C. ROBINSON.

Electric Alarm.

No. 45,347. Patented Dec. 6, 1864.

Fig. 2.

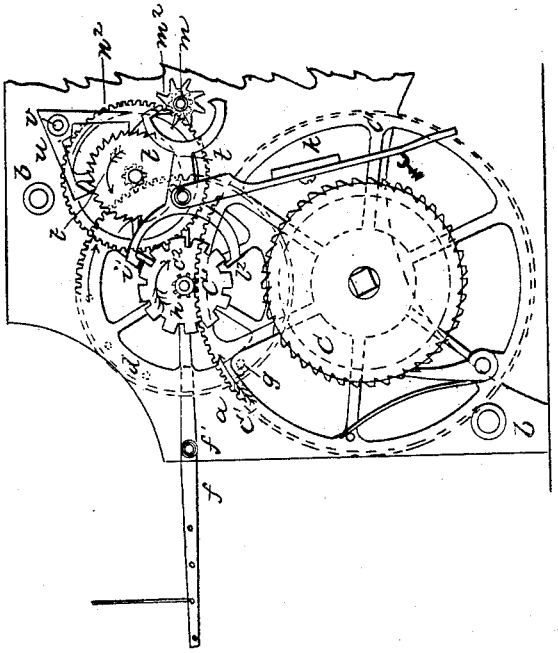


Fig. 1.

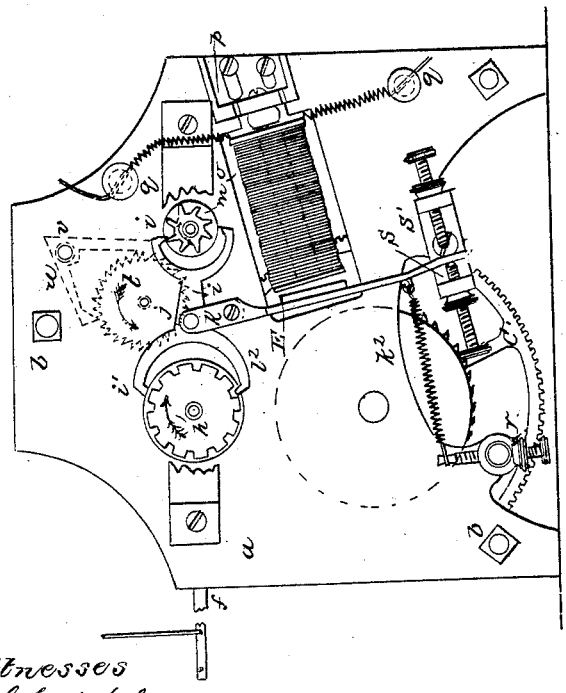
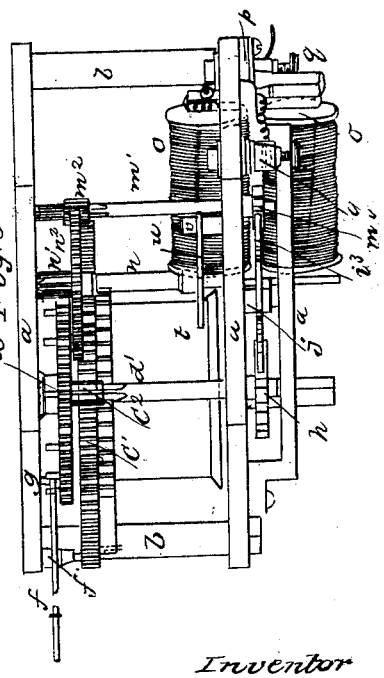


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES ROBINSON, OF NEW YORK, N. Y.

IMPROVEMENT IN ELECTRO-MAGNETIC MACHINES FOR RINGING BELLS.

Specification forming part of Letters Patent No. **45,347**, dated December 6, 1864.

To all whom it may concern:

Be it known that I, CHARLES ROBINSON, of the city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electro-Magnetic Telegraph Machinery for Ringing Bells, &c.; and I do hereby declare that the following is a full and correct description thereof, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference thereon.

My invention relates to the stop-motion combined with the striking mechanism and the armature of the electro-magnet, and consists, chiefly, in the arrangement and combination of a directing-wheel, a stop-wheel, and a stop-lever with the pin-wheel, which actuates the lever connected with the striking mechanism and the armature of an electro-magnet, in manner and for the purposes substantially as hereinafter described and shown; also, in the arrangement and combination of a regulator of speed with the stop mechanism.

More particularly to describe my invention I will refer to the annexed drawings by letters of reference, the same letters of reference referring to the same parts in the different figures of the drawings.

Figure 1 of the drawings represents a side elevation of the machine; Fig. 2, a partial side elevation with one of the side frame-plates removed to show a skeleton view of the wheel work; Fig. 3, a top view with the upper brace or frame-tie removed in order to show more clearly the wheel-work and shafts.

Letter *a* represents the frame of the machine; *b*, cross-ties. The wheel-work is driven by a weight or spring wound on a fusee, *c*, as in ordinary clock-work, the large wheel c' connected with the fusee-gearing into a pinion, c^2, on the shaft d', which carries the pin-wheel *d*. The pin-wheel has twelve pins projecting sidewise from its rim equidistant from each other, which, when the pin-wheel is permitted to turn, successively trip the lever *f*, which moves freely on a fulcrum-pin, f', the long arm connected by a wire, f^2, (shown broken off,) with any suitable bell-striker, and the short arm kept in place to be acted on by the pin-wheel by a pin, *g*, projecting from the frame. The operation of striking requires that considerable force shall be exerted by the pin-wheel, and therefore it is necessary to employ mechanical means in aid of the magnet for the purpose of controlling, stopping, and releasing the pin-wheel in the operation of the machine as a telegraphic fire-alarm.

The directing-wheel *h* is fast to the pin-wheel shaft and turns with the pin-wheel. It is notched in its periphery with twelve notches corresponding with the pins on the pin-wheel. The curved surfaces between the notches are smooth and serve as guides to the directing-arms i' i^2 of the stop-lever *i*. This stop-lever *i* moves freely upon a fulcrum-pin, *j*, and is connected with the armature-lever *k*, which also turns on the same fulcrum-pin, by a screw, k', which goes through the armature-lever and screws into a short arm (shown by dotted lines) projecting downward from the stop-lever, so that the stop-lever and the armature-lever move together as one piece. The action of the armature-lever spring k^2 is to bring the finger of the lower directing-arm, i^2, of the stop-lever against the surface of the directing-wheel, so that when a notch comes opposite the finger will be projected into the notch and the finger of the upper directing-arm, i', will be lifted from the surface of the directing-wheel correspondingly. The stop-lever thus moving enables the upper stop-finger, i^3, of the other forked arm to engage the stop-wheel *m*, which, being geared up from the pin-wheel so as to make ninety-six revolutions for every revolution of the pin-wheel and directing-wheel, arrests the motion of the wheel-work before the finger of the directing-arm of the stop-lever which has passed into the notch in the directing-wheel can come in contact with the side of the notch which is turning toward it, thus preventing any engagement or holding by the notches in the directing-wheel and the fingers of the directing-arms of the stop-lever, which would require too great exertion of magnet force to release in the practical operation of the machine.

The stop-wheel *m* is fast to the shaft m', and is geared from the pin-wheel as follows: On the periphery of the pin-wheel are ninety-six cogs, which gear into a pinion, n', of eight teeth on the shaft *n*, which also carries a spur-wheel, n^2, of sixty-four teeth, which gears into a pinion, m^2, on the stop-wheel shaft m'.

The use of the upper directing-arm and

lower stop-arm of the stop-lever is to enable the machine to work on a closed circuit as well as upon an open circuit; also, to prevent the alarm from being set in action continuously by the accidental continued closing of the circuit, or by an accidental circuit, from interfering wires or other causes.

In the operation of the machine the upper finger of the upper directing-arm is brought against the surface of the pin-wheel, between the notches, when the armature-lever is moved by the magnet to release the stop-wheel, and thus prevents the lower stop-arm from being lifted high enough to stop the stop-wheel, in the manner of an escapement-pallet motion, when the upper stop-arm is raised to release it; but if the distant operator keeps the circuit closed longer than the time occupied by the travel of the blank surface between the notches, the finger will be drawn into the next notch of the directing-wheel and the machine stopped until the circuit is broken.

The fingers of the directing-arms are narrower than the width of the notches, for the purpose of giving time to stop the pin-wheel without bringing the fingers in contact with the sides of the notches. The directing-arms are so adjusted with relation to the blank surfaces and notches that when the finger of one arm is withdrawn from a notch the finger of the other arm always comes against a blank surface, to prevent the action of the magnet from moving the stop-lever too far, as before mentioned.

Letter O represents the electro-magnet, of common U form, adjustable to the armature by the sliding bracket *p*, which holds the magnet. *q q* are binding-screws; *r*, an adjusting-screw for the armature-lever spring.

Letters *s s'* are the adjusting-screws of the armature-lever. The screw *s* determines the lap of the upper stop-finger on the teeth of the stop-wheel, and the screw *s'* the lap of the lower stop-finger on the teeth of the stop-wheel.

In the operation of this machine the distant operator closes the key firmly for an instant to release the stop-lever, then opens the circuit until the pin-wheel has tripped the striking-lever, and the machine is stopped, thus making one stroke at a time. This is practicable, because the machine takes a little time to make each stroke, and cannot in any event make two successive strokes, unless the circuit is first closed, then opened, and then closed again; but in order to get uniformity of action and a regulated speed, an inclined-toothed wheel, *t*, is fixed on the shaft *n*, and the angular pawl-lever regulator *w* applied to it, the angle pawl-lever moving freely on its fulcrum-pin *v*. I consider this the best form of regulator for this machine, but do not confine myself to it, because other regulators, such as placing wings on the shaft *m*, may be applied with benefit to the machine.

I claim as my invention and improvement in electro-magnetic telegraph machinery for ringing bells, &c.—

1. The directing-wheel, stop-lever, and stop-wheel, in combination with the armature of an electro-magnet and pin-wheel of a striking apparatus, substantially in the manner and for the purposes hereinbefore described.

2. In combination with the stop mechanism, the regulator of the speed of the machine, substantially as described.

CHAS. ROBINSON.

Witnesses:

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