3 Sheets--Sheet 1.

J. T. BEDFORD.

Electric Burglar-Alarm and Annunciator.

No. 169,077. Patented Oct. 26, 1875.

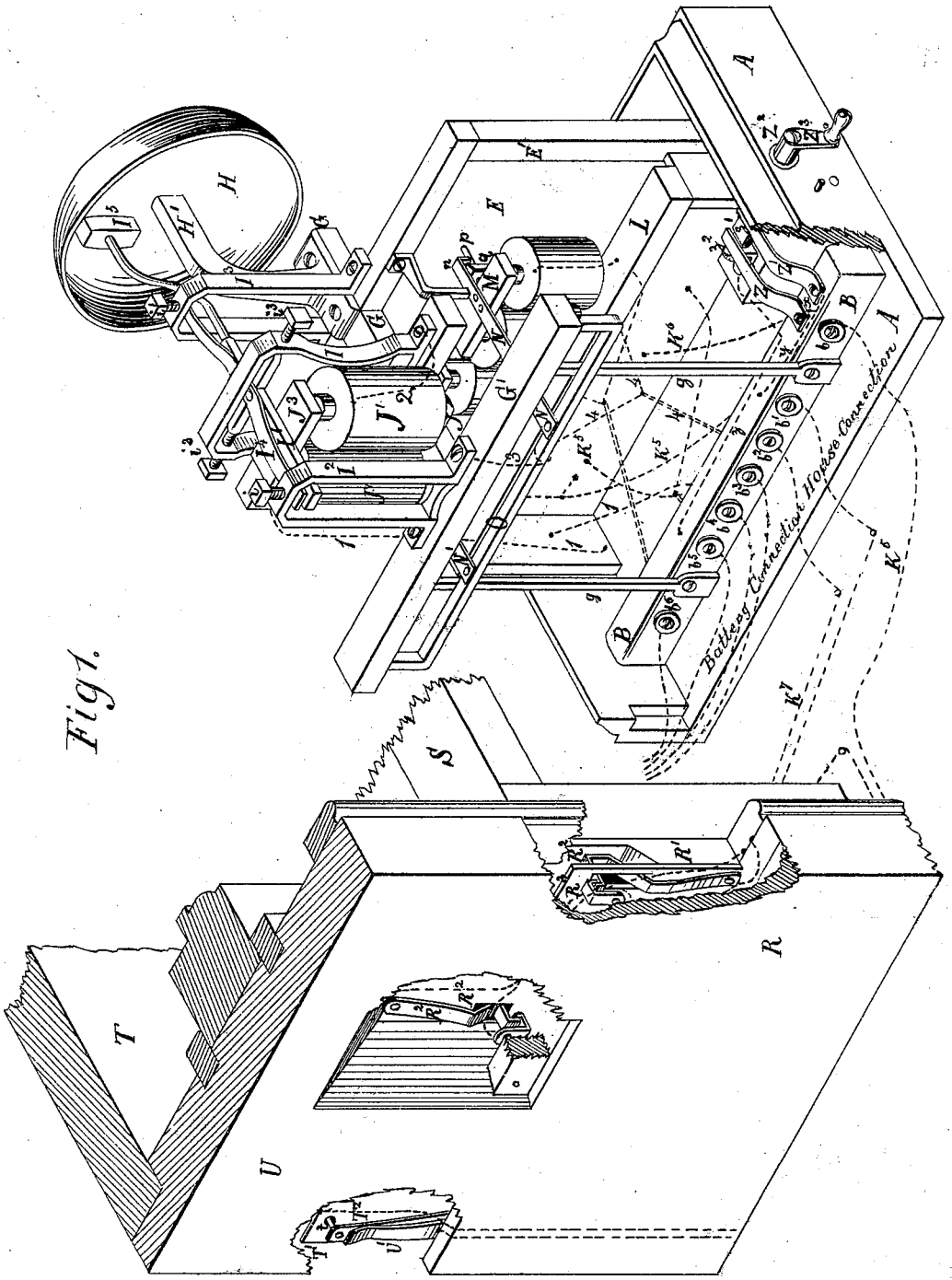

Fig 1.

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Fig 4.

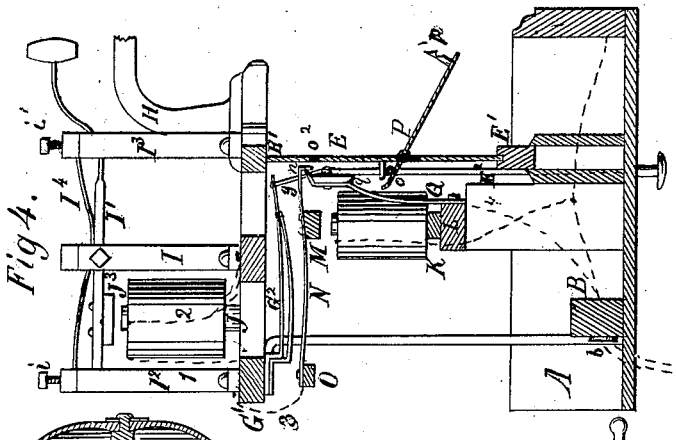
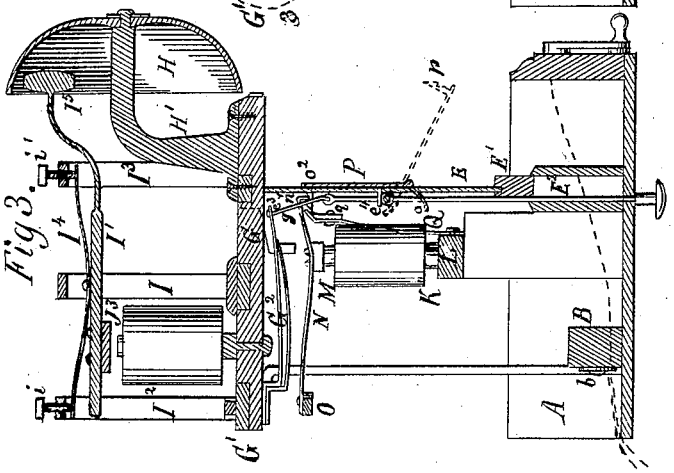


Fig 3.



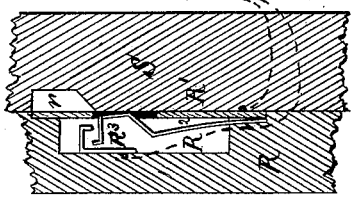
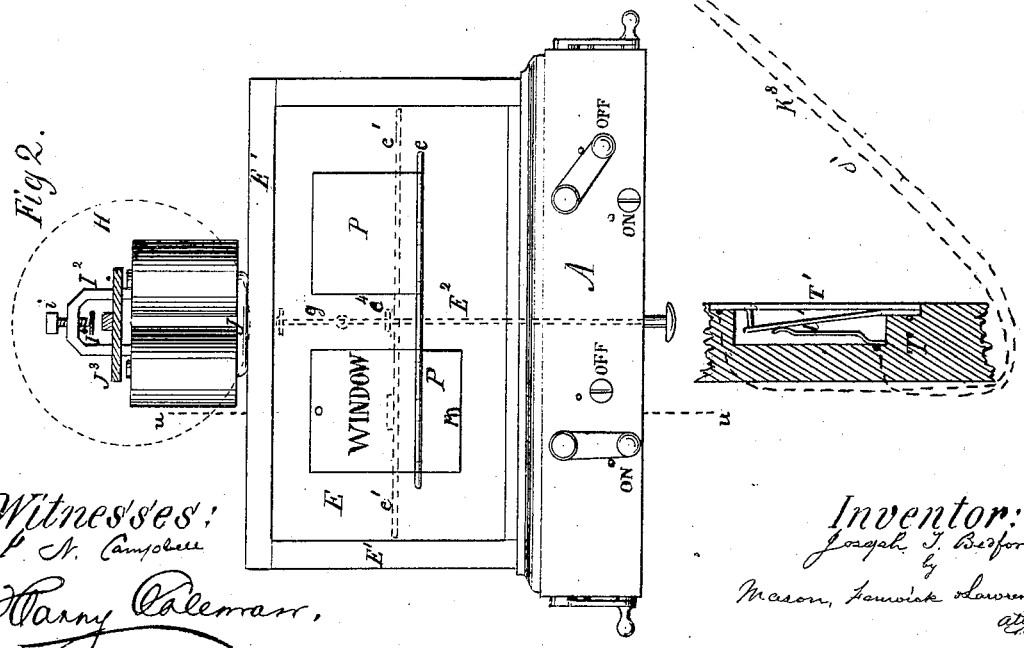


Fig 2.



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3 Sheets--Sheet 3.

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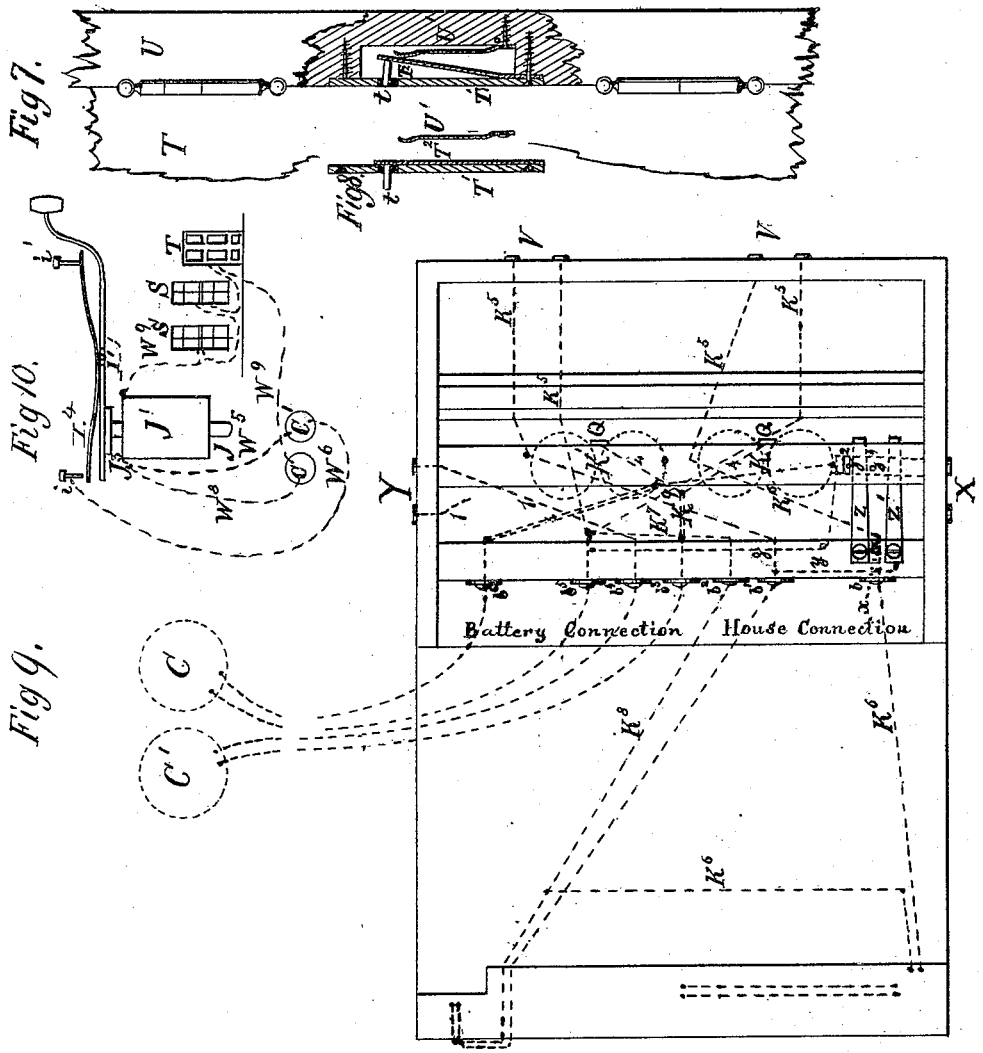

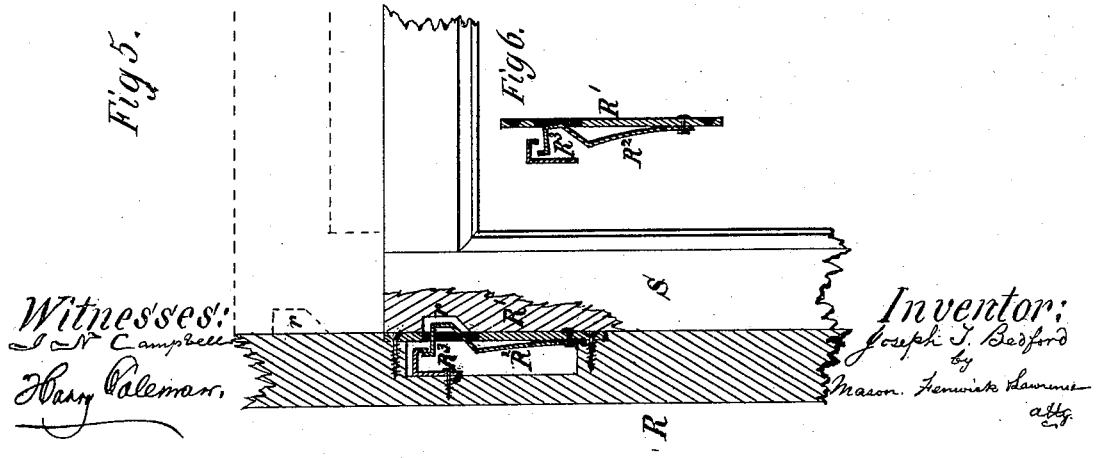

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UNITED STATES PATENT OFFICE.

JOSEPH T. BEDFORD, OF NEW YORK, N. Y.

IMPROVEMENT IN ELECTRIC BURGLAR-ALARMS AND ANNUNCIATORS.

Specification forming part of Letters Patent No. **169,077**, dated October 26, 1875; application filed July 9, 1875.

To all whom it may concern:

Be it known that I, JOSEPH T. BEDFORD, of the city, county, and State of New York, have invented a new and useful Improvement in Magnetic Burglar-Alarms and Indicators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of an instrument illustrating my invention as applied to both a door and a window. Fig. 2 is a front view of the instrument. Fig. 3 is a longitudinal central section of the instrument as applied to a door and set for action. Fig. 4 is a longitudinal section, showing the instrument applied to a window, and as indicating and sounding an alarm in line *u u*, Fig. 2. Figs. 5 and 6 are detail views of the circuit-breaker adapted for application to a window. Figs. 7 and 8 are detail views of the circuit-breaker adapted for application to a door. Fig. 9 is a diagram illustrating the connection of the different circuits. Fig. 10 is a diagram illustrating a modification of the invention.

The nature of my invention consists in certain constructions and combinations of the several parts of magnetic alarms and indicators, as hereinafter described and specifically claimed, whereby the instrument is greatly simplified, rendered more convenient of management, and whereby many objections to instruments of this kind in use are overcome, as will be hereinafter shown.

A is the base of the instrument; B, an insulating-bar, to which binding-screws b, b^1, b^2, b^3, b^4, b^5, and b^6 are fastened. C C′ are batteries connected with the binding-screws b^3, b^4, b^5, and b^6 by means of wires, and R U are portions of a building to be guarded, connected to the binding-screws b b^1 b^2 by means of wires. E is the indicating-plate of the indicator. It is made of suitable material, and marked off with characters—such as, for instance, "Window," "Door," "Hall." In front of each of these characters a cover, P, is placed, and by the swinging down of this cover the character behind it will be exposed to view, and the point where the burglar is operating made known, as illustrated in Fig. 2 of the drawings. This indicating-plate is arranged to form the front of the case of the instrument. H is an alarm-bell, supported by a bracket, H′. I is a standard or fulcrum for the lever I^1 of the bell-hammer I^5. i^3 i^3 are set-screws forming the pivotal bearing for the axis of the lever. I^2 I^3 are stands or controlling-brackets under which the lever vibrates. I^4 is a double-acting spring for actuating the hammer-lever. i i^1 are screws for controlling the extent of the vibration of the hammer-lever. J is the bell-magnet, consisting of two coils. J^3 is the armature of the bell-magnet. It is attached to the lever I^1. The parts named, relating to the alarm-bell, are to be suitably mounted on the top portion of the instrument-case.

The movements of the lever I^1 and its armature are controlled by the spring I^4 and the two set-screws i i^1, as follows: The spring being attached about midway of its length to the top of the lever, and its respective ends lying under the screws i i^1, it acts to alternately rebound the lever, and thus the lever is quickly acted upon, and when the hammer falls the rear end of its lever and spring will be thrown up against the set-screw i, and the spring will strike this screw and thereby cause the lever to rebound and come so close to the bell-magnet that very little magnetic power will be required to bring the armature in contact with the magnet. The set-screw i, by contact with the spring I^4, conducts the electric current to the standard I^2. K is the magnet of the indicator. It is fastened to a support, L, behind the indicator-plate, and its armature M is suspended by a spring, N, which is fastened to a metallic rod, O, below the top of the instrument-case G. The armature-spring is provided with a catch, n, on its forward end, and the indicator-cover with a hook, p, and the catch n engages with the hook p when the cover is raised and the hook has been passed through an opening, o^2, in the indicator-plate, as shown in Figs. 3 and 4. When the armature is released from its magnet it is raised by its spring N, and the catch n disengages from the hook p, and the cover falls down, as shown in Figs. 2 and 4. The cover P is provided with a tail-piece, o, which extends through the indicator-plate, under a horizontal rod, e^1, of a draw-bar, E^2. The draw-bar is connected to a spring, G^2, by

a link, g, and is guided by a staple, e^4. By pulling down the draw-bar the cover P is raised in front of the indicating-characters, and secured by becoming re-engaged, through its hook p, with the catch n.

In practice a series of indicating-characters, covers, armatures, and magnets will be provided in the instrument. In such case one draw-bar, with its cross-bar, will raise all the covers. Q is an upright spring placed in such relation to the spring N that an electric connection will be made when the catch n and hook p are disengaged from one another, as shown in Fig. 4. When these parts are engaged the circuit is broken by the hook p coming in contact with an insulator, q, on the spring Q, and thereby separating the spring Q from the spring N, as shown in Fig. 3.

The operating parts, which are used on a window in connection with the indicator or alarm, consist of a stationary plate, R^3, and a spring, R^2, which are so constructed that they are in contact when the window is closed, and out of contact when the window is open. R^1 is a perforated plate fastened to the frame R, and having the spring R^2 connected to it. The plate R^3 is also attached to the window-frame. The spring R^2 and plate R^3 are shaped to engage with each other, as shown in Fig. 5, and the former has an angular bend in it, which enters a recess, r, in the sash S, which recess is in line with the spring in the plate R^1. The said bent portion is impinged upon by the sash when the sash is raised. By thus impinging upon the spring R^2 it is forced out of contact with the plate R^3, and the circuit is thereby broken, as illustrated in Fig. 6.

The operating parts, which are fastened to a door-frame, U, and form the circuit-breaker, are as shown in Figs. 7 and 8. These consist of a spring, T^2, having a pin, t, and a circuit-completing plate, U′. The parts T^2 and U′ are placed in a recess of the door-frame, and are covered by a perforated plate, T^1, through which the pin t moves when the door is opened. The normal position of the parts is shown in Fig. 7, and this is changed and the circuit broken by the pin t being released as the door is opened. It will be understood that the door binds against the pin t when it is closed, and that the act of opening the door permits the spring to act, and assume the position shown in Fig. 8, by its pin t passing through the opening of the plate. The upper sashes are provided with the same operating parts as the lower sashes, but owing to the reversed motion the said parts are arranged in a reverse position, or upside down. The magnet K is operated from the battery C, and the negative wire K^5 thereof is provided with a switch, V, whereby the connection with the coil may be returned to this battery direct instead of completing the circuit through the house. If the current is run through the protected portion of the house, and from thence to the negative binding-screw b^2, and thence to binding-screw b^5 by wire K^7, and thence to the battery C, it is compelled to follow the wire K^6 through the binding-screw b into the house through the circuit-breakers of the sashes, and back on the wire K^8 through the binding-screw b^2, and on a short wire, K^7, which is connected with the negative wire K^5, and from thence to battery C through binding-screw b^5.

By my plan, as described, the circuit of battery C is broken by the circuit-breakers on the doors and sashes, and when the circuit is broken the armature M rises, and allows the indicator-cover to swing down, and at this instant a connection with the alarm-circuit is made, said circuit-wire K^9 being in connection with battery C′ through binding-screw b^3.

When the whole machine is to be inactive a main or combination switch, X, comes into requisition, which affords, when used, a more direct or shorter route from the coils of the magnets K K to the battery C, through wires $x\ y\ z$. The wire x connects the wire K^6 with the conducting spring-plate Z. The wire y connects the wire K^9 with the spring-plate Z^1, and the wire z makes connection between the negative binding-screw b^5 of battery C and the cam z^1 by means of the fulcrum-stand z^2 of the cam-shaft Z^2. As the highest part of said cam is turned up by means of the crank Z^3, the spring-plates Z Z^1 touch it, and the short route of the combined circuits is thereby effected, and the whole machine becomes passive without breaking the normal circuit.

Battery C′ runs an open circuit, by which the alarm is operated. The binding-screw b^4 of this circuit is connected by the wire 1 and the interposed switch Y with the bell-magnet J, and by the wire 2 the current is conducted to the standard I, and through the center screws i^3 i^3 to the lever I^1 and its balancing-spring I^4; thence through the set-screw i and stand I^2 and connecting-wire 3 to the metallic rod O. The current now follows the spring N and the upright spring Q, (provided the cover P is disengaged,) and follows the wire 4 to the negative binding-screw b^3 of battery C′.

When the machine is set for operation the switches Y X are out of action—that is, the short routes for the circuits are disconnected. If, for instance, a window-sash should be raised, the circuit of the magnet K will be broken, as seen in Fig. 4, and its armature M and the spring N released and allowed to rise and disengage the catch n and hook p of the armature M from the cover P, and allow the cover P to swing down and expose the word "Window." The spring Q at this instant moves forward until its upper end comes in contact with the catch n and makes connection with the battery-circuit C′, as shown in Fig. 4. The connection being made, the current passes from battery C′ to binding-screw b^4 and to the wire 1, and through the switch Y; thence to the bell-magnet J, and from thence to standard I by wire 2, and from thence through

the center screw I^3; thence through the arm of the lever I^1 and through spring I^4, at which point the connection is only maintained while the spring is in contact with the screw *i*. From the set-screw *i* the circuit is continued through standard I^2 on wire 3 to rod O, and from thence to and through springs N and Q, through wire K^9, to the binding-screw b^3, and back to the battery C′. A short time before the armature J^3 touches the magnet J the contact between the back end of the spring I^4 and the screw *i* ceases, and the armature finishes its descent by attraction of the magnet, and the blow on the bell follows. The forward end of the spring I^4 overcomes the spent power of the magnet by rebounding the hammer from the bell. This re-establishes the closed circuit by the contact of the screw *i* with the back end of the spring I^4, while the spent power of its front end gives a new impetus to the back end, by which the now recharged magnet J is assisted in re-attracting its armature, thereby causing a rebound upon the front end of the spring I^4.

If an alarm should be desirable without an indicator, the arrangement of the batteries and their connections with windows, doors, or other movable structures then would be as shown in Fig. 10, in which plan the connection by wires W^8 and W^9, between the magnet J, battery C, and the window-sash S and door T, and also the connection by wires W^6 and W^5 between the same magnet J^1, the lever I^1, the set-screw *i*, and battery C′ would be as shown. Under this arrangement the circuit of battery C is broken by the circuit-breakers, as in the other plans described and shown, and battery C ceases to act on the armature J^3, but it is immediately acted on by battery C′ through the connection *i*, and the lever vibrated and an alarm sounded. The wires W^8 and W^9 work in a closed circuit, while W^5 and W^6 work in an open circuit. By moving down the rod E^2, and checking its upward motion by a catch retaining its handle, the covers P P′ are kept permanently closed, and the indicator and alarm are thrown out of action, and this adjusting device may be used as a substitute for the switches in the event of their getting out of order.

In practice, a separate rod, E, to each cover may be provided for stopping the action of a connected circuit, which would be equivalent to the turning off of a single switch, and serve as a valuable substitute in case of accidental disorder of such a switch.

What I claim is—

1. The switch X, composed of the cam-shaft Z^2, the cam Z^1, the spring-plate Z, and the wires *x y z*, connected, respectively, with the wires K^6 K^9, and the negative wire of the operating-battery C, constructed and operated as and for the purpose set forth.

2. The combination of the distributing and returning wires of battery C, and the connecting wires of battery C′, the binding-screws, the armature-magnet J^1, and the spring I^4, substantially as and for the purpose described.

3. The double-acting spring I^4, in combination with the lever of the alarm-bell, and with the screws *i* i^1, constructed and operated substantially as and for the purpose specified.

4. The combination of the cover P, having tail-piece *o* and hook *p*, the spring N, the rod E^2, and bar e^1, constructed and operated substantially as and for the purpose specified.

5. The circuit-breaker, consisting of the plate R^1, the spring R^2, and the plate R^3, substantially as described.

6. The spring R^2 fastened to the plate R^1 which covers it, and bent as shown, so as to avoid much cutting away of the sash, in combination with the plate R^3, substantially as herein described.

7. The combination of the springs N and Q and indicator-covers P, whereby a simultaneous operation of the said indicator-covers and a closing of the circuit for the alarm magnet is effected, substantially as hereinbefore specified.

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