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3,158,698

ELECTRIC SLIDE SWITCH WITH SHIELDED TERMINALS

Filed Sept. 13, 1961

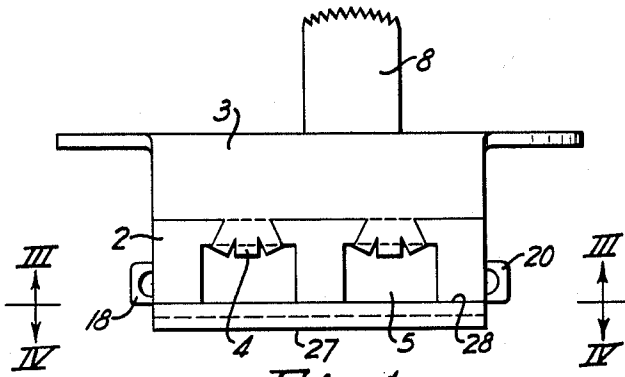


Fig. 1

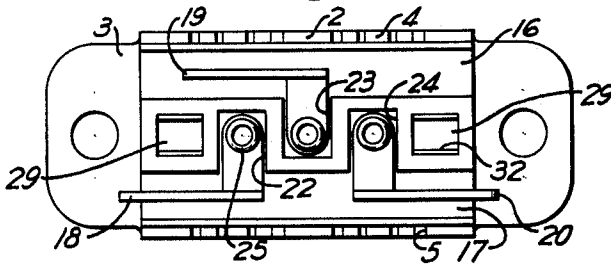


Fig. 3

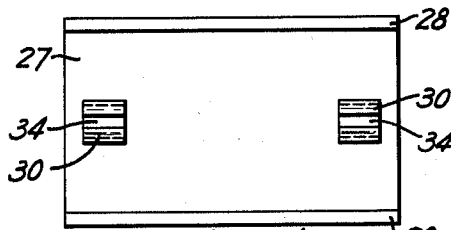


Fig. 4

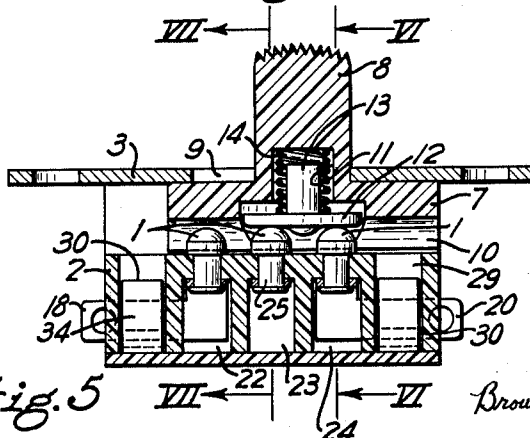


Fig. 5

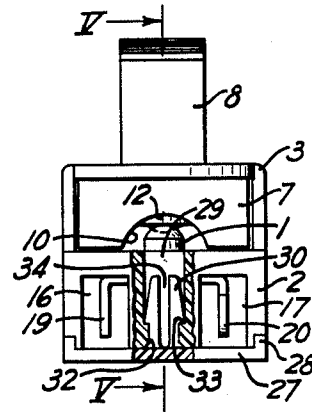


Fig. 2

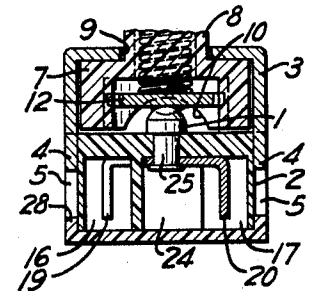


Fig. 6

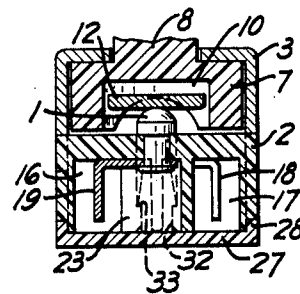


Fig. 7

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3,158,698 ELECTRIC SLIDE SWITCH WITH SHIELDED TERMINALS

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This invention relates to electric slide switches and more particularly to the electrical shielding of their terminals.

In my copending patent application, Serial Number 86,894 filed February 3, 1961, now Patent No. 3,097,269 granted July 9, 1963, a slide switch of the general type disclosed herein is shown. In that switch the electric terminals are covered and shielded by a snap-on insulating shield attached to the flat switch base. The shield is provided with recesses that receive the terminals and wire leads. The present invention is an improvement over that switch and has for its objects the provision of a switch in which the terminal-receiving recesses are in the base itself, in which the terminals do not project from the back of the switch even if the shield is omitted, in which the shield is a thin plate, and in which the shield can be permanently connected to the base.

In accordance with this invention, the insulating base of an electric slide switch is provided in its bottom with a pair of parallel longitudinal channels. Mounted in the channels are electric terminals. Fixed contacts are mounted on top of the base in a row extending lengthwise thereof and are joined to the terminals. A movable contact is slidable along the row of contacts in a housing that covers the contacts and is secured to the base. The bottom of the base normally is engaged by an insulating plate that covers the channels to shield the terminals therein. To hold the plate in place, the plate and base are provided with interengaging portions, such as a tongue and groove that snap together.

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

FIG. 1 is a side view of the switch;

FIG. 2 is an end view thereof;

FIG. 3 is a view of the bottom of the base without the shield;

FIG. 4 is a view of the top or inner side of the shield;

FIG. 5 is a longitudinal section of the switch taken on the line V—V of FIG. 2; and

FIGS. 6 and 7 are cross sections taken on the lines VI—VI and VII—VII, respectively, of FIG. 5.

Referring to the drawings, two or more spaced fixed contacts 1 are rigidly mounted in a straight line along the center of the inner or upper surface of a thick rectangular base 2 made of a suitable insulating material, such as nylon. Three contacts are shown for the purpose of illustration. Seated on the base is a channel shape metal housing 3, the side edges of which are provided with ears 4 extending through notches in the opposite sides of the base and into recesses 5, with which those sides are provided. The lower ends of the ears are staked to expand them in order to lock the ears in the notches and thereby securely fasten the housing and base together.

Disposed in the housing between its top and the base is an actuating member or slide that can be moved lengthwise over the switch. This slide, which preferably is made of a molded insulating material, has a rectangular body 7, from which an integral button 8 extends up through one end of a slot 9 in the top wall of the housing. The opposite ends of this slot limit the movement of the slide by acting as stops, which the button strikes. The button of the slide is provided with a channel 10 that receives the row of contacts on the base. The center of the

channel opens into a recess 11 that extends up into the button and that contains a sliding contact which, if in the form of a disc 12, has a central stem 13. The disc is pressed against the fixed contacts by a coil spring 14 encircling the stem. The sliding contact engages only two fixed contacts at a time.

According to this invention, the bottom of the base 2 is provided with a pair of laterally spaced parallel channels 16 and 17 that extend lengthwise of the base and that contain electric terminals 18, 19 and 20 connected to the fixed contacts 1 on the opposite side of the base. Each terminal has a portion in one of the channels for connection to or engagement with a wire lead (not shown), and a lug portion that extends laterally into a recess 22, 23 or 24 in the central portion of the base, where the lug portion can be connected to the contact above it by a short hollow stem 25 extending from the contact down through the base from that contact and riveted in the lug. This holds both the contact and the terminal in place. The terminals do not project below the base and therefore are not likely to be shorted accidentally or to give anyone a shock, but they may project from the ends of the channels if desired. The terminals may be the kind that receive wire lead connectors that slip over the terminals tightly, or the wire leads can be soldered to the terminals or attached in some other way. In either case, the leads extend away from the ends of the channels.

Another feature of this invention is that channels 16 and 17 and the terminals are covered by a thin insulating shield that can be quickly applied. Accordingly, a thin rectangular shielding plate 27, which may be made of the same material as base 2, normally fits against the bottom of the base like a cover. The opposite side edges of the shielding plate may be provided with flanges 28 that overlap the reduced side edges of the base. The plate and the base are provided with interengaging portions that hold them together. For this purpose they preferably are provided with at least one interengaging recess and projection. Most suitably, the central portion of the base between its channels is provided in its bottom with at least one recess, in which is fitted an upwardly extending projection on the plate. The recess may be a socket, preferably rectangular, and the projection a resilient tongue so that it can be compressed as it is inserted in the socket. Where two sockets 29 are used, they are at opposite ends of the base and are spaced apart by recesses 22, 23 and 24. The top of the plate then has a pair of spaced tongues 30 that fit into the sockets. The central part of the base projects down between the tongues.

To hold the shielding plate against the base, two opposite sides of each socket preferably are provided with integral horizontal ribs 32, the tops of which form shoulders. The bottoms may be beveled. Above the level of the socket shoulders the inserted tongue is thicker to provide shoulders 33 that overlap and seat on the socket shoulders. Above the tongue shoulders the tongue preferably is tapered upwardly to facilitate insertion in the socket. The natural resiliency of the plastic that is used to form the shield and plate may be sufficient to permit the tongues to be snapped into the sockets, but it is best to provide each tongue with a longitudinal slot 34 so that the opposite sides of the tongue can be flexed toward each other slightly by the socket shoulders when the tongue is placed against the entrance to a socket and pushed to cause it to enter the socket.

A switch made in accordance with this invention has a neat appearance, because there are no exposed terminals and wire connections. The bottom of the switch is smooth and flat. The shield protects the switch from short-circuiting and from damage to the connections between the wire leads and the terminals. It also prevents accidental grounding of the terminals to the housing lugs.

The shield is very inexpensive and can be applied quickly to the rest of the switch by merely snapping it in place. The shape of the overlapping shoulders will determine whether the shield is locked in place or can be removed if desired. It does not matter which end of the shield is at which end of the base. If left off, the terminals are still quite well protected in the recesses and channels of the base.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I 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.

I claim:

1. An electric slide switch comprising an insulating base provided in its bottom with a pair of parallel longitudinal channels having open ends, electric terminals mounted in said channels, fixed contacts mounted on top of said base in a row extending lengthwise thereof and joined to said terminals, a movable contact slidable along said row of contacts, a housing covering said contacts and secured to said base, and an insulating plate normally engaging the bottom of the base and covering said channels to shield said terminals, the central portion of said base between the channels having in its bottom a socket provided inside with shoulders, and the upper surface of said plate having a projection extending upwardly into said socket and provided with shoulders fitting over said socket shoulders to connect the plate to the base.

2. An electric slide switch according to claim 1, in which said projection is a bifurcated tongue tapered upwardly above its shoulders and resilient enough transversely to pass up between said socket shoulders.

3. An electric slide switch comprising an insulating base provided in its bottom with a pair of parallel longitudinal channels having open ends, electric terminals mounted in said channels, fixed contacts mounted on top of said base in a row extending lengthwise thereof and

joined to said terminals, a movable contact slidable along said row of contacts, a housing covering said contacts and secured to said base, and an insulating plate normally engaging the bottom of the base and covering said channels to shield said terminals, the central portion of the base between said channels having in its bottom a pair of longitudinally spaced sockets, and the top of said plate having a pair of longitudinally spaced compressible tongues fitting in said sockets, the central part of said central portion between said sockets projecting down between the tongues.

4. An electric slide switch comprising an insulating base member, fixed contacts mounted on top of said base member in a row extending lengthwise thereof, electric terminals mounted on the bottom of said base member and joined to said contacts, a movable contact slidable along said row of contacts, a housing covering said contacts and secured to said base member, and an insulating plate member normally engaging the bottom of the base member, one of said members being provided with a pair of parallel longitudinal channels receiving said terminals and having open ends, the central portion of said one member between the channels having a socket facing the other of said members and provided inside with shoulders, and said other member having a projection extending vertically into said socket and provided with shoulders fitting over said socket shoulders to connect the plate member to the base member.

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