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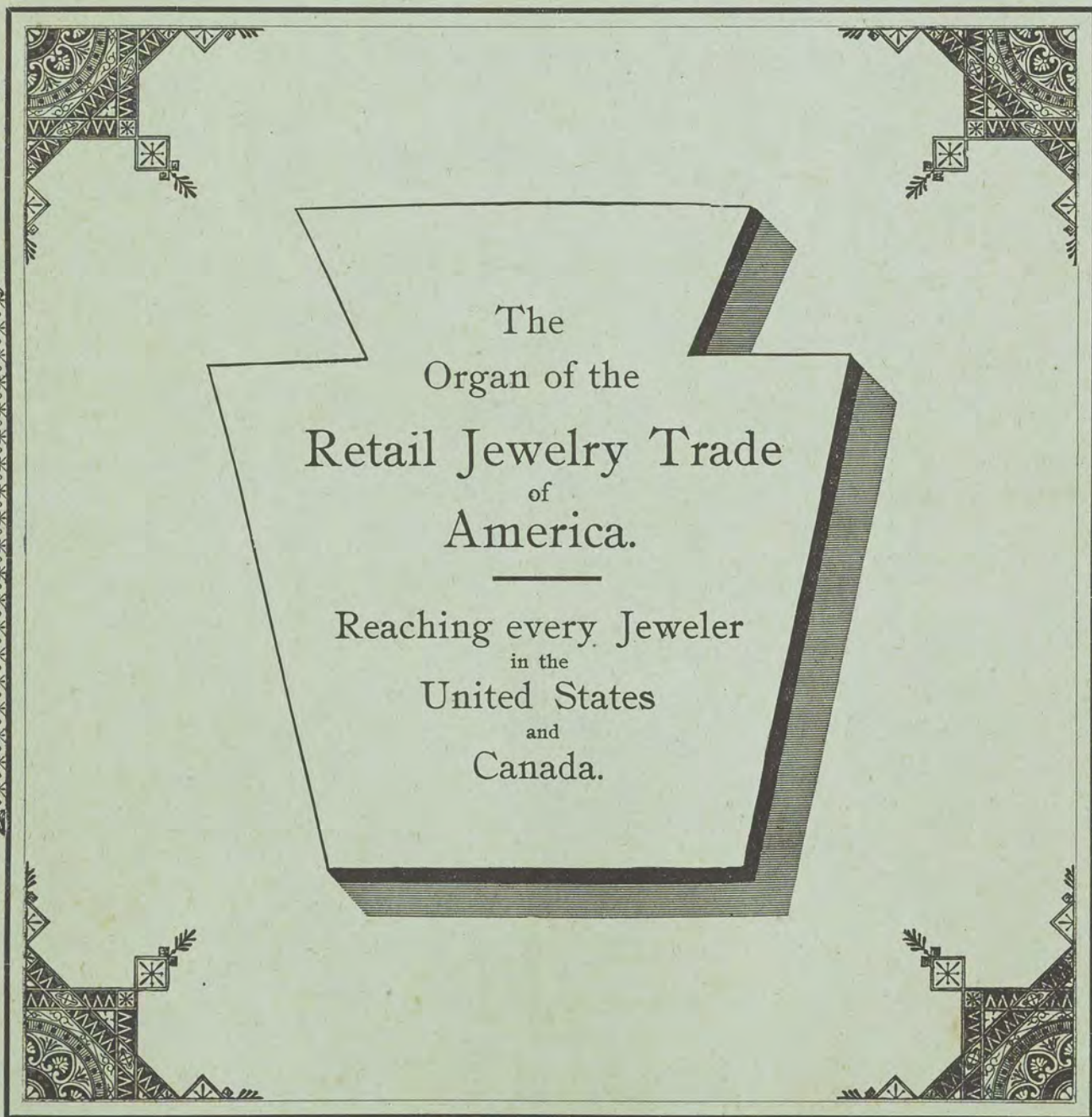
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Number 10.

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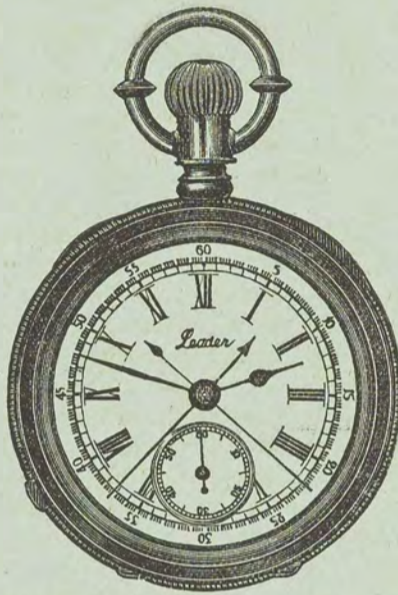
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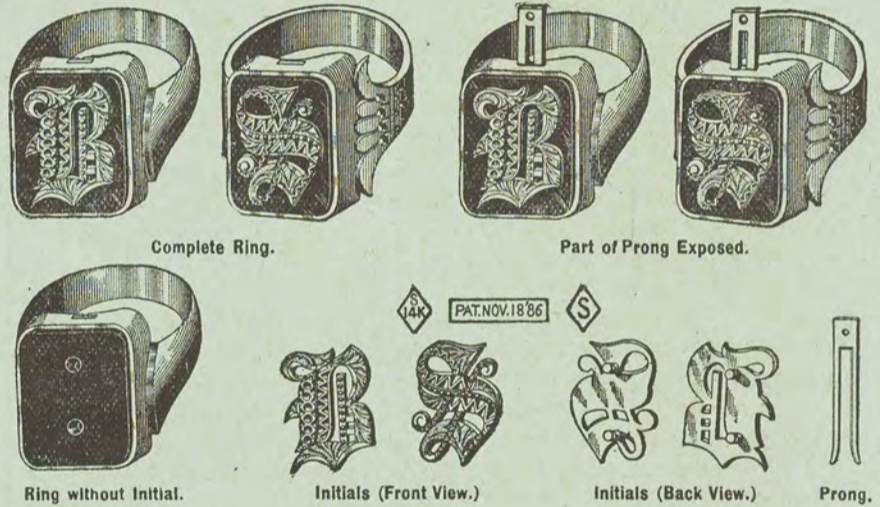
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THE KEYSTONE.

Volume 9.

Philadelphia, October, 1888.

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WORKSHOP CHEMISTRY.

By the Professor.

THE oxyhydrogen, or compound blow-pipe, is merely a hydrogen flame fed with pure oxygen. It is seldom in actual workshop affairs such a blow-pipe is required. But in some towns a profit can be made from illuminations, as the so-called calcium lights are simply a compound blow-pipe flame directed on a bit of lime—usually a chalk crayon such as is used on a blackboard. A gas bag made from rubber cloth, and cemented in the seams with rubber dissolved in benzine, will serve as a gas holder. Rubber in a soft, plastic state can be obtained of the rubber goods manufacturers, or from chemical supply houses, like Bullock & Crenshaw, 528 Arch Street, Philadelphia, at about twenty-five cents an ounce. Some of this dissolved in benzine and applied to the seams, renders the bag gas tight. It may be well to say in regard to rubber for dissolving, that the chemical supply dealers usually sell caoutchouc (pure rubber) for such purposes, but it does not as readily dissolve as the prepared rubber supplied by the rubber goods manufacturers, which, although not absolutely pure, answers well for the purpose. A pound of potassium chlorate will produce about five cubic feet of oxygen gas. The commercial value of the potassium chlorate is about eighteen or twenty cents per pound. An old iron tea-kettle can be used for a retort by luting the lid on with a paste made of plaster of Paris and glue. Common coal gas can be substituted for pure hydrogen. In the ordinary flame of a lamp or candle, the outside of the flame or surface in contact with the air is the only place where combustion actually takes place; but when mixed volumes of oxygen and hydrogen of the proper proportion are burned, the flame is solid, as all the elements essential to combustion are provided. It has been the usual practice in compound blow-pipes to combine the gasses just before reaching the point or place of combustion. But in some of the newer apparatuses the oxygen is blown or forced through the hydrogen flame. Such a blow-pipe is shown in Figs. 19 and 20, where *A* represents a short piece of tube; *B* the oxygen jet; *C* the hydrogen supply pipe. The hydrogen tube *C* is flat and the flow of gas rather slow, while the pressure on the oxygen bag should be sufficient to form a jet of flame as shown at *a*. Both supply tubes (*B* and *C*) are provided with metal stop cocks, so the flow of gases can be perfectly regulated. In lighting let on the hydrogen, and apply a match to the open front of *A*. Then turn on the oxygen. When the proper proportions of gas are uniting, the eye will soon learn to judge. The jet of

flame *a* is very insignificant in appearance, but if a piece of thick platinum wire is held in it, it melts readily, and iron or steel wire is burnt and dissipated almost instantly. A point of lime (blackboard crayon) held in the jet, glows like the sun and forms the well-known Drummond light. A reflector is used to concentrate the light.

Soap bubbles filled with hydrogen gas are produced by attaching an ordinary tobacco pipe to a piece of rubber tube, allowing the force of the gas to do the blowing. This makes a pretty experiment, as the bubbles rise in a room, and do not fall like those blown from the mouth. Hydrogen combines with many other elements. Conspicuous among these are the hydrocarbons, of which coal oil, benzine, and paraffine are well-known examples. These substances contain no oxygen. Many of the essential oils, like turpentine, resemble benzine in some respects, but have the property of absorbing oxygen

from the air, and are therefore not fixed hydrocarbons. I gave notice early in these papers that they would be conducted more for the workman than the student; consequently I shall take the liberty at any time to state facts of interest and importance to the artisan, although the subject matter may contain chemical principles not yet explained. The hydrocarbons just named are of first-class importance in the workshop. A pomade compounded of Vienna lime, coal oil and paraffine, is of great use in polishing metals, and the chemistry important to know in this matter is that the kind of lime known as Vienna lime contains a good proportion of silica, and possesses the property of polishing metals more rapidly than almost any known substance; but like other limes, which in the process of burning have had the water and carbonic acid driven off, soon absorbs carbon and water from the air, and becomes *air slacked*; consequently, this substance (Vienna lime) must be kept carefully from the air. By grinding this substance in benzine to the consistence of thin cream, and letting it stand a few minutes, the coarse particles will settle to the bottom. A dish in the form of a large earthen bowl is the best. The benzine should be allowed to evaporate until the lime is in a cake, when the bowl can be turned over and the cake knocked out. If now an ounce or two from the bottom is carefully shaved off with a knife, the coarse particles will all be removed.

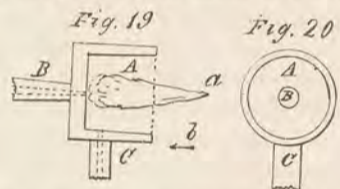
By mixing soft paraffine, or paraffine and coal oil with this fine lime, a superior polishing compound is obtained;

the paraffine preventing the lime from absorbing carbonic acid from the atmosphere, and becoming air slacked. Hydrogen united with sulphur forms hydrogen sulphide; a gas useful for blackening silver articles (oxidizing silver, as it is termed.) It is readily produced by the apparatus shown at Fig. 11, September KEYSTONE; substituting sulphuret of iron, *ferrous sulphide* FeS , for the zinc as stated in the text for producing hydrogen. Ferrous Sulphide is readily produced by holding a red hot (large) iron wire against a piece of roll brimstone. The sulphur unites with the iron with great violence. Let the globules formed drop into a deep dish of cold water. Cold water absorbs an equal volume of this gas, and can be used for blackening silver articles. A box closing tightly is best for oxidizing; placing the articles to be treated in the box with a tumbler containing a little dilute sulphuric acid, and a few grains of the ferrous sulphide. This gas should be collected over warm water, as warm water does not absorb it much. Hydrogen unites with phosphorus, forming *Phosphine* PH_3 . This compound is useful as decomposing several metallic solutions, and can be applied in the *galvano plastic* arts. It also furnishes one of the prettiest illustrative chemical experiments of the laboratory, as the bubbles of gas take fire as they rise through the water of the pneumatic trough. The apparatus used is essentially the same as shown at Fig. 2, August KEYSTONE; except substituting a smaller flask for *F*. The flask is filled with fresh, slacked lime and water, putting in a few bits of phosphorus. Phosphorus can be cut under water with a knife. The bubbles as they rise will catch on fire, producing rings of white vapor. In a darkened room the experiment is very effective. One fact should be borne in mind in regard to hydrogen stored in rubber bags, as directed for the compound blow pipe, and this is the property of interchange of hydrogen with the air outside of the bag. The natural conclusion would be if hydrogen (or other gases) were confined in a rubber bag with an actual pressure toward escape, that the only loss would be a leak or escape through fissures, or perhaps pores of the bag; but more than this takes place. There is an actual interchange called "osmose," by which air gets in as well as hydrogen getting out. Hence the danger of keeping hydrogen even in a gas holder, as it will become mixed with air and become explosive.

It has been demonstrated by Frost and others, that hydrogen has the property of penetrating through platinum and iron tubes at red heat, and palladium foil condenses 643 volumes of hydrogen at a temperature below $212^{\circ}F$. Many things point to hydrogen gas as a metallic vapor. The phenomena of

absorption of gases is termed "occlusion." Another method of producing hydrogen gas by the decomposition of water is, by passing steam through a tube filled with iron turnings, and heated red hot; the iron turnings abstracting the oxygen from the steam, and pure hydrogen gas is given off. What is seemingly strange about this experiment is, if we pass a stream of pure hydrogen through these same oxidized iron filings heated again to redness, the oxide of iron is reduced and a stream of steam given off which condenses to water. This strange contradiction is explained by some chemists by citing similar instances in other combinations, and offering as an explanation what they term "atmosphere" or "environment." But as the phenomenon in one case is attended with the indications of a positive electrical state, and the other by a negative condition, may not electrical influence afford the true solution?

The element Nitrogen will now be considered. This element in an isolated condition has the same mechanical properties as oxygen and hydrogen, and is also destitute of taste, color, or smell, and is a little lighter than air, 100 cubic inches weighing 30.14 grains. It will neither sustain combustion or animal life. It constitutes about four-fifths of the atmosphere. The characteristics of nitrogen seem to be mostly of the negative order. It can be isolated from its combinations with other substances by various methods. The usual plan is to float a shallow dish of porcelain in the pneumatic trough, (see Fig. 2,) in which is placed a piece of phosphorous. The oxygen of the air contained in the jar is burned out and almost pure nitrogen remains. A cloudy appearance is produced at first, but after a few minutes the phosphorous is extinguished, having exhausted all the oxygen, and the fine particles of phosphoric oxide settled, the gas can be examined. Nitrogen gas prepared in this way is contaminated with a trace of phosphorus, but is practically pure enough for the few experiments which are desirable, such as demonstrating its inability to support life or combustion. One of the most important combinations of nitrogen is its union with hydrogen, forming ammonia NH_3 . This substance cannot be formed by the direct combination of the elements. This chemical is used so much in the workshop that we will consider it somewhat at length. To produce it, place moistened slacked lime in a flask (see Fig. 2) with powdered salammoniac, and apply moderate heat, and ammonia gas will be given off copiously. To collect it we must use mercury in the pneumatic trough, as water absorbs 700 times its volume of ammonia gas, and forms the liquid ammonia of the drug stores. Ammonia gas becomes liquid at a pressure somewhat less than 100 pounds to the square inch. The value of spirits of ammonia



is in proportion to its strength or alkaline properties. This can be tested by gradually adding chemically pure nitric acid to a given amount, say one ounce, until a perfectly neutral condition is established. So much spirits of Ammonia is now used in the workshop it is well to know how to test for strength. Procure some blue litmus paper (it costs about five cents per sheet) and cut it into strips. Put a measured ounce of the ammonia spirits into a tumbler, and add chemically pure nitric acid drop by drop, stirring well until the strip of litmus paper (wound around a stick for the convenience of stirring) commences to turn red; indicating the complete neutralization of the alkali of the ammonia. There need be no standard of just how many drops of nitric acid, but it is well to insist on comparing it with a high standard, and if you find your druggist supplying you with weak ammonia, insist on corresponding weakening of the price paid.

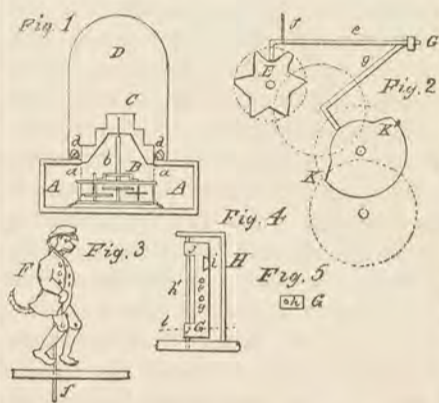
THE trial of the pyx at Goldsmith's Hall, London, England, is one of the most interesting ceremonies remaining to the guilds of the city. It is the final trial by weight and assay of the gold and silver coins of the United Kingdom of Great Britain, prior to their issue from the mint. It is so-called from the pyx (box or chest), in which are deposited specimen coins. When the coins are weighed into bags at the mint, two pieces are taken out of each bag, one for assay within the mint, the other for the pyx. The latter are sealed up by three officers and deposited in the chest or pyx. The trial takes place about once in three years by a jury of goldsmiths, summoned by the lord-chancellor. The jury are charged by him, at the exchequer office, Whitehall, in the presence of several privy-councillors and of the officers of the mint. Being furnished with a piece of gold and silver from the trial plates deposited in the exchequer, they are required to declare to what degree the coin under examination deviates from them. The jury then proceeds to Goldsmiths' Hall, where assaying apparatus is in readiness, and the sealed packets of coin being delivered to them by the officers of the mint, are first tried by weight, after which a certain number of pieces taken from the whole are melted into a bar, from which the assay trials are taken. A favorable verdict relieves the officers of the mint from responsibility, and constitutes a public attestation of the standard purity of the coin. It is an ancient custom, many centuries old.

MR. J. H. JOHNSTON, of 17 Union Square, New York, was at Saratoga this season with a choice stock of fine jewelry, among which was a 38K. diamond mounted as a shirt stud. But the gem of his exhibit was a pure white 7K. stone, set solitaire in a ring. Truly this was a regal jewel.

AN amusing strike of watchmakers was some time ago reported from Vilag, Denmark. According to this the watchmakers agreed to stop every clock in their windows, and to set them to 12 M. The object was to force the town authorities to provide public clocks, and they appear to have gained some success in the matter, for a commissioner was appointed to inquire into the matter.

JACK-KNIVES.

AT Fig. 1 is given a section in elevation of the revolving window show stand, described in September KEYSTONE. The box ten inches square and four inches deep, is shown at *A*. The dotted lines at *a, a*, show the position of the seven inch hole made in the top of the box. The diameter of the show steps it will be remembered was seven inches. Of course there is to be a little play left between the steps *C* and the hole in the box, so the show steps will turn perfectly free and yet make a tolerably close joint. To cover the joint and also to steady the bell glass cover *D*, a rope made of chenille is tacked to the top of the box, after it is covered with plush. It is not necessary to have so many wheels and so much complication, as one would suppose at first thought, to produce the required movements of automatic figures.



If we analyze the motions of four-fifths of the mechanical toys and automatic figures we see in the shop windows, we will find they are simply modifications of perpendicular and horizontal movements at irregular intervals. We will in the first place give an idea how these motions can be readily produced in an almost endless variety, and then proceed to apply them to some automatic figures. In the present instance, instead of laying our movement down flat we will set it up right, the same as it goes in the clock; still leaving the verge on as before to regulate the speed of the movement. It will be found on investigating a movement of this kind, that the scape wheel turns eight times to the third wheel's once, and the third wheel eight times to the second wheel's once. Now if we should place on the arbor of the scape wheel a wheel cut into coarse irregular teeth, as shown at *E*, Fig. 2, and the lever *e* rested on it, the motion given to *e* would be an up and down one; and if this was communicated to the figure *F*, Fig. 3, by the wire *f*, a jumping or dancing motion would be produced in the figure, which would be continued as long as our movement run. Now if we wished our dancing figure to stop for a moment or two, (say while some other figure performed an act) we would not need to stop the whole train, but only to hold up the lever *e*, so it would not fall into the notches in the wheel shown at *E*, Fig. 2. To do this we attach to the rocking bar *G* (to which *e* is attached) still another lever (*g*). It will be noticed that dotted circles are shown in Fig. 2, which correspond to the wheels of our movement, or we could also conceive them to represent wheels placed on the arbors of these wheels to produce the functions of the parts we are describing. Now if the added lever *g* rested on a wheel corresponding to the

dotted line of the second wheel, as shown in Fig. 2, the lever *e* would not fall into any of the notches of *E*; but if we cut away a portion of the wheel on which the lever *g* rests, as shown by the full lines at *K, K'* the lever *e* would then fall in the notches in *E*, and the figure commences to dance and continue to do so until the wheel at *K'* raised the lever *e* out of contact with the wheel *E*, through the action of the lever *g*. I said the old clock movement was to be attached to a piece of board in an upright position. Now for our present purpose it is not necessary to speak of any definite size, as we are in a sense dealing with an abstract condition, which can be applied to numerous figures. Consequently, we will suppose the old movement is screwed to a half inch board, large enough to support the several parts. For holding the rocking bar, to which the levers *e, g* are attached, we simply insert a piece of a large steel knitting needle into the face of the supporting board, at right angles to its face, and in such a position as to secure the proper action of the levers. The rocking bar to which the levers are attached, can be made of some hard wood about one and a half inches long, and one-fourth by three-eighths in cross section, and are cut in on one side as shown at *h'*, Fig. 4. At Fig. 5 is shown a transverse section of the piece *G* on the line *l*. The hole shown at *h* is for the steel pin *h* to work in. The levers *e* and *g* can be made either of wire or wood. If wire is used, they can be placed in the holes shown at *e, g*, Fig. 4. If of wood, they can be dove-tailed into notches shaped as shown at *i*. A great object in making such devices with old clock movements is to make the parts extremely light; consequently it is well to use wood as much as possible for such parts as admit of it. The bent wire *H* only serves to keep the rocking bar *G* on the wire *h*. Several wheels can be placed on each of the different wheel arbors, and by making the action of some of the parts depend on a wheel (like *K K'*) placed on the main wheel arbor, they can be made to occur at long intervals. If a spring is found to be insufficient to drive all the parts, a spool can be placed on the great wheel arbor, and a weight used, as there is no limit to the power applied, except to bend the teeth; as it is not important to have the parts wear for a great length of time.

J. W. Langford, Gibsland, Louisiana, says: "I regard the KEYSTONE as being 'par excellence' among the numerous journals of the craft, and would rather miss my supper, or seeing my best girl, than its bright and interesting face."

EMPRESS VICTORIA placed on the coffin of the late Emperor a golden chain with three lockets containing her pictures attached, which she had taken during their courtship, and which he had worn to his last illness.

It has been estimated that the average life of a watch is five years, and that during that time 5,000,000 watches are made and sold. In former years, before the labor-saving machinery now so extensively used was invented, the annual output for each man employed was fifty watches; now, with the help of machinery, each man employed at the business is enabled to turn out one hundred and fifty watches annually.

THE PEACOCK THRONE.

Of all the costly wonders that the palace of the Mogul Emperors at Delhi contained, the most wonderful and the most costly was the peacock throne. It was constructed during the reign of the magnificent Shah Jehan, and was the work of a Frenchman, Austin, of Bordeaux, who had sought refuge at the Mogul's court. It was estimated that the value of the wonderful throne was six million pounds sterling, or nearly \$30,000,000. It stood in the centre of the beautiful "Hall of Private Audience," which is still to be seen in a dilapidated state at Delhi, and which then formed a fitting casket for the jeweled throne which it contained. In "The Archaeology of Delhi," Beresford, as quoted by Carr Stephen, gives the following description of the throne: "In this hall was the famous peacock throne, so called from its having the figures of two peacocks standing behind it, their tails being expanded, and the whole so inlaid with sapphires, rubies, emeralds, pearls and other precious stones of appropriate colors as to represent life. The throne itself was six feet long by four feet wide; it stood on six massive feet, which with the body, were of solid gold inlaid with rubies, emeralds and diamonds. It was surmounted by a canopy of gold supported by twelve pillars, all richly emblazoned with costly gems, and a fringe of pearls ornamented the border of the canopy. Between the two peacocks stood a figure of a parrot of the ordinary size, said to have been carved out of a single emerald. On each side of the throne stood an umbrella, one of the oriental emblems of royalty. They were formed of crimson velvet thickly embroidered and fringed with pearls, the handles, eight feet high, being of gold, studded with diamonds.

Some descriptions of the throne mention but a single peacock, but the best authorities credit the two. It has been held that the famous Koh-i-noor (mountain of light) was one of the jewels that ornamented the throne, and as this diamond, which has since come into the possession of Victoria, was owned by Shah Jehan, the story may be true. Shah Jehan was the father of the famous Aurengzebe, who in 1659 wrested the empire from him and cast him into prison. According to some historians, it was Aurengzebe who built the peacock's throne, but the weight of authority is in favor of Shah Jehan.

When Delhi was sacked by the Persians under Nadir Shah in 1739 the throne was plundered of its jewels, broken up and carried away. A block of white marble now marks the spot where once stood this famous throne. The beautiful palace which contained it has been turned into a fort by the English, and hideous barracks disfigure the hall of private audience where once the great Moguls sat in royal splendor. "Sic transit gloria mundi."—*From American Notes and Queries.*

WE received a fine photograph of the pupils and professors of Parson's School for Watchmaker's, including some forty and more very intelligent looking faces. Mr. Parson deserves the credit of being a pioneer in his efforts to found a school where watchmakers could be taught both the theory and practice of their craft.

ENAMELING.

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

ENAMELS can be bought of all shades of color in cakes. These are to be broken with a hammer, as directed by Gee, in September KEYSTONE. The trouble in buying enamel already compounded is that there is no way of telling how it is going to work when we come to apply it to the job. Some specimens will permit using finer grinding than others. So one is all at sea, so to speak, until the enamel is tested by actual experiment. And there is also trouble when we go at it to compound and mix our own enamel, as there are so many contingents to be taken into account. To illustrate, in Gee's recipe for Fritz No. 5, he directs the use of silicious sand. I made note of this in my remarks pre-facing the article in September KEYSTONE. I would beg to add that few specimens of sand are proper to make even a fair quality of glass from, to say nothing about the requirements for a composition so exacting as jewelers enamel. Some of the best and most successful enamellers insist it is not exactly the purity of the sand which is the desideratum, but a peculiar mixture which nature affords in some deposits of sand. Cluet asserts that sand suitable for the best enamels should contain one part of talc to three of silicious matter, if a fine gloss is desired. The chemical composition of talc is silica 62, magnesia 27, alumina 1.5, oxide of iron 3.5, water 6. Now it is well-known that metallic oxides of all kinds are to be dreaded from their tendency to give a bad color, and yet here we have a substance recommended with three and one-half per cent. of iron by one of our best authorities on enamels.

Some enamel artists insist that ground flint has a tendency to make enamel wrinkle. Yet it is a well-known fact to all experienced enamel mixers, that ground flint fritted with saltartar makes a fine mixture for many enameling purposes. Now let us look into the chemistry of the matter. Saltartar is Potassium Carbonate, K_2CO_3 , and Gee in his addendum to Fritz 2, gives a mixture of silica with saltpeter and common salt. Now in chemical parlance, saltpeter is Potassium Nitrate, KNO_3 , and common salt Sodium Chloride, $NaCl$, and means in plain English a mixture of the oxides of tin and lead with a flux of silica soda and potash. I do not wish the reader to understand by this that I intend to say that certain natural products do not possess advantages over those artificially compounded, for in many instances they do. Still it is well to investigate such matters, and not accept a whim or opinion of some artist who, although skillful, may have a good many "crotchety" notions. The idea is to try and get at the bottom of the matter and find a reason for "why" we should accept one and reject the other. For instance, some compounders of enamel insist on the common salt used being sea salt, which may not be so far astray, as sea-salt is more largely contaminated by magnesia than salt from other sources.

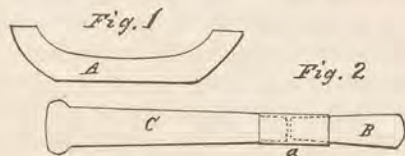
Now, may it not be that the secret of the reason some artists use sea salt, and others insist on sand with a percentage of talc containing magnesia is, that a certain amount of magnesian salts are

essential. A few words about some other of the terms Gee uses—when he says *flint glass* and *crystal goblets*. Now flint glass is precisely the same as crystal glass, except it contains a little more lead. A beautiful white glass, such as is used for making pastes and artificial stones, is composed of

Rock Crystal	4056 grains
Pure Flake White (carbonate of lead)	6300 "
Pure Potash	2154 "
Borax	276 "
Arsenic	12 "

This composition should be melted in a Hessian crucible, and poured into cold water, then ground very fine and remelted, letting the composition stand at red heat for twenty-four hours. This composition corresponds very nearly to Gee's Fritz No. 1. Pure glass-makers sand can be substituted for the rock crystal by heating it red hot, and after cooling, digest in hot muriatic acid. The Fritz No. 2 of Gee is only to be used for opaque enamel, as the slightest trace of tin oxide renders a fritz milky. To resume the preparation of enamels for use; the breaking up should be continued with the hammer until no pieces are left larger than a grain of buckwheat.

The process of grinding is conducted about in this way: An old coarse linen towel should be folded four thicknesses, well wetted with water, and laid on the bench. On this is set the agate mortar. In the mortar is placed the enamel to be ground and nearly covered with water. The pestle is to be wiped perfectly clean; then grasped



by the middle with the left hand, placing the right hand on top, leaning over the pestle so as to press on it with the shoulder, giving a twisting motion to the pestle by bringing the right elbow round with a circular swing, while the body is swung forward a little. The pestle, as it comes from the dealer, is too short, and has to be lengthened out, as shown in Fig. 2, where B represents the agate pestle, and C a wooden handle attached by the ferule a. There is a good deal of skill and experience required in grinding and preparing enamel to get the particles of an even size. After the grinding is done the fine particles are washed out by pouring off the water, and repeating the washing until the crushed enamel is like fine sand. Some enamels will need to be reduced to a finer grain than others, but this matter is only to be determined after repeated trials. One reason why enamellers so often choose to prepare their own enamels is the impossibility of procuring those which give uniformly the same results. The enamel being left in a sort of granulated condition, favors its melting into a solid mass without bubbles or blisters. The washing must be repeated until all the dust is removed. Many enamellers keep their colors prepared ready for use in bottles with water over the color. Fig. 1 is a vertical section of an agate mortar. Enamel colors can be obtained of J. L. & A. Bishop, 80 Nassau Street, N. Y., and A. Sartorius & Co., 12 Barclay St., New York.

TIME is really in the hands of the clock.

WORKSHOP NOTES.

"ENQUIRER" asks: "What solution is used to keep silver from tarnishing?" The silver after being brought to a perfect polish is coated with collodion. Collodion is made by dissolving gun cotton in a mixture of sulphuric ether and alcohol. Several parties have tried it for themselves, and only in a very few instances have we known it to succeed. The collodion should be very thin; much more fluid than such as is used by photographers for making negatives. Most of the collodion photographers use contain certain chemicals to further their art, like iodide of ammonium. For coating silverware use only the pure collodion.

"INQUIRER" asks: "What is the best method of managing pearls when set in a ring which has to be soldered?" Pearls are of animal origin, and can not withstand without deterioration a heat of more than about 450° F. If the shank of a ring, with pearl setting, is broken in the centre it can be hard soldered by burying the setting in a mixture of plaster of paris and pulverized alum; two parts of alum to one of plaster. The pearls should be whole, not half ones. Scraped potato is a very good protection for work to be hard soldered—we think about the best, all things considered, we ever tried. The great point in using the potato protection is to work quick. The advantage of potato is it chars on the immediate surface, and permits a more rapid and powerful heat to be given than with those protections which entirely repel the blow-pipe flame.

"A SUBSCRIBER" wishes to know "how to remove spots from gilded movements?" We suppose he means spots of green and brown oxidization which break through the gilding. This is something which seems to puzzle a good many. Acetic acid and salt will do, but it seems as though it was next to impossible to remove the remedy, *i. e.*, the salt and vinegar (as acetic acid is only distilled vinegar) from the gilding, so it will not break out again worse than ever. The trouble with all electro gilding is, it is not a solid coat of gold, but a porous and spongy deposit. A strong solution of cyanide of potash will remove these spots sometimes; but in many instances, if the action is continued long enough to effect the object, the cyanide solution attacks the gilding. If we carefully examine these spots, usually it will be seen that there is a central bright green spot surrounded by a ring of brown stain. With the aid of an eye-glass and a sharp steel instrument, we can generally scrape off the green centre without showing the tool marks, except by very close scrutiny, when a dip in a cyanide solution for ten or fifteen seconds will remove the brown ring. If a plate is badly spotted or stained, send it to the gilder, as it will only cost a quarter to have it regilt.

"VIENNA LIME" enquires: "What is used to polish common cheap stones, such as we find in the commoner rings?" If the setting is a real stone, the polishing is done on a lead lap or wheel with tripoli and water. For pastes use the lead or block tin lap, with putty powder and water. Vienna lime is scraped fine and used with alcohol on zinc or block

tin lap. Diamontine can be used in the same way, or made into a thick paste with sperm oil.

J. Glick, Stockton, Cal., writes: "I would not be without the KEYSTONE for five times the money, having found more information in it than in any other journal that I have read. Not only is it valuable to beginners, but also to those with years of experience, for one is always sure of finding a quicker and better way of doing a thing than he knew before."

STAGE JEWELRY.

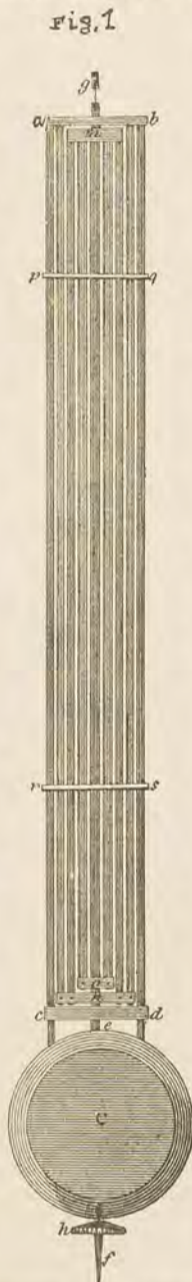
On Fifth Avenue, in the vicinity of Fourteenth Street, is a noted "stage jeweler." He attributes his title to the fact that he has repeatedly quoted the phrase, "I deal only in jewels for stage attire." In conversation, he said that a complete set of brilliants, including three rings, earrings, a breastpin and hairpin, will cost \$24. Necklaces cost a trifle over that sum, because they require more "backing," which means more quicksilver and point-shaped glass. "You would be surprised to know how much of this jewelry I sell. See, here is an order from a well-known star. She says she will pay for the jewelry out of her salary, by giving me an order on her backer, payment to be made after they are out two weeks. Of course I pay no attention to such orders; but here is another from a lady who is to play in 'Forget Me Not.' She requires two classes. One for a black lace costume, which I call class one, for which pure white pastes answer best. In class two, I will give her a variety of glass emerald, backed with green tin-foil, and a ruby surrounded by sapphires. This will go well with any gown of light fabric. That's where my success comes in. I make the jewels to suit the costume, and the footlights add splendor to my hopes." How about real jewelry? was asked. "Oh, that is seldom worn. Stars like Mary Anderson, Modjeska, Genevieve Ward and Janauchek possess considerable jewelry, but they buy it for an investment or for personal gratification, but they never wear it on the stage. There is too much risk, and actresses are not over particular in changing costumes in such short time as the waits allow, as they scatter hither and thither and allow their maids to look after their wardrobe and paste jewelry, which could not be done with genuine goods. I sell over \$25,000 worth of goods a year. As a sale never amounts to over \$200, you can imagine how many customers I must have. Its the best business I have ever been in, and it is all deception, my boy, all deception. The eye must be gratified, and we comply; only we fake and we substitute."—N. Y. Dramatic News.

ABOUT the most silly superstition that a person can entertain is that the wearing of a particular ornament will bring ill luck. For years that pretty stone, the opal, has been looked at askance by ignorant people, who "would not wear one for the world." It is said that there are jewelers who will not buy or sell, or even take them to repair. And yet one of the luckiest and happiest brokers in Chicago carries a big opal in his pocket "for luck." A queer thing is superstition.

CLOCKS.

THE description of a compensating pendulum using a zinc tube, and mentioned at the close of September article on Clocks, will not be given in this issue as announced, but be held for November, and a description of the gridiron rod substituted; giving full and complete directions and measurements. This change was made in response to several enquiries in regard to this system of pendulum compensation.

The length of the outside steel rods, from pin to pin in the uppermost and lowermost traverses or brass cross pieces *a, b, c, d*, is 36 inches; the next or innermost steel rods, from their pinning in the second uppermost traverse *m*, to that in the second lowermost *n*, is 35 inches; the steel centre rod, from the pinning of it, in the third lowermost traverse *o*, to the upper end of the pendulum spring, is 37 inches and $\frac{5}{8}$ of an inch, or nearly 37.628 inches; the centre *C* of the ball below the pinning of the outside steel rods and index rod, is 3.94 inches; the outermost brass rods, from their pinning, in the uppermost traverse to that in the second lowermost, is the smallest quantity possible less than 35.5 inches; the innermost brass rods, from their pinning in the second uppermost traverse to the third lowest one, is 34.5 inches. The whole length of the steel is then 112.568 inches, and that of the brass 70 inches. The diameter of the rods is a quarter of an inch each. The distance from the centres of the two outside steel rods, is 2.5 inches. The rods are placed equidistant from one another, only there is a little more space left between the two brass rods nearest the centre and the steel centre rod, in order to give room for the fork to come in and clip the centre rod. The two outside steel rods are prolonged below their pinning in the lowest traverse, as seen below *c, d*, about five or six inches within the ball, in order to keep it properly flat in the plane in which the pendulum should swing. In the centre of the lowest traverse *c d* is pinned a steel rod *e f*, somewhat more than a quarter of an inch in diameter, and about nine inches long. This rod goes through the centre of the ball, the index point *f* being on the lower end of it, and it is tapped for an inch in length at that part which lies near to the centre of the ball. A cross piece of brass is



fixed to the inside of the ball before casting it, the lowest side of which is in a line across the centre horizontally. The ends of the two outer steel rods, and the centre or index rod, come easily through this cross piece of brass. A hollow tube comes up within the ball, as far as the under side of the inside cross piece, on the end on which, where the cross piece and ball rest, is fixed within it a tapped nut, which screws on the tapped part of the index rod. On the lower end of the tube is soldered a sort of flat conical head or nut *h*, nerved on the edge outside, and whose diameter may be an inch or an inch and a quarter. On the upper surface of this nut are traced two circles, in order to put divisions between them, and figures so as to correspond with the turns of the screw in an inch. A small steel index *i* is screwed on to the lower part of the ball, to point at these divisions. The lower end of the tube is a very little below the edge of the ball, that it may rest freely on the upper end. The total length, from the upper end *g* of the pendulum spring to the index point *f*, is 47.75 inches, a length of radius which will require the length of a degree on the index plate to be 833142 of an inch. The distance from the upper end of the pendulum spring to the centre of the ball, is 42.5 inches very nearly, so that the centre of the ball is about 3.3 inches below the centre of oscillation. The lowermost traverse *c d* may be about half an inch thick, and its length and breadth such as to give it sufficient strength to receive the outside steel rods, and the centre or index rod. The uppermost traverse *a b* is nearly of the same dimensions. The second lowermost traverse *n*, and the second uppermost *m*, are nearly of the same size, and almost equal to that of the uppermost and lowermost; only they are a little shorter, having in their ends a sort of half hole, through which, in the second lowermost traverse, the outer steel rods pass easily; and through these, in the second uppermost traverse, the outside brass rods freely pass. This traverse is, of course, a little shorter than the second lowermost. In the second lowermost traverse is pinned the ends of the outermost brass rods, and in the second uppermost traverse are pinned those of the innermost steel and brass rods. In the third lowest traverse is pinned the innermost brass rods and the centre steel rod: The dimensions of this are nearly the same as the second uppermost and lowermost, only shorter, having a half hole at the ends, through which the inner steel rods pass freely. There is a hole in the middle of each of the two uppermost traverses, through which the centre rod can pass freely. Towards the lower ends of the centre steel rod, and those of the innermost brass rods, are two sets of holes, by which the third or lowermost traverse can be moved or shifted up either three or six inches, should the compensation be found in excess. It would be convenient, when shifting, to have a piece similar to the third lowest traverse, and three spare pins. This piece being like a half of the traverse, it may then be applied to the three rods, and pinned, but not to the place where the shifting is to be made. This piece will prevent the rods shifting away from one another, and will allow the traverse to be moved and fixed to the intended place. Two thin pieces of brass *p, q, r, s*, must be provided, having nine holes in them,

so that all the rods can move easily through them, the two outermost holes being kept rather a little tighter than the others. These pieces are intended to prevent any tremulous motion in the rods or pendulum, and are put at the same distance from the upper and lower traverses, as shown in the figure. The pendulum ball is composed of two frustums of equal cones; the greater diameter is seven inches, the lesser four inches, and the height half an inch, giving by calculation, 24.3474 cubic inches, the weight of which in lead is 9.997 lb. The ball, when filled with lead, together with the shells and inside cross piece, weighed 10 lb. 8 oz. The weight of the brass and steel rods, traverse pieces, pendulum spring, and top piece, etc., was 5 lb. 13 oz.; in all, 16 lb. 5 oz. The clock to which this pendulum was applied was a month one, and was kept going by a weight of 7 lb. 7 oz.

The third lowest traverse being shifted up three inches, there will then be this quantity less for lengths of brass and steel than has been stated. The steel will be 36 plus 35 plus 37.628 plus 3.94, minus 3, which equals 109.568 inches, and the longest brass rods may be taken at 35.49 plus 34.5, minus 3, which equals 66.99.

THE new clock just placed in the tower of the Glasgow University is a tremendous affair. The main wheels of the striking and quarter trains are twenty inches in diameter. The weight of the hammer that strikes the hours is 120 pounds, and it is lifted 10 inches. There is an automatic apparatus attached to the clock which stops the quarter peals at night and starts them in the morning. The pendulum is of zinc and iron, to counteract influences of temperature. The bob of the pendulum is cylindrical and weighs 300 pounds, and the beat is one and one-half second.

A CANINE TIMEPIECE.

On the bank of St. Mary's River, in the sequestered Ohio village of the same name, lives James Lithe, the fortunate owner of a remarkable dog, says the *Pittsburg Dispatch*. The animal is named Fritz because of the German propensity of its master. He is a beautiful specimen, being a sort of amalgamation between the German poodle and water spaniel species.

The dog has had a varied career, with the brightness and the blight common to dog life, but it will suffice merely to state the distinguishing feature of his make-up. Fritz's superiority lies in his power to clearly comprehend the divisions of time in vogue among civilized nations. He seems to be a first-class timepiece in disguise, and if anything an improvement on the stem-winder.

When asked for the time Fritz always replies in his peculiar fashion so correctly that it is quite incomprehensible. The hours are designated by sharp barks; the half hours are designated by a vocalism between a bark and a whine, and the quarter hour by a pure whine. He seems to take no notice of anything less than the quarter hour. His head towards the East signifies A. M., and toward the setting sun P. M. It will be seen that the interpretation is very simple, and the key to this canine clock is not being continually lost. For fear

that the accusation will be made that Fritz has been taught this as a trick, it should be stated that this is not the case. Mr. Lithe and his family are at a loss to explain just when and how their favorite acquired his art, but they are agreed that he is a self-made dog in this respect. His master is a jeweler, and its but fair to presume that Fritz's every day surroundings have been favorable to his natural bent.

Some of the unsophisticated of the neighborhood explain the freak in a very ordinary manner. They say the dog has howled so much at the town clock when striking, with his head dropped toward the ground, that he finally acquired the habit of telling the hour of the day by looking at his shadow. The premises, the mode of reasoning and the conclusion of the above theory is scarcely of that profound nature which would be acceptable to the mental philosopher, and this, together with the fact that Fritz seems to tell the time correctly in cloudy weather, will probably prevent the explanation from gaining a widespread credence.

Perhaps the strangest feat about this remarkable dog is the application of his powers in doing an alarm clock act. Owing to the fact that Mr. Lithe's son is in the railway mail service, it has been necessary for him to rise at all times of the night. So thoroughly has Fritz conquered this branch of the business that the convenience of an alarm clock has long since been dispensed with in the family.

The gong feature of Fritz is also easily managed. A wring of his tail just before going to bed informs him that he is to do the alarm clock operation, and the hour is indicated by the number of twists imparted to his caudal appendage. A quick jerk of the tail backward is the half-hour set. Fritz always attempts to awake the one who does the winding process by a series of barks graduated like those turned by a fire alarm. He seldom makes a mistake, but when he does it is generally found that someone has accidentally tinkered with his delicate machinery. Another useful trait about Fritz is his persistence in arousing the young ladies of the family for breakfast.

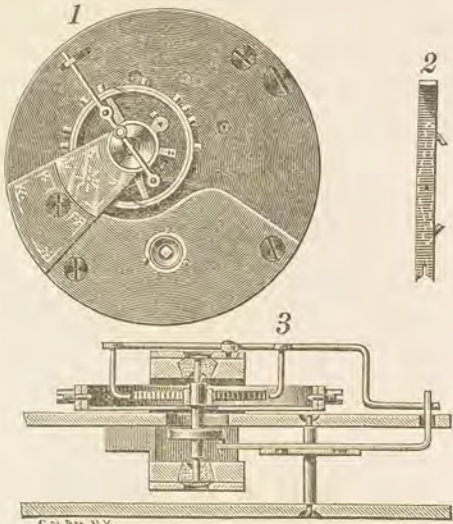
THAT we live in an age of progress, compared to which our fathers were strangers, may be verified by the statement of Mr. Butler at the banquet of the International Typothetae, that the art of paper making has reached a point where a tree may be cut down, made into paper and turned out as a newspaper in thirty-six hours!

AN impecunious colored man in Savannah, Ga., stole a watch, and with the advance given him on it at the pawnshop took out a marriage certificate.

A WOMAN recently swindled a Williamsport merchant who is also a pawnbroker, out of \$500 by a clever sell. She took to him a pair of genuine diamond ear-rings, worth about \$800 and borrowed a hundred for a few days. She redeemed the ear-rings at the proper time, and afterwards borrowed \$200, which she also repaid. Finally she borrowed \$500 and failed to show up, and the merchant discovered that the genuine diamonds had been removed and shell diamonds not worth \$50 substituted.

AN IMPROVED BALANCE ESCAPEMENT FOR WATCHES.

The application of a governor to the hair spring and balance wheel of a watch, in the form of a free curb actuated by the pallet or escapement lever, to lessen the effect upon the watch of jar or shock, is illustrated herewith, and has been patented by Mr. Sirius E. Kochenderfer, of Hollidaysburg, Pa. The escapement lever, shown in Fig. 2 (the escapement wheel not being shown,) has a forked end in which works the pin on the balance staff roller, and the outer or back end of the lever is extended



Kochenderfer's Balance Escapement for Watches.

and bent to form a slotted arm, working through a slot in the top plate, as shown at *a*, in Fig. 3, this arm engaging with a bent arm *b*, of a vibrating rod or wire, *B*, having its pivot, *c*, a little to one side of the axial line of the balance staff. This vibrating governor *B*, has inwardly projecting curbs, *d, d*, that serve to receive freely but moderately closely in between them the hair spring. This governor is vibrated in common with the escapement lever, by which it is driven, and serves to equalize the motion and adjust to equal motion in any position the watch may be turned. In case of shock or jar the balance wheel is restrained from making lost motion by the curbs of the governor, while the pin on the roller of the balance staff is not liable to work out of timely relation with the fork of the escapement lever, avoiding danger of locking the balance or producing breakage of the pin jewel. —*Scientific American*.

NOT the least valuable of the relics of bygone sovereigns of England, as a curiosity and work of art, is a little brass clock richly ornamented with *fleur-de-lys* and delicate engravings, now in possession of Queen Victoria. It was a gift from Henry VIII. to Anne Boleyn, on the occasion of their marriage in 1532. On the top of the clock is a lion bearing the coat-of-arms of England. The initials of Henry and Anne; with true lovers' knots, are engraved on their weights, together with inscription of "Most Happye" on one and the royal motto on the other. This curious little timepiece becoming the property of Lady Elizabeth Germanje, she presented it to Horace Walpole, who lodged it among the other collections in his sham castle at Strawberry Hill. At a subsequent sale of his effects this clock was purchased by its present owner for £110, 5s., and placed in Windsor Castle, where it can be found in an excellent state of preservation, and in comparatively good running order.

A RAILWAY CATECHISM.

How many miles of railway in the United States? One hundred and fifty thousand six hundred and fifty miles—about half the mileage of the world. How much have they cost? Nine billion dollars. How many people are employed by them? More than a million. How long does a steel rail last with average wear? About eighteen years. What is the cost of a palace sleeping car? About \$15,000, or \$17,000 if "vestibuled." What is the cost of a high-class eight-wheel passenger locomotive? About \$8,500. What is the longest American railway tunnel? Hoosac Tunnel, on the Fitchburg Railway (4¾ miles). What is the highest railroad in the United States? Denver and Rio Grande, Marshall Pass, 10,852 feet. What is the highest railroad bridge in the United States? Kinzua Viaduct, on the Erie road, 305 feet high. What is the longest railway bridge span in the United States? Cantilever span in Poughkeepsie Bridge, 548 feet. What is the longest mileage operated by a single system? Atchison, Topeka and Santa Fe system,

about 8,000 miles. What line of railway extends furthest East and West? Canadian Pacific Railway, running from Quebec to the Pacific Ocean. What road carries the largest number of passengers? Manhattan Elevated Railroad, New York, 525,000 a day, or 191,625,000 yearly. What is the fastest time made by a train? Ninety-two miles in ninety-three minutes, one mile being made in forty-six seconds, on the Philadelphia and Reading Railroad. What is the fastest time made between Jersey City and San Francisco? Three days seven hours thirty-nine minutes and sixteen seconds—special theatrical train, 1886. What are the chances of fatal accident in railway travel? One killed in 10,000,000. Statistics show more are killed by falling out of windows than in railway accidents.—*Frank Leslie's*.

THE new English law on trade marks is still the subject of debate. It has been decided that watches having the words *Fast, Slow*, engraved upon the balance cocks, will be passed by the English government as long as it is indicated whether the movements were made in America, Switzerland or France. The protective measures taken by England already bear fruit. During the first two months, January and February, the horological importations were £81,919 in 1886, and £110,038 in 1887, have fallen to £76,062 in 1888. If the government sustains the injustice of the English custom-house officers, who have seized the greater part of the watches passed through, because ostensibly, the shippers or importers have not complied with certain conditions not yet officially announced, England must be considered as practically closed against the importation of horological merchandise. The manufacturers and dealers in watches, etc., in France as well as in Switzerland, are at present completely discouraged over the prospect.

ADVICE TO YOUNG JEWELERS.

Those who have the pleasure of knowing P. S. Bartlett, of American watch fame, can well appreciate the dry humor of the following clipping from the *Elgin Every Saturday*:

The construction of a watch, he says, depends entirely on how it is made; the wheels have nothing to do with the case. A small watch will keep as much time as a large one, and sometimes more. The reliability of the watch as a timekeeper depends upon how big a liar the owner is; there is no exception to this rule.

In order to be a good watchmaker it is not necessary to know anything about a watch; you must know how to shake a watch; look wise and hold an eye-glass. If you cannot look wise try some other business. The proper thing for you to do when you do not know what ails the watch is to say the mainspring is broken; this will give the party confidence in you and show him you understand the business. All first-class watchmakers keep a broken mainspring on their bench to show customers when they come in what ails their watch. Some watchmakers will say the watch is dirty, but as this is a reflection upon the owner, it does not take so well.

The regular price for repairing a watch is \$3, it makes no difference what you do to it; some will take out three or four wheels and then charge the owner \$3 for what there is left. This is not right, as it lowers the high moral tone of the business, and will eventually lead to deception.

Some people have great ideas what a watchmaker can do. A young lady once brought us a very large, old-fashioned, bull's eye watch and wanted us to make two small ones out of it, one for her and one for her sister. We told her we could not do it, and she left us with a poor opinion of our skill and ability; thus is love's labor lost and truth crushed to the earth. But do not be afraid of telling the truth; you may get caught at it some day, and then you can wear diamonds.

If any customers complain of your prices tell them that the skill and dexterity required in the manipulation of the fine and intricate parts of so costly and beautiful a watch is hardly commensurate with the importance of the object required, and that if they ever wish to sell the watch you will give them \$2 for the first chance to buy it.

You can always guarantee a watch to run within one second a year, but state that it will take time to get it regulated down to it; the man will die or the watch will meet with some accident before you get it done, so your safe in saying so.

Never have a watch done the first time the owner comes for it, as that will give away the business, and he will think you have not done it well, or that you have not much work, or it was an easy job.

The most difficult thing to do to an old watch is to get the hayseed out of it and not lose any. It is important that you should be "the only reliable dealer in town" and "the best workman on both sides of New York;" this you can do in the daily and weekly papers; also that you should come from the watch factory; Cloudman can get you through in twenty minutes if you can keep up with him.

Watch oil comes in pint and quart

bottles; pints are 25 cents, quarts are 43 cents. It is made from the seeds of the sunflower at Los Angeles, Cal.

For tools you will need a grindstone, a monkey wrench, a hatchet and a lead pencil. With these few hints and two quart bottles of watch oil and \$5,000 in cash, an energetic young man can start in business.

SUBSCRIBE for the KEYSTONE. It is doubly worth the fifty cents it costs to every jeweler.

THE *Daily Transcript*, of Holyoke, Mass., in a late issue, says: "The local jewelers have abundant experience with petty thieves and shop-lifters, and can tell very interesting tales concerning such. Saturday night Geo. H. England had a little more experience in that line. Two well-dressed, apparently respectable looking young French girls came into his store and asked to see some rings. They were shown a case and after fumbling the rings over a little, one accidentally-on-purpose found its way to a pocket belonging to one of the girls. Now every jeweler knows just how many rings he keeps in a case and just where they are located, so it is of no use to try to fool him. Mr. England noticed at once that one was missing, but said nothing then. The girls didn't see what they wanted and started to go out, when Mr. England told them to wait a moment and he would show them some more, so turning his back he gave them another opportunity to repeat the act, and surely enough, like the wonders of the automatic city, another was gone.

This was evidence enough to convict both, but Mr. England was very easy with them and gave them a chance to "ante-up." But argument seemed of no use until the broad shoulders of Officer Hastings darkened the doorway. Then one ring was returned, and one of the girls left a gold watch as security to pay for the other, which she did in about an hour. It is surprising to see how many persons try that business, and some of them are pretty well-to-do persons, too.

Two Yorkshiremen, visiting Glasgow College, were surprised to note that the clock had only an hour hand, and that it was an hour behind time. One of the men, thinking to protect the good name of the college, said: "Hoot, man, that's naething ova 'od, man. I've seen our town clock aught days wrang!"

La Metallurgie gives the following receipt for cold solder: "Precipitate copper in a state of fine division from a solution of sulphate of copper by the aid of metallic zinc. Twenty or thirty parts of the copper are mixed in a mortar with concentrated sulphuric acid, to which is afterwards added seventy parts of mercury, and the whole triturated with the pestle. The amalgam produced is copiously washed with water to remove the sulphuric acid, and is then left for twelve hours. When it is required for soldering it is warmed until it is about the consistency of wax, and in this state it is applied to the joint, to which it adheres on cooling."

In addition it is well to say the mortar used should be porcelain; and that to employ this method for iron or steel articles the surfaces to be joined must be tinned, *i. e.*, must be coated with soft solder.—*Ed.*

LATEST NOVELTIES.

Small decanter clocks are now in the market.

Heavy twisted oxidized silver seals are fashionable.

Silver pin cases in veneer finish are coming into favor.

Earrings are out representing small enameled strawberries.

A chestnut bur of burnished gold is a peculiar hair-pin head.

"Owl clocks" in bronze, have the dial in the centre of the bird.

Bracelets made of plaited silver wire are courting feminine favor.

Quilted pattern silverware is quite a favorite in the upper circles.

A very taking breastpin is a knife-edge bar set with an immense ruby.

New umbrella handles are in the form of a ram's horn, of oxidized silver.

Horse's heads of fine coral and mounted as scarf pins are quite popular.

The newest thing out is a thin snake finger ring with a striped enamel skin, bearing a striking resemblance to the reptile it simulates.

A pretty gold locket has three bands pierced diagonally across the front.

Chatelaine watches with curious etched designs are the most sought after just now.

Among lace pin novelties is noticed a small stilleto of burnished gold with pearl handle.

High silver gilt vases lately introduced have the surface stamped on like alligator skin.

Large openwork mottled silver is now being applied to umbrella handles with good results.

Oval blood stones, mounted in rich chased gold settings, have been fashioned into cuff-buttons.

That desideratum of the dining table, the mutton-leg holder, is still in good demand.

Quite a novelty in scarf pins is a small gold cog-wheel attached to a miniature draughting compass.

A small, gold clef held between the prongs of a miniature tuning fork is a musician's scarf pin all over.

One of the favorite bracelets of the season is a polished gold knife edge bar mounted with a row of small bead moonstones.

A new umbrella handle is a massive oxidized silver ball through which slips a heavy silver cable bracelet adjustable to the hand.

New and pretty rings with large, square settings have a row of diamonds running down the centre, and a row of turquoises along each edge.

A handsome ornament of foreign manufacture is a large, steel helmet artistically engraved, with a clock in the centre in place of the visor.

In brooches, a unique design recently noticed, consisted of a network of slender gold wire against which were closely pressed a tennis ball and bat.

About as odd a looking scarf pin as anything in that line yet seen is composed of eight ordinary pins of gold, divided into fours, one lying across the other.

What might be termed a piscatorial brooch is a fishing basket held between two lines, at the ends of which dangle two tiny trout, all produced with variegated gold.

Caution.

This Company manufactures
Cases only, and has no connection
whatever with any other concern
of similar name.

To be sure you get Our Case,
see that it contains this

Trade  Mark,

which is stamped in every case
made by us.

In addition the following Trade Marks are stamped in each case of their respective kind:

Keystone Solid Gold



Star Filled



James Boss Filled



Keystone Solid Silver



Keystone Filled



Leader Silver



Silveroid



Look for these Trade Marks,
and accept no other.

Keystone
Watch Case Company,
Philadelphia.

New York.

Chicago.

A double ring of heavy gold cable links surrounding an anchor of platinum is just the brooch for lady sailors.

Horseshoes composed of two rows of garnets and made up as earrings, are very becoming to young ladies.

Among the endless varieties of campaign badges now flooding the country is an imitation red rose made of some composition to resemble enamel, from the centre of which the pleasant features of Mrs. Cleveland beam forth.

In inkstands an extremely odd design is a bronze sea-serpent resting on its fins and holding its body in a perpendicular position. In the crown of the head is a small well.—*Jeweler's Review.*

C. R. Martin, Optician and Jeweler, Hartford, Ky., renews his subscription to the KEYSTONE, and says: "I think it is the greatest paper published in the world as an instructor in the jeweler's art, and general jewelers information. No money would induce me to do without it. And every jeweler should, and will take it, and profit by it, if they ever see a copy of it."

SOMETHING NEW.

Messrs. B. Cerf & Son, watchmakers, of No. 42 John Street, New York City, have just completed for a Western jeweler a large display clock, artistic in design and original in its working. The hands are made of round wire, cut and shaped in circles and half circles, hard soldered together; the whole shape representing a spear, and finely nickel plated. The minute hand is two and a half feet long in its entire length, and two feet long from its centre to point. The dial is four feet in diameter. Each hand is propelled independently of the other. The minute hand has a small lever watch movement to which a curved shaped weight is made fast, concealed in an enclosure or box at the end of the hand. This weight, when down, including the box and its movement, nicely balances the front or pointing part of the hand. The movement is made fast to the centre of the box by the centre post. The hand itself is made to revolve around a thin steel spindle, which is screwed to the centre of the dial (which is made of glass.) When the movement is running, the weight, being always down by its own gravity, causes the hand to revolve regularly on its course, the same as any minute hand on a clock. The hour hand is made in the same way, with the difference that the concealed movement is fastened to the enclosure or box by its hour wheel.

This clock is intended for a large show window, and being thus propelled, shows no wheel work whatever in its centre.

A MAN from Michigan who was admitted to the apartment of the King in the royal palace at Amsterdam, says that he passed through a door hung on brass hinges and secured by a brass lock coming from a Massachusetts manufactory. A chair from Grand Rapids and a cuspidor, the production of a Baltimore manufactory, stood near. Over the mantel, designed by an American, hung a landscape by Thomas Moran, of Philadelphia, and upon it, among other ornaments, were a Colorado stag vase and a box of Michigan tooth-picks.

THE WORK OF A MINUTE.

A ray of light travels 11,160,000 miles in a minute.

In the United States the telephone is used 595 times, the telegraph 136 times in a minute.

In a minute the lowest sound your ear can catch has been made by 990 vibrations, while the highest tone reaches you after making 2,228,000 vibrations.

In a minute an express train goes a mile, and a street car thirty-two rods; the fastest trotting horse, 147 9-13 rods, and an average pedestrian of the genus homo has got over sixteen rods.

Of tobacco, 925 pounds are raised, and part of it has been used in making 6773 cigars, and some more of it has gone up in the smoke of 2292 cigarettes in the United States in one minute.

In a minute we are whirled around on the outside of the earth by its diurnal motion a distance of thirteen miles, and at the same time go along with the earth on its journey around the sun, 1080 miles.

A TINY drop of mercury rubbed on some corner of the surface to be examined will produce a white, silvery spot if the gold is pure, or if there is gold in the alloy. If this silvery spot does not appear, there is no gold in the surface exposed. To prove the correctness of this result, a drop of the solution of nitrate of mercury can be dropped on the surface, when a white spot will appear if the gold is counterfeit, while the surface will remain unaltered if the gold is genuine. After the operation, heating the article slightly will volatilize the mercury and the spots will disappear. Pure gold can be distinguished from its alloys by a drop of chloride of gold or of nitrate of silver. If the gold is pure there will be no stain, but if mixed with other metals the chloride of gold will leave a brownish stain upon it, and the nitrate of silver a gray stain.

AN exchange says the Duke of Wellington was extremely fond of watches, and at all times had fully half a dozen ticking their liveliest lying around him. Fearing that some ill might happen those just under his eye, orders were given that whenever he traveled to have as many more stored away in a portmanteau made to fit his carriage. One time-piece was, above all others, his acknowledged favorite; it was of old-fashioned English construction, and had once been the property of Tippoo Sahib. Another of the Duke's treasures had a strange history. Napoleon had ordered it of Breguet for the fob of his brother Joseph, and, as an extra courtesy, directed a miniature map of Spain to be wrought in niello on one side, and the imperial and royal arms on the other. Just as this lovely gift was finished, Joseph was driven out of his kingdom by the Duke, and the Emperor, for reasons best known to himself, refused to take or pay for the costly bauble. At the peace it was purchased from Breguet and presented by Sir E. Paget to the Duke of Wellington. Another watch owned by the Duke was made for Marshal Junot, and a great horological curiosity it is. There has never been known more than two others like it. They are constructed to mark both lunar and weekly movements.



Our Illustrated Catalogue—Largest and most complete published. Sent to the trade FREE. Sole Agents for Improved Terry Clocks.

48 and 50 Maiden Lane, 33 and 35 Liberty St., New York.

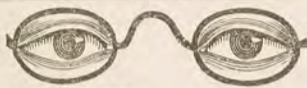
Importers, Exporters, Jobbers or Controlling Agents in all lines of goods that appertain to the Legitimate Jewelry Trade.

21 Different Departments. 21

Requiring and Occupying Larger Salesrooms than any other Wholesale Jewelry House in the World.



Successors to
JACOB COLTON & CO.,



W. W. Coomes & Co.,

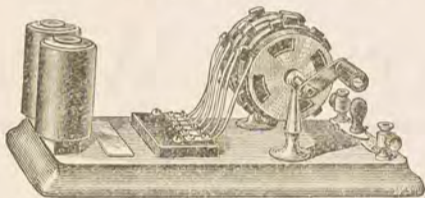
Manufacturers of

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

Long Meadow, Mass.

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.

SOLID Gold emblems, charms, rings, badges and buttons for secret societies of all descriptions, also school, college, boat, athletic, lawn tennis, base ball, shooting, etc., etc., badges, charms, jewels, medals and rings, manufactured.

Designs furnished on application.

Pfeil, Williams & Bredt,

137 and 139 State Street,
CHICAGO, ILL.

MANUFACTURING JEWELERS AND
DIAMOND SETTERS.

No Goods at Retail.

The Philadelphia Optical and Watch Co.,

(Limited.)

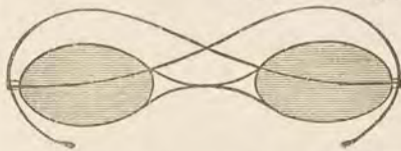
916 Chestnut Street, Philadelphia, Pa.

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.

It has been the aim of our ambition since the start to make better watch cases and more of them than any concern in the world. We have carefully avoided disparaging the products of other manufacturers; adopting the policy advised by an old Quaker, to whom a man was declaiming about the many faults and imperfections of a house his neighbor was building. The Quaker, as is the style of his fraternity, listened very quietly to the urged disparagements: of how the windows were too high, and the doors too narrow, and then clenched the situation by saying "Now, friend, I tell thee the best thing thee can do is to buy an adjoining lot and build a better house along side of it." In like manner we have sought, not by disparaging and proclaiming the faults and imperfections of the products of our competitors to advance our own interest, but to profit by them quietly, and produce better work of our own; leaving it to a discriminating public to decide the contest; and they have decided by aiding and sustaining us, until we have organized and put in complete operation the largest and most complete watch case factory in existence.

KEYSTONE
WATCH CASE COMPANY.

TWO DOZEN COMPRESSED FACTS.

There are 2750 languages.
 A square mile contains 640 acres.
 A barrel of rice weighs 600 pounds.
 The average human life is 31 years.
 The first steel pen was made in 1830.
 A barrel of flour weighs 186 pounds.
 A barrel of pork weighs 200 pounds.
 A span is ten and seven-eighth inches.
 A hand (horse measure) is four inches.
 Watches were first constructed in 1476.
 A storm moves thirty-six miles per hour.
 The first lucifer match was made in 1829.
 The value of a ton of silver is \$37,704.84.
 A hurricane moves eighty miles per hour.
 The first iron steamship was built in 1830.
 Modern needles first came into use in 1545.
 Coaches were first built in England in 1569.
 The first horse railroad was built in 1826-27.
 One million dollars of gold coin weighs 3685 pounds avoirdupois.
 One million dollars of silver coin weighs 58,920.9 pounds avoirdupois.
 The first complete sewing machine was patented by Elias Howe in 1846.
 Glass windows were first introduced into England in the eighth century.
 Albert Durer gave the world a prophecy of future wood engraving in 1527.
 Measure 209 feet on each side and you will have a square acre within an inch.

LIFE has great troubles in store for all of us; and few live to be men and women without knowing terrible grief. But fortunately these intense moments cannot fill all the years. Time helps us to forget, at least, the sorest of the pain. To everyone would come some joy but for the little worries that happen with the passing hours—cares about money, small quarrels, petty jealousies, false shame, and an awful dread of what the neighbors will think if we take a little comfort, and dress and eat to suit ourselves, and continue familiar with people we like, whether they are "genteel" or not, and say what we mean, instead of what is expected.

AN endless amount of bosh gets into the newspapers about watches. We copy the following from the *Analyst*:—

The smallest screws in the world are made in a watch factory. There can be no doubting that assertion on any score. They are cut from steel wire by machine, but as the chips fall down from the knife it looks as if the operation was simply cutting up the wire for fun. One thing is certain, no screws can be seen, and yet a screw is made every third operation. The fourth jewel wheel screw is the next thing to being invisible, and to the naked eye it looks like dust. With a glass, however, it is seen to be a small screw with 260 threads to the inch, and with a very fine glass the threads may be seen very clearly.

These little screws are 4-1000th of an inch in diameter and the heads are double in size. It is estimated that an ordinary lady's thimble would hold 100,000 of these tiny little screws.

About 1,000,000 of them are made a month, but no attempt is ever made to count them. In determining the number 100 of them are placed on a very delicate balance, and the number of the whole amount is determined by the weight of these. All of the small parts of the

M. A. Mead & Co.,



Wholesale Dealers

in

American Watches.

No. 104 State Street,
 Chicago, Ill.

CHAS. HOLLINSHED.

HENRY HOLLINSHED, JR.

Hollinshed Bros.,
 Wholesale Jewelers,

(Strictly Wholesale.)

806 Chestnut St., Phila., Pa.

Elgin
 Waltham
 Springfield
 Columbus

Movements

WALTHAM COMPLETE—Watches from Silver Queens to Gold Chronographs.

GOLD CASES—All the best styles, guaranteed qualities.

FILLED CASES—Boss, Crescent, Monarch, Conqueror, Montauk, and all leading makes in best designs.

SILVER CASES—All the most desirable.

Solid Gold and Rolled Plate Jewelry in immense variety.

A large variety of the most reliable Chains.

Jobbing, Engraving and Repairing for the trade.

Send us your orders for immediate attention.

watch are counted in this way, probably fifty out of 120.

After being cut, the screws are hardened and put in frames, about 100 to the frame, heads up. This is done very rapidly, but entirely by sense of touch instead of sight, so that a blind man could do just as well as the owner or the sharpest eyes. The heads are then polished 10,000 at a time. The plate on which they are polished is covered with oil and a grinding compound, and on this the machine moves them rapidly by reversing motion until they are fully polished.

Now if any of our readers know what a "fourth jewel wheel is," let him shout it out. Then again the writer says, "these screws are four one-thousandths of an inch in diameter and have 260 threads to the inch." This would be in the ratio of about one thread to a screw diameter, and could be represented by a screw one inch in diameter, one thread to the inch.—ED.

ALTHOUGH it is not generally known, there existed formerly in Great Britain, in Wales, Ireland, and even Scotland, "diggings" quite as rich as some which subsequently proved mines of wealth in California and Australia. In Richard the Second's time hosts of mines were "located," berg "manner" were actually brought from Bohemia to work them, and the records of the years succeeding are studded with royal quests to work real or fancied mines of the metal. It is, indeed, believed that some of the coin of the period was made out of the native gold, though the chances are that, to avoid the royal dues, a large portion was concealed or made into ornaments. In Scotland, David I. granted a gold mine in Fifeshire, and about thirty years ago there was something like an "excitement" over the attempts made to resume the working of these long abandoned deposits.

THE biggest watch in this town is the "Jeweler's Watch," which consists of six stalwart extra policemen that guard the Maiden Lane district at night, to scare thieves away from the millions in gold and precious stones gathered in that dingy quarter.—*N. Y. Tribune*.

A SUGGESTION.

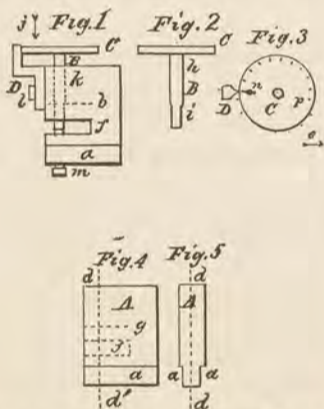


Suspicious-Looking Man—I would like to look at some of your diamonds, if you please.

Jewelry Clerk—With pleasure, sir. Just throw your "dips" into these bracelets before you begin.—*Cincinnati Enquirer*.

MAINSPRINGS.

SINCE the publication of the description and illustrations of the little micrometer gauge for measuring the thickness of mainsprings in August KEYSTONE, we have seen a simpler device than the one then shown; and as it is the aim of the KEYSTONE to furnish its readers with all the latest wrinkles in the trade, we give cut and description of the new gauge. A piece of brass or iron one-quarter of an inch thick, three-fourths wide, by one inch in length, is what is needed to start with; the shape is shown in Figs. 4 and 5. Next drill a hole through the piece length-wise on the line *d*. Then cut in on each side of the piece one-quarter of an inch from the bottom as shown at *a*, Figs. 4 and 5. This part is to go into the bench vice. Fig. 5 is an edge view of *A*, Fig. 4 After the hole on the line *d* is drilled, cut with the edge of a coarse file the recess *f*, Figs. 1 and 4. This recess should be about one-eighth wide, and three-eighths deep. A twist drill is the best for such work. In drilling such a job, the best method is to centre the piece *A* for the hole on the line *d* with a graver at both ends, then put your drill in a split chuck, and let the centre of the tail stock rest at the lower end (*d'*) drill down to the line *g*, with a drill a trifle larger than the drill you select to match the screw you are to cut. Revolve the piece *A* in the latter



slowly as you drill, this will keep the hole straight. Now carefully tap the hole from *g* to *f*; and turn a blank for a screw as shown at Fig. 2. Cut your screw to fit the hole tapped in *A* at *g*, and turn the part of the screw at *h* so it fits nicely in the larger part of the hole at *k*, Fig. 1. At the upper end of the screw we put on a disc of brass about three-fourths of an inch in diameter. This disc should be of brass about one-sixteenth of an inch thick. The lower end of the screw *B* should be hardened and drawn to a straw color. Opposite to the screw *B* is a short screw *m*, Fig. 1. This should also be hardened like *B* to prevent wear. The screw *B* should be at least one-tenth of an inch in diameter, and the thread a fine one, (not more than forty to the inch.) It will be seen in Fig 1, at *D*, is a cork or bridge extending up to the edge of the wheel *C*. Our readers will notice this affair is only a modification of the Brown & Sharpe micrometer gauge, but its recommend is, it is easily made and costs only a little time. To get at anything like an accurate measurement, take one of the little bits of mainspring furnished by the KEYSTONE, 10-1000 of an inch thick, and after the gauge is complete, screw the lower end of *B* down firm on the upper end of *m*. Now look at the device in the direction of the arrow *J*, Fig. 1, and it will appear as

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.

Importers of Diamonds, Pearls, Emeralds, Sapphires, Rubies, Opals, and all other precious stones. Gems matched. Diamonds recut and polished. Full line of jobbing stones.

Pfeil, Williams & Bredt,

137 and 139 State Street,

CHICAGO,

ILLINOIS.

Manufacturers of HAND-MADE diamond mountings. Diamond set initial rings and lockets with encrusted and raised letters made to order.

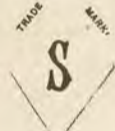
Col. J. M. Rutherford, Auctioneer,
Specialty made of Diamonds, Watches, Jewelry, etc.

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. Sheaffer & Co.,

108 S. Eighth St.,
Philadelphia.



Manufacturing
Jewelers.

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

ANNOUNCEMENT.

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

Gone Manufacturing Co., Cedar Rapids, Iowa.

H. H. HEINRICH,

Chronometer Manufacturer, and Agent for K. Zimmerman Watches,
No. 14 John Street, New York.

Chronometers sold on installments on terms to suit the purchaser.
Chronometers to Rent. \$5 per month.



This cut is a Marine chronometer with Heinrich's adjustable balance. Certificate from U. S. observatory. In order to give an opportunity of examining and testing my chronometers, I will rent them out at the rate of \$5 per month, payable in advance. To those desiring to purchase chronometers, after examining them, an allowance of the first month's rent will be made from purchasing price. A large stock of new and second-hand marine chronometers on hand for the trade. All my second-hand chronometers are in the very best condition, readjusted, and look like new. **Springing and Adjusting with C. A. Paillard's Palladium Balance Springs a Specialty.**



Headquarters for
Musical Boxes,
Jacot & Son,
37 Maiden Lane, New York.

All our Music Boxes are provided with
Jacot's Patent Safety Check.

Send business card for illustrated Catalogue
Send 25 cents for our book, "How to repair Musical Boxes." Second edition. It should be in the hands of every watchmaker.

shown in Fig. 3. Now with a graver cut a line on the disc *C* opposite to the point on the piece *D*, as shown at *n*, Fig. 3. We now unscrew the screw *B*, and place the bit of spring between *B* and *m*. When of course the screw will not go down so far, we now mark on the disc *C* where the point of *D* stands, (say at *p*) and divide the arc embraced into ten parts, which of course represents thousands of an inch. These parts can be sub-divided into halves and quarters. The divisions can be continued farther around on the disc; but the measurements after a complete revolution of the disc are imperfect. The points of the screws *B* and *m* should be flattened. It is an undoubted fact that such a gauge is not *absolutely correct*, but if it is well made, it will be found to answer every purpose, and not exceed one four-thousandth of an inch from perfection.

James Denniston, Pulteney, N. Y., says: "The KEYSTONE is invaluable to the beginner. Twelve numbers are worth as much as one year in the average store."

AN INDIGNANT WATCHMAKER.

A retired St. Louis jeweler says that there is as much profit in the repairing department of watch-making as there is in plumbing. A mainspring, for instance, for replacing which few jewelers charge less than \$1.50, costs on an average about eight cents, and it takes only about half an hour to set it in a watch.

MR. EDITOR:—The above was clipped from the *Call* of this city, and in the interest of the watch and jewelry trade, of which you are the leading exponent, I think the KEYSTONE should take some cognizance of such ridiculous nonsense.

The fabulous wealth of the plumber, which originated in a humorous journalist's sanctum, is only giving credence by such cranks as the publisher of the above absurdity.

A physician will write an R on a piece of paper that costs less than one cent, and charge you a dollar for it, "and it takes only about five minutes to do it." This seems extortionate to those that fail to take into consideration the years of patient and trying study, and sometimes the great expense necessary to acquire the requisite ability to write the aforesaid recipe.

The same with a watchmaker. He spends five or six years to learn his trade before he may expect any remuneration. Then he has to supply himself with an expensive complement of tools; keep an assortment of materials, etc., and then he is supposed to supply parts to a disabled watch at small profit, simply on the cost of the material. To "kids" and window-gazers, the jeweler appears to be the richest man on the face of the earth, but any rational business man with sound judgment knows the contrary to be the exact fact. No other business is subject to such loss by the whims of fashion; no other business suffers the same depredation; (without from shop-lifters, and within from thieving clerks), and no other business requires as great an outlay to make a respectable display (the equivalent of one show-case in an ordinary jewelry store would be sufficient to stock a complete store in most any other business.)

Another beauty of the jewelry business is in its being encroached upon by other dealers. If a dry goods, gents' furnishing, or trimming store has a spare or vacant corner, the proprietor forthwith puts in a little case with a complete line of elegant jewelry, and if a clothier or tea dealer wants to "rush" things, he commences to give away watches and diamond pins as a special inducement. Yours, etc.,

"A DISGUSTED EX-JEWELER."

PHILADELPHIA, October 4, 1888.

We can heartily endorse the sentiments of our contributor, who signs himself "A Disgusted Ex-jeweler." Such

notices in our general newspapers, as he sends an example, are entirely uncalled for, and just on a par with those botches, ranging on the confines of watch repairing, who put in watch glasses for ten cents, and clean a watch for fifty cents. The trouble is we have not only too many cheap watchmakers, but too many cheap contributors and reporters—watchmakers who know nothing about a watch, and reporters who know quite as much about a watch as they do about most things.

CAUGHT AT LAST.

There is little doubt that the authorities have at length succeeded in arresting the long-sought diamond thief who stole \$7,350 worth of diamonds from Burt & Hurlbut last April. About the middle of September, H. Day, alias Henry Adams, alias Lee, etc., was arrested in New York for robbing Ludwig Nissen of a package of diamonds. The authorities there telegraphed to Detroit that they thought he was the man who had robbed Burt & Hurlbut. Mr. Burt went to New York and saw Day in the Tombs, and became satisfied that he was the man. He acknowledged to Mr. Burt that he was in their store on April 3d, the day of the robbery. The accompanying portrait is regarded as a faithful likeness of Day:



Messrs. Burt & Hurlbut have sent a requisition to New York for Day's arrest, so that in the event of his being discharged there, he will be taken to Detroit to face their charge. Should he by any technicality get clear there, he will be handed over to the Chicago authorities, where he relieved wholesale jewelers of loose diamonds to the amount of \$11,000 before going to Detroit. He was also indicted by the Grand Jury at Boston some time ago on a similar charge, but jumped his bail. For the past two or three months he has confined his attention to Maiden Lane and John Street, New York.

His favorite methods are those of the shop-lifter and confidence man. Representing himself as a jeweler, he will make a number of purchases of a wholesale house, paying in cash, but almost invariably purloining something before the transaction is finished. He is a Swede by birth, and his accent is foreign. He is of medium height and build, has sunken cheeks and high cheek bones, light blue eyes, and a general mildness of appearance and demeanor that disarms suspicion. His age is fifty-three years. He will no doubt be recognized by many jewelers, and it is to be hoped that he will now get his just deserts. Mr. Burt says in reference to him: "I would rather have that man and convict him than to have the diamonds or their value, as it will vindicate us, and dispel the cloud that rests upon our reputation."

Our New Ladies' Chain
"THE VICTORIA"



214 1056.

Excels the old style
 "Fob" or "Queen"
 in
SAFETY,
UTILITY
 and
NEATNESS.

Send direct to us for names of Jobbers in the United States and Canada, handling this Chain. Mention the KEYSTONE.

H. F. Barrows & Co.,
 North Attleboro, Mass.

Jno. O. Slemmons,
 77 Fifth Avenue, - - Pittsburgh, Pa.
Wholesale Jeweler.

Diamonds, Watches, Clocks and Jewelry,
Bronzes, Silverware, etc., etc.

Watchmakers' Tools and Material a Specialty. Watchmaking, wheel cutting, engraving and jewelry repairing for the trade. Solid gold work made to order.

General supply depot for the trade.

Sample orders solicited.

AN HONORABLE WAY TO DO BUSINESS.

Some time last July the Keystone Watch Case Company received a notice that one of their Boss cases was not giving satisfaction. As it proved on examination, time and wear had developed a flaw in the joining of the goldsheet and the filling. The party owning the watch was written to about it, and the old case sent in to the factory. On receipt of the case, a new one was immediately forwarded by express, and elicited the following response:

KEYSTONE WATCH CASE CO.

GENTLEMEN.—Your kind favor of the 17th came to hand, also the cases. To say that I was well pleased with them would hardly express my feelings in regard to the kind treatment and fair dealing of your firm. Every one that has seen my cases thinks they are fine, and that the Boss Case is the case for railroad men. I will not forget your kindness, and will always recommend them to every one that I come in contact with. Many thanks to the Boss Watch Case Co.

Yours very respectfully,

C. M. EVANS,

L. N. A. & C. Co.,

LAFAYETTE, IND., August 22, 1888.

John F. Skelton, watchmaker and jeweler, 123 North J Street, Fresno, Cal., writes as follows: "I cannot do without the KEYSTONE. It is a jewel, and a priceless one to the watchmaker and jeweler. Success to it."

LIST OF PATENTS.

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

TUESDAY, SEPTEMBER 4.

- No. 388,927. Anti-friction Adjustable Bearing for Lathe Spindles. John Stark, Waltham, Mass.
- No. 388,947. Musical Box. Jean Billou Haller, Geneva, Switz.
- No. 389,012. Tool Rest for Hand Lathes. Edward Rivett, Boston, Mass.
- No. 389,042. Button. John U. Adams, New Orleans, La.
- No. 389,064. Emery-Wheel Dresser. Charles H. Douglas, Chicago, Ill.
- No. 389,111. Self-Setting Time-Piece. Albert Rosenbaum, New York, N. Y.
- No. 389,120. Alarm-Clock Case. David B. Tiffany, Xenia, Ohio.
- No. 389,156. Fountain and Feed Attachment for Writing Pens. John H. Koenig, Cincinnati, O.

TUESDAY, SEPTEMBER 11.

- No. 389,446. Inlaid Jewelry. Matyas Cziner and Rudolf Brettner, New York, N. Y.

TUESDAY, SEPTEMBER 18.

- No. 389,625. Electric Time Recorder. Aloys Wirsching, Brooklyn, N. Y.
- No. 389,663. Canon Pinion for Watches. Herman E. Murdock, Waltham, Mass.
- No. 389,778. Interchangeable Initial Ring. Otto Thie, and Charles M. Levy, New York, N. Y.
- No. 389,830. Ear Wire. Barton A. Ballou, Providence, R. I.
- No. 389,852. Clock. Edward M. Moulton and Mark Moulton, Rochester, N. Y.

TUESDAY, SEPTEMBER 25.

- No. 389,931. Clock Key. Almeron M. Lane, Meriden, Conn.
- No. 390,115. Electric Current Indicator. Patrick B. Delany, New York, N. Y.
- No. 390,161. Watch Movement Box. Charles A. Morningstar, Columbus, Ohio.

DESIGNS.

TUESDAY, SEPTEMBER 11.

- No. 18,601. Jewelry. Stephen M. Griswold, Brooklyn, N. Y.
- No. 18,605. Clock Case. Leonard Krower, New Orleans, La.
- No. 18,608. Watch Case. Fred. Parker, Jersey City, N. J.

TUESDAY, SEPTEMBER 18.

- No. 18,614. Ornamentation of Handles for Spoons. Alexander Dominick, New York, N. Y.

TUESDAY, SEPTEMBER 25.

- No. 18,628. Button. I. L. Goff.
- No. 18,633. Jewelry Setting. H. Huestis.

It is said that the Krupp works of Essen are to go into the manufacture of aluminum. The material used is cryolite, from Greenland, and chemically pure aluminum is promised at about \$1.50 per pound.

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, OCTOBER, 1888.

WE intend issuing our December (Holiday) number as near the first of the month as possible. Our friends advertising with us will please send in the copy for their advertisements as early in November as they can arrange it.

WE desire our friends in different parts of the country to give us notice of any change of firm, or new parties going into business, or parties closing out.

HOROLOGICAL schools are springing up all over the country, and the prospect is in a few years the professional botch, who reveled in soft solder and shellac, will pass away, and his place be supplied by skillful graduates from these schools.

THE early days of October are certainly more like November than seem desirable. Fires in the heaters, and light overcoats seem a little unseasonable, but they are certainly comfortable. If the low temperature will succeed in checking the yellow fever in Florida, we should submit to the discomfort not only patiently, but with a feeling of thankfulness.

WE have had several letters from workmen complaining about jobs being left on their hands for a long time; the owner not calling for them in some cases for years. In many of the States there are statutes regulating this matter, requiring a special notice to be given at the time of leaving the goods, to enable the holder to sell or dispose of the article if not called for in a specified time. The best method we know of is to have a printed check given to every customer on leaving an article for repairs, giving the required notice.

RECENT improvements in the phonograph and graphophone warrant the hope that at no distant day authors and business men will have at their command a mechanical amanuensis to which they can dictate and have a perfect and complete record made of their words, free from the annoyance which more or less attends when having a person to perform these functions. These instruments come very near a realization of the prayer of the writer who prayed for an "idea catcher,"—something that would seize a thought and hold it until it could be clothed in words that could be used. All writers, we fancy, experience the annoyance of not being able to record a passing thought in the glowing words which were present in the mind at the time of its in-

ception. It is but reasonable to believe also that phonetic tracings will tell their message as well to the eye as the ear.

OUR hand-book on Turning and Pivoting is the most complete work on the subject published, and yet we give it away to every subscriber for fifty cents.

TUBULAR bells are being introduced with great satisfaction in England. It is claimed for them that they can be heard at a greater distance than the ordinary bell, on account of the purity of the tone.

WE have in our possession a balance and cylinder taken from a watch repaired at one of our leading composite houses, which sells dry goods, watches, jewelry, etc. One of the arms of the balance is soft soldered in, and both pivots set in shellac. The young man who did the job works very cheap. Now tell us that we do not need horological schools?

DIAMOND robberies are becoming more frequent every day; not only by direct theft, but by exchange. This sort of thing is worked by two accomplices—a man and a woman. The woman goes into a store by herself and notices the style and form of settings. She tells her masculine accomplice, who is more or less in the trade, and he buys a similar mounting, putting in a paste diamond. The woman then goes back and adroitly makes an exchange. Very few clerks or attendants would notice carefully enough to detect the theft at the time.

WE publish in this issue the portrait of Henry Adams, alias Lee, and probably a dozen other aliases, with a brief account of his career. It pleases us at any time to have a thief brought to justice, but our greatest joy on this occasion is the exoneration of Messrs. Burt & Hurlbut. A business embarrassment occurring at the time of the robbery, brought this enterprising firm into a financial strait, and some people were unkind enough to cast a cloud on their commercial integrity. The unjust suspicion is now fairly lifted; and this pushing and enterprising firm stand fully vindicated, and without a taint on their reputation.

WE are in receipt of a mainspring from E. P. Davis, Lexington, N. C., broken into sixty-six pieces. We have often seen as high as thirty pieces and more, but this certainly takes the prize. The spring evidently belonged to an 18 size American, and some of the pieces are not one-half as long as the width of the spring. There is a peculiarity about the breaking of springs in this way we have never heard mentioned, which is in the character of the broken edge. If we break a mainspring with our fingers or a pair of pliers, the broken ends are always deflected or bent over, indicating undue force at the immediate point of rupture. Not so with the pieces of spring broken when under tension in a mainspring barrel. Here the ends are as abrupt as if the spring was of glass. This condition clearly indicates a shock of some kind, as if the attraction of cohesion was for the instant annulled; because

we can not break a mainspring by any mechanical means in our power which will present this form of fracture. Even shearing with dies or shears shows a tensional resistance to the rupturing force. There is certainly something about the phenomenon none of our known laws of physics will explain.

WE were shown recently some microscopic ruling by the veteran chronometer and clock-maker, Chas. Fasoldt, at his place in Albany. These test slides, as they are called, have heretofore only been produced in Europe. Mr. Fasoldt has also obtained a patent on microscope illumination, which enlarges the field of microscopic research very much. We regretted extremely our time was so limited that we could not give the matter more attention. The ruling we saw was perfect up to the power of our sight to resolve the lines, which were 30,000 to the inch. Mr. Fasoldt is also the inventor of a gravity escapement of superior merit, which defies storms in tower clocks. The Albany Astronomical Observatory has one of his precision clocks, with an astonishing close record.

WE were compelled to leave out of our columns this month the first of a series of very interesting and instructive article on "Magnetism." The writer is thoroughly posted on the subject, and has no new and startling theory of his own to advocate, but will content himself with giving the facts as they exist; and point out particularly the features of magnetism as they relate to and influence pocket watches.

Most persons who carry fine watches expect too much of them. It is well for dealers to impress this on the mind of their customers. There is a vast deal of difference between the real performance of pocket watches, and what the owners tell about them. In the first place few men have a standard clock which can be relied on for comparison. Indeed for that matter no clock even is to be entirely trusted. In the article on "Clocks," now running in our columns, actual records will shortly be given of some of our finest clocks, and a look at the statements will satisfy any candid man that there is a good chance for improvement.

THERE is no disguising the fact that the diamond market is gradually weakening; the terms favoring the buyer. True, a great many assert that blue white stones were never so high as at present. This may all be true enough, but gem stones do not constitute the criterion by which the market is to be judged, any more than the horse market is to be estimated by the price of animals with a 2.10 record. The kind and quality of stones which constitute the bulk of the trade range from forty to sixty dollars a carat. The stones referred to at these prices are better cut, and as fine in fire and color as would a few years ago have commanded seventy-five to a hundred dollars a carat. From present indications, a syndicate will be organized to control the output, which may in a measure regulate the matter until a new Kimberly turns up, and then the wheel of fortune will take another turn. That one-tenth or one-hundredth part of the diamond bearing districts have been developed is extremely doubtful.

TRADE TOPICS.

WE will be extremely obliged to any of our friends who will send us August numbers of both 1887 and 1888; also December, 1887, and May, 1888.

OUR readers will bear in mind the special offer of Bowman & Musser, of Lancaster, Pa., in regard to their engraving blocks and gravers at greatly reduced prices. This reduction only extends to the 31st of October. These desirable necessities were particularly noticed in September KEYSTONE.

KING & EISELE, manufacturing jewelers, of Buffalo, N. Y., write us they had the largest attendance at the fair in their city this autumn ever convened in that part of the country. Over 100,000 visitors were estimated as being in the city during the two weeks occupied by the exhibition, many customers visiting the large factory of this enterprising firm. We have received a beautiful medal made in their factory as a souvenir of the event.

THE Chicago Horological Institute, incorporated, at 182 State St., Chicago, Ill., opens for pupils on October 15th. This technical school is highly spoken of, and starts with testimonials from leading firms throughout the country. Notice adv. on page 15.

DAVID F. CONOVER & Co., 7th and Chestnut Sts., Philadelphia, Pa., are in the front rank of jobbing houses for prices, and their willingness to oblige customers is proverbial.

MESSRS. PFEIL, WILLIAMS & BRETT, manufacturing jewelers, 141 and 143 State Street, Chicago, Ill., manufacture an elegant watch case decorated with Mystic Shrine emblems. This firm makes a specialty of richly decorated cases, and other high art jewelry work set in diamonds and other precious stones. A cut of one of their cases will be found in their adv. on another page.

W. F. A. WOODCOCK, of Winona, Minn., writes us that his Watchmaker's School is rapidly increasing in numbers; he having pupils from Connecticut to Colorado. Mr. Woodcock is a fine workman, and his pupils speak in the highest terms of his school.

THE Pfaelzer Bros. & Co., 819 and 821 Market Street, claim that they have everything in the way of jewelry, from the cheapest to the finest. They certainly have a full and very fine line of American watches and desirable jewelry.

THE "Techno-Chemical Receipt Book," is the title of a valuable work published by H. C. Baird & Co., 810 Walnut Street, Philadelphia, Pa. It was prepared under the supervision of Wm. H. Wahl, P.H.D., of the Franklin Institute—a sufficient guarantee of its reliability. It contains dozens of valuable receipts to the trade.

STERN & STERN, the diamond brokers, at 13 Maiden Lane, N. Y., have missed several thousand dollars worth of diamonds, and suspected J. P. Miller, one of their clerks, as the cause of their disappearance. Search warrants were procured, and \$14,000 worth were found in pawnshops. Miller has disappeared.

THE new ladies' chain, "The Victoria," manufactured by H. F. Barrows, North Attleboro, Mass., is a great favorite with the trade.

THE Hollinshed Bros., 806 Chestnut Street, Philadelphia, carry complete lines of Elgin, Waltham, Springfield and Columbus movements, and all leading makes of cases. This house is strictly wholesale.

HUTCHINSON'S School for Watchmakers at La Porte, Indiana, is rapidly filling up. Special instruction is now given in Engraving and Designing to evening classes. The new study course can be had on application.

C. F. HAPPEL & Co., report trade as being highly satisfactory. These gentlemen sell only to the legitimate trade, and deserve their success.

OUR readers will remember that the enterprising firm of R. & L. Friedlander, 65 and 67 Nassau Street, New York, offered a prize of \$25 for a machine which would count the teeth of wheels automatically; giving a record of the broken teeth, as well as those remaining. Several parties were competitors, offering a number of very ingenious devices for accomplishing the desired object. The successful inventor, however, was Mr. A. McKenzie, of Elkhorn, Neb.

J. L. CLARK, refiner and sweep smelter, 823 Filbert Street, Philadelphia, Pa., has been in the business for eighteen years, and is in every way trustworthy and reliable.

WHOEVER wants a neat, tasteful regulator for little money, should look over B. F. Norris, Alister & Co's. adv. Their stock of watches, jewelry and material is very complete.

MR. H. H. HEINRICH is meeting with deserved success in the sale of his chronometers. One of the two chronometers sent last December to the Washington Observatory, in the competitive trial, having been purchased by the Government.

THE Anti-magnetic Shield of Giles Bro. & Co., is finding great favor with railroad men.

RETAIL dealers can always depend on H. O. Hurlburt & Sons, 938 Market Street, Philadelphia, for favorable prices, desirable goods and gentlemanly attention.

H. MUHR & SONS, with offices at Philadelphia, New York, and Chicago, make the importation and sale of diamonds a specialty.

W. H. SHEAFER & Co., manufacturing jewelers, formerly at 612 Chestnut Street, have removed to 108 South Eighth Street, Philadelphia, Pa. These gentlemen make a specialty of band and wire bracelets, and choice diamond goods in great variety.

STERN BROS. & Co., 30 Maiden Lane, N. Y., are among our leading diamond importers. They buy close and sell close, depending more on the magnitude of their sales than the profit on individual transactions.

ALL watchmakers have experienced the annoyance of having gravers break and crumble when turning. The Ohio Watch Tool Co., make gravers to stand almost anything.

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.

Send your Repairs to

Pfeil, Williams & Bredt,

Manufacturing Jewelers and Diamond Setters,

137 and 139 State Street,
Chicago, Ill.

PROMPT AND CAREFUL attention given to fine jobbing, repairing of watch-cases, gold and silver plating, lapidary work, stone-setting and matching.

Solid Gold jewelry made to order from any catalogue or design.

Stein & Ellbogen,

Chicago, Ill.

Wholesale

JEWELERS,

Importers of

DIAMONDS,

and Dealers in all Grades of

American Watches.

Our friends will notice we do not publish as many cuts of our cases in this number of the KEYSTONE as usual. Those who have received our recent display charts, will understand the reason, and not attribute it to any scarcity of the supply of new designs, for our artists have lately been out doing themselves, both in quantity and elegance of new efforts in this way. We would beg to remind dealers of the necessity of sending in their orders well in advance of the holidays, to secure some of the desirable lines. We know that for the past three years many dealers have been sadly disappointed in getting our goods when they waited until the last minute. Although our out-put is much greater than in any previous year, still our order book shows that if dealers are going to depend on the goods we are yet to make for the holiday trade, they will stand a slim chance, except the provident jobber has made the thing safe for them. Still, the wise man selects while there is a full assortment, and don't wait until it is Hobson's choice, "these or none." Earliest birds get the best worms.

Keystone Watch Case Company.

Remember

That our special offer of \$5.00 reduction on the "Lancaster" Engraving Block, Ball Base, and \$4.50 reduction on Flat Base positively closes on October 31st, and that in consequence you will have only a few days after this reminder in which to avail yourself of this unusual opportunity. Our reasons for this special offer were given in full in our two-page advertisement in September Keystone. On October 31st, we shall restore the Blocks to their regular price—\$20.00 for Ball Base (now offered at special price of \$15.00), and \$18.00 for Flat Base (now at \$13.50.) You would not be without the Tool for twice its cost, if you once had it under your skilled or unskilled hand.

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 Eisial Imperfections. Price \$1. No dealer should be without it.

Spencer Optical Mfg. Co.,

15 Maiden Lane, New York.

Factories : Newark, New Jersey.

C. F. Happel & Co.,

Jobbers to the
Legitimate Trade Only

Chicago, Ill.

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.

Office of
 Otto Young & Co.,
 149 and 151 State Street,
 Chicago, Ill.

To Legitimate Jewelers.

We have forwarded you a copy of our new

Catalogue for 1889.

We consider it the finest book of the kind ever issued. It contains a full line of Tools, Material, Optical Goods, Silverware, Watches, Watch Cases, Movements, Chains, Jewelry, Clocks, Canes, Umbrellas, etc., and everything at a uniform low price.

Bear in mind

That this book is sent to Legitimate Jewelers only, and that we positively decline to sell goods at retail or to the outside trade.

Wishing you a prosperous future, and hoping to receive frequent orders from you, we remain, etc.

Otto Young & Co.

Chicago Horological Institute,

(Incorporated.)

182 State Street, Chicago.

URBAN W. FRINK, President.

O. C. JAQUITH, Secretary and Treasurer.

Opens
 October 15th
 1888

Established for the purpose of giving a thoroughly practical and technical education in Watchmaking. Instruction given by the best talent in the trade. Adjusting taught in all its branches by PROF. THEO. GRIBI, the ablest writer on horological subjects, and acknowledged by all to be the most scientific and practical watchmaker in this country. Weekly Lectures on Jeweling, Springing, Escapements, etc., by professionals. Send for matriculation card and circular giving full information.

THIS CERTIFIES that we are acquainted with the gentlemen who have organized the above Institution, and that we fully endorse the Chicago Horological Institute, and recommend the same to the favorable consideration of the trade.

ELGIN NATIONAL WATCH CO.

AMERICAN WALTHAM WATCH CO.

KEYSTONE WATCH CASE CO.

H. M. Carle, Agent.

SWARTCHILD & Co.

C. H. KNIGHTS & Co.

W. W. WILCOX.

Editor Jewelers' Journal.

ROBBINS & APPLETON.

COGSWELL & WALLIS.

E. HOWARD WATCH AND CLOCK CO.

H. E. Howard, Agent.

H. F. HAHN & Co.

M. A. MEAD & Co.

TOWLE MANUFACTURING CO.

THOSE who have tried it tell us as an advertising medium in the interests of the watch and jewelry trade, the KEYSTONE stands ahead.

THE business failures for the first nine months of the current year, as compiled by *Bradstreet's*, number 7,330, with liabilities of \$83,941,991 and actual assets of \$44,649,552, the percentage of assets to liabilities being 53.1. The failures for the same period in 1887 numbered 6,958, with liabilities of \$90,642,157 and assets of \$44,545,000, the percentage of assets to liabilities being 49.1, or 4 per cent. less than this year. This constitutes a favorable feature of the present year's exhibit, and indicates that the condition of business is healthier, if possible, than last year, in spite of a small increase in the number of failures. In only two of the last seven years have the liabilities of the failing houses been as low. In 1882 the liabilities of the first nine months were only \$71,162,000 and in 1886 but \$77,110,000, as against \$83,941,991 this year. The liabilities in 1883 were \$123,054,000; in 1884, \$195,951,000; in 1885, \$90,976,000, and in 1887, \$90,642,157.

Hutchinson's
Practical School for Watchmakers,
La Porte, Indiana.
Send for circular and study course to J. L. HUTCHINSON, Box 160.

GRIFFITHS BROTHERS,
Manufacturing Jewelers
15 John Street, New York.
Repairing and Matching. Roman, Antique, Etruscan and Filigree jewelry, rings, etc.

Pivot Wire.
The best ever used for that purpose. The steel uniform in temper throughout. Once used always used. Three sizes (red, white and blue wrappers.) Ten cents per bundle. Three for twenty-five cents. For sale by jobbers and
Roberts & Pettengill, Mfgs.,
Boulder, Colo.

Send to Headquarters for Goods.
H. H. Kayton,
82 Nassau Street, New York.
Importer and Jobber
In Watch Materials, Tools, Jewelers' Findings, Spectacles, and other Optical Goods. Best goods at lowest prices. Work for the trade promptly attended to. Orders filled by any catalogue.

To The Trade.
I make a specialty of supplying the trade with stones for jobbing purposes. A large stock of Cameos, Pearls, Turquoise, Garnets, Amethysts, Doublets, Foil Backs, White and Colored Imitation Stones, Brazilian Beutles, etc., on hand. All kind of Settings for the trade. Send for Price List.
Wm. Archibald,
73 Nassau Street, New York.

Alex. Wiederhold,
No. 43 Nassau Street, New York,
Repairing Jeweler,
Makes a specialty of repairing all kinds of jewelry for the trade. Also matches up lost pieces such as Sleeve Buttons, Ear Rings etc. Gold Vest Chains filled and equal to new. Jobbing sent us by mail or express will be repaired and returned promptly. Prices moderate and first-class workmanship guaranteed.

CHARLES KOHLBUSCH,
Manufacturer of
Fine Balances and
Weights
For all purposes.
35 Nassau St., N. Y.
Send for Catalogue.
Repairs promptly attended to.

To the Trade.
Do you wish your repairing done well at reasonable prices? If so, send to
Edward W. Fox
all your broken jewelry, silverware, watch cases, movements, clocks, spectacles, eye-glasses, pipes, fancy goods, also engraving and plating. Save express by sending everything in one package to 7 Province Ct., Room 3, Boston, Mass.



Patented Jan. 17, 1888.
C. G. HARSTROM'S
For sale by all leading material houses; or send for samples, 15 cents each. Peekskill, 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.

OSGOOD FOLDING CANVAS BOAT
Invented and Manufactured by N. A. OSGOOD, Battle Creek, Mich.
BEST, SAFEST and Lightest.
Impossible to tip over by Rocking. Makes up four different weights, the same as four boats combined in one. Oars and paddle are slided, and pack in boat without extra charge. This cut shows the twelve-foot boat and packing chest. Send for Illustrated Catalogue.



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*.


Established 1869.
Chas. Reiss,
31 and 33 S. Pearl St., Albany, N. Y.
Watchmakers' Tools and Materials
Watchmaker to the Trade.
Watchwork received from all over the United States and Canada.
Send for Price List.

HOUGHTON & CO.,
Manchester, N. H.
Manufacturers of face plates and slide rests. Prices reasonable, and quality guaranteed. Ask your jobber for one on approval.



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.



PFEIL, WILLIAMS & BRET,
137-139 State St., Chicago, Ill.
Patentees of this Ornamentation.



Large stock of elegantly ornamented watch cases on hand, 6 and 18 Size.
We decorate watch cases to order. Sketches furnished.



Campaign.
Headquarters for
Campaign Badges,
Charms, Pins, Buttons
etc., etc.



Send for Illustrated Circular.

King & Eisele
283 Main Street, Buffalo, New York.

Spring Garden Metal Works
Manufacture Small Metallic Wares of every description. Patented Novelities, Clasps, Blanks, Metal Buttons, Buckles, Eyelets, and all kinds of Round, Square and pressed Tin, Brass, etc. Estimates furnished for Special Articles in Metal, Gold, Silver, Copper Plating and Japanning. Dies and Punches made to order.
520 N. Tenth St., Phila., Pa.

H. M. DAVIS,
No. 73 Nassau Street, Room 6, New York.
Watch Case Repairer.
Jewelers desiring first-class workmanship and prompt attention will find it to their advantage to give me a trial. Jobs sent me by mail or express will be repaired and returned promptly. Engine Turning, Springing, Jointing, Polishing and general repairing neatly and quickly executed.

BUY THE BEST.
Tweedle Dee and Tweedle Dum, the Best and Cheapest Nickel Time and Alarm Clocks made.

Oskamp, Nolting & Co.,
Wholesale Jewelers, Cincinnati, Ohio.

J. J. DONNELLY,
73 Nassau Street, Room 6, New York

Gold and Silver Electro Plater, Fire Gilder and Colorer.
All kinds of work neatly and promptly executed. Orders by mail or express will receive prompt attention.

THOMAS REYNOLDS,
19 Union Square, New York.
Manufacturer and Importer of 8 day, weight Striking Clocks, etc. Material of all kinds for repairing old English and other clocks. Dials made to order. Steel and Gilt Hands. Escape Wheels and Pallets, Wheels and Pinions. Repeating work, Springs, Chains, Gongs, Bells, Weights, Pulleys, etc.

Gold and Silver Refiner.
H. T. Roberts,
1132 Arch Street, Phila., Pa.
Old Gold and Silver bought. Packages received by mail or express promptly remitted for.

A Great Repository of Practical and Scientific Information.
One of the Fullest, Freshest and most Valuable Hand-Books of the Age. Indispensable to Every Practical Man.

The Techno-Chemical Receipt Book
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Industrial Publishers, Booksellers and Importers.
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Foot-Power Machinery.
Complete Outfit for actual Workshop Business. Lathes for wood or metal. Circular Saws, Scroll Saws, Formers, Mortisers, Tenoners, Etc. Polishing Machines. Lathes for the heavier work of Jewelers.

OUR Patent Velocipede Foot-Power is without question the best yet applied to Lathes. Read a few expressions from those using them: "I do not see how your lathes can be produced at such a low cost." "The Velocipede Foot-Power is simply elegant." "Can turn a whole day, and feel as little tired as though only walking around." "In regard to the Velocipede Foot-Power, I consider the lathe without an equal." "Using the Velocipede Foot-Power, the operator can hold a steady hand for doing the work." "For doing actual business, the lightest or the heaviest, give me the Velocipede Foot-Power." "The 4 1/2 Lathe is equal to any costing twice the money." "What astonishes me is, how you can make machines to pay you for so small a sum of money." "The No. 1 Lathe is the most perfect tool I ever saw for the money." "I can do double the amount of work on the Velocipede that I can on any other style of foot-power lathe." "There is no tax on strength, the body is at rest, steady, the hands and attention free for the job." "The Velocipede is the best foot-power of any for lathes." Sold ON TRIAL. Price List Free.

W. F. & John Barnes Co.,
660 Ruby Street, Rockford, Illinois.

AWARDING OF PRIZES

FOR DESIGNS OF ENGRAVING, AS ANNOUNCED IN JUNE "KEYSTONE."

A Committee of five experts met in the spacious offices of the Keystone Watch Case Co. on Saturday, September 15th, to award the prizes for designs for cases as announced in June KEYSTONE. There were several hundred designs offered by competitors from all over the Union and Canada. The Committee experienced great difficulty in deciding for the first and second prizes; on the first ballot, each voting for a separate competitor for first prize. The matter was finally settled in a very impartial manner, considering the difficulties, and the following prizes were awarded:



FIRST PRIZE.

J. E. GREENE,
Coccoa, - - Georgia.

18 Size, 11 Jeweled
American Lever Movement
in elegant

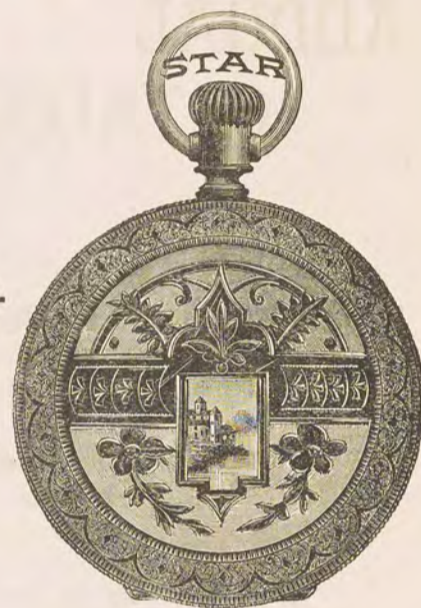
JAS. BOSS FILLED CASE.

SECOND PRIZE.

A. L. TETAZ,
No. 70 Madison Street,
Chicago, - - Illinois.

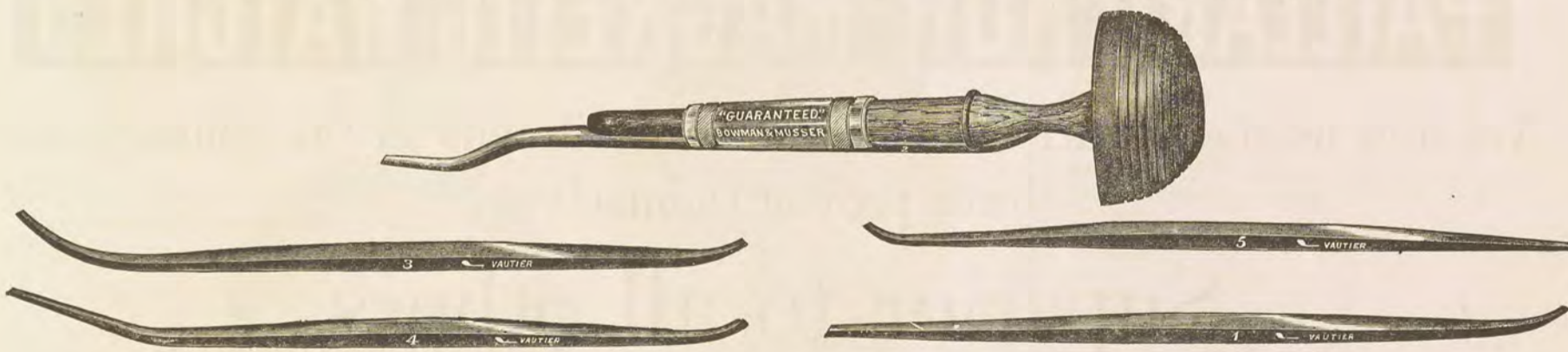
18 Size, 7 Jeweled
American Lever Movement
in elegant

STAR FILLED CASE.



Other Prizes Awarded.

The following competitors were each awarded a set of Bowman & Musser's Celebrated Gravers:



A. J. HARRIS, Rochester, N. Y.
W. A. SAVAGE, Le Roy, Kan.
ARTHUR FORTH, Gorham, N. Y.
HARRY FELIX, Lafayette, Ind.

W. G. LAWSON, Waterbury, Conn.
R. C. TOZER, Binghamton, N. Y.
BENJ. A. BARNES, Iowa City, Iowa.
CLARENCE B. KERN, Mount Joy, Pa.

H. T. CORY, Dexter, N. Y.
EDWARD PIEPENBRING, Washington, D. C.
C. O. SNYDER, Bloomville, Ohio.
W. F. SCHEUING, Philadelphia, Pa.

We express thanks for the liberal manner in which our friends responded to the call on their talent and ability. We feel as though the words used by an American officer to his men after Burgoyne's surrender will express our sentiments exactly: "I knew you were the boys who could do it; and you have done it nobly; my hearty thanks to you."

Keystone Watch Case Company,

New York.

Philadelphia.

Chicago.

Headquarters

For Everything needed by Jewelers.

Originators and Publishers of the Only Catalogue without Jobbers' Names.

Is now being arranged and will contain the

Finest and Largest Selection ever shown.

OUR 13TH
ANNUAL
CATALOGUE

Retail Jewelers wishing same will please make application at once with business card, so your name, town and state can be stamped on outside of cover.

If you have not traded with us, send a trial order.

Largest Store, Largest Stock,
Largest Business.

(Non de Plume.)
"Busiest House in America."

Northwest Cor. Washington Street.

Lapp & Flershem,

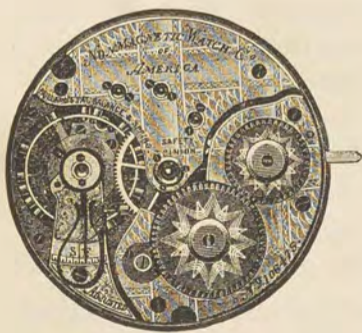
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PAILLARD NON-MAGNETIC WATCHES

Are now used on nearly all the leading Railroads in the country, and have proven themselves

Superior to all others.



No Dealers Stock complete
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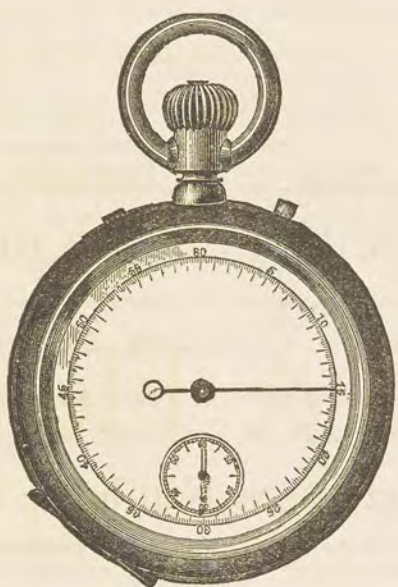


Made in 16 size Elgin Open Face and Hunting Stem Wind. A large and varied line of Ladies' small size; Gentlemen's Fine and Complicated Watches.

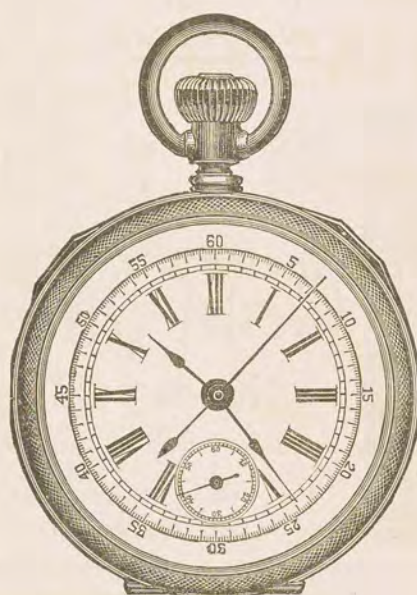
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141 & 143 STATE STREET,
CHICAGO, ILL.



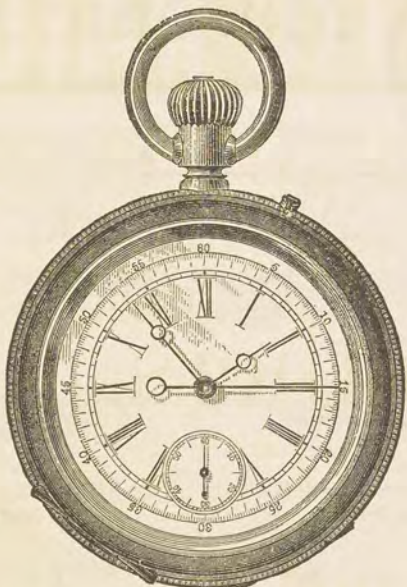
NICKEL HORSE TIMER.
Stem Wind, Sweep Second Hand, Beats 1-5 Seconds;
Stop and Fly Back, Minute Register.



**SOLID SILVER OR GOLD FILLED
O. F. CHRONOGRAPH.**
Fine Stem Wind and Stem Set Watch Lever Movement,
Ruby Jeweled, Breguet Hair Spring, with perfect
Chronograph Attachment, Beats 1-5 Sec-
onds, Stop and Fly Back.

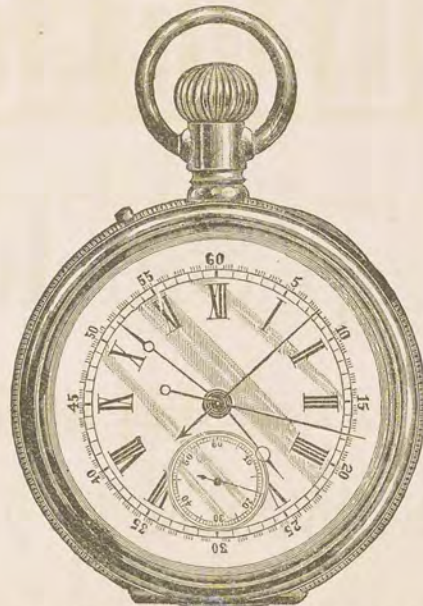


Showing Nickel Movement, 3 1/2 Pairs Extra Jewels in
Settings, Adj., Comp. Bal., Pat. Reg.

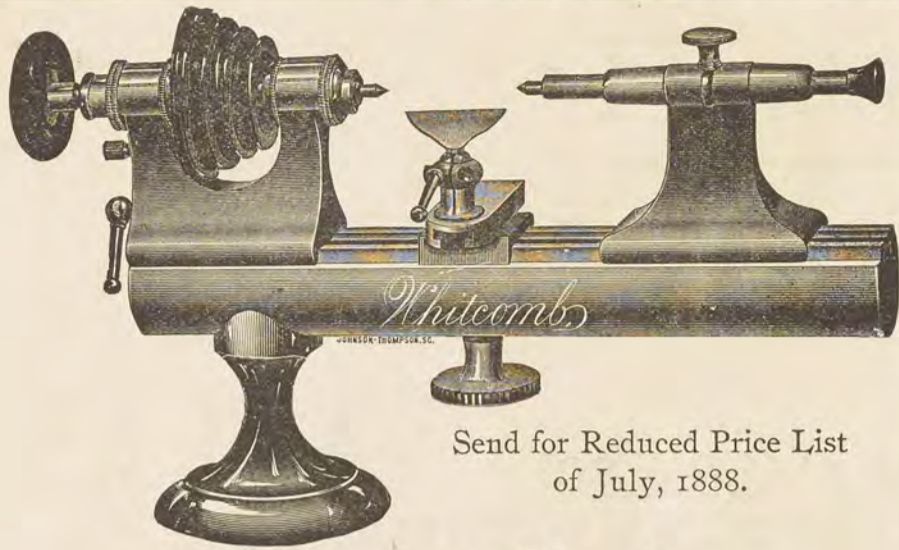


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Fine Stem Wind and Stem Set Watch, In Silver Case,
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The Largest Stock and Most Complete Assortment of
**HORSE TIMERS,
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and REPEATERS**
in Solid Gold, Gold Filled, Silver and
Nickel Cases, to be found.
Send for Prices.
BENJ. ALLEN & CO.
141-143 State St.



SOLID SILVER O. F. SPLIT SECONDS CHRONOGRAPH.
Fine Stem Wind and Stem Set Watch, Lever Movement
Ruby Jeweled, Breguet Hair Spring, with perfect
Chronograph Attachment, Beats 1-5 Sec-
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Split Seconds.



Send for Reduced Price List of July, 1888.

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.,
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Established 1870.

J. L. Clark,
Refiner and Sweepmelter of
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No. 823 Filbert Street,
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Gold and Silver of any kind bought.
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L. Lelong & Brother,
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We carry a full line of all grades of movements and cases in 14 K., 10 K., Wheat and Eagle. Full line of Boss and other filled cases. Mail orders get our special attention.

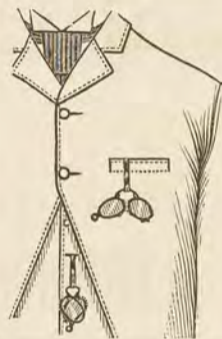
Our motto: "No Misrepresentation."

Macnair & Burlingame,
Manufacturers of
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Sell direct to the
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Rand's Patent Safety Eye-Glass Holder.

Manufactured from the finest Damascus Tempered (Blued) Steel. It has no pin, yet it may be instantly attached and detached from a pocket, buttonhole or eyelet.

"Will never, never slip." PRICE, 10 CENTS. "Will never lose its grip." Sample and Pamphlet, entitled, "What one hundred prominent men say about the Holder," sent FREE to the trade upon receipt of their business card.

From MRS. GEN. JOHN A. LOGAN.

From RT. REV. HENRY C. POTTER, D. D., L.L.D., Bishop of N. Y.

I thank you for the very ingenious device, the Safety Eye-glass Holder, for keeping near one the truant glasses we sometimes cannot do without.

Many thanks for the useful contrivance, the Safety Eye-glass Holder, which you have so kindly sent me.

Safety Eye-Glass Holder Co.,

Bedford Ave., Cor. Fulton St., Brooklyn, N. Y.

Breitinger & Kunz,

Importers, Manufacturers, Jobbers and Dealers in

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Manufacturer of Crosby's Jeweling Tools, Watch Keys, Watch Case Springs, etc.



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THE LOOP KEY cannot be excelled in quality and finish.



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CLARK'S FIVE HOLE CASE SPRINGS. None better or more reliable for repairing.
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Send for price list.

Sold by the Trade.

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.

Stern Bros. & Co.,

Have just received several large invoices of

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Selected with great care in the best European Markets, and are offering the same to the trade at very reasonable prices.

No. 30 Maiden Lane,
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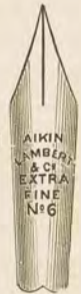
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Manufacturer of

Society Badges, Charms, Scarf-Pins and Rings.

Made of Solid Gold, handsomely enamelled, patented designs. Send for Price List containing cuts of Charms, Badges, Scarf-Pins, Rings, etc. Badges and Charms of all organizations made to order.



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Manufacturers of

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Show Case and Fancy Tray Apartments
arranged specially for Jewelry -
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Fountain Holders.

Catalogue and List sent only to Dealers,



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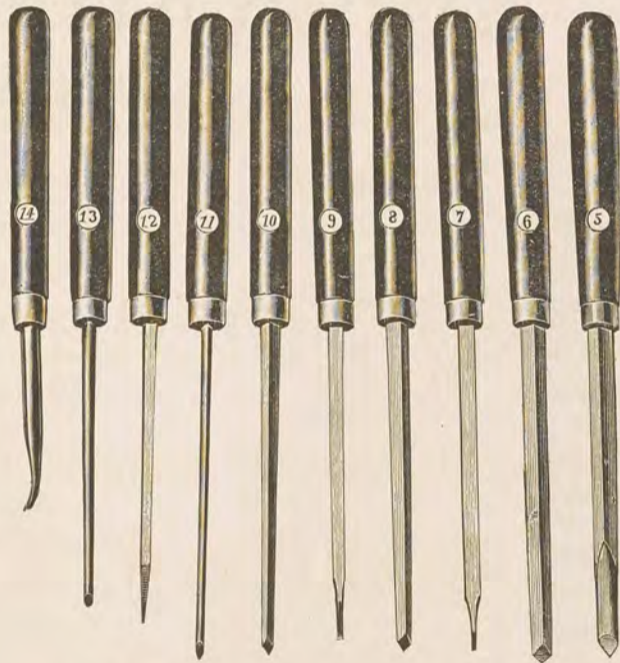
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Is the Handsomest in the Market

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Olin's Pivoting Gravers.

Manufactured from the

Best Steel Possible.

Best and Finest Temper of any. Ground to Desirable Shapes, and Sharpened Ready for use.

Price, \$3.50.

Put up in Neat Paper Boxes, with description pasted in cover. Sent to any address complete on receipt of price.

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THE TRENTON WATCH DISSECTED.



THE TRENTON WATCH MOVEMENT WITH TOP-PLATE REMOVED.

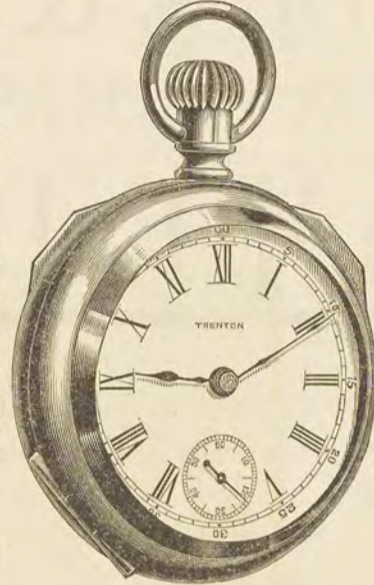
Straightforward dealing is the highest business intelligence.

THE TRENTON WATCH has nothing mysterious about it—except the mystery of skill in its making and the cheapness of its selling price.

The intelligent Jeweler is invited to give this engraving—made from a photograph—the SEVEREST SCRUTINY.

THE TRENTON WATCH is a regular-made and accurate time-keeper, with straight-line lever escapement, second-hand, jeweled, 18 size, stem-wind and set with improved back-ratchet, quick train.

Investigation invited.



BEST WATCH IN THE WORLD
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GLICKAUF & NEWHOUSE,

84 and 86 State Street, Chicago, Ill.



- 1 WALTHAM, Old Model, New Style, 18 Size.
- 2 WALTHAM, Old Model, Old Style, 18 Size.
- 3 WALTHAM, A. T. & Co.
- 4 " Crescent Street.
- 5 " New Model Hunting 18 Size.
- 6 WALTHAM, New Model, Open Face, 18 Size.
- 7 WALTHAM, 16 Size.
- 8 " Bond Street.
- 9 " 14 Size.
- 10 " 10 Size.
- 11 " 8 and 6 Size.
- 12 } ELGIN, New Style, 18 Size.
- 13 }
- 14 " Old Style, 18 Size.
- 15 " New Style, 16 Size.
- 16 " Old Style, 16 Size.
- 17 " New Style, 10 Size.
- 18 " Old Style, 10 Size.
- 19 " New Style, 8 and 6 Size.
- 20 ELGIN, Old Style, 8 and 6 Size.
- 21 HAMPDEN, 18 Size.
- 22 ROCKFORD, 18 Size.
- 23 ILLINOIS, 7, 6 and 4 Size.
- 24 " 18 Size.
- 25 HOWARD, 18 Size.
- 26 " 16 Size.

We will supply you with the G. & N. Gravier Mainsprings, which have proven themselves Superior to those made by any Watch Company. Our Springs are each one coiled separately and tag with name of Spring on. Also each Spring has the G. & N. Gravier name engraved on end.

The
G. & N. Gravier Mainsprings
For Waltham, Elgin, Hampton, Rockford,
Illinois, Howard and Lancaster.

A full line of
American Watches.

Watchmakers' and Jewelers'
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Fine Gold Lapped and Rolled Plated
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The only Reliable Mainspring in the World.
A Trial will convince. **\$1.25 per dozen.**

Why are these the Cheapest Springs for You?

Because we guarantee you against a loss of more than 1/2 dozen to the gross, which surely is money in your pocket, besides time saved in putting another Spring into your watch.

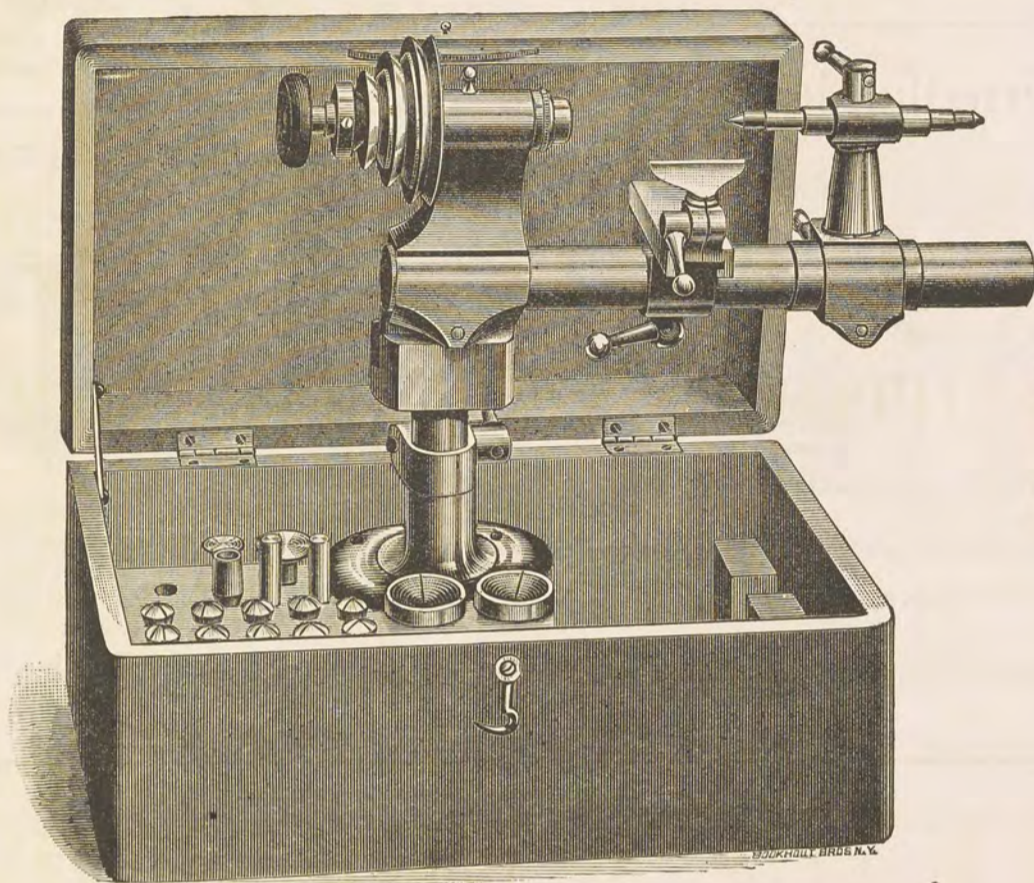
Send for some and try them, and if they are not as we guarantee, we will take them back from you.

Remember, These are not Sold as Cheap as the Common Goods in the Market, but as Cheap as any American Made, although superior than those.

We have now in stock a full line of FLINT GLASS GENEVA WATCH CRYSTALS, which for Whiteness in Color and Accuracy in Measurements we place in the market for \$1.50 per gross, being far better equivalent for the money, than any ever offered to the Trade. Our Extra Thick Mi-Concave, at \$3.00 per gross, is a very superior Glass, and well proportioned; not having the convexity so unshapely as in most Glasses.

C. H. KNIGHTS & CO., IMPORTERS

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MATERIAL

THE LITTLE GEM

Nickel Plated with
10 Wire Chucks
2 Wheel Chucks
Tail Stock
And Cement Brasses.

Combination \$25.00.

GUARANTEED TRUE.

Extra Attachments.

Universal Head,	-	-	-	-	\$10.00.
Slide Rest,	-	-	-	-	\$20.00.

LARGEST STOCK IN THE WEST.

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Successors to
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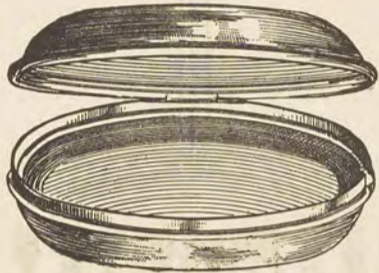


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Wholesale Agents for AMERICAN WATCHES.

Manufacturers of
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R. & L. Friedlander.



Watch Protectors.
\$2.50 per Dozen.



Adjustable Casesprings.
Best in the Market.
50 cents per Doz.

Watches, Jewelry, Optical Goods and Jewelers' Supplies.

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1000 dozen Bamboo Vest Chains @ 75 cents per dozen.

65 and 67 Nassau Street, N. Y.

Send for Price List.



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.,
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177, 179, 181 Superior St., Cleveland, O.

Farley's Patent Bar-Spring Eye-Glass.



This eye-glass has been in use long enough to show that it is a thing needed, and that it is liked by those who wear it. It is durable and a slight accident does not ruin it. In this respect, it is found to be mechanically practicable. Some wear them because they have astigmatism; others because it holds on firmly, and does not fall off or blow off in the wind, and still is most comfortably worn; still others, because they have low noses, and cannot keep any other kind on. (Low noses generally wear this with offset even better than prominent noses.) Others wear it because it sets up before the eyes like spectacles and many more wear it for no other reason than that they like the looks of it on the face better than any other kind or style.

For Sale by
First-Class Jobbers in Optical Goods.

Send your orders for

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DIAMONDS and JEWELRY

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35 Maiden Lane, . . .

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Importers of
DIAMONDS.

Manufacturers of the
"Eclipse" Gold Cases.

ESTABLISHED, 1864.

STERN & STERN

ECLIPSE



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Jobbers of
American Watches.

Manufacturers of
FINE JEWELRY.



Anti-Magnetic Shield Cases.

For Sale

—BY ALL JOBBERS—

Most practical and efficient protection known to the trade. For
Descriptive Circular or information

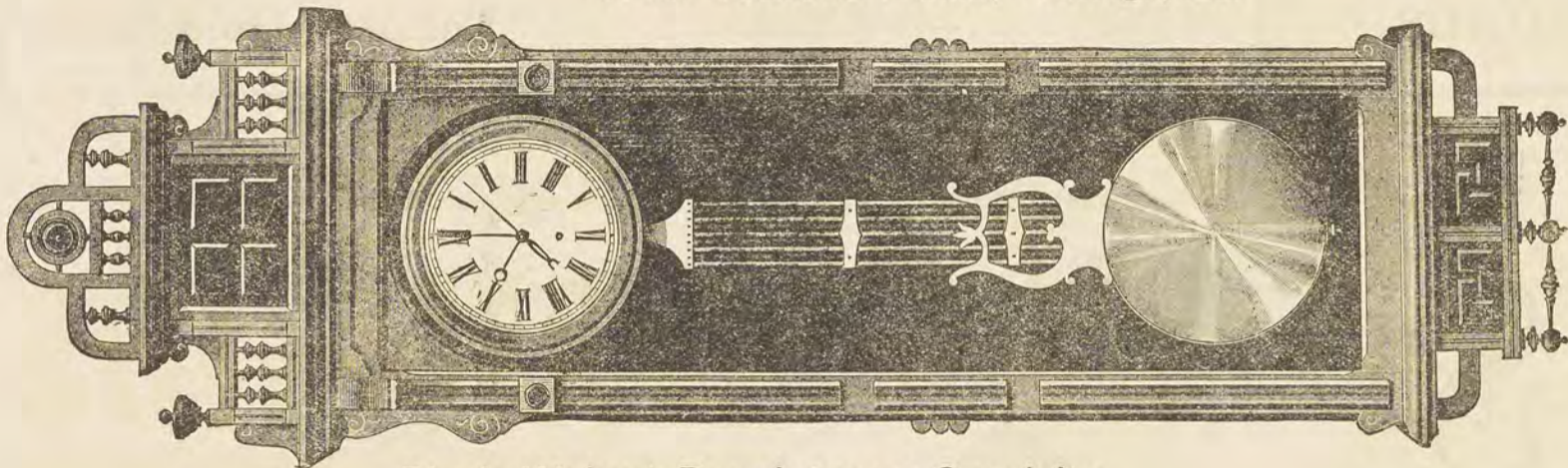
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Giles Bro. & Co., Selling Agents,
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EASTERN OFFICE: 1½ Maiden Lane, New York.

ADDISON CONKLING Manager.

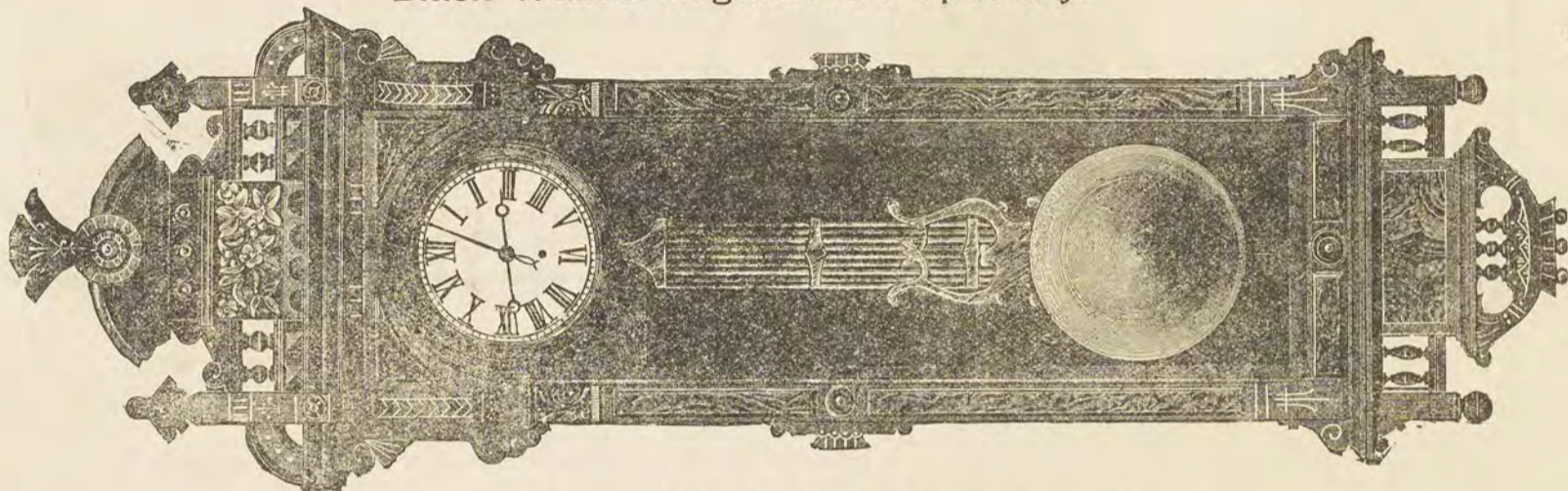
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Black Walnut Regulators a Specialty.

12 inch Dial.
\$37 net cash.
Height, 7½ ft.

Warranted
Correct
Time Keepers.



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Headquarters for Watchmakers' Tools and Materials.

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Manufacturers of

Full Plate 18 Size Movements

of Superior Finish and Time-Keeping Qualities of Highest Character

The Best Watch Made for the Price.

Eleven Grades of Open Face Pendant Setting Movements.

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Eleven Grades of Htg. Stem Wind Movements.

Seven Grades of Key Wind Movements.



No connection with Trusts or Combinations.

Movements are sold without Cases.

Dealers are protected from unfair competition.

Manufacturers also of the GUILD Watch, made under special contract with the U. S. Jewelers Guild and bearing its registered trade mark. Sold to none but members of the Guild.

We have appointed Max Young, Wholesale Jeweler, 170 State Street, Chicago, Ill., our special agent for the sale of Aurora movements to the retail trade in the City of Chicago, State of Colorado and Washington, Idaho, Montana, Utah, Wyoming, New Mexico and Arizona Territories.

Write to the Factory for information.

General Office at the Factory.

Aurora Illinois.

Prices and Quality
Guaranteed.

HONEST GOODS
AT
HONEST PRICES



Loose and Mounted

DIAMONDS

H. F. Hahn & Co.,

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Chicago, Ill.

Solicited Packages
Sent to Responsible Parties.

Something New and Low Priced

INSULATED WATCH PROTECTORS.

Will Protect all Watches against Magnetism.

Convenient in Use.

Made in various Sizes.

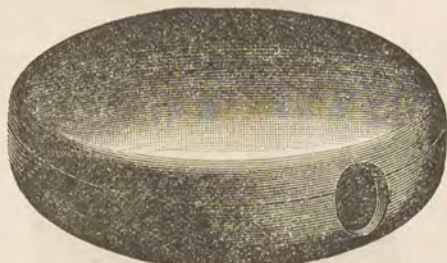
Perfect in Action.

Price within the reach of Everybody.

For Sale by all Jobbers and Wholesale Dealers.



Pat. Applied For.



Pat. Applied For.



Pat. Applied For.

Manufactured only by the

Newark Watch Case Material Co., Alex. Milne, President

Manufacturers of PENDANTS, BOWS, CROWNS, SPRINGS, etc.

New York Office: No. 41 Maiden Lane.

Mention this Paper.

Factory: No. 19 Ward St., Newark, N. J.



Waltham Watches, Keystone Cases, and Elgin Movements

DIAMONDS

in the
Queen City of the Rockies

We are the only exclusively Wholesale House in this section; are Special Jobbers of the Waltham, and Diamond Importers, and fill orders at Eastern prices from any Catalogue. Send orders or write for prices.

Blythe, Lehman & Co.,

Legitimate Jewelry Jobbers,
1421 to 1425 Sixteenth Street,
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All our own New and Original Specialties. Every live Jeweler should keep abreast of the times, and see our new styles.



Shell Watch Boxes. \$12 per Doz.

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.

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.

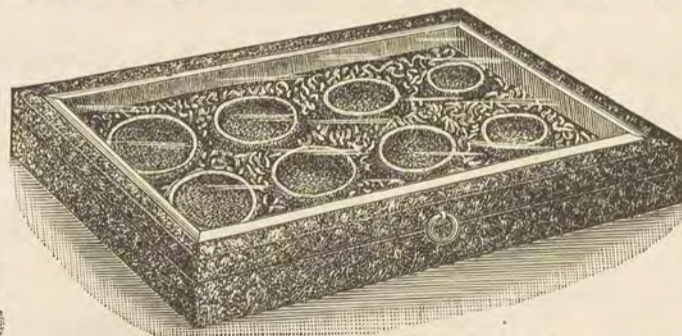
Send for Catalogue.

Discounts to Jobbers.



Plate Glass Box for 1/2 Doz. Tea Spoons.

628 Arch Street,
Phila.



Patent Plate Glass Watch Tray. 11 1/4 x 8. Price \$4.50.



Plate Glass Ring Tray. 8 1/2 x 7. Price \$3.50.



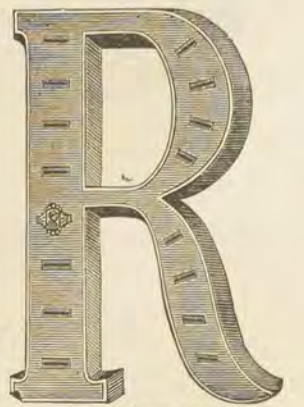
Klotz's Patent Tray.

Sole owners of Patent, and Manufac-
turers of Klotz's Ring and Thimble Trays.
No. 1. Size, 9x6, \$2.00 each.
No. 2. Size, 10 1/2 x 7 1/2, \$2.50 each.



Pat. Sept. 15, 1885.

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



Pat. July 25, 1884.

Our Patent Initial Tray
for Rings, Drops, Lock-
ets, etc. Price, \$3.50 each.

SETH THOMAS CLOCK CO.

THOMASTON, CONN.

154 State Street, Chicago.
132 Sutter Street, San Francisco.

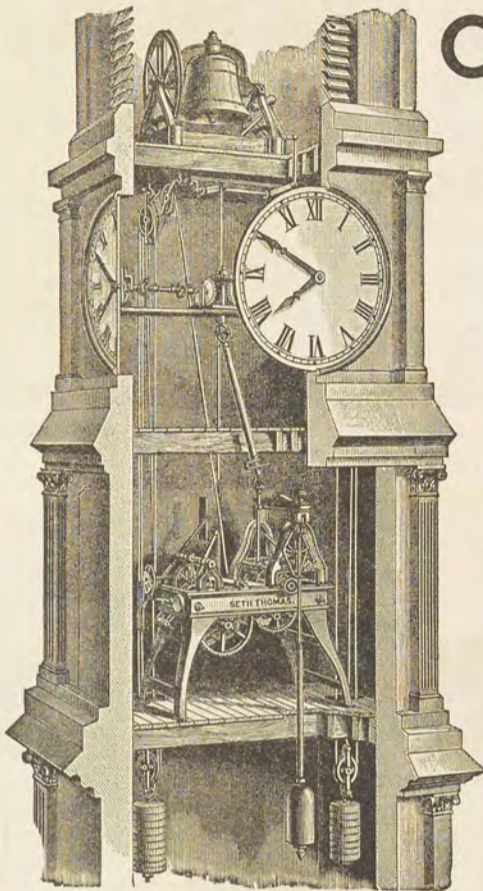
1003 Olive Street, St. Louis.
7 Cripplegate Bldgs., Wood Street, London.

20 Murray Street, New York.

CLOCKS AND WATCHES

NONE BETTER IN THE WORLD.

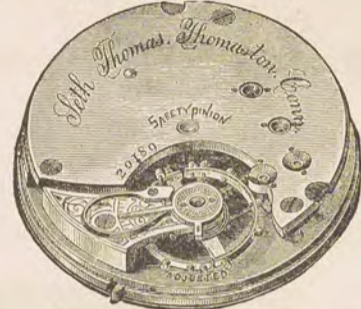
Seth Thomas Watch Movements.



SETH THOMAS
TOWER CLOCKS.

- No. 33. 7 Jewels.
- No. 55. 11 Jewels, Micrometer Regulator.
- No. 70. Full Jeweled, Micrometer Regulator.
- No. 101. Full Jeweled, Micrometer Regulator, Adjusted.

OPEN FACE, No. 101.



Quick Train, 18-Size, $\frac{3}{4}$ Plate, Gilded, Expansion Balance, OPEN FACE, Stem Winding and Setting, Sunk (Cut) Seconds Dial. Fit all styles Standard 18-Size Open Face Cases.

- No. 34. 7 Jewels.
- No. 56. 11 Jewels, Micrometer Regulator.
- No. 71. Full Jeweled, Micrometer Regulator.
- No. 102. Full Jeweled, Micrometer Regulator, Adjusted.

HUNTING, No. 34.



Quick Train, 18-Size, $\frac{3}{4}$ Plate, Gilded, Expansion Balance, HUNTING, Stem Winding and Setting, Sunk (Cut) Seconds Dial. Fits all styles Standard 18-Size Hunting Cases.

The 16 Size

Three-Quarter Plate Watch Movements

Manufactured by the

American Waltham Watch Company

named "ROYAL,"

are now ready for delivery by

David F. Conover & Co.,

S. E. Corner Chestnut and Seventh Sts., Philadelphia, Pa.

Prices sent to Watchmakers and Jewelers only.

We issue no Price Lists.

WE LEAD, OTHERS FOLLOW.

DETROIT PLUSH TRAY AND BOX COMPANY,

DETROIT, MICHIGAN, U. S. A.

Manufacturers of Plush Boxes and Trays.

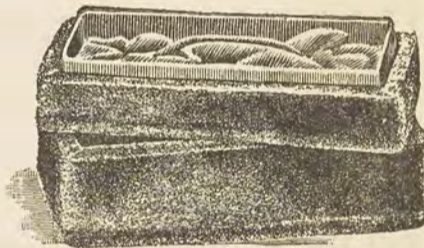
Office: 95-97 Woodward Ave.

Office Telephone, 715.
Factory Telephone, 796.

The following is a complete list of all the regular goods we make. Estimates on any size Boxes and Trays given on application. WE PUBLISH NO CATALOGUE THIS YEAR. Have greatly enlarged our facilities and give our customers better goods for less money than ever before. We only make PLUSH Boxes and PLUSH and VELVET Trays.



No. 400. Watch Box. 88 cents.



No. 425. Bar Pin Box. 45 cents.



No. 470. Spectacle Case. 20 cents.

Silverware Boxes.

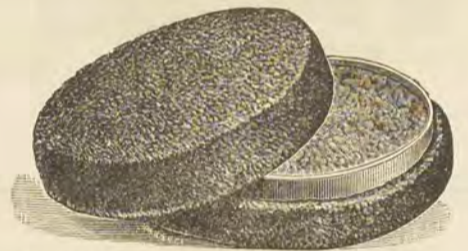
No.	Description	EACH
No. 200.	Tea Spoon Box, 6 Spoons,	\$1 25
No. 201.	" " " 12 " "	1 75
No. 205.	Coffee " " 12 " "	2 50
No. 210.	Dessert Spoon Box, 6 Spoons, -	1 75
No. 211.	" " " 12 " "	2 25
No. 215.	Table " " 6 " "	1 75
No. 216.	" " " 12 " "	2 25
No. 217.	" " " 6 Teas and 6 Tables	2 25
No. 220.	Sugar " " 1 Spoon,	1 00
No. 221.	" " " 2 " "	1 25
No. 222.	" " and Butter Knife Box,	1 25
No. 225.	Cream Spoon Box, 1 Spoon,	1 25
No. 230.	Berry " " 1 " "	1 50
No. 235.	Gravy " " 1 " "	1 50
No. 240.	Macaroni " " 1 " "	1 50
No. 245.	Salad " " 1 " "	1 50
No. 246.	" " " 2 " "	2 00
No. 247.	" " and Fork Box,	2 00
No. 250.	Child Set Box, 3 Pieces,	1 25
No. 255.	Butter Knife Box 1 Butter,	1 00
No. 256.	" " " 2 " "	1 25
No. 257.	" " and Sugar Spoon Box	1 25
No. 260.	Fruit Knife Box, 6 Knives,	1 25
No. 261.	" " " 12 " "	1 75
No. 265.	Medium Knife Box 6 Knives,	2 00
No. 266.	" " " 12 " "	2 50
No. 267.	" " and Fork Box, 6 each,	2 50
No. 270.	Dessert " " Box, 6 Knives,	2 00
No. 271.	" " " 12 " "	2 50
No. 272.	" " and Fork Box, 6 each,	2 50
No. 275.	Fish Knife Box, 1 Knife,	2 00
No. 276.	" " and Fork Box, 1 each,	2 50
No. 280.	Cake Knife Box, 1 Knife,	1 50
No. 285.	Pie " " 1 " "	1 75
No. 290.	Salad Fork Box, 1 Fork,	1 75
No. 291.	" " and Spoon Box,	2 50
No. 295.	Fish Fork Box, 1 Fork,	1 75
No. 296.	" " and Knife Box,	2 50
No. 300.	Medium Fork Box, 6 Forks,	2 00
No. 301.	" " " 12 " "	2 50
No. 302.	" " and Knife Box, 6 each,	2 50
No. 305.	Dessert Fork Box, 6 Forks,	2 00
No. 306.	" " " 12 " "	2 50
No. 307.	" " and Knife Box, 6 each,	2 50
No. 310.	Cheese Scoop Box, 1 Scoop,	1 50
No. 315.	Oyster Ladle " 1 Ladle,	1 75
No. 320.	Gravy " " 1 " "	1 75
No. 325.	Soup " " 1 " "	3 50
No. 330.	Carving Set Box, 3 Pieces,	3 25
No. 335.	Nut Pick " 6 Picks,	1 25
No. 336.	" " " 12 " "	1 75
No. 337.	" " " 6 " " 1 Crack,	1 75
No. 338.	" " " 6 " " 2 " "	2 00
No. 339.	" " " 12 " " 2 " "	2 75
No. 349.	Silverware Box, 18 Pieces, 6 Knives, 6 Forks, 6 Tables,	4 75
No. 350.	Silverware Box, 26 Pieces, 12 Teas, 6 Tables, 6 Forks, Butter and Sugar,	6 00



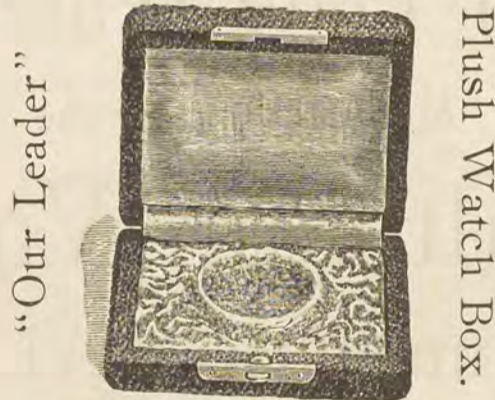
No. 455. Ring Box. 35 cents



No. 404. Watch Box. 75 cts. Plush top and Satin side.



No. 403. Watch Box. (Round.) 50 cents.



“Our Leader”

Plush Watch Box.

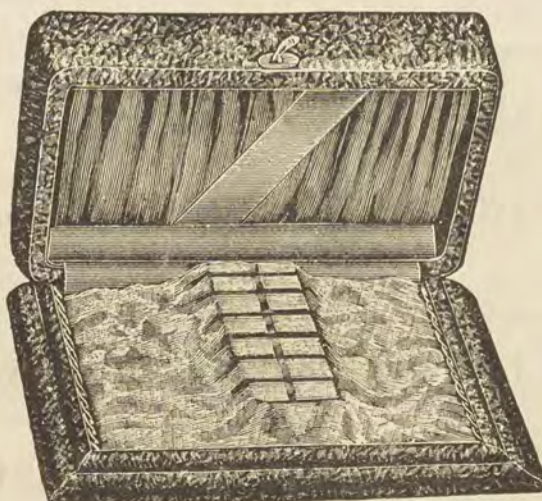
No. 398. Watch Box. 57 cents each. Best in the world for the money.



No. 435. Ear Drop Box. 45 cents.

Watch and Jewelry Boxes.

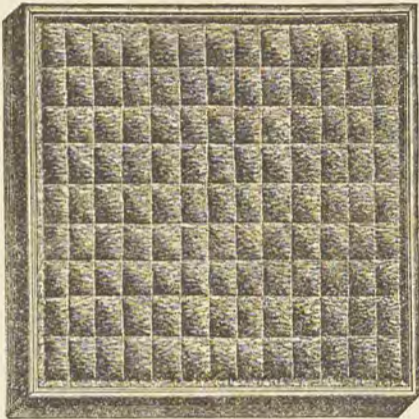
No.	Description	EACH
No. 398.	Watch Box, Ladies',	57
No. 399.	" " Gents',	57
No. 400.	Watch Boxes, Ladies',	88
No. 401.	" " Gents',	88
No. 402.	" " Round, large,	75
No. 403.	" " small,	50
No. 404.	" " " "	75
No. 415.	Bracelet Boxes, Chain,	1 25
No. 416.	" " 1 Bangle,	1 00
No. 417.	" " 2 " "	1 15
No. 425.	Bar Pin Boxes,	45
No. 426.	Broach Pin " "	45
No. 430.	Scarf " " "	45
No. 435.	Ear Drop " " "	45
No. 440.	Locket " " "	45
No. 445.	Sleeve Button Boxes	45
No. 450.	Stud Boxes, Single Stud	35
No. 455.	Ring Boxes, Round,	35
No. 460.	Thimble Boxes, Round,	35
No. 465.	Masonic Jewel Boxes,	1 25
No. 470.	Spectacle Case	20
No. 475.	Jewel Casket,	2 75
No. 480.	Handkerchief Casket,	2 50
No. 485.	Glove Casket,	2 50
No. 500.	Show Case Mats, with corded edge,	1 50
No. 501.	" " " " Silk Fringe edge,	2 00



No. 200. Tea Spoon Box.

Complete List of Regular Trays Kept in Stock.

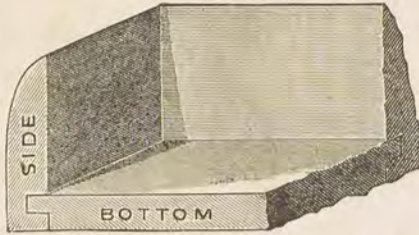
Stack Trays.



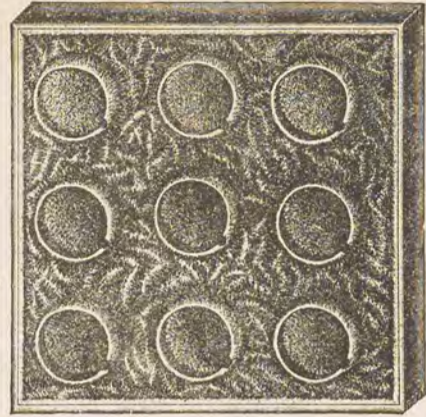
No. 020. Ring Tray. \$2.75.



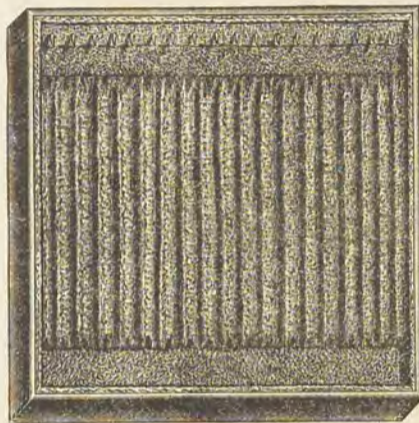
No. 030. Watch Tray. \$2.75.



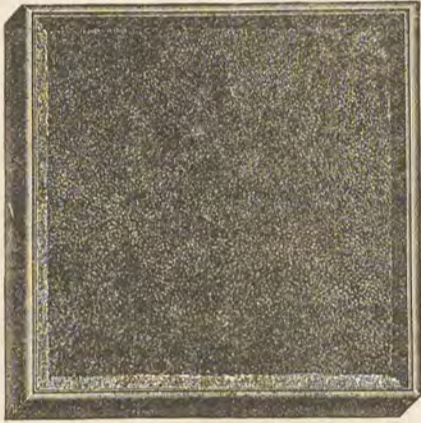
The above shows section of our X Trays, which meets the wants of those who cannot use Stack Trays.



No. x30. Watch Tray. \$2.25.



No. 070. Chain Tray. \$2.50.

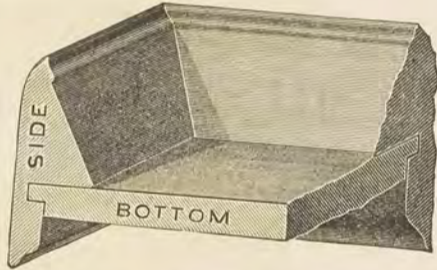


No. 090. Plain Tray. \$1.50.

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,	11 3/4 x 11 3/4,	-	-	-	\$2.25
No. x 21.	"	5 7/8 x 11 3/4,	-	-	-	1.25
No. x 25.	"	7 1/4 x 10 1/4,	-	-	-	1.25
No. x 30.	Watch Tray	Gents' 11 3/4 x 11 3/4,	-	-	-	2.25
No. x 31.	"	Ladies' 11 3/4 x 11 3/4,	-	-	-	2.25
No. x 50.	Locket Tray,	11 3/4 x 11 3/4,	-	-	-	2.00
No. x 51.	"	5 7/8 x 11 3/4,	-	-	-	1.25
No. x 60.	Charm "	11 3/4 x 11 3/4,	-	-	-	2.00
No. x 61.	"	5 7/8 x 11 3/4,	-	-	-	1.25
No. x 70.	Chain "	11 3/4 x 11 3/4,	-	-	-	2.00
No. x 71.	"	15 3/8 x 11 3/4,	-	-	-	2.75
No. x 80.	Thimble "	11 3/4 x 11 3/4,	-	-	-	2.25
No. x 81.	"	5 7/8 x 11 3/4,	-	-	-	1.25
No. x 90.	Plain "	11 3/4 x 11 3/4,	-	-	-	1.13

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,	11 3/4 x 11 3/4 each,	-	\$2.75
No. 020 B.	"	for Band Rings,	11 3/4 x 11 3/4 each,	-	3.25
No. 021.	"	45	5 7/8 x 11 3/4 "	-	1.75
No. 021 B.	"	for Band	5 7/8 x 11 3/4 "	-	2.00
No. 022.	"	63	7 1/4 x 11 3/4 "	-	2.25
No. 022 B.	"	for Band	7 1/4 x 11 3/4 "	-	2.63
No. 030.	Watch Tray,	Gents' 9 holes,	11 x 11 3/4 each,	-	2.75
No. 031.	"	Ladies' 12	11 3/4 x 11 3/4 "	-	2.75
No. 032.	"	Gents' 12	15 3/8 x 11 3/4 "	-	3.50
No. 033.	"	Ladies' 15	15 3/8 x 11 3/4 "	-	3.50
No. 040.	Bracelet Tray,		11 3/4 x 11 3/4 each,	-	3.25
No. 050.	Locket Tray,		11 3/4 x 11 3/4 "	-	2.50
No. 051.	"		5 7/8 x 11 3/4 "	-	1.75
No. 052.	"		7 1/4 x 11 "	-	2.25
No. 060.	Charm Tray,		11 3/4 x 11 3/4 each,	-	2.50
No. 061.	"		5 7/8 x 11 3/4 "	-	1.75
No. 062.	"		7 1/4 x 11 3/4 "	-	2.25
No. 070.	Chain Tray,		11 3/4 x 11 3/4 "	-	2.50
No. 071.	"		15 3/8 x 11 3/4 "	-	3.25
No. 080.	Thimble Tray,		11 3/4 x 11 3/4 each,	-	2.75
No. 081.	"		5 7/8 x 11 3/4 "	-	1.75
No. 090.	Plain Tray,		11 3/4 x 11 3/4 each,	-	1.50
No. 091.	"		5 7/8 x 11 3/4 "	-	1.00
No. 092.	"		7 1/4 x 11 3/4 "	-	1.25

We still manufacture the No. 1 Trays, which we have made for the past years, with Mahogany finished border card 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



No. 70.

Trays.

No. 1.	Ring Tray,	11 3/4 x 11 3/4,	-	-	-	each,	\$1.50
No. 2.	"	5 7/8 x 11 3/4,	-	-	-	"	1.00
No. 10.	Watch	Gents' 11 3/4 x 11 3/4,	-	-	-	"	1.50
No. 11.	"	Ladies' 11 3/4 x 11 3/4,	-	-	-	"	1.50
No. 30.	Locket	11 3/4 x 11 3/4,	-	-	-	"	1.50
No. 31.	"	5 7/8 x 11 3/4,	-	-	-	"	1.00
No. 40.	Charm	11 3/4 x 11 3/4,	-	-	-	"	1.50
No. 41.	"	5 7/8 x 11 3/4,	-	-	-	"	1.00
No. 50.	Chain	11 3/4 x 11 3/4,	-	-	-	"	1.50
No. 51.	"	11 3/4 x 23 1/2,	-	-	-	"	2.75
No. 52.	"	5 7/8 x 23 1/2,	-	-	-	"	2.25
No. 60.	Thimble	11 3/4 x 11 3/4,	-	-	-	"	1.75
No. 61.	"	5 7/8 x 11 3/4,	-	-	-	"	1.00
No. 70.	Plain	11 3/4 x 11 3/4,	-	-	-	"	.63

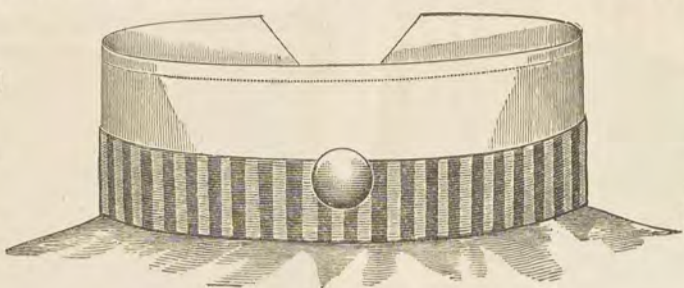
If you have no account with us, please give reference. Terms, 30 days, net cash, or 5 per cent. off if paid in 10 days.

Detroit Plush Tray & Box Co.,

DETROIT, MICH., U. S. A.

The "Sensible" Scarf Holder and Collar Button.

Patented
Feb. 8,
1887.



The
Latest
Novelty.

A Collar Button
and Scarf Holder combined.



Prevents the Scarf from Sliding up on the Collar
Ask for the Sensible Collar Button.



Try It.

Also the
Acme Lever
Sleeve Button



Manufactured and
sold to the
Wholesale Trade
only by

Fred. I. Marcy & Co.,
Manufacturing Jewelers,
Providence, R. I., U. S. A.

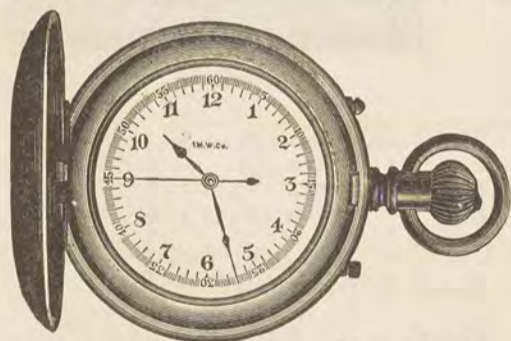
Manhattan Watch Co.,

Manufacturers of

Low Priced Watches.

Sold DIRECT to the RETAIL TRADE.

List Prices \$5.00 to \$15.00. Discounts given on application.



Three-Quarters size cut of Stop Watch.

Movements with or without
Sweep Seconds and Stop Attachments.

Nickel-Silver and Gold Plated Acid Proof, Open Face and
Hunting Cases.

Every Watch Fully Guaranteed.

Sample of any style will be forwarded by registered mail to any dealer not
having them on application with business card.

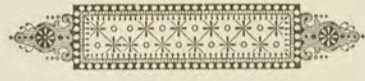
Office and
Salesrooms | 234 and 235 Broadway,
New York City.

Opposite Post Office.

Have you seen the

14 K. 1-4 Gold Chain of
R. F. S. & Co.'s make?

THEY are warranted to wear TWENTY-FIVE YEARS, and are made in open curb trace and cable links. What use has any one for a solid gold chain that will soon have to be sold for old gold at a GREAT SACRIFICE, when for one-fourth of the money they can procure an article equally satisfactory?



Krementz & Co.,

184 and 186 Broadway, Cor. John Street,
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Manufacturers of

Fine Gold Jewelry,

and the Well-Known

"ONE-PIECE"

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BUTTON in ten sizes.

Ask your Jobber for them or address
Krementz & Co.,
182 and 184 Broadway, New York.

T. B. Hagstoz & Co.,
(Limited.)
Importers and Jobbers.

The Philadelphia Optical Co., (Limited)
Manufacturers of Gold and Silver Spectacles, Eye-Glasses, Lenses, etc.,
Consolidated under the title of

Diesinger & Williams,
Watch Case Makers and
Manufacturers of
Plain and Band Gold Rings.



The Philadelphia Optical and Watch Company,

(Limited.)

Importers, Manufacturers and Jobbers.

One of the few houses that protect the Dealers' interests.

916 Chestnut Street, - - Philadelphia, Pa.

Have you seen the new Keystone Filled Case? What, you haven't. Then send for one, and if you think it is not worth your while to have one in stock, you can return same at our expense.



We think you will like our

Special Features.

We do not sell at retail, and never have.

We do not sell your customers and endeavor to sell you also.

You will never meet your customers in our office.

We take as much care in filling small orders as we do in large ones.

We guarantee our Band and Plain Rings to be exactly as represented.

We do not pay more for old gold and silver than it is worth, but you can rely on receiving full value every time. We will cheerfully furnish estimate on all packages sent us, and if price offered is not perfectly satisfactory, we will return them.

We have what few houses in the trade can boast of—a complete repair shop under the personal supervision of one of the firm, and can promise prompt return of all work sent us. Send us your odd work and any old cases you wish made like new, and we will cheerfully furnish you an estimate of cost to put in order, and if too high will return all goods at our expense.

Rolled Plate and Fire Gilt Chains.

Full assortment of
14 k., 18, 16, 6 and 4
Size Cases.
Latest Styles.

Casing odd Move-
ments and the manu-
facture of Plain Rings
a Specialty.

18, 16, 6 and 4 size
Eagle Gold
and
Wheat Gold Cases.
New Designs.

All Styles and Sizes of
Keystone Silver,
Leader Silver, and
Silveroid Cases.

18, 16, 6 and 4 size
Boss Filled, Star Filled,
and
Keystone Filled Cases.

We have every grade of
Elgin and Springfield
Movement made
and can have a package in ex-
press office within one hour
from receipt of order.

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.

IT IS AN OPEN SECRET

WHAT the purchasers of James Boss Cases receive more real value for their money than when buying any other filled gold case on the market. They are unequalled in elegance, fit, finish, style—everything. Make these cases your leading card, and you are sure to win.



New York.

Keystone Watch Case Company,

PHILADELPHIA.

Chicago.