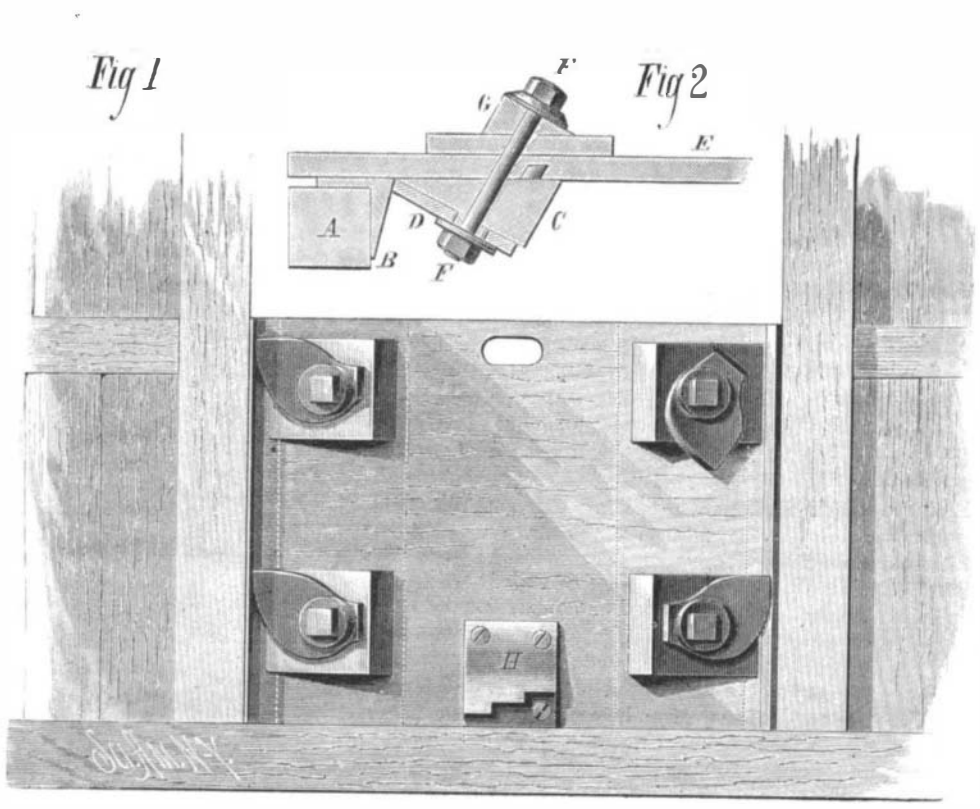
NEW FASTENER FOR GRAIN-CAR DOORS.

The great failing in grain car doors as ordinarily made is their liability to become loosened so as to allow grain to escape. When doors are nailed to compensate for defects in their fasteners, the doors soon become destroyed and the jambs or casings are permanently injured.

We give an engraving of a grain-car door fastening which remedies these defects and permits of fastening the door quickly and securely, and in such a manner as to avail of the jarring of the car to tighten the fastenings rather than loosen them. The inventor of this fastener has been for many years a shipper of grain, and being familiar with the defects of other doors, and knowing the requirements of the case, has devised the door shown in the illustration, which is believed to overcome all of the difficulties hitherto experienced, and to be capable of closing a car so that the grain cannot leak from the door; in fact, the greater the amount of jarring the more firmly does the door become fastened. The fastenings are upon the outside and in plain view, and the door can be loosened and lifted as easily as an ordinary gate is opened. It will be seen that its construction is inexpensive, and that it may be readily applied to old cars, not only furnishing a complete door, but also supplying a protector for the door jambs.



BURNTRAGER'S GRAIN-CAR DOOR FASTENER.

In the engraving, A is the door jamb, and B is a false jamb, made of angle iron and having its inner face beveled or inclined from within outward. C is a wedge-shaped block having on one face a projection on which a cam, D, is pivoted, and on the opposite face two projecting lugs, which enter corresponding inclined sockets in the door, E, to steady the blocks, C, in position.

On the inside of the door, E, are secured vertical panels or braces for strengthening it. The cams, D, are held in place by bolts, F, that pass diagonally through the block, C, door, E, and a wedge-shaped washer, G, which is on the inner face of the panel.

The cams, D, have their semicircular or rounded edges beveled to correspond with the bevel of the false jambs, B, so that when turned and forced down against the bevel of the false jambs, B, as shown in Fig. 1, the cams will draw the door outward and hold it firmly against the outer faces of the jambs. By striking up the cams the door is loosened, and can then be pried up for the removal of the grain from the car by inserting the end of a bar under one of the steps of the block, fixed centrally at the lower edge of the door, a suitable fulcrum being placed in position for the prying bar

It will be seen that the false jambs, B, and beveled edges of the cams, D, form opposite inclined planes, that will continue to bear the same relation to each other and together operate to hold the door tightly closed, however great may be the wear on them.

This invention was lately patented by Mr. Aaron Burntrager, of Mulberry, Ind., who may be addressed for further information.

STORING OF ELECTRICITY.

One of the latest and most interesting of electrical novelties is the improvement in the secondary battery of Gaston Planté, by M. Faure, which has been brought to the notice of the scientific world by the accounts of the transportation of a box of "electric energy" from Paris to Glasgow, for the purpose of having it submitted to Sir William Thomson, the eminent electrician, for tests and measurements. The results of this experiment have been pronounced wonderful, but no facts have yet been made public which afford a basis for an estimate as to the commercial value of the invention.

An extemporized Faure secondary battery of small dimensions has been in operation for several days in the office of the SCIENTIFIC AMERICAN, and although no extended tests have been made as yet, the results of the experiment are very promising. We give below an account of the experiment for the benefit of such of our readers as may desire to investigate the subject.

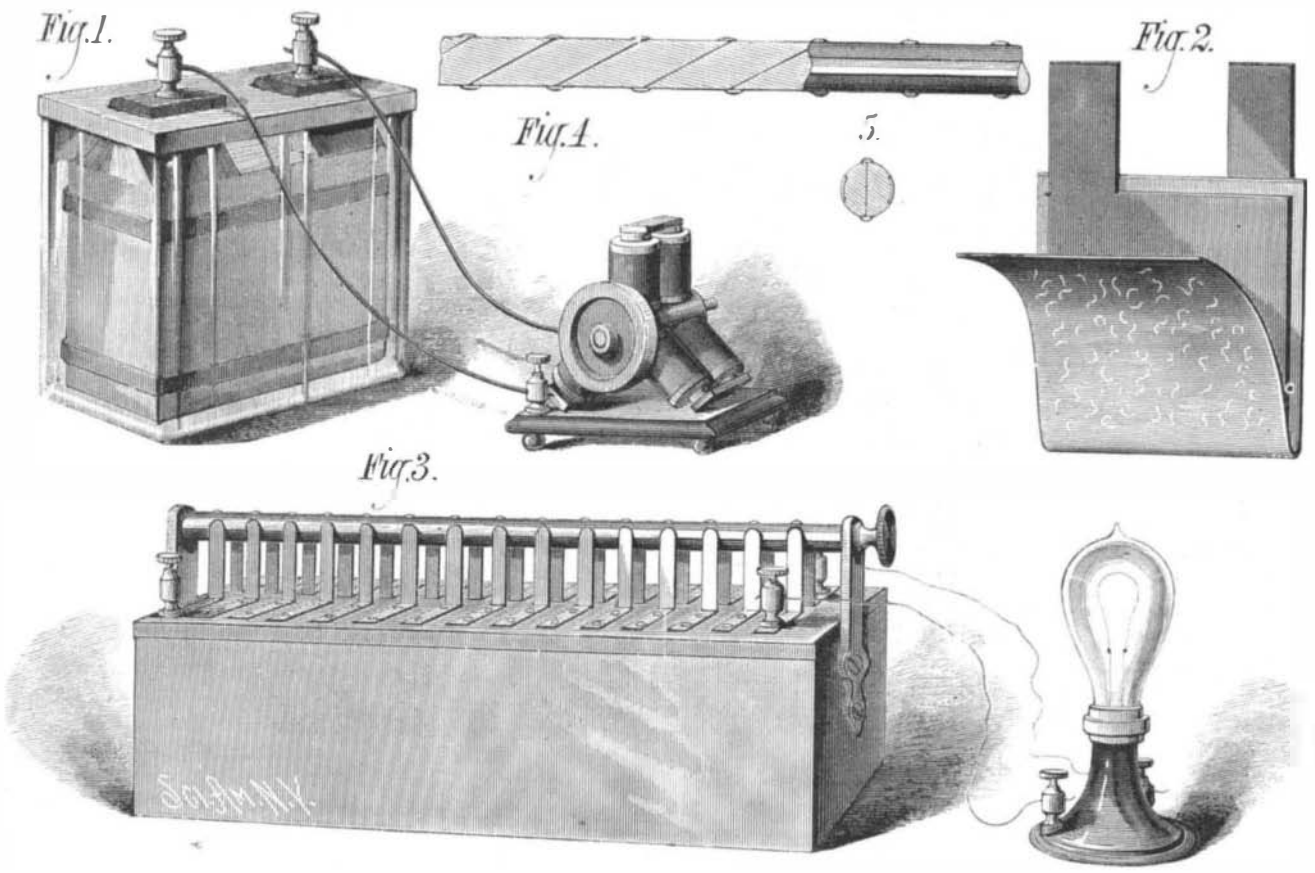
In attempting to follow M. Faure's plan of construction some difficulty was experienced in making the red lead remain in place during the rolling up of the two electrodes. Therefore the battery was constructed of square plates of lead, each having an ear projecting upward from one side, for attachment to a binding post. This plan succeeded very well, the flat plates having the advantage of retaining a great quantity of red lead and of being easily formed into a compact pile.

Fig. 1 in the engraving shows a single pile operating a small electric motor. Fig. 2 shows the method of combining the plates. Fig. 3 shows how a battery may be arranged with a commutator for combining the elements for tension or quantity, and Figs. 4 and 5 are respectively longitudinal and transverse sections of the commutator.

The plates employed in the experimental battery were of pure lead foil, having the thickness of a postal card, a width of 7 inches, a height of 7⅛ inches, with an ear projecting from the top 1½ inches wide and 3 inches high. The total effective surface on both sides and edges of each plate is 100 square inches. Ten such plates are sufficient for a single element for ordinary uses, and such an element may be fairly charged by means of four gravity cells, but a stronger current is much quicker and more satisfactory. The method followed in building up these secondary elements was as follows:

After cutting out a sufficient number of lead plates, pieces of canton flannel, 15 inches long and 7½ inches wide, were cut, and finally as many sheets of blotting paper, 7½ inches square, as there were lead plates were provided.

The next step was to prepare a thick paint of red lead by mixing the dry pigment with water containing one-tenth of sulphuric acid. This paint had a consistency of paste, and was applied thickly to one side of the sheet of lead with a common flat paint brush. The canton flannel having been painted to within one-quarter inch of all its edges on the nap side, the lead was laid, painted side down upon the painted canton flannel, when the other side of the lead was painted and the cloth was neatly folded over the lead, completely enveloping it with the exception of the ear at the top, and projecting about one-quarter inch beyond all of the edges of the lead. The lead with its envelope was then laid upon a level board, and another plate was prepared in the same manner and placed over the first, with an intervening layer of blotting paper, and with the ear placed opposite the ear of the first. Other lead plates were added in the same way, with the interposed sheet of blotting paper and with the ears alternating in position, as indicated in Fig. 2. When ten plates had been placed together in this manner they were clamped together with two or three elastic bands, and the ears were brought together and passed through a slit in the wooden cover of the containing cell and bent down upon the top of the cover, as shown in Fig. 1. They were then pierced and traversed by the screw of a binding post which enters the wood. In this way each pole of the element was furnished with a binding post, and at the same time firmly secured to the cover. The cell was then partly or wholly filled with acidulated water—water 10 parts, sulphuric acid 1 part—and after the cloth and blotting paper had become saturated the element was connected with four gravity cells. In one hour the element had stored electricity sufficient to heat 1½ inches of fine platinum wire to redness, to work a magnet strongly, and to run at a high rate of speed for fifteen minutes a small electric motor, that requires at least ten gravity cells to operate it. After this preliminary experiment a number of the new secondary elements were prepared in the same way and charged separately with a dynamo-electric machine. One element of ten plates, after receiving the current from the dynamo, for ten minutes operated the small motor above referred to for something over three hours.



STORING ELECTRICITY.—THE NEW SECONDARY BATTERY.

Another ten minutes' application of the current from the dynamo charged it, so that after eighteen hours of rest it yielded a current which seemed as strong as when it was first charged on the previous day; but a time test proved that it was incapable of running the motor for quite so long a time as when the current is used soon after storing. However, it proved that a large quantity of electricity could be stored and retained for a considerable time.

Six elements of ten plates each can be readily charged with the smallest current that can be obtained from a two light dynamo machine; that is, a current that will not support a single arc light will easily charge the number of elements, and they will readily support a single Reynier or Werdermann lamp.

For general experimental purposes the battery may be conveniently arranged as shown in Fig. 3. Each pole of each element is connected through the cover to a spring which is bent upward at right angles. The springs of the