(No Model.)

A. H. ARMEN.

ELECTRIC QUICK BREAK SWITCH.

No. 575,047. Patented Jan. 12, 1897.

FIG. 1.

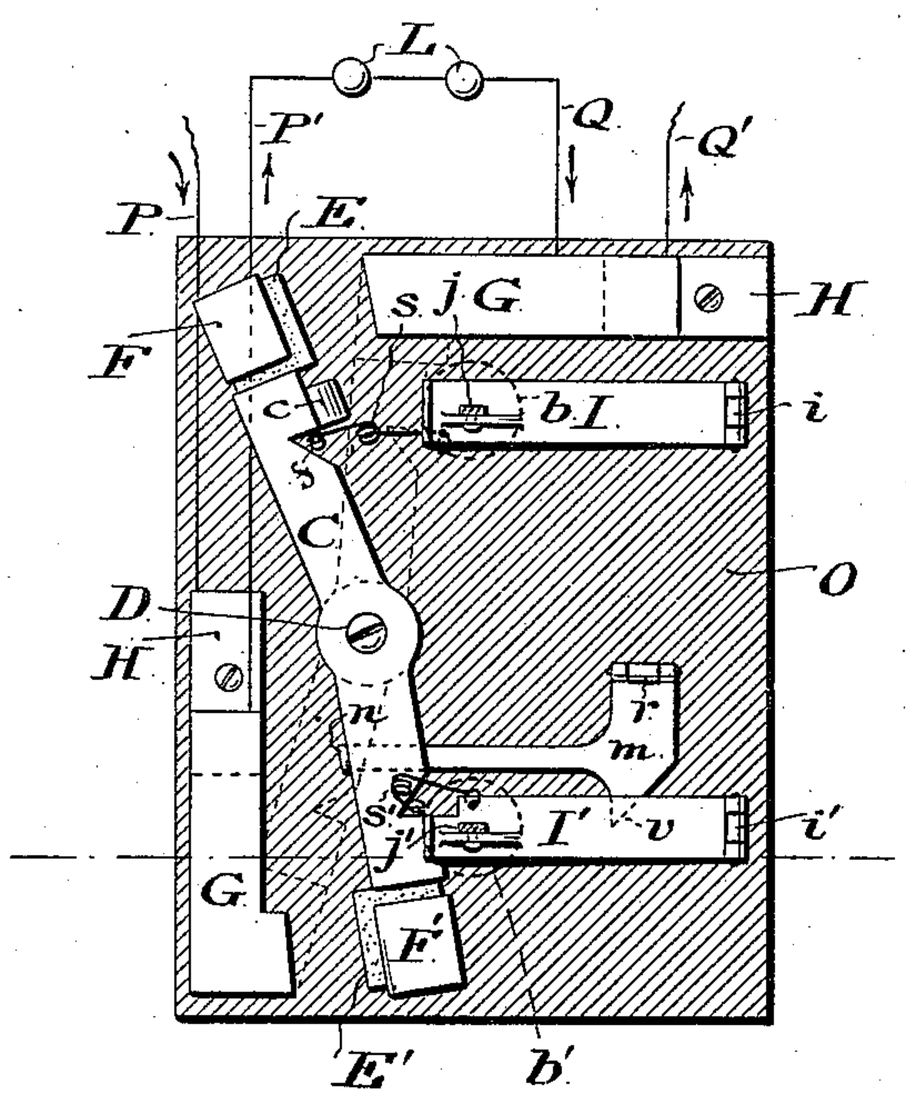
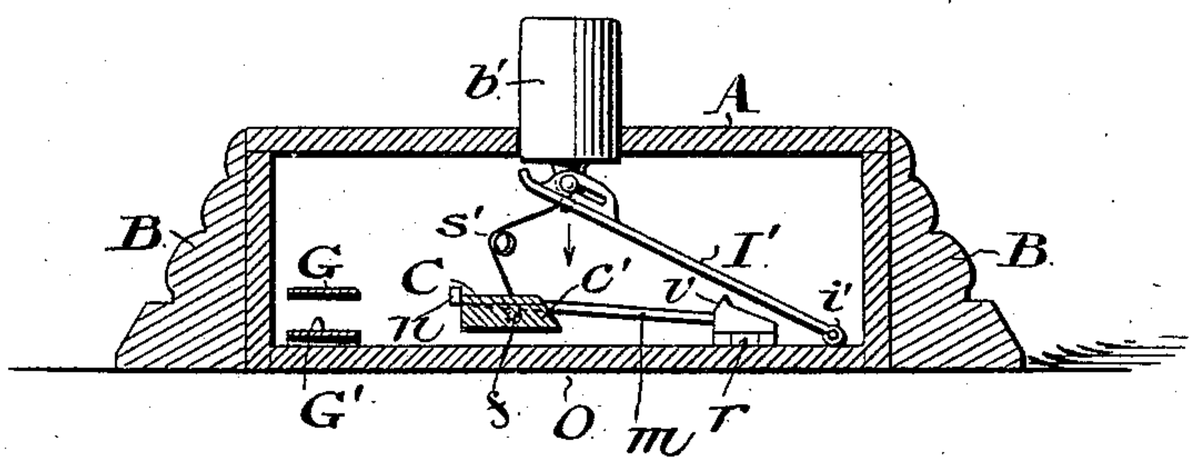


FIG. 2.



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ELECTRIC QUICK-BREAK SWITCH.

SPECIFICATION forming part of Letters Patent No. 575,047, dated January 12, 1897.

Application filed March 30, 1896. Serial No. 585,374. (No model.)

To all whom it may concern:

Be it known that I, ARAKELYAN H. ARMEN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electric Quick-Break Switches, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in that class of electric quick-break switches which are operated by push-buttons and which are generally used in houses, hotels, and public buildings for either arc or incandescent lighting. Such switches heretofore patented are so designed that a recess is required to be cut in the wall upon which it is to be fastened for the hind parts of the instrument.

The objects of my improvement are, first, to reduce the switch in size and to flatten it into less than an inch thickness, so that it could be fastened directly on the wall without having any necessity of a recess or space in the wall, saving thereby labor and expense and leaving the decorations of the wall uninjured; second, to simplify its construction and reduce its cost; third, to effect easy operation. I accomplish these chiefly by using a lever working in a plane parallel with the surface upon which the switch is to be fastened, with intermediary springs and push-buttons. The detailed description of the mechanism and the working of these with their necessary parts are found in the following specification and accompanying drawings.

Figure 1 is a plan view of the switch as it appears after the removal of the face-plate, buttons, and the mat. Fig. 2 is a sectional view of same parts of the instrument on the dotted line shown in Fig. 1.

Similar letters refer to similar parts throughout both views.

In Fig. 1 the face-plate, buttons, and the mat are removed, and O is a thin board or non-conducting plate upon which are fastened the different parts of the mechanism.

C represents a lever which, being about one-eighth of an inch thick, works around the pivot or screw D. At both ends of the lever a rectangular piece of insulating material E is fastened. Upon this rectangular piece is fastened a metallic cap F, which is electrically disconnected from the lever by means of said insulating material E. In front of each end of the lever on opposite sides there are two metallic brushes G G′, fastened on an insulating rectangular piece H, as shown in Figs. 1 and 2. These brushes are electrically insulated from each other and are so arranged or fastened on the rectangular piece H that they receive the metallic cap F by the movement of the lever C and make a perfect contact at the two flat surfaces of said metallic cap. As the caps at each end of the lever are considerably thicker than the lever, a suitable washer is put between the base-plate O and the lever C at the center of the lever (not shown) in order to keep the lever with its capped ends above the base-plate and free to move in both directions.

I I′ are hinged metal plates near each end of the lever, and *i i′* their hinges.

j j′ are the points where the push-buttons are attached. These work like levers and are free to move up and down at one end where the buttons are attached.

c c′ are two small pieces of iron or steel with an inclined surface at one end, and are fastened to the ends of the lever C from underneath. The hinged plates or button-arms I I′ have their outer ends turned up. The sectional views of I I′ and *c c′* are clearly shown in Fig. 2.

s s′ are springs attached to and working between said small iron pieces and button-arms, as seen in Figs. 1 and 2.

m is a long metallic arm or plate pivoted at *r* and bent upward at right angles at *n*, being governed by a spring, (not shown,) and serves to catch the lever as a dog. These are more clearly seen in the sectional view, Fig. 2, in which A is the metallic face-plate, *b* is the push-button, and B is the ornamental mat surrounding the switch.

I will now describe the operation of my apparatus. The circuit is open while the lever is in the position shown in Fig. 1; but when it takes the position shown by the dotted lines the circuit is closed, that is, the brushes G G′ are electrically connected through the cap F, and the brushes at the other end of the lever also are connected electrically through the cap F′. The object in such switches is to

break the circuit very rapidly, so as to prevent it from making an arc or burning. This object is attained in my apparatus by the peculiar device consisting in the small rectangular pieces with an inclined surface *c c'*, the springs *s s'*, the push-button arms I I', and the dog *m*. The spring *s* is hooked at one end on a pin *f*, fastened on *c*, Figs. 1 and 2, and is hooked at the other end on I. The spring *s'* also is in connection with the respective parts in the same manner. The push-buttons are attached to the arms I I' at the points *j j'*, and which are shown by dotted lines in Fig. 1.

The button-arms I I' are merely for governing the upward and downward movement of the buttons. These arms or levers, however, may be dispensed with and the buttons may be made to move up and down in a slot with necessary mechanical construction. In that case an auxiliary metallic piece is fastened at the lower end of the button in order to have the spring *s* attached to or work at; but the herein-described lever or arm method answers for the purpose best.

When either one of the button-arms is pressed down, the other one rises up. When the circuit is open and the lever C is in the position shown in Fig. 2, the button-arm I is pressed down, but I' is raised up. The button-arm I' while in this position is a little higher than the lever C, as seen in the sectional view, Fig. 2. *m* is pivoted at *r*, and has a dog *n* at its outer end, and has another projected end *v* partly under the button-arm I'.

In order to close the circuit, the button-arm I' is pressed down, while the dog *n* holds the lever C unmoved until I' reaches to *v* and presses it down. At the instant *v* is pressed down and the dog *n* leaves the lever the spring *s'* with its accumulated force pushes the lever C to the brushes rapidly, that is, to the position shown by the dotted lines. The circuit in this manner is closed, and while the lever C is thus on the dotted lines the button-arm I' is down and I is up.

Each one of the two springs is in its normal condition when the circuit is fully open or fully closed, and when one of the button-arms is pressed down only then the corresponding spring is under tension until the lever C reaches its destination, while the other spring is not affected or tensioned by this, but, being loosely hooked at its ends, serves to lift up its button-arm and button. These can be seen in both figures. In Fig. 2, however, the button-arm I' is put far above the switch, higher than its normal position, in order to show the spring more clearly.

In order to break the circuit, I is pressed down, while the pressure and the friction of the brushes G G' keep the lever C unmoved until the spring force overcomes it. The lever then jumps off very rapidly. In some instances where the friction of the brushes G G' is not sufficient to hold the cap F and thereby accumulate sufficient force in the spring a similar dog as *m* is put near I, so as to hold the lever C long enough to accumulate sufficient force in the spring.

There may be liability for the springs to be too weak to release the lever C from the brushes G G' or to push it back to the brushes to a full contact. In order to avoid this, both the small pieces *c c'* and the arms I I' are provided with inclined surfaces to work or slide on each other, as distinctly seen in Fig. 2. Thus when I is pressed down its outer end slides on the inclined surface of *c* and thereby releases the lever from the pressure or friction of the brushes. I' and *c'* work in a similar way and push the caps into the brushes, resulting in full and safe contact no matter what the strength of the springs may be.

The current in Fig. 2 enters through the wire P, as indicated by the dart, and reaches to the bottom brush G', (not seen,) and, passing through the cap F' to the top brush G, reaches to the lamps L by the wire P'. Then it runs from the lamps to the top brush G through the wire Q and through the cap F to the bottom brush G', and from which it goes out to complete the circuit.

Different parts of my apparatus may be designed in different ways, but still on the same principle. Such arrangement of parts, however, is one of the best. It has easy operation, sure action, and simplicity. The whole mechanism is suitably inclosed in an ornamental mat and covered by a face-plate, and with a gross thickness of less than an inch.

What I claim as my invention is—

1. In an electric quick-break switch, the combination of a switch-lever and push-button working in planes perpendicular to each other, with a button-arm auxiliary to the button and a spring working between the switch-lever and button-arm, substantially as set forth.

2. In an electric quick-break switch, the combination of the lever C oscillating in a plane parallel with the surface upon which the switch is to be fastened, the push-buttons *b b'* moving in planes perpendicular to that of the lever C, the button-arms I I' adapted to govern the movement of the buttons, the springs *s s'* working between said lever and button-arms, and the dog *m* so constructed as to catch the lever C, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ARAKELYAN H. ARMEN.

Witnesses:
CALVIN F. HECKLER,
ISAAC C. PEARSON.