines and lotions. Muscæ have no pathologic significance whatever, unless perhaps occasionally to the disordered imagination of a dipsomaniac.

—Philadelphia Medical Journal.

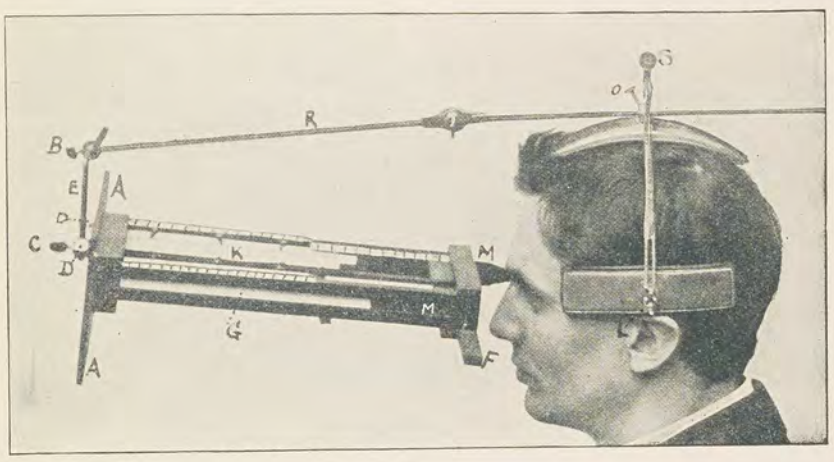
Scribner & Loehr, Cleveland, Ohio, have added an optical department and also taken in more floor space, so now they have nearly double the space of the old store room.

Chambers, Inskeep & Co., of Chicago, are receiving from refractionists high commendations of their new ophthalmometer, which has many improvements, among which are stationary luminous mires and adjustable prisms, which give accurate readings of the curvature of the cornea. It is structurally a very beautiful and perfect instrument, as well as being a very effective one.

Two New Instruments for Measuring the Monocular Field of Fixation.

In a former number of THE KEYSTONE we gave a description of a new reflecting tropometer by Dr. F. B. Eaton, of San Francisco. We then expressed the opinion that for its practical success a great deal depended upon the mechanical construction of the instrument, which was not given at that time. Dr. Eaton now gives it, together with the description of a new tropometer in the August number of the *Ophthalmic Record*. We reprint here the complete description of both instruments, but cannot help to express the opinion that both instruments are too complicated in their mechanical details. Too many screws are employed in the part which is fixed to the head, not to call up a rather unfavorable comparison with the old reliable method, recently in part employed by Stevens in his tropometer, of using a board with sealing wax, which, if taken between the teeth, gives a perfectly fixed position. The author describes his two instruments as follows:

The apparatus consists of a head-piece, Fig. 1, the branches of which are approximated by the screw *S*, and will fit any head. By means of the bent rod *E*, and the screws *B* and *C*, the plane *A A* is fixed in any desired position with reference to the eyes and head. The instrument itself, which is simply a wooden frame with parallel sides, is



Fig, 1.

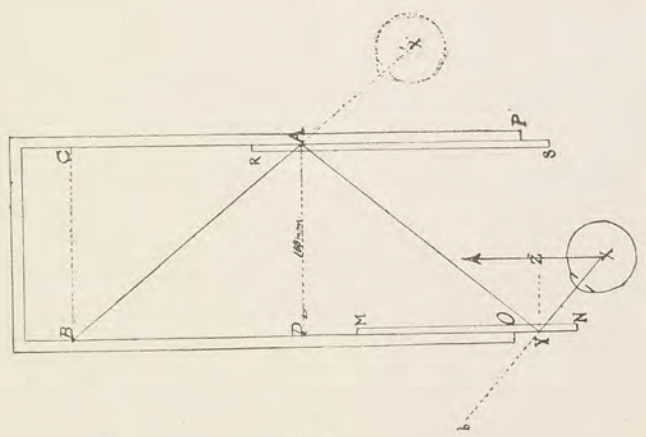


Fig. 2.

attached to the plane by the screw *D* or *D*, according to the eye being tested, and can be rotated on the screw around the line of fixation. In adjusting the instrument, the object is to place the plane *A A* parallel to an imaginary transverse plane passing through the centers of rotation of the eyes and perpendicular to a horizontal plane passing through the lines of fixation when the eyes are in the primary position. To place it parallel to the transverse plane the instrument is so adjusted that the distance from the projection *F* (parallel to *A A*) to the external canthus is the same on each side. How it is placed perpendicular to the horizontal plane will be shown when describing the other instrument. When properly adjusted, the plane *A A* is firmly fixed by the screws *B* and *C*. Then after measuring the field of one eye, the instrument is detached from the plane by unscrewing *D*, and moved over and screwed on in front of the other eye. Thus the amplitude of rotation of the eyes *relative to each other*, is assured in spite of any error in adjusting the plane *A A*. Along the sides of the instrument are long slots, *G*, covered on the inner sides by the graduated strips, *K*, designed by Dr. Casey Wood for use on the perimeter arc.* They are retained by small turn-pins, and can be quickly removed. Each side is marked out alike in centimeters and half centimeters, beginning at the proximal, to the distal end. The width inside is exactly 100 mm. The mirrors, *M M*, slide easily back and forth.

In Fig. 2 is shown the method of trigonometric measurement of the angle of rotation. Suppose the angle *Y, X, Z* is to be measured. The patient sees the reflection of the graduated strip between *O* and *B* projected towards *b*. He is told to read the farthest possible syllable to his left. Suppose this is at *B*, which is 169 mm. from *O*; it is seen as if at *b* by reflection from the mirrors *R S* and *M N*. The surgeon now moves the mirror *R S* until one of the lines scratched through its silvering appears to the patient to cover *B*. Its position *A*, on *P C*, is noted; it is the point of reflection. Suppose it is 50 mm. from *P*. We now have the two equal and similar triangles *D B A* and *B A C*, in which the angles *DBA* and *BAC* are equal. $BD = OB - PA = 169 - 50 = 119$ mm., and *AD*, 100 mm. Cot. $DBA = \frac{BD}{AD} = \frac{169-50}{100} = 1.19$, from which it follows that angle $DBA = 40°$. But $DBA = BAC$, and $BAC = YXZ$, which is the angle sought.

In practice it is only necessary to deduct the position of the mirror-line in millimeters from that of the syllable read, and divide by 100, and read off the angle from a table of cotangents attached to the instrument. In making an *objective* examination the graduated strips are removed and a small vertical marker moved along the side across the slot *G*, and the mirror shifted until mirror and mirror-line appear to the operator whose eye is at *B*, superimposed upon the reflection of the pupil. In the above example when this is done, the patient's eye appears projected at *X*, with *B*, *A* and *X* in one straight line. The angle is then estimated as above.

The second instrument, Fig. 3, which is the joint invention of Mr. F. M. Graham and myself, is so constructed that two similar arcs, *A A*, of 27.5 centimeters radius are accurately and simultaneously centered with each eye. It is fixed to the head by means of the same head-piece used with the reflecting tropometer, and is balanced by the weight *W*. The rod *R*, and the tube *Tt*, on each side, are in the same plane which passes through a true radius of the arc, and they are independently movable on the sliding joints *J J*, by which the tubes can be separated in accordance with the pupillary distance. The threaded rod *N* moves like a wheel spoke on the joint.

The instrument is adjusted for use by sliding it on the swiveled screws *L* until the distance between the center of the arcs and the external canthus of the correspondiug side is exactly 27.5 centimeters. By means of the screw *V*, by adjusting the head-piece, and by moving the screw *L* up or down in its slot so that each rod *R* is brought level with a point on the upper lid one-eight inch above the external canthus,† the tubes *Tt* and *Tt* are so placed that the patient can see *straight* through them.

That the radius passing through the center of each arc is then placed as accurately as is possible coincident with the line of fixation of the eyes in the primary position, is made apparent in Fig. 4, where *F* corresponds to the swivel-screw *L*, *A* to the tube when in the primary plane, and *T* and *S* to it when not in that plane. For while the tube could be seen through if *F* (that is *L*) were opposite the center of the eye, even if not in the primary plane (as *S S*) in its position some distance behind it, the line of fixation and the axis of the tube only coincide when the latter is on *A F*, not *T F*. When adjusting tubes laterally the instrument moves on the point *H* as a center, which is also far behind the eyes.

While the radius can be absolutely made to pass through the centers of rotation, it (represented by the rods *R R* and the tubes), may not always coincide with the primary plane of fixation, but the distance from the center of the arc to the end of the rod *R* being sixteen inches, when the head is placed approximately in the primary position, any slope of the rods and tubes from the horizontal becomes at once apparent. In placing the plane *A A* (Fig. 1) of the reflecting tropometer perpendicular to the primary visual plane, a rod sixteen inches long is placed in the swivel-screw *L*, adjusted as in the rod *R*, Fig. 3, the sights in the instrument used as if they were tubes, and the sides of the instrument placed parallel with the rod.

A comparison of the fields as measured by each of these instruments from day to day shows some differences, but absolutely none as regards the rotations of the eyes *relative* to each other. The fields are also remarkably uniform; on several successive days I do not often find a greater difference in any one direction than half a degree, and am not satisfied until during daily examinations the *total* rotations in all the meridians, as, for instance, the sum of the rotations in the vertical meridian (up and down) do not vary. Such uniform accuracy, however, is not possible until the patient has learned to put forth his utmost effort, and it is positively necessary to make from three to five trials in a given direction, and above all to rest the eye well after each.

The accuracy possible is such that my experience has been that the existence of hyperphoria and of over or under action of elevators or depressors, and the eye affected, can invariably be detected, and always agree with the other tests for this condition. I have also found that the rotation upward is apparently a fixed quantity, for while the boundaries in all other directions are uniformly extended by practice, upward it remains unchanged, as if the rotation were abruptly checked by the check ligaments before the effort had reached its limit. When once, therefore, the upward limit has been found by one or two careful adjustments of the instrument, in future examinations as long as the total rotation in the vertical meridian remains the same, the rotations upward and downward respectively, are at once known. As to which of the two instruments is the more useful and practical, I have found the reflecting tropometer more quickly and easily

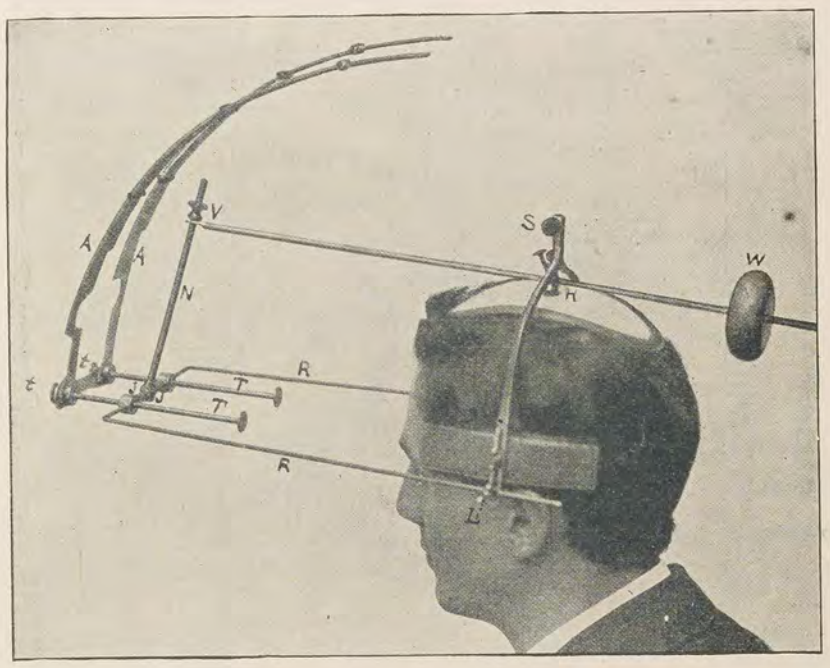


Fig. 3.

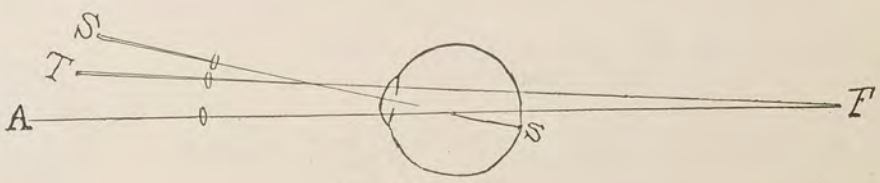


Fig. 4.

adjusted, but sometimes when the accommodation is weak, or there is a convergence excess, the apparent proximity of test words as seen by reflection leads to slight convergence in accommodation and to diminished rotations outward. Once adjusted, the examination can be made more rapidly with the arc tropometer, which can also be used to accurately measure the rotations of a blind or amblyopic eye objectively. Both instruments were made in this city and are comparatively inexpensive.

* *Jour. Amer. Med. Asso.*, vol. xxvii, p. 1130, Nov. 28, 1896.

† In most persons, in the primary position, the center of the pupil is one-eighth inch above a line joining the canthi. See "System of Dis. Eye," Norris and Oliver, Vol. I, p. 80, Fig. 7.

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Have you ever heard of a lawyer, minister, dentist, doctor, engineer, chemist or any scientific man learning his profession by correspondent courses? Yet Opticians, even Doctors of Optics, are manufactured by wholesale by correspondent courses, often in one or two weeks. How long will the optical trade stand this stigma, is the question. The Klein School gives no correspondent courses. Every student has to learn by actual work done. It gives no fancy diploma, but it gives you a paper that is recognized by opticians, physicians and the public as representing your ability in the various branches of optics. If you want a thorough knowledge, go to the Klein School.

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WHY I RECEIVE SO MANY ORDERS EVERY DAY.

Because I am still the cheapest in the Optical line, and you can save a lot of money if you buy from me. Have you tried me? If not, write at once for samples, to

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Importing, Manufacturing and Jobbing Optician,
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A thorough study of optics can be made at home by taking our Correspondence Course. Our method is original, modern and scientific. Distance is no hindrance. The student has a course of study mapped out for him by a competent instructor, and he is constantly under the instructor's personal care and attention.

Two Courses—Attendance and Correspondence.

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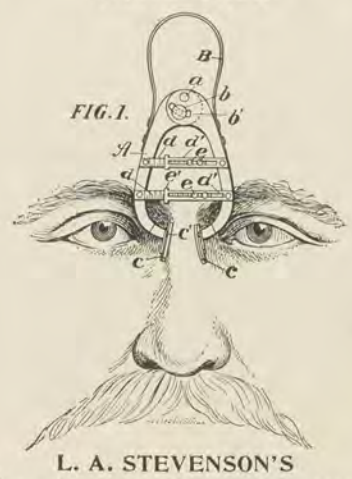
KELLAM & MOORE'S COLLEGE OF OPTICS,
Atlanta, Ga.

This eye is looking for Jewelers, Druggists and Doctors to attend an optical college **that is up to date,** practical, scientific and successful in the instruction of how to prescribe and adjust glasses; theoretical and practical use of all optical instruments; the fitting of frames; making out of prescriptions. Each student given personal instruction. You can enter any time—school open all the year. Tuition of complete course, $25.00. Our references will suit you. Write us for catalogue.

JUST AS IMPORTANT AS A TRIAL CASE



L. A. STEVENSON'S

Eye-Glass Guard Gauge

Illustration is ¼ size.

Throw away the rule and stop your guessing. The difficulty of **FITTING EYE-GLASSES MADE EASY.** Ask your jobbers for it. If they can't supply you, I will, upon receipt of **$3.00,** to any address.

L. A. STEVENSON, Gaylord, Mich.

Just One Word, Jewelers and Opticians!

I have the latest and most up-to-date scheme for advertising goods that has ever been put on the market.

Have been working on the plan for over four months, and was paid for my trouble in first ten days after using same. This is no tapping-on-window machine, no revolving wheel, or attraction of this sort, but something that if worked as per my directions, will bring you a crowd every day and night, and each line of goods can be shown off every five or ten minutes. Can be used in window or in body of store. Send $1.00 for printed instructions of this plan if you wish to make your store the center of attraction in town. After receiving same, if not satisfied, return, and I will remit full amount paid.

Refer you to Reedsburg Bank and State Bank of Reedsburg as to my reliability.

R. P. OUTERBRIDGE,
Jeweler and Optician,
Reedsburg, Wis.

Outfit required is not expensive.

IMPORTANT!

Those intending taking a course of study in **Skiascopy** and **Ophthalmoscopy** are reminded that appointments must be made in advance, as only a limited number of open dates are available. Terms, $30.00. Address

L. L. FERGUSON,
32 Maiden Lane, New York.

"The Canadian Optician"

Reaches every Optician, Jeweler or Druggist in Canada.

In sending your subscription **($1.00)** now, you receive in addition a handsome set of optical display cards, alone worth the subscription price.

Advertising rates on application.

The Canadian Optician,
20 Lombard St., TORONTO, ONT.

"MARSH'S OPTICIAN'S RECORD BOOK."

Keep a complete record of your cases, by using the oldest and best Record on the market, the **only** RECORD BOOK with detachable coupons for customers, 250 leaves, 500 records. American Optical Co., agents to the wholesale trade. If your jobber don't keep it, send **$2.00** to

E. A. MARSH, 133 West 3d St., Cincinnati, Ohio

THE
Great French

EYE WATER

The Best Remedy Known for
Weak or Inflamed EYES, Granular or Scaly Eyelids, Etc.

IT CURES

Once used, recommends itself.

$18.00 per Gross.

Ask your Jobber for it or send $1.50 for a sample dozen to the manufacturer,

F. A. UPHAM,
111 E. Seventh St.
St. Paul, Minn.

Display advers., $2.50 per inch per column. Smallest adver. inserted, one inch.

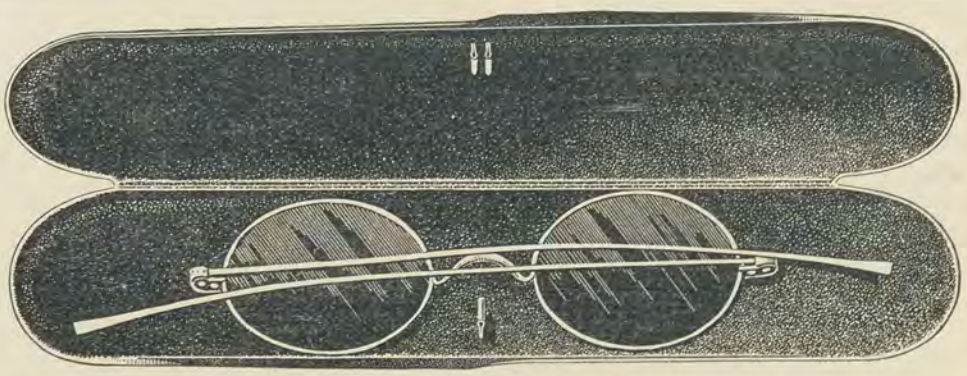
"TRADE WINNER."

IMPROVED HUB, for Straight Bow Spectacles.

Made in Steel and Aluminum, nicely finished, in plain black or in fancy leathers, suitable for the Holiday trade.

Patented. Sold by the Jobbing Trade.

HUB OPTICAL CASE CO.,
77 CHELSEA STREET, EAST BOSTON, MASS.

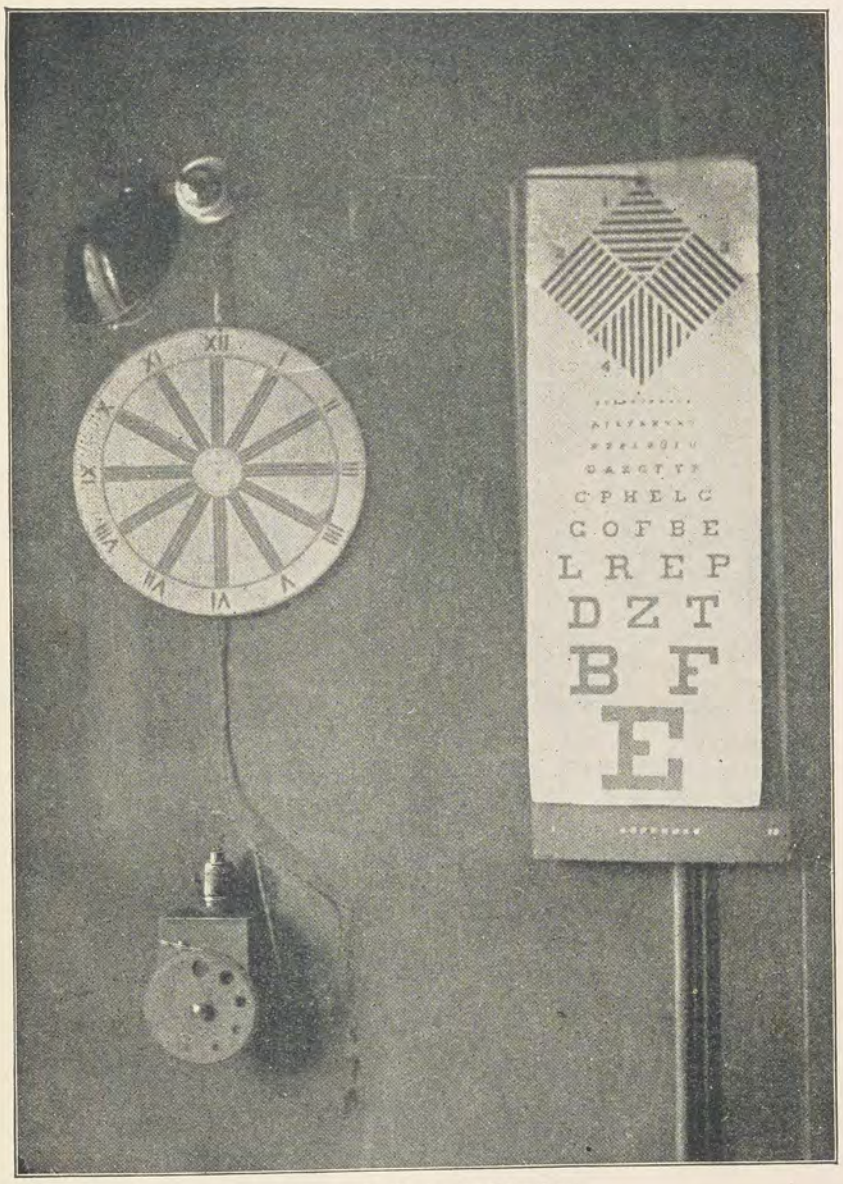


When writing to advertisers, kindly mention The Keystone.

A Convenient Apparatus for Testing the Color Sense.

BY S. MITCHELL, M. D.

FOR some time I have been desirous of procuring some practical application for office use in testing the color sense, other than the Holmgren test. I have made use of a light and colored glasses for some time, but could not find in the market any apparatus whereby colored glasses could be conveniently used for this purpose.



Apparatus for Testing the Color Sense

For the one that is here described I claim nothing original, as I am wholly indebted to Dr. C. H. Williams, of Boston, for the ideas used in the construction of the essential parts.

The lantern which he exhibited before the section on ophthalmology at the last meeting of the American Medical Association, after reading his excellent paper on "The Examination of the Visual and Color Sense of Railway Employees," has been taken as a model.

As I journeyed homeward from Columbus I busied myself with making a sketch of a lantern, in which I did not strive to improve on the doctor's lantern, but only sought to simplify and bring into a more compact form the essential parts of his lantern.

Having decided to employ a 10-candle power incandescent lamp with a frosted globe for the illuminant, and to make the lantern a permanent fixture in my office, it was comparatively an easy matter to secure both simplicity and compactness in its construction.

The photograph presented herewith, shows the lantern *in situ* in my refraction room. The box for the lamp is made of ⅜-inch maple wood and is 3 inches square by 4 inches high, and painted a dead black inside and out. It was left open at the back, as the wall to which it is secured is also painted a dead black to form a suitable background for test cards. The top is movable and has an aperture in the center, through which the small end of the lamp globe is thrust and then screwed into its socket. Hence, when the lamp is dropped into position, the box is tightly closed and light is emitted only from an aperture ¾ of an inch in diameter, made in the front and near the top of the box. There are two brass disks, one 5 inches in diameter, and pierced with 9 apertures ¾ inch in diameter, each filled with a colored glass. There being three shades of green, three of red, and one each of rose, yellow and blue. To facilitate the turning of it, this disk has a milled edge. The other disk is smaller by ¼ inch than the one just described and is turned by means of a small knob in the center. This disk has 6 apertures, ranging in size from ¼ to ¾ of an inch in diameter. It is placed over the larger disk when they are both in position on the box, and both turn on the same pivot. This pivot is so placed on the front of the box that by turning either disk, the center of any aperture may be made to correspond to the center of the aperture in the box, where light is emitted. By means of a catch attached to the box and a shallow notch opposite each aperture in the disks, the disks may be revolved separately and made to stop at any desired point.

Aside from the utility of this appliance as an auxiliary in testing the color sense, which is not the purpose of this paper to discuss at all, I have found it very convenient to use the luminous spot where the colors are displayed, when using the phorometer or the Maddox rod. So the time-honored candle in my office has been relegated to the dark room, where it still performs faithful service in determining light perception and light projection of cataractous eyes.

The work of constructing this apparatus was all done from my sketch, by a mechanic in this city (Hornellsville, N. Y.), with the exception of blackening the brass disks and fitting and setting the colored glasses, which work was done by E. B. Meyrowitz, the well-known instrument maker of New York City.

—From *The Ophthalmic Record.*

Percentage of Color Blindness to Normal Color Vision as Computed from 308,919 Cases.

In a paper read before the Western Ophthalmologic and Oto-laryngologic Association, Dr. J. A. Mullen, of Houston, Texas, gives three tables about the statistics of color blindness. Table I. contains the examinations of 308,919 males for color blindness. It is founded especially on the medical examination in the United States Navy, but makes use also of the reports from the naval departments of England, France, Russia and Austria. Table II. gives the percentage of color blindness in respect to the different nations, while Table III. gives the percentages according to different authorities. We are sorry that Dr. Mullen does not give the method employed in each set, because we are afraid that many of these examinations have been and still are conducted quite differently, and ought not to be brought together for the purpose of obtaining an average. We also miss in Table III. the result of the investigation of Dr. Holmgren, undoubtedly the highest authority on this subject, and whose careful researches by his own method probably give the most reliable results that can be obtained. There were eight typographical errors in the tables, which we have taken the liberty to correct.

TABLE I.—STATISTICS ON COLOR BLINDNESS.

DATES	Observer, Country and Department	Male	Female	REJECTED AS COLOR BLIND		PER-CENT'GE	
				Men	Women	Men	Women
1880–1896, inclusive	Med. Ex'n U.S. Nv'y	161,491	. . .	2,077	. .	1.28	. .
1885–1890, inclusive	Med. Ex'n U. S. Naval Ac.	495	. . .	8	. .	.16	. .
	Med. Ex'n England Naval Ac.	3,400	. . .	18	. .	.05	. .
	Med. Ex'n Engln'd Naval Cl. & Ac.	1,500	. . .	2	. .	.13	. .
1880	Com. of Opt. Society	14,846	. . .	617	. .	4.16	. .
1892–1896	Med. Ex'n, France						
	Young Rec . .	19,356	. . .	20	. .	01	. .
	Fontenay, Denmark	4,000	. . .	155	. .	3.80	. .
	Holmgren, Sweden	32,165	. . .	1,019	. .	3.16	. .
	Jeffries, America .	19,183	. . .	802	. .	4.12	. .
	Jeffries, America .	. . . .	14,764	. . .	11	. .	007
1886–1897, inclusive 1897	Med. Ex'n Russian Navy	47,530	. . .	787	. .	2.65	.
	Austria, N. S. Fiume	985	. . .	. . .	. .	. .	. .
	Dr. A. Field, China, Swatow . .	600	. . .	19	. .	3.16	. .
	Dr. A. Field, China, Swatow . .	. . . .	600	. . .	1	. .	.17
	S. U. S. N., Japan (soldiers) . . .	1,200	. . .	29	. .	2.41	. .
	S. U. S. N., Japan (men)	596	. . .	32	. .	5.45	. .
	S. U. S. N., Japan, (2 regiments) . .	1,200	. . .	41	. .	3.40	. .
	S. U. S. N., Japan, (boys)	372	. . .	5	. .	1.40	. .
	S. U. S. N., Japan, (girls)	. . . .	270	. . .	4	. .	1.5
	Total	308,919	15,63	5,631	16	1.82	0.1

TABLE II.—PERCENTAGE OF COLOR BLINDNESS ACCORDING TO NATIONALITY.

COUNTRY.	TOTAL EXAMINATIONS		TOTAL REJECTED C. B.		PERCENTAGE	
	Male	Female	Male	Female	Men	Women
United States .	181,169	14,764	2,887	11	1.53	.0073
Russia	47,530	. . . .	787	. . . .	2.65	. . . .
Sweden	32,165	. . . .	1,019	. . . .	3.16	. . . .
England	19,476	. . . .	637	. . . .	3.2	. . . .
France	19,356	. . . .	20	. . . .	.01	. . . .
Denmark . . .	4,000	. . . .	155	. . . .	3.80	. . . .
Japan	3,368	270	107	4	3.1	1.5
China	600	600	19	1	3.16	.17
Austria	985	. . . .	. . . .	. . . .	. . . .	. . . .
Total . . .	308,919	15,634	5,631	16	1.82	0.1

TABLE III.—PERCENTAGE OF COLOR BLINDNESS.

Authorities.	Males Per Cent.	Bibliography
Prof. Seebeck, Ger. upper class, 5 out of 40 boys . .	12.5	Color Vision, Jennings, 1896, p. 40
Prof. Prevost, Genoa . . .	5.	Color Vision, Jennings, 1896, p. 40
Prof. Wilson, Edinburgh, 1 out of 17.7 persons	5.6	Color Vision, Jennings, 1896, p. 40
Prof. Favre, 1 out of 10.7 persons	9.33	Color Vision, Jennings, 1896, p. 40
Dr. Fontenay, Denmark, 165 out of 4.492 persons . . .	3.45	Color Vision, Jennings, 1896, p. 43
Dr. J. E. Jennings, U. S. .	4.00	Women, 25, Jennings, 1896, p. 40
Drs. Thomson and Weiland, 2,653 out of 71,994 persons	3.69	Norris and Oliver, Sys. Dis. of Eye, vol. 2, p. 325
Drs. Thomson and Weiland, 14 out of 15,853 women . .	0.088	Norris and Oliver, same as above
Dr. de Schweinitz	3.00	Women, 20, de Schweinitz, Dis. of Eyes, 96, p. 487
Dr. Joseph A. Mullen, Houston, Texas, 5,613 out of 308,919 men	1.82	
Dr. Joseph A. Mullen, Houston, Texas, 16 out of 15,634 women	0.1	

THE WORKINGMAN'S SPECTACLES.

ASK YOUR JOBBER FOR

PATENTED

EXPANSIBLE.

TO BE HAD FROM JOBBERS ONLY

Spectacles and Eye-Glasses.

THE BEST WEARING QUALITIES FOR THE LEAST MONEY.

POINTERS

SOLID TEMPLES, WELL TEMPERED.

NO SCREWS TO RUST, WORK LOOSE OR DROP OUT.

RE-ENFORCED END-PIECES.

BROAD SWELL NOSES.

NO SOLDER AT JOINTS.

Prices
Eye-Glasses
$24.00 to $30.00
per gross.

Prices
Spectacles
$15.00 to $24.00
per gross.

POINTERS

INTERCHANGEABLE, NON-BREAKABLE SPRINGS.

SUPERIOR FINISH.

UP-TO-DATE STYLES.

Made in Three Qualities of Material:

NICKEL SILVER.—A white metal resembling silver, high lustre that will not tarnish or rust, more durable than steel.

GOLD FILLED.—Made from seamless 10 K. stock, not electro plated, wear and LOOK LIKE GOLD. Each Pair Tagged and Guaranteed to Wear 10 Years.

GOLDOIN.—A combination of metals resembling 14 K. gold, highly finished and chemically treated to withstand atmospheric changes.

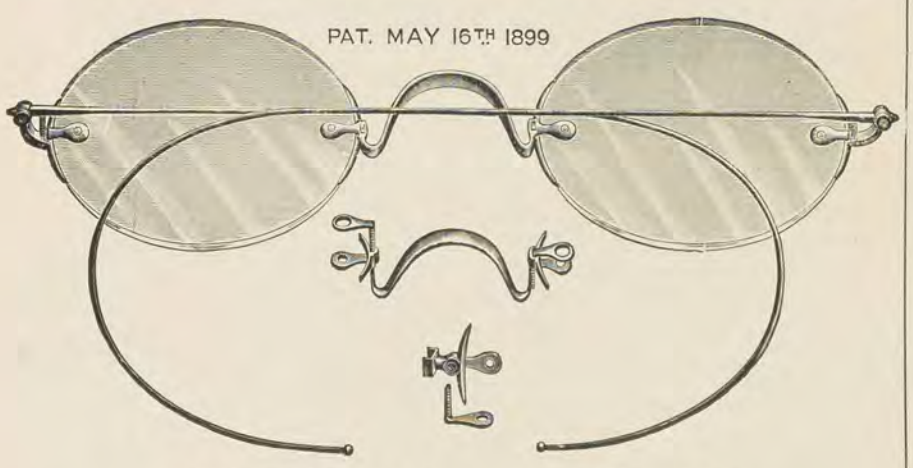
Among the Jobbers handling these goods are the following

Julius King Optical Co., New York City.
S. F. Myers Co., New York City.
R., L. & M. Friedlander, New York City.
Eliassof Bros. & Co., New York City.
Otto Young & Co., Chicago.
F. A. Hardy & Co., Chicago.
Geneva Optical Co., Chicago.
Coulter Optical Co., Chicago.
J. M. & A. C. Johnston, Chicago.
Brooks Optical Co., St. Louis, Mo.
L. Bauman Jewelry Co., St. Louis, Mo.
Oskamp, Nolting & Co., Cincinnati, Ohio.
E. & J. Swigart, Cincinnati, Ohio.
A. & J. Plaut, Cincinnati, Ohio.
C. L. Merry Optical Co., Kansas City, Mo.
L. Black & Co., Detroit, Mich.
Johnston Optical Co., Detroit, Mich.
Globe Optical Co., Boston, Mass.
H. L. Houghton, Boston, Mass.
E. W. Reynolds, Los Angeles, Cal.
B. Lawrence, Toronto, Ont.

LENSES TO SUIT YOUR TRADE { *PERISCOPIC DOUBLE OR PLANO.* *COQUILLE OR MICOQUILLE.*

THE UNIVERSAL

Rimless Spectacle and Eye-Glass Mounting



THE SIMPLEST *THE BEST*

No separate parts to lose. One little screw makes the straps adjustable to any lens. **Made in all metals.**

SEND FOR SAMPLE { In Steel, ... **35 cents.** Or in Gold Eye-Glass, **$1.25** Spectacles, ... **2.25**

QUEEN & Co.

Philadelphia

THE PIONEER OPTICIANS OF THE UNITED STATES

Priced and Illustrated Catalogues sent on application.

Part E—Spectacles and Eye-Glasses.
D—Ophthalmological Instruments, Test Sets, etc.
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SUPREMELY SATISFIED

with herself, the world in general, and especially with her

ANATOMICAL EYE-GLASSES.

THE IMPROVED ANATOMICAL GUARDS

are a boon alike to dealers and wearers. They are the most easily adjusted, the most comfortable and the most secure of any guard in the market. The main guard supports the eye-glasses, resting on the bony structure of the nose, the spring pad grasps the more yielding surface at the bridge of the nose and prevents the glasses from tipping forward.

SEND FOR PARTICULARS TO

F. A. HARDY & CO., WHOLESALE OPTICIANS,

SILVERSMITHS' BUILDING, CHICAGO

Items of Interest.

J. T. Laughlin has succeeded Laughlin Bros., Boise, Idaho.

Val. Scheuerell, Sun Prairie, Wis., has moved to a larger store.

C. Aug. Carmany, has started in the jewelry business in Coatesville, Pa.

A. Rickaby, of Belding, Mich., is about to remove his stock of goods to St. Joseph, Mich.

J. H. Dunnaway, formerly at Langley, S. C., has moved to Graniteville, same State.

Fritz E. Sandwall, South Omaha, Nebr., has moved into much larger and better quarters.

A. Grundler, a manufacturing jeweler, has removed from Springfield, Mo., to Joplin, Mo.

Jas. H. Bell, Tarboro, N. C., has been purchasing holiday stock in the Northern markets.

F. W. Zimmerman, formerly of Hammond, Minn., has moved to Glendora, Los Angeles County, Cal.

D. W. Carey, Hampton, Va., has moved into a new and more capacious store at 11 East Queen Street.

We are requested to state that J. F. Walden, Atlanta, Kans., is the only watchmaker or jeweler in that place.

Caroline Bogart, the wife of Victor Bogart, Lexington, Ky., died October 4th, after a long and painful illness.

M. L. Landis, Detroit, Mich., has opened his engraving school in the Clawson Building, 94 Miami Avenue.

William J. Sidwell, Charleston, Mo., was married, October 16th, to Miss Ora Mitchell. THE KEYSTONE extends congratulations.

R. P. Outerbridge, Reedsburg, Wis., is finding a ready sale for his "up-to-date" advertising scheme. See advertisement on page 1198. *

W. H. Broers, of B. H. Broers & Son, of Toledo, Ohio, spent several days in Detroit on business. He reports his trade excellent.

C. W. Bechtol, of Kesselmeir & Bechtol, Galion, Ohio, recently returned from New York, where he had been purchasing holiday supplies.

John Speckerman, of Sidney, N. Y., died October 2d. Mrs. Speckerman desires to sell his stock of tools and material. The death leaves a good opening in Sidney for some jeweler.

E. R. Flint, Carson City, Mich., attended the meeting of the Postmasters' Association of Michigan, held in Detroit last month. Mr. Flint has the post office of the above place in his store.

The firm of McCord & South, Montevallo, Ala., has been dissolved by mutual consent. The business will be continued in the name of J. H. South, who assumes the obligations of the partnership.

Ed. B. Leckey and wife, of Eagle Grove, Iowa, recently returned from a three months' trip through Washington, Oregon, California. They went by steamship from Seattle to San Francisco and were delighted with the trip and scenery.

Jos. Linz & Bro., Dallas, Tex., opened in the new Linz Building on October 20th, and the local public were giving an opportunity to witness one of the finest jewelry stores in the South. The display of goods was dazzling and aroused great admiration.

C. E. Butler, for fifty-three years leading jeweler of Hudson, N. Y., has closed out his business by auction. Auctioneer St. Clair Fechner officiating.

Roy Curtis, for the past five years watchmaker for Jeweler Hayden, of Topeka, Kans., has accepted a position with F. M. Rhomberg, Alamogordo, New Mexico.

Joseph J. Buser recently resigned his position in J. Linnenbrink's jewelry store, Rochester, Pa., and will open up a first-class jewelry store, of which he will be sole proprietor, in the Morgan Block on Third Avenue, Freedom, Pa.

Manning, Bowman & Co., Meriden, Conn., have issued a new illustrated catalogue showing their line of chafing dishes, English pewter placques, trophies, etc. The trade are interested in these goods, which make attractive and salable stock.

Thos. Scott, of J. W. Scott & Sons, Cadiz and Uhrichsville, Ohio, has returned from a vacation spent in the wilds of Wyoming. He is delighted with the scenery in Yellowstone Park and elsewhere in that section, and says the good times are everywhere visible.

Henry G. Thomas, Washington, Ind., had a notably attractive turn-out at the Washington Street Fair, held on September 28th. We regret that pressure on our space prevents our reproducing a photograph of the handsome team and its still handsomer occupants.

Hutchinson & Hart, Shreveport, La., had a grand annual opening on October 23d. Every visitor received a ticket, which gave him a chance for a prize, and thirty valuable gifts, the finest a gold watch, were given away. Music and candy were abundant and free.

H. A. Andrews & Co., Greensboro, Ala., have moved into the new store room formerly occupied by W. A. Munch in the Opera House Block on Main Street, one of the handsomest storehouses in the city. The inside furnishings are all in oak, of elegant design and finish and strictly up to date.

W. E. Tower, of the Tower Jewelry Co., Springfield, Mo., has just returned from Chicago, where he placed some very liberal orders for the holiday trade. This firm, while new to Springfield, is doing a good business, which they deserve, as they have a model store and few, if any, are finer in the State.

As a sequel to the booklet "What Shall we Make of our Boy?" issued by the Ezra F. Bowman Technical School, Lancaster, Pa., a new prospectus has now been issued by the same institution. This school is devoted to the thorough teaching of watchmaking and engraving, and prospective students of these branches would do well to secure a copy of the prospectus.

Arthur W. Miller, of Monroe, Wis., has become part owner of the E. L. Marsh Jewelry Store at Fort Dodge, Iowa. Mr. Miller has been in the jewelry business for twelve years and has worked in some of the largest jewelry stores of Chicago and Rockford, Ill. In the latter place he was salesman and had complete control of the repairing department of the J. F. Sullivan store.

E. Rivett, of the Faneuil Watch Tool Co., Boston, Mass., will probably not take his usual trip on the road this fall, on account of being overwhelmed with orders. The company's European agents recently received from a customer a highly eulogistic communication, of which the following is an extract: "Referring again to the Rivett lathes which we now have, I take this opportunity to inform you as a connoisseur, that I think the careful and elegant design, as well as the excellence of the manufacture of this machine, are simply marvelous."

Optical Notes.

Dr. L. Baker, of Chicago Optical Co., Lansing, Mich., spent a day recently in Detroit looking over the lines for anything new.

F. W. Powers, Ashland, Ky., formerly in the general merchandise business, has discontinued the latter and has opened a jewelry store and optical parlors instead. He will devote his entire attention to these branches.

J. Siegal, of Grand Rapids, Mich., is branching out in his line of business. Besides his large jewelry business he has added a complete stock of optical goods. Mr. Siegal is one of Grand Rapid's most successful business men.

J. Segal, representing the L. Black Co., wholesale opticians, Detroit, Mich., spent a few weeks in New York with his family. While there he attended the wedding of his sister, who was married to M. Abromovitz, of New York.

An attempt was recently made to burglarize the store of the Columbia Optical Co., in Omaha, Nebr. The robber succeeded in removing a quantity of goods from the store but to avoid capture he discarded his plunder and ran. The goods were recovered.

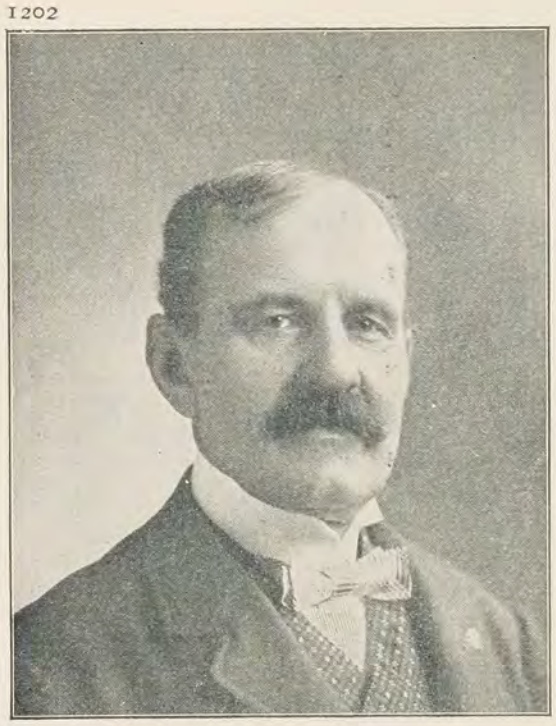
The new catalogue of the C. L. Merry Optical Co., Kansas City, Mo., is an excellent compilation from which to order optical supplies for holiday trade. Opera glasses and gold filled spectacles may be ranked high among holiday specialties, and the Merry Company's aggregation of these goods makes easy the work of selection of suitable stocks for individual opticians.

The Pacific Optical Co., Los Angeles, Cal., whose "Aurocone" spectacles are proving so popular, now announce that they are supplying these spectacles with the retainers loose, thus enabling the opticians to adjust them to the required length for each patient, and with the utmost accuracy, without being compelled to carry an excessively large stock. A valuable characteristic of the "Aurocone" is that when once adjusted they are always adjusted, and never cause any discomfort to the wearer.

Oregon Association of Opticians.

The first meeting of the Oregon Association of Opticians was held at the Auditorium, in Portland, on October 24th, and a permanent organization was effected. The following officers were elected: President, J. O. Watts, Eugene; first vice-president, H. S. Butterfield, Portland; second vice-president, G. Heitkemper, Portland; treasurer, W. E. Garretson, The Dalles; secretary, C. L. Haynes, Portland. The meeting was largely attended and was characterized by enthusiasm and harmony. The next meeting of the association will be held in Portland on the third monday in January. At this meeting a paper on "Heterophoria" will be read by Dr. C. F. Torrence; one on "Retinoscopy" by Dr. Phillips, and one on "Optics in General" by Dr. Capps. This triple attraction should result in a large meeting.

The Webb C. Ball Watch Co., Cleveland, Ohio, has been organized with increased capital at a recent meeting of the stockholders in the local offices of the company. Frank Rockefeller and Frank Brewster, of the Standard Oil Co., of New York City, identified themselves with the Ball Company by investing in substantial blocks of stock. Frank Brewster was elected president of the company, with the following persons composing the directors: Frank Rockefeller, Frank Brewster, J. A. Beidler, J. H. Dempsey, F. I. Ball, J. P. Dawley and Webb C. Ball.



F. R. CLAYTON,

Jewelers' Auctioneer,

Also Art, China and Bric-a-Brac.

OFFICE:
39 Stanley Terrace,
CHICAGO, ILL.

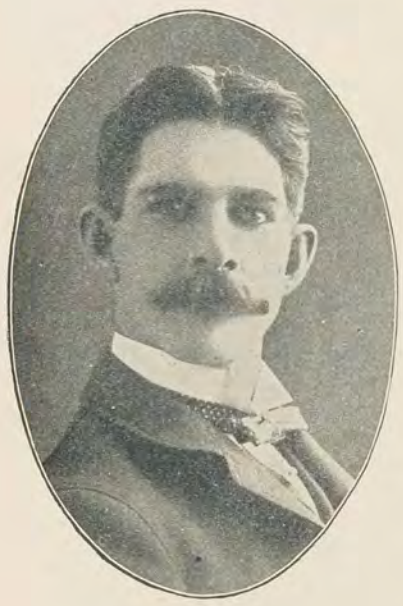
A FEW OF THE JEWELERS FOR WHOM I HAVE CONDUCTED SALES:

A. H. POLLARD, Shelbyville, Ill.
JOHN HOLT, Eau Claire, Wis.
A. H. HOLZHEIMER, 103 State St., Chicago.
FRANK FOOT, Lake Mills, Wis.
C. E. SEARL, Merrill, Wis.
C. E. RYAN, Baraboo, Wis.
S. W. GRAY, Fort Dodge, Iowa.
THEO. KAMPF, Bryan, Ohio.
L. P. HUSEN, Holland, Mich.
W. R. DOYLE, Chillicothe, Mo.
J. J. CLEMMER, Cresco, Iowa.
M. M. MCMILLEN, Des Moines, Iowa.
C. W. HANEY, Hampton, Iowa.
W. H. THORP, Beaver Dam, Wis.
DAVIS & HELLER, Terre Haute, Ind.
AMIDON BROS., Hartford, Wis.
C. F. TRYON, West Superior, Wis.
H. STONE, St. Joseph, Mich.
E. D. BEARDSLEY, Harvard, Ill.
D. DRUMMOND, La Crosse, Wis.

WHOLESALE HOUSES:

A. C. BECKEN, 103 State St., Chicago.
NEW HAVEN CLOCK CO., Chicago, Ill.
HOLMES & EDWARDS SILVER PLATE CO., Chicago, Ill.
TOWLE MFG. CO., 149 & 151 State St., Chicago, Ill.,
and many others.

Mail sent to my office in my absence will be forwarded to me at once. Write for terms and particulars. All correspondence strictly confidential.



"By Their Works Ye Shall Know Them,"

which explains **Raven's** popularity.

First make up your mind to hold a sale, then let me hear from you. I want the opportunity of furnishing some references from men who are living to-day and the representative jewelers in their respective cities. I furnish good references—still, that is not the only thing I can do. I can sell jewelry stocks for jewelers who wish to hold a sale for any reason, and am successful in my work; that is why I am conducting more and better sales than any other man in the business. I am well-known among the jewelers everywhere, and would be pleased to make known my methods and terms to any inquiring jeweler. I ought to be as well posted in the art of auctioneering as any man could possibly be, if experience is a teacher, for I was born crying—an auction, and am still at it.

I get good prices for what I sell, and sell all there is to be sold—who could do more! I hold large audiences by treating them courteously and making the sale lively and interesting.

If you engage me to conduct your sale you will jump sideways you will be so well pleased.

JOHN H. RAVEN, Holland, Mich.

THE TIME IS NOW RIPE FOR SUCCESSFUL MONEY-MAKING AUCTION SALES

References cheerfully furnished from many established jewelers of twenty-one States for whom I have made sales in the past five years. I also refer to Union National Bank, Kansas City, Mo., or any wholesale jewelry house in Kansas City. If you have not secured your auctioneer, write me at once.

ALL INQUIRIES STRICTLY CONFIDENTIAL.
Auctions Personally Conducted on a Guarantee Basis for Established Jewelers Only.

D. O. HERNDON,

JEWELERS' REALIZER,

OFFICE:
333 New York Life Bldg., Kansas City, Mo.
TELEPHONE 2341.

Why do so many Jewelers make assignments after so-called leaders make their sale?

I can tell you:

The auctioneers worked for their commissions and slighted their fine goods. No customers of mine ever failed after I sold for them. Why? Because I worked to make them money, and if I cannot sell their diamonds and fine goods at profits they are in their stock when I close the sale. If there must be a loss it is on their old trash, plated jewelry, etc. I sell diamonds and fine goods at a profit. I would not sell unless I can make my employer money. I have never made a sale without a profit and I guarantee a profit on the average on my entire sale; no difference if the sale is $1000 or $100,000, I make a profit. Why? I have spent my life of thirty-five years in the business and I do not drink, play cards or waste my time. I work every minute while in your city. I have just closed a three weeks' sale for G. Frockman, jeweler, Salem, Ohio. Average sales, $300 per day; net profit, 25 per cent, in a town of 8000. Mr. Frockman has employed five different auctioneers in his life and says I can give them all cards, and am by far the finest salesman he ever employed. If you want a big sale, a money maker, write me at once.

DAN. I. MURRAY,

America's Leading Jewelry Auctioneer,

Old address, 126 State St., Chicago, Room 602.

Eastern office, 3 Maiden Lane, New York, Room 61.

READ THIS LETTER—YOU WILL NEVER REGRET IT.

ANDERSON, IND., Sept. 30, 1898.

A word to the Jewelry Trade:

We have, during our business career of 20 years, had five auction sales, and we have employed the best auctioneers in this country to make our sales. Our last two sales has been made by Dan. I. Murray, of Chicago. He has just closed a two weeks' sale for us that has been a grand success, although he had many difficulties to contend with, as another jeweler here opened a sale the same day we did, and he opened up with one auctioneer, then finally got two, and with two auctioneers he had to close after four days' trial; and I will say that whenever Murray is on the block it is useless to try a sale by others. Mr. Murray is the most accomplished salesman that ever faced a crowd; his oratorical work is beautiful; his kindness and his wit, with his hard work, is a guaranteed success. He sold in our sale our finest diamond goods at a profit of thirty per cent. He can, and does, sell all your old goods that could not be given away in a regular way. All in all, we cannot speak words of praise too highly for this wonderful salesman—a perfect gentleman, and makes hundreds of friends in his sales by his kind and genial ways. If you are thinking of a sale, write me a line—I will tell you who is the best auctioneer to-day on the stand in one word: we consider Dan. I. Murray the best, and we have employed the leaders. One of the leaders tried a sale for us two years ago and worked two days to sell only a few dollars' worth of goods, and he had to quit. Dan. I. Murray's sales run from $150 to $300 per day in the same store and stock for two weeks, and he could stay one month, but is engaged and we cannot hold him longer. We will be pleased to answer at any time letters of inquiry regarding Mr. Murray.

Respectfully,
WASHBURN JEWELRY CO.
Per J. M. Washburn.

An Electric Window Display.

By JEWELER J. W. RISIEN, Mexia, Texas.

I AM pleased to send you a plan for an electrical window display, which I myself used with success and which would be a most appropriate display for the holiday season. The necessary apparatus can be made by any watchmaker.

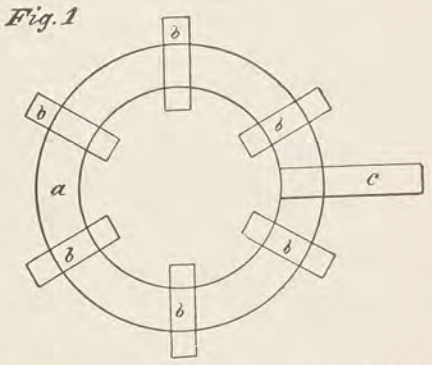
This display consists of a number of colored electric light bulbs, fastened on a revolving disk, and so arranged that each color burns awhile and then suddenly changes to another color, and so on, and at intervals all are lighted at once. As may be guessed, it makes a fascinating display and involves very little expense, or skill in its construction after you know "the how."

You will first require two electric motors. The ordinary fan motors will do by removing the fan blades. It is well to secure these first, as the plans must be modified to the capacity of the motors. These motors can usually be borrowed or rented. One motor is to run the automatic switch and the other to run the revolving disk which carries the lights. Both motors should be of one-eighth horsepower, and, of course, must be suited to the requirements of the current; that is, if your current is of the alternating type your motors must be also of the same. Consult your local electrician on this point.

The motor which runs the disk must be one that will run with its shaft in a vertical position. All motors will not run well in this position on account of the lower bearing not being suitable, but almost any motor can be so altered without injury or trouble. Look after this point first, and see that your motor will run easily and smoothly in the vertical position of its shaft.

Next procure a piece of soft, light wood, ¾ inch thick, and cut a circular piece 20 inches in diameter. It must be free from cracks and be smooth, and its surface perfectly even. Bore a hole in its center the exact size of the motor shaft, and with washers and nuts make it fit firmly and true on the shaft. Next procure a sheet of polished copper 20 inches square, No. 24, B. & S. gauge, and with a pair of large dividers work out five copper rings ⅞ inches wide. Set you dividers at 9⅛, 8⅛, 8⅞, 7⅞, 7¼, 6⅞, 6⅛, 5⅜, 4⅛ and 4 in inches, and they will mark out the rings near enough for practical use. This, of course, will make the smallest ring, 8 inches diameter on the inside and 9¾ inches outside. Next cut these rings out with a pair of tinner's shears. The perforations to start the shears in the metal are, of course, made in the spaces left between the rings, thus leaving the rings smoothly cut. The rings will warp in being cut out, but that does not matter, but you must avoid making any sharp bends or "buckling" the copper, as it is difficult to smooth out such places. Now cut fifty-four pieces of sheet copper ⅜ inch by 1⅝ inches. Go to the tinners and solder these on the rough side of the copper rings at regular intervals, 16 on the largest, 14 on the next, 10 on the next, 8 on the next and 6 on the smallest one. Then cut five pieces of copper 1 inch wide and 3 inches long and also solder one each of these on the rings. The manner of soldering these pieces on is shown

Fig. 1

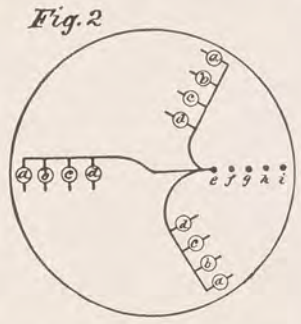


at Fig. 1, *a* being the copper ring, *b b b b b b* being the strips and *c* being the long, wide strip.

Now procure a piece of heavy mat the same size as the wooden disk—i. e. 20 inches in diameter—which can be obtained from a furniture store (it is used in framing pictures). Lay all of the copper rings on the mat, one inside another, and equi-distant from each other, and draw all around each ring and its strips. This is to show just where the strips came. Then take a small chisel, just the width of the strips, and cut a slit clear through the mat, just where the strip touches the edge of the ring it is soldered to. Then bend each projecting end of the strip at right angles to the ring toward the side on which they are soldered; then put the ring back on the mat, push all the arms of the strip through (including the wide piece, which must have a slit made for it, and be bent the same as the strips). Turn the whole thing over, press the mat firmly down against the ring and bend the protruding strips over. It will be seen that these strips are for the purpose of fastening the rings to the mat, presenting the smooth side of the copper rings out, the rough side, on which are soldered the strips, being underneath. The wide strip is for the purpose of soldering a wire to, which goes to the lamps. In fastening all these rings on the mat it is essential to see that none of the strips came near to or touch any of the other rings or its strips. Now take five pieces of flexible incandescent lamp cord a foot long, cut off an inch or two of the insulation at one end of each, and securely solder one end of each to the wide strip on each ring. Cut off the end of the strip if too long. Use the double lamp cord as *one wire*, soldering both ends of one terminal to the strip. Now lay the mat with its rings on the wooden disk and see where the wires came. Mark the places and bore a small hole for each of the five wires; replace the mat on the disk with the rings out, put the wires through the holes, be sure that there are no short circuits—i. e., one piece of wire or metal touching any other piece, and with light brads tack the mat firmly to the disk.

The next thing is to place the lamps on this disk, which go on the opposite side of the rings. Procure twelve porcelain screw bases. Screw these on the wooden disk as shown in Fig. 2, at *a*, *b*, *c*, *d*, commencing at the edge and putting them as close to each other as possible. Then next comes the wiring of the lamps. This is sometimes confusing, and lest I make the diagram too confusing I will explain the way to do it, rather than put down too many wires. The letters *e*, *f*, *g*, *h*, *i* represent the terminals of the wires which are soldered to the copper rings on the other side of the disk, *e* being the inside ring. Now, one terminal of every lamp must be connected with *e*. Next, the other terminal of the three outside lamps must be connected with *i*, the terminals of the next three lamps *b*, *b*, *b* connected with *h*, the three lamps *c*, *c*, *c* connected with *g*, and three lamps *d*, *d*, *d* connected with *f*. That is all there is to it. You must remember that it is highly important that not even the smallest strand of wire must touch any other of the wires. All connections should be securely soft soldered. For the wire shown in diagram connecting at *e*, use *both* of the conductors of the lamp "cord." For the other wires which are not illustrated, but have been described, use only one of the two wires of the lamp cord. Use only the flexible lamp cord for this work.

Fig. 2

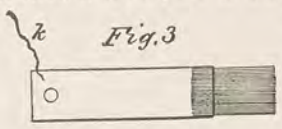


As arranged the three outside lamps will burn at once, and then the next three, and so on as the current is switched on and off. On the three outside put lamps all of one color, say blue. On the next three inside all of another color.

The next thing is the brushes which supply current to the lamps through the rings.

Take a piece of hard wood, pine will do, 2 inches wide, 6 inches long. Cut five strips of copper 1 inch wide and 2 inches long. Take a piece of lamp cord and cut off all the insulation with a pocket-knife. Cut this up into a number of pieces an inch long. Take five or six such pieces and solder their ends on the end of each of the copper strips, having about ⅜ inches of the wire to lap on the strip. Drill a hole in the other end of the copper strip to screw it to the piece of wood referred to. These, when completed, will be as per Fig. 3. Screw each of these pieces on the piece of wood in such a position that each brush will correspond to each ring, and will press lightly but surely against each of the rings when the latter are revolving. Of course, the motor and the brushes must be firmly fastened to the bottom of your show-window, and the disk run true enough to keep the brushes in good contact. These should touch the rings at an angle of about 20° and have some spring so as to be sure of contact at all times. The brush to supply the inside or smaller ring should have more fine wires soldered on it than the others, and be carefully adjusted, as it will carry a heavier current than the others, and is consequently more liable to burn out. Wires must be soldered on each of the bushes as shown in Fig. 3, at *k*, to run inside the store to the changing or automatic switch which will now be described.

Fig. 3



As the other motor which is to run this switch runs very fast, as all electric motors do, it is necessary to rig up a set of gears to reduce speed. If you can get one of the motors, the speed of which can be regulated, as some of them are, so much the better. I used such a motor, and found that different effects could be produced by changing the speed of the switch, which were very pleasing. To reduce the speed of the motor you will have to make two wheels 24 inches in diameter, with a pulley on each three inches in diameter. You can make such wheels out of soft wood of ¾ inch thickness, and saw the rim of each to hold, carry, a round cord belt, and arrange these wheels in a light wood frame. The axles of the wheels can be a piece of hard wood an inch square, with a large screw in each end with its head sawed off. These screws will run in holes bored in the wood frame, with very little friction. Square holes can be sawed in the center of the wheels and pulleys so as to slip tight over the axles. I will not give any details of their construction, as any one can easily make them, and I have found such a gear to answer every purpose. A small pulley must be put on the motor to run to the first large wheel. A 3-inch pulley on this wheel goes to the next 24-inch wheel, and in turn a pulley on this wheel goes to the switch, which will now be described.

Cut out a circular piece of wood 20 inches in diameter and ¾ inch thick. Cut four strips of your copper sheet 2 inches wide and 17 inches long. Bend each of these strips around the edge of your wheel, and fasten them there with common wood screws. These strips must be flush on one side with this wheel (it is not a wheel, but I will so call it), and extend over the other side 1¼ inches, the polished surface *inside*. The ends of these strips must be cut so that when they are screwed on the wheel the ends will have ⅛ inch space between. This wheel is screwed stationary in a frame. Opposite this must be made a wheel like the other two I briefly described, the wheel to turn being placed next to that side of the stationary wheel with the projecting strips of copper next to the moving wheel and close to it. This latter wheel engages the pulley of the previous wheel, and will revolve about once every minute. This wheel is to be made exactly like the others, except that a large circular hole should be sawed in one side of it extending from within a few inches of the axle to within an inch of its outer edge. This is for the purpose of observation, and so that adjustments can be made. On the *outside* of this wheel a pulley wants to be placed to turn with the larger wheel 4 inches in diameter and ¾ inch thick. The edge of this must be flat, and a copper band ¾ inch wide, cover the edge of it. You should cut this just the right length to fit around the pulley, and hard solder its edges flush, and make it so as to slip tight over the pulley without any fastenings. On the *inside* of this rim of copper solder a heavy copper wire 12 inches long, and bore a hole in the larger wheel for this wire to run through to the inside. A strip of copper will do quite as well as the wire. On the inside of the large moving wheel arrange a brush to engage into the four projecting copper segments on the stationary wheel. Take a piece of copper an inch wide and 4 inches long, and saw one end of it like a comb with your jeweler's saw. These slits must be about an inch long, lengthwise. You can screw a small block of wood on the inside of the wheel and then screw the brush to it. In this case, as also in the other brushes on the window apparatus, you must see, of course, that they slant in the right direction. You can easily arrange your motor to turn your gear and switch wheel in either direction by turning your motor around or by cross belts, but make your switch wheel turn to the right. Now solder the heavy wire or strip from the copper-faced pulley to this brush. Then, on the frame which covers the switch wheel and its pulley, make another heavy, strong brush to engage with the copper-faced pulley. Screw this on the frame with two wood screws. In the middle of these put a brass wood screw with two copper washers under it. This is to fasten one of the live wires to, and the copper washers on each side of the wire and the brass screw insures a good contact. Two such screws, with their washers, must also be placed in each of the four copper segments on the stationary wheel. The wires running from the brushes in the show-window, which correspond to the terminals *f*, *g*, *h*, *i*, in Fig. 2, are fastened one wire to each segment of the switch-board. The terminal *e*, Fig. 2, is connected through the inside brush directly to the live wire.

Now for the switch which is to burn all the lights at one time at intervals, a feature which should not be omitted.

Make a circular piece of hard wood ⅜ inch thick by 4½ inches in diameter. Cut a piece of sheet copper ½ inch wide and 5¼ inches long. Cut out a hole in the middle ¼-inch square, or round, as suits your convenience. This hole is for the purpose of letting the screw, which holds this wheel in place, passing through the copper when it is fastened on the wheel. Bend over ⅜ inch of each end of copper, place the copper strip right across the wheel, and by means of holes in the turned down ends fasten it to the wheel with two small screws into the edge of the wheel. Cut a piece of wood ⅜ inch thick and 1 inch diameter and fasten it to the middle of the wheel by means of screws, right over the copper strip. Bore a clean hole right through the center of the wheel and get a screw that will fit it loosely and go ¾ inch further through. Screw this wheel on the stationary wheel 4 inches from the axis of the large moving wheel on the side the segments project over, adjusting the screw so as to make the little wheel turn a little bit hard. Before you screw the wheel in place finally, however, you must put four arms on the wheel, to project from its edge ¾ inch. These may be smooth wire nails, and after they are driven in can be cut off to the proper length with a fine saw Now fasten a stout screw, with its head cut off, in the large moving wheel 6½ inches from its center. Put the small wheel in place, and then the large one, and see that the pin strikes the arms on the small wheel properly to cause it to rotate ¼ of a revolution every time the large wheel makes *one* revolution. Adjust this screw to work properly. This screw should be placed close to the large hole in the large wheel—6½ inches from its center will be about right—so that the working of the small wheel can be watched. Then work on the stationary wheel, where the copper strip on the under side of the small wheel *stops*, when the pin on the large wheel leaves it. The side of the small wheel which carries the strip must be next to the stationary wheel. After carefully marking this place, take all the wheels off and mark a line on the stationary wheel under the small wheel, where the center line of this strip is every time the large wheel causes the small wheel to stop at its second revolution. Then make four brushes, 3½ inches long and ½-inch wide, on the same style of the two large brushes, slitting their ends. Then solder heavy wires on the other end, and with two small screws to each brush fasten them securely to the back of the stationary wheel, under the small wheel, in such a manner that all four of the brush ends will touch the line at which the copper strip stops. Two brushes will have to be placed on each side of the wheel. The object is to have all four of the brushes resting on the copper strip on the small wheel at the same time. The wires soldered to these brushes run through holes of the stationary wheel behind, one wire to each segment. The ends of the brushes must be bent up and so adjusted as to touch the copper strip only at the proper time, the end of which device is to connect, electrically, all of the segments, thus turning on all of the lights during one complete revolution of the large wheel.

When I used the display, I also attached a number of stationary electric lights, both white and colored, which I had inside my store, and of course these went out and lighted up again in a manner very mysterious to the public, especially as only a part would be lighted at a time, and then others, and at intervals all of them.

Small Advertisements

No advertisement inserted for less than 25 cents.

Under heading "Situations Wanted," ONE CENT per word for first twenty-five words. Additional words and advertisements, THREE CENTS per word.

Under all headings except "Situations Wanted," THREE CENTS per word.

Name, address, initials and abbreviations count as words.

If answers are to be forwarded, postage stamps must be enclosed.

To insure insertion money must accompany all orders for advertisements, and copy must reach us not later than the 25th of each month for insertion in the following month's issue.

The real name and address of every advertiser must accompany the copy of the advertisement.

Advertisers who are not subscribers must send 15 cents if they desire a copy of the paper in which their advertisement appears.

Address,

THE KEYSTONE,
19th & Brown Streets, Philadelphia, Pa.

SITUATIONS WANTED.

Under this heading, ONE CENT per word, for first twenty-five words. Additional words and advertisements, THREE CENTS per word. No advertisement inserted for less than 25 cents.

FINE watchmaker and registered pharmacist, 8 years' exp. Fine engraver, good salesman; single, 26. A1 refs.; own tools. "L 44," care Keystone.

EXPERIENCED salesman, either behind the counter or on the road. Will furnish best of refs. Watchmaker by trade. Address, 1406 Canfield Ave., Detroit, Mich.

A YOUNG watchmaker desires a position at once. Address, A. L. Spalding, 2308 Locust St., St. Louis, Mo.

FINE watchmaker, engraver, competent on repeaters, chronographs and railroad watches; good ref., sober and reliable. Don't write unless you can pay $20 per week, or more. Chas. Sibert, Freeport, Illinois.

BY young man, age 27, to finish trade. Some exp. with watches and clocks. Wages, $3 a week and board. Roscoe Chaffee, Crown Point, Ind.

A POSITION as jeweler and watchmaker; bench exp. 3½ years. Age 21; college education. Salary, $10 per week. "D 28," care Keystone.

BY first-class watchmaker, engraver and optician. Age 26; 14 years' exp. at the bench, 3 years' practical exp. as optician. Thoroughly up to date in all methods of refraction. Own tools. Sample engraving on application. Gilt-edge refs. Address, "H 69," care Keystone office.

BY Dec. 1st, young man, 19, wants place to finish learning the trade. Ref. furnished. Address, Charles King, Grand Rapids, Minn.

FIRST-class refractionist would like position with some optical house. Has test-case, ophthalmoscope and other instruments. 5 years' practice. Address, Dr. R. H. Small, Rockland, Me.

BY young man, age 20, as assistant watchmaker. Can do good clock and jewelry repairing and hard soldering; good salesman. Desires position with good man. Address, "L. C. L.," box 90, Galena, Ohio.

PERMANENT position by young man, 5 years' exp. as all-around workman. Own tools, best refs. Now or Jan. 1st. C. G. Theiling, Box 304, Rocky Mount, N. C.

ASSISTANT watchmaker, German-American, age 27. Can do watch, clock and some jewelry repairing. Want position by first-class watchmaker and optician to finish trade. Own tools; Central States pref. C. H. Riggert, Odell, Nebr.

WATCHMAKER, jeweler and engraver wants a permanent position at once. Can speak English and German. Prefer Ohio or Indiana. Mention wages in first letter. "S 97," care Keystone office.

BY first-class watchmaker, jeweler, monogram and letter engraver, permanent position; A1 ref. State salary in first letter. Prefer South or North; wish to change. Address, "Golf," box 736, Augusta, Ga.

BY watchmaker, engraver and good salesman—wants steady position. Not afraid to work. A1 ref. P. A. Fischer, care Water office, Sedalia, Mo.

EXPERIENCED graduate optician, own test case. Do ordinary watch repairing, French clock, all jewelry repairing. Married; excellent refs. C. M. Ray, Logansport, Ind.

AS watchmaker; must be in or near Philadelphia. Have tools, exp. and best refs. "H 72," care Keystone office.

FIRST-class watchmaker and mfg. jeweler, with all tools and machinery; engraver. Age 30; wages $16 to $20. Address, "Jeweler," 909 Olive Street, St. Louis, Mo.

EXPERT optician and watchmaker, competent on difficult work, wants position with first-class firm before 1900. Engraving, jewelry repairing and salesmanship, if necessary. Box 492, Everett, Wash.

BY strictly first-class watchmaker, optician and engraver. Best refs. from last employers. Only A1 position wanted. 8 years' exp. "J 14," care Keystone office.

BY watch, clock and jewelry repairer. Address, George A. Messer, East Alstead, N. H.

BY first-class watchmaker and engraver, competent to handle fine and high-grade watches, and do good ordinary letter and monogram engraving. First-class refs. Address, "H," care E. A. Dayton & Co., Omaha, Nebr.

BY fine watchmaker, engraver, competent on all fine American and Swiss watches, 18 years' exp. Good salesman; fine ref.; can mount diamonds. Salary, $20 per week. James J. Leonard, Cairo, Ill.

BY an all-around hustler as salesman or watchmaker. First-class on jewelry repairing, plating, etc. Unexcelled refs. J. Reginald Tuck, 353 Hughson St., Hamilton, Ontario.

SITUATIONS WANTED.

BY fine watchmaker, engraver, competent on chronographs and repeaters. Sober and reliable, 20 years' exp. Good ref.; good salesman; good diamond-mounter. Salary, $22 per week. Chas. J. Smitshon, Memphis, Tenn.

BY experienced watchmaker, engraver and optician and salesman, situation at once in or near New Jersey pref. Lathe and complete set of tools and trial case. Single and strictly temperate. Salary, $18. "P 38," care Keystone office.

AT once, by good watchmaker, engraver and first-class jeweler. Permanent position in first-class establishment desired. Good refs.; no bad habits. "R 27," care Keystone office.

WATCHMAKER and machinist. Can do wheel-cutting, pivoting, jeweling, staff work, springing, etc. Have Moseley lathe, all attachments. Best refs., work and character. Box 3, Chase City, Virginia.

BY young man, 22, 2 years' exp. at bench and store. Would like place to finish trade. Low wages. Best ref. Address, "E. B.," 1625 Nowland Ave., Indianapolis, Ind.

YOUNG man, 28, wants place to finish trade. Honest, reliable, sober, industrious, willing. Best refs. Good on clocks and jewelry. "F 39," care Keystone office.

FIRST-class watchmaker and optician at once. Middle States; 29; single. "H 71," care Keystone office.

YOUNG lady wants situation, optical store or department. Experienced refractionist, understands business thoroughly; 3 years' exp. Refs. Correspondence solicited. Address, "T 28," care Keystone office.

TO finish trade with an up-to-date workman. Am good on watches, engraving and jobbing. Have most tools; refs.; no bad habits. V. J. Bennett, Lowville, N. Y.

BY young man, 25, to finish trade. Do ordinary watch and jewelry repairing, good engraver. Own tools. Reliable refs. Burton R. Dodge, Elgin, Ill.

WITH reliable firm as saleslady and optician, graduate. 2 years' optical office exp. References exchanged. Miss E. Victoria, room 732, Chicago Opera House Block, Chicago, Ill.

WATCHMAKER, jeweler, engraver and optician. Good refs. All. J. Schlichter, Oregon, Clark County, Ind.

BY first-class watchmaker, salesman and graduate optician, higher prisms. Owns tools. Speaks German. Plain engraving. S. Field, 18 Chestnut, Rochester, N. Y.

EXPERIENCED watchmaker, jeweler, optician, salesman and engraver. Can furnish lathe and small tools, if necessary. Address, R. Warner, No. 61 Main Street, Greenfield, Mass.

STEADY position wanted by first-class watchmaker, jeweler and engraver. An all-around man in retail store. Ad., P. O. Box 100, Tonica, Ill.

BY general repairer, 14 years' exp.; salesman, clean stock-keeper; not afraid of work. Would take stock Jan. 1st on commission. Chas. Burgess, Bloomfield, Iowa.

BY watchmaker, young man, practical workman; can also do plain engraving and hard solder work. Wages reasonable. Middle States preferred. H. W. Hawkinson, Grove City, Minn.

AS optician and salesman to learn fine watchwork and engraving, or either. "M 56," care Keystone.

OPTICIAN, competent refractionist, a practical workman at all branches of the trade, and well posted on theoretical and practical optics, desires situation. Refs. "A 28," care Keystone office.

GRADUATE refractionist, first-class frame-fitter, salesman, watchmaker and jeweler, 20 years' exp. and strictly up to date, wants situation after Jan. 1st. Write for photo., particulars and solid refs. "T 27," care Keystone office.

BY Feb. 1st, by good watchmaker, optician and salesman, also do plain engraving. Have full set tools, roller-top bench and trial-case. Wisconsin or Iowa pref. State salary when writing. G. A. Shannon, Minneota, Minn.

BY a young man of good habits, first-class watchmaker, jeweler, engraver and salesman, 3½ years' exp. A permanent position with a No. 1 firm. Owns small tools; best of refs. Address, Edward Kuntz, 18 Crescent St., Waltham, Mass.

A GRADUATE and an expert optician wants a situation with a first-class jeweler in a place of 8000, or more. Write for particulars. "S 96," care Keystone office.

WATCHMAKER, salesman and jeweler, thoroughly acquainted with the jewelry business, 18 years' exp. Competent on plain and complicated watches; capable of taking charge of store. Tools and refs. Address, M. F. Finkler, Streator, Ills.

BY watchmaker, jeweler and salesman. State salary paid in first letter. Address, Box 140, Kent, Ohio.

BY watchmaker and optician, 22 years' exp.; is married and wants permanent position. "T 26," care Keystone office.

EXPERT refracting optician, age 35, 7 years' exp., wishes situation with first class house. Complete knowledge of mechanical department. Competent to take full charge. Refs. "H 70," care Keystone.

PERMANENT position at once by competent Scandinavian watchmaker, 4 years' exp. Does hard soldering and plain engraving. Moderate wages. Central or Western States. "G 26," care Keystone office.

DEC. or Jan. 1st, by watchmaker, jeweler and engraver; adjusting, gear cutting, etc. Own tools. Age 32. Salary, $20 per week. No optician. Best of refs. Address, "Jeweler," Pulteney, N. Y.

BY first-class watchmaker, jeweler, clock repairer and graduate optician of American College of Ophthalmology, New York City, 14 years' exp. Fine tools, also examination instruments. Also speak German. Good ref. "L 43," care Keystone.

STRICTLY first-class watchmaker and jeweler, also do neat engraving. Full set tools; 15 years' exp. at bench. Good habits. Can furnish best refs. State salary in first letter. "M 55," care Keystone.

GRADUATE optician, 3 years' exp.; good frame-fitter, first-class salesman in retail store. Best ref.; can come at once. J. D. Pobst, Tazewell, Va.

BY expert watchmaker, jeweler and fine engraver, graduate optician; have trial case and tools. 15 years' exp.; good ref. "M 54," care Keystone.

BY young man, age 20, 3 years' exp. Can do watch, clock and jewelry repairing and plain engraving. Address, Box 11, Shakopee, Minn.

AS watchmaker, engraver and salesman, 17 years' city exp. Capable of taking charge of watch dept. A1 city refs. Ad., "C 41," care Keystone.

(*Continued on page 1206.*)

SITUATIONS WANTED.

(*Continued from page 1205.*)

SCIENTIFIC optician, experienced retinoscopist, would accept position in first-class store as refractionist or wholesale traveling salesman. Best ref. "Ossip," 97 Broadway, Paterson, N. J.

BY lady optician, in jewelry house, thoroughly competent to take charge of optical department; familiar with jewelry trade. Refs. "S 99," care Keystone office.

UP-TO-DATE refractionist, 15 years' exp., wants position with optical house, or to take charge of department. Age 38; married; physician. A1 refs. "F. H. B.," Box 118, Mokena, Ill.

TRAVELING salesman, with established jewelry trade in Minnesota, Iowa and Dakotas, would contract with good Eastern house next year. Ad., with stamp, "E 24," care Keystone office.

BY expert watch and clockmaker; capable of taking charge of store. Good ref. Steady position. Box 403, Monticello, Iowa.

FIRST-class watchmaker, 27 years' exp, desires position with good house. Competent to take charge of repairing department or store. Good salesman and well posted in all branches of the business. "J 15," care Keystone office.

BY first-class watchmaker and engraver, 20 years' exp. First-class refs. Address, "L 46," care Keystone office.

BY mfg. optician, with 20 years' exp.; is well posted in surface grinding and gold work, and can fill all kinds of prescriptions. Address, "R 2," 811, 103 State Street, Chicago.

BY first-class jeweler, watchmaker and engraver, 15 years' exp., own tools, best of refs. L. Cook, 72 Catherine Street, Saratoga Springs, N. Y.

WATCHMAKER, engraver, salesman desires permanent position; 9 years' exp. Temperate, own tools, best refs. Address, "O," box 70, Coopers Plains, N. Y.

GRADTATE optician, 20 years' exp.; good watch repairer, jeweler. Can take charge of store if required. No bad habits. Best refs. Reinhold Starcke, Junction City, Kans.

HELP WANTED.

UNDER THIS HEADING THREE CENTS PER WORD.

SUPERINTENDENT. Capable and energetic man, thoroughly experienced in factory practice, knowledge of the principles of electricity desirable but not essential. Address, "S 94," care Keystone office, stating exp., age, refs. and salary expected.

A YOUNG man, first-class clock and jewelry repairer. State salary expected. Must be good hand in hard soldering and jewelry repairing. Inquire at once at A. Brodfuehrer, Columbus, Nebr.

A FIRST-class watchmaker, jeweler, engraver and optician from December 1st to April 1st. Must be in every way reliable. Anyone wishing to come to Florida for their health would find this a desirable opportunity. Write, stating salary per month or week, "C 39," care Keystone office.

JEWELER and druggist wanted. Good position for right man. Address, I. L. Talbott, Ladd, Bureau County, Ill.

AN edge grinder. State wages and exp. Fourth floor, 84 Wabash Ave., Chicago, Ill.

AT once, fine engraver who can do some watch work and help wait on trade. Good salary; permanent. Leon M. Carter, Shreveport, La.

A FIRST-class watchmaker, jeweler and optician. P. T. Ives, Meriden, Conn.

A GOOD engraver to instruct me. Will teach him optics and pay good salary. Watchmaker pref. "C," box 435, Anniston, Ala.

A YOUNG man to do engraving, clock and jewelry repairing. Send ref., price wanted and sample of engraving in first letter. Permanent to a good man. Wanted at once. Address, R. H. Trask, Ottawa, Ill.

WATCHMAKER and jeweler; first-class workman. Send refs. C. M. Bankston, Winona, Miss.

FIRST-class watchmaker, optician, jeweler, engraver; must be a good salesman and good all-around man. Permanent position. Good wages to right man competent to take entire charge of jewelry department. The Pfeiffer Co., Cedar Falls, Iowa.

COMPETENT all-around grinder and rimless man in wholesale optical house, New York. Steady work. "J 13," care Keystone office.

AT once, a salesman who can engrave; permanent position at $25 a week. Send samples and refs. with application. Unless first-class don't apply. J. H. Leyson Company, Salt Lake City, Utah

SALESMEN desiring good side line of flatware on liberal commission address, with particulars, Regent Mfg Co., Chicago, Ill.

THOROUGHLY competent watchmaker, hard solderer, plain engraver; steady position; Illinois town; $15 week. State age, exp, refs. and photo. Must be able to take charge of repair work. "M 49," care Keystone office.

OPTICAL workman wanted at once, who can do first-class work of every description, including surface grinding. Address, stating salary wanted, E. B. Meyrowitz, St. Paul, Minn.

A FIRST-class engraver and jeweler; must be good workman. Permanent. Address, with refs., not later than November 15th. Franz Mahncke, Tacoma, Wash.

AT once, good watchmaker, jeweler, plain engraver, with tools. One willing to make himself useful in general way. Send sample of engraving and refs. first letter. Good, permanent job and fair salary. J. H. Bate, Marietta, Ga.

A NEW YORK wholesale optical house desires a first-class, all-around optician, capable of doing the best kind of work in all branches except surface grinding. Permanent position for right man. "B 67," care Keystone office.

WATCHMAKER for general run of work. Can use man wishing to finish trade. State ability, wages and refs. in first letter. F. Catlin, Winsted, Connecticut.

WATCHMAKER and engraver. Must be first-class in both lines; 30 years of age or over. Send photo., samples of engraving, refs., wages wanted, etc., in first letter. Address, "P 39," care Keystone office.

YOUNG man that can repair clocks, do some jewelry repairing and is willing to be useful. The more he knows the more he will be worth. Harry E. Thomas & Co, 509 Market St, Wilmington, Del.

AT once, a good watchmaker; must have good refs. B. Mantele, Hutchinson, Kans.

HELP WANTED

WATCHMAKER, jeweler and engraver. State salary, send samples of engraving and send photo. if convenient. Permanent position to right man. Address, Lock box 598, Dunkirk, Ind.

YOUNG man; jewelry and clock repairer. E. J. Peters, Albany, N. Y.

AT once, a man who understands the optical business; one who can take care of the bench work as well as the fitting. We use the Javal ophthalmometer, also the De Zeng. A splendid chance for a man to advance if worthy. State wages to start with and refs. The Lawton Optical Co., 816 Market Street, Wilmington, Del.

WATCHMAKER and plain engraver in a retail store in Philadelphia. Salary, $30 per month, board and washing. "L 45," care Keystone office.

STRICTLY A1 optican, who is a good watch or jewelry repairer. J. M. Blake Jewelry Co., Hot Springs, Ark.

FIRST-class jeweler and engraver. Must be single, Ad., Wm. H. Broer, 427 Summit St., Toledo, Ohio.

A FIRST-class engraver, clock and jewelry repairer for permanent position. Address, with sample of engraving, Herman S. Hewett & Co, Brockton, Mass.

YOUNG man to do prescription work, edging, bending and repairing frames. Must be good on frameless work. State age, exp., salary expected and ref. in first letter. "F 42," care Keystone office.

EXPERIENCED watchmakers; factory exp. pref. Liberal pay for competent men. Write or call. Trenton Watch Co., Trenton, N. J.

NOV. 1st, first-class jeweler and clock repairer. Must be good workman and come well recommended. Steady position and good salary to right party. Send refs. and salary expected in first letter. Address, "Jeweler," No. 228 Main St., Norfolk, Va.

A WATCHMAKER and plain engraver at once. $12 per week. Address, A. Rabinowitz, No. 32 Atlantic St., Stamford, Conn.

A GOOD engraver at once; permanent position. F. A. Averbeck, Clarksville, Tenn.

FOR the South, a first-class watchmaker and optician who can do fair engraving. Of good appearance, must not drink or chew tobacco, and be able to take entire charge of watch repair department. Salary, $20 to $22.50 per week. Photo. and ref. in first letter. "L 47," care Keystone office.

A YOUNG man to do job work, clock work and good salesman. Must be of good address, sober and industrious. State wages wanted. Address, Bauer Bros., Zanesville, Ohio.

EXPERIENCED workmen on frameless gold spectacle and eye-glass mountings. The Meyrowitz Mfg. Co., 636 First Ave., New York.

EXPERIENCED watchmaker for position in one of the leading jewelry stores in city of Mexico; single young man pref. Must be competent workman, fair salesman and well recommended. Knowledge of Spanish not necessary—dealings are with Americans. Excellent position to right party. Address, with refs., and, if possible, send photo., "E 25," care Keystone office.

GOOD watchmaker, permanent situation and good pay to right man. D. C. Percival & Co., Jewelers' Building, Boston, Mass.

A GOOD watchmaker, jeweler and engraver with own tools. Permanent place. Must work on percentage. Box 242, Wapakoneta, Ohio.

YOUNG man, good engraver and optician, and desires to increase exp. as watchmaker and jeweler. Moderate wages. G. A. Spies, Monongahela, Pa.

OPTICAL workman. Must be expert in rimless and bridge work. Good, permanent position. Apply, giving age, exp. and ref. S. Galeski Optical Co., Richmond, Va.

FIRST-class watchmaker, jeweler and engraver. All-around man. Send sample of engraving in first letter. Good wages; A1 ref. required. "J 16," care Keystone office.

A TRAVELING representative for Iowa, Nebraska and nearby States territory, one with established trade. Ad., "X K 22," 811, Columbus Memorial Building, Chicago.

A GOOD watchmaker, jeweler and engraver. Send refs. $15 per week to right man D. A. Tobias, Charlottesville, Va.

IMMEDIATELY, a first-class watchmaker and engraver. He must be good at both, with undoubted refs. Send sample, price and ref. in first letter. "T 30," care Keystone office.

ABOUT Jan. 1st, jeweler; must be good stone-setter, optician pref. Address, with refs., "E 26," care Keystone office.

AN experienced salesman that is thoroughly posted in the retail jewelry business. A permanent position for a good man. Streicher's, 1017 Main St., Kansas City, Mo.

WATCHMAKER, engraver and jeweler, all-around helper with tools, $12 per week. Send sample of engraving and ref. Give full particulars. Ad., "B 60," care Keystone office. This is a steady job for right party. Good store, good town to live in. Board and room cost $3.50 per week.

PRACTICAL watchmaker, jeweler and engraver, with tools, single man pref. One willing to make himself useful about the store. Send sample of engraving, ref., wages wanted, how long at business and full particulars. J. F. Butler, Potsdam, N. Y.

AT once—A good watchmaker and engraver; must have had experience in retail store at repairing and close regulating of watches for railroad service, and be able to engrave fine script and old English. Also good at repairing jewelry, resetting stones, etc., and not use liquor. To a thoroughly good man a permanent situation in a pleasant New York town is open. Have a fine optician. "W 52," care Keystone.

AT once, a thoroughly practical watchmaker, jeweler and engraver with tools; one accustomed and willing to make himself useful in a general way about store—none other need apply. State salary, refs., and send samples of engraving in first letter. L. T. Dickinson, jeweler and art dealer, North Adams, Mass.

EXPERT refractionist, who is also a good salesman, to take charge of optical department. State age, exp., refs. and salary expected. "G 27," care Keystone office.

EXPERT jeweler, diamond-setter and engraver to take charge of shop. Only A1 man with good refs. need apply. Permanent position and good salary to the right man. Address, Albert Pfeifer, Little Rock, Ark.

A GOOD watchmaker and jeweler and first-class engraver, at once. Will pay good salary. Must have all tools. State full particulars in first letter. Address, James Kincheloe, Carrollton, Ky.

A TRAVELING man as missionary, for a large manufacturing concern, to show its goods and explain them to retail jewelers. Ad. with ref., and state salary wanted, "X 1," care Keystone office.

WANTED.

UNDER THIS HEADING THREE CENTS PER WORD.

GOOD, second-hand engraving block and American lathe. Box 446, York, Nebr.

TO purchase optical instruments. Address, "Optician," lock box 215, Springfield, Tenn.

TO correspond with watchmaker and plain engraver, who is willing to accept permanent position at moderate wages. "C 40," care Keystone office.

AT once, electric turntable, complete, for window display. Must run by primary battery. Price must be very low. O. C. Retsloff, Winnebago City, Minn.

STREET clock. State maker, catalogue number, condition. Otherwise give full description. Price, F. O. B. or delivered. Schwartz, 619 Sixteenth Street, Denver, Colo.

SECOND-hand trial case as good as new. Will exchange a Francis engraving machine or pay cash. Hansell & Co., 513 E. Main St., Stockton, Cal.

TWO 7 or 8-foot wall cases at once; oak or walnut. T. B. Phillips, Bellaire, Ohio.

LATEST improved ophthalmometer. State condition and price. Cook Optical Co., Knoxville, Tenn.

CORRESPONDENCE with watch, case, jewelry or optical manufacturer wishing to secure additional capital on favorable terms All correspondence confidential. "F 40," care Keystone.

TO buy second-hand Hardy or Meyrowitz ophthalmometer. E. H. Hagerty, Colorado Springs, Colo.

TO open branch in Minneapolis for Eastern house with first-class line of jewelry and novelties to sell dry goods, clothing and department stores. Established trade. Address, with stamp, "S 98," care Keystone office.

TO buy stock of jewelry well located and established. "Q 4," care Keystone office.

OPHTHALMOMETER, Hardy or any good make. Must be cheap. Ad., "B 68," care Keystone.

EVERY kind of gold and silverware, jewelry, watches, platinum. Market value paid. Sent by express or registered mail. Price not satisfactory, I will return all articles. J. L. Clark, refiner and sweepsmelter of gold and silver (established 1870), 727 Sansom Street, Philadelphia.

JEWELERS in financial straits, or in need of money, or having shopworn or old-style goods, have all to gain and nothing to lose by writing in confidence. Col. St. Clair Fechner, 423 Ninth St., N. W., Washington, D. C.

FOR SALE.

UNDER THIS HEADING THREE CENTS PER WORD

MADE money enough to retire; 16 years' established on the same block in the prettiest and healthiest city of the Southern Atlantic coast—selected by the government as the best place for sending sick and convalescent soldiers to recuperate. The man who buys me out need not be a watchmaker, as I am not one myself; or one who is tired of the bench will find it more healthy and profitable to run the business on my plan—department store style—jewelry, hair goods, cutlery, barbers' supplies, notions. The work of the benches—repairing, engraving, hair work, grinding etc.—averaging $160 per month, pays all expenses needed for labor, rent, light, living, etc. The departments of hair goods and barbers' supplies command a territory of 200 miles, and a population of 150,000 to draw from. Another fortune awaits a man up to date in business ideas. Terms for stock, fixtures, safes and lease: $6000 cash, or $3000 cash and $3500 on gilt-edge security. Communicate to Fegeas, proprietor of the Savannah Hair, Jewelry and Shaving Supply House, 28 East Broughton St., Savannah, Ga.

TO settle estate will sell, cheap, paying jewelry business N. E. mfg. town. Investigate quick. A rare chance for man moderate capital. Address, "F 38," care Keystone office.

SMALL stock of jewelry, bench tools, materials, etc., also book, stationery and news depot. Town of 40,000 pop. Particulars address, H. McPike, 413 Second St., Clinton, Iowa.

1 DE ZENG refractometer, good as new, $40; 1 pair rolls on upright, with extra ring roll, double, 2 handles, cost $50, sell for $35; one 20-light acetylene gas machine, price $110, will sell for $60. J. J. Palmer, 222 Twenty-eighth St., Newport News, Va.

DYNAMO for $10, good order; cost $75. Mankato Watch Factory, Mankato, Minn.

ENGRAVING machine, $25; 3 sets type. Frank Diehl, jeweler, Staunton, Va.

CHEAP.—Oak wall and counter cases. J. W. Coatsworth, Galena, Ill.

JEWELERS' large safe, burglar and fire-proof, Hall's make. A bargain. Lock box 191, Deepwater, Mo.

WELL-established jewelry and optical business. It will pay you to investigate. For full particulars address, Wm. T. Chapman, Pawling, N. Y.

$58 WILL buy a brand new Javal ophthalmometer, never used. Fitted for kerosene, gas or electric lights. Interested? Write us. T. R. J. Ayres & Sons, Keokuk, Iowa.

AT a bargain, 4 8-foot walnut counter cases, 2 upright walnut cases, 1 walnut regulator, 1 safe. Going out of business. H. O. Witte, Jackson, Ohio.

$200 WILL buy fixtures and good-will of only jewelry store in manufacturing town of 3000 pop. Late owner gone to California. Geo. MacAlpine, Warehouse Point, Conn.

JEWELRY store in best town in Oklahoma; pop. 3000. "B 66," care Keystone office.

$1000 BUYS fixtures and stock; prosperous town. Good chance before holidays. Engaged in other business. "M 52," care Keystone.

DEATH of owner causes me to offer a good, paying jewelry and optical business. Will sell for cash only. A Missouri town of 1500. No competition. Invoice $1200 to $1500. Can reduce stock. Only those who mean business write, "M 53," care Keystone office.

$25.—WHITCOMB lathe, 27 chucks and tail stock, in good condition; also fine trial case. S. M Strain, Tuscola, Ill.

CHEAP.—An electro-plating outfit, dynamo, turning lathe, polishers, burnishers, solutions and all appliances. A. V. Reeves, Genesee, Idaho.

A BONANZA for a live young watchmaker and jeweler. $1800 in tools, machines, furniture and stock for $900. This is an opportunity of a lifetime—do not lose the chance. A lovely village in central New York of 1200 pop. situated on L. V. R. R. and Cayuga Lake. No competition and all the work 2 men can do. Write quick for particulars to W. S. L. Frear, Union Springs, N. Y.

FOR SALE.

FRANCIS engraving machine, good working order, 4 sets of type; $25. Marsh & Miller, Fort Dodge, Iowa.

ONE Webster-Whitcomb lathe, foot-wheel and countershaft. Been used 2 months. F. E. Williams, Beaver Dam, Wis.

ONE *Eb* cornet, Besson best, list price $71; sell for $25. One year in use, good as new. "F 22," 811, Columbus Memorial Building, Chicago.

NEAT store in Illinois, only one in town. All tools, fixtures, safe, etc. Up-to-date stock, low rent, good trade. Invoice about $1800. A great chance for a young watchmaker. "B 69," care Keystone office.

ONE 10-foot case good order, 1 charm tray, 1 ring tray, 2 watch trays and balance plain trays; 1 2000-pound safe, all good as new; 3000 crystals. All above for half price. Address, J. J. Wills, No. 3 N. Center Street, Pottsville, Pa.

"SAUNIER'S Modern Horology," cost $16; "Saunier's Hand-Book," cost $3; "Grossman's Detached Lever Escapement"; "Adjusting Watches," by "Excellsor," cost $3; "Workshop Receipts," *Jewelers Circular*; "Text-Book of Ophthalmology," by Norris & Oliver, cost $5; "Optician's Hand-Book," by Bohne; "Anomalies of Refraction," by Tiffany; "Ophthalmoscope," by Hartridge; "Refraction," by Hartridge; "Eye Studies," by Johnson; "Retinoscopy," by Jackson; "Retinoscopy," by Thorington; "Refraction," by Valk; "Electro-Plating," by Watt; imitation slide-rest for Webster-Whitcomb lathe; face plate for Webster-Whitcomb; monogram book, cost $15; large bench turning lathe; rounding-up tool, genuine Webster-Whitcomb; flat and wire rolls on column, cost $50; dynamo and rheostat, cost $125. Best cash offer takes them. E. C. Kern, Montclair, N. J.

FINE Mosler safe, fixtures and stock of jewelry, all new, reduced to $1500, more or less. No other jewelry store. Pop. 1800. Best business between Albuquerque and Los Angeles. 2 new railroads building. Few locations equal to this. Enterprises: Lumbering, mining, stock-raising, agriculture and smelter. Town has electric lights and telephone system. Reason for selling, nervous prostration. Write for particulars. M. B. Warren, Williams, Ariz.

CASH, only jewelry store, with good-will, etc. Good run of work and trade. Invoice about $4000. A. M. Cross, Topeka, Kan.

A GOOD jewelry business in Iowa town of 800. Invoice about $1000; no competition. Or will reduce stock and sell January 1st. Must go West. Rent, $6. "F 41," care Keystone office.

A BARGAIN.—Test case, ophthalmoscope, case of watch crystals, trays and signs. Address, Box 58, Raymond, N. H.

CRAIGLITH grindstone, 1 x 12, trued; mounted on spindle, $7.50. Address, 16 Boardman Bldg., Troy, N. Y.

AN extraordinary opportunity to purchase a first-class jewelry business, with or without diamonds and watches. Has been the leading jewelry store for many years in a city of 25,000 pop. in Central Illinois. Established in 1854. Clean stock, handsome store, moderate rent. Owner desires to retire from business. Address, J. H. Melluish, jewelry store, Bloomington, Ill.

OPTICAL business clearing over $2500 a year; a bargain. "T 29," care Keystone office.

A PAYING jewelry business well established; best location in one of the best towns in Colorado. Will sell location and fixtures with or without stock. For particulars address, P. O. box 322, Boulder, Colo.

LOCATION for jewelry store, with or without stock. "Jeweler," box 528, Grayville, Ill.

$800 BUYS the only stock in a town of 7000 pop. Address, Box 325, Menasha, Wis.

CHANCE of a lifetime. Only optical business in town of 10,000. Price, $3000, including real estate, stock, horse, carriages, etc. Particulars to those who mean business. "S 95," care Keystone.

HOPKINS sliderest, practically new. T. L. Peck, Fayetteville, N. C.

ESTABLISHED jewelry and optical business, best town in the State. Stock, tools and fixtures about $8000. Retiring from business. Will trade for well located, centrally located, business property and part cash. This is the chance of a lifetime to step into a built up business. Give description and full particulars in first letter. W. C. Stull, New Whatcom, Wash.

JEWELRY business earns $2000 to $3000 profit for owner a year. Have a watchmaker who understands the trade and business who will take third or half interest if purchaser does not want all. This business is built up, it comes to you if taken care of. Come and see us do business for yourself. Box 96, Wilmington, Del.

CHRONOMETER in first-class order for sale, cheap. Address, "B 70," care Keystone office.

OPTICAL business in Canada, established 45 years. Has to be sold owing to ill-health of proprietor. Good chance for anyone with capital. For particulars apply "P 37," care Keystone office.

STOCK and fixtures of established wholesale material firm. Small capital required. Will sell ⅓ less than the cost. Large trade work and mail orders. Chance for party to travel on road. Amount of inventory on application. Hobbs Bros., Buffalo, N. Y.

JEWELER'S safe, show-case, etc.. See KEYSTONE, September issue. D. D. Knapp, Waverly, N. Y.

CHEAP.—Watchmaker's Swiss lathe, cement chucks. Wheeler & Son, Salem, N. J.

75C. on the dollar. Ohio jewelry store, county seat, manufacturing, of 10,000. Stock invoices about $4500. Established 20 years. All staple goods. Terms made to suit purchaser. "S 87," care Keystone.

A COMPLETE set of well-kept watchmakers' and engravers' tools at a reasonable price. Mrs. C. Runyeon, 126 Cajon St., Redlands, Cal.

ONE of best located and prettiest stores in Indiana. New stock, established trade; city of 8000, Railroad division. Reason, going into mfg. business. "O 8," care Keystone office.

STOCK jewelry, etc. Why not call on me and buy some of my stock, if not all? John Hammer, Alma, Wis.

DE ZENG refractometer, good as new. Have two. Sell one for $35. C. Tiffany, South Manchester, Connecticut.

JEWELRY store, first-class location. For particulars address, Lock box 12, Minerva, Ohio.

GRANDFATHER clocks! A few very fine, old, 8-day, with moon and calendar in running order, for sale. Ad., S. R. Stibgen, Marietta, Pa.

FOR SALE OR EXCHANGE.

UNDER THIS HEADING THREE CENTS PER WORD.

FIRST-class magic lantern, engraving block or music box. Box 446, York, Nebr.

WILL sell for cash or trade for good, unincumbered real estate, city or farm property. The best jewelry and optical business in Northeastern Indiana. For particulars address, "G 24," care Keystone.

NEW solid gold, 16 size, 14 K. Hunting case watch, 30 dwt. case, with Rockford, 11 jewel movement, to exchange for Francis engraving machine, latest improved, with type and silverware holders, in first-class order. S. M. Cooley, Mayville, Mich.

NEW, 8-room brick residence. Value, $1550; for jewelry store or merchandise. Address, Box 106, Milford, Ind.

ONE fine "Eagle" portable acetylene generator, Geneva prisoptometer, Oliver ring rolls, Whitcomb lathe and chucks. L. M. Guess, Crystal Springs, Miss.

66 AND ⅔ gross watch glasses, all sizes, with $15 case; will sell cheap, or trade for most anything. Prefer thoroughbred chickens or small stock. Also big lot of mainsprings. What have you? Keystone Poultry Farm, Valdosta, Ga.

A FINE model 32-40 Marlin rifle, Ballard patent, pistol grip and set trigger, with case and loading tools. Cost $40; will sell for $21. Murphy Bros., Fox Lake, Wis.

122 $\frac{38}{100}$ ACRES zinc land, surface outcropings, Stone County, Mo. Price, $1000 cash, or clean stock watches, jewelry. Address, A. C. Hailey, Cassville, Mo.

LATHE with chucks or other articles for good make typewriter. W. A. Dean, Tivoli, N. Y.

ONE No. 4 Remington typewriter, good condition; one polishing lathe and outfit, new; large brass balances. Want saxophone or salable goods. C. E. Van Voorhis, Yates Center, Kansas.

COMBINATION ladies' and gents' tandem in good condition. Will trade for phonograph and records. Care of "Jeweler," box 57, Monona, Iowa.

TOWN lots in Texas for slide-rest, Moseley No. 2, typewriter or engraving machine. Address, W. R. Crawford, McKenzie, Tenn.

KEYSTONES from '91-'99. Address offers to W. J. Hanks, Postville, Iowa.

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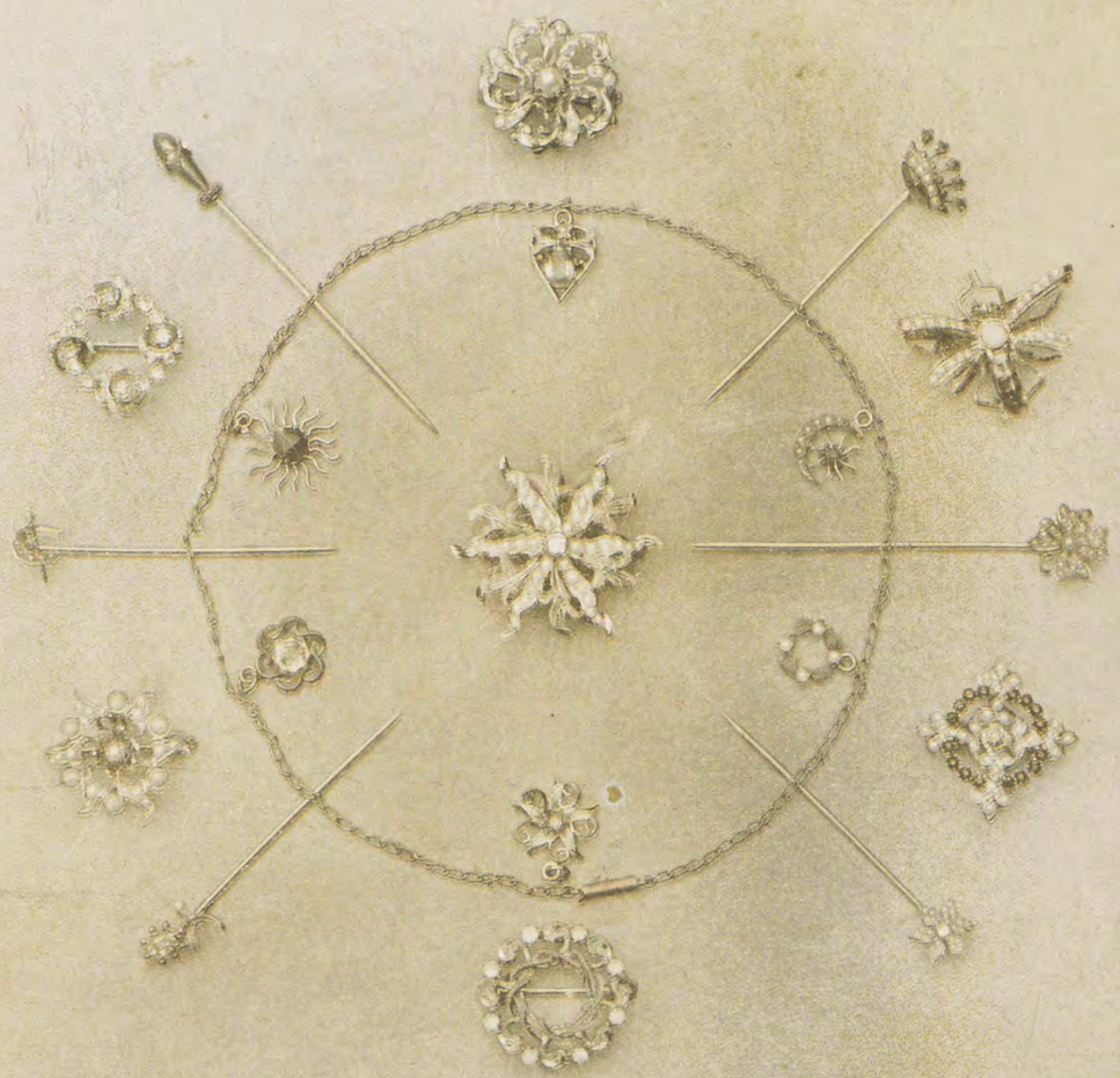

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