

(No Model.)

2 Sheets—Sheet 1.

H. T. JOHNSON.
ELECTRIC TIME RECORDER.

No. 524,386.

Patented Aug. 14, 1894.

Fig. 1.

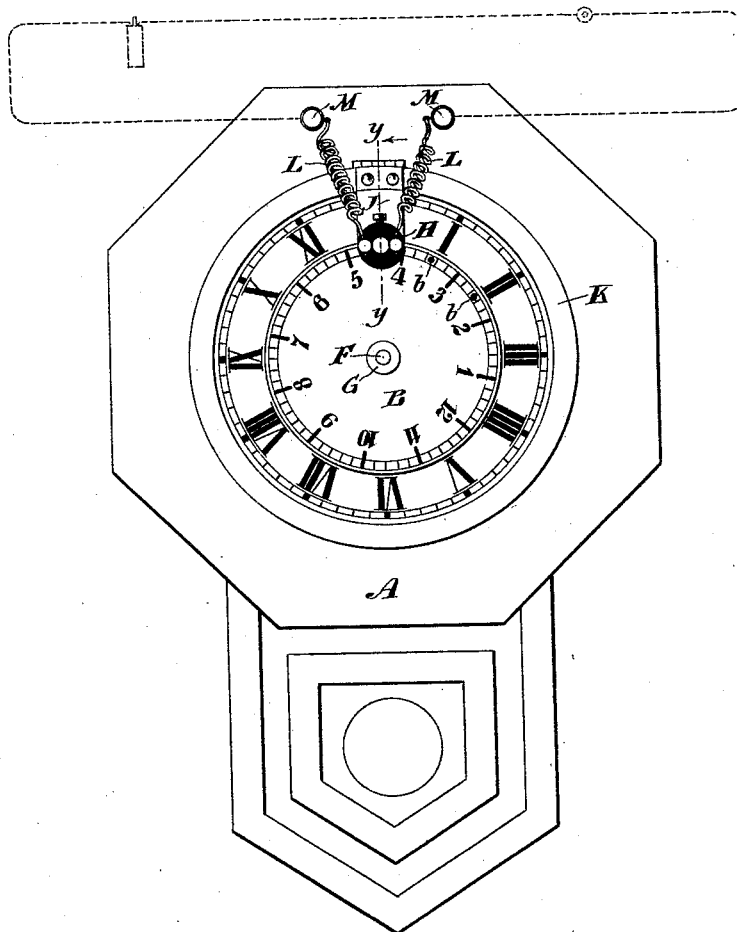
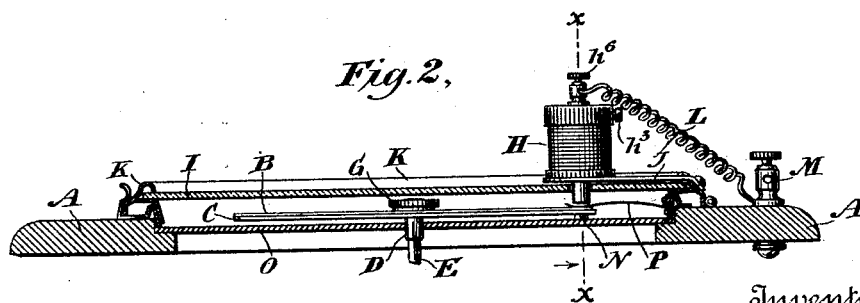


Fig. 2.



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Fig. 3.

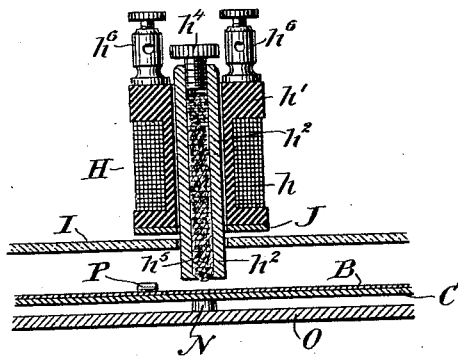


Fig. 4.

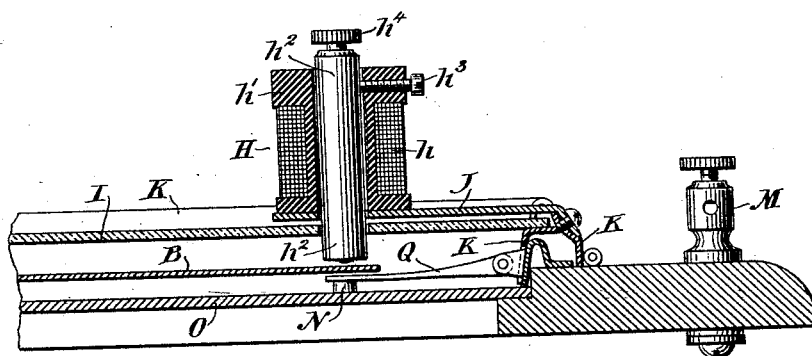


Fig. 5.

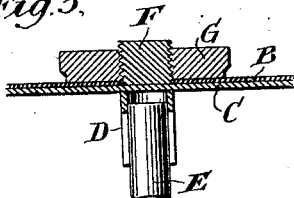
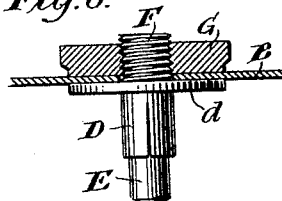


Fig. 6.



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UNITED STATES PATENT OFFICE.

HARRY T. JOHNSON, OF ELIZABETH, NEW JERSEY.

ELECTRIC TIME-RECORDER.

SPECIFICATION forming part of Letters Patent No. 524,386, dated August 14, 1894.

Application filed December 26, 1893. Serial No. 494,724. (No model.)

To all whom it may concern:

Be it known that I, HARRY T. JOHNSON, a citizen of the United States, and a resident of the city of Elizabeth, county of Union; and State of New Jersey, have invented certain new and useful Improvements in Watchmen's Time-Detectors, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to that class of apparatus which is employed to record the movements of watchmen and others and which, when an electric circuit, with one or more of which the apparatus is connected, is closed, will indicate the time at which the circuit or either of them is closed and thus check the movements of the watchman by recording his presence at one or more stations at certain specified, regular or predetermined times.

The object of my invention is to provide an apparatus of this character, simple in construction and effective and reliable in operation, which can be manufactured and sold at a comparatively low price; and to this end it consists in the novel combination, construction and arrangement of parts and details herein shown and described and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in elevation of one form of the apparatus which I employ. Fig. 2 is a cross section thereof. Fig. 3 is a detail sectional view showing the magnet and co-operating parts on the line $x-x$ (Fig. 2). Fig. 4 is a similar view on the line $y-y$ (Fig. 1) showing a modification. Fig. 5 is a detail sectional view showing the manner of attaching the chart, and Fig. 6 is a similar view showing a modification.

Similar reference characters are employed to designate corresponding parts in all the views.

In the drawings A is the motor, by which the record receiving chart or dial B is actuated. This motor as shown, may, and preferably does, consist of a clock which may be of any ordinary construction, and the only alteration required to adapt it for the purpose, is the removal of the hands.

The record receiving chart B is preferably constructed of paper and upon it are printed the hours of the day consecutively arranged from right to left, as shown. In the form of construction shown in Figs. 2, 3 and 5, the chart B is supported and carried by a circular disk C, of the same diameter as the chart.

The disk C is by preference made of thin sheet iron and to it is secured a thimble D, which fits on the end of the hour hand arbor or spindle E of the clock, so that the thimble, disk and chart will revolve at the speed the hour hand would have had, or once in twelve hours.

The thimble D is preferably kerfed or slotted, whereby its sides will yield slightly when fitted on the arbor E, so as to clasp it firmly while at the same time permitting it to be easily removed or adjusted.

The disk C is provided with an axial stud F, screw-threaded and projecting above the face of the disk. The charts B are furnished with a central opening or perforation which permits them to be slipped over the stud F so as to be flat against the disk C, to which they are securely clamped by the thumb nut G. In the construction shown, an electro-magnet H is mounted over the glass front I of the clock. The coils h of this magnet are carried on the spool h' and are arranged in a circuit comprising a suitable battery and a circuit-controlling device, such as a push button (see dotted lines, Fig. 1) by which the coils of the magnet are energized when the circuit is closed.

The core h^2 of the magnet is adjustably supported in the spool h' by the set screw h^3 which holds it firmly in place, but permits the distance between the chart B and the lower end or pole of the magnet, which projects through the glass I, to be varied, as desired. The core h^2 is of course made of soft iron and is bored out longitudinally to form a hollow chamber, which chamber or bore is somewhat contracted at its lower end and the upper end thereof is closed by a thumb screw h^4 or other equivalent device. This chamber is filled, or partially filled, with a fibrous or other packing h^5 , preferably of an absorbent nature, which is well saturated with a marking substance

such as aniline ink, the consistency of which is sufficient to prevent its dropping through the opening in the lower end of the core, but which is possessed of sufficient fluidity to enable it to permeate the packing h^5 .

I prefer to employ the thumb-screw h^4 to close the top of the chamber in the core h^2 , because it can be adjusted to bear against the packing h^5 with a greater or less degree of pressure, thereby regulating the flow of the marking compound to the force of the magnet core.

The magnet H is carried by an arm J which is attached to the rim K in which the glass front of the clock is mounted.

The coils h of the magnet are connected to the binding posts h^6 which are, by the wires L, connected to the binding posts M mounted on the frame of the clock and to which the terminals of the circuit are connected.

A pin N may be secured to the dial O of the clock to serve as a bearing for the chart B or disk C, and a light spring P, secured to the rim K, and projecting over the chart B, normally holds the chart B away from the pole h^2 of the magnet.

The operation of my device (Figs. 1, 2, 3 and 5) is as follows: The clock or other motor being wound and started, and the disk C having been secured firmly in place by slipping the thimble D on the end of the arbor E, a chart B is placed upon the disk and after having been adjusted so that that particular portion of its circumference which represents the time at which the chart is attached, lies under the center of the magnet core h^2 , the chart is secured to the disk by screwing down the nut G. The chart B will then be revolved regularly and continuously from left to right, one numbered subdivision passing under the core of the magnet every hour. When the circuit is closed by pressing a push button, or otherwise, the magnet will be energized and will attract the iron disk C which acts as an armature for the magnet. There is in ordinary clock movements usually sufficient lost motion to allow the disk to tilt under the attractive force of the magnet applied at its outer edge, and to carry the chart B into contact with the pole of the magnet and with the fiber projecting through its lower end. This, as stated, being saturated with some suitable coloring matter, produces a colored impression b on the chart B in the exact location on its circumference which corresponds with the time at which the circuit is closed. As soon as the circuit is broken by releasing the push button, the disk or armature C is released and returns to its normal position under the action of spring P which is, however, not of sufficient tension to overcome the attractive force of the magnet. When the circuit is again closed, the operation is repeated and a second impression will be made on the chart, each impression showing the exact time at which the circuit is closed. When the chart B has

made one complete revolution, it may be removed and filed away for reference, and a fresh one placed in position.

Instead of depending on the lost motion in the bearings of the hour hand arbor to allow the disk C to tilt bodily to bring the chart into contact with the magnet, as above described, the disk C may be made thin and sufficiently flexible to permit the periphery thereof to be drawn up so as to carry the chart against the magnet pole, without any corresponding movement of the arbor in its bearings.

Although I have shown an instrument arranged to be operated from one station only, it will be apparent that the record may be made from a number of different stations by simply arranging a number of magnets over the chart at different distances from the center of the chart, each of which magnets is included in a separate circuit, a circuit closing device being provided at the desired point or station for each circuit.

I do not wish to be understood as limiting my invention to the specific means or device for producing the impression on the chart which I have shown and described herein, since other means may readily be substituted therefor without departing from the spirit of my invention so long as the magnet is mounted over or in proximity to the chart, or so long as the chart is carried into contact with the impression device by the action of an armature beneath the chart.

In Figs. 4 and 6 I have shown a modified construction in which the revolving, chart-supporting, disk armature C is dispensed with. In this construction, the chart is carried by the thimble, being held between a flange d secured to the thimble, and a thumb nut, and the armature Q, which carries the chart into contact with the impression device, is pivoted at one side of the dial. Resting normally on the pin N under the chart B, it will carry the chart into contact with the impression device when the magnet is energized.

The simplicity of my apparatus will insure its reliable operation at all times, and also enables me to produce a practical, operative instrument at a fraction of the cost of the complicated apparatus which is now generally employed for like purposes.

It will also be observed that when the motor employed is a clock, the recording attachments may be removed and the hands replaced when it will serve as an ordinary time piece, the functions of which will not have been impaired by its employment as a motor for the time detector and that if desired the apparatus may be readily arranged so that it will indicate correct time when the recording mechanism is in operation.

Another desirable feature of my apparatus is that the action of the impression producing device shown herein does not retard the

movement of the chart, so that if the circuit should become accidentally closed, the dial will continue to revolve and the chart will show the exact length of time during which the circuit is thus closed.

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

1. In a watchman's time detector an electro-magnet provided with a pole which carries an impression-producing device, an armature for said magnet and a record chart mounted to revolve between the armature and the impression-producing device substantially as shown and described.

2. In a watchman's time detector, the combination with a clock or motor carrying the record chart, an electro-magnet having a hollow core mounted in front of the chart and containing a marking substance such as described, an aperture in the magnet core through which the marking substance is fed to its lower face, and an armature back of the chart co-operating with the magnet to carry the chart into contact with the marking substance when the magnet coils are energized, substantially as shown and described.

3. In a watchman's time detector an electro-magnet mounted directly in front of the record chart, an impression device carried by the pole of said magnet, an armature for said magnet and a record chart mounted to revolve

between the magnet pole and the armature whereby when the magnet coils are energized the chart will be lifted by the armature into contact with the impression device, substantially as shown and described.

4. In a watchman's time detector, the combination with a clock or similar motor, of a revolving disk armature carried thereby, a chart removably secured to said armature, an electro-magnet having its pole mounted in front of the chart, an aperture in said pole communicating with a chamber or reservoir containing a marking substance such as described, an absorbent substance held in said aperture, and an electric circuit and circuit-closing device, substantially as shown and described.

5. In a watchman's time detector, the combination of a chart-carrying mechanism, an electro-magnet, and means for supplying a marking substance to the pole face of the magnet, substantially as shown and described.

6. In a watchman's time detector, the combination of the chart carrying mechanism, with an electro-magnet having a hollow core apertured to feed a marking substance to the pole face of the magnet, substantially as shown and described.

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