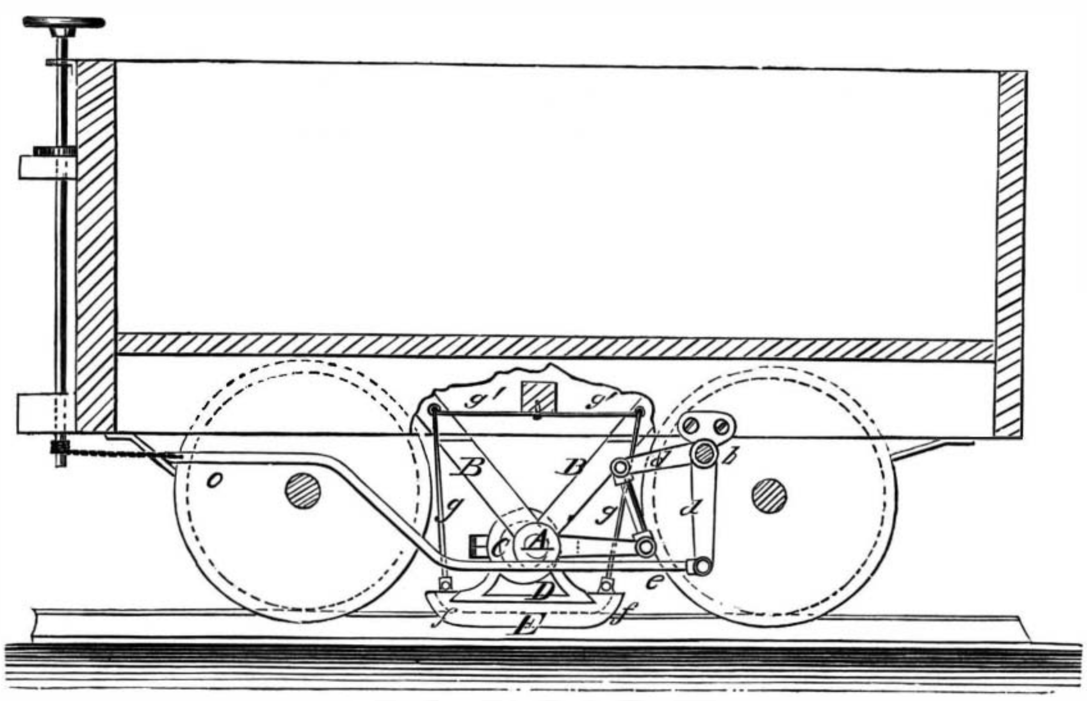
IMPROVED CAR BRAKE.

Mr. William L. Hofecker, of White Haven, Pa., has invented the car brake shown in the annexed engraving. A represents a short lateral shaft that is supported on hangers, B, applied rigidly to the truck frame, between the wheels. A lever arm, *a*, is keyed to the shaft, and connected either directly or by an intermediate shaft, *b*, crank, *d*, and connecting rods, *e*, with the hand wheel and ratchet and pawl mechanism at the front and rear platforms of the car, or to steam or vacuum appliances, by which the brakes are operated in the customary manner. Shaft, A, carries vertically above the rail of the track an eccentric, C, keyed thereto, to which is applied, by an encircling band, the loosely sliding frame, D, that supports at its lower end the brake shoe, E. The encircling band and shoe-carrying frame are secured by fastening bolts, or in other suitable manner, around the eccentric, the brake shoe being connected by a dovetail groove and bolts to the frame, and suspended at the ends by rods, *g*, attached to a spring of the truck frame, by which the brake shoe is steadied and carried in upward direction. The shoe is made of suitable length with a side flange, *f*, extending downward along the rail head for the purpose of bearing jointly on the top and side of the same. The shoe is carried by the turning of the eccentric either toward or from the rail, being retained by its weight and the sliding band parallel to the top of the rail.

The brakes are applied by turning the operating wheel in one direction, and raised from the wheel by means of the spring, *g*, on releasing the hand wheel mechanism.

Patented March 7, 1876, through the Scientific American Patent Agency.

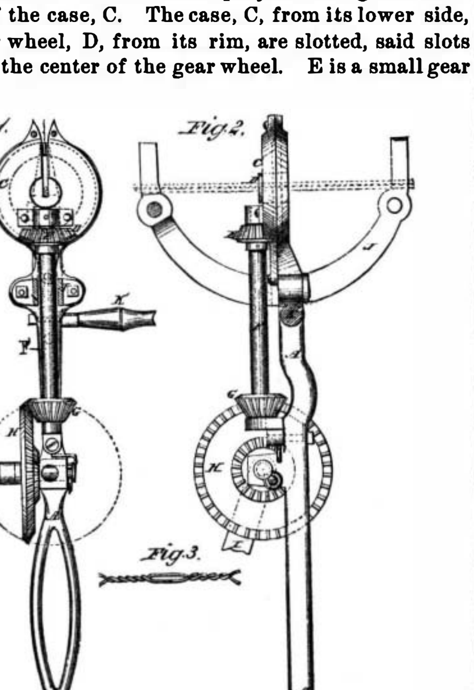


HOFECKER'S CAR BRAKE.

A NEW MACHINE FOR SECURING BALE WIRES.

A correspondent recently suggested that some new and simple method was necessary for securing the ends of the wires used for bands on bales of merchandize, etc., so that said ends would not slip or allow the bale to expand. Mr. Moses C. Smith, of Starkville, N. Y., has patented through the Scientific American Patent Agency, June 6, 1876, a novel device for twisting the ends of a wire band together, to form a tie after the band has been passed around a bale or other bundle.

A, in the engraving, is the shank of the machine, to the upper end of which is swiveled a breast plate, B. The lower end of the shank, A, is widened into circular form, and is concaved upon one side to form half of the case, C, the other half of which is secured to said first half and the shank. In the case, C, is inclosed a large bevel gear wheel, D, the ends of the hub of which project through holes in the center of the case, C. The case, C, from its lower side, and the gear wheel, D, from its rim, are slotted, said slots leading into the center of the gear wheel. E is a small gear

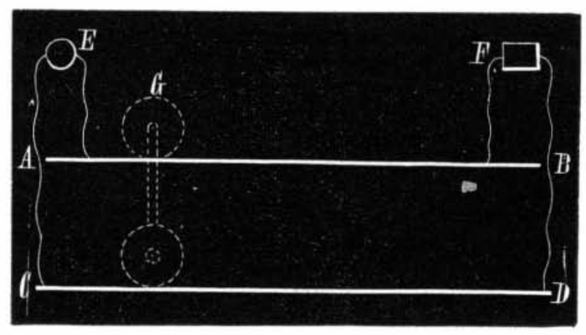


wheel, the side of which passes in through the side of the case, C, and its teeth mesh into the teeth of the gear wheel, D. The gear wheel, E, is attached to the shaft, F, which revolves in bearings attached to the shank, A, and case, C. To the upper part of the shaft, F, is attached a small bevel gear wheel, G, the teeth of which mesh into the teeth of the large bevel gear wheel, H, pivoted to the shank, A, and to which is attached a crank, I, which serves as a handle for applying power to operate the machine. To the opposite sides of the lower part of the shank, A, are attached curved arms, J, the lower ends of which are slotted in line with the slot in the case, C, and gear wheel, D. To the shank, A, upon the opposite side from the gear wheel, H, is attached a handle, K, for convenience in holding the machine. In using the machine the wire band is passed around the bale, and its lapped ends are passed into the slots in the arms, J, case, C, and wheel, D, and the crank, I, is turned four or five revolutions, which will twist the wires together, as shown in Fig. 3.

The device is shown in the engraving, Figs. 1 and 2, arranged for twisting wires that pass around the bale the short way. When the wires are passed around the bale the long way, the gear wheel, H, and handle, K, are detached and moved one quarter around the shank, A, and are again attached to it.

A NEW ELECTRIC RAILWAY SIGNAL.

A new railroad signal has been in use on the Boston, Lowell, and Nashua Railroad, for a short time past, which appears to solve the long sought problem of making the rails serve as conducting wires in an electrical circuit governing the signal mechanism. We append an engraving of the arrangement, which certainly is exceedingly simple, and, from the testimonials of railroad engineers and others who have had direct experience in its working, a very effective invention.



A B and C D are the rails; E is a single cell Callaud battery; F is the signal, the mechanical arrangement of which need not be described. The conducting wires of the battery are secured, as shown, one to each rail, and the two rails, as here represented, may indicate a section of track, say two miles in length, each section being, however, insulated from adjoining sections. The signal at F has an electro-magnet connected to each rail by the wires, as shown. When the circuit is closed, as is normally the case, the magnet is excited, and the signal controlled thereby so as to show "line clear." Should, however, a car or a train run upon the section, then the circuit is completed by the wheels and axles, and the current, taking the shortest course, will traverse through G and then return to the battery rather than go through the longer distance necessary to pass through the signal. Consequently the circuit will at once be ruptured, the magnet will cease to attract, and the signal, by mechanical means, is at once turned to "danger."

It is obvious that this must occur as long as a single car remains on the track, or when the circuit is broken by a displaced or ruptured rail, or any other cause. Hence the device may be applied over an entire line, and will indicate the condition of every section thereof to the train about entering on the same.

The inventor, Professor Wm. Robinson, of 268 Washington street, Boston, Mass., informs us that there is no drawing-off of the current of the earth under the rails; nor, during his experience with the device under all conditions of rain, snow, etc., has he found any time when it became inoperative. In actual employment he has also determined that the single Callaud cell will last for 158 days; and by using two cells in connection with an ingenious device whereby every train which passes over the section throws the cell in use out of action and the other into action, the lasting qualities, curious as it may appear, are greatly enhanced. The invention, by suitable mechanical arrangement, is made applicable to switches, drawbridges, etc.

The Simplest Tide Motor.

For the benefit of several correspondents who have inquired relative to means for utilizing tide power, we would state that the simplest and probably the most effective device for the purpose is that in use in several flouring mills on Long Island Sound. The mill is commonly located at or near the mouth of any little arm or inlet of the main body of water, and across the inlet a short dam is erected. The only access left for the water to run in or out of the arm is under the mill, and there the two undershot wheels are located. As the tide rises outside, the aperture is too small to admit its entering the inlet with sufficient rapidity to keep the water level uniform. Hence there is at flood tide a powerful current running under the wheel inward, and at ebb tide a similar current running outward. The wheels are of course turned, as it may be flood or ebb tide, in reverse direction; but by simple mechanical gearing they are caused to drive the machinery always in the same direction. There is no time when the machinery need not be going, as even when slack water arrives the dam is holding back a sufficient head to keep the wheels going until the tide definitely sets in or out; and even then it is obvious that a very slight difference of level on one or the other side of the dam is sufficient to generate current enough to operate the wheels.

This is an old invention and a very simple one, but it appears not to be known to a great many people, who are vexing their brains over intricate systems of movable floats and gearing for accomplishing the same purpose. The mill is the nearest thing to *a* perpetual motion (not *the* perpetual motion—for that includes the idea of self-generated power) on earth.

A NEW SCISSORS GAGE.

Mrs. Elizabeth Wiggins, of Brooklyn, N. Y., has patented through the Scientific American Patent Agency (May 20, 1876), a novel device for attachment to shears for cutting bias and straight trimmings. It enables the trimmings to be cut much more rapidly and accurately than in the old way

In the engraving, A, Fig. 1, represents a pair of shears, to the upper blade of which, near its pivot, is attached the end of an arm, B, which is made in two parts sliding upon each other, and clamped to each other, when adjusted, by a set screw, b'. The inner end of the arm, B, is bent at right angles, to form a base to rest against the blade of the shears, and has a hole formed through it to receive the screw, by which it is secured to the blade of the shears. Upon the parts of the arm, B, is formed a scale of inches and fractions of an inch, for convenience in adjusting the gage plate, C. The gage, C, slides upon the extension arm, B, and is secured in place, when adjusted, by a clamping screw, C'. The gage plate, C, is made in two parts, pivoted to each other near their inner ends, and connected to each other near their outer ends by a pin attached to one of the said parts, and passing through a slot in the other, as shown in Fig. 2. By this construction, when the blades are closed, the two parts of the gage plate, C, are closed; and as the blades are opened, the lower part remains upon the table, so as to serve as a stop to the goods. In using the device, the cloth is folded evenly, and the gage plate, C, is adjusted to the required distance. The lower blade of the shears is then passed beneath the folded fabric, in such a position that the edge of the same may rest against the gage plate, C. The strip is then cut off by a single clip of the shears.

Fig. 1

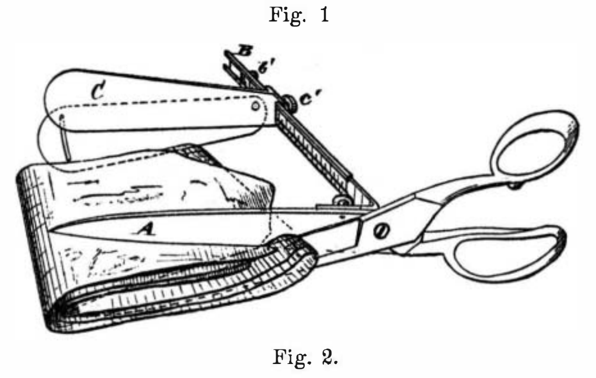
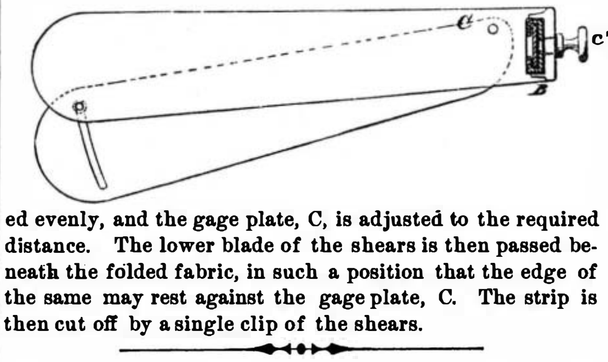


Fig. 2.



An ordinary boiler furnace requires 300 cubic feet of air for the consumption of each lb. of coal. From 13 to 20 lbs. of coal may be consumed per superficial foot of fire grate. Three quarters of a foot of fire grate are required to evaporate a cubic foot of water.