Dec. 5, 1950 H. E. HELLER 2,532,305

ELECTRIC SWITCH

Filed Aug. 17, 1949

Fig. 1

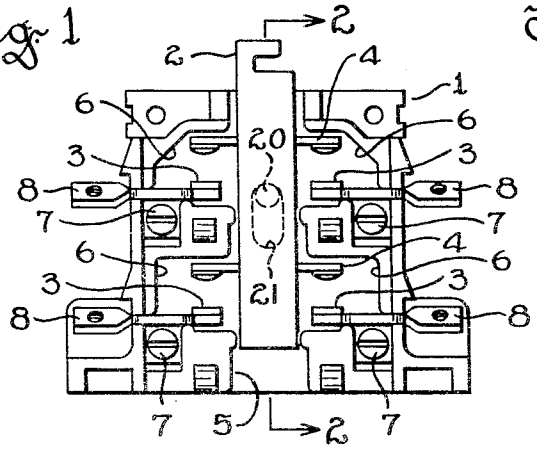


Fig. 2

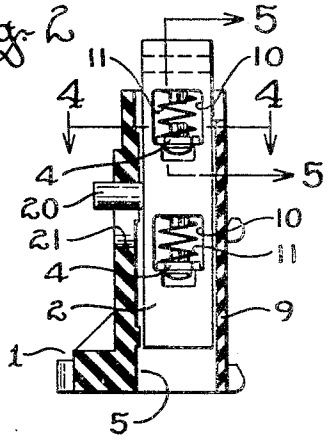


Fig. 3

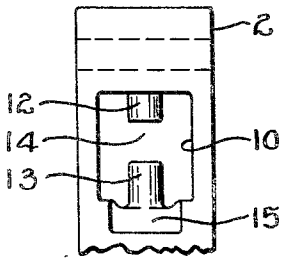


Fig. 4

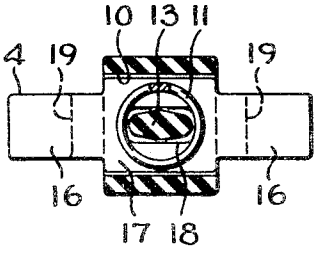


Fig. 5

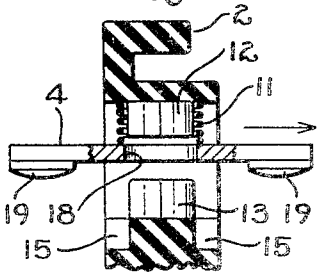


Fig. 6

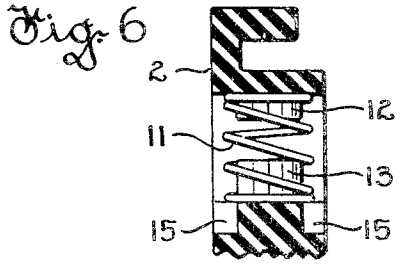


Fig. 7

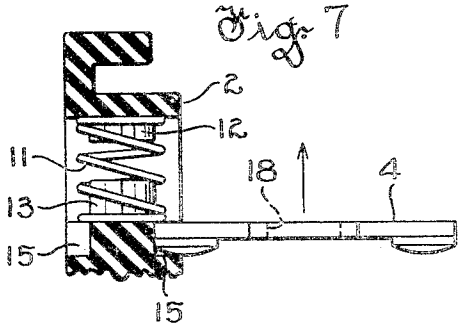
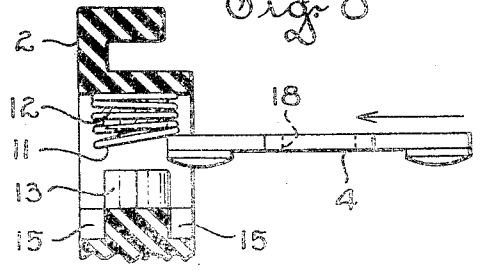


Fig. 8



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ELECTRIC SWITCH

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Application August 17, 1949, Serial No. 110,720

5 Claims. (Cl. 200—165)

1

This invention relates to electric switches, and more particularly to switches of the reciprocable slide bar type.

The invention has among its objects to provide an improved slide bar contact element for switches of the aforesaid type which is exceedingly simple and rugged in construction, reliable in operation and which comprises a small number of parts which can be readily manufactured and assembled at low cost.

Another object is to provide a movable contact assembly for switches of the aforesaid type which comprises an insulating slide bar having one or more bridging contacts mounted thereon, each of which is yieldingly supported and held in assembled position within a transverse aperture in the slide bar by an associated spring.

Another object is to provide for ready removal of the bridging contacts from the slide bar and ready replacement thereof in assembled position thereon and to also provide for retention of the contact springs within the contact receiving apertures in the slide bar upon removal of the bridging contacts.

Various other objects and advantages of the invention will hereinafter appear.

The accompanying drawing illustrates an embodiment of the invention which will now be described, it being understood that the embodiment illustrated is susceptible of modification without departing from the spirit and scope of the appended claims.

In the drawing,

Figure 1 is a front elevational view of a switch which is provided with a slide bar contact element embodying the invention;

Fig. 2 is a vertical sectional view taken substantially on line 2—2 of Fig. 1;

Fig. 3 is an enlarged side elevational view of the upper end of the slide bar illustrated in Fig. 1;

Fig. 4 is an enlarged sectional view of the slide bar contact element on line 4—4 of Fig. 2, and

Figs. 5, 6, 7 and 8 are fragmentary sectional views taken substantially on line 5—5 of Fig. 2 illustrating the manner in which the slide bar contacts are removed from the slide bar and replaced in assembled position thereon.

Referring to Fig. 1, the same illustrates a switch comprising a stationary contact carrying base 1 and a movable contact carrying slide bar 2. The switch illustrated is of the 2-pole type, each pole consisting of a pair of stationary contacts 3—3 mounted upon base 1 and a cooperating bridging contact 4 mounted upon slide bar 2.

2

Base 1 and its associated stationary contacts will be only briefly described since the present invention resides in the construction of slide bar 2 and its associated bridging contacts 3.

Base 1 comprises a molded insulating part having its front face recessed to provide a longitudinal center passage 5 for receiving slide bar 2 and to also provide cavities 6 on opposite sides of said passage for receiving the pairs of stationary contacts 3. Stationary contacts 3 are secured to base 1 by associated screws 7 and are provided with terminal extensions 8 which extend outwardly through side openings in said base. As shown in Fig. 2, slide bar 2 is held in assembled position within passage 5 by an insulating cover plate 9 which is detachably secured to the front face of base 1.

Slide bar 2 comprises an elongated molded insulating part of rectangular shape which is provided with spaced transverse apertures 10 for receiving bridging contacts 4. As shown in Fig. 2, each of the bridging contacts 4 is yieldingly supported and held in assembled position within its associated aperture 10 by a helical spring 11. It is of course apparent that slide bar 2 may be of any desired length and may be provided with contact receiving apertures for any desired number of bridging contacts.

More specifically, the contact receiving apertures 10 in slide bar 2 are identical and as shown in Fig. 3 each of said apertures is rectangular in shape and has centrally disposed end projections 12 and 13 formed on the upper and lower walls thereof. These projections are spaced to provide a gap 14 therebetween and as shown in Fig. 4 the same are of elliptoid shape and extend lengthwise between the open ends of aperture 10. Slide bar 2 also has recesses 15 formed on opposite sides thereof which extend downwardly from the lower walls of apertures 10.

Bridging contacts 4 are of identical form and as shown in Fig. 4 each comprises a flat metal stamping which is shaped to provide narrow end contact portions 16 and an enlarged center portion 17 which fits between the side walls of its associated aperture 10. Center portion 17 is provided with a center opening 18 for receiving the projection 13 on the lower end of its associated aperture 10 and as shown in Fig. 5 the end contact portions 16 have contact tips 19 fixed to the under side thereof. Each of the bridging contacts 4 is normally held in engagement with the lower wall of its associated aperture 10 by its associated spring 11. As shown in Fig. 2 each contact spring 11 is held under compres-

sion within its associated aperture 10 and encircles the end projections 12 and 13 therein.

As is apparent from the foregoing, bridging contacts 4 are yieldingly supported upon slide bar 2 to permit continued downward movement of said slide bar after said bridging contacts are moved into engagement with their associated stationary contacts 3. During such continued movement of slide bar 2 each of the bridging contacts 4 is moved upwardly within its associated aperture 10 against the action of spring 11 and is guided and supported against lateral displacement within said aperture by the projection 13 on the lower end thereof. Also during such continued movement of slide bar 2 each of the bridging contacts 4 is capable of rocking movement upon its associated projection 13 to provide for proper engagement thereof with its associated stationary contacts 3.

Slide bar 2 and its associated bridging contacts 4 constitute a unit assembly which is removable from base 1 upon removal of cover member 9. Upon removal of slide bar 2 from base 1 each of the bridging contacts 4 can be readily removed from said slide bar and replaced in assembled position thereon in the following manner.

To effect removal of a bridging contact 4 from slide bar 1 the same is lifted upwardly against the action of its associated spring 11 into a position midway between the projections 12 and 13 in its associated aperture 10. Fig. 5 illustrates the upper bridging contact in this position and as is apparent from this figure the bridging contact can then be slid endwise out of aperture 10 for removal from slide bar 2. It should be noted that when the bridging contact is positioned as shown in Fig. 5 substantially all of the turns of spring 11 encircle the upper projection 12 to prevent lateral distortion of said spring when the bridging contact is moved endwise out of aperture 10. Upon removal of the bridging contact from aperture 10 the lower end of spring 11 moves into encircling engagement with the lower projection 13 in said aperture. Spring 11 is then held under compression between the upper and lower walls of aperture 10 and the lower end thereof is exposed within the recesses 15 on opposite sides of slide bar 2.

To effect replacement of a bridging contact within its associated aperture 10 one end thereof is inserted into one of the side recesses 15 in slide bar 2 for engagement with the lower end of its associated spring 11 as shown in Fig. 7. The bridging contact is then lifted vertically with respect to slide bar 2 as shown in Fig. 8 to move the lower end of spring 11 out of engagement with projection 13 and to position said contact midway between the projections 12 and 13. As is apparent from Fig. 8, bridging contact 4 can then be slide endwise between the projections 12 and 13 and when the same is centered with respect to projection 13 the same can be released for downward movement on said projection under the action of spring 11.

In the embodiment illustrated in Figs. 1 and 2 slide bar 2 has an operating pin 20 fixed to the rear side thereof which extends through a slotted opening 21 in the rear wall of base 1. Opening 21 is so located and of such length as to limit the range of movement of slide bar 2 between the up position shown in Fig. 1 and a down position which permits a limited degree of overtravel of said slide bar after bridging contacts 4 are moved into engagement with their cooperating stationary contacts 3. As will be understood, the degree of overtravel of slide bar 2 is such that bridging contacts 4 are maintained in engagement with their associated projections 13.

I claim:

1. In a contact device, in combination, a carrier having a through slot therein and having in said slot oppositely disposed end projections which are aligned endwise but spaced apart, a helical spring mounted on said projections and a contact receivable between said projections and perforated to slide onto one of said projections, said carrier having an entrance for an end of said contact into said slot beyond an end of said spring thus to enable said contact to be used to push said spring off of one of said projections for insertion of said contact between said projections and alignment of the perforation of said contact with the projection from which the spring has been removed.

2. A contact device comprising an insulating slide bar having a transverse aperture and having in said aperture oppositely disposed end projections aligned endwise but spaced apart, a helical spring extending between said projections and encircling the same, and a contact receivable between said end projections and perforated to slide onto one of said projections, said slide bar having a side entrance opening beyond an end of said spring which enables an end of said contact to be used to push said spring off of one of said projections for insertion of said contact between said projections and alignment of the perforation of said contact with the projection from which said spring has been removed.

3. A contact device comprising a molded insulating slide bar of rectangular shape having a transverse aperture extending between opposite side faces thereof and having in said aperture oppositely disposed end projections aligned endwise but spaced apart, a helical spring mounted upon said projections, and an elongated bridging contact receivable in the space between said end projections and perforated midway between its ends to slide onto one of said end projections, said spring being wholly included between the side faces of said slide bar and said slide bar having side entrance openings beyond one end of said spring which enable an end of said contact to be used to push said spring off of one of said projections for insertion of said contact between said projections and alignment of the perforation in said contact with the projection from which said spring has been pushed.

4. A contact device comprising a slidable insulating carrier having a transverse aperture therein and having in said aperture oppositely disposed end projections aligned endwise but spaced apart, a helical spring encircling said projections and extending therebetween, and a contact receivable between said projections and perforated to slide onto one of said projections, said carrier having side entrance openings beyond one end of said spring which enable an end of said contact to be used to push said spring off of one of said end projections for insertion of said contact between said projections and alignment of the perforation in said contact with the projection from which said spring has been removed, and said projections being proportioned to hold said spring within said aperture upon removal of said contact from said carrier.

5. A movable switch assembly comprising an insulating slide bar having a transverse aperture and having in said aperture oppositely disposed end projections aligned endwise and spaced apart,

a helical spring encircling said projections and an elongated bridging contact extending through said aperture and perforated intermediate its ends to slide onto one of said end projections, said bridging contact being yieldingly held in engagement with said end projection under the action of said spring to maintain the same in assembled position within said aperture, and being removable from said aperture and replaceable therein when moved against the action of said

spring into the space between said projections, and said slide bar having entrance openings on opposite sides of said aperture which enable an end of said contact to be used to push the contact engaging end of said spring out of engagement with its associated end projection for insertion of said contact between said end projections.

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No references cited.