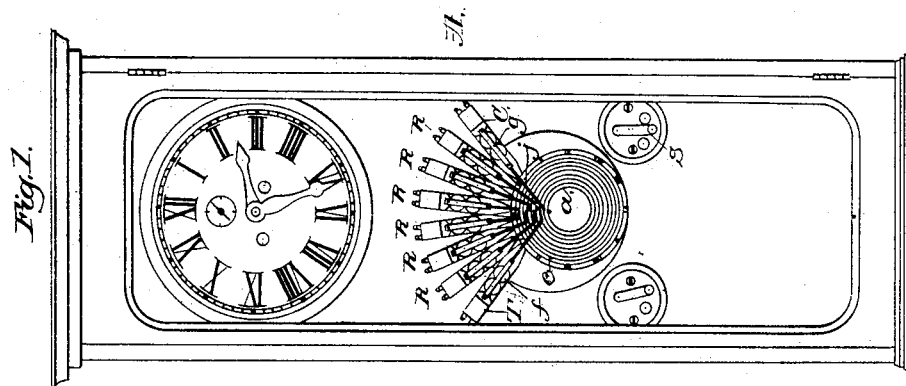
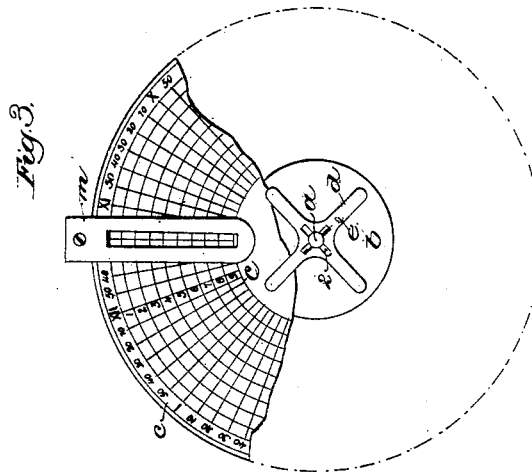
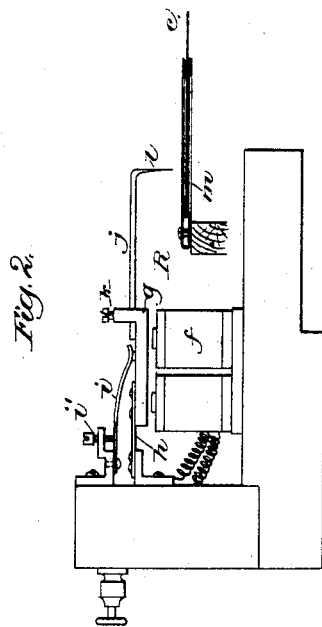


G. W. ADAMS.

WATCHMAN'S ELECTRIC REGISTER.

No. 265,912.

Patented Oct. 10, 1882.



Witnesses.
John F. C. Prinkert
Fred A. Powell

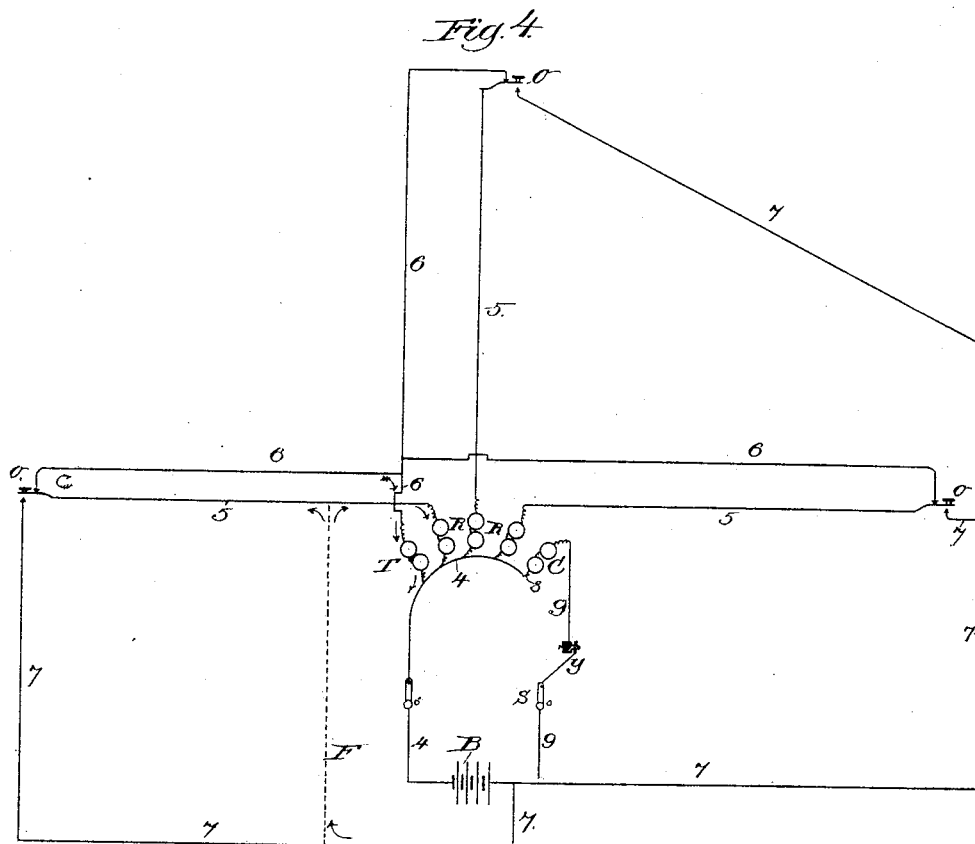
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UNITED STATES PATENT OFFICE.

GEORGE W. ADAMS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE BOSTON ELECTRIC PROTECTIVE ASSOCIATION, OF SAME PLACE.

WATCHMAN'S ELECTRIC REGISTER.

SPECIFICATION forming part of Letters Patent No. 265,912, dated October 10, 1882.

Application filed August 22, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. ADAMS, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Electric Watchmen's Registers, of which the following description, in connection with the accompanying drawings, is a specification.

My invention relates to an electric watchman's register of that class in which the watchman, by operating keys or circuit-controlling devices at various points or stations, causes a signal to be recorded by a recording device in circuit with the said key upon a surface traveling with uniform speed—as a dial rotated by clockwork—so that a complete record is made upon the dial of the time at which the watchman visited each station and operated the key there.

The present invention has for one of its objects to detect an attempt on the part of the watchman to evade duty by closing the circuit of any of the recording-instruments at any other point except where its key is located; and it consists in the combination, with each key, of what may be termed a "tell-tale" wire or circuit, the said tell-tale wires from all the keys passing through a single tell-tale recording-instrument common to all the stations. The circuits are in this instance normally-open branches passing from one pole of the common battery through the actuating-magnet of each recording-instrument, and thence to the corresponding key, and one wire passes from the same pole of the battery through the tell-tale recorder, and thence to all the said keys, at each of which the said tell-tale wire is connected to the back stop or contact-point of the key, so that the said tell-tale wire and station circuit-wire are normally connected together; but when the key is depressed the said wires are disconnected. A battery-wire passes from the other pole of the battery to the anvil-piece of each key, so that by depressing the key the circuit is closed therefrom and the battery thrown upon the corresponding recording-instrument, which is thus caused to make its record. If, however, the said circuit is closed otherwise than by depressing the key—as by throwing a battery-wire on at any other point—the current will divide, a portion passing directly through the corresponding station recording-

instrument and a portion passing from the key to the tell-tale wire and recorder, so that a simultaneous record will be made by the tell-tale instrument and by the instrument of the station which the watchman sought to evade visiting without detection. The clock-case containing the recording-dial is provided with a circuit-closer operated by opening the case, and controlling a recorder, so that if the watchman should attempt to make his record by opening the clock-case that fact would also be recorded. The said clock-case recorder is operated when the recording-dial is removed and a new one inserted, so that a record of the time of the said operation is made. The recording-instrument consists of a sharp-pointed finger at the end of an arm connected with the armature of an electro-magnet, which in this invention is arranged to operate as an automatic circuit-breaker, so that the pointed finger is vibrated rapidly, thus insuring a certain and distinct record upon the paper passing beneath it.

Figure 1 is a front elevation of a clock provided with recording apparatus such as employed in practicing my invention; Fig. 2, a side elevation of one of the recording-instruments detached; Fig. 3, a front elevation of the recording-dial on a larger scale, and Fig. 4 a diagram illustrating the circuit and keys.

The recording apparatus is contained in a clock-case, A, of any suitable construction, it having an arbor, *a*, arranged to make a revolution once in twelve hours, the same as the hour-hand of the clock. The said arbor is provided with a disk, *b*, (see Fig. 3,) upon which a paper dial, *c*, may be fastened by a spring-spider, *d*, provided with a slot, 2, to enable it to be removed from or placed upon the arbor *a*, which is provided with a cross pin, *e*, to hold the said spider in place, with the paper clamped between it and the disk *b*, as shown in Fig. 3. The paper dial *c* is divided by radial divisions representing time, the said divisions coming successively into a vertical position in the rotation of the dial with the arbor *a*, and they are divided into a series of concentric divisions corresponding to the number of recording-instruments comprised in the apparatus. Each of the said recording-instruments, as

shown in Fig. 2, consists of an electro-magnet, *f*, the armature *g* of which is mounted on a spring, *h*, normally pressing it against a back contact-spring, *i*, the said parts *g h i* being included in the circuit of the magnet *f*, so that when the said circuit is completed the said armature *g* will be automatically vibrated, making and breaking the circuit between it and the spring *i*, which is made adjustable toward and from the armature *g* by means of the screw *j*. The said armature *g* carries an arm, *j*, fixed thereon by the set-screw *k*, and provided at its end with a puncturing-finger, *l*, which is brought above the proper concentric division of the dial *c* and in line vertically above the arbor *a*, so that when the said armature *g* is vibrated the point or finger *l* will pierce the paper of the dial in the concentric division corresponding to the particular recording-instrument that is operating and in the radial division that happens to be uppermost, according to the time when the said recording-instrument is operated.

The various recording-instruments *R* are arranged, as shown in Fig. 1, around the dial *c*, and their points *l* are brought to the proper position by adjusting the arms *j* longitudinally with relation to the armatures *g* and bending them laterally when necessary. The paper of the dial *c* is supported at the point pierced by the fingers *l* by means of a metallic strip, *m*, embracing the said paper above and below, as shown in Fig. 2, and slotted, as shown in Fig. 3, where the fingers *l* strike. By making the actuating-armature of the puncturing-finger operate as an automatic circuit-breaker a large number of blows will be struck by the end of the finger in substantially the same place upon the paper in the time occupied by the operator in depressing the circuit-closing key; instead of the single blow that would be produced if the coils alone of the magnets *f* were included in the circuit. Such a single blow is not certain to puncture the paper unless a very great battery-power is employed; but by the rapid succession of blows the paper is sure to be punctured, and an easily-discernible record produced with a comparatively small battery-power. The clock is provided with as many of the station recording-instruments *R* as there are stations to be visited by the watchman, and also with two additional instruments, *T C*, the former constituting the tell-tale recorder and the latter the clock-case recorder, the former indicating any closure of any of the circuits except at the proper point, and the latter indicating if the clock-case has been opened.

The operation of all the recording-instruments is shown in the diagram Fig. 4. The battery *B*, by which they are all actuated and which may be kept in the clock-case, has one pole connected by the wire 4 with one terminal of each of the magnets of the recording-instruments, and the other terminal of each of the station-recorders is connected by wire 5 with the key *o*, placed at the station the watchman is to visit. The other terminal of the tell-

tale recording-instrument *T*, Fig. 4, is connected by wire 6 with a back contact-point for each of the keys *o*, which thus normally connect the wires 5 of the station recording-instrument with the corresponding wire, 6, of the tell-tale recorder. The other pole of the battery *B* is connected by wires 7 with anvil-pieces for the various keys *o*, so that when any one of the said keys is depressed the circuit is closed through the corresponding station-instrument, but the key is at the same time disconnected from the tell-tale wire 6, so that no current is sent through the tell-tale recorder *T*. If, however, it is attempted to connect the battery-wire 7 with one of the station-wires 5 at any other point except at the key *o*, as indicated by the dotted line at *F*, it will be seen that a divided circuit is afforded, a portion of the current passing through the wires 7 and 5 and the corresponding station-instrument, and another portion passing from the wire 5 to the key *o*, and thence to the wire 6, and through the tell-tale recorder *T*, so that a simultaneous record is made both by the station and tell-tale instruments, thus indicating the improper closure of the circuit and which circuit was so closed.

The clock-recorder *C* is in circuit between the wires 8 and 9, connected with the poles of the battery, and including a circuit-closer, *y*, operated by the door of the clock after the manner of the usual burglar-alarm circuit-closers, it being retained open when the door is closed, and closing the circuit the moment the door is opened.

The switch *S*, inside the clock-case, which is shown in Fig. 1 as provided with a glass front, enables the operator to open the circuit of the recorder-instrument *C*, so as to prevent it from operating while he is changing the dials. After a new dial is inserted in the proper position the switch *S* is closed, thus causing the clock-recorder *C* to produce a signal while the door is being closed and another when it is again opened, so that the time of supplying and removing the dial is thus recorded on the face of it. In case the watchman should attempt to produce his record at the clock instead of from the keys *o*, the clock-recorder *C* would produce a record of the time that the clock was opened for that purpose.

I claim—

1. In a watchman's detector, the combination, with the traveling recording-surface, of the recording-instrument consisting of an electro-magnet, its armature and back contact-point therefor in circuit with the said magnet, and the arm provided with a puncturing-finger mounted on and actuated by the said armature, substantially as described.

2. The combination of a series of station recording-instruments, conductor leading therefrom to a series of corresponding stations, circuit-controlling devices at the said stations, and tell-tale recording-instrument and conductors leading therefrom to all the said stations, and normally connected through the said

circuit-controlling devices with the conductors leading to the several station recording-instruments, whereby if a signal is given otherwise than by the circuit-controlling device at the station a simultaneous record will be produced by the tell-tale recording-instrument and one of the station-instruments, substantially as described.

3. The traveling recording-surface and series of recording-instruments and inclosing-case therefor, combined with a recording-instrument and circuit-controlling device there-

for, operated by the door of the said case, whereby a record is made of the opening of the door, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEO. W. ADAMS.

Witnesses:

JOS. P. LIVERMORE,
FRED A. POWELL.