No. 884,353. PATENTED APR. 14, 1908.

H. H. BERRY.

ELECTRIC SWITCH.

APPLICATION FILED DEC. 16, 1905.

2 SHEETS—SHEET 1.

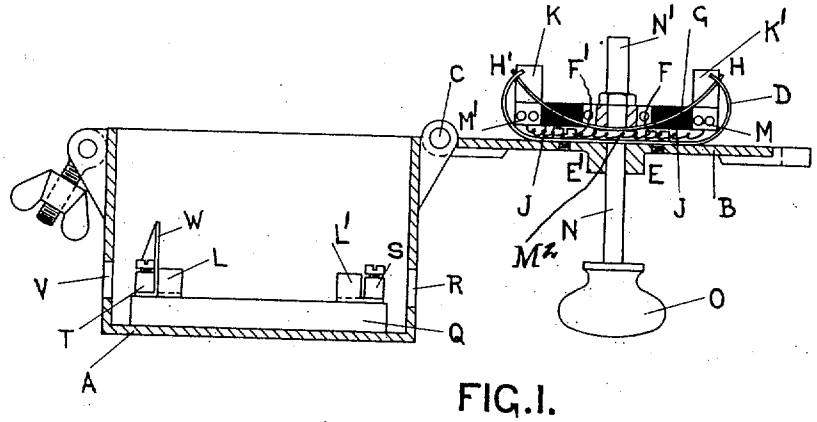


FIG. 1.

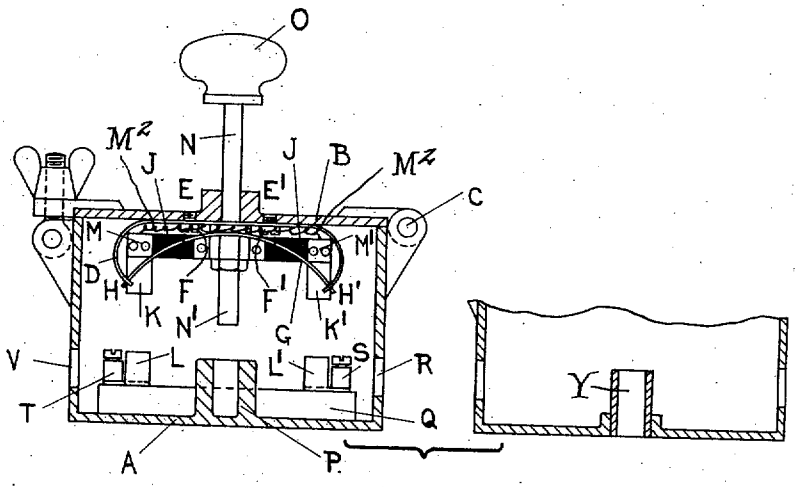


FIG. 2.

Witnesses.
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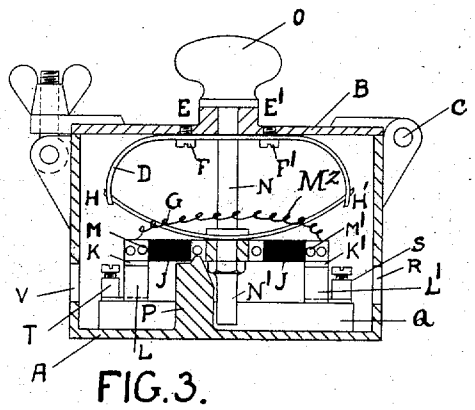


FIG. 3.

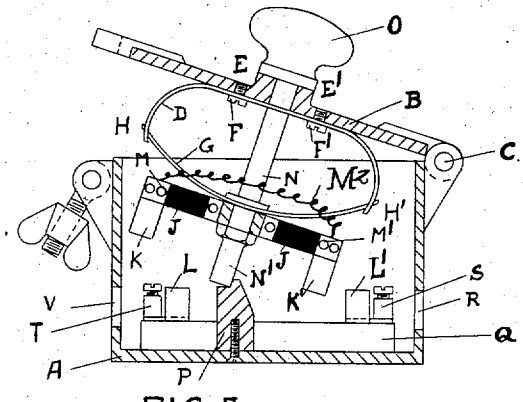


FIG. 4.

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UNITED STATES PATENT OFFICE.

HERBERT HENRY BERRY, OF ENFIELD, ENGLAND.

ELECTRIC SWITCH.

No. 884,353. Specification of Letters Patent. Patented April 14, 1908.

Application filed December 16, 1905. Serial No. 292,094.

To all whom it may concern:

Be it known that I, HERBERT HENRY BERRY, a subject of the King of Great Britain, residing at Uplands House, Chase Ridings, Enfield, in the county of Middlesex, in England, have invented new and useful Improvements in Electric Switches, of which the following is a specification.

This invention relates to that class of electric switch fuse which is inclosed in a metal or other protected type of case, and the object of my invention is to construct the mechanical parts of the apparatus in such a way that the hinged lid or cover of the case must first be closed down before the switch fuse can be brought into contact with the live circuit. It must only be possible for the operator to close the circuit by a rapid make spring action and that after the hinged lid has been closed.

The object of my invention is also to make it impossible to break the circuit by opening the lid or cover on its hinges. It must only be possible to open the lid or cover after the operator has opened the circuit by a rapid break spring action. The advantages of such an arrangement are obvious and an apparatus constructed in such a manner becomes in the hands of unskilled people practically fool-proof.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a sectional view of a combined double pole switch and fuses with its hinged cover open and with its fuses readily accessible without the necessity of getting into close proximity with any live parts conveying electric current. Fig. 2, is a sectional view showing the hinged cover closed with the switch and fuses in its "off" position. Fig. 3, is a sectional view showing the hinged cover closed and the switch and fuse in its "on" position. Fig. 4, is a sectional view showing that it is impossible for a careless operator to close the cover if the switch contacts have previously been given their quick make action. It also shows that the position of the switch contacts must be in their "off" position and the cover closed as in Fig. 2, before a quick make action of the switch can be obtained as in Fig. 3. It is therefore impossible for the operator to draw an arc or a series of arcs likely to damage the contacts by careless manipulation of the apparatus.

Figs. 1, 2, 3, and 4, show an outer case A of metal or other suitable material with a lid or cover B arranged to open upon a hinge C. Attached to the cover B I arrange a quick break and quick make push and pull switching device which consists of a bandspring D rigidly fixed to the cover B at E, E′, by the screws F, F′, and a loosely fixed band spring G the ends of which are sprung into slots in the spring D at H, H′. The loose spring G when sprung into place is free to move at the will of the operator from a concave to a convex position, and vice versa, as in Figs. 2, and 3, thereby giving a rapid make and rapid break to the switching device which is mechanically attached to it. This switching device consists of a strip or strips of suitable insulating material J with metal contacts K, K′, at their respective ends which are plunged into suitable metal jaws L, L′, when required to complete the circuit, the fuse wire M^2 are clamped between suitable terminals M, M′, upon the contact K, K′. I control the movement of the band springs by a rod of metal N, preferably square or rectangular which I call a plunger, which is arranged to pass in a vertical direction through a hole bored through the hinged lid or cover B, of the case. I attach a suitable operating handle or knob O, to the outside extremity of this plunger for the purpose of operating the switch. The plunger is free to pass backwards and forwards through the hole in the center of the fixed spring D but is mechanically attached to the loose spring G, in such a manner that when the switch gear is moved backwards or forwards, the relative action of the springs is such, that, a quick make and quick break action is obtained. In order that it may not be possible to break the circuit by opening the cover B, without first utilizing the quick break action of the springs D, and G, I arrange plunger N, N to be of such length that when the hinged lid or cover B, is shut down as in Fig. 3, and the switch "on," the end of the plunger N, N′, remote from the handle or knob O makes a loose fit into the hole in a protection P, cast in the base of the case A, as shown in Fig. 2, or into a tube Y, that may be fixed to the base. It is obvious that owing to the push and pull parallel movement of the plunger N, N′, carrying the switching gear, and the relative movement of the lid or cover B, opening on the arc of a circle centered at C, that with this arrangement it may be made impossible as shown in Fig. 4, to close the circuit by means of the

hinged lid B, if a careless operator has omitted to arrange that the loose spring G, shall be in its concave position as shown in Fig. 2. In the same manner it is obvious, that, the operator cannot open the lid B, on the hinge C, when the spring G, is in its convex position as shown in Fig. 3. He is prevented from so doing by the elongated plunger N, N', the lower end of which will strike against the projection P, on the base of the case. If however the operator pulls the handle O, the switch contacts will leave the contact jaws on the base in which they have been forced, and the spring G, will open out the spring H, H', and will fly into a concave position as shown in Fig. 2. The cover B, can then be opened freely as shown in Fig. 1, and the operator is free to replace the fuse between the terminals M, M', without close proximity to any live parts carrying electric current. The switch jaws L, are fixed to bases of suitable insulating material Q.

The wire or cable enters the case A, through the hole R, and is attached to the terminal S, which is fixed to the terminal T, and the other wire passes through the hole in the case A at V. It is obvious that, the required end may be attained by slight mechanical modifications, for instance, the cover B, cannot be opened if the switch jaw L, is closed at one end by the metal stop W, Fig. 1, thereby preventing the lid B, opening on an arc of a circle from its hinged center C, or a projection P, as in Figs. 3, and 4, cast or fixed to the base of the box, would serve the purpose equally well.

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In an electric switch, the combination of a case having a hinged cover, a switch member arranged within the case, a switch member movable on the cover and adapted to contact with the switch member in the case when the cover is in the closed position, and means preventing the closing of the cover as long as the movable member is in the "on" position.

2. In an electric switch, the combination of a case having a hinged cover, a switch member arranged within the case, a switch member movable on the cover and adapted to contact with the switch member in the case when the cover is in the closed position, and means preventing the opening of the cover as long as the movable member is in the "on" position.

3. In an electric switch, the combination of a case having a hinged cover, a switch member arranged within the case, a sliding plunger movable in the cover, perpendicularly to the latter, a second switch member carried by the sliding plunger, and adapted to engage the switch member in the case, and means positioned to be engaged by the sliding plunger when the same is in the "on" position when the cover is closed.

4. In an electric switch, the combination of a case having a hinged cover, a switch member arranged within the case, a sliding plunger movable in the cover, perpendicularly to the latter, a second switch member carried by the plunger and adapted to engage the switch member in the case, and a projection extending upwardly from the bottom of the case and arranged to be engaged by the plunger when the latter is in the "on" position, and the cover is moved to open or close the case.

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

HERBERT HENRY BERRY.

Witnesses:
H. D. JAMESON,
F. L. RAND.