No. 636,989. Patented Nov. 14, 1899.

R. B. HEWSON.

QUICK BREAK ELECTRIC SWITCH.

(Application filed May 17, 1899.)

(No Model.)

Fig. 2.

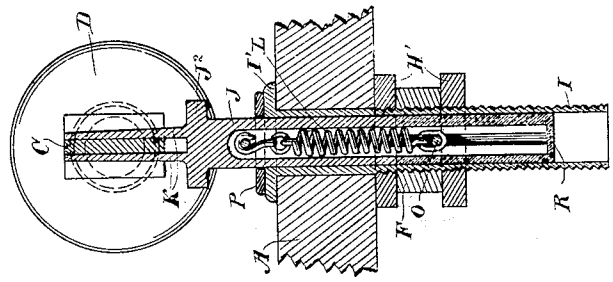


Fig. 1.

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UNITED STATES PATENT OFFICE.

ROBERT B. HEWSON, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO AUSTIN KANZEE, OF SAME PLACE.

QUICK-BREAK ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 636,989, dated November 14, 1899.

Application filed May 17, 1899. Serial No. 717,120. (No model.)

To all whom it may concern:

Be it known that I, ROBERT B. HEWSON, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Quick-Break Electric Switches; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a switch adapted to make and break the circuit in which it is placed by a sudden or snap movement for the purpose of reducing sparking and consequent injury to the contacts.

It consists of a lever mounted upon an insulated base having one end connected with one of the terminals and the other movable between compressing-plates which are connected with the other terminal, the connection consisting of a slidable cylinder movable in a tube with which the second terminal is connected and having a spring connection by which when the contact is broken by the withdrawal of the lever from between the plates the parts are moved in opposite directions with a sudden movement.

The invention also comprises details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a side elevation and section of my device. Fig. 2 is a vertical transverse section.

A is a base which is formed of any suitable non-conducting material. Upon this base is erected a standard B, to which a lever C is fulcrumed. This lever has an insulated handle D, by which it may be moved up or down about its fulcrum-point. A terminal for one of the circuit-wires is fixed to the base-plate A near the standard B and consists of a vertical metallic conducting-post E, having upon the upper end the elastic plates E′, forming a fork between which this portion of the lever C is movable, the plates pressing against the lever, so as to insure a perfect contact. Below the base I have shown the connection F for the terminal G, this connection contacting with the post E and the whole being secured by binding-nuts, as shown at H. The other terminal G′ is correspondingly attached to a connection F′, which surrounds a tube I, the exterior of the tube being screw-threaded to receive the nuts H′, by which the parts are held in place. This tube extends through the base and has a collar I′ resting upon the top of the base, so that when the nuts H′ are screwed to place the parts are all firmly locked together on the base.

Within the tube I is a slidable tube J, which is made of copper or other good conducting material for a portion of its length, and the lower portion J′, which forms an extension thereof, is made of some poor conductor, such as German silver or other material having a high resistance.

The upper end of the tube J has a head J^2, from which the metallic spring-plates K project upward upon each side of the lever C, near the handle thereof.

Within the tube J is a spiral spring L, one end of which is connected with the upper part of the interior of the tube J, and the other end is connected with a stationary pin O, fixed in the outer tube I. The lower part J′ of the tube is here shown slotted from the bottom up to the pin, so that it is slidable with relation to the pin.

Between the head J^2 of the tube J and the collar I′ of the tube I is an elastic washer or buffer P, which receives the impact of the head J^2 when the device is released and suddenly drawn downward by the action of the spring.

The operation of the device will then be as follows: When the circuit is to be broken, the lever C is raised, turning about its fulcrum in the standard B, and the compression of the spring-plates K upon the sides of the lever is sufficient so that the tube J is drawn up with the lever, the spring L yielding to allow this movement until the good conducting portion J has been drawn out of the tube I, leaving the poorer conductor having the high resistance in contact with the tube I. When the parts have reached this point, the contact of a stop pin or bar R at the bottom of the part J′ with the stationary pin O or similar stop will arrest the further movement of the tube J J′, and the continued movement of the lever C will withdraw it from between the elastic plates K, so that when it finally escapes therefrom the action of the spring L will sud-

denly draw the tube J J′ back into the tube I while the lever C is still being moved in the opposite direction. This causes a sudden break of the contacts, which will greatly reduce the arcing usual from the breaking of high-tension currents and which will injure the contacts.

The amount of arcing is very greatly reduced by the fact that a portion of the tube J J′ is made of a material having a high resistance, which consequently reduces the current at the instant before the break takes place. I also propose to make the spiral spring L, situated in the tube or hollow bar, of high-resistance metal and use it also to increase the resistance of the circuit at the moment before the break is made.

In order that the movements of the lever C shall be approximately in the line of movement of the part J J′, the pin-hole in the standard B may be elongated, as shown at *b*, or an equivalent guiding device may be employed.

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

1. A switch for an electric circuit consisting of a pivoted lever-arm, connections between one of the terminals and this arm, a conducting-tube with which the other terminal is connected, a tube or bar slidable within said tube, compressing spring-plates connected with the upper part of the slidable part, between which plates the lever-arm is retained by friction whereby the inner tube may be withdrawn with relation to the outer tube, and a stop to limit the movement of said tube whereby the lever-arm may be withdrawn from between the compressing-plates, and a spring by which the tube is suddenly retracted when the contact is broken.

2. A circuit-breaking device consisting of a fulcrumed lever, a device by which one of the terminals is connected therewith near the fulcrum-point, a conducting-tube with which the other terminal is connected near the handle of the lever, a tube or bar slidable in the outer tube having spring-plates extending upwardly from its upper end upon each side of the lever and connecting therethrough with the other terminal, a stop by which the slidable bar is arrested after it has been drawn upward within the outer tube, whereby the pressure of the elastic plates upon the lever is overcome by the continued movement of the lever, and a spring by which the bar is suddenly retracted into the tube at the instant of breaking the contact while the lever is moved in the opposite direction.

3. A circuit-breaking device consisting of a fulcrumed lever, a contact device with which one of the terminals is connected near the fulcrum, a second contact device consisting of a tube fixed with relation to the lever near the handle, and to which the other terminal is connected, a tube or bar slidable within and forming contact with said outer tube, said slidable bar having the upper portion made of good conducting material and the lower portion of a poor conductor, spring-plates extending upwardly from the top of said bar and pressing upon opposite sides of the lever, whereby the raising of the lever will withdraw the bar from the tube, a stop by which the movement of the bar is arrested when the good conducting portion has been withdrawn from the outer tube whereby the continued movement of the lever withdraws it from between the spring-plates to break the circuit, and a spring by which the tube or hollow bar is quickly returned to its normal position within the tube at the instant of the breaking of the contact.

4. In a mechanism for breaking electrical circuits, the combination of inner and outer tubes one slidable within the other, one of said tubes having a portion of its length of low electrical resistance and the remaining portion of high electrical resistance.

5. An electrical circuit-breaking device consisting of separable contact-surfaces a portion of one of which is made of a metal having a high resistance, and a spring by which said surfaces are drawn together after separation said spring being also made of metal having a high resistance.

In witness whereof I have hereunto set my hand.

ROBERT B. HEWSON.

Witnesses:
S. H. NOURSE,
JESSIE C. BRODIE.