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ELECTRIC SLIDE SWITCH

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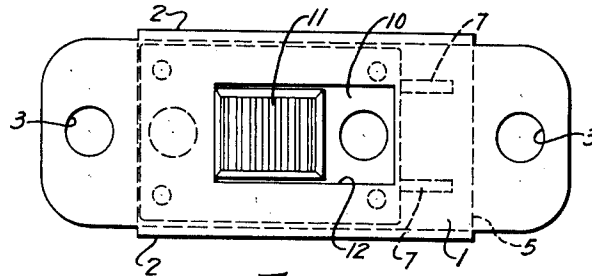


Fig. 1

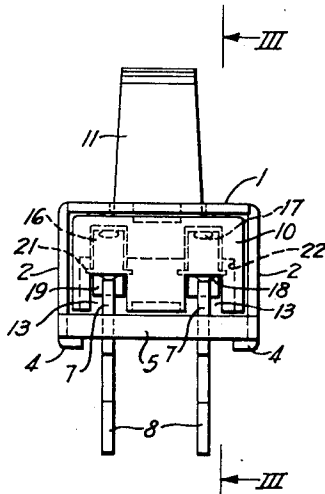


Fig. 2

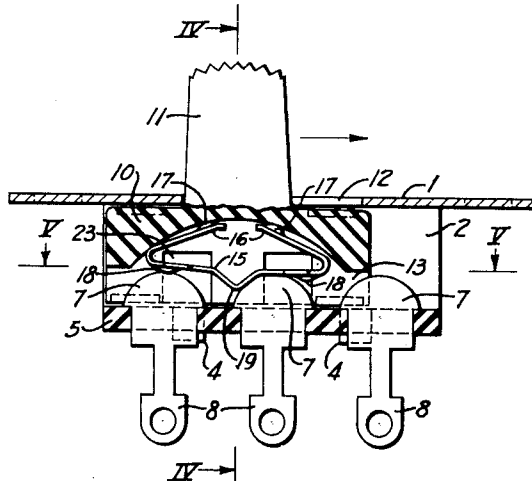


Fig. 3

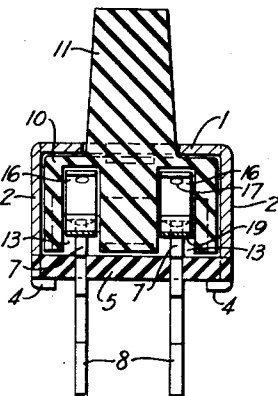


Fig. 4

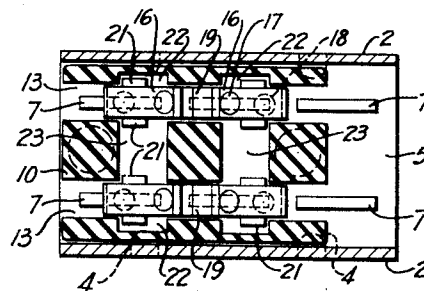


Fig. 5

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ELECTRIC SLIDE SWITCH

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5 Claims. (Cl. 200—77)

This invention relates to electric slide switches, and more particularly to those in which a sliding metal strip bridges two contacts.

In switches of this character known heretofore, separate indexing members have been required for holding the bridging members in their different positions. When such a switch is a double pole switch it often happens that the indexing member does not permit both bridging members to make good contact.

It is among the objects of this invention to provide a slide switch which is simple and inexpensive in construction, which has a bridging member that is self indexing, and in which good contact can always be made between the bridging members and the stationary contacts when it is a double pole switch.

In accordance with this invention, at least three spaced stationary contacts project from the upper face of a base in a line extending lengthwise of a slot formed in the top of a housing above the base. An actuating member or slide is disposed in the housing for movement lengthwise of the slot, and it is provided with a button which projects through one end of the slot for moving the slide. For bridging two of the contacts, a current-conducting spring strip in the housing has a central portion that extends across the tops of the two contacts in sliding engagement with them. The portions of this strip at opposite ends of its central portion extend upward and inward toward each other and have their upper ends pressing upward against the slide to press the strip down against the contacts. The strip is movable longitudinally by the slide. To make the strip self-indexing, its center projects downward between the two contacts engaged by the strip to prevent it from moving until the slide is moved by its button toward the opposite end of the housing slot. Preferably, the bottom of the slide is provided with a recess which receives the upwardly extending portions of the spring strip. The opposite sides of the central portion of the strip may be provided with laterally projecting ears, and the opposite side walls of the recess provided with notches that loosely receive the ears to positively connect the strip to the slide. This type of switch is most useful when it is a double throw, double pole switch, wherein there are two rows of stationary contacts, two self-indexing strips and two recesses in the slide.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which

Fig. 1 is a plan view of the switch;

Fig. 2 is an end view;

Fig. 3 is a longitudinal section taken on the line III—III of Fig. 2;

Fig. 4 is a transfer section taken on the line IV—IV of Fig. 3; and

Fig. 5 is a longitudinal section taken on the line V—V of Fig. 3.

Referring to the drawings, a housing is provided which is shown in the general form of an inverted channel; that is, it has a web or top wall 1 and parallel flanges or side walls 2. The top wall has extensions at its ends provided with openings 3, by means of which the switch can be fastened in place to the desired support. Although this housing may be made of any suitable material, it is preferred to make it of metal and to provide the lower

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edges of its side walls with lugs 4 which extend through notches in the edges of a base member 5 and are bent under it to position it in spaced parallel relation to the top of the housing. The member 5 has been described for convenience as being at the bottom of the switch, but of course it will be understood that the switch may be located in an inverted position or on its side or end. The base member is made of insulating material, and mounted in it are two rows of flat metal terminals, each of which has a convex portion projecting above the base to form a stationary contact 7, and a terminal portion 8 extending through a slot in the base for connection to a wire of an electric circuit. Three contacts are shown in each row, and they are spaced in a straight line extending lengthwise of the switch.

Disposed in the housing between its top and the base member is an actuating member or slide that is movable lengthwise of the switch. This slide, which preferably is made of a molded insulating material, has a generally rectangular body 10 from which an integral button 11 projects upward through one end of a slot 12 in the top wall 1 of the housing. The opposite ends of this slot limit the longitudinal movement of the slide by acting as stops which the button strikes. In a double pole switch, which is the one illustrated, the bottom of the slide is provided with a pair of upwardly extending parallel recesses 13, each of which receives one row of contacts on the base. The opposite ends of the recesses are open, and their top walls preferably are concave lengthwise.

The center contact in each row can be connected electrically with either of the end contacts in the same row by means of a movable bridging member, which is formed from a strip of spring metal that is a good conductor of electricity. Each spring strip has a central portion 15 that extends lengthwise of the recess above the underlying contacts, but it is only long enough to engage two contacts at a time, the center contact and either of the end contacts. The portions 16 of the strip at opposite ends of its central portion are bent upward and inward so that they are inclined upward toward each other. The spring strip is compressed between the top of a recess 13 and the underlying contacts, whereby it is pressed fairly tightly against the contacts to assure good electrical connections. The upper ends of the strip are bent downward slightly to prevent them from digging into the concave upper wall of the recess, and they also may be provided with spherical detents 17 on their upper surfaces to help the strip adjust itself in the recess.

Each end of the central portion of the strip also preferably is provided with a downwardly projecting spherical detent 18 for engaging the top of the adjacent end contact. The detent isolates the arc to a point on the side of the detent and the adjoining stationary contact 7 which is not the normal point of contact between them, and thereby keeps their contact surfaces clean. The intermediate zone of the strip always remains in engagement with the stationary center contact, and it engages the top of that contact at all times except during switching.

To make the switch self-indexing so that the spring strips will hold themselves at either end of the switch until moved to the opposite end by the slide, the center of each strip is provided with a downwardly projecting detent 19, preferably formed by bending the strip downward into the shape of a shallow V. The strip is of such length that when the slide button 11 engages either end of slot 12, the detent 18 at that end engages the underlying end contact 7. To hold the slide and bridging strip in that position, indexing detent 19 projects down between the two bridged contacts in engagement with the side of the center contact, as shown in Fig. 3. The strip can not move toward the opposite end of the housing unless enough force is applied to the slide button to cause

the indexing detent to tilt and compress the spring strip sufficiently to ride over the center contact. The expansion of the spring strip when the indexing detent passes the center point of the center contact causes the strip and slide to snap toward the adjacent end of the housing.

Engagement of the upper ends of the spring strips with the concave tops of recesses 13 generally will furnish enough friction to cause the slide to move the strips with it. Nevertheless, it is preferred to have a more positive connection, which can be produced by providing the opposite edges of the central portions of the strips with ears 21 that project loosely into open bottom notches 22 in the outer side walls of the recesses, and into notches 23 in their inner side walls. The latter notches can extend entirely through the central portion of the slide from one recess to the other. There is enough play between the ears and the notch walls to permit each spring strip to adjust itself into proper bridging position at either end of its stroke.

According to the provisions of the patent statutes, we have explained the principle of our invention and have illustrated and described what we now consider to represent its best embodiment. However, we desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

We claim:

1. An electric slide switch comprising a housing having a slot in its top, a base for the housing spaced from said top, three spaced stationary contacts projecting from the upper face of the base in a line extending lengthwise of the slot, a slide disposed in the housing for movement lengthwise of the slot and provided with an actuating button projecting through one end of the slot, and a current-conducting spring strip having a central portion extending across the tops of two adjacent contacts in sliding engagement therewith spaced from said base, the portions of the strip at opposite ends of said central portion extending upward and inward toward each other and having their upper ends pressing upward against the slide to press the strip against the contacts, the strip being movable longitudinally by the slide but always engaging the center contact, and the center of the strip having a detent projecting downward out of the plane of said central portion between the two contacts engaged by the strip, the side of said detent engaging the center contact, whereby the strip is self-indexing.

2. An electric slide switch comprising a housing having a slot in its top, a base for the housing spaced from said top, three spaced stationary convex contacts projecting from the upper face of the base in a line extending lengthwise of the slot, a slide disposed in the housing for movement lengthwise of the slot and provided with an actuating button projecting through one end of the slot, and a current-conducting spring strip having a central portion extending across the tops of two adjacent contacts in sliding engagement therewith spaced from said base, the portions of the strip at opposite ends of said central portion extending upward and inward toward each other and having their upper ends pressing upward against the slide to press the strip against two of the contacts, the strip being movable longitudinally by the slide but always engaging the center contact, the opposite ends of said central portion of the strip being provided with downwardly projecting spherical detents for engaging the tops of the end contacts, and the center of the strip projecting downward between the center contact and the end contact engaged by the strip to make the strip self-indexing.

3. An electric slide switch comprising a housing having a slot in its top, a base for the housing spaced from said top, three spaced stationary contacts projecting from the upper face of the base in a line extending lengthwise of the slot, a slide disposed in the housing for movement lengthwise of the slot and provided with an actuating button projecting through one end of the slot, the

bottom of the slide being provided with a recess above said contacts having a concave upper wall, and a current-conducting spring strip having a central portion extending across the tops of two adjacent contacts in sliding engagement therewith spaced from said base, the portions of the strip at opposite ends of said central portion extending upward and inward toward each other and having their upper ends provided with upwardly projecting spherical detents pressing against the upper wall of said recess to press the strip against the contacts, and the center of the strip having an indexing detent projecting downward out of the plane of said central portion between the two contacts engaged by the strip until the slide is moved by its button toward the opposite end of the slot to move the detent across the center contact.

4. An electric slide switch comprising a housing having a slot in its top, a base for the housing spaced from said top, at least three spaced stationary contacts projecting from the upper face of the base in a line extending lengthwise of the slot, a slide disposed in the housing for movement lengthwise of the slot and provided with an actuating button projecting through one end of the slot, the bottom of the slide being provided with a recess above said contacts, and a current-conducting spring strip having a central portion extending across the tops of two adjacent contacts in sliding engagement therewith spaced from said base, the portions of the strip at opposite ends of said central portion extending upward and inward toward each other and having their upper ends pressing against the top of said recess to press the strip against the contacts, the opposite sides of said central portion being provided with laterally projecting ears and the opposite side walls of said recess having notches therein loosely receiving said ears to connect the strip to the slide, and the center of the strip having an indexing detent projecting downward out of the plane of said central portion between the two contacts engaged by the strip.

5. An electric slide switch comprising a housing having a slot in its top, a base for the housing spaced from said top, two parallel rows of stationary contacts projecting from the upper face of the base, each row extending lengthwise of the slot and containing three convex contacts, a slide disposed in the housing for movement lengthwise of the slot and provided with an actuating button projecting through one end of the slot, the bottom of the slide being provided with a pair of parallel recesses above said contact rows, and a current-conducting spring strip above each row and having a central portion extending across the tops of two adjacent contacts in the underlying row in sliding engagement therewith spaced from said base, the portions of each strip at opposite ends of its central portion extending upward and inward toward each other and having their upper ends pressing against the top of one of said recesses to press the strip against two of the underlying contacts, the adjacent inner sides of the central portions of the strips being provided with ears projecting laterally toward each other and the portion of the slide between said recesses having notches therein loosely receiving said ears to connect the strips to the slide, and the center of each strip having an indexing detent projecting downward out of the plane of said central portion between the two contacts engaged by that strip, the sides of the detents engaging the center contacts.

References Cited in the file of this patent

UNITED STATES PATENTS

1,740,535	Bramming	Dec. 24, 1929
2,303,693	Hill	Dec. 1, 1942
2,384,652	Smith	Sept. 11, 1945
2,453,498	Crowley	Nov. 8, 1948
2,550,145	Geci	Apr. 24, 1951
2,588,793	Barry	Mar. 11, 1952