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Editorial.

WHY MERCHANTS FAIL.

It is said on good authority, that more than seventy-five per cent. of all the people who start in business fail during some period of their career. If this be a fact, and from the many eminent names which back up the assertion we cannot reasonably doubt it, it surely reveals "something very rotten in the state of Denmark." We believe that this statement is true, and we think that perhaps a short discussion of a few of the principal reasons of such failure may not be out of place at this juncture.

Of course nearly every case of failure is caused by a different combination of circumstances, and still there are some general principles underlying trade, the non-observance of which will furnish a key to many otherwise inexplicable disasters. Amongst the principal of these may be mentioned the following:

1. *Lack of business training.* Probably more people fail from this cause than any other. It is a common thing in this country of ours, where people do not stick to the same business from generation to generation as they do in the old world, to find persons who have made some little money by farming or some kindred occupation take up the idea that they are fully competent to run a store, and that such a life, while being more genteel than the one they have hitherto led, is also more remunerative. Acting upon

this idea they sell their farms and invest the proceeds in stock, and as long as the money lasts they are apparently prosperous. But a time comes sooner or later to the most of these dealers, when this source of supply becomes exhausted, and then they begin to realize that business is not such child's play as they used to think it, and in nine cases out of ten the end of the struggle is failure. Others again are tempted to put their money into some established business on the strength of some plausible story of the business paying well, but wanting more capital, and the novice, knowing little of the general principles of business and less of book-keeping, is oftentimes drawn into the trap and taught to pay for his experience at the loss of his money. Apropos of this kind of thing there is a good story told of a certain Israelite who had just roped into his business a partner having more money than brains. Being asked by some one on what principles the business was established, and how it came about that the other partner furnished the money while he furnished the funds, he replied, "Well you see at present he has the monies and I have the experience, but after awhile I will have the monies and he will have the experience." This story may not be strictly true, but it has at least been the truthful experience of many a person who put his good money into a business, as against his partner's experience.

We scarcely understand how any sensible man should expect to succeed in any business that he is not thoroughly conversant with. Of course there are exceptions to this rule, but they succeed either on account of advantageous surroundings or natural business talent, and their success is no proof that every Tom, Dick or Harry can go and succeed likewise. It would appear about as sensible to us for a farmer who never touched a piano in his life to expect at once to make a living by teaching pupils to play on an instrument about which he knew really nothing. The fact is that business is a science, its rudiments and principles have to be mastered in the same manner as mechanics, music or any other business or profession that is usually supposed to demand previous training. They understand these things better in the old world than we do in this, and young men have there to serve a five years' apprenticeship to any business before they are supposed to understand it. With us, a lad after

putting in six months in a shop usually thinks he can run the machine as well as his boss, and the result is that our failures from this cause as compared with those in the old world are just about in an inverse ratio to the time spent in training.

2. *Extravagant habits* are very often the cause of failure, even to those whose capital and business habits should entitle them to a high measure of success. To use a common expression, successful merchants often "feel their oats" so much that they are carried away by their success, and forgetting that economy was a great factor in helping them into their present position, they allow themselves to be led into all sorts of useless expenditure. Better dress and more of it, increased household expenses, free handed charity: these and many other things of a like nature combine to impoverish many a merchant who, had he persevered in the methods with which he entered business, might have kept on steadily making money. Every merchant should find out at least once a year how his business is prospering, and his general expenses should always be based upon his profits and always be within his means. He should, in other words, put himself on a salary, and his salary should never be exceeded except for some very grave and weighty reason. In regard to charitable subscriptions, while he should do all in this way his means will allow, he should remember that "persons should always be just before they are generous," and that if he exercises this habit too freely, he may be making a gift of his creditors' money instead of his own. We have known merchants, (who were afterwards proved at the very time to have been hopelessly insolvent) donate thousands of dollars for the purpose of church building, when as a matter of fact they were worth less than nothing, and the money thus misappropriated was really not their own but that of their creditors. This kind of thing may be orthodox and pass current in some of our churches, but it don't come up to the standard of respectable business morality by a jug full. In referring to an incident of this very kind that occurred in one of our large cities, a Canadian poet sarcastically observes:

"Plank down, plank down your shokels;

Don't say you can't afford;

You'd better let your creditors wait,

Than try to cheat the Lord."

3. *Speculating in real estate, and building fine dwelling houses* is another and very

fruitful source of failure, and many a man with a good business training and economical habits has shipwrecked his vessel on this commercial rock. As a rule a merchant has no business what-over to encumber himself with real estate. He may with advantage own his dwelling house, but even here he loses money if the interest on his investment comes to more than the rent of similar quarters. However good speculations in real estate may be for the man out of business who has capital to invest, to the man in business they are usually a loss in more ways than one. Instead of locking up his money in real estate a business man should endeavor to keep it in his business. Ready cash is always handy to a good business man, and by its help he is often enabled to take advantage of bargains that he could not possibly touch unless he had on hand and to spare. If a man's business pays him at all, he can generally find plenty of room in it to invest all the money he can command, and as a rule such investments will pay him a better per centage than real estate speculations, however promising they may look at the outset.

If a merchant has more money than he can possibly use in his business, he may invest it any way he pleases; but few of our merchants are in that position, we are sorry to say.

We think we can recall a score or more of merchants, among the very highest in the land, who ruined themselves by attempting to build dwelling houses far beyond their means. In several instances these palatial residences still bear testimony to their original owners by the device sculptured over their portals, while those who wrecked themselves in their construction are penniless wanderers. The "old book" was not far astray when it advised a man before he started to erect a building, to carefully count the cost, least not having money enough to finish it, he should lose all he had and another should come in and enjoy his labors.

4. *Over-buying, and not buying carefully enough*, are also good assistants in this work of ruining merchants. The best buyer is also the most careful buyer, and though he may at times buy large lines of staple goods when he gets a first-class bargain, he generally buys just to suit the necessities of his business. As a rule the reckless buyer will come to grief in the long run, for reckless buying

necessitates reckless selling and reckless credits. The reckless buyer often does a large and apparently flourishing business, but as has been proved a hundred times by the assignee, he has done it without profit. Having large notes maturing he was forced to make large sales, and no matter whether the goods were in demand or not, they had to be sacrificed in order to keep the ball rolling. As a rule a merchant should always buy his goods for cash, and take advantage of all the discounts that can possibly be obtained. If he buys in this way and buys carefully he need never fear; no creditor can trouble him, and he is bound to succeed. Few merchants know the saving that may be effected by these cash discounts; in even a small business they will amount to hundreds of dollars, and often pay shop rent, fuel and such like expenses. The merchant who pays cash is always the best served, and he can't possibly fail because he doesn't owe anybody. The nearer any merchant can come to paying cash for all he purchases, the nearer he will come to assured success.

5. *Too much, and indiscriminate credit*, is a very common trouble amongst country merchants, and investigation has proved it to be a fruitful source of failure. We have often said that credit is too cheap in this country both by wholesale and retail dealers; the sooner this evil is remedied the better and the healthier trade will become. We know lots of retail merchants who with thousands of dollars' worth of accounts on their books have not been able to raise cash enough to pay a hundred dollar note. Now, why should such a state of things exist, except for the reason we stated above that competition and cheap credit make the merchant's business scarcely worth doing. Our idea is that every retail merchant should do an exclusively cash business, he should buy for cash and sell for cash, and if he credits at all it should be as seldom as possible, and only as a special favor to responsible customers. There are occasions in every business when circumstances almost compel a merchant to give credit rather than lose a good sale, but we are satisfied that these are much fewer than most merchants would care to admit. No matter how good a person's standing or wealth may be, as far as the merchant's business is concerned, he is not half as good as the poor man who pays cash; provided he wants credit always. Cash

is the merchant's best customer—he gives him no trouble in collecting accounts, he never causes him any bad debts, and he is always on hand when notes or payments of any kind have to be met. Credit on the contrary is long-winded, he puzzles the merchant's brain and spoils his eye-sight in looking over his bookkeeping, he is never on hand when wanted, his collection costs money, and in any shape you may dress him he takes up much valuable time that might be better employed. He costs both buyer and seller more than the regular market price, and often ends by ruining them both. Therefore we say to all of our readers, cultivate cash and discourage credit—it will pay you.

6. *Neglect of business for public affairs* has ruined many a promising merchant's career. As a rule this kind of thing attacks only the smartest and most successful of our merchants, and although in some cases the result may not be fatal, it is always detrimental to a business. We do not wish to be understood as saying that merchants should never have anything to do with public affairs; on the contrary we think they should always take a hand in them, provided they do not do so at the expense of their own business. What we deary is not conscientious efforts for the public good, but the mania that a great many merchants have to devoting most of their time to public affairs from which they cannot honestly reap any pecuniary advantage. "Charity begins at home" is an old motto and a true one, and if such merchants would only consider that they owe duty to themselves, their families and their creditors, as well as to the general public, they would probably devote more of their time and talents to minding their own affairs and making an honest living.

7. *Drinking habits*, we have reserved to the last, not because it is the least important however, or the least productive of evil. By this pernicious habit merchants have not only been ruined in business, but ruined in body and soul as well. Everywhere we meet with these wrecks of humanity, persons that have thrown away good chances in business, thrown away friends, thrown away public respect, and finally after throwing away self-respect, are deliberately throwing away their lives. People may differ on the question of temperance and total abstinence as on

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any other great social question, but so far as the successful business man is concerned the total abstainer has a great many advantages over his competitor who indulges too freely in drinking habits. Total abstinence never made a merchant incompetent to conduct his business, but the same cannot be said of drinking habits.

There are many other things that we might refer to in this connection did time and space permit, but we have already taken up more space than we intended when we first commenced this article. We cannot however conclude without saying that the rocks we have tried to point out as being dangerous to merchants are no imaginary ones, that they are a reality is proved every day by the account of failures which might possibly have been avoided had the bankrupts kept the correct course on the ocean of commercial life, and avoided the hidden rocks which centuries of experience have shown to underlie it.

WHAT ARE GOOD TIMES?

By the query which forms the caption of this article, we do not refer in any way to the good old times of "Queen Bess," or anything in that line, but simply ask the question in the abstract relative to the commercial good and bad times of the present age.

"Good" and "bad" are the antithesis of each other, and there should therefore be little or no danger of mixing them up in any connection, but we are afraid that as applied to commercial affairs, these phrases are sadly misused, and that in reality our "good" times are "bad" times, and our "bad" times "good" times, if we did but know it. How this is, let us briefly explain.

Times that we call "good times" are generally an era of inflation, everything goes up in value, produce of all kinds, stocks, real estate; in fact almost everything advances in value; business increases, profits are good, people make money, and spend it just as freely. Everything goes on smoothly to all appearances, and a good deal on the principle that the river's current is generally strongest and most tranquil just before it plunges over the dangerous waterfall, which shivers it to pieces. Are such times as these in reality good times? We think not, unless people are wise enough to profit by them. As a rule

during such periods of commercial inflation both nations and individuals live above their means. Credit is cheap, and goods are plentiful, and thus many are induced to buy on time luxuries that they would never dream of had the ready cash to accompany the purchase. It is really because of this extravagance that many people fancy that times are good. But all this has to have an end. Importers cannot always go on increasing their importations *ad infinitum*; neither can retail dealers always expect to sell the increased stock that a former season's success has induced them to buy. An end must come to all this, and that limit is reached when the nation or individuals have to pay up. When the day of reckoning comes it is found that the so-called good times have in reality been very extravagant times, during which nearly everybody had been living beyond their means. In other words during the so-called good times both nations and individuals bankrupt themselves commercially, and then have to go into liquidation, or bad times, in order to straighten themselves up again.

Now let us see what these "bad times" are, that are held up as such a bug-a-boo to the uninitiated in commercial politics. When bad or hard times come on, and nations or individuals who have for years been living beyond their means are compelled to pay up, they are forced, however, unwillingly to retrench their expenditure and bring it within their means. As a consequence purchases are not so frequent, more economy is practiced in buying, the volume of business decreases between heavy stocks and strong competition, and poor hard-up buyers' profits are reduced to a minimum, stocks and properties of all kinds shrink in value; in fact everything shrinks, because it has to come down to a cash basis, which is really its true commercial value.

The consequence is that in a few years of this enforced economy, both nations and individuals begin to recover their position—by saving money they have made money, and as they again begin to find themselves in easy circumstances their rigid supervision and economy decreases until they gradually drift into their former habits of extravagance. Then we have another decade of "good times" when, forgetting the lessons of past years, they again launch out into the old habits of overbuying, and which after a time, longer or shorter, according to

the rate at which they live, is succeeded by another period of depression or "bad times."

We think that most of our readers will agree with us that our bad times are not the worst times for us, although they may not be the most pleasant. No one cares particularly to diet themselves and go into a thorough course of training, although in the abstract they are willing to admit that it may be a good thing for the constitution, but when forced to do such a thing by the physician's orders, and it is "do or die," most of us prefer doing and health to neglect and death.

As a matter of fact, "hard times" are not the matters of necessity that some writers would have us believe, but are simply an outgrowth, as they are the result of our own extravagance. If people always paid cash as they went there would never be any "hard times" in the sense in which the expression is used at the present time. How could a people be hard up when they didn't owe anything; it is only those who owe and cannot pay that have to fear these periodical hard times.

The lesson for every merchant to learn from our remarks is to live well within your means, save something every year, be it ever so little; keep your business well in hand, and buy as nearly on a cash basis as you possibly can, and sell as nearly as you can for cash only, and you will find that when the so-called "hard times" come around again you will be able to view their approach with a feeling of security that you never knew before under similar circumstances. The wise man profits by experience, whether his own or that of others, and we trust that for their own sakes all of our readers will put into practice the suggestions we have thrown out.

Selected Matter.

JOHN HARRISON, THE CHRONOMETER MAKER.

(Continued from last month.)

Everyone knows the beautiful machinery of a timepiece, and the perfect tools required to produce such a machine. Some of these Harrison procured in London, but the greater number he produced for himself. Many entirely new adaptations were required for his chronometer. Wood could no longer be employed, and he had therefore to teach

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himself to work accurately and minutely in brass and other metals. Having been unable to obtain any assistance from the Board of Longitude, he was under the necessity, while carrying forward his experiments, of maintaining himself by working at his trade of a carpenter and joiner. This will account for the very long period that elapsed before he could bring his chronometer to such a state that it might be tried with any approach to certainty in its operations.

Harrison, besides his intentness and earnestness in respect of the great work of his life, was a cheerful and hopeful man. He had a fine taste for music, and organized and led the choir of the village church, which attained a high degree of perfection. He invented a curious monochord, which was not less accurately than his clocks in the measurement of time. His ear was distressed by the ringing of bells out of tune, and he set himself to remedy them. At the parish church of Hull, for instance, the bells were harsh and disagreeable, and by the authority of the vicar and church wardens he was allowed to put them into a state of exact tune, so that they proved entirely melodious.

But the great work of his life was his marine chronometer. He found it necessary, in the first place, to alter the first mover of his clock to a spring wound up, so that the regularity of the motion might be derived from the vibrations of balances, instead of those of a pendulum in a standing clock. Mr. Folkes, President of the Royal Society, when presenting the gold medal to Mr. Harrison in 1749, thus describes the arrangement of his new machine. The details were obtained from Harrison himself, who was present. He made use of two balances situated in the same plane, but vibrating in contrary directions, so that the one of these being either way assisted by the tossing of the ship, the other might constantly be just so much impeded by it at the same time. As the equality of the times of the vibrations of the balance of a pocket watch is in a great measure, owing to the spiral spring that lies under it, so the same was here performed by the like elasticity of four cylindrical springs or worms, applied near the upper and lower extremities of the two balances above described.

Then came in the question of compensation. Harrison's experience with the compensating pendulum of his clock

now proved of service to him. He proceeded to introduce a similar expedient into his proposed chronometer. As is well known by those who are acquainted with the nature of springs moved by balances, the stronger those springs are the quicker the vibrations of the balances are performed, and *vice versa*; so it follows that those springs, when braced by cold, or when relaxed by heat, must of necessity cause the timekeeper to go either faster or slower, unless some method could be found to remedy the inconvenience.

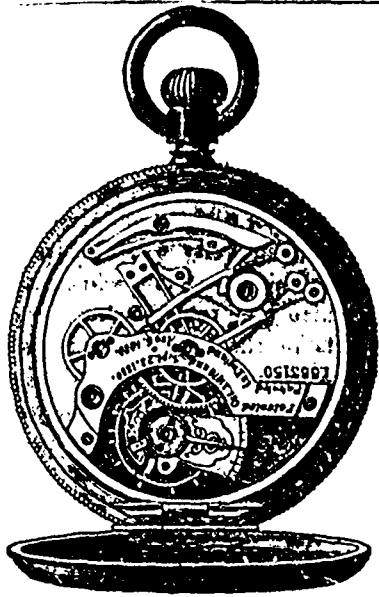
The method adopted by Harrison was his compensation balance, doubtless the backbone of his invention. His "thermometer kirb," he himself says, "is composed of two thin plates of brass and steel, riveted together in several places, which, by the greater expansion of brass than steel by heat and contraction by cold, becomes convex on the brass side in hot weather and convex on the steel side in cold weather; whence, one end being fixed, the other end obtains a motion corresponding with the changes of heat and cold, and the two pins at the end, between which the balance spring passes, and which it alternately touches as the spring bends and unbends itself, will shorten or lengthen the spring, as the change of heat or cold would otherwise require to be done by hand in the manner used for regulating a common watch." Although the method has since been improved upon by Beroy, Arnold, and Earnshaw, it was the beginning of all that has since been done in the perfection of marine chronometers. Indeed, it is amazing to think of the number of clever, skilful and industrious men who have been engaged for many hundred years in the production of that exquisite fabric—so useful to everybody, whether scientific or otherwise, on the land or on sea—the modern watch.

It is unnecessary here to mention in detail the particulars of Harrison's invention. These were published by himself in his "Principles of Mr. Harrison's Timekeeper." It may, however, be mentioned that he invented a method by which the chronometer might be kept going without losing a second of time. This was during the process of winding up, which was done once in a day. While the mainspring was being wound up a secondary one preserved the motion of the wheels and kept the machine going.

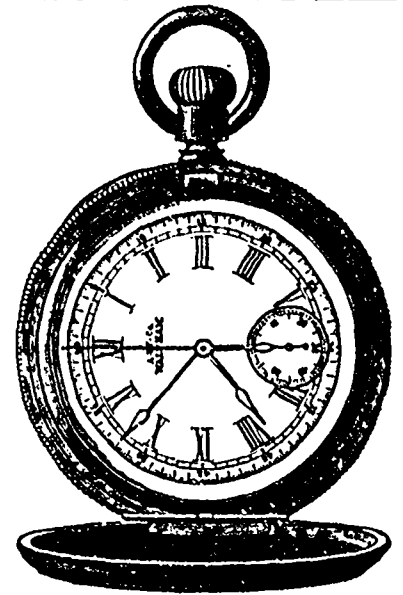
After seven years' labor, during which Harrison encountered and overcame numerous difficulties, he at last completed his first marine chronometer. He placed it in a sort of movable frame, somewhat resembling what the sailors call a "compass Jumble," but much more artificially and curiously made and arranged. In this state the chronometer was tried from time to time on a large barge on the river Humber, in rough as well as in smooth weather, and it was found to go perfectly, without losing a moment of time.

Such was the condition of Harrison's chronometer when he arrived in London with it in 1785, in order to apply to the commissioners appointed for providing a public reward for the discovery of the longitude at sea. He first showed it to several members of the Royal Society, who cordially approved of it. Five of the most prominent members—Dr. Halley, Dr. Smith, Bradley, Mr. John Machin, and Mr. George Graham—furnished Harrison with a certificate, stating that the principles of his machine for measuring time promised a very great and sufficient degree of exactness. In consequence of this certificate, the machine, at the request of the inventor and at the recommendation of Sir Charles Wagner, First Lord of the Admiralty, was placed on board a man-of-war, and carried, with Mr. Harrison, to Lisbon and back again. The chronometer was not affected by the roughest weather, or by the working of the ship through the vast rolling waves of the Bay of Biscay. By means of its exact measurement of time an error of almost a degree and a half (or ninety miles) in the computations of the reckoning of the ship was corrected at the mouth of the Channel.

Upon this first successful trial of his chronometer the Commissioners of Longitude gave Harrison the sum of 500*l.*, on condition that he should proceed to make further improvements in his machine. Mr. George Graham urged that the Commissioners should award him double the amount, but this was refused. At the recommendation of Lord Monson, however, Harrison accepted the sum as a help towards the heavy expenses and labor which he had incurred, and was about to incur, in perfecting the machine. He was instructed to make his new chronometer of less dimensions than the first, which was thought too cumbersome



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and to occupy too much space on board.

He accordingly proceeded to make his second chronometer. It occupied a space of about only half the size of the first. He introduced several improvements. He lessened the number of the wheels, and thereby diminished friction. But the general arrangement remained the same. The second machine was finished in 1789. It was much more simple in its arrangement, and much less cumbersome in its dimensions. It answered even better than the first, and though it was not tried at sea its motions were sufficiently exact for finding the longitude between the nearest limits proposed by parliament.

(To be continued.)

METHOD FOR CLEANING PEARLS.

[Mr. PAUL HIEHLE, in *Journal der Goldschmiedekunst.*]

In order to answer many inquiries desiring us to specify a method by which pearls that have become yellow by age or dirt can be purified and restored to whiteness, we have no hesitation in publishing the following, which, although not by any means new, appears to be unknown by many of our worthy colleagues:

The genuine pearl is a voidance product of several univalves and bivalves of both the ocean and inland waters. Its value depends upon its properties, among which size, shape, color, and luster (the so-called "water") are of chief importance. The pearls most valued are those which possess a pure silver-white luster, of very little iridescence, which is a rare sort. By far the greatest number has a tinge into yellow, and varies through almost all color shades into brown, green and black.

Such natural defective colors cannot be corrected in any manner. Still, even the purest white pearls may become yellow or change their once handsome color by continued wearing in the hair, around the neck, or on the arms, by absorbing perspiration and filth. This defect, produced by natural causes, may be corrected in the following manner.

Boil the pearls for about one-quarter of an hour in fresh cow's milk, in which soap has been dissolved; then take them out, rinse them in clean water, and dry with a clean white cloth. Inspect whether desired results have been obtained; if not, repeat the result several times. Should

they still not become better, try the following:

Ask the baker in your neighborhood at what time he is engaged in baking bread, and go to him at this hour; let him form a small loaf of bread, within which the pearls are laid, either strung upon a silk thread or loosely wrapped in a piece of gauze, then let him bake the bread pretty strong, not too brown, however. When withdrawn from the oven, let it cool, break it and take out the pearls, which will generally be found to satisfaction and handsomely white. But it might occur that also this remedy is insufficient, and the pearls are still yellow; this is a sure sign that the dirt has become old and deeply penetrated into them, or that they appear green and blue, owing to have been strung on silvered copper wire. Forceful agents now become necessary.

Take a teaspoon full of well heated wine-vinegar, and suspend the pearls, hung upon a silk thread, or wrapped in a piece of gauze, in it for a few minutes. Also sulphuric acid, diluted with its equal quantity of water, may be used. Then remove and rinse them well in clean water, and repeat the operation until they have become white, and that the green spots have disappeared. This remedy will never fail except the pearls were naturally yellow or colored, against which defect, as already said, there is no help.

The causes of these operations are about as follows: The boiling of the pearls in milk and soap simply dissolves the exterior coating of dirt, the baking in bread absorbs it by the steam. These two remedies are perfectly innocuous and may be employed any number of times without ever hurting them. If, however, the last forcible means has to be used, caution is necessary, because the acid of the vinegar, still more the sulphuric acid, attacks them and dissolves the exterior coating, and would dissolve them altogether if not removed in time. Since, however, the dissolving occurs but very slowly, there is no danger of ruining them, if any degree of care is exercised, since they are composed of thin lamina, and it is plain that by exposing them to the vinegar, only the outer pellicle will be dissolved without in the least injuring the water of the others, and with it also the dirt is removed, and the blue and green copper solution which colored them exteriorly, by which they are restored to their original purity.

At this place I would like to append

an observation to those jewelers who are principally engaged with stringing and setting pearls. I stated that the blue and green color originates from the silvered copper wire on which they have been strung. These wires being of copper, and the silver soon rubbing off, perspiration or other humidity will dissolve a little of this metal. This solution is verdigris which penetrates into the pearls, and imparts to them that disagreeable color to be seen in many, especially older articles, and which reduces their value most materially. Pearls should always be strung on fine silver wire, whereby they experience no alteration whatever. The trifling additional cost of the silver will not materially increase the value.

THE AUTOMATONS OF JACQUET-DROZ.

A manufacturer of the Canton of Neuchâtel, by the name of Jaquet-Droz, was famous for his astonishing productions of automatic figures. One day he presented the King of Spain with a clock containing a shepherd, a dog, and a basket filled with apples. At the stroke of the hour the shepherd played his flute, while the dog playfully gambolled around him. The King was astonished at the mechanism.

"This is not all," the skillful artist said, "Your Majesty will please take one of the apples."

The King extended his hand toward the basket, but the dog commenced barking so fiercely that all the dogs of the palace joined in.

"This is not all," Jaquet-Droz again observed. "Will your Majesty have the kindness to ask him what time it is?"

"*Que hora es?*" (What time is it?) the King asked.

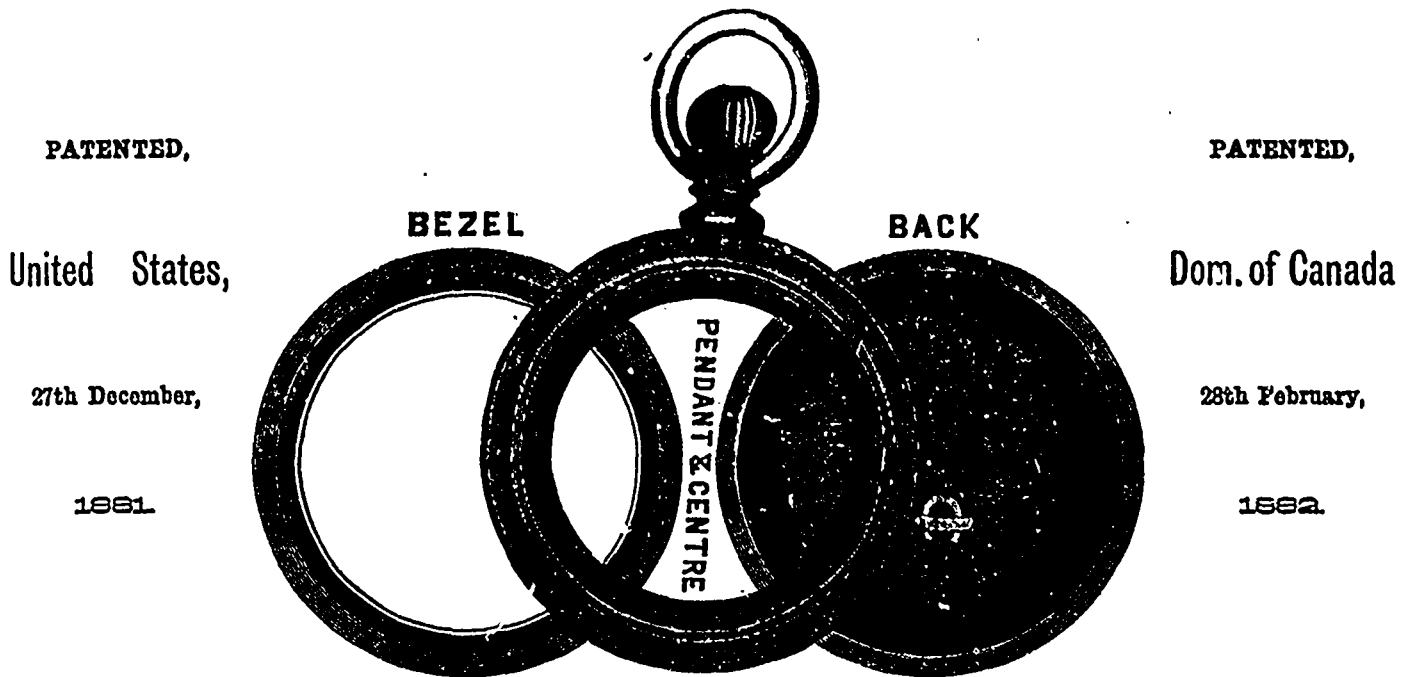
"Ah, Sire," answered the horologist, "this good beast is born Switzerland, and does not understand Spanish. I was able only to teach him French."

"*Quelle heure est il?*" (What time is it?) the King asked.

"Fifteen minutes to three," distinctly responded the dog.

"This must be the veritable devil," tremblingly exclaimed a Spanish gentleman who was present at the audience, and tradition adds that Jaquet-Droz was accused of sorcery.

The "Excelsior" Patent Dust Proof Case.



This is the first and only case made without one grain of solder. Every piece is cut from the solid metal and pressed into the shape used in the case. This process hardens the gold and silver by the only method known (that is to work it), and is handed to the Trade as hard as is possible to make it, being a great advantage over a case made in the ordinary way, in saving gold and silver by making a case as strong as a much heavier one that has been softened as heat does in soldering on pendant, joints, thumb catches, or joint to swing movement in. Heat not only softens the gold or silver, but warps it out of the shape that the snaps have been fitted to, and it is never perfect after soldering. The Excelsior Patent Dust Proof is never soldered, never heated, is fitted perfectly, and remains perfect. The Excelsior Dust Proof has no joints to wear out or break off. The Excelsior Patent Dust Proof has no spring to break or wear the case. There is no part of the Excelsior Patent Dust Proof that will wear. The Excelsior Patent Dust Proof is the safest case made for protecting the movement—it will never open in the pocket. Put an Excelsior Dust Proof in your pocket, bend forward, backward, put yourself in any position you please and the Excelsior is closed tight. In an ordinary case, with springs, by bending forward the case will often open and when the lock-spring is worn, the case is nearly always open.

The Excelsior Patent Dust Proof Case is the strongest, best fitting and most durable case made. Ask your Jobber for the Excelsior Patent Dust Proof. Every case warranted as stamped, 18 kt., 14 kt., 12 kt., 10 kt., United States Mint Assay or Coin Silver, as may be stamped, and every genuine case bears the Trade Mark. The Excelsior Patent Dust Proof Case may be obtained from any of the jobbing houses in the country.

TRADE MARK.



Instructions to Open the Excelsior Patent Dust Proof Case.

First press the crown as in opening an ordinary Hunting Cased Watch, then to open front, turn bow to the right with thumb and finger; to open the back, turn left. To close, turn case back in same position as when case was closed, and snap same as glass bezel on any watch.

BIGGEST THINGS ON EARTH.

A SHORT ACCOUNT OF SOME OF THE WONDERS OF THE WORLD—MARVELS OF NATURE—STUPENDOUS WORKS THAT HAVE BEEN ACCOMPLISHED BY MAN.

The highest range of mountains is the Himalays, the mean elevation being estimated at from 16,000 to 18,000 feet.

The loftiest mountain is Mount Everest, or Guarisanker, of the Himalaya range, having an elevation of 29,002 feet above the sea level.

The largest city in the world is London. Its population numbers 3,020,871 souls. New York, with a population of about 1,250,000, comes fifth in the list of great cities.

The largest theatre is the New Opera House in Paris. It covers nearly three acres of ground. Its cubic mass is 4,287,000. It cost about 100,000,000 francs.

The largest suspension bridge will be the one now building between New York and Brooklyn. The length of the main span is 1,595 feet six inches; the entire length of the bridge 5,989 feet.

The loftiest active volcano is Popocatepetl—"smoking mountain" thirty-five miles south-west of Puebla, Mexico. It is 17,784 feet above the sea level, and has a crater three miles in circumference and 1,000 feet deep.

The largest island in the world, which is also regarded as a continent, is Australia. It is 2,500 miles in length from east to west, and measures 1,950 miles from north to south. Its area is 2,984,287 square miles.

The longest span of wire in the world is used for a telegraph in India over the river Kistnah, between Bezorah and Sectanagram. It is more than 6,000 feet long, and is stretched between two hills, each of which is 1,200 feet high.

The largest ship in the world is the "Great Eastern." She is 690 feet long, 88 feet broad, and 60 feet deep, being 22,927 tons builders, 18,915 gross and 18,944 net register. She was built at Millwall, on the Thames, and was launched January 31, 1857.

The biggest trees in the world are the mammoth trees of California. One of a grove in Tulare county, according to measurement made by members of the State Geological Survey, was shown to be 276 feet high, 106 feet in circum-

ference at base, and 76 feet at a point 12 feet above the ground. Some of the trees are 376 feet high and 84 feet in diameter. Some of the largest that have been felled indicate an age of from 2,000 to 2,500 years.

The largest university is Oxford in England, in the city of the same name, fifty-five miles from London. It consists of twenty-one colleges and five halls. Oxford was a seat of learning as early as the time of Edward the Confessor. University College claims to have been founded by Alfred.

The largest body of fresh water on the globe is Lake Superior, 400 miles long, 160 miles wide at its greatest breadth, and having an area of 82,000 square miles. Its mean depth is said to be about 900 and its greatest depth about 200 fathoms. Its surface is about 685 feet above the level of the sea.

The most extensive park is Deer Park in the environs of Copenhagen, in Denmark. The inclosure contains about 4,200 acres, and is divided by a small river. The largest pleasure ground in America, and one of the largest in the world, is Fairmount Park, Philadelphia, which contains 2,740 acres.

The highest monolith is the obelisk at Karnak, in Egypt. Karnak is on the east bank of the Nile, near Luxor, and occupies a part of the site of ancient Thebes. The obelisk is ascribed to Hatsun, sister of Pharaoh Thothmes III, who reigned about 1,600 B. C. Its whole length is 122 feet, and its weight 400 tons. Its height without pedestal is 108 feet 10 inches.

The biggest cavern is the Mammoth Cave, in Edmonson County, Ky. It is near Green River, six miles from Cape City, and about twenty-eight miles from Bowling Green. The cave consists of a succession of irregular chambers, some of which are large, situated on different levels. Some of these are traversed by navigable branches of the subterranean Echo River. Blind fish are found in its waters.

The longest tunnel in the world is that of St. Gothard, on the line of railroad between Lucerne and Milan. The summit of the tunnel is 980 feet below the surface at Andermatt, and 6,600 feet beneath the peak of Kastelhorn, of the St. Gothard group. The tunnel is 26½ feet wide and 19 feet 10 inches from the floor to the crown of

the arched roof. It is 9¼ miles long, 1½ miles longer than the Mount Conis tunnel.

The largest inland sea is the Caspian, lying between Europe and Asia. Its greatest length is 760 miles, its greatest breadth 270 miles, and its area 180,000 square miles. Great Salt Lake, in Utah, which may properly be termed an inland sea, is about 90 miles long and has a varying breadth of from 20 to 35 miles. Its surface is 4,200 feet above the level of the sea, whereas the surface of the Caspian is 84 feet below the ocean level.

The largest empire in the world is that of Great Britain, comprising 8,557,658 square miles, more than a sixth part of the land of the globe, and embracing under its rule nearly a sixth part of the population of the world. In territorial extent the United States ranks third, containing 3,580,242 square miles, including Alaska; in population it ranks fourth, with its 50,000,000 of people. Russia ranks second, having 8,352,940 square miles.

The largest bell in the world is the great bell of Moscow at the foot of the Kremlin. Its circumference at the bottom is nearly 68 feet, and its height more than 21 feet. In its stoutest part it is 28 inches thick, and its weight has been computed to be 448,772 pounds. It has never been hung, and was probably cast on the spot where it now stands. A piece of the bell is broken off. The fracture is supposed to have been occasioned by water having been thrown upon it when heated by the building erected over it being on fire.

The largest desert is that of Sahara, a vast region of northern Africa, extending from the Atlantic Ocean on the west to the valley of the Nile on the east. The length from east to west is 3,000 miles, its average breadth about 900 miles, its area 2,000,000 square miles. The town of Timbucto, about eight miles from the Niger River, is surrounded by desert, but at a distance of a few days' journey to the northeast and north are the oases of Mabrook and Arawan. Rain falls in torrents in the Sahara at intervals of five, ten and twenty years. In summer the heat during the day is excessive, but the nights are often cold. In winter the temperature is sometimes below freezing point.

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BUSINESS CHANGES FOR MAY.

S. J. Petley, Arthur, jeweler, sold out to J. B. Tait, and moved to Lindsay. J. B. Tait, jeweler, Bowmanville, moved to Lindsay and succeeds S. J. Petley. W. J. Ryckman, jeweler, Thedford, has removed to Parkhill. J. & W. Allan, stoves and tins, Ailsa Craig, dissolved partnership; James continues alone. McLean Bros., Brandon, Man., dissolved, Arthur continues. J. J. Radford, jeweler, Winnipeg, compromised at 30 cents, secured. James M. Kean, jeweler, Digby, N. S., burned out; no insurance. McIntyre and Griffin, hardware, Oakville, dissolved, Samuel Griffin continues. D. N. Germain, hardware, &c., West Lynne Manitoba, gone out of business. S. R. Lennox, tins, &c., burned out and dead. Hatch & Brother, Hardware, Toronto and Whitby; S. B. Hatch of this firm dead. Andrew W. Carter, jeweler, Pictou, N. S., away. H. D. Heuson, watches, &c., burned out. Albert Foster, tins, &c., Leamington, burned out; H. J. Woodside, jewelry, &c. Portage La Prairie, assigned in trust.

BUSINESS NOTES.

THE revised assessment of Toronto for the present year shows a total value of \$62,160,184.

THE total assessment of Brantford is \$3,931,170, against \$3,701,200 last year. A gain of six per cent.

A NEW ENTERPRISE.—Messrs. Hemming Bros., late of Montreal, have started a factory at 52 Adelaide Street, Toronto, equipped with the most improved machinery for manufacturing cases and trays of every description for jewelry and silverware. We wish them every success.

The steamers *Magnet* and *Spartan* so long known as of the Richelieu and Ontario line, between Hamilton and Montreal, have been sold to ply on Georgian Bay, we understand, in connection with the Toronto, Grey & Bruce Railway, and the Owen Sound Steam Navigation Co.

THE hegira of Toronto jewelers seems to have already set in, no less than half a dozen having started for the European markets. Amongst those who have gone or soon start are Messrs. Smith, Carrier, McNaught, and Segsworth. We trust they may all have a good time, and buy themselves rich before they come back.

The celebrated Brooklyn bridge was formally opened on the Queen's Birthday. The following is the schedule of tolls: One cent each for foot passengers, five cents for one horse and a man; ten cents for one horse and vehicle; twenty cents for all two horse vehicles; five cents each for neat cattle, and two cents each for sheep and hogs. The amount expended to 30th April is \$14,629,379.69.

We had a very pleasant visit a few days ago from Mr. Thorpe, of the firm of Hagstoz & Thorpe, manufacturers of the celebrated "Jas. Boss" patent stiffened gold case. Mr. Thorpe visited this city with a view towards pushing the sales of the "Boss" case by an extensive system of advertising, and his efforts in this direction will no doubt be of great benefit to

the trade, by posting the public thoroughly as to what are the distinctive features and merits of the "Boss" case. The general verdict of the Canadian Jewelry trade is that the "Boss" case is the *boss case*, and a long way ahead of all competitors.

The Bell Telephone Co. is arranging for the construction of a line of wire connecting Kingston with Toronto, Hamilton, and Western points. Some of the company's officers have gone over the road between Kingston and Odessa, and laid out the route. On the line from Kingston to Belleville, the most difficult section in Ontario, a great deal of blasting will be required. The line will connect Odessa, Napanee, Deseronto, Belleville, Trenton and other points between Cobourg and Kingston. It is intended to begin operations about June 1st.

MR. ARBAGE, the employé of Messrs. P. W. Ellis & Co., who was arrested by that firm for stealing goods from their factory, and who was allowed out on bail by the Magistrate, has since jumped his bail and cleared out to the land of the free and the home of the knave. Mr. Arbage was a first-class workman, who, if he had kept in the strict path of honour, would have risen to almost any position in the gift of his employers, but by his foolish and suicidal action he has once again proved the truth of the old adage that "Honesty is the best policy."

EARLY Thursday morning, May 17th, the jewelry store of G. N. Asselstine, Gananoque, was entered by burglars. The entrance was effected by the front door, the lock of which was picked. The safe stood a few feet from the door, and the thieves drilled a hole into it near the lock, but failed to get it open. They then knocked off the inner knob, and punched out the wheels of the lock. Inside the safe were two iron vaults, these were taken to the back yard and broken open with a sledge. Over sixty watches belonging to customers were taken, and between twenty-five and thirty new ones—many of them valuable. Over \$2,000 worth of jewelry and about \$700 in cash was taken. A blacksmith's sledge, chisels, and a punch were found in the yard, covered with straw. A large quantity of silverware in the window and the show cases was not disturbed.

WORKSHOP NOTES.

RUBY PIN.—If it is necessary to tighten a ruby pin, set it in asphaltum varnish. It will become hard in a few minutes, and be much firmer and better than gum shellac, as generally used.

TEMPERING BRASS.—Brass is rendered hard by hammering or rolling; therefore, when you make a thing of brass necessary to be tempered, you must prepare the material before shaping the article. Temper may be drawn from brass by heating it to a cherry red, and then simply plunging it into water, the same as though you were going to temper steel.

POTATO CELLULOSE.—According to a Vienna journal, a substance may be produced from potatoes possessing the properties of celluloid. For this purpose the peeled potatoes are boiled for 36 hours in a fluid consisting of 8 parts sulphuric

acid and 100 parts water, then dried between blotting paper and relieved of the superfluous water by pressing. Pipe bowls are at present made therefrom in France that can barely be distinguished from real meerschaum, and billiard balls are likewise made from it by strongly pressing.

COLORING COPPER.—To produce a dark-browned color upon copper, take the white of an egg, beat it into froth, add a little boiled or rain-water, and add to this mixture *caput mortuum* (red oxide of iron) color; rub them well together in a mortar, and sufficiently thick until the color covers, and may be applied. The copper article is to be pickled and simply washed; no sand must be used, also the color adheres badly. The latter is next applied with a brush until it covers the surface; it is then dried by fire, the article is gently rubbed with a soft rag and *caput mortuum* powder, and finally hammered with a hammer with polished face.

WATCHES LOSING TIME.—Should a watch lose time from the action of the balance spring, pin the latter into the stud, so that that part, the part of the eye immediately emerging from the collet, and the center of the collet, are in a line; then you will have the spring pinned in, in equal terms, as it is called by those who are versed in the higher branches of springing. Bring the watch to time by adding to or taking from the balance, and poise it; try the watch with the 12 up for two hours, then with the 6 up for two hours, then lying down for the same time, the trials here described will be sufficient if the watch has seconds, keep the curb pins close, so as to allow the spring only a little play, the vibration of the balance should be 1½ turns, or 1½ lying.

REPAIRING CYLINDER WATCHES.—It frequently happens that the cylinder edges are worn off, and it does not pay to put in a new cylinder; the watch may, nevertheless, be put into keeping a good rate by altering the escapement. Look at the cylinder and see if there is room either above or below the old wears to shift the action of the wheel. If the wheel holes are of brass, make one a little deeper, and put a shallower one on the other side—this may perhaps be sufficient. This must be done according as you want your wheel up or down. If the holes are stone, shift your wheel on the pinion by a new collet, or turning away more of the old one, as the case may require. If you raise your wheel, see that it works free of plate and top of cylinder, and that the web of wheel clears the top of passage. This last fault may be altered by polishing the passage a little wider, if the rub is slight. If shifted downward, see to freedom at the bottom of the cylinder, etc.

CHAIN RUNNING OFF FUSÉE.—In the first place, you must look and ascertain the cause of the difficulty. If it results from a chain being too large, the only remedy is a new chain. If not too large, and yet it runs off without apparent cause, change it end for end—that will generally make it go all right. In cases where the channel in the fusée has been damaged and is rough, you will be under the necessity of dressing it over with a file of the proper size and shape. Sometimes you will find the chain naturally inclined to work away from the body of the fusée. The best way to remedy a difficulty of this kind is to file off a very

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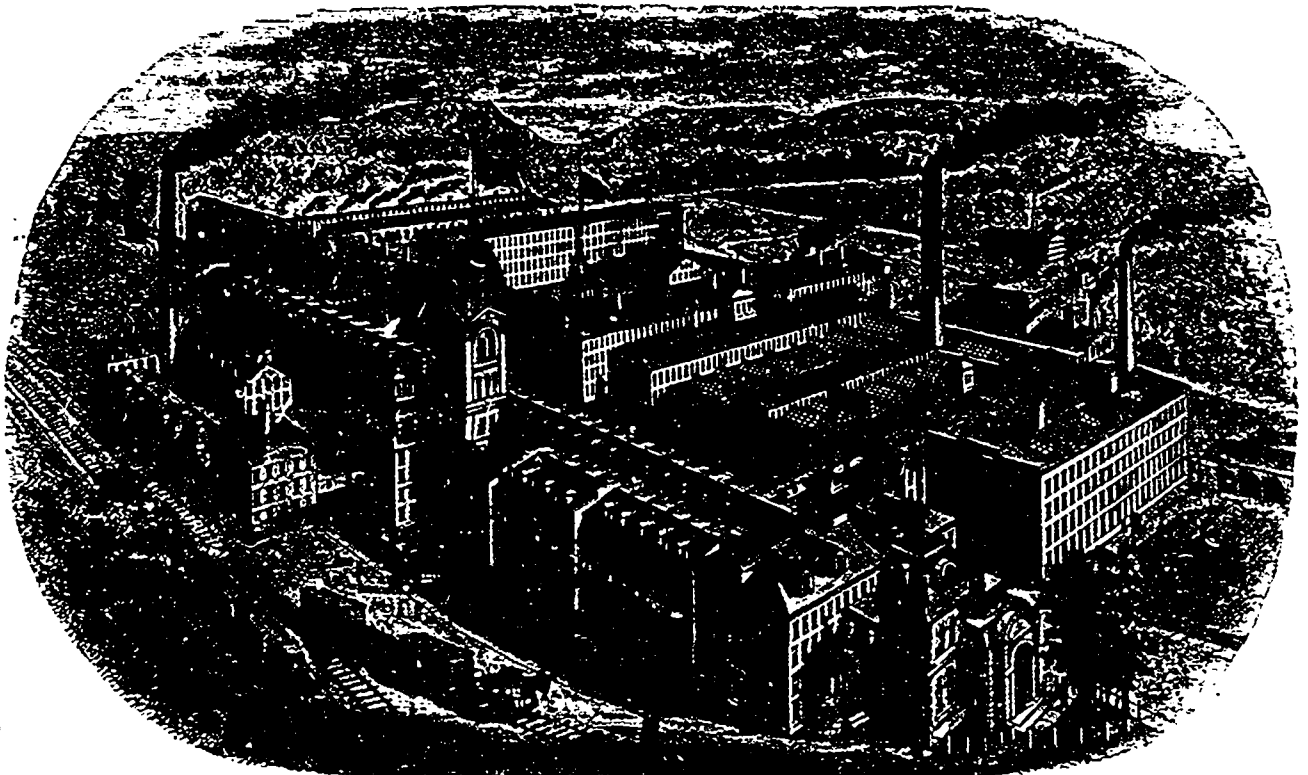
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little from the outer lower edge of the chain for its entire length; this, as you can see, will incline to work it on, instead of off. Some workmen, when they have a bad case, and a common watch, change the standing of the fuzee so as to cause the winding end of its arbor to incline a little from the barrel. This, of course, cannot do otherwise than make the chain run to its place.

HOW TO REGULATE A WATCH QUICKLY.—The following is a practical method for regulating a watch in a few minutes, also to put in a new balance spring, of the right size and regulated perfectly, in a watch without running it: First ascertain how many vibrations the watch beats in one minute, by counting every other vibration, and comparing that time with a well-known watch or regulator. In general, Swiss watches beat 18,000 in one hour, viz., 300 in one minute. American watches also, either 18,000 or 16,200, or 270 beats per minute, and the English lever 14,400, or 240 per minute. If there is any doubt, it is better to count up leaves and teeth and ascertain the right number, but cases that watches beat odd numbers are scarce. Having ascertained the right number, examine the balance carefully for one or two minutes, counting every vibration from right to left, and in the meantime examine the regulator or clock, to see when one minute is up. If the watch is well regulated, the number of vibrations must be exactly half of the regular first number, viz., 150, 185, or 120, as every other vibration has been recorded to facilitate the observation. If not so, move the regulator right or left until a perfect coincidence comes. To pick up a new balance spring after having recorded the right number of beats—either by the old spring or by the number of the train—lay first the spring with its centre well in the centre of the cock jewel, and having ascertained where the coil will enter between the curb pins of the regulator, note the place. Stick to the pivot of the balance a small round piece of beeswax; then stick to the centre of the spring, so as to establish a temporary but firm connection of the two pieces, and having pinched with the tweezers the balance spring indicated by the regulator pins, cause it to vibrate gently; then count the vibrations for one minute, and when you have a spring that will produce nearly the required number of beats, pin it to the collet and cause it again to vibrate, moving the tweezers backward or forward until the right number of beats is produced; with another pair of tweezers pinch the balance spring about one-eighth of an inch back of the regulating point, so as to counterbalance the gain produced by the regulator pins, and bend the wire slightly, which is the place where the hair spring must be pinned to the stud. Having then tuned up the spring, proceed to put the regulator to the right place, by using the way indicated in the beginning of this article, and the work is done. Success is certain when the operation has been carefully performed. The balance must be made to vibrate on some hard and well polished substance, so as to keep up the vibration to about the standard of regular running. A little practice will soon enable the watchmaker to change a balance spring very quickly, and without any trouble whatever.

SCIENCE NOTES.

A TURIN jeweler has made a tiny boat forming a single pearl, which shape it assumes in swell and concavity. Its sails is of beaten gold, studded with diamonds, and the binnacle light at its prow is a perfect ruby. An emerald serves as its rudder, and its stand is a slab of ivory. It weighs less than half an ounce; its price is \$5,000.

A PITTSBURG firm has commenced the manufacture of glass shingles, which are to be cheaper, stronger, more durable, and more satisfactory in every way than slates or any other roofing substance now used. They will drive the lightning rod men to parts unknown, for glass is such a good conductor of electricity that a fancy rod will be unnecessary on a house roofed with the new shingles. A city full of houses roofed with highly coloured glass would present a beautiful sight.

CHEAP diamonds by colouring may be made to look like gems, and the unwary are easily deceived thereby. The process is now about a year old. The trick is performed by dipping the diamond in a preparation of aniline dyo. This can easily be detected by washing the stone with soap and water. Within a month, however, the sharpers have added a preparation of gum arabic, which successfully stands the soap and water test. The only way the latest deception can be detected is to wash the stone with ammonia. The colouring of diamonds is causing thousands of dollars of loss to innocent people.

THE Archdeacon of Melbourne relates that during the epoch of the great gold fever he had a curate whose duty it was to officiate at some of the gold diggings. On Sunday mornings he preached at one set of shanties, and then walked eleven miles to another village for evening service. Half way across the plain stood a solitary tree, where he used to rest and eat his frugal dinner. For two years he had done so, when one day three miners, following his example, sat down to picnic on the same spot, and one of them, on getting up, just tried the soil with his pick, where, at a depth of about two feet, lay a mass of ore which realized \$140,000. That curate pondered deeply on what might have been.

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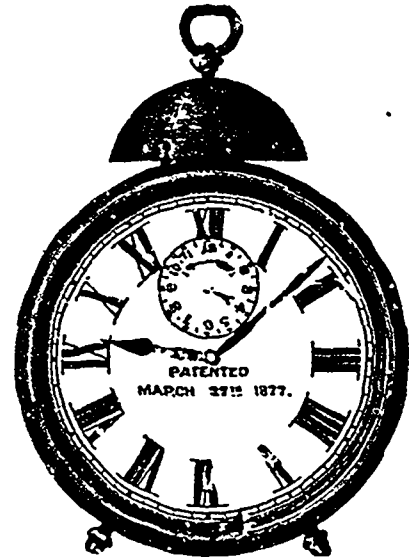
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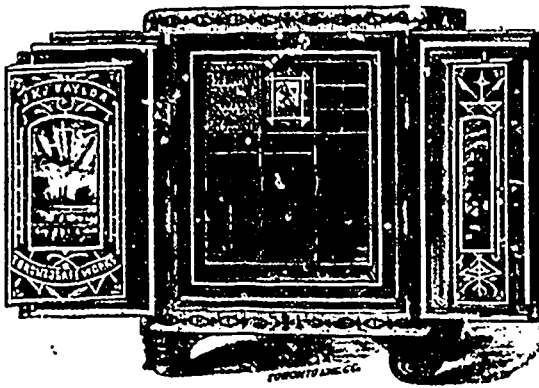
I have just returned from the eastern States and have imported a large stock of Walnut and Nickel Clocks, which I will sell at prices that defy competition. Also receiving daily Jewellery of all kinds. Roll Plate Chains a specialty. Large stock of Swiss Watches in Gold, Silver and Nickel Cases, key and stem winders. The best value in Whitby Jet Goods, such as Bracelets, Necklets, Sets Earrings, etc., which I will cut low prices to the Trade only.

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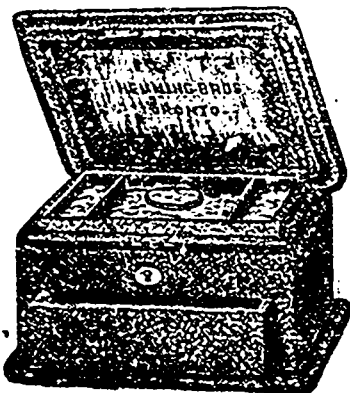
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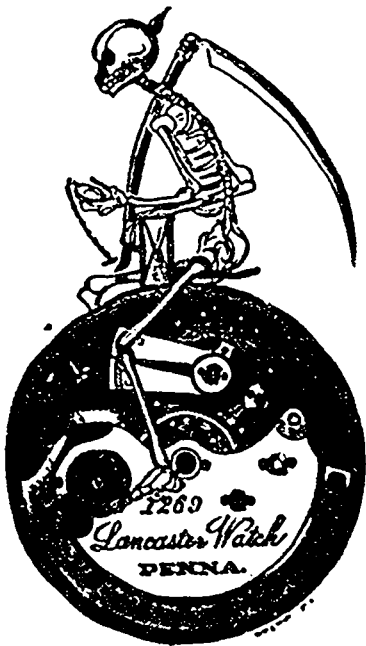
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