

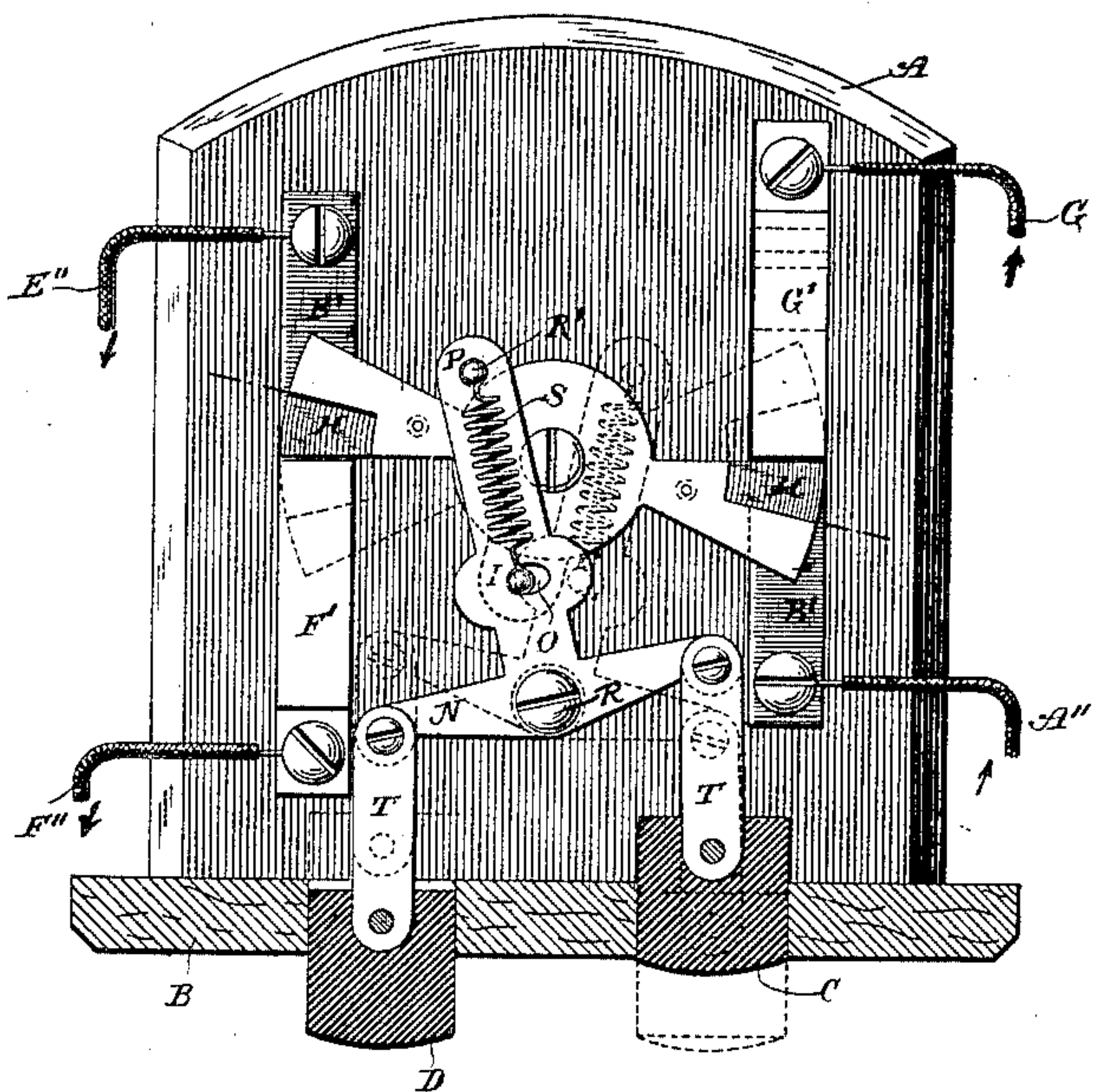
(No Model.)

L. T. STANLEY & H. B. CUTTER.  
ELECTRICAL SWITCH.

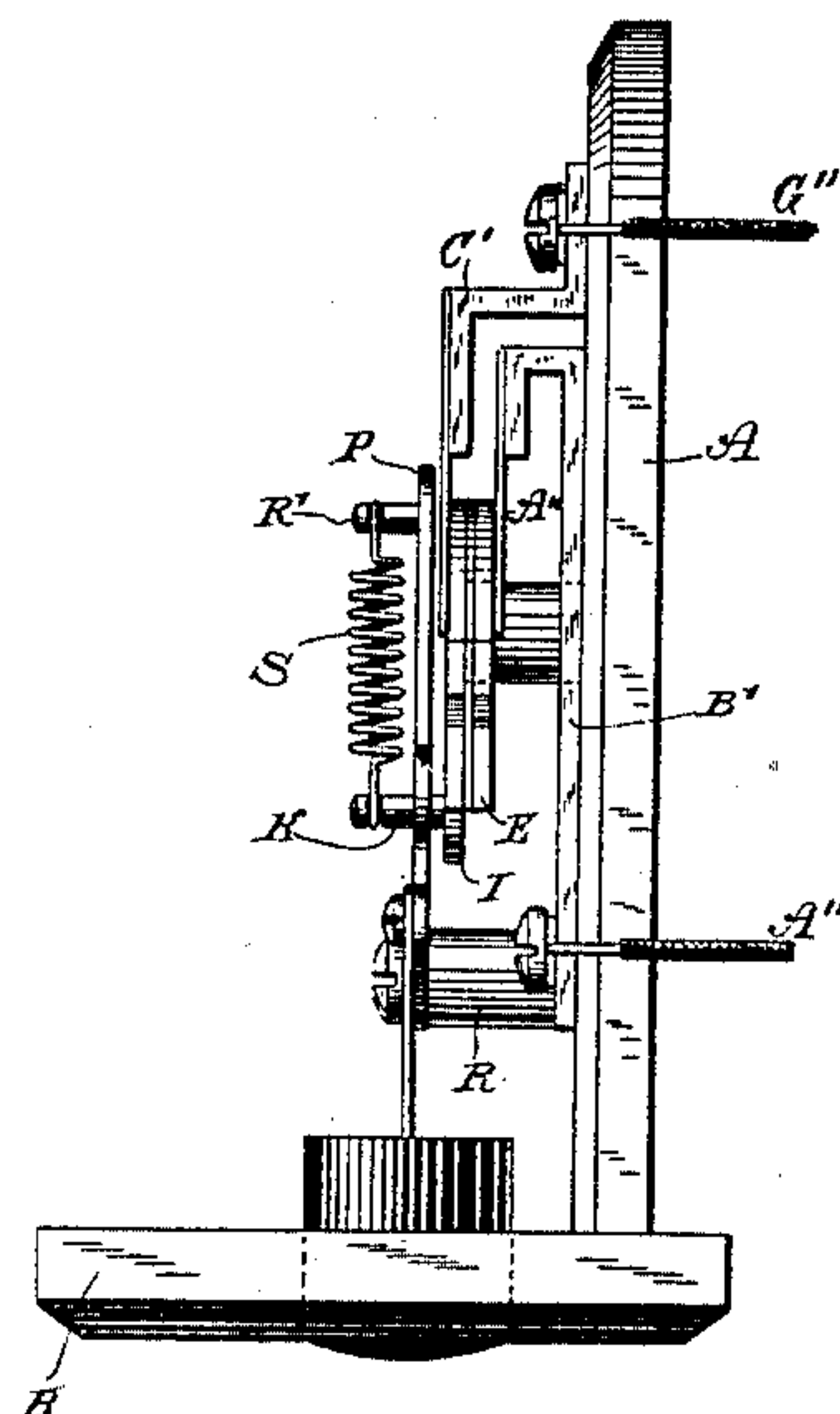
No. 437,667.

Patented Sept. 30, 1890.

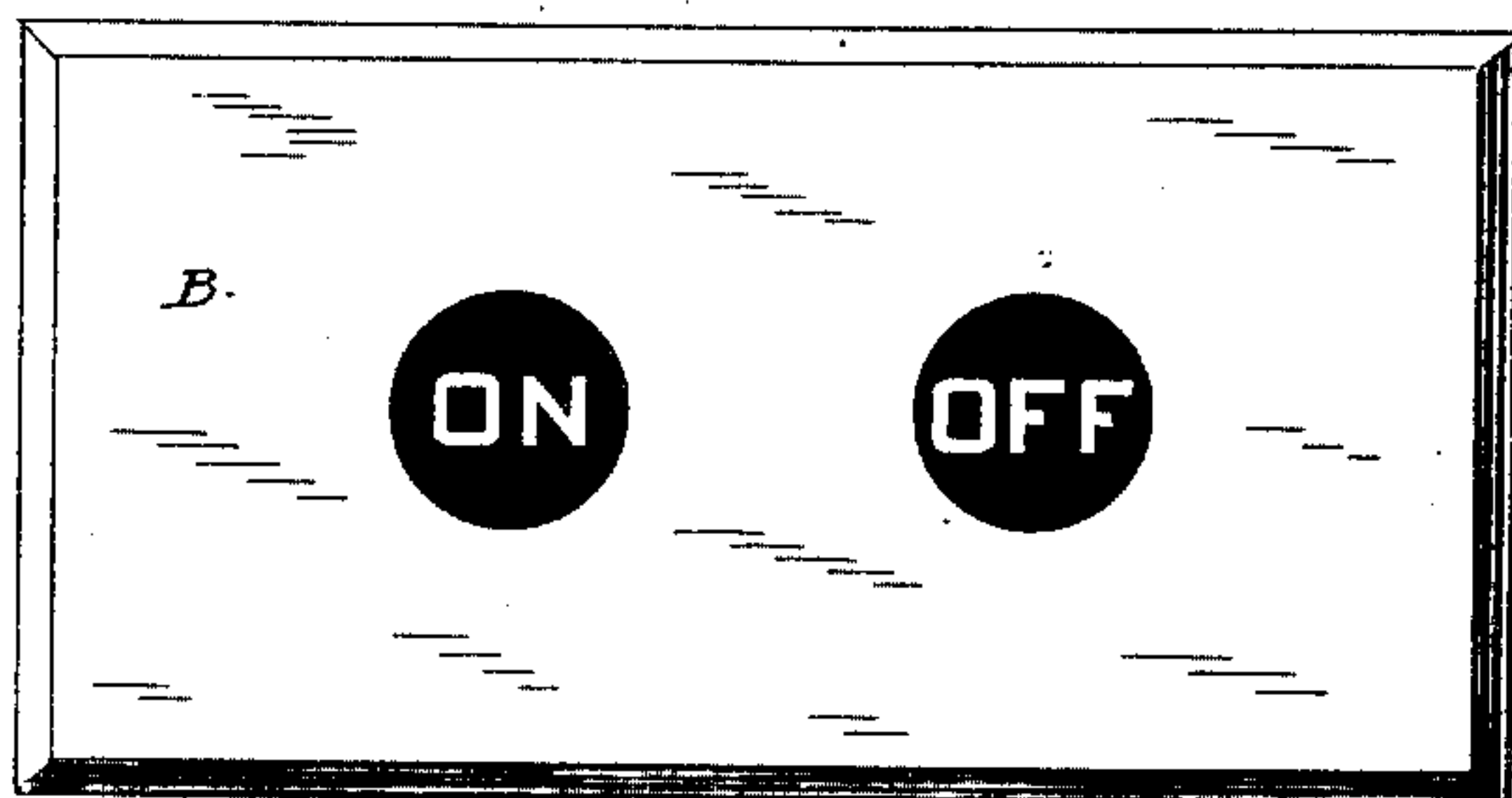
Fig. 1



*Fig. 2*



*Fig. 3*



*Fig. 4*

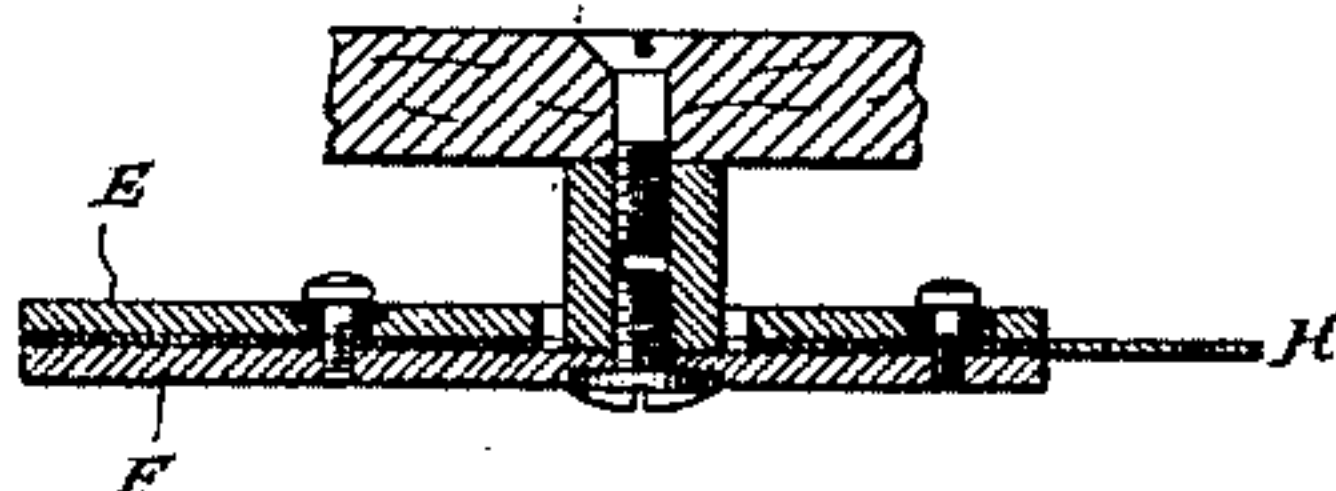
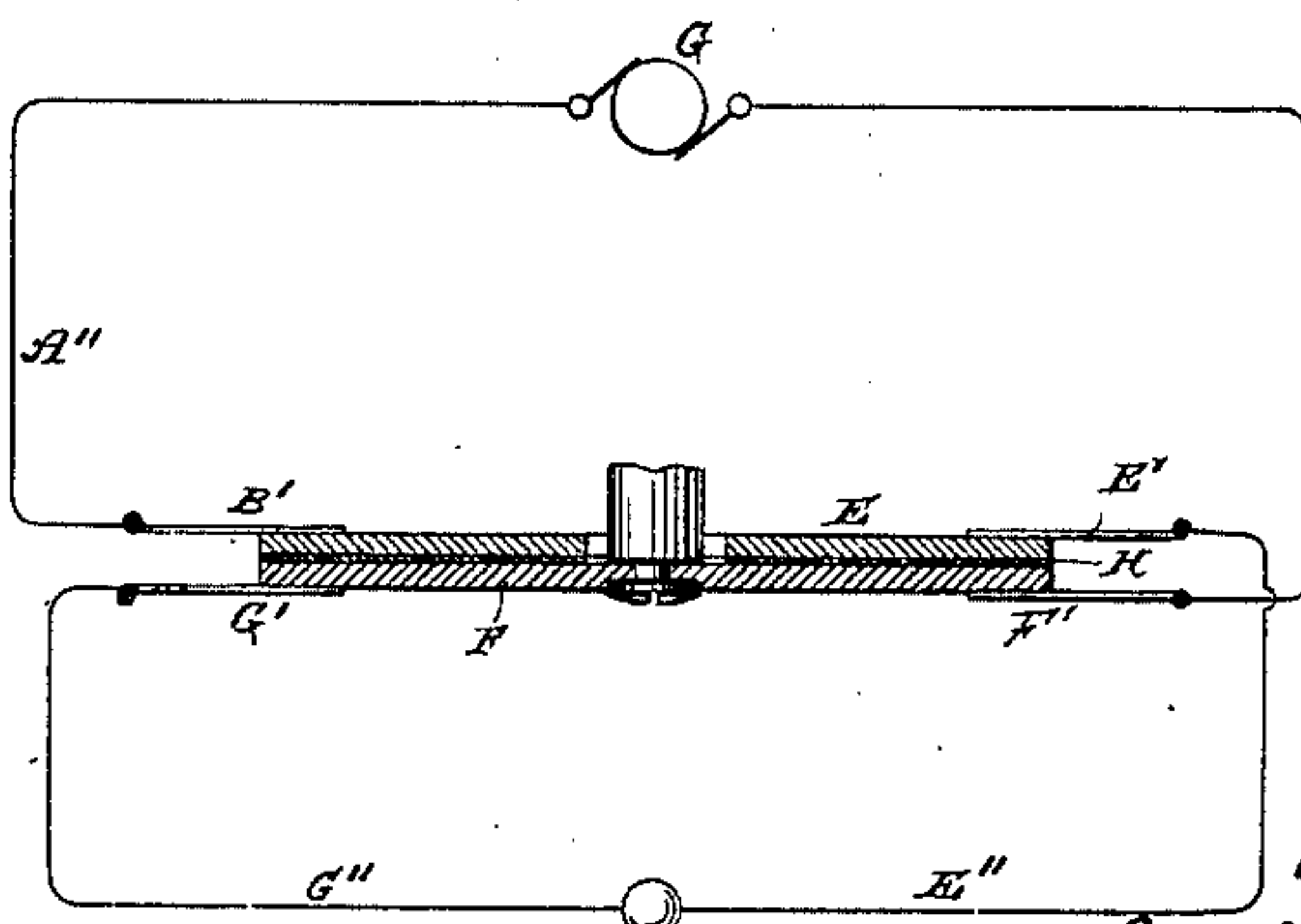


Fig. 5



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# UNITED STATES PATENT OFFICE.

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## ELECTRICAL SWITCH.

SPECIFICATION forming part of Letters Patent No. 437,667, dated September 30, 1890.

Application filed July 5, 1890. Serial No. 357,728. (No model.)

*To all whom it may concern:*

Be it known that we, LUCIUS T. STANLEY and HENRY B. CUTTER, both citizens of the United States, residing, respectively, at Brooklyn, in the county of Kings and State of New York, and Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electrical Switches, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

This invention is an improvement in electrical switches or circuit-breakers of the kind commonly employed in systems of electrical distribution for turning on or off one or more incandescent lamps, motors, or other devices, or generally for making or breaking any electric circuit or branch thereof.

The switch which we have herein illustrated as exhibiting our invention is designed and constructed as a "double-pole" switch—that is to say, one wherein the conductors of one circuit terminate in two brushes, springs, or contacts, and in the same way the conductors of a second circuit terminate in other brushes or contacts, all so arranged relatively to a movable contact arm or lever in such manner that in one position of said arm or lever the corresponding conductors of the two circuits are connected together, while in the other position of the said arm the circuit at both terminals of each circuit is broken or interrupted. The two circuits referred to are usually and may be considered as a main or supply circuit and a distributing or branch circuit, respectively. Therefore, although the mechanism which we have devised is in many respects applicable to single-pole switches, the description herein will be confined to the special switch above set forth.

Our main purpose has been to produce a neat and ornamental switch mechanism which may be applied and used in any house or room without disfigurement, and which at the same time shall be complete and effective as a device for making and breaking a heavy current, and our further object has been to improve the construction and mechanical details of the switch mechanism itself. We

have accomplished these objects in the device which is shown in the accompanying drawings.

Figure 1 is a front elevation of the operative parts of our improved switch contained in its casing. Fig. 2 is a side elevation of the same. Fig. 3 is a view of the face-plate, exhibiting the push-buttons, by means of which the switch is operated. Fig. 4 is a sectional detail of the contact arm or lever. Fig. 5 is a diagram illustrating the plan of electrical connections.

We mount our switch mechanism proper on a base A, which may be in a casing and made fire-proof and water-tight and set in a recess in the wood-work or wall to completely conceal the same. This base or casing is provided with an ornamental face-plate B, having two openings, in which work push-buttons C D. By pushing in the button C the circuit is broken or off, while button D, when pushed in, closes the circuit. The two buttons, however, should be distinguished in some way, as by the words "on" and "off," or by making one black and the other white, so that it may be seen at a glance what the condition of the switch is.

On the base or plate A we secure four metallic terminals B' G' on one side and E' F' on the other, and these are formed or provided with flexible plates or jaws A'', between which the ends of the contact-arm are adapted to pass when the switch is on. Between these terminals is mounted on a central pivot the contact arm or lever. Said arm is formed of two metallic plates E and F, with an interposed plate H of mica or other insulating material. From the ends of this arm and on opposite sides or edges of the same sections of the metal plate are cut away, as shown, leaving, however, the mica sheet. There is also a section removed from the under plate E for the passage of the stud, upon which the under side of plate F bears and to which the two plates are pivoted. The two plates are secured together by insulated screws or rivets in any proper manner. The upper plate is provided with a lug I, carrying a pin K. A rocking lever N, pivoted to a stud R, has an extended arm P, in which is a



slot O, through which passes the pin K. A pin R', set near the end of arm P, is connected with the pin K by a spiral spring S.

The push-buttons C D are connected by means of links T to the opposite ends of the lever N, so that the bar N may be tilted in either direction by pushing in one or the other of said buttons.

In Fig. 1 the switch or contact-plate is in position to open the circuit, and the spring S, from its relative position to the pivotal point of said plate, serves to hold the plate firmly in this position. It will be seen that the elliptical slot O extends from a central line, which may be drawn from the pin R' to the pivotal center of lever N to the right, so that when the arm or lever N and the contact-lever are in the position shown the pin K rests against the left-hand extremity of the slot. Consequently when it is desired to close the circuit, and the arm N is moved toward the right by the immediate engagement of the extremity of the slot with the pin K, the contact ends of the switch-bar are moved positively toward their respective terminal plates or brushes. This movement is so arranged as to continue until the pivotal center of the contact-bar, the pins K and R', and the pivotal center of lever N are in alignment, when actual contact is made between the contact-lever and the brushes or terminals. Continuing this movement until the pin K has passed the pivotal point of the contact-arm to the right, the tension of the spring throws the contact ends of the arm into full contact with the terminals, as shown in dotted lines. While in this position it will be observed that the pin K is stopped by the engagement with the slot at about the same point as when in the first position, so that the main position of the slot is still to the right of the pin. This position of the slot is an important feature, as upon its position is determined whether or not one or both movements of the switch-bar shall be positive or dependent upon the tension of the spring after the pins R' and K are past the pivotal point of the switch-arm. We prefer to place the slot as shown; but it may be placed so that the greater portion of it is to the left of a central line on the arm N, in which case, with the switch arranged as in Fig. 1, the positive movement would occur when the arm was being moved to break the circuit, or the slot may extend equally on either side of the central line, in which case neither the make nor the break movement would be positive, but each would depend upon the tension of the spring after the pins on the rocking arm and switching-lever were moved past the pivotal point of the latter.

The operation of the parts in closing the circuit will be similar to that described. We would state, however, that the special mechanism for operating the switching or central lever may be greatly modified.

The push-buttons C D extend through the face-plate B in such manner that the button that has last performed service is flush with the outer surface of the plate, while the other projects outward beyond the surface.

The circuit-connections are as follows: Starting from the positive brush of the dynamo G, Fig. 5, the current is to the switch-contact B' by wire A'', thence to the translating devices by way of the under plate E of the switching-arm, contact-terminal E', and conductor E'', and thence back to the dynamo by the conductor G'', terminal G', switch-plate F, terminal F', and conductor F''.

From the above description it will be observed that the terminals of the main and distributing circuits, which are placed in proximity to each other, are of the same polarity, and that if the contact-surfaces of the switch-bar are removed a sufficient distance from their respective terminal contact-brushes the formation of arcs between the terminals is impossible.

As a further safeguard against the formation of an arc we provide the insulating-shield described, which at the moment of breaking the circuit by removing the contact-surfaces of the switch-bar away from their respective terminal contact-brushes is interposed between the contiguous surfaces of these brushes in such manner as to intercept any possible arc. Ordinarily this shield is formed by extending the insulating-plate which separates the two conducting-plates of the switching-bar beyond the sections cut away from the plates, as shown. This position of the insulating-shield being in the line of movement of the contact ends of the bar, it will be seen that as the contact-surfaces of the bar are moved away from contact with the terminal brushes the insulating-shield is interposed at the instant the circuit is broken. This shield may, however, be extended so as to cover the entire contiguous surfaces of the terminals when the switch is in a state of rest with the circuit broken, but for currents of comparatively-low electro-motive force it will be sufficient that they extend only to a point that will bring the edge that is toward the terminal brushes in a line with the ends of the brushes when the circuit is off and the switch is at rest.

What we now claim as our invention is—

1. A contact lever or bar for electrical switches, composed of two conducting-plates secured together with an interposed sheet of mica or insulating material and having portions cut away at the contact ends, leaving the mica exposed, as set forth.
2. The combination, in an electric switch with contiguous terminals, of a contact-bar pivoted in position to be turned between and away from said terminals and composed of two conducting-plates secured together with an interposed sheet of mica and having portions of its contact ends cut away, leaving the mica exposed, whereby the exposed parts of



the mica will be interposed between the terminals on the separation of the conducting-plates from the terminals, as set forth.

3. In an electric switch, the combination,  
5 with the centrally-pivoted contact-lever having an extension or lug I, of the rocking lever N, having an arm or extension P, containing a slot O, and a spiral spring S, connecting the end of the pin R' with a pin K,  
10 set in the lug I and extending through the slot O.

4. In an electric switch, the combination, with a rocking lever constituting a part of the operative parts of the switch mechanism, of a  
15 face-plate for inclosing said switch mechanism in a suitable receptacle, and push-buttons passing through said face-plate and connected

with opposite ends of said rocking lever, as set forth.

5. A spring-actuated electric switch adapted 20 to be inserted in a recess in a wall and a pivoted lever for operating the same, in combination with a face-plate for covering said recess and inclosing said switch, and push-buttons passing through said face-plate and connected 25 with the lever of the switch mechanism, whereby the switch may be set in action or operation to make or break circuit by pushing one or the other of said buttons.

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