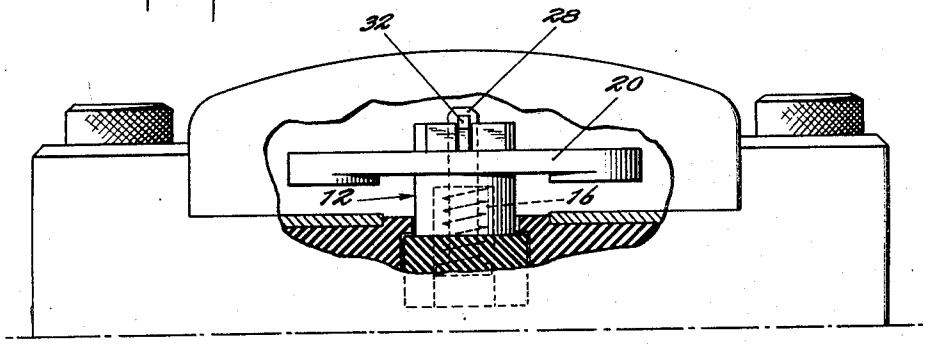
Aug. 22, 1950 H. E. SCHLEICHER 2,519,855

MOVABLE CONTACT RETAINING MEANS FOR ELECTRIC SWITCHES

Filed April 1, 1948

Fig. 1.



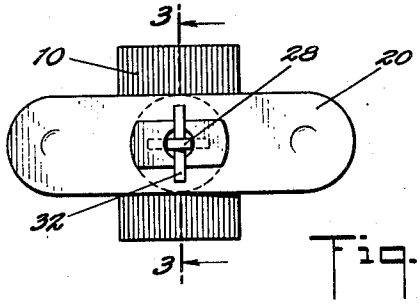


Fig. 2.

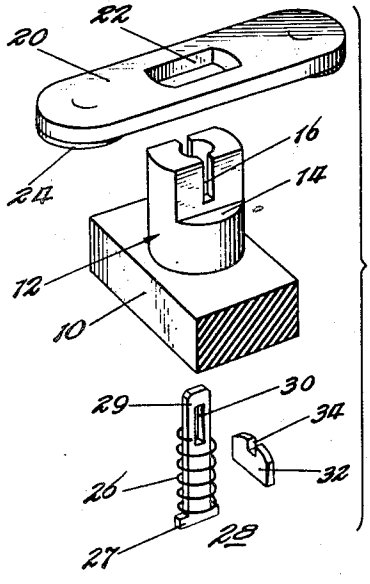


Fig. 4.

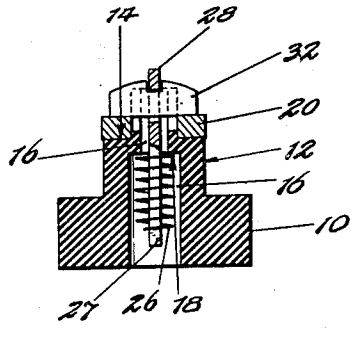


Fig. 3.

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MOVABLE CONTACT RETAINING MEANS FOR ELECTRIC SWITCHES

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14 Claims. (Cl. 200—166)

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This invention relates to electric switches and more particularly to the improved means for mounting movable contacts on electric switch operating means.

It is an objection of the invention to improve the means for mounting movable contacts on electric switch operating means, particularly in electromagnetically operated electric switches.

A further object is to provide means to prevent the loss of parts of the mounting means when the contact portion has to be removed.

Another object is to provide protection of the contact-holding spring from the play of the arcs that commonly occur on contact separation.

Another object is to provide, as a two-fold advantage, both contact retention and spring pressure by a novel arrangement of contact spring and associated parts.

Other objects and advantages will become apparent as the invention is described in the accompanying drawing.

In the drawing:

Figure 1 is a side elevation view of a switch embodying the novel mounting means of the invention for mounting the movable contact;

Figure 2 is a plan view of the novel contact mounting means illustrated in Figure 1;

Figure 3 is a section view taken along line 3—3 of Figure 2;

Figure 4 is an exploded perspective view of the parts illustrated in Figures 2 and 3.

Referring to the drawings, the invention is illustrated as it would be applied to a bridging contact mounted on the insulating contact-carrier bar of an electromagnetic switch; but the invention is not limited to such usage. Such contact-carrying bar and its electromagnetic operating mechanism is disclosed in my Patent 2,399,575, dated April 30, 1946.

In the present invention, the insulating carrier or bar 10 is formed or molded with a cylindrical boss 12 thereon, the upper half of which is segmentally cut away or flattened on opposite sides of its axis forming a pair of outside shoulders 14. Perpendicularly to the flattened faces of its upper half, the boss is diametrically slotted, as at 16. Axially within the boss is a bore whose lower end is enlarged providing an offset 18 about midway along the bore.

Seated on the outer shoulders is a bridging contact 20 having an elongated aperture 22 shaped to receive the upper portion of the boss. The contact member has contact buttons 24 on its ends.

A coiled compressed spring 26, located within

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the enlarged portion of the bore 16, supplies the force to press the contact member 20 resiliently against the shoulders 14. The spring presses at its inner or top end against the offset 18 and at its bottom and against the cross bar 27 of a T-shaped tension bar 28, around the leg 29 of which the spring is coiled. The lower end of the tension bar works within the enlarged portion of the bore 16 while the upper end extends out of the top of the boss. In the upper end of the tension bar is a long narrow aperture 30 receiving a small thin plate 32 which has a straight edge resting on the upper or outermost surface of the contact member 20 and a slot 34 in its opposite edge into which the portion of the tension bar, directly above its aperture 30, moves due to the effort of the spring 26. Interengagement of the plate 32 with the T bar 28, through the agency of the aperture 30 and slot 34, prevents sidewise movement of the plate 32 and at the same time prevents the tension bar from sliding through and falling away from the carrier bar 10. In other words, that interengagement is responsible for maintaining all the parts assembled.

To disengage the contact member 20, only two simple operations are involved: The contact 20 is pulled against the pressure of spring 26 until the plate 32 is disengaged from the boss and then the plate 32 is turned a quarter turn. The plate 32 will come to rest on the top of the boss and the contact can be removed (the plate 32 being shorter than the length of the opening 22 in the contact).

To replace the contact, it is slipped on the boss and the plate 32 (together with the tension bar 28) is turned a quarter turn, whereupon the plate 32 will move down into the slots 16.

During removing and replacing of the contact 20, the remainder of the mounting stays assembled. There are no loose parts to be lost or misplaced or which need be reassembled before the contact can be replaced. Moreover, the metallic parts, other than the spring, are small and may be inexpensively made.

The mounting described permits the bridging contact to adjust itself to the fixed contacts as is required ordinarily in electromagnetic and other switches to which the invention may be applied. Besides this advantage the movement of the contact along the smooth sides of the insulating boss gives a smoother and steadier action than heretofore.

Although the invention is illustrated as applied to a carrier bar which, when operated, will pull

the bridging contact toward the fixed contacts and will hold it resiliently in engagement with them, the invention may be adapted to a bridging contact which is pushed into engagement with its fixed contacts.

As may be seen in the form illustrated and described the spring **26** is contained within the insulating body **10**, **12** entirely and is thus shielded completely from the play of the arc. Since the spring is a comparatively thin metal part which would easily be burned away, protection of it is a valuable advantage of my novel mounting structure; and that advantage can be had whether the invention be embodied in a structure wherein the contact is pulled or pushed.

Modifications within the scope of the invention will occur to those skilled in the art. Therefore the invention is not limited to the specific embodiment shown.

I claim:

1. An electric switch contact mounting comprising an insulating boss, a bridging contact non-rotatably mounted on said boss, a holding plate engaging said contact, a tension bar engaging said plate, spring means acting to maintain said bar in engagement with said plate, said holding plate having non-rotatable sliding engagement with said boss.

2. An electric switch contact mounting comprising an insulating boss, a bridging contact member non-rotatably mounted on said boss, a tension member, spring means exerting tension on said tension member, and a contact holding member having non-rotatable sliding interengagement with said tension member and said boss.

3. A contact mounting as claimed in claim 2 wherein said bridging contact has non-rotatable, sliding engagement with said boss.

4. A contact mounting as claimed in claim 2 wherein the holding member has non-rotatable sliding engagement with said tension member and separate non-rotatable sliding engagement with said boss.

5. A contact mounting as claimed in claim 2 wherein the holding member is a stamped sheet metal part having slotted engagement with said tension member.

6. A contact mounting as claimed in claim 2

wherein the tension member is T-shaped, and the spring means presses against the cross arms and against the underside of the boss.

7. A contact mounting as claimed in claim 2 wherein the tension member has an opening receiving the holding member, said holding member being of stamped sheet metal and slotted to interengage with said tension member.

8. A contact mounting as claimed in claim 7 wherein the boss has a slot receiving said holding member in slidable non-rotary engagement.

9. A contact mounting as claimed in claim 8 wherein the bridging contact has slidable, non-rotary engagement with said boss.

10. A contact mounting as claimed in claim 2 wherein the boss has a slot receiving said holding member in slidable, non-rotary engagement.

11. An electric switch contact mounting comprising an insulating boss, a bridging contact member mounted on said boss, means holding said contact member non-rotatably on said boss comprising spring means, a member on which said spring means exerts tension, means in association with said tension member having non-rotatable sliding engagement with said boss and transmitting the resilient pressure of said spring means to said contact member.

12. A contact mounting as claimed in claim 11 wherein the boss is slotted and receives the means which is associated with the tension member.

13. A contact mounting as claimed in claim 12 in which said spring means is located in a bore in said boss through which said tension member passes.

14. A contact mounting as claimed in claim 11 in which the bridging contact member has a non-circular aperture fitting a non-circular portion of the boss to prevent relative rotation.

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

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