

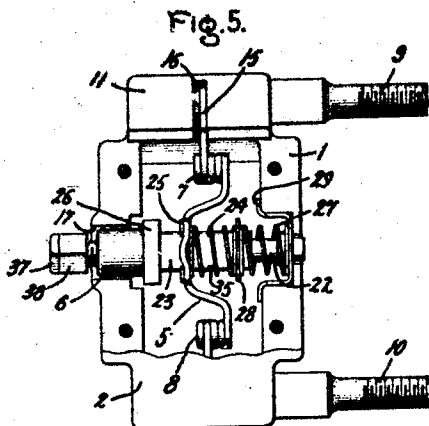
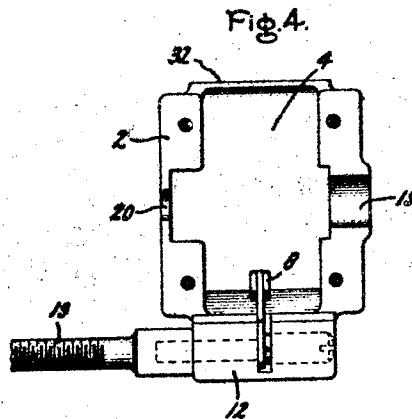
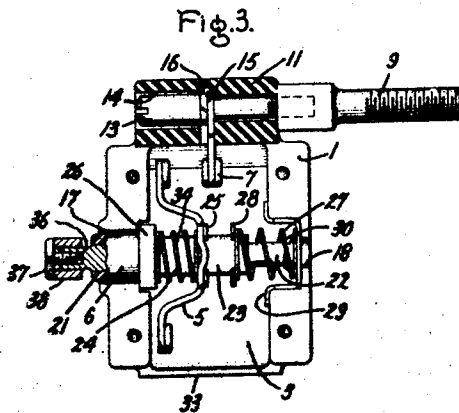
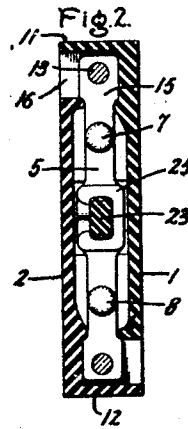
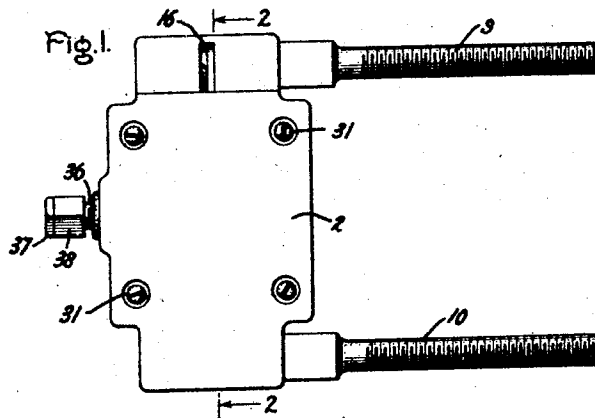
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ELECTRIC SWITCH

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UNITED STATES PATENT OFFICE

2,419,072

ELECTRIC SWITCH

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2 Claims. (Cl. 200-168)

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My invention relates to electric switches, more particularly to electric switches especially adapted for use as interlock switches on contactors and has for its object a simple, reliable, and inexpensive switch of this type.

This application is a continuation-in-part of my copending application Serial No. 533,688, filed May 2, 1944, for Electric switch.

In carrying out my invention in one form I provide two enclosure members made of electrically insulating material and which are identical in construction. Each of these enclosure members is provided with a stationary electric contact and is further constructed for the mounting between them of operating means for a bridging contact which is enclosed by the assembly of the two members together in reversed end relationship.

For a more complete understanding of my invention, reference should be had to the accompanying drawing, Fig. 1 of which is a side elevation view of an electric switch embodying my invention; Fig. 2 is a sectional view taken along lines 2-2 of Fig. 1 looking in the direction of the arrows; Fig. 3 is a side elevation view partly in section with one enclosure member removed showing a normally open switch; Fig. 4 is a view similar to Fig. 3 but viewed from the opposite direction showing the opposite enclosure member, while Fig. 5 is a fragmentary side elevation view of a normally closed switch.

Referring to the drawing, I have shown my invention in one form as comprising two enclosure members, or casing parts, 1 and 2, made of a molded electrically insulating material, which are identical in construction and which fit together in reversed end relation with each other. The enclosure members are provided, respectively, with cavities or recesses 3 and 4 which register with each other when the parts are put together, as shown in Figs. 1 and 2, to form a closed chamber for a bridging contact member 5 mounted on an operating member or plunger 6 and cooperating with a stationary contact 7 mounted on the enclosure member 1 and a stationary member 8 mounted on the enclosure member 2.

For the purpose of providing for the mounting of the stationary contacts and the threaded electric terminal conductors and supporting bolts 9 and 10 of the enclosure members, the enclosure members are provided with end portions 11 and 12 whose thickness is substantially equal to the combined thickness of the remaining portions of the two enclosure members when the two members are assembled together, as shown in

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Figs. 1 and 2. The bolts 9 and 10 serve both as mechanical supports for the switch and as electric connections for the stationary contacts 7 and 8, respectively, whereby the switch may be connected in an electric circuit. For example, the terminal bolts 9 and 10 may be inserted in holes in an electrically insulating supporting panel for the switch, with nuts not shown on the bolts for clamping the switch in position.

As shown in Fig. 3, the terminal bolt 9 is secured to the enclosure member 1 by means of a bolt 13 extended through an aperture 14 in the enlarged portion 11, which bolt also secures in position an electrically conducting supporting strap 15 for the stationary contact 7. The end of the strap 15 opposite the contact 7 extends into a narrow slot 16 in the portion 11 and is provided with an aperture through which extends the bolt 13, whereby the bolt 13 clamps the supporting member 15 against the right-hand wall of the slot 16, as viewed in Fig. 3, and clamps the end of the terminal bolt 9 against the right-hand outer end of the portion 11. The mounting of the corresponding parts on the enclosure member 2 is, of course, identical with the mounting on the enclosure member 1.

Also, the enclosure member 1 is provided with semi-cylindrical depressions or grooves 17 and 18 and the member 2 is provided with similar complementary grooves 19 and 20 which, when the two enclosure members are put together, form apertures for the longitudinally movable switch member or plunger 6 extending in a direction at right angles to the contact faces of the stationary contacts 7 and 8.

As seen in Fig. 3, the left-hand end of the plunger 6 is provided with an enlarged portion 21 for increased strength, the opposite end 22 being much smaller while the grooves 17 and 18 are of corresponding sizes to provide for a loose sliding fit for the plunger 6.

On an intermediate portion 23 of the plunger, which may be substantially rectangular in cross section as shown in Fig. 2, is mounted the bridging member 5, the portion 23 extending loosely through an aperture in the bridging member and the bridging member being biased by a helical spring 24, as shown in Fig. 3, against a stop 25 on the portion 23. The opposite end of the spring engages a square shoulder 26 on the plunger 6. A second helical spring 27 surrounding the plunger portion 22 biases the plunger toward the left-hand end, as seen in Fig. 3, with the shoulder 26 against one left-hand wall of the cavity 3. One end of this spring rests against a flange 28 on the

plunger, while its opposite end rests against a U-shaped metallic member 29 having a cone shaped spring seat 30 with a central aperture there-through for the plunger portion 22. This member 29 is inserted in a recess formed by complementary recesses in the right-hand side wall of the member 1, as seen in Fig. 3, and the left-hand side wall of the member 2, as seen in Fig. 4, when the parts are assembled.

It will be understood that the plunger 6 and the bridging member and springs mounted on it can be assembled on either one of the enclosure members 1 or 2 after which the two members are fitted together in reversed end relation and secured together by screws 31. It will be understood that when assembled the upper relatively thin end portion or edge 32 of the member 2 is in abutting relation with a shoulder formed by the relatively thick end portion 11 on the member 1, while the lower relatively thin opposite end portion or edge 33 of the member 1 is in similar abutting relation with a shoulder formed by the relatively thick portion 12 on the member 2. With the two parts assembled together it will be observed that the stationary contacts 7 and 8 are directly opposite each other in the chamber formed by the two members, as indicated in Fig. 5, for cooperation with the bridging member 5.

The switch as shown in Figs. 1 to 4 inclusive is normally open. It can be converted easily to a normally closed switch as shown in Fig. 5 by simply reversing the bridging member 5. The bridging member has its ends bent into laterally displaced relation with the central portion mounted on the plunger 6 so that by turning the bridging member through an angle of 180 degrees about an axis perpendicular to the plunger 6 the contacts carried by the bridging member are changed from the left-hand side of the stationary contacts, as seen in Fig. 3, to the right-hand side, as shown in Fig. 5. In this position the bridging contact member is held with its ends in engagement with the stationary contacts by the spring 27, while the spring 24 having one end bearing against the stop 28 now biases the bridging member toward the left hand against the stop 25, the position of which has been changed on the plunger 6. As shown, the stop 25, as well as the stop 28, consists of a U-shaped member the side arms of which are inserted in oppositely disposed slots in the portion 23 of the plunger 6. In Fig. 5 the stop 25 is in a pair of slots 34 shown in Fig. 3, while in Fig. 3, the stop 25 is secured in a pair of slots 35 as shown in Fig. 5. Preferably, the two springs are identical in construction, but the spring 24 is compressed somewhat more so as to hold the bridging member 5 against the stop 25 against the face of the spring 27.

The plunger 6 is made from a molded, electrically insulating material but is provided with a metal insert 36 in its enlarged end 17, which part 36 is engaged for operation of the switch. Operating tolerance is provided by a screw 37 in the end of the insert 36, the head of the screw being engaged by the operating member for the switch and the screw being secured in position by lock nut 38.

While I have shown a particular embodiment of my invention, it will be understood, of course, that I do not wish to be limited thereto since many modifications may be made, and I therefore contemplate by the appended claims to cover any such modifications as fall within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A switch comprising two enclosure members made of electrically insulating material each of said members being provided with a cavity, a stationary contact member secured to one end of each of said enclosure members and extending into the cavity in said enclosure member, means for securing said members together in reversed end relation with one end of each member engaging an opposite end of the other member and with said contact members at opposite ends thereby to form a closed chamber having two stationary contacts at opposite ends of said chamber, said enclosure members being shaped to provide an opening, an operating member mounted in said opening, a contact member on said operating member cooperating with said stationary contacts, and a supporting electric terminal member secured to each of said enclosure members and electrically connected to the stationary contact on said enclosure member.

2. A switch comprising two substantially identical enclosure members made of electrically insulating material, each of said members being provided with a cavity and with relatively thin and thick portions at opposite ends, a stationary contact member secured to the thick portion in each of said members and extending into the cavity in said member, means for securing said members together in reversed end relation with said relatively thin portion of one member engaging said relatively thick portion of the other member thereby to form a closed chamber having two stationary contacts in opposite ends of said chamber, said members being provided with complementary grooves forming an opening extending across said chamber transversely with respect to a line connecting said stationary contacts, a plunger operating member slidably mounted in said opening, a bridging contact on said operating member arranged for engagement with said stationary contacts, a supporting and electrically conducting member secured to each of said thick portions and electrically connected to the stationary contact in said thick portions, and spring means for biasing said plunger to a predetermined switching position.

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REFERENCES CITED

The following references are of record in the file of this patent:

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Number	Name	Date
1,981,064	Norviel	Nov. 20, 1934