

By comparing these with other pieces, already found in similar localities, the investigators have concluded that such fragments were thrown into the wells as votive offerings to local divinities by the ancient inhabitants of the country, and that the same custom, continued through centuries, accounts for the presence of the much more recent Roman money. A chain of proof, mainly circumstantial, has been elaborated, which refers the stone fragments to the neolithic epoch, in prehistoric ages, and further shows that the pieces probably represent the earliest money used by man.

Self-Acting Car Couplings.

At a recent meeting of the Master Car Builders' Association, the subject for discussion was "Freight Car Couplings, Draw Bars, and Buffers," upon which Mr. Partridge made an address.

Mr. Adams was called upon for information on what is required by railroad companies, and said that he had no specific facts to present in relation to the repair of drawbars throughout the country. It was very difficult to get very specific data. The habits and customs of our car men have not been of the character to present these data accurately. The committee appointed on this subject, in looking over the matter, had made up their minds as to some important points to arrive at in the way of improvements. "We have been shown by Mr. Partridge some of the defects in the present arrangement, which had been considered by the committee. But there were some other things that presented themselves to their minds, and one of the most startling of the whole of them was the expense of links and pins. Upon some roads this expense was enormous, amounting to anywhere from \$10,000 to \$60,000 or \$70,000 a year, according to the size of the road. The ordinary roads perhaps would average \$30,000 to \$40,000 a year. We need something to couple our freight trains which will enable us to dispense entirely with pins and links. This was one of the points to be striven for. Another point in which we thought there was an absolute necessity for improvement was a greater power of resistance in our buffer springs, and a greater range of motion. Our resistance is altogether below the line of connection. If the springs were made stronger, given more motion, and placed in the direct line of resistance, the difficulty would be materially obviated. Various devices have been presented to us during the past year; a good many models have been brought out, and some of them have approximated somewhat to the accomplishment of the idea, but we have not seen any yet that meet our wants, in the opinion of the committee. The thing, after all, is progressing, but yet there is room for improvement. We have got to have a device that will couple freight cars without a link and pin, and, in addition to that, a separate buffer placed directly in the line of the frame or bottom of the car, and we have got at the same time to use our present stock; that device must be made to connect itself with our manner of coupling. We have got to use our present stock until it is worn out. But the committee is not as yet prepared to recommend anything. They have not found anything that will entirely accomplish the purpose. A buffer must be so built that it won't couple when you don't want it to. Many inventors seem to think that you must get something that will couple every time it strikes. There have been but few models that seemed to embody the idea to dispense with links and pins, but I think we shall have to make it in two parts, a separate buffer and separate hook, because we want our connections to be in the floor of the car. Mr. Stone in his model has accomplished considerably towards it, and I have no doubt he may be able to bring it perhaps to something near what we want."

Mr. L. Garey said that it was easy to find fault, and difficult to apply the remedy. "The necessity for improvement in the attachment by which cars are coupled together has been felt for a great number of years, and it was still evident that the improvement had not been got. The necessity of these improvements was shown by the immense number of patents granted year after year. The real necessity is an automatic coupler with buffing attachments, either connected or with another device placed on the line of resistance. The buffing requires from one half to double the resistance of the drawing to make it substantially strong. Now if some of our inventors will dispense with the use of the links and pins entirely, provide us with a coupling, automatic or not, which can be uncoupled from cars from the top or side, and give us a buffing attachment which is sufficient for the work, that ought to make a dozen fortunes for him and secure him the blessings of all the people, not only those that travel, but especially of the men employed on railroads. He thought that the railroads would say that, out of the cars which were side-tracked for repairs, eight tenths were owing to some defect in the drawing or attachment. If this could be reduced to three tenths, it would be a great deal. There was more difficulty from the failures of the attachments than in the drawbars themselves."

Don't Leave a Legitimate Business for Financiering.

It is an evil of the intense competition in great mercantile communities that it drives many from the walks of legitimate business into schemes of speculation with reference to sudden and extravagant gains. The history of frauds teaches that they originate chiefly in the attempt to grow rich rapidly by financiering rather than by diligence in business. Financiering has its place in legitimate business. Some men have a talent for this, which is as true a mark of genius as is poetry or art. But it is not a talent that every man can acquire, and it is fortunate that this is so; for if all the world should turn financiers, the earth itself would soon go

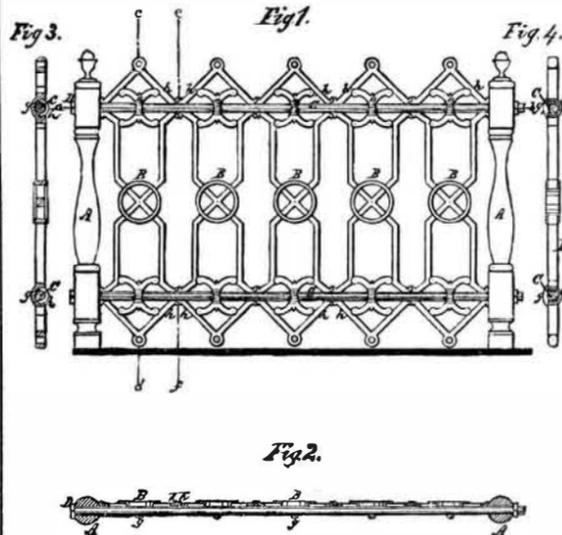
into bankruptcy. Now, the calamity of a great city is that every one who gains a little money takes to financiering as a readier mode of increasing it than regular business. Wall street, the focus of financiering, gives a tone to the whole business community.

But financiering is a deep game; and he who leaves an honest toil in a business that he does understand, for calculations of chance in matters where he has no skill, is very apt to become the loser, and, as in all lotteries, to grow desperate in the attempt to make up his losses. We do not speak of investments in stock as property, but of the spirit of speculation; and we have no doubt that a just verdict upon many cases of fraud would be: "This man lost his capital and his character by speculation in stocks." Keep, therefore, to honest toil in a legitimate business, and do not aspire to become a financier. "Be content with such things as ye have."

ROBERTSON'S IRON FENCE.

The use of ornamental iron fences is no longer confined to expensive city residences, but is gradually extending to the more humble suburban or village houses; and they would be used much more but for their great cost; to lessen this is the object of an invention lately patented by Mr. T. J. W. Robertson, which is illustrated in the accompanying engraving, Fig. 1 representing an elevation, and Figs. 2, 3, and 4 showing sections through the lines, *a b*, *c d*, and *e f*, respectively.

This fence is made up of castings having the metal so disposed as to allow rods to be passed through the ornamental openings in the sections or pickets, whereby the latter are so effectually secured to the former that they cannot be removed when the panel is in place between the posts by which it is supported; and this is done without fitting, riveting, or other fastening, except that necessary to secure the rods in the posts. To accomplish this, the sections or pickets are made with three vertical bars, *h g h*, where the tie rods are to be connected to them; and these bars are so formed as to admit the tie rods between them, in the same manner as the weft thread passes through the warp in weaving cloth. That the tie rods may readily pass through the sections, the two side bars, *h h*, have recesses on one side, and the central one, *g*, on the other, so that an edge view of the castings would show holes through it about the size of the rods, *C C*, through which the latter are passed.



With sections thus cast, all that is required to make a panel of fence is to pass rods or gas pipes through a sufficient number of sections and the posts, and then bind the whole together by screwing nuts on the ends of the tie rods, when the panel is ready to be erected. Where large hollow posts are used the nuts may be concealed in their interiors.

From this it will be seen that the cost of a fence of this character may be reduced to that of the castings, rods, etc., as no time is spent in fitting, boring, riveting, etc.; and although thus cheaply built, it is one of the strongest fences made, as the whole strength of the materials employed is utilized in fastening the parts together.

For further particulars, or the purchase of State or county rights, application should be made to the patentee at 818 O street (N. W.), Washington, D. C.

A NON-RETREATING BUNSEN BURNER.

BY PRESIDENT HENRY MORTON, PH. D., STEVENS INSTITUTE OF TECHNOLOGY, HOBOKEN, N. J.

In consequence of the low pressure of gas during the day time, in this place, we have long experienced trouble from the retreating of Bunsen burners of the usual construction. This having repeatedly proved a source of annoyance and loss, I was led to a series of experiments with the view of removing the difficulty, if possible, by some modification in the form of the burner. After various trials with burners, in which the relation of height to diameter in the main tube and the size of the gas jet were varied, I was led to the following consideration of the subject:

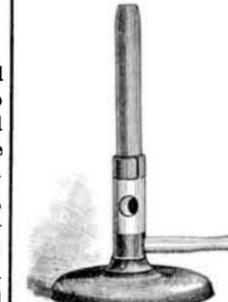
The retreat of a burner will evidently occur whenever any part of the ascending column of mixed gas and air is moving at the orifice with a velocity less than that at which the same will burn. Now, in an ordinary burner, with its main tube of regular cylindrical bore, it is evident that the friction of the surface of the ascending column of mixed gases will cause that portion to move at a less velocity than the central part, and that even currents of the nature of eddies will be developed. It will thus happen that, while the central portion of the ascending column of gaseous mixture issues at a velocity much greater than that at which the ma-

terial can burn downwards, and thus is quite free from any danger of retreating, the marginal portions of the column or jet of gas will be escaping at a rate so much less that the velocity of their combustion downwards will exceed that of their upward motion, and retreat of the flame will ensue.

It is well known that, to secure a jet of water or of any other fluid whose particles shall move with equal velocities in all parts, and thus avoid currents and eddies, it is only necessary to make the orifice of efflux an aperture in a thin wall. In following out this idea, I made a burner of a bore rather large compared with its height, and then drew in its upper edge into the form of an open-ended thimble, so contracting the orifice of escape to about two thirds of the area of the tube, and rendering this orifice practically an opening in a thin horizontal wall or plate. The results of this modification far surpassed my anticipations.

A burner thus constructed, as shown in the engraving, gives a perfectly non-luminous flame with gas pressures varying between 1 1/2 inches and 1/10 of an inch of water, and with the lowest of these pressures cannot be made to retreat by the most violent handling in the way of sudden movement or waving about in the air, even when this violence is carried to the extent of extinguishing the flame altogether. Under like conditions of pressure, a burner of the ordinary construction is made to retreat by a slight draft of air or a very moderate amount of motion.

These burners are being manufactured, for our own use and for other colleges, by George Wale & Co.



Correspondence.

The Purification of Water.

To the Editor of the Scientific American:

In 1869 I took occasion through the columns of your valuable journal to call attention to the beneficial action of air for purifying water which had become foul with decomposing organic matter, and to offer my patent air treatment for the purpose, for domestic uses, free of charge. At that time the subject was new to the public; and few perhaps attached to it the importance which more recent developments have shown it to possess, especially for dwellers in cities. Recent articles by various writers on the subject tend not only to fully support my statements, but to show that bad water invariably suffers for want of oxygen, the degree of foulness indicating the diminished proportion or the absence of free oxygen.

The putrid water of a river can be reclaimed by absorption of oxygen, and it will arrive at sweetness and wholesomeness as soon as it possesses 3/4 of 1 per cent of free oxygen; this amount is necessary for fishes to thrive in water. But such water would not necessarily be suitable as a beverage for man.

Great apprehensions are now entertained that the horridly putrid condition of the ponds in Central Park will spread disease over the neighborhood, and these fears will be too fully justified if the present state of things continues. But there is no necessity for pond water to be putrid, or to become unwholesome, at any time. By the moderate annual expenditure incurred in running an air force pump or pressure blower, requiring about 20 horse power, in a place conveniently central, conveying the air by light but durable mains of about 12 inches bore to pipes of smaller bore near the bottom of the ponds, with perforated branch pipes through which the air issues, all apprehension of the re-occurrence of foulness in ponds can be entirely removed. Sufficient oxygen can be supplied by thoroughly agitating the water for about one hour daily, by pumping in air, to keep the ponds sweet. To purify them in their present state, the most rigorous air treatment for several days is needed; it may take a week to do it. The Croton water has suffered with this malady for years, and if it be not speedily provided against, it will fill our cemeteries at a still higher rate than 27 in 1,000 per annum, a death rate only exceeded by Bombay with 29.

New York city.

The Treatment of Diphtheria.

To the Editor of the Scientific American:

I wish to make known to the public a method of treatment for diphtheria, which has been uniformly successful, in the practice of the writer, during a number of years, which included two epidemics; and in a large number of cases, not a case has been lost since this treatment was adopted. I feel confident that, by its general use, the mortality may be reduced to one per cent, or even less. I have heretofore delayed publishing the results in order to make sure that the treatment was really what it promised to be, and I now wish to use the columns of your journal, in order that the public generally may have the knowledge in their own possession.

An attack of diphtheria is usually ushered in with a high fever and headache, and, in children, with nausea and vomiting. There is great prostration. Upon the tonsils and surrounding parts are seen white, snow-flaky patches. In malignant cases, the patches are often yellow or brownish, and a terrible odor is perceived.

The remedy found successful by the writer is permanganate of potash, in conjunction (not combination) with the tincture of belladonna. The method of administration is as