J. B. JOHNSON.

Electric Time-Registering Clock.

No. 223,517. Patented Jan. 13, 1880.

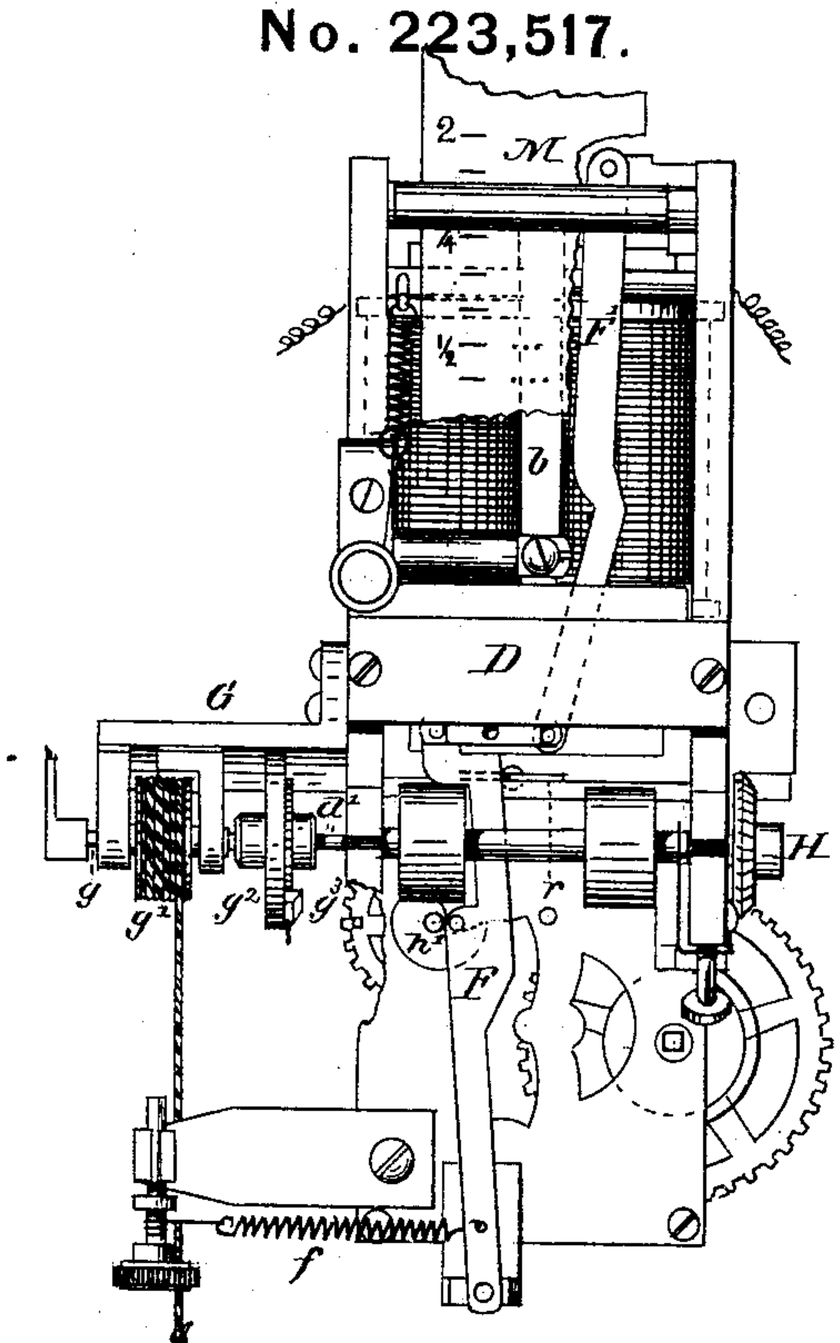

Fig. 1.

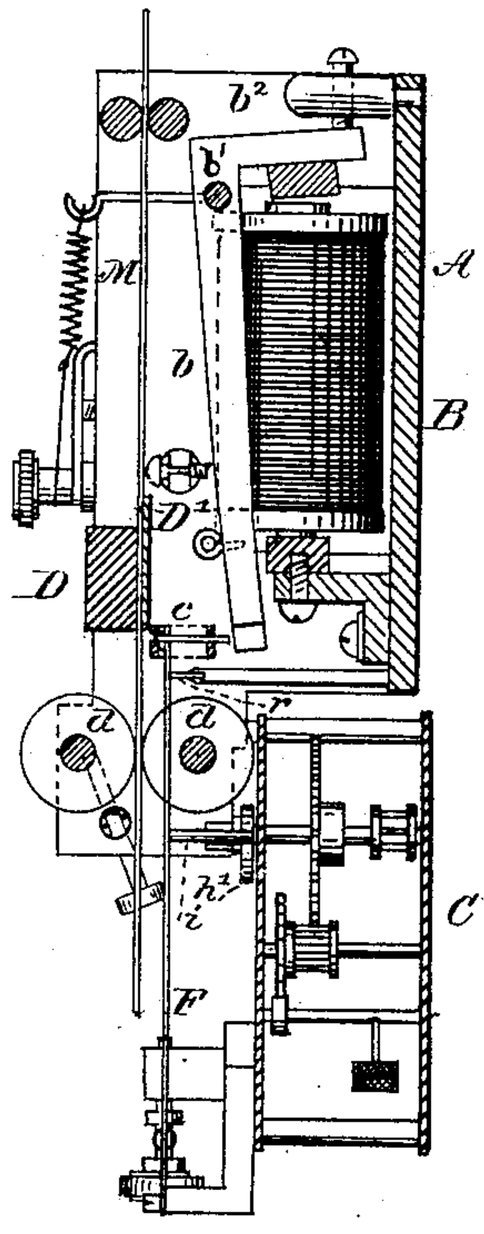

Fig. 2.

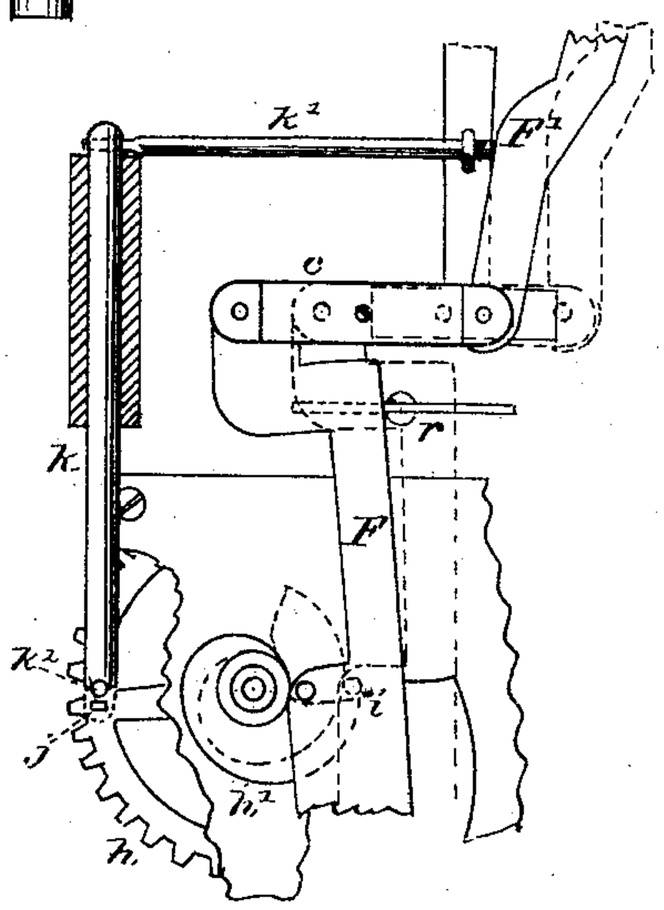

Fig. 3.

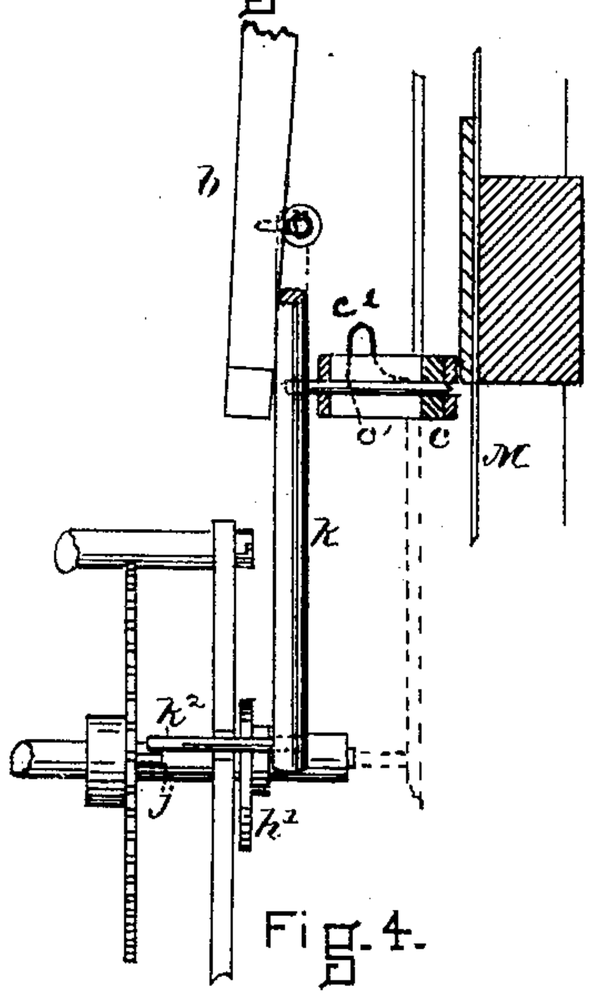

Fig. 4.

WITNESSES

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ELECTRIC TIME-REGISTERING CLOCK.

SPECIFICATION forming part of Letters Patent No. 223,517, dated January 13, 1880.

Application filed November 22, 1878.

To all whom it may concern:

Be it known that I, JOHN B. JOHNSON, of Boston, county of Suffolk, and State of Massachusetts, have invented a new and useful Improvement in Time-Registering Clocks, which invention is fully set forth in the following specification.

This invention relates to certain improvements in electric time-registering clocks, wherein the presence of a watchman at any station is recorded by means of dots or perforations on a strip of paper within the clock.

My invention consists, first, of a novel method of holding and giving motion to the carrier-block with the perforating-needle by means of two simple levers, to which the carrier-block is secured in such a manner that when a swinging motion is imparted to the lever the perforating-needle is caused to move in a straight line across the path of the registering-paper without the intervention of slides or rods that would create friction; second, in an improved method of driving the feed-rolls by which the registering-paper is made to travel over the perforating-needle, the power that drives the feed-rolls being applied directly to the axle of the rolls instead of their deriving their motion from the same weight that carries the clock, the rolls being connected, however, to the train of the clock by suitable gearing, so that their motion is regulated by the movement of the clock, the same as they would be were they driven by the same weight.

The device employed by me to accomplish the purpose of my invention will be readily understood by referring to the drawings accompanying this specification, in which—

Figure 1 is a plan, and Fig. 2 a side elevation, partly in section.

A is the frame, to which are secured the electro-magnets B and the train of wheels C. *b* is a lever hung on a shaft at *b'*, to the short end of which is secured the armature b^2, and whose long arm is T-shaped and terminates directly beneath the carrier-block *c* and perforating-needle *c'*, and forming a sort of hammer with which to drive the needle.

F F' are simple levers, connected at their free ends to the carrier-block *c*, and which constitute my improved method of supporting and moving the carrier-block *c*. *f* is a spiral spring by which the levers are brought back and held in their normal position. *r* is a rest that supports the lever F and prevents any sagging of the carrier-block *c*.

At G is shown the device for operating the weight that drives the feed-rolls. The shaft *g* has a winding barrel and cord, *g'*, to which the weight *o* is attached; also, the disk g^2, to the face of which is secured a pawl, g^3, which pawl engages with the teeth of the ratchet-wheel *d'* upon the axle of the feed-roll *d*.

The disk g^2 and the ratchet-wheel *d'* are shown in close contact; but as the winding-shaft terminates at the face of the disk and the feed-rolls terminate at the ratchet-wheel *d'*, the only connection is through the medium of the pawl g^2.

The geared wheel H is secured to the shaft of the feed-rolls *d*, and is, in turn, connected with the train of the time-piece, (not shown in the drawings,) and by which the movements of the feed-rolls are made to move in unison with the clock.

In Fig. 3 is shown the manner of operating the levers F F' and the carrier-block *c*. To the shaft of the wheel *h* is secured the cam-wheel *h'*. The pin *i* in the lever F bears against the face of the cam-wheel, and as the wheel *h* revolves a swinging motion is imparted to the levers, as shown by the dotted lines.

The shaft *k* is connected by the arm *k'* to the long arm of the armature-lever *b*, while the arm k^2 stands in the path of the pin *j* in the wheel *h*, and serves as a stop-motion to the train of wheels C.

Fig. 4 is a side elevation, showing the stop-motion and also the position of the armature-lever *b* with relation to the carrier-block *c* and perforating-needle *c'*. It also shows the position of the needle *c'* with its relation to the guide-plates D D' and the spring c^2, by which the needle *c'* is held down in the carrier-block.

M is the registering-paper between the guide-plates D D'. The outer edge of the guide-plate D' is made to project beyond the plate D to facilitate the entrance of the paper, while, by bringing the inner edge close to the path of the needle, the paper is held securely in its place and cannot be drawn downward by the needle sticking in the paper.

The operation of my invention is thus described: The clock and registering apparatus

are connected by suitable wire and battery connections to any required number of boxes or stations, which stations are provided with a circuit-closer, which may consist of a simple telegraph-key, or, what I would prefer, an automatic circuit-closer consisting of a switch-wheel driven by a clock-train and spring, a full description of which is given in the specification of a patent allowed to myself and H. Whittemore, May 23, 1878. This switch-wheel is provided with a number of projections at its periphery, which may correspond in number to that of the station, and are so arranged that as the switch-wheel revolves, which it is caused to do by being wound with a key, the projections come in contact with a spring-switch so arranged as to close the electric circuit, thereby charging the electro-magnet B, which will draw the armature b^2 to the magnet, thus giving motion to the lever b, and, by means of the arm k', partially rotating the shaft k and displacing the arm k^2, allowing the wheel h, which is driven by a spring or weight power, to turn and give motion to the levers F F′ and carrier-block c.

The position of the needle with relation to the hammer is such that the first movement of the hammer does not drive the needle, it being beyond the path of the hammer when the carrier-block is at rest. As the switch-wheel revolves, the circuit is almost instantaneously closed and broken as each projection passes the spring-switch, each time charging the electro-magnet B, operating the lever b, and at each subsequent motion driving the needle and making punctures in the registering-paper corresponding to the number of projections on the switch-wheel.

As the punctures in the registering-paper correspond exactly with the projections on the switch-wheel, and the switch-wheel of each circuit-closer may differ in number or arrangement, each record on the paper will indicate from which station it was received.

The registering-paper has graduations upon it to represent the divisions of time corresponding to those upon the dial of the clock, and is caused, by the movement of the clock, through its connection with the feed-rolls by means of the guard-wheel H, to pass the perforating-needle at intervals corresponding to those indicated by the hands of the clock upon the dial. Thus, if the watchman at any given hour sends a record from a station, the number sent will be recorded on the registering-paper at the point indicating the hour at which it was sent, thereby making a permanent record of the time of sending, as well as the station from which it was sent.

The advantage claimed for my improved method of operating the carrier-block is, that by the use of the swinging levers the minimum of friction is obtained and greater accuracy of movement is secured.

The levers may differ in form from those shown, and any arrangement of the same whereby the needle, held between their free ends, is caused to move in a straight line will accomplish the purpose of my invention.

The advantage claimed by my improved method of driving the feed-rolls by the use of a weight attached directly to the axle of the rolls is, that much less weight is required than when applied in the ordinary way, one pound of weight applied directly to the feed-rolls in the manner herein described being equivalent to twelve pounds of weight working through the medium of the whole clock-train. It therefore requires no more weight to drive the clock than if it were used only for an ordinary timepiece.

I am thus enabled to use a lighter and less expensive clock, while any resistance offered to the feed-rolls is more easily overcome, and greater accuracy in the operation of the timepiece is secured; also, any danger arising from overloading the train is avoided.

Having thus fully described the purpose and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a time-registering clock, the levers F F′ and carrier-block c, with needle c', connected together and so arranged that when a swinging motion is imparted to the levers the needle c' will be carried in a straight line across the path of the registering-paper M, the whole operating in combination with the electro-magnet B, armature b^2, and vibrating lever b', in the manner shown, and for the purpose specified.

2. In combination, the electro-magnet B, connected with a series of circuit-closers, vibrating lever b, with armature b^2, swinging levers F F′, operating in connection with train C, carrier-block c, and needle c', feed-rolls d d, driven by weight o and connected with a timepiece by means of the wheel H, whereby it is made to move in unison therewith, all operating together to produce parallel rows of perforations at intervals of time indicated upon the registering-paper M, in the manner and for the purpose specified.

JOHN B. JOHNSON.

Witnesses:
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S. C. MILLS.