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IN THE INTEREST OF THE JEWELRY TRADE.

Volume 9. Philadelphia, November, 1888. Number 11.

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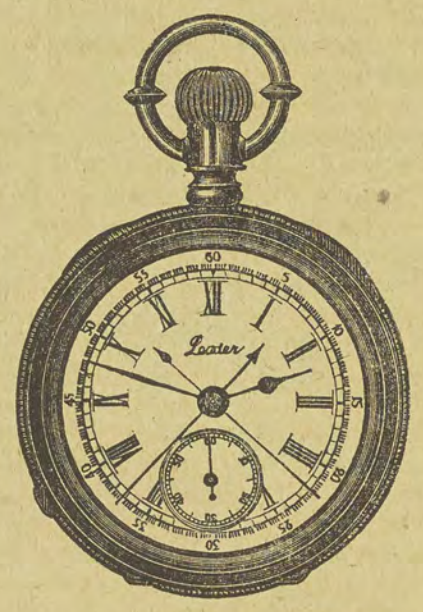

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THE KEYSTONE.

Volume 9. Philadelphia, November, 1888. Number 11.

WORKSHOP CHEMISTRY.

By the Professor.

NITROGEN unites with chlorine, forming nitrogen chloride, one of the most violent explosives known, but it presents no particular interest to the workshop student. Nitrogen unites with iodine also, producing an explosive so sensitive as to explode with the slightest touch. The most important combination, in a workshop sense of nitrogen, is its union with oxygen, forming nitric acid, HNO_3. The ordinary *aqua fortis* of the shops is an impure nitric acid, and usually contains both sulphuric and muriatic acids. For many purposes in the arts, this is to be preferred to chemically pure nitric acid. Aqua Regia is a mixture of nitric and hydrochloric (muriatic) acid; the proportions being two of muriatic to one of nitric; the chlorine being the active principle in attacking the metals to be dissolved. There is an anhydrous nitric acid of no special interest. The term "anhydrous" means without water, consequently, anhydrous nitric acid means nitric acid free from water. Anhydrous salts means salts which contains no water combined in the process of crystalization, as for instance, saltpetre is an anhydrous salt, while borax and alum contain water united in the process of crystalization. A very good illustration is in plaster of paris. In this substance a large proportion of water is present, which has to be heated much above the boiling point to cause it to be thrown out of combination. The terms "burned alum" and "calcined borax" mean simply that the water of crystalization has been driven off by heat. The same explanation applies to calcined plaster of paris. This substance, when it gets in such a condition that it will not "set" or harden when mixed with water, can be restored by heating to about 400° F.

Nitric acid can be tested for purity, in regard to mixture of muriatic or sulphuric acids, by the following tests: Dilute one ounce of the nitric acid to be tested with four or five of distilled water; divide the mixture into two parts in separate glasses. A solution of pure silver nitrate in distilled water is dropped into one vessel, and a solution of barium nitrate into the other. If no change ensues it is proof that the nitric acid you are testing is free of muriatic or sulphuric acids. The whys and wherefores of these tests are, first: when the solution of silver nitrate is added to one portion of dilute acid, if any muriatic acid was present, it would combine with the silver, forming chloride of silver, showing a white curdy precipitate. Second: if any sulphuric acid was present it would decompose the barium nitrate, and form barium sulphate, also a white precipitate. If nitric acid stands these tests, it is pretty good evidence of its purity, as this acid is seldom sophisticated with other substances. The test for strength is in its specific gravity. Chemically pure nitric acid should be 1.42 specific gravity; and is worth about twenty-five cents per pound in small quantities, and twenty cents in seven pound packages. Nitric acid is easily produced by distillation from saltpetre and strong sulphuric acid. It will require, however, a different apparatus from anything we have so far used, as the cork would be destroyed by the acid. At Fig. 21 is shown a suitable apparatus, and consists of a retort *A*, and condenser *B*, both of glass. At *a* is fitted a ground glass stopper for introducing substances to be treated, and at *b* the neck of the retort *A* is ground and fitted to the neck of the condenser *B*. The condenser *B*, when used, is covered with cloths wet with cold water, and the retort *A* heated with an alcohol lamp or a Bunsen burner. To produce nitric acid with this apparatus, put equal weights of strong sulphuric acid and saltpetre in the retort *A*, and apply heat to *A*. At first, red fumes are evolved, but these gradually disappear, until near the

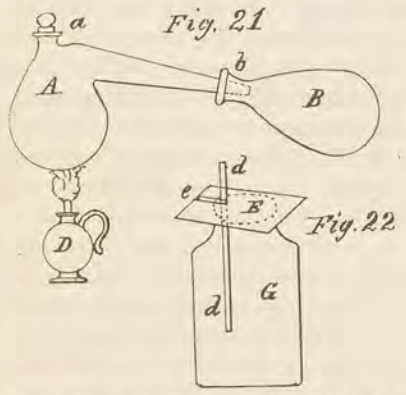


Fig. 21

Fig. 22

finish of the operation. As soon as the red fumes commence again, it indicates the process is over, and the lamp should be removed. The stopper at *a* must be lightly set in place, so if any undue pressure occurs, it will act as a safety valve. The condenser *B* must be kept constantly wet with cold water applied to the cloths above mentioned. The source from which the nitric acid is obtained, is the saltpetre, also called nitre. This salt is produced abundantly in tropical climates, and is in chemical phrase "potassium nitrate." In the retort, by the aid of the heat applied, the sulphuric acid unites with the potassium, setting the nitric acid free in the form of vapor, which the condenser reduces to a fluid. There is something remarkable about the boiling point of nitric acid, it varying with the strength. Nitric acid of the specific gravity 1.5 boils at 210° F, and of 1.45 s. g,, boils at 240° F. There are several other combinations of nitrogen and oxygen, approximating the nitric acid form, but only of minor interest. The remaining combination calling for special notice is Nitrogen Monoxide, N_2O, called also nitrous oxide and *laughing gas*. The use to which this gas is principally applied, is as an anesthetic in dental operations. This gas is readily prepared by heating ammonium nitrate in a flask, as shown in Fig. 2 (August KEYSTONE), collecting the gas over warm water (as cold water absorbs it.) A rubber gas bag, as described for holding hydrogen, can be used to receive and store this gas. No particular care or skill is required to produce it, except to avoid too rapid heating.

It seems strange that the balmy morning air we breathe with so much pleasure and satisfaction is composed of precisely the same elements as corrosive nitric acid, yet such is the fact, except in the case of nitric acid, the combination is a chemical one; while with air, it is a mere mixture, leaving the oxygen free to combine with any substance under the slightest affinities. The next element we will consider is carbon. This element occurs pure in nature in the form of diamond and graphite, or black lead. A few years ago graphite was considered a combination of iron and carbon, and text-books gave three distinct combinations of iron and carbon, viz: steel, iron with a percentage of one-half to two per cent. of carbon; cast iron, iron with three to six per cent. of carbon, third graphite, iron with an excess of carbon. Now it is well-known that the iron in graphite is only an impurity. Carbon in some form is united with many mineral substances, but it is in its combinations in the animal and vegetable kingdoms that it plays its most remarkable parts. While it is not the purpose of these articles to speak at any length of chemical principles not applicable to some useful end in the workshop, still, some chemical phenomena, which for the present can only be considered of abstract interest, may at no distant day be made to aid man in his endeavors and purposes. Does any one imagine Volta or Franklin, in their first experiments with electricity, would have believed that man would yet harness this subtle agency, and make it a servant to carry his messages under oceans and across continents? Yes! even drag his chariots (street cars) at a touch of his finger. What we least understand at present, chemically speaking, is how to convert at will, light into other energies, viz: heat and electricity. Carbon is the element in nature through which light, by chemical action, stored up our coal fields. But I will have occasion to speak further of these matters, when considering light, heat, and electricity. Carbon unites with oxygen in several proportions, and has already been briefly mentioned. A few of the more important combinations can, however, be mentioned a little more at length.

Carbon Dioxide, CO_2, or *carbonic acid gas*, as it is more generally termed, will not sustain combustion or animal life. It can be produced by the action of dilute sulphuric acid on chalk or marble dust. The apparatus shown in Fig. 2 serves to produce it. A gas bag, or the device shown at Fig. 22, should be used to receive it, as water absorbs it volume for volume. This gas is colorless, with an agreeable prickling taste and pleasant odor, as all know who drink soda water; the bubbles in this beverage consisting of this gas. It is so much heavier than common air, that it can be poured from one vessel to another, although the transfer is invisible to the sense of sight. A hundred cubic inches weigh 47.25 grains, and is in round numbers one and one half times heavier than air. It forms the bulk of fire damp in wells and old cellars, and is always produced where charcoal is burned in the open air. Carbon monoxide, CO, called also *Carbonic Oxide*, is prepared by passing carbon dioxide over red hot charcoal or iron, which robs it of one-half its oxygen. This gas, though containing less oxygens, is combustible. It is almost odorless, perfectly colorless, and highly poisonous. Carbon unites with sulphur, forming Carbon Disulphide, or Bisulphide, a substance used extensively in the arts. Gutta percha dissolved in this solvent, is the material employed for attaching the so-called invisible patches of the shoemaker. It also dissolves sulphur, phosphorus, iodine, camphor, caoutchouc (native rubber,) and most of the rosins. The solution of gutta percha joins leather belts, and forms a useful water-proof cement for many purposes. Carbon also forms a Monosulphide CS, but of no known importance for workshop purposes. Carbon unites with nitrogen, producing Cyanogen, CN, the active principle in potassium cyanide. Cyanogen gas is colorless, and has a peculiar, bitter almond smell. It is almost twice as heavy as air, and burns with a lilac colored flame. Cyanogen unites with hydrogen, forming the well-known prussic acid. Carbon unites with silicon, but the compounds are of minor interest.

We will next consider the element chlorine. This substance is allied to iodine, bromine, and fluorine. It does not exist in an isolated state in nature, and in order to procure it in a pure state, we must separate it from some of its compounds, like common salt, where it exists in combination with sodium. This gas has a yellow green color (from which it derives its name), a suffocating smell, and is nearly two and one-half times as heavy as common air. Under a pressure of about sixty pounds to the inch, it condenses to a yellow transparent liquid. This gas is fatal to animal life, but supports combustion, phosphorus and copper leaf taking fire in it spontaneously. Water absorbs twice its volume of this gas, and then possesses great bleaching

and disinfectant properties. Exposure to the light soon decomposes the watery solution. Linen or cotton goods, stained with fruit or almost any substance, will be bleached perfectly white in a few minutes, by soaking in chlorine water. Chlorine gas can be procured by pouring muriatic acid on pulverized black oxide of manganese; using the apparatus shown in Fig. 2. The gas can be collected over salt water, or better allowed to flow into a glass jar covered with a piece of thin board, shaped as shown in Fig. 22, where *G* represents the glass jar, *E* the wooden cover, and *d* the tube from the retort. The first gas which comes over is to be allowed to go to waste, as it is impure. The bleaching properties of chlorine are among its most noticeable features, not only in its mild aqueous solution, but in its stronger combinations, as for instance, in chloride of lime. The bleaching power of this substance is remarkable, and well worth attention. Ink stains on white marble disappears as if by magic from a paste of this substance being applied.

HISTORY OF TIMEPIECES.

The sun dial of Ahaz is the first record of a time-keeper, that the obelisks of the Egyptians were intended as gnomons, and that the next record of a sun dial was the hemicycle of the Chaldean astronomer, Berosus, 450 B. C. The clepsydra, or water clock, was the next contrivance for measuring time, used by the Chaldeans; but clocks were set up in churches as early as 1174, and in the reign of Henry VI. a pension was granted to the Dean of St. Stephen's for taking charge of a clock in Palace Yard, Westminster.

In 1326, Richard Wallingford, abbot of St. Alban's, placed a clock in his monastery which showed the hours, the motion of the sun, the changes of the moon, the ebb and flow of the tide, etc., and the account of this clock is still preserved in the Bodleian Library at Oxford. In 1340, Peter Rightfoot, a monk of Glastonbury Abbey, made a clock which at the Reformation, was removed to Wells Cathedral, and the original is now to be seen at the South Kensington Museum. The clock for the Strassburg Cathedral was begun in 1352, and finally completed in 1574 by Conradus Daspodius.

The use of the pendulum for securing accuracy of time was first adopted by Vincent Galileo, in 1648, and the anchor escapement for regulating it by Dr. Hook, 1666. The most remarkable episode in the construction of time-keepers is the lever escapement, invented by Thomas Mudge, in 1770, the last epoch in the history of the watch. The progress of the last fifty years in watch making has consisted rather in the perfection of proportions than in the introduction of new principles.

At the International Inventions Exhibition of 1885, Kendal and Dent exhibited a horological novelty of a watch with two dials placed back to back, with the movement between them. On one dial was marked the old divisions of twelve hours, and on the other, the suggested hour circle with twenty-four divisions.

FOR a gent's birthday present a silver match box, engraved in Grecian squares, the centre of which forms an antique scroll wheron the name of the recipient may be inscribed, is recommended.

CLOCKS.

WE would beg to say that the description of the gridiron pendulum rod, published in October KEYSTONE, was copied from the article "Horology," by Mr. Thomas Reid, in the "Edinburgh Encyclopedia." The present description of a zinc compensation is also from the same source. The greatest objection to a zinc tube as described is the labor attending the making. The writer has constructed a zinc compensating rod, formed of two strips or bars of sheet zinc, which he will describe and illustrate in the next issue of this journal.

REID'S PENDULUM.

Mr. Thomas Reid's compensation pendulum is composed of a zinc tube AB, and three steel rods, *ab*, *cd*, *ef*. In order to obtain a proper tube, the zinc must be very gently fused into a bar about an inch square, and 24.25 inches long, and the mould into which it is poured should be upright, or nearly so. Let this be very carefully hammered to half an inch per foot, meanwhile keeping it pretty warm, to prevent cracking or breaking. After this operation, a hole is pierced straight through the bar, from end to end, and opened up by means of a clean cutting broach, until it is .450 of an inch, or so, in diameter. The outside may be turned down till it is .7 of an inch, or less. The length should be 25.34 inches, the same as the zinc rods were taken at. The steel rods must be a quarter of an inch in diameter; the length from pin to pin, in the upper and lower traverses of the two outside steel rods *c d*, *e f*, 27 inches, five or six inches more being prolonged to go within the ball. In the middle of the lower traverse pinned a *m n* is steel rod *g h*, somewhat more than a quarter of an inch in diameter, and nine inches long, which comes through the centre of the ball, which is fitted up in the same way in every respect as was described for the gridiron pendulum. The steel centre rod *a b* goes up inside of the zinc tube, from the pin which is in the lower end of it, which is in a traverse, a very little above the lower one, to the upper end of the pendulum spring, 36.75 inches; from the pin in the lower end of the centre rod, to the centre of the ball, 4.75 inches. A hole in the upper traverse *o p* allows the centre rod to pass freely through. The lower end of the tube rests on the traverse *g r*, in which the centre rod is pinned. The upper traverse bears on the upper end, both traverses having a part turned from them, about one-tenth of an inch in height, and of such a diameter as to go into the ends of the tube, for the purpose of keeping it to its proper place. The distance from the centre of the holes in the upper and lower traverses, about 1.25 inch, which will be enough to make the two outside steel rods stand clear of the zinc tube. A thin piece of brass, with three holes in it for the outside steel rods and tube, might be put half way between the ends of the tube, to prevent any bending, or tremulous motion; a thing, however, not likely to take place. It would be proper to have a few holes in the tube, for the purpose of admitting air more freely to the centre rod.

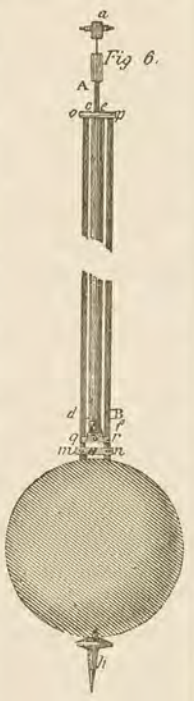


Fig 6.

The centre steel rod *a b*, when lengthened by heat, will make the lower end B of the zinc tube, (which is supported by the lower end *b* of the steel rod *a b*,) descend with it, but the same cause which lengthens the steel rod *a b* downwards will expand the zinc tube AB upwards, and this will carry up the two outside steel rods with which the ball of the pendulum is connected; their expansion downwards, as well as that of the centre rod, is compensated by the upward expansion of the zinc tube. The length of the steel rods and of the zinc tube, has been shown to be in proportion to their expansive ratios.

Joseph Tanner, Prescott, Ont., writes as follows: "I consider the KEYSTONE the best publication of the kind for watchmakers, jewelers, and their apprentices to read regulnrly. It contains more information of value than any other."

HOW TO PROVE THAT THE EARTH TURNS.

It has puzzled the heads of a good many youngsters to know how the earth turns round, says the *Court Journal*. A German educational journal published in Frankfort gives the following directions for proving that the earth "does move." Take a good-sized bowl, fill it nearly full of water, and place it upon the floor of a room which is not exposed to shaking or jarring from the street. Sprinkle over the surface of water a coating of lycopodium powder—a white substance which is sometimes used for the purposes of the toilet, and which can be obtained at almost any apothecary's. Then upon the surface of this coating of powder make, with powdered charcoal, a straight black line, say an inch or two in length. Having made this little black mark with the charcoal powder on the surface of the contents of the bowl, a stick or some other straight object, so that it will be exactly parallel with the mark. If the line happens to be parallel with a crack in the floor, or with any stationary object in the room, this will serve as well. Leave the bowl undisturbed for a few hours, and then observe the position of the black mark with reference to the object that it was parallel with. It will be found to have moved from east to west—that is to say, in the direction opposite to that of the movement of the earth on its axis. The earth in simply revolving has carried the bowl but not the water, which is demonstrated by the black line on its surface. The line will always be found to have moved from east to west, which is perfectly good proof that everything else has moved the other way."

AMONG the curiosities at the Glasgow exhibition are a watch made by Hugh Wilkie and three horseshoe nails. The nails, driven into a kitchen table, the exhibitor avers, formed the lathe, by which the whole of the turning of the wheels, pinions, staffs and pivots was accomplished.

The King of Portugal has a 426 carat diamond valued at $28,000,000.

WORKSHOP NOTES.

"ENQUIRER" asks "how can I remove the silvery looking coat left on gold after hard soldering?" Immerse in a mixture of equal parts of strong sulphuric acid and saltpetre. A few seconds will do it.

"MERCURIAL PENDULUM" asks for "the height of mercurial column to compensate?" This correspondent also asks about zinc compensation. Reid says for a pendulum rod 43.5 inches, a column of mercury 7.5 inches is required. Actual tests have convinced us that 8. inches is nearer the required height for this length of pendulum. The difficulties attending the exact relative adjustments induced us to adopt auxiliary compensation to regulate small errors, which will be explained at the proper time in the article on "Clocks," now running in our columns. The kind of zinc to be used is zinc rod (drawn) three-eighths of an inch in diameter. Zinc expansion is so near two and one-half times the ratio of steel, that we are pretty safe in adopting it, as different samples of these metals would change the ratio either way. Zinc rod, of the size mentioned above, can be had of E. L. Hall & Co., 19 N. Seventh St., Philadelphia, Pa. It comes in lengths of six feet. A detailed description of a zinc two rod compensating pendulum will be given in December KEYSTONE.

"OLD SUBSCRIBER" asks "how to fasten the small second-hand dials which so frequently come loose in sunk second watches?" Take mastic tears, *i. e.*, gum mastic, which come in little round drops, and pulverize them. Place the second dial in the proper position; the whole dial face down; make a little ring of the mastic dust over the joint, then heat over your alcohol lamp until the mastic melts. As soon as the dial cools, shave of the excess with a knife.

"A READER" asks "how to preserve the color of gold when hard soldering?" Cover the job with a coating of yellow ochre, mixed with a little borax and water.

WE have had a great number of enquiries for processes in regard to electro-plating and gilding. We have given repeated processes of this kind, and propose to give a series of articles on these and kindred subjects, and finally publish it in book form, like our work on "Engraving," by Cellini, Jr.

"OLD GOLD" asks "how steel is gilt, like as we see on the eyes of needles?" Dissolve pure gold in nitro-muriatic acid, (two parts muriatic to one of nitric,) as long as the acid (warmed) acts on the gold. Put the acid containing the gold into a bottle large enough so the acid will only about one-third fill it. Add to this twice the volume of sulphuric ether, and shake well. The ether will rise to the top, and contains all the gold. Any steel article immersed in the ether, will instantly be coated with gold.

"ECONOMY," asks "is there any cheap substitute for alcohol?" Methylic alcohol costs about one dollar a gallon less, and for many purposes is equal to ordinary alcohol.

ENAMELING.

A series of articles on this art by Cellini, Jr.

WE are at last to the part of the process of applying enamel to the work. Any enameler, who will be candid, will tell you that much depends on the engraver. This part of the subject has been carefully gone over, and if the reader will master the details given in the early numbers of these articles, he will be able to do the cutting in such a manner as to afford good specimens for his first attempts at filling and firing. To fill the cut recesses, a spatula is used, proportionate to the size of the work. In many jobs a broad surface is to be produced, like covering the whole back of a watch case. Such jobs require a broader spatula than would be needed for narrow surfaces. For experiment, the specimens of work given in June KEYSTONE are about right. The ground enamel is wet with water into a moist state, and plastered into the recesses with such sized spatulas as one's own ingenuity would suggest. The process is very much like filling in recesses with putty by a painter, and tools which in one man's hands would answer admirably, would totally fail in another's. Two important features are the enamel must be dried slowly and heated slowly, until it ceases to steam, and *not allow to cool off until fired, i. e.*, fused in the furnace. If by any accident a job gets cooled off, heat again very slowly up to about 600° F, (this is the temperature where lead melts and steel turns dark blue). Before firing, use copper for your first experiments. Many enamelers show silver specimens, but I warn the novice to let silver alone until he has mastered copper, because silver is a nasty metal to enamel at best, as he will learn if he attempts to work with it at first.

The "*firing*," or fusing the enamel in the recess filled with the granulated enamel, is the next thing in order. Small recesses can be filled with black enamel, and fused with the blow pipe; but high fine colors need to be protected in a "*muffle*." These muffles can be procured of all large material houses, or from the manufacturers, like J. & H. Boulter, 1609 North Street, Philadelphia, Pa. They are made of fire clay, and cost from 75 cents to $1.00. They are in fact a very small oven, which is to be heated from the outside until red hot. Into this red hot muffle the work to be enameled is placed on a perforated iron plate, and gradually pushed forward as the heating process advances. These muffles will stand a white heat, but modern enamels melt at a much lower temperature than was supposed to be necessary a few years ago; but it must be confessed that they are not as fine as either. We will let this part rest for the present.

Furnaces for enameling are to be had with places provided for receiving the muffle, but these cost from $18 to $35, and are made usually to use coke as a fuel; but the most desirable are using gas as a fuel. These last are very expensive. We are well aware many of our readers would like to experiment with enameling, but would hesitate about incurring so much expense. A furnace can be built of common brick and heated with coke to answer very well. A muffle, however, is indispensible. In making a furnace, it is important it should be located so as to have a good draft. This can be accomplished by having the furnace built so that it is near a chimney or flue. A furnace of this kind can be constructed to have a stove pipe attached, and used precisely like a stove. Such a furnace can also be used for gold assay. In our next issue we will give a full detail description of such a furnace, also a melting furnace built on the same plan.

A FINE, LARGE GARNET.

In our illustration is shown the finest, large garnet crystal ever found, perhaps, in the United States, and discovered, strange as it may seem, in the midst of the solidly built portion of New York city. It was brought to light by a laborer excavating for a sewer in West Thirty-fifth Street, between Broadway and Seventh avenue. A quartzite vein, traversing the gneiss, contained the crystal.

A Remarkable Garnet.

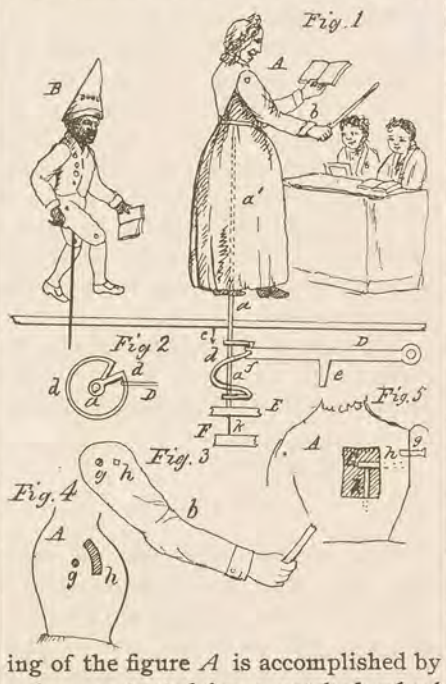
It weighs nine pounds ten ounces (4.4 kilos,) and measures fifteen cm. (six inches) in its greatest diameter, and six cm. on its largest trapezohedral face. Twenty of the trapezohedral faces of the crystal are perfect, while the remaining faces were obliterated in the formation of the crystal by pressure against the quartzite matrix. On the surface the color is a reddish brown, with an occasional small patch of what is apparently chlorite, which greatly enhances its beauty. On a fractured surface, however, the color is a light almandine, and the material in the interior of the crystal is found to be very compact.

This "find" is of peculiar interest, because within the past few years large garnets have been brought to light at other localities in this country, notably at Salida, Colo., where large almandine crystals occur, which are very perfect. In Burk county, N. C., where garnets are mined for emery purposes, they are found in sufficient quantities to warrant the establishment of grinding mills. Although both of the above localities have afforded large crystals, yet no finer crystal of its size than the one here illustrated has ever been found.

THE director of the United States Mint has reported that, according to his established methods of computation, the gold production of the United States for the calendar year 1887 was $33,093,000, compared to $34,869,000 for 1886, and the production of silver $53,418,800, compared to $51,321,500, for 1886. The world's consumption of gold and silver in the arts for the year 1886 is estimated at $46,000,000 gold and $22,000,000 silver. The world's production for 1886 he estimates at $98,764,235 gold and $126,457,500 silver.

JACK-KNIVES.

IT frequently occurs in automatic figures that a horizontal turning motion is desirable, as for instance, a certain figure is required to turn around, or half around. Of course, such figures cannot be cut from paper or thin wood, but must be made of some material which will represent the body as having thickness. Wood, all things considered, answers for such figures the best of anything, as it is light and strong, and is readily shaped. It is usually best to make full figures in parts, and then glue the parts together. The pith watchmakers use to clean pinions, glued together, make nice figures, only they are frail and will not stand much handling. But where anything of this kind is required very light, it is the best possible material, and it colors up beautifully with water colors. Suppose we have a figure of a woman, as shown in Fig. 1, which we wish to turn about to watch the little darkey at *B*, with the dunce cap on his head, who, as soon as she turns her back, commences to dance. The turning of the figure *A* is accomplished by a lever actuated by a notched wheel placed on the arbor of the second wheel. Not, however, like the wheel shown in Fig. 2, October KEYSTONE, but with several notches. We will first understand how the woman is made to turn and face about. The figure is mounted on a piece of ordinary joint wire, as shown at *a*, *a'*. The dotted lines at *a'* show where the wire extends up into the figure of the woman. The object of using joint wire is to allow a very fine steel wire to extend up through the hollow joint wire *a*, and move the arm and rod *b*, Fig. 1, up and down. The joint wire *a* has a piece of a spiral coil of steel wire attached, as shown at *d*. To explain how this acts, suppose we wound on a rod three-eighths of an inch in diameter, some No. 22 wire, until we had half a dozen coils; we should then pull the coils apart until they are about half an inch asunder. Now we want to use about one coil of this wire bending the ends in, so as to be attached to the joint wire *a*, in such a way that the centre of the coil corresponds to the centre of the joint wire, as shown in Figs. 1 and 2, where Fig. 2 is an end view of the spiral seen in the direction of the arrow *c*.



At *D*, Fig. 1, is shown a lever, with a fork at the end shown at *f*. This fork grasps the spiral wire *d*, and it will readily be understood that any up and down motion of *D*, will cause the spiral to revolve, carrying the figure along with it. At *e* is shown a piece extending down from *D*, to engage a wheel placed on any of the arbors, such as have been described in September and October KEYSTONE. In making the notches in the wheel to act on the projection *e*, they should be cut so the woman would turn sometimes quickly and sometimes slowly. The arm *b* is jointed at the shoulder, and the body of the woman is morticed in the back, so the small wire working through the joint wire will raise the arm. At *E*, Fig. 1, is shown the support for the foot of the wire *a*. The fine steel wire *k*, which works the arm *b*, passes through the piece *E*, and rests on the end of the lever *F*. Only a part of the lever *F* is shown, as it is not supposed to be necessary to give every detail, but rather suggest such parts as are needed, and give a general idea of principles, letting the reader arrange the parts to suit his fancy. The lever *F* should be connected to a notched wheel, placed on the third wheel arbor. The recess in the back of the woman, which contains the mechanism for working the arm *b*, can be covered by a small bit of red or blue silk, cut to represent a shoulder shawl. The arrangement for working the arm is very simple, and consists of a joint or pin *g* on which the arm turns, and a wire pin *h*, extending from the arm into the mortice or recess *G*, made in the back of the woman. The inner end of the wire *h* is flattened so as to not miss the end of *k* as it rises. The arm *b* is allowed to fall until the wire *h* rests on the bottom of the circular slot, shown at *h*, Fig. 4. It will be noticed that the action of the wire *k* is the same, no matter how the woman faces, as the point of *k* turns freely on the lever *F*. The lower end of the joint wire *a* steps into *E*, and *E* has a hole large enough to permit *k* to pass, but support *a* all right. The dunce *B* is made to dance and desist, as described in October KEYSTONE, and the parts are arranged so the instant the teacher turns, the boy stops dancing.

THE Treasury Department Bureau of Statistics has just issued the summary statement of imports and exports for the month ending August 31, 1888. A careful comparison of the figures given, with those of the month of August, 1887, will be of interest:

IMPORTS.—Clocks and parts, 1888, $50,733; 1887, $45,395. Watches and parts, 1888, $126,988; 1887, $150,528. Jewelry and manufactures of gold and silver, 1888, $168,645; 1887, $139,478. Unset precious and imitation stones, 1888, $1,084,312; 1887, $1,295,709. Rough and glaziers' diamonds, 1888, $525; 1887, $41,784.

EXPORTS OF DOMESTIC MERCHANDISE.—Clocks and parts, 1888, $83,550; 1887, $84,551. Watches and parts, 1888, $25,000; 1887, $13,122. Jewelry and manufactures of gold and silver, 1888, $31,698; 1887, $37,636. Plated ware, 1888, $46,661; 1887, $72,553.

EXPORTS OF FOREIGN MANUFACTURES.—Watches and parts, 1888, $182; 1887, none. Clocks and parts, 1888, $9; 1887, none. Jewelry and manufactures of gold and silver, 1888, $121; 1887, $305. Unset precious and imitation stones, 1888, none; 1887, none. Rough and glaziers' diamonds, 1888, none; 1887, none.

AN American economist says that every five dollars of precious metals dug out of the earth since 1850 has cost six dollars.

GOLD WORKING.

Extracts From the Work of George E. Gee, on Gold Working, with Notes by the Editor of this Journal.

COLLECTION AND TREATMENT OF JEWELER'S LEMEL.

HAVING comprehensively described the art processes, mechanical and chemical, comprised in the business of a goldsmith, we shall now proceed to explain with some amount of detail the economical processes of a jeweler's establishment. The practice of economy, strictly enforced, is the only true safeguard of the goldsmith against misfortune. His trade reminds us somewhat of the professional money-changer, who exchanges 19*s.* 11½*d.* for a sovereign. The goldsmith or jeweler, however, has not only bad debts to guard against, but also the serious item of waste of material. For in all the various processes through which the precious metal has to pass; with every touch of the file, of the lapidary's wheel, and each application of the polishing mixture, every revolution of the drill, and stroke of the various tools employed, as well as each time the work is annealed and boiled out, minute portions of gold according to the quality of the alloy are detached. Waste therefore is one of the chief features to be seriously considered and avoided in every jewelry establishment.

To begin, we shall say a word or two about the economy of jeweler's *lemel*, which consists of the very small particles of gold-dust removed from the various articles under process of manufacture by means of the file, turning-tool, graver, etc. It is almost impossible to keep this lemel or gold-dust free from organic matter and impurity; and the consequence of this is fully apparent in the loss occasioned in its collection, although it is always done separately and with care.

Workmen have the gold weighed out to them, each one being responsible for his own portion; and the operatives employed in its manufacture have to account for, and weigh up to within a grain of, the quantity given out to them; always deducting therefrom the usual allowance for waste or loss in working, which commonly amounts to six grains to the ounce, in the making department. This allowance constitutes or forms another kind of waste, of which we intend to speak hereafter. For the scrap, dust, and refuse of every kind, is carefully swept up from the floor of the work-shop twice a day, sifted and well searched for the purpose of detecting any small portions of gold which may be visible to the naked eye. When this is done, the refuse which remains is scrupulously taken care of and sold to the refiner who will give the most for it.

Lemel is subjected to various kinds of treatment in the different workshops of this country, everyone claiming to employ the best method for its recovery. There is, however, a great deal yet to be learnt before the economical processes (as we call them) belonging to the jeweler's trade, have attained perfection; at least, so far as some houses are concerned. In some establishments the workmen are allowed to weigh-in their lemel in a most dirty state, that is, containing a considerable amount of organic matter; the usual allowance for loss in working being granted, it operates injuriously against the economy of the business arrangements. Such conditions are certainly in favor of the workmen, but they encourage a tendency to exercise less care than is right for the property and welfare of their employers.

There are, however, better methods than these, which may be put into operation without inconvenience, and should commence in the first instance with the workmen. By the adoption of the following plan, the operation commonly attendant upon the employer or his manager (such as sifting and examining the lemel for the detection of iron and steel filings, organic matter, etc.,) should be performed by the workmen before weighing it into the warehouse, where their responsibility ceases. This may be very simply performed by providing an iron ladle, and the lemel should then be treated as follows:—Sift it well through a fine sieve to separate the small portions of gold from the dust, letting the lemel fall on to a clean sheet of paper provided for the purpose; this should then be carefully put into the iron ladel, and heated until all the organic matter is entirely destroyed. When the burnt lemel has sufficiently cooled, put the magnet through it in order to collect and remove whatever iron or steel filings may be contained therein. This should be a part of the responsible duties of each workman, and ought to be strictly enforced. The scrap should be always separated from the lemel. Its treatment has been already spoken of.

There are two methods in use for the collection of the lemel; the first is performed in the following manner. Take—

Lemel or gold-dust	12 ozs.
Carbonate of potassa	2 "
Common salt	1 "
	15 ozs.

Well mix the lemel with the salts, and then place the preparation in a skittle-pot, after which place a layer of common salt on it, and transfer it to the furnace. A greater proportion of the mixture should not be put into the crucible than will fill it to within one inch of the top, to be safe, as it rises in the furnace and may overflow. When the fire is at its height, the heat must be continued for half an hour longer; the pot, at the expiration of that time, must be carefully withdrawn, and placed aside to cool, when it may be broken at the bottom with a hammer, and the gold will then be found in a button. A little nitrate of potassa (saltpetre) may be added occasionally when it is in a state of fusion, in order to refine the mass more thoroughly; but the saltpetre must be added with very great care; for if too much be put in, and organic matter be still present, it will rise above the top of the melting-pot, and carry some portion of the precious metal with it. This may be prevented, however, by the timely application of a little extra dry common salt, in powder, and, if added at the proper moment, no evil consequence will result. The button of gold, which will consist of an alloy of gold, silver, and copper, may again be melted with a little potash, borax, or charcoal as flux, and poured into an ingot-mould; it may then again be worked up, if of proper quality after assay (there is no advantage in this), or granulated and refined as may be desired.

The reducing, or collecting salts should be used in proportion to the lemel sought to be recovered, and in about the quantities we have given. We have used sal-enixon instead of the saltpetre as the refining agent, and prefer it for many reasons; first, it is considerably cheaper and answers quite as well—perhaps better; and, in the second place, it keeps the flux and lemel towards the bottom of the crucible, which the saltpetre does not.

Another good plan, and one which has found great favor with some manufacturers, is to put the lemel in an ordinary melting-pot, with a very little flux, such as carbonate of potash or soda; and when it is well melted the crucible must be withdrawn and the contents poured into a casting-mould. The lemel bar may at once be sent to the refiners for sale, or may be exchanged for new gold. By adopting this plan goldsmiths are not subjected to so much loss through having had an indifferent working gold, as no lemel will be in these bars. Lemel is the principal cause of bad gold, the unworkable qualities of which are to be adjudged more from the presence of this, than any other reason.

G. E. Willey, Portland, Mich., writes as follows: "The KEYSTONE is an invaluable aid to the craft, both as to information new and crisp, and as an advertising medium. Your premium book alone is worth many times the subscription price."

TRAVELING SALESMEN.

Traveling salesmen have become indispensable to the modern merchant. In the present ultra-competitive condition of the commercial world there is no available substitute which can be relied upon to do their work, and with the increased competition of the future, still more arduous duties will devolve upon them. If, then, more is expected of the trade emissary to-day than was required of his predecessors, the greater the need of care and judgment on the merchant's part in the selection of those who on the road are to uphold the dignity of his house, and with such a broad and constantly widening field for usefulness we should look to see ability of the highest order engaged in this sphere of activity. This does not seem to be the general rule in the jewelry business, however, where the heresy that any able-bodied man is competent to sell goods is spreading fast, especially in the east. There is no lack of that verdant and precocious class of striplings whose sole equipment for their work consists in the muscular strength to carry a sample box and intelligence enough to board the train west, but the thoroughly reliable and efficient salesman, who is willing to make a study of his profession, is one we must search for to find. The economic maxim that cheap labor is dear labor is, we fear, not so well understood by the jewelry trade as it ought to be.

A salesman should have at least in some degree the social and mental qualities of the trade he caters to, if he is to make an impression on them. A manufacturer, therefore, whose customers are men of any calibre at all pays them but a dubious compliment in sending out a boy to treat with them. For to enter a store, display samples and expatiate on them, is but a small part of the salesman's work, and brings into play abilities of little higher order than those of the porter and the poll parrot. His main task should be to study his man with a view to establishing cordial relations between himself and his customer, and trade will then follow as a matter of course. Friendship is a powerful factor in the business world, and the firmest foundation for profitable business relations is a feeling of mutual respect and confidence. First then, if he is dealing with men, the salesman should be himself a man in thought and bearing, and in manners a gentleman.

But giving these qualities, there are other talents which will greatly aid the salesman in his work. They are accomplishments of whatever kind. A drummer for a prominent tinware and wire house in the west is an enthusiastic amateur photographer and always carries his apparatus with him on the road. In this way he has been able to make friends of his customers. He enters their homes, and even assists in amusing the children with photographic and stereopticon entertainments. Many drummers doubtless would regard this as a puerile pastime, but his house does not so regard it, for this little accomplishment has been the means of saving them $3 a day on expenses and increasing his sales by $40,000 annually. And he not only draws a salary in proportion, but apart from pecuniary considerations, has enjoyed the refining influences of family life and kept out of bad company, the rock on which many a good salesman is wrecked. Other travelers find the musical or the dramatic talent helpful in winning the friendship and esteem of their customers. In short, the kinships of the intellect and the heart are far stronger than those of the bacchanalian order. Salesmen who spend their spare time in hobnobbing with the "boys" instead of cultivating the friendship of their customers, should remember this.—*Jewelers' Review.*

KEEP THE GOLD AT HOME.

The amount of gold mined in the United States according to the Director of the United States Mint, since the discovery of gold in California in 1848, is $1,600,000. The same authority says we had on hand July 1, 1886, about $600,000,000; therefore, we must have exported a round billion within thirty-eight years. This, to say nothing of the silver, which is probably $200,000,000 or $300,000,000 more. It represents a part of our excess of imports over exports. Probably as much more has been paid in interest-bearing securities, bonds, etc. This sum is greater than all the deposits in the savings banks in the United States at the present time. It is more than the total amount of money in circulation in the United States at the present time. Suppose this money had remained here, by fostering new industries, and the price of boots was $10 per pair, wool $1 per pound, and butter the same. With labor $4 per day who is hurt?—and we would still have the $1,000,000,000. Yes, and we would have $5,000,000,000 more in real estate, linen, silk and woolen mills, glass and chemical manufacturies. It will be better understood when it is known that all the taxable property in the United States in 1886 was less than $20,000,000,000.—*Tariff League Bulletin.*

BETTER THAN GOLD OR FAME.

Better than genius when applied
To work that aids the wrong
Is conscience linked to common sense
In effort clean and strong.

Better than gold by cheating won
Is honest labor's pay;
Nobler than one enriched by fraud
Is he who toils each day.

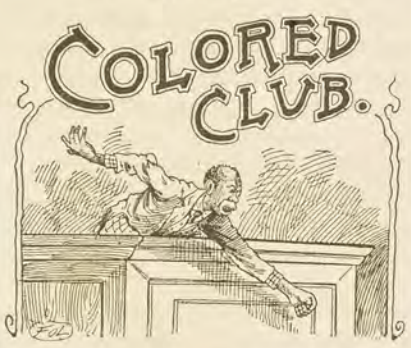
Better than deeds by sin inspired,
Though they success impart,
Is one kind act that friendship gives
To some poor, aching heart.

Better than fame by sacrifice
Of manhood's honor won,
Is honest reputation gained
By manly actions done.

Better than vice, though it be clad
In purple rich and rare,
Is virtue, though a homespun dress
'Tis doomed fore'er to wear.

Better than palace where sweet love
Has never held its reign
Is home where true affection dwells,
Though it be e'er so plain.

—Caleb Dunn, in N. Y. Ledger.



REPORT OF PROCEEDIN'S AT DE REG'LAR MEETIN'

The Professor visits Europe in the interest of the Boss Case.

BY J. L. S.

Well, belubed members of de Enlightners S'ciety, I'se powerful glad fer to see you all once mo, as you all knows I has jess got back from Europe, whar I spent my wacation, an' you can jess bet your rabbits foot dat I has had a R. H. T., which means a red hot time. I has been knockin' round wid de nobility, an' on several bums wid de crowned heads. An' you will get on ter Mrs. Snowball, she am a regular female dude. She done got it into her head dat she am related to de royal family of Spain, an' she never goes to bed any mo' until she puts her head out ob de window an' hollers "Buenas Noches" at de neighbors. Dis am de Spanish for good night. She also sent for de doctor de odder day to come an' bleed her, fer to see if she did not hab blue blood in her veins. But for myself, I'se de same old, true American dat I allus was. I tells you niggahs dat dis land am good enough for me. Der may be more rich people in Europe dan der am in dis country, but I discovered de fact dat der am also more poor ones. So I comes back to my own country, an' tanks my lucky stars dat I was born in dis lan'. Still I don't care to yell at all de people ob dat country. Some ob de nobility am powerful nice people, an' de Prince of Wales am a hummer. De Prince and Mr. A. Green, a trabeler for Lissauer & Sondheim, and myself done up de town. Green used to buy a pair of pants three times a day, an' him an' de Prince had seberal rows 'bout de styles, etc. De Prince am a great admirer ob de Boss case, an' carries nine ob dem at one time; one in ebery pocket, an' one in his hat. One night when we was out doin' up de town, a Yankee wid a snide casè said it was de best in de world. Den you ought to hab seen de Prince, he jess sailed into dat Yankee, an' befo' we could part dem, he had bit off de man's ear, split his coat up de back, an' pulled off de Yankee's pants, an' made him go to his hotel in dat style which de Prince said was "dishabille," which am de French for shirt-tail. Den de Prince grabbed de pants an' jumped up on an ash-cart an sang de song from Pinafore which says "I am an Englishman." De Prince sent a pictah to to de s'ciety, which we now uncover an' let you hab a peep at it. While you is doin' so, I'll jess slide 'round de corner to de Prohibition saloon, an' take a little drink at de expense ob de s'ciety.

It am a Boss case, an' he won't be happy until he gets it.

Berry soon after I had landed in England, de Queen sent me a billet-doux. Dis am de French for a note. You niggahs will pardon me for usin' so much foreign language, as I'se been mixin' so much wid de crowned heads ob Europe dat I had fallen into der ways. Besides, it looks to de rest ob de world dat dis s'ciety am a high-toned one, an' you can jess bet your biler dat it am too. Well, in dis note de Queen axes de pleasure ob my company to a watermelon soree; said dat all de nobility would be der, an' dat dey wanted me to lectuah on de Boss case. Well you jess ought ter hab seen Mrs. Snowball, she fixed herself fo' a reg'lar cake walk; said she was goin' fer ter astonish de Queen, an' show her some ob de American style. Jess as soon as we got dar, de Queen she done ax Mrs. Snowball to stay all night, kase she wanted to get a pattern ob her dress, and de Queen she hab one made jess like it.

Well, I wish you all had been dar an' see de way de nobility carry on when I walked out on de stage in full dress, an' my dog Towser wid me wid de snide case tied on his tail. I jess tought de Queen would hab a fit. She jess laughed an' coughed, an' coughed an' laughed till she jess busted de buttons ob her dress, an' her switch ob hair fell on de floor, an' Towser he see it an' make a grab fo' it, an' rushed all round de hall wid it. De Prince he jess howled an' stamped his feet, and swore it was de funniest ting he had eber seen, an' he ordered up de beer an' cheese for de whole gang. When de Queen scolded him fo' his extravagance, he jess said "charge it to the Government, an' dats de kind of a hair-pin I is." De Duke ob Norfolk was so tickled an excited dat he jess jumps up an' claps his hands together, and said he "could whip any man in de house dat said de Boss was not de best." De Queen said she would hab de Parliament pass a bill dat any ob her subjects who did not buy an' wear a Boss case would be fined, an' be compelled to drink a pint of castor oil three times a day. Den de Prince ob Wales started a song like dis:

"See de boat come 'round de ben',
Good-bye, snide cases, good-bye.
It's loaded down wid Boss cases, men,
Good-bye, snide cases, good-bye.
Bye snide case makers,
Bye, Oh! snide cases,
Bye, Oh! snide cases,
Good-bye, snide cases, good-bye

Den de Prince an' Ed. Hardy, Max Kallman, A. Green, an' Fred. Bennett, done a double shuffle an' a walk 'round. After dat I gib dem a long talk on de merits ob de Boss case, sir. When I tole dem dat some ob de cigar dealers in America had almost ruined de trade by gibin' away watches wid der cigars, de Prince hop right up in de meetin' an' said, "Why in de debil don' de jewelers gib away a box ob cigars wid de watches dat dey sell. I tought dem Yankees was such a mighty pert set ob fellows. Why eben de dullest ob de English jewelers would do dat. An' Professor, when you goes back to America I wants you ter advocate dat business. Tell de jewelers to jess sail in, an' when a hog does business in der town an' wants de whole earth, an' gibs away watches wid whateber he sells, why sell or gib away de same ting; an' dey will soon find out dat it will make de odder feller get up an' git. I'll jess write a lettah to dat celebrated house ob J. T. Scott & Co., one ob de largest an' best houses in America, an' tell dem to tell Cook, an' Grafton, an' Robbins' an' Gaw, an' Bucklin, to tell all de jewelers my views on dis subject. As all dese boys are particular friends ob mine, dey will jess do so. You heah my horn. I gibs all you royal nobs a pointer, dat what de Scott boys don't know 'bout de jewelry business, am not worf de knowin'.

Right heah, de Prince axed me to shet up for a while until he displayed a drawin' or paintin' dat de court artist had got up, an' I tink it am berry good. I will lucidate a little on it fo' you. In de first pictuah a monkey finds a snide case artist in de woods paintin'. De monk sees de watch, an' as he had wanted one fo' a long time, he jess slips up an' steals it. In de next view de monk sets down under de tree an' looks at his watch. Den a sort ob a "hash fo' dinner" expression comes ober his face. In de third view, when he sees dat it am a snide, he shakes his tail, puts his hand on his heart, an' swears by de great bald-headed monk ob Africa, dat he will hab revenge. In de fourth view he am gettin' his revenge, as he jess takes dat snide an' belts, an' belts de snide case artist; pushes de artist's head through de pictuah; upsets de paint-pot, an' raises de debil generally, an' climbs a tree an' sings, "Snide cases, good-bye."

De Prince sent de pictuah to de s'ciety wid his compliments, an' all de nobility in de hall at once jined our great s'ciety. As you all can guess dis made a great deal ob talk throughout England. De press was full ob it. Interviewers come after me, an' dey tole a lot ob lies 'bout me. Dey tole all 'bout Mrs. Snowball; an' I is a bow-leged dude, wid a big collar, if one ob dem did not tell 'bout de stripe on Mrs. Snowball's stockins. Dis made me bilen mad, an' I was goin' down fer ter clean out de whole business, but de Prince coaxed me not do it. He said dat de strained relations 'twixt America on de Fish question would, wid dis business, bring on a wah between America an' England, an' de Queen she jess begged me not to bring on de wah, kase she wanted Mrs. Snowball to spend the wintah wid her, an' if de two countries got into a wah, she was afraid dat George Francis Train an' de Mugwumps might come ober der an' start a snide case factory. So I let up.

In my next lectuah I'll tell you ob de views ob English, Irish, and Scotch jewelers dat I interviewed in de interest ob de Boss.

Dar are a good many tings dat want regulatin' in de s'ciety. Some ob de members want to get de bounce, an' der am a lot dat want to jine. I also understands dat Dick Supple, de handsome trabeler of D. C. Percival & Co., wants to start an independent bean-eaters branch, an' dat Frank Wilson, of Morrell Bros. & Co., wants de s'ciety to select some beautiful names fo' his twins. Also dat Mr. Chapman wants de s'ciety to appropriate ten dollars fo' him to celebrate de 'lection ob de next President ob de United States.

Dar am also a lot ob complaints ob various kinds which must be 'tended to. In conclusion, I'se pow'ful glad to heah dat de Association hab gained de victory, an' dat its competitors am on der knees. I tells you all dat right am allus boun' fer ter win; and though it may look blue fo' a time, de sun am sure to bust out on de right side; an' den de men dat have kept de faith am de ones dat rejoice an' feel happy.

C. G. Deuble, Malvern, Ohio, writes: "I think every jeweler in the country ought to get the KEYSTONE. One number alone will pay for the price of it a year."

ELECTRIC LIGHT PLANTS AND STATIONS.

At the recent convention of the National Electric Light Association, the president said in February last there were 4,000 isolated electric lighting plants and central stations in the United States, which operated 175,000 arc lights and 1,750,000 incandescence lights. Since then there have been added 1,361 new isolated plants and stations, operating 35,201 arc lights and 392,944 incandescence lights.

A complete record is kept of these, and from it appears that now there are 3,351 plants and stations, operating every night 192,500 arc and 1,925,000 incandescence lights. There are also 459,495 horse power of steam engines devoted to electric lighting. The capital invested in the electric lighting companies during the past half year has been increased to the extent of $42,210,-100. In February there were in this country 34 electric railways, with 138 miles of track, operating 223 motor cars, and utilizing 4,180 horse power for stationary engines. Forty-nine new roads are now being built, having a total of 189 miles of track, and to use 244 motor cars. There are also several motor factories, some of them employing as many as 1,200 men.

AN ENTERPRISING FIRM.

There is one house in Philadelphia that is always busy. No matter when you stop in, winter or summer, rain or shine, hot or cold, you see the same rush, the same bustling busy place. We think the reason of all this prosperity was very ably explained in a talk the writer of this article had with one of the company, Mr. W. R. Williams, who said, "you ask me how it is we are always busy?"

"Well, in my opinion, it is because we have always protected the dealers interest by not retailing, having confidence enough in the trade to feel convinced, that if we protected their interests, they would return the favor by looking after ours. The result has proven we were not wrong. Don't you think so? Then, when once we gain a dealer's confidence and trade, we hold it by doing all in our power to please him. But leaving all that out of the question, I will show you, if you will spare me an hour or so of your valuable time, many other reasons why the trade deals with us."

We were forthwith taken on a tour of inspection, in which we were shown much we had never dreamed of, and which it would pay many dealers to learn. First, we took a peep at the watch stock, and although we knew they carried a fine line, we were surprised at the quantity of cases and movements of all kinds and grades. Then we were shown drawer after drawer of gold spectacles and eyeglasses, thousands and thousands of them, all kinds and descriptions, every size eye made, every patent on the market; but all so systematically arranged that the office people know just where to lay their hands on whatever may be asked for. Many of our readers can appreciate the importance of all this system, for we doubt if there is any business under the sun, that has the immense detail the optical business has, and we can well believe Mr. W. R. William's statement, that there are few wholesale houses in the country who have even commenced to master the details. From the office we were conducted up a flight of stairs into the lens grinding department. Here, we were introduced to Mr. Christopher Huber, who has charge of this difficult and important work, and who showed us the different tools for grinding lenses, from 1 inch to 144 inches. He explained how the spherical was ground on a cylindrical lens; how prisms were made, and cross cylinders ground; and how, with one dioptric, equaling forty American inches and thirty-six French inches, a two dioptric convex lens neutralized a two dioptric concave lens. With many other ideas in regard to optics, our heads were completely turned. We are willing to admit that for difficult problems, careful workmanship and enormous detail, the optical and lens grinding business takes the "cake." If any of the readers of this article get tangled in any question on optics, we certainly advise them calling on the Philadelphia Optical and Watch Co., limited, and inquiring for Mr. C. Huber, who certainly is well able to sustain his reputation, as one of the oldest and best practical opticians and lens grinders in the United States.

From the lens grinding department, we were shown how gold frames were made. We were surprised at the many different measurements the frame had to be made to, and the dexterity with which it was done. Then we were shown how lenses were ground to certain different size eyes, and were surprised to learn that no matter what size they were ground to, Nos. 00, 0, 1, 2, 3, 4, or 5, they were all interchangeable in the size they were ground.

We were next taken up another flight of steps into the watch case shop, where we were introduced to the two remaining members of the firm, Messrs. W. Howard Williams and Edmund Diesinger, who have this and the ring and jewelry department in charge. They instructed us into the mysteries of plain gold ring making, and the many different branches of the watch case business. We were also shown into their special renewing department, where old silver and gold cases are made to look like new, and it was really surprising to see how an old dented case in the hands o. these artisans could be so altered and fixed up as to look like a new one.

From the case-making shop, we were shown up another flight of stairs to the counting room, which is also the room where all the goods are taken to be marked. It is certainly the beau ideal of a marking and book-keeping room, for it is so far away from the main office, that none of the noise and confusion can reach it, and as a consequence, the work is done without any chance of error.

We could not but help admiring the perfect system and order prevailing all over the establishment, and we now know why it is that The Philadelphia Optical and Watch Co., limited, are always busy; why their trade is increasing day by day. There are very few large jobbers, and this firm certainly is one in every sense of the word. Who can say, as they can, that every member of the company are practical mechanics, who are able to take any piece of work in their respective departments and do it right? There are still fewer jobbers who have the immense facilities for accommodating their patrons, and the large shops for making anything in their line. While the trade knows they are doing a large business, we doubt if there is one out of every twenty-five who realize the big business they are doing, or have any idea of the wonderful facilities they possess of turning work out quickly and correctly. With characteristic modesty, they believe in letting their work speak for them, while they are, in general, too busy to invite many to go through their building. There is no firm more willing to show anyone through, who may desire to learn something of the manner in which lenses are ground or watch cases and band and plain rings made. We can vouch for it, that after you have been through and seen all, as we did, you will say, that any house doing business on the principles they do, and having the knowledge of the business and the facilities they have, cannot help but succeed. No one can blame them for being proud of their success and of their business. We feel there are thousands of dealers who will join us in hoping their business may continue to grow and prosper, and that The Philadelphia Optical and Watch Co., limited, 916 Chestnut St., Phila., Pa, may reap golden harvests of their well directed and well meant efforts to protect the legitimate jewelry trade.

A FUNNY WORLD IS THIS.

This world is very funny,
For no matter how much money
Man is earning he will spend it, and be hard up all the time;
To his utmost he is straining
To catch up without attaining,
Till he makes his life a burden when it should be bliss sublime.

He who earns a thousand merely,
Thinks two thousand dollars yearly
Would be just the figures to make happiness complete;
But his income, when it doubles,
Only multiplies his troubles,
For his outgo then increasing makes his both ends worse to meet.

It is run in debt and borrow,
Flush to-day and broke to-morrow,
Financiering every which way to postpone the day of doom;
Spending money ere he makes it,
And then wondering what takes it,
Till he, giving up the riddle, looks for rest within the tomb.

Oh, this world is very funny
To the average man whose money
Doesn't quite pay for the dancing that he does before he should;
And he kills himself by trying
Just a little higher flying
Than is suited to his pocket and his own eternal good.

—*Goodall's Sun.*

MULTIPLYING DIAMONDS.

We have now had several articles on precious stones, and have further shown the strange notions entertained by the ancients concerning various facts in natural history. Here is the view of Sir John Maundeville, the famed but credulous traveler and entertaining writer of the fourteenth century, regarding the origin and nature of diamonds:

"The dyamandes in Ynde * * * growen many to gedre, one lytille another gret. And ther ben sum of the gretness of a bene and sume as gret as an haselle note. And thei ben square and pointed (crystallized) of her own kinde, both aboven & benethen withouten worchinge of mannes hande. And thei ben noryssed with the dew of hevene. And thei engendren commounly and bringen forthe smale children that multiplyen and growen alle the yeer. I have oftentimes assayed that yif a man kepe hem with a litylle of the roche and wete hem with May dew ofte sithes, thei schulle growe everyche yeer, and the smale wole waxen grete."

We venture to think that not a few of our lady readers would be well content that the diamond should produce sons and daughters, and that by bathing it with May dew it should be made to "growe everyche yeer and waxen grete."—*American Notes and Queries.*

A DIMUNITIVE TIMEPIECE.

Apropos of the newspaper talk about the "smallest watch," a resident of Brighton, England, writes the New York *Times*, saying that in the show window of one Funnel, a watchmaker of Brighton, there has been exhibited for many years the "smallest watch in the world." "It is a gold lever watch, measures only seven-sixteenths of an inch in diameter and one-eighth in thickness. It has ten holes jewelled and five other ruby actions, goes twenty-eight hours with one winding and keeps time accurately. It was first exhibited at the great exhibition in 1851 in H. P., Class 10, No. 26; also in the Paris Exhibition, Class 8, and for which medals were awarded. It is the exact size of an English silver two-penny piece, special coinage. It took Mr. Funnel, who designed it, five years to complete it. The bow which was used for turning was made from the hair of his wife's head. Mr. Funnel has also made a second miniature watch—a lever and jeweled throughout. It is exactly the size of an English three-penny piece."

OUR NATIONAL STRENGTH.

Mr. Michael G. Mulhall recently read a carefully prepared paper before the British Association, in Bath, on the "Growth of American Industries and Wealth." Mr. Mulhall is a distinguished scholar and an eminent English authority in statistics, and is a gentleman having a high regard for truth, so that his figures are not likely to be accused of falsehood.

He considers the three chief sources of power—man, horse and steam—and shows conclusively that this country vastly exceeds the great nations of the Old World in all three. In proof he furnished the following table setting forth the aggregate energy of the three leading powers of Europe in millions of foot tons daily, in comparison with the United States:

Countries.	Hand.	Horse.	Steam.	Total.
United States	8,454	33,600	48,400	89,454
United Kingdom	5,290	8,700	38,960	52,950
France	5,690	8,500	16,150	30,340
Germany	6,930	10,500	19,800	37,230

There is *multum in parvo* in those few but tremendous figures, and doubtless the English savans present were astounded at its significance. It demonstrated beyond question that the working power of the United States is one and two-thirds times as great as that of the United Kingdom of Great Britain and Ireland, two and one-half times as great as that of Germany, and three times as great as that of Germany, and three times as great as that of France, while it is equal to that of the two greatest nations combined. What a mighty power this young nation of ours possesses in comparison with the "Mother Country" and the empires of the continent! Yet it has been developed in a century!

Mr. Mulhall, though an Englishman, looks with kindly and glowing eyes to our future and says: "At present the increase of industry, energy and wealth goes on unabated. The next census in 1890 will probably show a population of 66 millions, with an aggregate energy of almost 100,000 millions of foot tons daily, and an accumulated wealth of 14,000 millions sterling, figures never before applicable to any nation in the world." The distinguished writer evidently is not imbued with the prejudices and jealousies of the great majority of his countrymen, and his frankness and good words will be appreciated by the American people.—*Phila. Commercial List.*

A YOUNG lady who attends the Holyoke, Mass. High School had a nice gold watch given her which she valued very highly. She had the watch in its usual place the other day, and while walking had her pet dog in her arms. The dog was finally placed on its feet and followed its young mistress until some one made a remark which called attention to the dog. She was astonished when she saw her watch attached to the dog's hind leg by the fob chain. While holding the little dog in her arms the chain had been wound around its leg and the watch had been dragged over the sidewalk till it was ruined. A jeweler is now trying to restore its usefulness.

The largest collection of coins, 125,000 in number, is in the Cabinet of Antiquities, Vienna. 50,000 are Greek and Roman.

MAGNETISM.

IT is not generally known that all metals, and for that matter all the elements, even to gasses, are more or less influenced by magnetism. This influence in not in degree, but in a certain measure, antagonistic. To illustrate, take the instrument shown in Fig. 1, which is a common steel horseshoe magnet. It may be admissible to say, however, that an electro-magnet will affect the substances to be experimented upon in precisely the same way, only the electro-magnets are much more powerful. The permanent steel magnet was only selected as being the simplest. Between the bars *A A'* are placed two pieces of brass *C, C'*, which support the arbor or staff *b*, which turns easily in *C*, and is stepped with a cone bearing in *C'*. The bar *a* is supposed to be made of such material as is to be experimented upon. In this brief communication none of the delicate methods for determining how gases are affected will be considered. In considering our cut, the bar *a* will be supposed in the first instance to be made of iron. Now if we were to look in the direction of the arrow, the bar *a* would arrange itself over the poles of the steel magnet, as shown. If we should swing it around toward the dotted line *d* it would, the instant it was released, arrange itself as shown. The influence of the magnetism would "induce" polarity of the opposite kind in each end of the soft iron bar *a*: that is, the end of the bar *a*, over the north pole of the magnet, would be filled

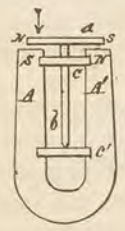


Fig. 1

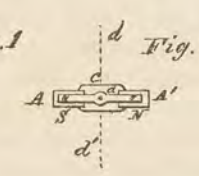


Fig. 2

with south polarity, and the south end with north polarity. If we substitute a bar of gold for the iron on *a*, the bar will be repelled. That is, instead of standing over the magnetic poles, it would arrange itself on the dotted line *d*. The class of elements which are attracted (as the iron) are called paramagnant, and those which are repelled like gold are called diamagnetic. Among the paramagnetic elements are iron, nickel, cobalt, manganese, chromium, cerium, titanium, palladium, platinum, osmium, aluminium and oxygen, also most of these substances in solution. The diamagnetic elements are bismuth, antimony, zinc, tin, cadmium, sodium, mercury, lead, silver, copper, gold, arsenic, uranium, rhodium, iridium, tungsten, phosphorus, iodine, sulphur, chlorine, hydrogen and most of their compounds. Glass containing no iron, water, alcohol, nitric acid, resin wax, rubber, gum, starch and wood. By combining bars of paramagnetic and diamagnetic metals, a perfectly neutral condition can be realized. That is, if combined bars of palladium and silver were exposed, no appreciable influence would be seen, as one mettle would compensate for and annul the effect of the other.

It may be well to add that the force we have named diamagnetism, seems, as far as it has been investigated, to be a force by itself, and not a mere negative of magnetism. But this point has small bearing on the topic of which we are writing. The object we have in view is to only consider the subject of magnetism, as it relates to pocket watches; and whether the diamagnetic force is primitive or deserved, makes small odds to us, so we can use it as a corrective power to compensate for direct magnetic influence. The greatest problem now brought before the watch making world is to counteract the influence of magnetism on pocket watches. That the watch of the future must be non-magnetic is conceded. The details of the problem involve the factors of what materials we are to make such watches with. Of course many come forward with plans and suggestions, and we have already several watches of this nature on the market; but it is time only that is going to decide, if they are to prove as serviceable as those we have been using.

Another point about non-magnetic watches. They should be manufactured as cheap as others of their grade and quality. That palladium is the only metal which will serve to make a reliable balance spring is an open question. Many of the alloys of alluminium are highly elastic, and the low specific gravity of this metal is a point in its favor for timeing in position. The big question of the present situation is, what are we to do with the millions of of watches we now have on hand, which are subject to deterioration from magnetism. We pointed out at the commencement of this article, such substances as would serve to correct each other in regard to magnetic influence. We now propose to consider the remedies for watches of ordinary construction which have become magnetized. We all know that if we touch a piece of hardened steel with a magnet, the property of magnetism is imparted, and in a great measure retained. To illustrate, if we rub a steel knife blade with an ordinary steel horse shoe magnet, the property of attracting paramagnetic bodies is imparted to it. If we bring a magnet near a steel magnet, the power is also imparted, but in a much more feeble degree. One law in regard to steel magnets is well to bear in mind, which is that hardened steel is slow to receive magnetism, and in like manner slow to part with it. The great trouble with most of the apparatus for demagnetizing is that the reversal of the poles is too rapid. Every magnetized piece of steel has a north and south pole, and to neutralize one is to neutralize the other. In demagnetizing a watch, each of the several parts should be tested, if the watch is a fine one.

Paul Otto, Eagle Lake, Minn., says: "Believe me when I say that I can not do without the KEYSTONE. I consider it to be the best instructive paper there is out in print."

IT has long been thought an excellent thing to mix silver with the other metal, when a bell was to be cast, and many pious persons have rejoiced at the thought that the silvery chime of their church bell was in part due to their gifts. Now comes a writer in an English scientific paper with this paragraph: "I once asked a foreman in a well-known bell foundry whether putting silver in a melting pot was of advantage. He replied, of great advantage—to the founder, as the silver sinks to the bottom; the founder pours off the copper and tin, and when the silver has cooled, puts it in his pocket."

The Keystone.

Circulation Universal, and QUANTITY and QUALITY considered, THE BEST OF ANY JOURNAL of its class in America.

The KEYSTONE reaches every Jeweler in the United States and Dominion of Canada.

To secure a place in the columns of the KEYSTONE, advertisers should forward copy so that it may reach us not later than the EIGHTH of each month.

Classified advertisements under these headings, THREE CENTS per word, one insertion; 10 per cent. off for three insertions; 15 per cent. off six for insertions, and 25 per cent. off for twelve insertions. Name and address included.

TO INSURE INSERTION, MONEY MUST ACCOMPANY ALL ORDERS FOR ADVERTISEMENTS.

ADVERTISEMENTS.

T. J. HOWE, Fulton, Kentucky, says: "I received 268 answers to my advertisement in the KEYSTONE."

FOR SALE.

GOOD paying jewelry business in the best town in the state of New York; is rapidly growing and very healthy. Will invoice $3,000. Only those meaning business need apply. Can reduce stock if desired. Address, "John," care this office.

THE leading 10 years standing jewelers establishment, located in the best business centre in one of the liveliest mining towns in central Illinois. Population 3.000. Clean, well selected stock, with safe and fixtures invoicing about $6,000. Would reduce to suit purchaser. Address, "Ch.," care of this office.

TO watchmakers. A well established repairing business for sale. 662 Madison St., Chicago, Ill.

$5000, An established wholesale watch material and tool business. First-class trade. Established 3 years. Stock all fresh and in first-class order. No opposition. Splendid chance for a man to make money. Sales are cash. Owner has real estate to look after. Owner would remain in office 2 months and assist purchaser, and guarantee satisfaction. Address, Charles Melchor, No. 11 Maiden Lane, New York City

A WELL established jewelry and optical business, in a growing town of 4,000 inhabitants. New shoe factory and canning factory built this season. Ship building and numerous other industries. Reasons for selling, other change of business. Stock and fixtures, invoice $800. Terms cash, or bankable securites. F. B. Rowe, Waldoboro, Maine.

A GOOD, paying jewelry business in town of 3,500 inhabitants. Stock and fixtures invoice about $2,000. Reasons for selling, wife's poor health. For particulars address, E. W. Davies, Athens, Pa.

IN southern Kentucky. Jewelry store. Business established for 25 years. Owing to the death of my husband I wish to dispose of the stock and fixtures, value about $3,000. Sewing machine trade in connection. Store and dwelling combined; built especially for the business. Will sell or lease house. Address, Mrs. A. K. Brodersen, Russellville, Ky.

$1800 Will buy a good paying, jewelry business in a growing manufacturing town; 4 R. Rs., 12,000 inhabitants, and is a rich, farming country, good, healthy climate. Reason for selling, have other business I am obliged to look after. Don't write unless you mean business. Address, "Graver," care this office

NEW Whitcomb lathe, and set of jewelers tools, regulator, etc. Address, "Kansas," care this office.

A PARKINSON & FRODSHAM ship chronometer. Address, P. Ford, Rochester, N. Y.

ANTIQUE old clocks, Grandfather, Wall Sweep and others, 100 to 150 years old. Description and price on application. H. S. Hart, South Bend, Indiana.

A NO. 1 Mosely lathe, 22 chucks, in perfect order. Cost $85, will sell cheap. Address, B. M. Stufft, Scottdale, Pa.

A WELL established watch and jewelry business in a city of 70,000 inhabitants, in the southeastern part of Mass. Fine location; large repairing business. Stock and fixtures invoice $4,500. Will sell for less. A grand chance to catch the holiday trade. Good reasons for selling. Address, "B," care this office.

AN established jewelry store, long lease, good location. Owner wants to go to Europe. Invoice about $2.500. Address, M. Sheftel, 304 N. Main street, Los Angeles, Cal.

OR exchange for a Kearney or Moseley or any good lathe, one wheel-cutting engine, 22 cutters, 5 chucks in good order. Address, J. Gresham, Augusta, Ga.

A SOFT "snap" in jewelry stock and fixtures for young man with a little capital. Neat, clean stock. Good town in central Ills. Good reasons for selling. 2 R. Rs. and other advantages. Good brick room, large, plate glass front. Don't write unless you mean business. "A. B. C," care this office.

STEAM fire proof safe, good condition. Cleats for 35 trays, 6 shelves and 3 private drawers. Inside measure, 41 inches high, 25 wide, 18 deep, price $100 cash. Also 1 safe, same make, 19½ inches high, 13½ wide, 11½ deep, price, $30. Address, "Safe," this office,

CASH only will buy a good paying jewelry business in Kansas. A large territory and well settled to deal with. A good trade established. No competition. Will also sell or rent residence. Address, this office, "X. Y. Z."

JEWELRY fixtures. Four ten foot walnut wall cases, 1 large regulator, 1 fire and burglar proof safe. All new and in good condition at a bargain. Address, W. W. Rurl, Delphos, Ohio.

FOR sale in Laredo, Webb Co., Texas, good, established jewelry business, low rent, good location, fixtures new, stock $2,500 to $3,000. Will sell part or all of stock. Ad., F. G. Cabezon & Son, Laredo, Tex.

$1000 Cash, January 1st, will buy good will, fixtures, hollow-ware, clocks, jewelry optical goods, etc. Business 20 years, established in a pleasant manufacturing town. Very little opposition. Parties meaning business address, Box 312, South Paris, Maine.

STOCK and fixtures of an established jewelry store for sale, or will give it in charge of a competent watchmaker and jeweler of good reference and security. Will sell for $1200. Frank Schmidt, 801 Edgmont Ave., Chester, Pa.

FOR SALE.

$10, AMERICAN lathe with chucks and foot-wheel, cost $45, made by J. Starke, Waltham, Mass. Reynolds Bros., 1604 Federal St., Philadelphia, Pa.

A CHANCE OF A LIFETIME.—One of the best paying jewelry stores in the state of North Carolina. Those interested, write for particulars. Satisfactory reasons for selling. Those not meaning business, will please not reply. Address, "Rare Chance," care this office.

WANT to sell half interest in manufacturing jewelry business. For particulars address "Jeweler," care this office.

A $410 Stock of jewelry for $300, consisting of ladies and gents' pins, earrings, bracelets, cuff buttons, rings, charms, chains and watches, etc. Address, "Iowa," care of this office.

A FRANCES engraving machine, Masonic and Odd Fellows emblems, 4 sets of type. No outs about it. Price, $50 cash. F. B. Rowe, Waldoboro, Maine.

$1000 Buys No. 1 jewelry store. Town 3,000 inhabitants. Failing health. Must sell Dec. 1st. Answer at once. Lock Box 67, DeKalb, Illinois.

$1200 Cash January 1st, will buy good will, fixtures, hollow-ware, clocks, watches, jewelry and some other stock and tools of a business paying about $1,500 last year above store expenses. Town has about 1,500 inhabitants, and are booming on account of a coal mine to be opened here before next Spring. Good reason for selling. Address, "A. M.," care this office.

A WELL established and good paying watch and jewelry business for sale in one of the best locations in Philadelphia. Poor health reason for selling. Rent moderate with dwelling. Trade rapidly increasing. A splendid chance for a first-class watchmaker, with small capital. Address, E. Warful, care of S. L. Futer, 513 North 41st Street, West Phila., Pa.

JEWELRY business in western North Carolina; Address, Lock Box, 44, Hickory, N. C.

SPECIAL NOTICES.

VALUABLE gold solder for jewelers. $1 will secure the receipt of an 18 K. gold solder, flowing like soft solder. Ad., E. Alline, Alexandria, La.

JEWELERS wanting watchmakers, and watchmakers wanting positions would do well to correspond with me. I keep a record book of all such wants. Enclose postage stamps. Have been the benefactor on both sides. C. Reiss, wholesale jeweler, dealer in watches, tools, materials, etc., 31 and 33 S. Pearl St., Albany, N. Y.

MOSELY & CO., Elgin, Ill., manufacturers of the "Mosely Lathe," with full line of fixtures and attachments. Designed especially for watchmakers and repairers. Combining accuracy, durability, convenience and style. Honest tools at fair prices. Send for new price list. Agencies with most of the jobbers.

SEND all your work to Charles Reiss, 31 and 33 South Pearl St., Albany, N. Y. New staffs, pinions, cylinders fitted with despatch. Stem-winding wheels cut to order. 7 expert watch repairers employed specially for trade work. Send for catalogue. Correspondence solicited. Mention this paper.

I AM paying standard prices for old gold and silver. 10 K., 40 cents per dwt.; 14 K., 56 cents per dwt.; 18 K., 72 cents per dwt. Send packages by mail or express. Remitted for same day. H. T. Roberts, Refiner, 1132 Arch Street, Phila, Pa.

SEA shells for watch charms. 10 sent postpaid for 25 cents. Address, A. Hamilton, Westerville, O.

CHAS. REISS, 31 and 33 S. Pearl St., Albany, N. Y., is the busiest trade repairer in the U. S. Packages with broken watch work coming from all over and promptly attended to by experts under his personal supervision. Special despatch to jewelers at a distance.

USE Frears' Gold and Silver solders, best in use. Prices, Gold, 75 cents per dwt.; Silver, $1.50 per oz., extra easy to flow. W. S. L. Frear, Union Springs, N. Y.

WILD land and improved farms in Illinois, Iowa, Missouri and Nebraska to exchange for a jewelry store. Edwin Blakeslee, Anamosa, Iowa.

FINE business real estate to exchange for a good stock of jewelry—about $9,000. Address, "O. W.," care this office.

CHANCE for married man. Business and fixtures, $100. Store, 3 rooms $10 a month, at Norfolk, Ct. Population 1,500. Only jeweler. 56 inch bicycle for $50, in American watches or a rotary press. F. B Catlin, Winsted, Ct.

TO exchange St. Paul property for a stock of watches, clocks and jewelry, value $1,500. Ad., L. O. Hulbery, Farmington, Minn.

TO trade jewelry and spectacles for bokos, stationery or fancy goods. W. C. Montgomery, St. Cloud, Minn.

IF you want to learn to be a *good* watchmaker you will go to W. F. A. Woodcock, Winona, Minn. He has finished men in a few months, and made them good watchmakers, and will be glad to give you names, and you can write them and see for yourself. He now has men with him who tried for years to learn the trade and failed *until* they came to W. F. A. W., and now they are all doing splendidly, and doing the finest and most complicated work. I have young men with me who have only been here a few months who can put to the blush and to shame some so-called masters and teachers. I have one young man who has been getting ready to come for several months, who has spent nearly two years and a great deal of money at one watchmakers school; has been in business for himself and worked as a journeyman. With all the above, there are many things that come in nearly every store almost daily that he could not do, but I have given him light and he now can work, and is learning to do *everything* first-class; the same as all the rest of my pupils. Good references.

TO exchange a heavy job printing press 7 by 9 for a Francis engraving machine, Mosely lathe or other good tools. Ad., Box 543, El Dorado, Kan.

A RARE CHANCE.—The best paying jewelry business in New England for sale. Sales $10,000, work $1,500 per year, stock $5,000, fixtures extra. Ill health positively the only reason for selling. Address, "K," this office.

WANTED.

WATCHMAKERS who wish to perfect themselves in the art. Chicago Horological Institute, 182 State St., Chicago.

TO exchange for watches and jewelry, improved stock or grain farm, 320 acres on lake. Address, Lock Box 75, Morris, Minn.

A FIRST-CLASS watchmaker who can do fair engraving and jewelry work. Will pay good wages to the right man. Address, L. Lechenger, Eagle Pass, Texas.

OLD gold and silver, full value paid. Packages received by mail or express remitted for same day. H. T. Roberts, Refiner, 1132 Arch Street, Phila, Pa.

YOUNG men to learn the watchmakers trade. See "ad" in this issue. Chicago Horological Institute, 182 State St., Chicago.

TO exchange key-wind American movement and other stock for a side case, 10 to 12 feet, or to buy cheap. Write Box 262, Hartford, Wis.

FIRE and burglar proof safe for jewelers use; state size and maker. Address, G. Schleuder, Austin, Minnesota.

A GOOD watchmaker, with good refs., willing to make himself useful in the store. Address, P. O. Box 144, Santa Fe, New Mexico.

A GOOD watchmaker and engraver. A good position for the right man. Address, W. K. Snyder, Shamokin, Pa.

WHITE engraving machine, in good condition and cheap. Chas. Simanton, Allentown, Pa.

A GOOD watchmaker with tools. Must be well recommended by good houses. Nowlin & Nowlin, Martin, Tenn.

BY the trade. Young men to go and learn practical watchmaking at the Chicago Horological Institute, 182 State St., Chicago.

SOME well recommended young man that has a natural mechanical talent to finish trade under a thorough, competent and practical watchmaker of 22 years exp. Learned trade in the old country. Conditions: Board and lodging only. No tuition fees charged. Location, S. E. Neb. Town 2,000 inhabitants. Address, "Learn," care this office.

A YOUNG man who is first-class at repairing watches, clocks and jewelry, must furnish own tools and lathe and good ref. No letters answered unless stated what wages wanted. Address, "Box 6," Coalport, Pa

A SMALL engraving machine. Must be cheap and do good work on spoons. I. A. Walker, Valparaiso, Ind.

A GOOD jeweler wanted; also good clerk wanted. Brunner Bros., 255 Superior St., Cleveland, Ohio

EVERYWHERE.—Watchmakers who have taken instruction in the art at the Chicago Horological Institute, 182 State St., Chicago.

SITUATIONS WANTED.

BY a first-class watchmaker and engraver, of 18 years exp. at the bench in N. Y. state. Good refs. Ad., "A B C," P. O. box 14, E. Andover, N. H. *

BY a watchmaker. Good reference in workmanship and morality. D. L. Dow, 30 Washington St., New Castle, Pa. *

BY young man, a place to finish trade. 2 years experience. References. Address, M. E. Caveny, Newton, Kansas. *

POSITION as fine watchmaker and engraver. Large exp., good refs. and tools. Address, "Reynolds," care this office. *

ROLL plate maker and wire drawer wants situation. Young man who uuderstands both. California pref. Ad., "R. P." Box 800, Chicago, Ill. *

BY young man, 2 years exp. at watch, clock and jewelry repairing. Good refs. Age, 21. Ad., Box 185, Indiana, Pa. *

POSITION by young man, 3 years on watchwork and engraving. Good reference. A. B. Lease, Washington, C. H., Ohio.

POSITION by watchmaker to sell goods in South or West. Can furnish refs. as to character, etc. Can give bond if necessary. Address, "H. L. D.," care U. S. R. S. Co., Anniston, Ala. *

WANTED Dec. 1st, $10 a week. Can do common repairing. Refs. F. W. Loomis, Box 46, Liberty Hill, Conn. *

AS watchmaker and jewelry repairer, 12 years exp., good salesman, speaks English and German, with tools. Address, "Mainspring," care this office. *

BY first-class watch repairer, 21 years old. Single. Full set of tools. Reference furnished. Ad., A. E. Grimes, LaGrange, Ind. *

BY young man with nice set of tools and one years' constant work at the bench, is desirous of finishing the trade with some good man; Conneticut or New York preferred. Address, U. B. Smith, 107 Beach St., Bridgeport, Conn. *

JANUARY 1st, by a young man, 24 years old, that is fully conversant with the jewelry business in a reliable jobbing house to work in the house or on the road. Best of references. Address, John M. Tuttle, La Fayette, Ind. *

CHICAGO LETTER.

CHICAGO, NOV. 3, 1888.

Mr. Tom Bristol, and C. P. Smith, travelers for C. H. Knights & Co , are at home for the purpose of replenishing their stocks for the last trip of the season.

"Deacon" Chase, H. C. McConnel, and G. M. Steese are putting in their best licks for Benj. Allen & Co., to excel their good trade of 1887. All are old timers and popular men.

H. P. Cutter and Ike Hendershot, who are representing B. F. Norris, Allister & Co., report good trade. "Ike" is known as the "farmer jewelry traveler," who combines agriculture with that of commercial travelling.

Sam Loeb, Jake Joseph, and the Despress Brothers, represent H. F. Hahn & Co. creditably, and are popular young men in their respective territories.

Politics have taken the place of business in this city. Republican and Democratic clubs have been formed, and both paraded on Saturday, Nov. 3rd, the Republicans 350 in number at 3 P. M., and the Democrats of from 375 to 400 at 7 P. M. Some of the leading jobbers took active part with both parties.

The gifted St. Louis "penny a liner" of the *Watch Dial*, under date of Oct. 20th, in that paper, indulges in a few pleasantries concerning two "bright lights" of a contemporary trade journal. This gifted "p. a. l." is a modern Taney or Marshall, and considered a connoisseur of Maryland terrapin, lobster salad, and liquids—not music—from "Faust." By reason of his association with "Phineas Fogg," and the almost persuaded "Don Quixote" of "the Ohio idee," has espoused the "wrong cause" unfortunately. The counterbalance over all is "Romeo," who with Julius S——, the Berry Wall of St. Louis, are steady workers in the vineyard within the jurisdiction of the "K. O. G."—a society for the prevention of cruelty to the *blase*, and solving of great problems over "schooners." As Phineas Fogg and "Romeo" are related by the closest ties, much good may be expected from the jovial "p. a. l," who will keep apace with progressive ideas, assisted by a copy of every issue of the KEYSTONE to be sent him in future. MARTIN.

THE superstitions that in ages have clustered about engagement and wedding rings and about precious stones are innumerable, and some of them have descended to the present day. In the fourteenth century a fanciful Italian writer on the mystic arts set forth the virtues of the various gems, indicating also the month in which it was proper to wear particular stones in order to secure the best result. The idea took, and for some time it was the fashion in several Italian cities to have the precious stone of the ring determined by the month in which the bride was born. If in January, the stone was a garnet, believed to have the power of winning the wearer friends wherever she went. If in February, her ring was set with an amethyst which not only promoted in her the quality of sincerity, but protected her from poison and from slanderous tongues. The blood-stone was for March, making her wise and enabling her with patience to bear domestic cares; the diamond for April, keeping her heart innocent and pure so long as she wore the gem. An emerald, for May, made her a happy wife; while an agate, for June, gave her health and protection from fairies and ghosts. If born in July, the stone was a ruby, which tended to keep her free from jealousy of her husband; while in August, the sardonyx made her happy in the maternal relation. In September, the sapphire was the proper stone, it preventing quarrels between the wedded pair; in October, a carbuncle was chosen, to promote her love of home. The November born bride wore a topaz, it having the gift of making her truthful and obedient to her husband; while in December the torquoise insured her faithfulness. Among the German country folk, the last-named stone is to the present day used as a setting for the betrothal ring, and, so long as it retains its color, is believed to indicate the constancy of the wearer.

B. DeWitt, Terra Alta, W. Va., says: "I could not do without the KEYSTONE if it cost four times as much."

LIST OF PATENTS.

THE following is a list of Patents of interest to the trade, issued during October, 1888. To obtain a complete copy of specifications and drawings for any patent here noticed, enclose 25 cents to the Commissioner of Patents, stating the number and date of issue:

TUESDAY, OCTOBER 2d.

No. 390,209. Button. Frank B. Crooks, Los Angeles, California.
No. 390,222. Time Register for railroad stations. Buckner F. Freeland, Vistula, Ind.
No. 390,230. Apparatus for Synchronizing Clocks. Charles E. Hoefling, London, England.
No. 390,260. Watchmaker's Tweezers. Philip Seewald, Hudson, Mich.
No. 390,333. Winding Indicator for Time Pieces. Abraham M. Bachrach, New York, N. Y.
No. 390,457. Watchmaker's Tool. James Cook, Chattanooga, Tenn.
No. 390,501. Repeating Watch. Charles H. Meylan, New York, N. Y.
No. 390,620. Jewel Setting. Nathaniel L. Ripley, Newton, Mass.

TUESDAY, OCTOBER 9th.

No. 390 672. Twist Drill, Henry E. Holmes, Boston, Massachusetts.
No. 390,786. Alarm Clock. Almeron M. Lane, Meriden, Conn.
No. 390,855. Button. Heinrich F. Hambruck, Hamburg, Germany.
No. 390,869. Button. Rudolph Liebmann, New York, N. Y.
No. 390,908. Cuff Holder. Andrew W. Sawyer, Providence, R. I.
No. 390,933. Manufacturer of Gold Pens. Edwin Wiley, Brooklyn, N. Y.
No. 390,934. Machine for Cross-rolling the Nibs of Gold Pens. Edwin Wiley, Brooklyn, N. Y.

TUESDAY, OCTOBER 16th.

No. 391,016. Method of making Watch Case Pendants. William W. Bradley, Newport, Ky.
No. 391,057. Finger ring or other article of Jewelry Harry Lehr, New York, N. Y.
No. 391,076. Separable Button. Eugene Pringle, Gloversville, N. Y.
No. 391,101. Watch Regulator. Howard W. Welles, Poughkeepsie, N. Y.
No. 391,183. Watch Barrel. Henry Oehl, Cheshire, Connecticut.
No. 391,199. Writing Pen. Conrad Seabaugh, Austin, Texas.
No 391 200. Separable Button. Madison D. Shipman, De Kalb, Ill.
No. 391,230. Button. Shubael Cottle, New York, N. Y.
No. 391,265. Cuff Fastener. Charles L. Moore, Worcester, Mass.
No. 391,271. Clock. Albert Phelps, Ansonia, Conn.

TUESDAY, OCTOBER 23d.

No. 391,446. Clock Synchronizer. Arthur G. Wiseman, Webster Grove, Mo.
No. 391,483. Alarm Bell. Herman Nichols and Henry C. Rose, Detroit, Mich.
No. 391,504. Music Box. Emile Bornand, Ste Croix, Switzerland.
No. 391,531. Time Piece Holder. Joseph H. Hodgetts, Wallingford, Conn.
No. 391,736. Ingot for making seamless plated wire. Levi L. Burdon, Providence, R. I.
No. 391,739. Cuff Holder. Edwin N. Dodge, Claremont, Minn.

TUESDAY, OCTOBER 30th.

No. 391,802. Alarm Clock. Almeron M. Lane, Meriden, Conn.
No. 391,886. Rewinding Clock. Charles E. Emery, Brooklyn, N. Y.
No. 391,969. Electric Self-Winding Clock. Vitalis Himmer, New York, N. Y.
No. 391,996. Medicine Dial. Miley B. Wesson, Fort Worth, Texas.
No. 392,053. Spectacles. August Morck, Warren, Pennsylvania.
No. 392,056. Self-setting Time Piece. Emanuel Muller, New York, N. Y.
No. 392,140. Stem Winding and Setting Watch. John H. Thornhill, Wilkes Barre, Pa.

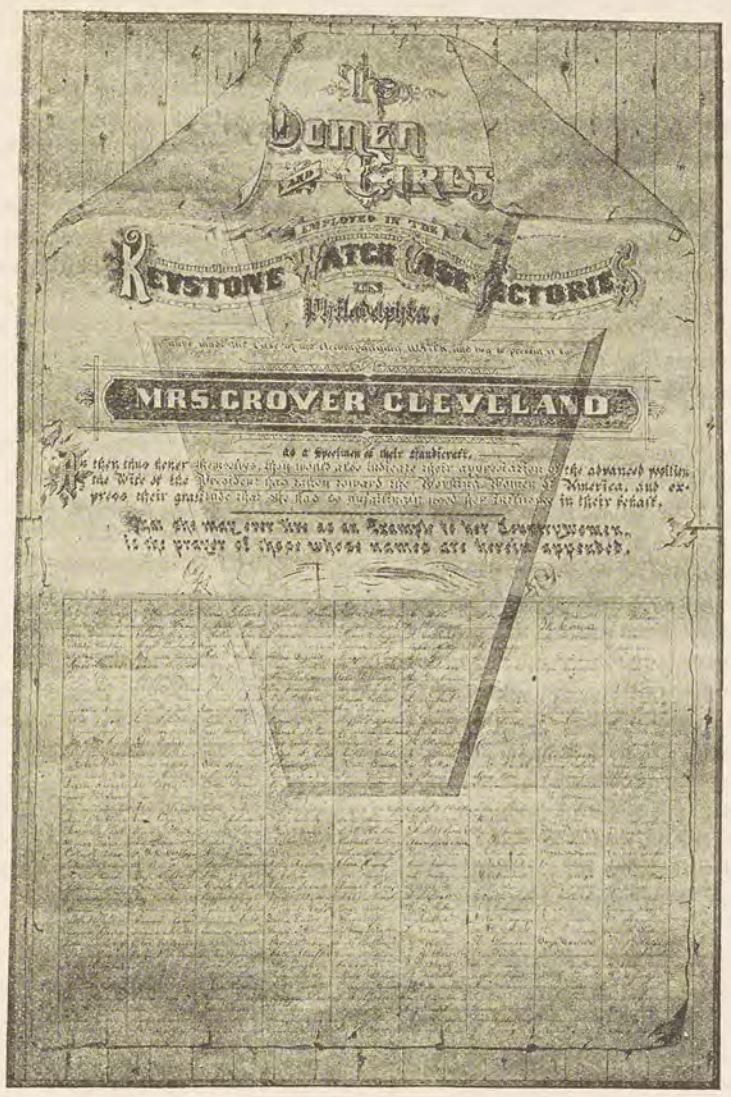
DESIGNS.

No. 18,769. Watch Case Ornamentation of C. H. Pfeil, Chicago, Ill.

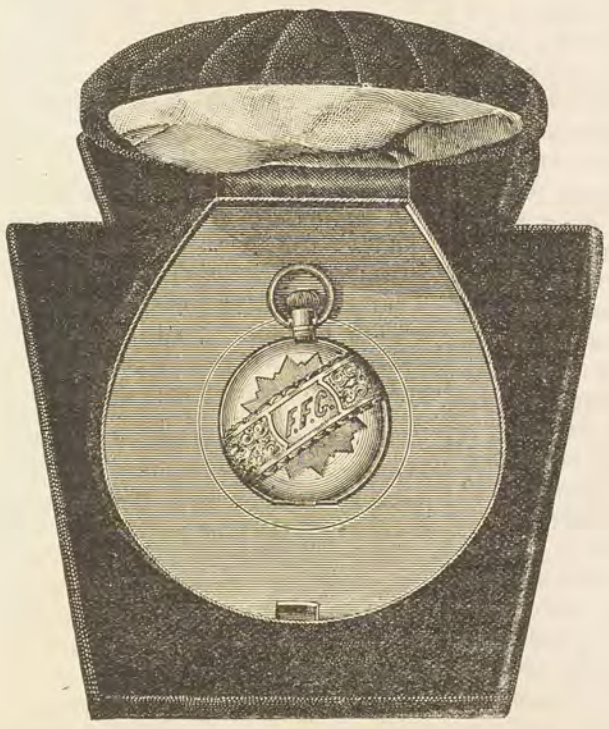
"Kind Words Can Never Die."

A LITTLE episode in the lives of the Keystone Watch Case Co.'s female wage-workers culminated on October 30th, when Mrs. C. N. Thorpe, wife of the President of the Keystone Watch Case Company, presented a watch to Mrs. Grover Cleveland on the part of these same female operatives. The watch was accompanied by an elegantly engrossed testimonial, bearing the names of several hundred of these working women and girls. In presenting this elegant token of esteem, Mrs. Thorpe made the following terse and appropriate remarks:

"The women and girls employed in the Keystone Watch Case Factories in Philadelphia have made the cases of this watch, and beg to present it to Mrs. Grover Cleveland as a specimen of their handicraft. As they thus honor themselves, they would indicate also their appreciation of the advanced position the wife of the President has taken toward the working women of America, and express their gratitude that she has so unfailingly used her influence in their behalf. That she may ever live as an example to her country-women is the prayer of those whose names are herein appended."



The immediate cause of the female operatives of the Keystone Watch Case Co. combining to present Mrs. Cleveland with a watch, was some remarks made by her, when on a visit to this city (Philadelphia), in regard to the commendable course taken by so many women here in being self-reliant and self-supporting. These sentiments were expressed in the presence of George W. Childs, Esq., of the Philadelphia "Ledger," who is largely interested in the Keystone Watch Case Company, and through him were not long in reaching the ears of the leading spirits among these same female operatives, who, although the remarks did not especially refer to them, took enough of their spirit to themselves to act instantly on the idea of presenting her with a token of their esteem and a specimen of their handiwork. We give a cut of the watch, and also a half-tone photo-engraving of the testimonial.



We cannot refrain from saying just here, that there is no manufacturing concern in existence which has given so much encouragement to their female operatives as the Keystone Watch Case Co. It was early in the history of this enterprise Mr. C. N. Thorpe conceived the impression that much of the work done by male operatives could quite as well be performed by females, traditions of the trade to the contrary notwithstanding.

Acting under these impressions, and while matters were a good deal under his own supervision, he determined to give the sex a chance under favorable auspices, and the result was all his reason told him to expect. The effect was that the Keystone Watch Case Co. gathered hundreds of female artisans as skillful and adroit in their several departments as those of the other sex, and they receive a generous compensation for their services. Although compelled to earn their own livelihood, they are, in many instances, cultivated and refined, and as sensitive to praise or disparagement as their more fortunate sisters in womanhood. It is very difficult for any person, who has not been subjected to them, to understand and appreciate the annoyances (and this is a mild way to put it) to which a refined and sensitive woman is subjected, who makes an attempt to be self-supporting. Consequently, any words of encouragement from ladies in higher social circles are like dew to the withered flower. We sincerely hope more ladies in high places will emulate Mrs. Cleveland in this respect. Certainly there is no broader field for applied Christianity now open, than to aid such women in their efforts to avoid the humilition of being dependent.

Our readers will observe that the case is an exquisite specimen of case maker's skill, and would attract particular attention in an exhibition of gold workers art, and contained a fine O size nickel Elgin movement.

The Keystone

A monthly journal for the Jewelry Trade, published at Nineteenth and Brown Streets, Philadelphia. Price, 50 cents a year in advance.

CORRESPONDENCE and other copy for publication should reach the KEYSTONE before the FIRST of each month.

ADVERTISING rates for column, double column quarter page, half page, and full page advertisements furnished on application at this office.

CIRCULATION is 15,000 larger than that of any other journal of its class, reaching every jeweler in the United States and Canada.

THE KEYSTONE has a bona fide circulation of 22,000 copies.

Address all communications to
"THE KEYSTONE,"
Nineteenth and Brown streets,
Philadelphia, Pa.

J. T. WILLIAMS, Editor.
S. H. STEELE, Publisher.

PHILADELPHIA, NOVEMBER, 1888.

WE will issue an enlarged holiday number for December with several improvements, and increased number of pages. We would again advise our friends who anticipate advertising with us, to send in their copy early, if they wish to secure desirable space.

THE attempt to substitute imported movements for American has proved a sad failure. Movements of this kind which cost $3.50 to import, go begging for purchasers at $2.

IT is conceded that the American manufacturers of jewelry, in the way of cheap goods, which combine elegance of design and serviceable wearing qualities, excel the world.

WHEREVER watches and jewelry of American manufacture have been introduced, it is impossible to supply their place with the products of any other country. These remarks apply particularly to filled goods.

WE advise all apprentices to watchmaking to subscribe for the KEYSTONE. The little work on "Pivots and Pivoting," which we give to every new subscriber as a premium, is as good as six months instruction under a skillful teacher.

Now that the Presidential and attendent economic questions have been definitely settled for at least four years longer, "let us have peace," and business men return to their wonted avocations with renewed zeal. Now, that the election, with its consequent excitement, is a thing of the past, commercial activities and interests will loom up with greater importance than for many months.

WE fancy jewelers as a rule do not study window display enough, especially about the time of holiday trade. The laboring class of people are as desirous of making presents within their means as those possessed of more wealth. Many such persons are sensitive, and do not like to come into a man's place and waste his time while they are looking and handling over goods without buying something; yet they do not know exactly what they want, and would like to look around. Now, if your goods are placed tastefully in your window, this class of people will often see something to please them, and you will make a sale which you would not otherwise secure.

IT is hard to discriminate in customers between those who come to see and those who come to buy. About the best method to pursue is to be courteous to all. Many persons are led to buy by judicious management, who originally came into the place to gratify their curiosity.

IT seems a shame that there can be no greater unanimity of feeling and concert of action among the retail watch and jewelry trade. The great antagonism seems to be petty jealousies and a tendency to let private interest rule, like the old print of two dogs coupled together running for the same rat. Almost as their noses touched the rodent, they ran astride a post. Neither would yield, and neither got the rat. We have advocated State and United States conventions of watchmakers for a year and more, and very little has come of it. We received a dozen or two letters about the matter, but it seemed as if everybody was waiting for some one else to move in the thing. Let us see once more what can be done—suppose we try in Pennsylvania for a convention of practical watchmakers to meet some time during the year. We wish all workmen who would favor such a scheme to write to the Editor of the KEYSTONE, saying they would be willing to do so. It will then be very easy to arrange the details of date and place of meeting. No doubt reduced fares for the occasion could be obtained on all the trunk lines of railroad. Now let us see, gentlemen, who will come forward.

WE are indebted to Mr. H. F. Yergey, the well-known jeweler of Columbia, Pa., for an elegant invitation to attend the celebration of the Centennial Anniversary of the founding of Columbia.

WE are no admirers of slang phrases at best, but if there is one which can be classed as our pet abomination, it is the very popular one of "got there all the same;" which means, as generally applied, that incompetency by sheer effort of cheek and trickery has succeeded in placing itself on top of ability and worth. There is no place where the truth of these conclusions are more strongly demonstrated than in watch repairing. Take, as an instance, a town of four or five thousand inhabitants. In such a place, five or six men will generally be found who devote themselves to the repair of watches; and out of this five or six one or two will be very good workmen. Then follow a couple of fair men at repairs, and the tail of the hunt brought up by two or three most execrable watch killers, who are forever singing their own praises, and crown a piece of botch work they have accomplished without either good sense or good tools by saying they "got there all the same,"—meaning they got the poor fool's money who confided the job to their hands.

THERE has been a good deal of discussion lately in regard to eye-glasses for watchmakers, many contending that high powers injured the eye. The necessity of using an eye-glass at all is imposed by the kind of work in hand, and the power employed should be proportionate to the exactions. That an eye-glass of two and one-half inches focus strains the eye any more than one of four inch focus is simply nonsense to assert. If it is necessary for us to do a certain piece of work, requiring a definite accuracy—we will suppose, to illustrate, it to be one-thousandth of an inch—we must, to accomplish this, employ a magnifier capable of distinguishing spaces of this extent, and if we use an insufficient magnifying power, we either have to overtask the eye or can not discriminate as close as we should. There is very much difference between taking a thing for granted, and absolutely knowing it is right. The average human eye will distinguish lines ruled on a steel plate from 250 to 280 to the inch, and, in rare instances, eyes will be found to recognize lines 300 to the inch. Consequently, we need a lens which will increase the power of the eye four times to be able to distinguish thousandths of an inch. The plan to adopt is to use an eye-glass of sufficient power to discriminate to the desired accuracy without straining the eye. For ordinary fine watch work, a two and a half to three inch focus lens is about right; and for pivots, a double eye-glass is required.

THE KEYSTONE for December will be replete with good things. Don't miss it. Subscribe in time, and get Cellini's book of instructions on Engraving.

UNDERHANDED and tricky methods are always disasterous in the end. Straight, square dealing is the true course, and will ultimately bring out the best results.

WE have often wondered of what possible interest the notices we find in so many trade journals of styles, or rather whims and conceits in jewelry was to the average retail jeweler; all described as gotten up in high art, and elaborately set with diamonds of the first water, or flawless rubies, or sapphires of great size. We know something of the watch and jewelry trade, and fancy not one in ten of our readers average the sale of a diamond of any kind once in a week. Yet these are the men who sell ninety per cent. of all the watch and jewelry goods manufactured. What these men want to know is how they can sell more seven jewel movements in Silver cases; more eleven jewel movements in Boss cases, and how to increase the demand for fifteen jewel movements in Solid Gold Keystone cases. Such information, in conjunction with a method of disposing of a large amount of first-class rolled plate chains, lockets, sleeve links, etc., is what the intelligent readers of the KEYSTONE desire to know. We are doing all we can to aid this class of men; giving useful hints and timely suggestions; knowing very well that dealers who sell gold tennis bats set with sapphires, are eminently competent to take care of themselves; and that there is not the slightest danger of a gents' furnishing goods place, or a general grocery store, annoying him with competition.

"*Good Housekeeping*," published by Clark W. Bryan & Co., Springfield, Mass., comes to us replete with matters of domestic interest. We fancy a household could hardly be complete without its interesting and instructive pages. All matters that tend to make "home" healthy and happy are intelligently dealt with in its columns.

TRADE TOPICS.

IN response to many enquiries for same, Mr. Hammond, inventor of the Hammond Wheel, now in use in nearly every repair shop in the country, has placed on the market a lapidary set for use with ordinary polishing or turning lathe, by which any jeweler can make repairs of skeleton eye-glass lens; polish perfectly edges of any lens easily and rapidly, doing as fine work as at factory. Specimens of its work shown are simply perfect.

THROWING goods into the windows, or show cases, as a farmer scatters corn to his chickens, does not attract customers in this day. You must convey to buyers the impression your goods are choice and valuable; and there is no way you can convey this idea to your customers better than by displaying your goods in some of the many devices for this purpose made by the Detroit Plush Tray and Box Co. Articles of second-class merit come up to the 18 K. standard when placed in their superb trays and boxes. Every jeweler should send for their price list.

AMONG the front rank of pushing firms are found Messrs. Bowman & Musser, of Lancaster, Pa. These gentlemen carry about everything a jeweler needs, and the immense business they are doing is the best evidence of their prices being favorable.

THE place of the three-handed jeweler, who can hold anything red hot, is supplied by Eddy's Patent Repair Clamp, for hard soldering specs and eye-glasses.

HENRY C. HASKELL, 18 John Street, New York, is the maker of a puzzle ring that is creating much talk. It is one of the novelties of this season. To any one never seeing it, and putting it together, can have one if they succeed.

THE Chicago Horological School expects to open November 1st. The facilities for instruction in this school are very complete.

MESSRS. LAPP & FLERSHEM, of Chicago, withheld the issuing of their catalogue for 1889 until after the first of November, so the trade could recover from the election excitement, and settle down to business. Their catalogue is now ready, and if you are not supplied, send in your business card and get one.

THE Jacot musical boxes are very desirable as choice holiday presents. These boxes are among the finest instruments of the kind produced.

THE cut of Parson's Horological School, on another page, gives a good idea of this prosperous and commendable enterprise.

A. N. CLARK, Plainville, Conn., issues a price list of watch keys, watch case springs, jewelry tools, etc., which every jeweler ought to have.

THE New York Standard Watch Co. are putting out many movements in the retail jewelry trade. They fit any regular 18 size case of American manufacture. The New York office, 83 Nassau Street, where all shopping is done, is a busy place. We understand a large order was refused last week; price being only a few cents lower per watch than the regular price.

THE annual meeting of the Aurora Watch Company stockholders has just been held. J. H. Weber, the business manager, in his annual report, announced the gratifying fact that the business of the company for the year 1888 up to September 30, was 132 per cent. greater than during the corresponding months of last year. During the same period the pay roll has increased but 59 per cent. The actual sales of the first nine months of the year were nearly double those of the same months of the preceding year.

MR. J. L. HUTCHINSON, La Porte, Ind., reports many new accessions to his school, and also many inquiries from the trade for workmen from among his pupils. He says: "Almost every letter I receive mentions the KEYSTONE. It shows that the trade read it thoroughly, expecting something new every issue. The KEYSTONE for me every time."

AMONG manufacturing jewelers, Pfaelzer Bros. & Co., of 819 and 821 Market Street, Philadelphia, have reason to congratulate themselves upon the commanding position they are assuming among their many competitors. They report a steadily increasing trade, and carrying as they do everything desired in the stock of a well equipped retail house, it is not surprising that their orders are numerous and large. Their stock is varied, complete, and their prices are always bottom figures. Goods cheerfully sent to reliable dealers in any part of the country on approval. Established since 1866. Their reputation among the jewelry trade as a thoroughly reliable house, has long been established.

MISCELLANEOUS.

The "Terror," Mr. H. A. Hardy, with D. C. Percival & Co., of Boston, was seen last week rushing through New England in a pair of yellow pants and a red neck-tie. Rumor has it that the "Terror" is going to marry a large, fat German girl this Fall.

MARRIED.—At Chicopee, Mass., September 17th, Mr. Chas. B. Houghton to Miss Minnie A. Patrick.

Mr. Houghton is one of the representatives of Messrs. Floyd, Pratt & Rounds, Boston, Mass. Our readers will no doubt remember of seeing Mr. Houghton's picture in the KEYSTONE some time ago. Mr. Houghton is a man of great prominence in social life and politics; is President of one of Boston's most aristocratic Social Clubs, and likewise of the Harrison and Morton Club of South Boston. He is also, or was for some time, quite a base ball player, and acted as short stop in the Boston Club, and lost his fore-finger in stopping a "hot ball."

The wedding was quite a swell affair. Boston's blue blood was there. Governor Ames and staff, and General Butler were noted as being present. The presents were valuable and numerous. One very large check from his great-grand-father was seen on the table. The firm sent a valuable solid silver set, and the boys in the office united in sending a handsome gold watch and chain. The different clubs with which Mr. Houghton is connected sent valuable presents. After the ceremony, dancing was indulged in until a late hour. At midnight there was an elegant repast served up, to which all did justice, particularly the boys of the office. The KEYSTONE was remembered, and acknowledges the receipt of a large slice of the bride's cake.

Miss Minnie, we understand, was one of the leading ladies of Chicopee, and is celebrated for her beauty and wit. The happy couple visited Niagara Falls and Washington City. The KEYSTONE wishes this worthy and happy couple all the joys of wedded life that is due to all who deserve it. And in this case we can say it is most truly deserved; and may time deal as gently with them as it does with a Boss case, and may they wear as well. In this wish we are confident all Boston and Chicopee will join.

MARRIED.—Mr. Philip Present, of Rochester, New York, to Miss Celia Selling, of New York City, on Sunday, October 21, 1888.

Mr. Present is a wholesale jeweler at Rochester, N. Y., and the KEYSTONE is glad to welcome him to the ranks of the Benedicts. We extend our congratulation to the happy couple, and if Philip makes as good a husband as he is a business man, the lady is deserving of great congratulations. We have known Mr. Present for some time, in fact from the time he started in business in a small way, and have seen him climb up higher and higher each year, until to-day he has a business that he may well feel proud of. This, we know, has been done by hard work, close attention to business, together with integrity and honesty. There is not a customer on his books but that is his friend as well as customer, and that his success may continue, and his married life be a happy one, is the wish of all who know Mr. Philip Present.

The

ATLAS

10 Karat Case

Is the Handsomest in the Market

MARX & WEIS,

No. 180 Broadway,
New York.

Border Chased.

Successors to

McCarty & Hurlburt,

131 N. Second St.

Chased.

H. O. Hurlburt & Sons,

Wholesale Agents for AMERICAN WATCHES.

Manufacturers o
Gold and Silver Thimbles, Gold Spectacles, and Silverware.

938 Market Street, Phila., Pa.

Judge Mack's Opera-Glass Holder

will fit any Opera Glass. We have the sole agency. Any infringements will be prosecuted.

Examine our new
"ELITE" Test Lenses.
They are the Finest and Most Complete in the Market.

Gold Goods always up to the Standard.

Our "ELITE" Opera and Field Glasses are Perfect.

We are recognized by the trade as furnishing
Strictly Interchangeable
SPECTACLES and EYE-GLASSES.

Julius King Optical Co.,

4 Maiden Lane, New York.
177, 179, 181 Superior St., Cleveland, O.

The Chicago Horological Institute

(Incorporated),

Office: No. 182 State Street, Chicago.

U. W. FRINK, President. O. C. JAQUITH, Secretary and Treasurer.

Established for giving Practical and Technical Instruction in Watchmaking and Repairing. Adjusting taught in all its branches by MR. THEO. GRIBI, one of the most scientific and practical watchmakers in this country. Weekly lectures on escapements, jeweling, springing, etc., by professionals.

Send for circular giving terms and full information.

Chicago Horological Institute,

No. 182 State Street, - - Chicago, Illinois.

THIS CERTIFIES that we are acquainted with the gentlemen who have organized the above Institution, and that we fully indorse the CHICAGO HOROLOGICAL INSTITUTE and recommend the same to the favorable consideration of the trade.

ELGIN NATIONAL WATCH CO.
E. HOWARD WATCH AND CLOCK CO., } H. E. Howard, Agent.
SWARTCHILD & CO.
ROBBINS & APPLETON.
W. W. WILCOX, } *Editor Jeweler's Journal.*
H. F. HAHN & CO.
AMERICAN WALTHAM WATCH CO.
KEYSTONE WATCH CASE CO., } H. M. Carle, Agent.
M. A. MEAD & CO.
C. H. KNIGHTS & CO.
COGSWELL & WALLIS.
TOWLE MANUFACTURING CO.

H. Muhr's Sons,

Importers of

DIAMONDS

629 Chestnut St., Phila., Pa.

OFFICES.
14 Maiden Lane, New York.
139 State Street, Chicago, Ill.

EUROPEAN OFFICE: 45 Rue Simon, Antwerp, Belgium.

Macnair & Burlingame,

Manufacturers of

Jewelers' Findings & Repairing Material,

226 Eddy St., Providence, R. I.

Sell direct to the

RETAIL JEWELERS

at Manufacturers Prices.

Send for Illustrated Catalogue and Price List.

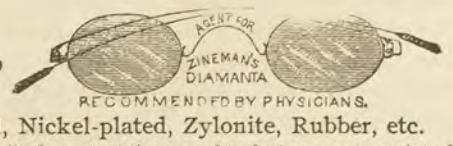
Every live jeweler sells them.

Diamanta Spectacles and Eye-Glasses.

Manufactured only by

M. Zineman & Bro.,

130 S. Ninth St., Phila., Pa.



In Gold, Silver, Steel, Alloy, Nickel, Nickel-plated, Zylonite, Rubber, etc.

To introduce our goods more thoroughly we will, for a short time, send to dealers, upon receipt of $35, a complete line embracing: 6 doz. Eye-Glasses, 6 doz. Spectacles, 6 doz. Cases, Optometer and Test Cards with directions for measuring Eyes, Signs, Electrotypes and 1,000 circulars describing goods and containing name of dealer. We have sold hundreds of these outfits to dealers all over the country. The demand for the "Diamanta" goods is increasing daily, and every wide-awake dealer makes a specialty of them. We send a complete advertising outfit and a show case, or a Spectacle cabinet with every large order. We are always glad to hear from you and furnish any information. Our department for making Prescription Glasses is complete. We employ only skilled workmen. Our prices are unusually low.

Keystone Filled Cases

WHEN you have a customer who asks a reduction on a James Boss Case, show him a Keystone Filled. We got them out especially for such people. We know they are not as good as the Boss—we do not guarantee them to be as good, and yet we know them to be better than many cases sold and represented to be just as good as the Boss. These cases are, in every way, sound and serviceable, beautifully made and elegantly engraved, giving the purchaser a generous return for his money. Excepting the Boss, it is the best Filled Case on the market.

Keystone
Watch Case Co.
Philadelphia
New York · Chicago

We are Fully Ready

for the Holidays, with every desirable thing in the Watch and Chain line. Our stock, always very large, is now over-full; our selection, always comprising specimens of the highest attainable reach in art, now fairly blooms with beautiful creations; our prices are always right. Quantity, Quality, Style, Price, Promptness, and absolute Protection to the Legitimate Retail Jeweler—we submit these six points as our argument in favor of your sending us a trial order. We believe we will not disappoint your expectations. We shall be pleased to hear from you.

Bowman & Musser,

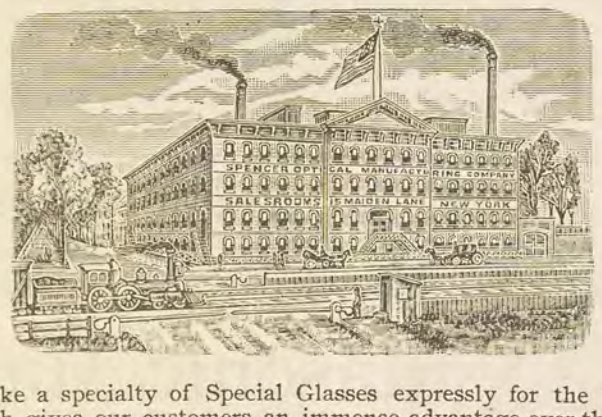
Jobbers in

Watches and Chains, Tools and Materials,

Lancaster, Pa.

Spencer Optical Mfg. Co.,

15 Maiden Lane, New York.



We make a specialty of Special Glasses expressly for the Fine Retail Trade, which gives our customers an immense advantage over their competitors and destroys the ruinous competition. We manufacture the largest line of Optical Goods of any house in the world. Sole Agents for Audemair's Opera and Field Glasses. Send for our new Catalogue that will be issued September 15th.

Audemair's Complete sets of Trial Lenses.

Trial Lenses in Cases in fifteen different styles, with and without Rims, Metal and Celluloid.

Beautiful Styles of Lorgnettes in Shell and Celluloid. Genuine Brazillian Axis cut Pebble Spectacles and Eye-Glasses in Steel, Celluloid and other Frames, from $9.00 to $15.00 per dozen. Standand Interchangeable Frames in ALL materials, with perfectly colorless lenses, accurately centered, ground and focused, and labeled for the same. Spectacle and Eye-Glass Cases, all materials, styles and grades, including Plush of all colors, Celluloid, Shell and Turkish Morocco.

Gold, Steel and Solid Nickel Eye-Glasses.

Publishers of Dr. Bucklin's Detection and Correction of Eisual Imperfections. Price $1. No dealer should be without it.

Spencer Optical Mfg. Co.,

15 Maiden Lane, New York.

Factories : Newark, New Jersey.

The Best Watch Oil Ever Produced.

Every watchmaker in the world is acquainted with the fact that the Oil that will stand the lowest temperature is invariably the one that gives the best results.

Working upon this fact, we have found that our Watch and Clock Oils, when passed through the process of refinement at temperatures lower than 20° below zero, are freed from all impurities that Corrode and Blacken the Pivots of a Watch, at the same time they are rendered Perfectly Unaffected by Heat or Cold.

We have spent much time and money in determining this method of refinement, and the exquisite quality of the goods that were produced by our experiments caused us to immediately establish a refinery at a high Canadian latitude, where the work could be carried on uninterruptedly in severe cold.

Watchmakers have always found trouble, even with the best known Watch and Clock Oils, and have strongly desired an article that could be invariably relied upon. We are the first to respond to the demand for an improvement in these Oils, and we invite the severest tests that can be applied to them.

William F. Nye

In use upon all Watches sent out from the Waltham Factory.

In use upon the Strasburg Cathedral Clock.

MR. WM. F. NYE, New Bedford, Mass., U. S. A. Strasburg, April 14, 1887.

DEAR SIR: In answer to your question, we do not hesitate to certify that the Clock Oil, of which you sent us a supply, fulfills every condition that we could demand. That is to say, it is very liquid, leaves no gummy deposit, does not corrode the metal, and remains greasy after several months of use. It acts equally well at a high or low temperature. The results of the different experiments to which we have submitted the Oil, have proved in every case very satisfactory.

UNGERER BROS.,
Keepers and Repairers of the Strasburg Cathedral Clock.

To the Watch and Clock Trade.

Realizing that we were in possession of the finest stock of raw material for such goods, the "Jaw" and "Melon" Oil, and knowing from years of experience the great difficulty of producing a uniform quality of this Oil in a climate so variable as in the vicinity of our factory at New Bedford, we attempted the scheme of refining it in a higher latitude, and accordingly a stock was sent to the borders of Canada—St. Albans, Vt.—and after a thorough chilling at a temperature 35° below zero, the process of refining was completed at an average temperature of 20° below zero. The experiment was a great success, and we can now assure the trade that we have produced the finest quality of watch and clock oils ever shown to the world. Watchmakers have only to ask their dealers to send them a bottle of Nye's Watch or Clock Oil to prove the correctness of our statement.

WILLIAM F. NYE,
New Bedford, Mass., U. S. A

OSGOOD FOLDING CANVAS BOAT

Invented and Manufactured by N. A. OSGOOD, Battle Creek, Mich.

BEST, SAFEST and Lightest.

Impossible to tip it over by Rocking.

Makes up four different weights, the same as four boats combined in one. Oars and paddle are jointed, and pack in boat without extra charge. **This cut shows the twelve-foot boat and packing chest.**

Send for Illustrated Catalogue.

HOUGHTON & CO.,

Manchester, N. H.

Manufacturers of face plates and slide rests. Prices reasonable, and quality guaranteed. Ask your jobber for one on approval.

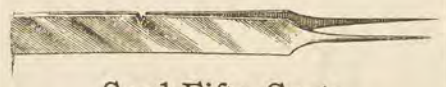
JEWELER'S LAPIDARY

Complete set with grits, polishing material, chargers and full directions. In case, by mail, $1.50.

With this set any jeweler can replace a broken skeleton eye-glass lens, drill holes, equally as well as by sending to factory, and produce rapidly as fine polish on edges of any lens, or crystal. For sale by all material houses.

W. F. Hammond, Mfr.,

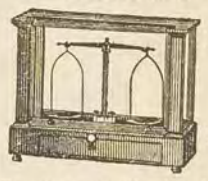
Greenport, Suff. Co., N. Y.



Send Fifty Cents

To JOHN A. MILLER, Cairo, Ill., for his handy tweezers, the best tool out to remove and replace cock and foot jewels, press on hairsprings, roller plates, second and minute hands, etc.

CHARLES KOHLBUSCH,



Manufacturer of Fine Balances and Weights

For all purposes.

35 Nassau St., N. Y.

Send for Catalogue.

Repairs promptly attended to.

Barnes' Patent

Foot-Power Polishing Machine.

THIS Polishing Machine has advantages that were never before gained by any application of foot power for this purpose. All the appliances common to the polishing departments of jewelry manufacturing establishments can be tried on this machine, and equal results attained. It is inexpensive, and dealers cannot afford to be without an outfit.

The consequence and convincing powers of a salesman are poor inducements to the purchaser as compared with a well kept stock of goods, that have their original charms of polish, luster and freshness.

Our Lithological or Lapidary Lathe has the same application of foot-power, and it is giving results never before reached by any other application of foot-power for this purpose. These machines are of great value to Jewelers, and their correspondence is solicited. Illustration Catalogue FREE.

Address, 660 Ruby Street,

W. F. & John Barnes Co.,

Rockford, Ill.

ANNOUNCEMENT.

We are prepared to do all kind of jewelry, manufacturing, enameling, engraving and watchmaking for the trade. Knight Templar and Knights of Phythias goods a specialty. Would kindly solicit a trial from jewelers in surrounding country. Satisfaction guaranteed.

Cone Manufacturing Co., Cedar Rapids, Iowa.

ALL RAILROAD MEN

Carry Fine Watches

and use

RAMSAYS' LEATHER LINED SWIVELS

To Protect the Watch Bow.

We will send samples of not less than one-half dozen to any regular Jewelers, and if you do not agree with us that they stand head and shoulders above any other swivel on earth, you can return them. They cost no more than any good swivel.

Manufactured only by

Burt Ramsay & Co.

185 Superior Street,

Cleveland, O.

Established 1870.

J. L. Clark,

Refiner and Sweepsmelter of

Gold and Silver

No. 823 Filbert Street,

Philadelphia, Pa.

Gold and Silver of any kind bought.

Send by Mail, Express or Freight.

L. Lelong & Brother,

Gold and Silver Refiners, Assayers

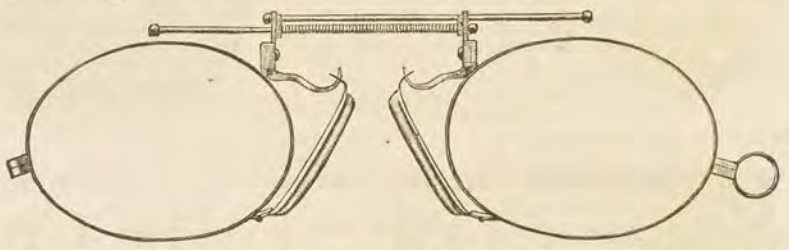
AND

Sweep Smelters,

S. W. Corner Halsey and Marshall Sts.,

NEWARK, N. J.

Farley's Patent Bar-Spring Eye-Glass.



This style of eye-glass with offset guard (which a front view does not show) will be found best adapted for a large proportion of noses, especially low noses which cannot well, if at all, wear an ordinary eye glass. The horns holding the upper part of the guard have the temper drawn, so that they can be bent in or out, making the guard more or less parallel, as the slope of the nose may require; or one guard can be set in or out, if the nose is unequal as is often the case. Any excess in the length of the horns can be cut off. This style in No. 3 eye will be found well suited for the soft and ungrown noses of children.

For sale by Jobbers in Optical Goods.

I. Bedichimer,

618 Chestnut Street, Philadelphia.

Manufacturer of

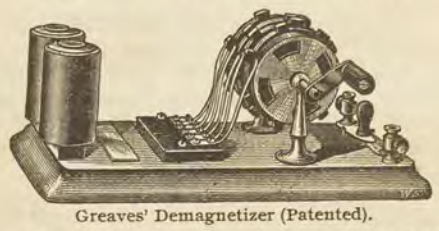
Masonic Marks,

Society Emblems, Pins and Jewels.

Highest award at Franklin Institute, 1874, International Exhibition, 1876.

The Most Useful and Important Invention for Watchmakers.

No Electric Light Wire Required.



Greaves' Demagnetizer (Patented).

Cost of Maintenance less than 50c. a Year.

Watches Demagnetized without Taking Apart.

The Best and Quickest Demagnetizer Ever Made. Takes up less Room on a Bench than a Lathe.

The simplest and most effective machine ever produced for that purpose. Anybody can demagnetize a watch in from one to three minutes' time, *without taking the movement apart*, by *following the instructions* which accompany each machine. The price being only $35 permits the most modest shop in the country to possess one. Address all correspondence and orders to

The Jaccard Watch and Jewelry Co.,

No. 815 Main Street, Kansas City, Mo.

Who Does Your Repairing?

How very important is this question, and how often it is asked. How frequently do you say to yourself: "My, how I wish I knew of a place where I could send my repairing and have it done right, and returned promptly." We do all this and more, for as we do so much of it, we can do it for less money than those who do only a little. We have reduced it to a perfect system, each class of work is done in a separate department, under the management of a thorough mechanic, and the smallest jewelry job to the making of the finest 18 K. watch case over an expensive movement, is given the most careful attention. So is it in our optical shop, from grinding an ordinary spherical lens in a frame, to grinding the most difficult crossed cylindrical lens; from merely soldering a break in a pair of steel spectacles, to making a new gold frame of complicated measurements. Everything is done carefully and correctly.

We have a department for the renewal of Old Silver and Gold Cases, and to such perfection has this department been brought, that if there is only enough material in the case, that is, if the backs and centre are not too thin, you will not be able to distinguish the case from a new one when we are through with it, no matter how bad a condition it was in when we received it.

Our intention is to please, and the best assurance we can have that we are doing so is from the fact that we have not lost a single customer since commencing business, and are daily increasing our list of them; but we are not satisfied if your name is not on our books. It is you whom we are talking to, not to those who have given us a trial and are now numbered amongst our patrons; but you and yours is the name we want to see on our books. Will you please give us a trial and judge for yourself whether we can, and are, doing all we say? We promise you that every question will be answered, every detail noted, and every job, however small, given our very best attention. Who can promise more?

Kindly glance over our repair and manufacturing departments, and remember each is under the head of a careful manager, and one who understands his business.

DEPARTMENT 1. For the manufacture of special watch cases, gold and silver, and plain gold rings.

DEPARTMENT 2. For renewing old silver cases, and for watch cases and jewelry repairing of all descriptions.

DEPARTMENT 3. For the grinding of lenses of all kinds.

DEPARTMENT 4. For the manufacture of gold, silver, or steel spectacles and eye-glass frames.

DEPARTMENT 5. For the repairing of optical goods.

Chas. Trewin. W. R. Williams. Dayton Ball.

Edwin Diesinger. Chris. Huber. W. H. Williams.

Wm. Sutton. Wesley Fenimore. Harry Huber.

We make a Specialty of Casing odd American and Swiss Movements in Gold and Silver, and the making of Plain and Band Gold Rings.

We carry a complete stock of Elgin, Waltham and Springfield Movements; 10 K. and 14 K. Gold Cases; Wheat and Granger Cases; Boss, Keystone and Star Filled Cases; Keystone and Leader Silver Cases; Silveroid Cases, etc., etc.

Send us your Prescription Grinding, and other orders for whatever you need in the Optical line.

Send us your orders for Plain Rings, and your Jewelry and Watch repairing.

Send us your old gold and silver watch cases, and have them made to look like new at small expense; send on all you have on hand and we will furnish you with estimates of cost of repairing.

Send us your old gold and silver. We pay you whatever it is worth—it's full value. Why? Because we can use it in our shop, and it pays us to allow full value.

A Talk About Seamless Gold Rings with a Practical Ring Maker.

We notice a great deal of advertising about Seamless Plain and Band Gold Rings, and there are no doubt many dealers who would like to know what it all means. How seamless plain rings are made, and if they possess the great advantages claimed for them. To a plain question we give a plain answer. They do not. Old case makers will tell you how years and years ago, long before you or I were born, rings were made just as the seamless rings are made now—CAST. Think of it, a method which years ago was discarded is now taken up and palmed off as a new invention, as a wonderful improvement. FAUGH, the idea of it is enough to make a good workman, a thorough mechanic disgusted.

CAST RINGS. Is it any wonder they crack and break when you try to stretch them. Is it any wonder they are full of little pores and holes. Of course it is not. They are cast. Why then do you not come to us for your rings, buy of one of the few houses who make rings as they should be made, and who employ only skilled workmen to make them. We first run our melted gold into ingots, and after annealing, roll the bar through heavy steel mills to the required thickness and width, after which it is cut into pieces of proper lengths, and after being bent on the mandril soldered and turned to the shape and size wanted, and after the ring is finished, we defy any one to find the seam. Our rings are seamless and are not cast. They are wrought, and which is the best—wrought metal or cast. Our rings are wrought, and will stretch without breaking or cracking, while the seamless rings are cast, and like all cast metal are full of pores and exceedingly brittle. We leave it to your own good judgment as to which is the best method, and which you will buy. We guarantee all our rings to be as represented. Melt them up. Have one assayed. Do anything you please with them. We are not afraid. We know our rings. They will stand the test. Send for order tablets, and give us a sample order, if only for one ring.

The following are Some Things you can't very well do Without.

Our Celebrated Brand of

Le Pert Opera and Marine Glasses.

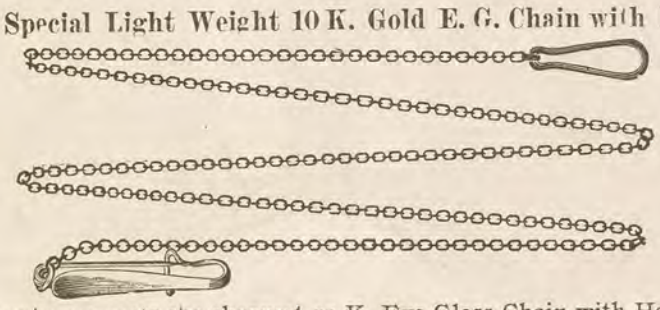
We are the sole agents of this famous make of goods in the United States, and claim for them that they will equal in style, finish, and quality of lenses, the best goods made, being perfectly achromatic, while the price is much lower.

Send for a Price List, and for a sample line to select from.

OUR SPECIAL LIGHT WEIGHT GOLD RIDING BOW.

The above cut is emphatically the lowest priced gold spectacle on the market. Send for a sample dozen.

Our Special Light Weight 10 K. Gold E. G. Chain with Hook.



The above cut represents the cheapest 10 K. Eye-Glass Chain with Hook on the market. Send for a sample dozen and be convinced.

Our Special Heavy Roll Plate Eye-Glass Chain with Hook.

Send for sample dozen and judge for yourself of quality and price.

Our 6 size Star Filled Watch.

This cut represents a 6 size Star Filled Case handsomely engraved, which fitted with an Elgin or Springfield Movement, makes the cheapest and most attractive Ladies' Watch ever offered to the trade. It is the neatest and contains the most gold of any filled case of its price on the market. We can also furnish the same case fitted with an Illinois movement in 4 size.

Our 18 size Open Face Silveroid Key-Wind Watch.

We have fitted up a number of these very desirable cases with I. W. Co.'s 7 Jewel K. W. Movements, making a complete watch for $4.50. Get in your orders for this very scarce watch as early as possible, for we will not have them very long. A word to the wise is sufficient.

Our Telegraph Code for quick ordering of anything you want in the Optical Line.
Our Illustrated Catalogue of Optical Goods.
Our Price List of Watches, published monthly.
Our $85 00 complete Watchet Test Set.
Our $25.00 complete Test Set of Spherical Lenses.
Our $10 00 Test Set, very neat.
Our complete Test Set of Trial Frames.
Our Book of Prescription Blanks.
Our Tablet for ordering Plain and Band Gold Rings.
Our Monthly Circular giving latest Patterns of Watches, and many items of interest to the Legitimate Trade, to whom it is sent only.
Our Book of Test Type.
Our Addressed Envelopes.
Our Line of Samples of whatever you want in Watches or Optical Goods.

We also respectfully desire to inform our patrons that anticipating a scarcity of desirable movements this fall, we bought up all we could during the summer months, of Springfield's, and now have an immense stock of every grade on hand. We are aware that this movement is not so well known as the older Company's production, but we propose carefully examining every movement, before sending them out, in order to make sure that it is in good running order. If any do not give satisfaction, we will cheerfully exchange for others, either of same production, or whatever make you desire.

The Philadelphia Optical and Watch Co., Ltd., 916 Chestnut St.

We do not Retail, Never Have, and Never Intend to.

There are many firms doing a wholesale business, who wish they could say the same. There are many who wish they could go before the trade truthfully with such a record. Yet, how many are there in your recollection who can? "Not many," you say, "very few—too few." Why is this the case? Why is it so very few jobbers and manufacturers sell only at wholesale? Why is it the majority sell to whoever they can, and whenever they can? Why, because it pays them to do so, is their answer, and because they think you will buy off them anyhow, retail or no retail. The old firms that the majority of the jobbers of to day learnt their business with used to retail and make lots of money by it, and it sort of became "dyed in the wool," and the jobber of the present time thinks he should keep up the old custom, sell to whoever he can, and make all the money he can. Of course Jones and Brown and Smith will growl and bluster and kick. So did Jones and Brown and Smith of olden times do the same, but they bought of us just the same, and so will they buy of us now and in the future. Suppose they don't like it, what are they going to do about it, and who are they going to buy from? They have got to have goods, and what jobber or manufacturer don't retail when they get a chance. There are none of them but what do. They would be fools if they didn't, and so it is reasoned by the majority of the firms you are buying from, by those you are paying hundreds and hundreds of dollars to every year, the past has proved they were about right—because you could not help yourself. They all retailed; of course you didn't buy of the man in your city, but you bought of one just as bad in another city. The jobber in your city couldn't sell you, but he could sell to a retailer in another city, and so it went. Because the retailing jobber sold you in the past will he in the future? In our humble opinion, he will not. At any rate, we have cast the die as non retailers. We were willing to trust the trade to protect us, and are still willing to do so. We knew the trade were not going to rush into our office at the first notice they had of our going into business, and of our non-retailing feature, for they had been fooled too often by houses starting with the same promises, and after trying it for a few months getting discouraged, and either giving up altogether, or else retailing all they knew how. But we were not made of that kind of stuff. We had come to stay, and stay we did, and stay we will, and no retailing either. We worked awfully hard to take orders, and then worked still harder to fill them correctly. We took in all kinds of repair work, and worked early and late to get it out satisfactory and on time. That we succeeded goes without telling. The customers we had then we have now; for when we gain a customer we work harder to please him and hold his trade than we do to gain a new name on our books. In a short time we became known to the trade, not because we did not retail only, but because we turned out good work; because we were manufacturers as well as jobbers, and because we sought to please, and when our trade doubled and tripled and doubled again, we were still as anxious to please and cater for a small order as when we commenced business, and no matter how our business increases, we will ever be the same. A small order will be filled with the same care and accuracy a large one receives. This you can count on.

When the trade found they could buy whatever they wanted in optical goods or watches they commenced to patronize us, and we can safely say not one of the many dealers who have been in our office have ever seen a man, woman, or child, buying an article at retail of us. It may seem of no particular importance to the dealer in San Francisco, that the house they are buying goods of in Philadelphia or New York City retail, but it really is of the greatest importance, and the sooner you stop patronizing them the sooner will you attain the point you are striving for. Should they find you are in earnest in what you say, and that you will buy of no jobber who retails, just so soon will they stop retailing and not before. That is why we say it is of the greatest importance that you buy only of non-retailers. How many times, particularly around the holidays, do you go into a wholesale house, maybe the one you are giving the bulk of your trade to, and find that house selling your neighbor, and we say, what does it matter if they do charge retail prices? Your neighbor don't think so, or he wouldn't have gone down town to buy. He would have bought of you. He thinks he is buying at wholesale prices, because he knows he is buying of the firm you buy of. He saw you buying, and he says to himself, and what is still worse he may say to another neighbor, "what is the use of buying of Smith when I or you can go down to (mentioning the jobbers name), "and buy at the same price he does," and so it gets around the neighborhood, and you find your trade leaving you. Now this state of affairs was bad enough when you could not avoid it; when you could not find a wholesale house which did not retail. But if you still continue to patronize such houses; if you still buy off your competitors; if you still help people to undersell you, then the blame be on yourself, then you are indeed working against your own interests, and advertising some other fellow's business. Therefore, when we say, "You do not meet your customers in our office," when we say, "We do not sell you, and endeavor to sell your customers also," think well over it, and then consider we carry a full and complete line of watches and chains, and a full and complete stock of optical goods. That we are the sole agents in the United States of Le Pert's celebrated line of Opera and Marine Glasses; that we have a complete shop for all manner of repairing; that we manufacture watch cases, plain and band gold rings, gold spectacles and eye-glasses, lenses of all descriptions, etc.; that we do not retail, and never have; and that we can give you as good terms and prices as any one, possibly better, and we think you will say that is the house it will pay us to tie up with—the house that can give us as reference the legitimate jewelry and optical trade of their own city must certainly be pretty sure of what they claim—must certainly protect their customers interests in every sense of the word.

H. C. Haskell, 18 John street, has received more orders this spring for class pins, rings, medals, badges, &c., than he has for years past. His customers seem to appreciate his enterprise in promptly furnishing designs for all kinds of special articles, and as a consequence he is "full of orders." Those in need of anything in his line should give him a trial. When Mr. Haskell obtains a customer he endeavors by close attention to his wants to retain him.

—From Jewelers Weekly.

SPECIAL DESIGNS,
CLASS PINS, RINGS,
SOCIETY PINS,
MEDALS, TROPHIES,
EXCLUSIVE DESIGNS.

H. C. Haskell,
18 John Street, - New York.

Catalogues sent Dealers upon request.

Birch's Patent Bench Keys.

No. 41 Bench Key (Nickel Plated with Hard Rubber Handle.)

Engine Turned, Assorted Patterns.

Sold by the trade. Circulars on application.

John S. Birch & Co., 182 and 184 Lewis St., N. Y.

Established 1866.

Pfaelzer Brothers & Co.,

Manufacturing Jewelers.

Importers of

DIAMONDS.

Wholesale Agents of all makes of

AMERICAN WATCHES.

819 and 821 Market Street, Phila., Pa.

Our line comprises *everything* from the cheapest to the finest in Jewelry, Watches, and Diamonds; our assortment of stock is second to none in this Country and always at bottom figures. Goods cheerfully sent on selection, but those unacquainted with our House will please furnish references.

We sell on close profit and short time only.

Col. J. M. Rutherford, Auctioneer,

Specialty made of Diamonds, Watches, Jewelry, etc.

Sales made only for established jewelers in their regular places of business. Am a practical jeweler, with an experience of 25 years as a special salesman. Can refer to over 100 jewelers, for whom I have made successful sales in all parts of the United States. Address,

Room 7, 618 Chestnut Street, Philadelphia.

W. H. Sheafer & Co.,

108 S. Eighth St., Philadelphia. Manufacturing Jewelers.

Link, Band and Wire BRACELETS.
Lace Pins, Ear Rings, Sleeve Buttons, Studs and Lockets.
Diamond Mountings and Diamond Goods.
Designs made to Order and Estimates furnished.

Aikin, Lambert & Co.,

23 Maiden Lane, New York.

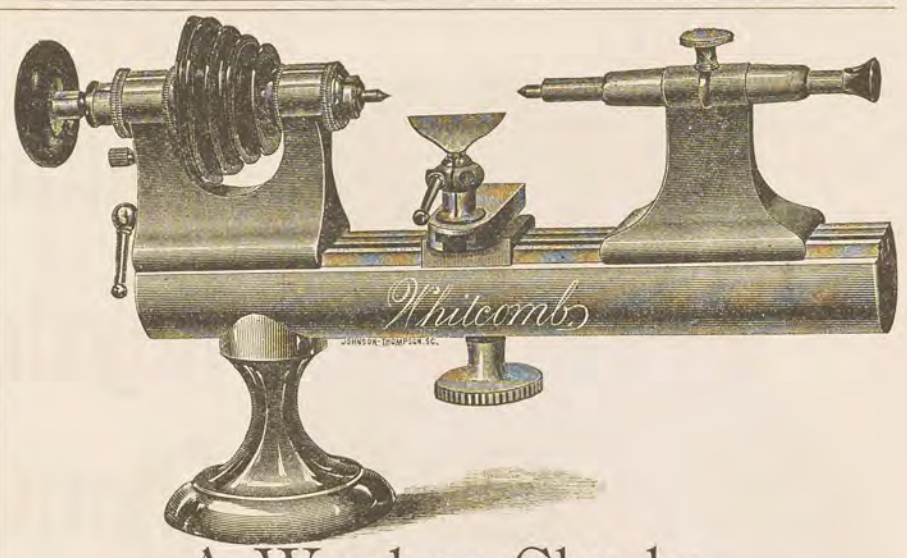
Manufacturers of

Gold Pens, Holders, Pencil Cases, Pencils, Tooth-Picks, Match Boxes, Novelties, etc., etc.

Show Case and Fancy Tray Apartments arranged specially for Jewelry Trade.

Fountain Holders.

Catalogue and List sent only to Dealers.

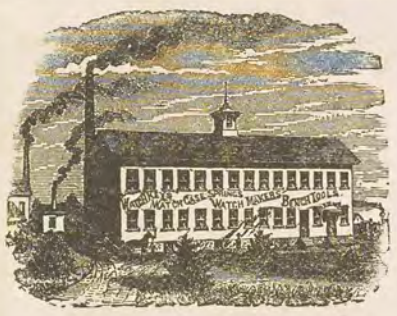


A Word on Chucks.

See that the word "WHITCOMB" is on your chucks. Base imitations have been put on the market. So we have since 1886 marked our make which we guaranteed true by

American Watch Tool Co.,
Waltham, Mass.

Send for Reduced Price List of July, 1888.



Send to

A. N. Clark,

Plainville, - Conn.,

for

New Illustrated Price List

Of Watch Keys, Key Rings, Watch Case Springs, Tweezers, Jewelers' Tools, etc., etc.

A. N. Clark, Manufacturer, Plainville, Conn.

We are Still Moving Ahead.

KING & EISELE,

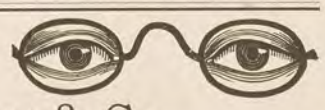
Manufacturing Jewelers,

Buffalo, New York.

Carry in stock complete lines of everything sold and used in a jewelry store. Our Snaps are all the rage. Send business card for our new lists.

Mention this paper.

Successors to
JACOB COLTON & CO.,



W. W. Coomes & Co.,

Manufacturers of

Gold and Silver Spectacles, Gold Eye-Glasses, and Gold and Silver Thimbles.

Long Meadow, Mass.

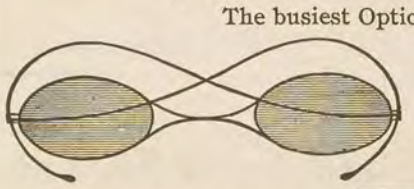
No Goods at Retail.

The Philadelphia Optical and Watch Co.,

(Limited,)

916 Chestnut Street, Philadelphia, Pa.

The busiest Optical House in America.



Manufacturers of

Lenses, Gold, Silver and Steel Spectacles, Eye-Glasses, etc.

We have the largest Prescription Grinding Department in the country.

The Chief Feature of an Optical Store is an Attractive Spectacle Sign.

Recognizing this fact, we have had made very attractive light wooden spectacle signs, bound in iron, and set with blue glass in four different sizes, and which we will furnish our customers with, at cost, If you need one, write us, and we will furnish price.

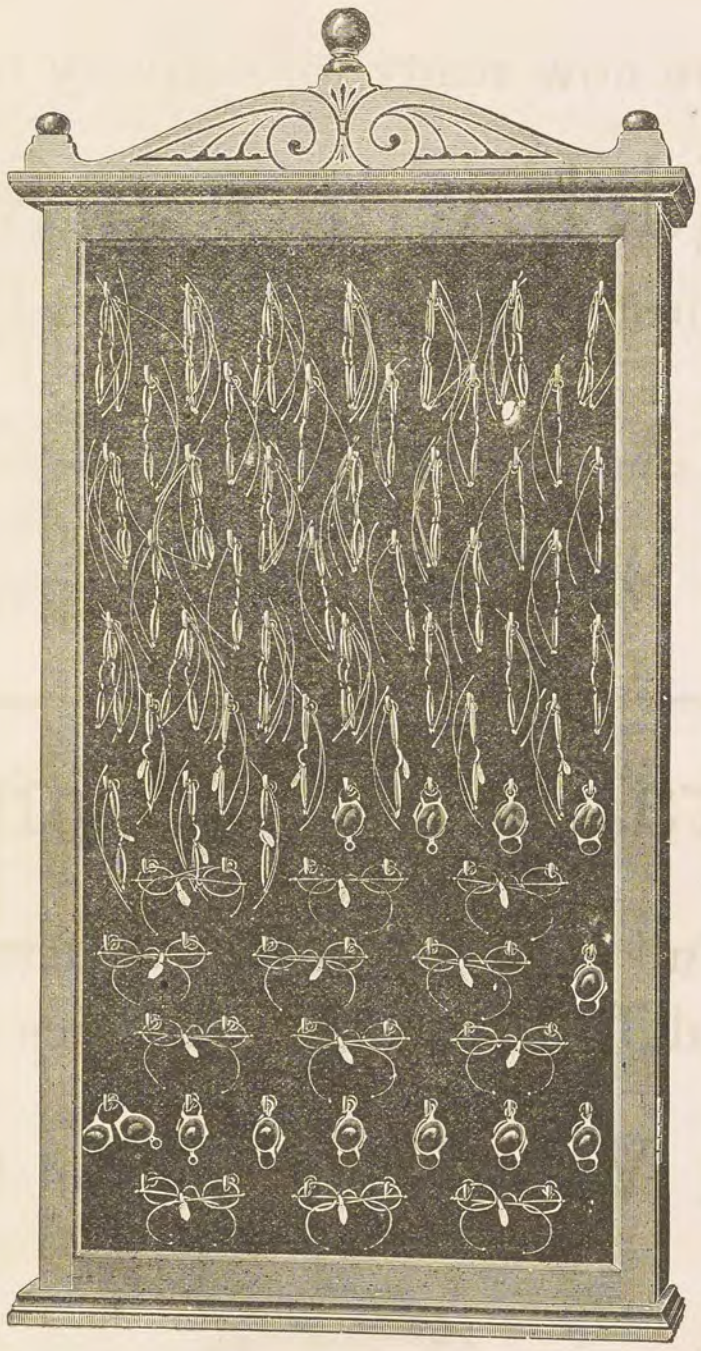
Special Notice.

We have added to our manufacturing departments one for the manufacture of leather spectacle and E. G. cases of all grades and styles, and there is no better time than the present for ordering them. Let us send you a line of samples. Remember, we manufacture.

C. H. KNIGHTS & CO.,

MAKE A SPECIALTY OF

SPECTACLES AND EYE-GLASSES



$25.00 Outfit.

2 Doz. Pairs, 1st Quality Steel Spec Frames, Interchangeable, No. 1 Eye.

1 Doz. Pairs, 1st Quality Steel E. G. Frames, Interchangeable, No. 1 Eye.

3 Doz. Pairs, 1st Quality Lenses, Interchangeable.

2 Doz. Pairs, Tempered Steel Specs, Assorted as desired.

2 Doz. Pairs, Common Steel Specs, Assorted.

1 " " Rubber Eye-Glasses Assorted.

1 " " Cog Specs.

$50.00 Outfit.

1 Doz. Pairs, Fine Steel Spec Frames, Extra Quality, Interchangeable.

2 Doz. Pairs, Steel Spec Frames, 1st Quality, Interchangeable.

2 Doz. Pairs, Steel E. G. Frames Pat. Nose Piece, Interchangeable.

1 3.50 Pair 14 K. S. T. Spec Frames, Interchangeable.

1 3.00 Pair 10 K. S. T. Spec Frames, Interchangeable.

1 2.75 Pair 14 K. R. B. Spec Frames, Interchangeable.

1 2.00 Pair 10 K. R. B. Spec Frames, Interchangeable.

6 Doz. Pairs, 1st Quality Interchangeable Lenses, Assorted as Desired.

3 Doz. Pairs, Common Tempered Specs, Assorted.

1 Doz. Pairs, Common Specs Assorted.

3 Doz. Pairs, Rubber E. G. Assorted.

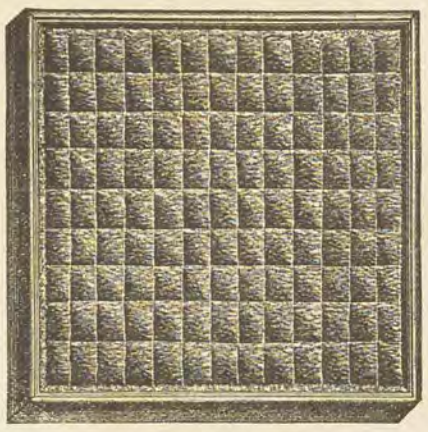
This Fine Cherry Case will be furnished FREE OF CHARGE where an Outfit is ordered. Our INTERCHANGEABLE Line is very desirable, avoiding a large stock of duplicates.

ORDER EARLY.

CHIGAGO, - - - - - ILLINOIS.

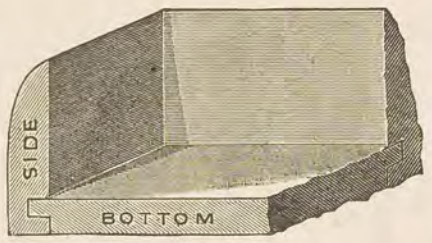
Complete List of Regular Trays Kept in Stock.

Stack Trays.

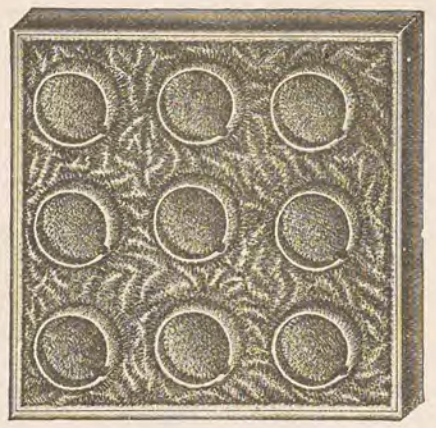


No. 020. Ring Tray. $2.75.

No. 030. Watch Tray. $2.75.



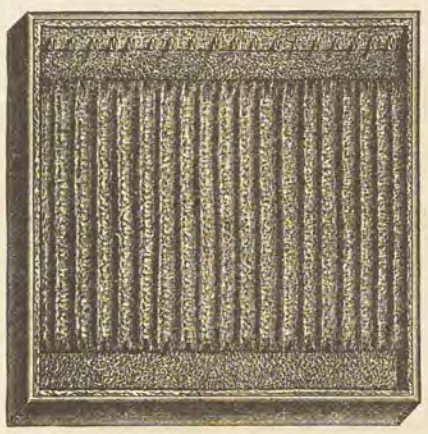
The above shows section of our X Trays, which meets the wants of those who cannot use Stack Trays.



No. x30. Watch Tray. $2.25.

Our X Tray is made of Black Walnut with highly finished dove-tailed corners. Red plush lined, with plush border.

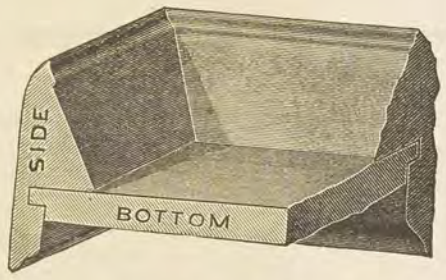
No. x 20.	Ring Tray, 11¾ x 11¾,	- - -	$2.25
No. x 21.	" " 5⅞ x 11¾,	- - - -	1.25
No. x 25.	" " 7¼ x 10¼,	- - -	1.25
No. x 30.	Watch Tray Gents' 11¾ x 11¾,	- - -	2.25
No. x 31.	" " Ladies' 11¾ x 11¾,	- -	2.25
No. x 50.	Locket Tray, 11¾ x 11¾,	- - - -	2.00
No. x 51.	" " 5⅞ x 11¾,	- - -	1.25
No. x 60.	Charm " 11¾ x 11¾,	- - - -	2.00
No. x 61.	" " 5⅞ x 11¾,	- - -	1.25
No. x 70.	Chain " 11¾ x 11¾,	- - - -	2.00
No. x 71.	" " 15⅝ x 11¾,	- - -	2.75
No. x 80.	Thimble " 11¾ x 11¾,	- - - -	2.25
No. x 81.	" " 5⅞ x 11¾,	- - -	1.25
No. x 90.	Plain " 11¾ x 11¾,	- - - -	1.13
No. 124.	Ring " 7¾ x 11¾, all plush,	- -	2.50
No. 124½	" " 7¾ x 11¾, all velvet, nickel corners,		1.50



No. 070. Chain Tray. $2.50.

No. 090. Plain Tray. $1.50.

Section of our Elite



Plush Border Stack Tray.

These Trays are dove-tailed Mahogany finished Solid Cherry, lined with fine Ruby Plush, and are unsurpassed for finish and durability.

No. 020.	Ring Tray, 99 Rings, 11¾ x 11¾ each,	-	$2 75
No. 020 B.	" for Band Rings, 11¾ x 11¾ each,	-	3 25
No. 021.	" 45 " 5⅞ x 11¾ "	-	1 75
No. 021 B.	" for Band " 5⅞ x 11¾ "	-	2 00
No. 022.	" 63 " 7¾ x 11¾ "	-	2 25
No. 022 B.	" for Band " 7¾ x 11¾ "	-	2 63
No. 030.	Watch Tray, Gents' 9 holes, 11 x 11¾ each,		2 75
No. 031.	" Ladies' 12 " 11¾ x 11¾ "		2 75
No. 032.	" Gents' 12 " 15⅝ x 11¾ "	-	3 50
No. 033.	" Ladies' 15 " 15⅝ x 11¾ "		3 50
No. 040.	Bracelet Tray, 11¾ x 11¾ each,	- -	3 25
No. 050.	Locket Tray, 11¾ x 11¾ "	- -	2 50
No. 051.	" 5⅞ x 11¾ "	- -	1 75
No. 052.	" 7¾ x 11 "	- -	2 25
No. 060.	Charm Tray, 11¾ x 11¾ each,	- -	2 50
No. 061.	" 5⅞ x 11¾ "	- -	1 75
No. 062.	" 7¾ x 11¾ "	- -	2 25
No. 070.	Chain Tray, 11¾ x 11¾ "	- -	2 50
No. 071.	" 15⅝ x 11¾ "	- -	3 25
No. 080.	Thimble Tray, 11¾ x 11¾ each,	- -	2 75
No. 081.	" 5⅞ x 11¾ "	- -	1 75
No. 090.	Plain Tray, 11¾ x 11¾ each,	- -	1 50
No. 091.	" 5⅞ x 11¾ "	- - -	1 00
No. 092.	" 7¾ x 11¾ "	- -	1 25

We still manufacture the No. 1 Trays, which we have made for the past years, with Mahogany finished border cord inlaid. The price is same as Elite Tray. In ordering, if you want the No. 1 Tray, put the figure 1 in place of the 0, thus, 020 would be the Elite Ring Tray, and 120 would be the No. 1 Tray, same size.

Special odd size Trays made to order, and require ten days extra time to manufacture. In ordering odd sizes, always give the exact OUTSIDE MEASURE.

Eureka Trays.

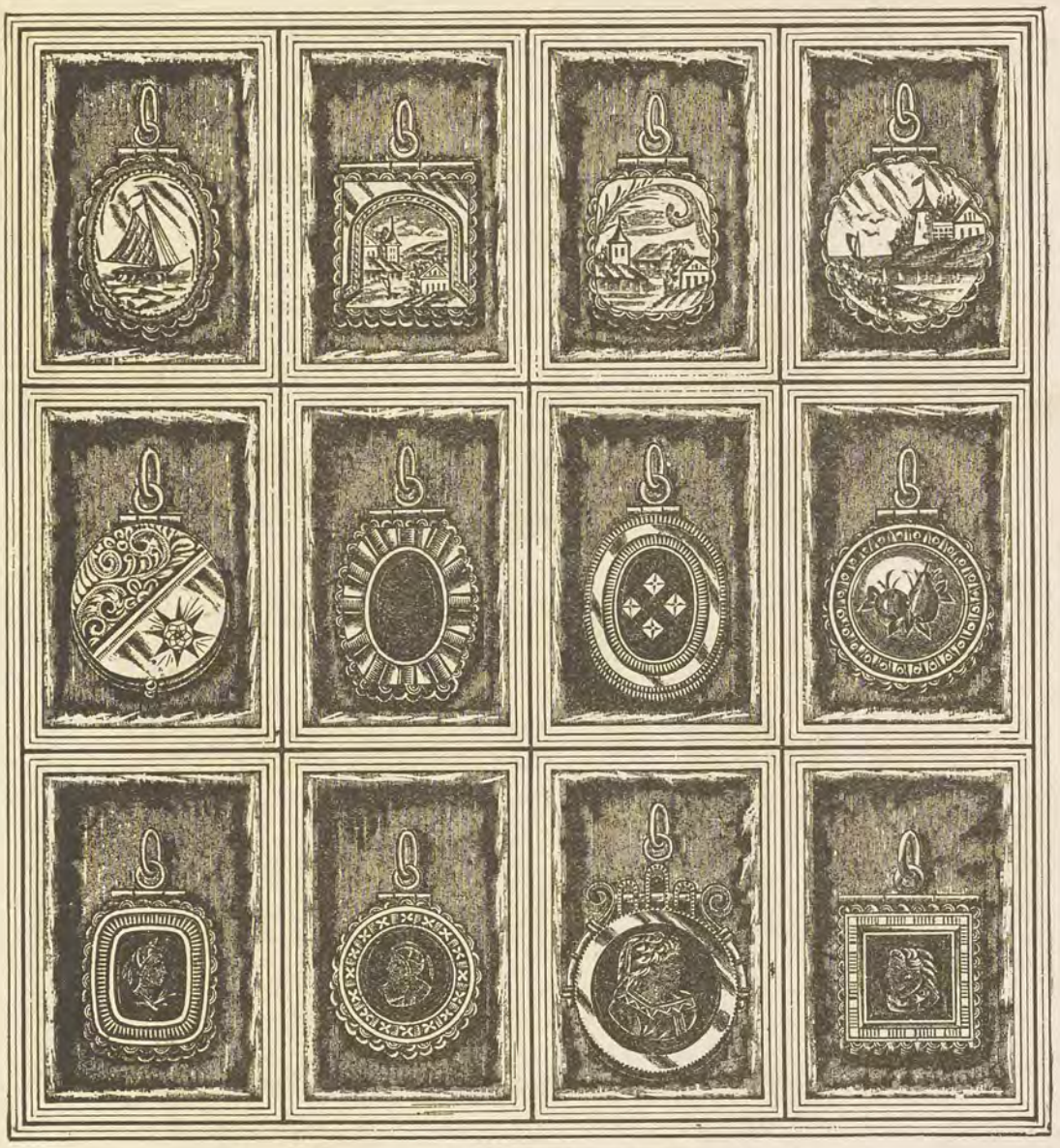
These Trays are made of Tupelo wood, walnut finished, mitered corners. Not stack.

No. 70.

Maroon velvet lined cord inlaid. Best Tray for least money ever made.

No. 1.	Ring Tray, 11¾ x 11¾,	- - each,	$1.50
No. 2.	" " 5⅞ x 11¾,	- - - "	1.00
No. 10.	Watch " Gents' 11¾ x 11¾,	- "	1.50
No. 11.	" " Ladies' 11¾ x 11¾,	- - "	1.50
No. 30.	Locket " 11¾ x 11¾,	- - "	1.50
No. 31.	" " 5⅞ x 11¾,	- - - "	1.00
No. 40.	Charm " 11¾ x 11¾,	- - "	1.50
No. 41.	" " 5⅞ x 11¾,	- - - "	1.00
No. 50.	Chain " 11¾ x 11¾,	- - "	1.50
No. 51.	" " 11¾ x 23½,	- - - "	2.75
No. 52.	" " 5⅞ x 23½,	- - "	2.25
No. 60.	Thimble " 11¾ x 11¾,	- - - "	1.75
No. 61.	" " 5⅞ x 11¾,	- - - "	1.00
No. 70.	Plain " 11¾ x 11¾,	- - - "	.63

If you have no account with us, please give reference. Terms, 30 days, net cash, or 5 per cent. off if paid in 10 days.



No. 8 Box. 12 Rolled Plate Lackets for $7.50.

Above box contains 4 Engraved Gold Front, 4 Fancy Stone, 4 Real Tiger Eye, Brown Cameo and Intaglio Lockets, each one in small satin lined box. Sold in full boxes to dealers only.

Send orders to

LAPP & FLERSHEM,

Chicago, Illinois,

For

Diamonds, Watches,

Jewelry, all kinds,

Canes, Umbrellas, Silverware,

Clocks, Tools,

Materials, Findings.

Electro Platers' Supplies.

Largest Stock. Largest Store.

Largest Business.

The only Jobbing House which publishes a catalogue with only List Prices and without jobbers name. Sent on application to Retail Jewelers only.

All our own New and Original Specialties. Every live Jeweler should keep abreast of the times, and see our new styles.

H. B. Sommer & Co.

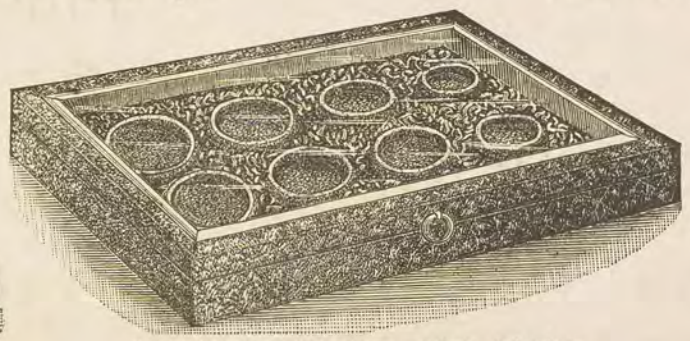
Jewelers' Paper and Plush Boxes, Patented and other Specialties.

The Plate Glass Specialties are the only Dust-Proof Trays and Boxes in the Market.

Send for Catalogue. Discounts to Jobbers.

628 Arch Street, Phila.

Shell Watch Boxes. $12 per Doz.



Patent Plate Glass Watch Tray. 11¾ x 8. Price $4.50.

Plate Glass Ring Tray. 8½ x 7. Price $3.50.

Plate Glass Box for ½ Doz. Tea Spoons.

Beveled Plate Glass Mirrors for Jewelers' windows: Size 12x12, $1.50 each; size 12x15, $2.00 each; size 15x18, $2.50 each. Beveled edge signs printed in gold for Jewelers, etc. The following mottoes, $3.00 per Doz.: "Watch and Jewelry Repairing,", Spectacles and Eye-Glasses," "Fine Holiday Presents," and "Birthday and Wedding Presents."

Manufacturers of

Paper Boxes, Cards, Tags, Cotton, etc., etc.

Sole Proprietors of

Schencks'

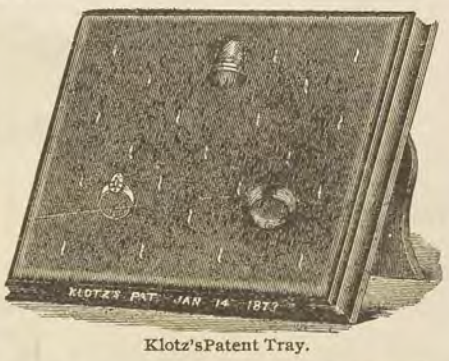
German Putz Pulver.

The best powder for Silverware in the world.

Price, per gross, $6.00.
" per dozen, $0.60.

Pat. Oct. 15, 1886.

Our Patent Plate Glass Top Watch Boxes, $15.00 per dozen.



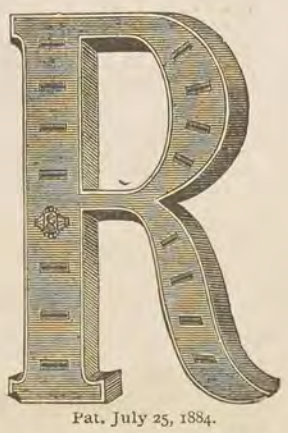
Klotz's Patent Tray.

Sole owners of Patent, and Manufacturers of Klotz's Ring and Thimble Trays.

No. 1. Size, 9x6, $2.00 each.
No. 2. Size, 10½x7½, $2.50 each.

Pat. Sept. 15, 1885.

Sole Patentees of Album-shaped Boxes for Watches, Drops, Lace, Cuffs, Silverware, etc.



Pat. July 25, 1884.

Our Patent Initial Tray for Rings, Drops, Lockets, etc. Price, $3.50 each.

HOLD YOUR HOLIDAY ORDERS

UNTIL YOU HAVE RECEIVED

S. F. MYERS & CO.'S

New Illustrated Catalogue for 1889.

Distributed during November, free of expense, to our thousands of customers, and those who are on our mailing list, and to the trade in general upon application.

HANDSOMER, LARGER and MORE ELABORATE THAN EVER.

CONTAINING NEARLY 700 OCTAVO SIZE, OR 328 QUARTO PAGES.

5,000 NEW DESIGNS FROM OUR 23 DIFFERENT DEPARTMENTS.

LOWEST PRICES AT LIST FIGURES.

DISCOUNTS AND NET PRICE LIST BY SEPARATE SEALED MAIL.

WATCHES, DIAMONDS, JEWELRY, SILVERWARE, CLOCKS, LAMPS, UMBRELLAS, OPTICAL GOODS, MATERIALS and EVERYTHING APPERTAINING TO THE JEWELRY TRADE.

PUBLISHERS OF THE
NEW ∴ YORK ∴ JEWELER.

S. F. MYERS & CO.,
48 and 50 Maiden Lane,
33 and 35 Liberty Street,
New York.

REQUIRE and occupy larger double stores and salesrooms than any other firm in our line

TRULY AMERICAN.

New York Standard Watch.

Lever Worm Escapement. New Perfected Principle.

Full Plate.	Straight-Line.
18 Size.	Jeweled.
Quick Train.	Stem-Wind and Set.
Second Hand.	Sunk Second Dial.

Fits all Regular Cases.

All Movements fully tested, and must pass final critical inspection.

Movements with or without Cases.

Cased in Nickel, snap or jointed back and bezel.

Dealers authorized to warrant to purchasers.

New York Standard Watch Co.,

83 Nassau Street, New York.

FRANK G. MILLER, General Selling Agent.

☞ Send for descriptive catalogue and prices.

"Facts are Mighty and Will Prevail."

FACT 1.

The James Boss Filled Gold Cases have greater intrinsic value and will yield the wearer more pocket service than any filled cases manufactured.

FACT 2.

The James Boss Filled Gold Cases are, mechanically considered, the best constructed, and most perfectly fitted filled gold cases ever produced.

FACT 3.

The James Boss Filled Gold Cases are the most elegantly engraved and stylishly gotten up cases to be found in the market.

FACT 4.

The James Boss Filled Gold Cases are the best sellers. They need no petifogging. Just say it is a "Boss," and that settles it.

Keystone Watch Case Company,

New York. PHILADELPHIA. Chicago.