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W. SCHMID

2,256,295

ELECTRIC SWITCH

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Fig. 1.

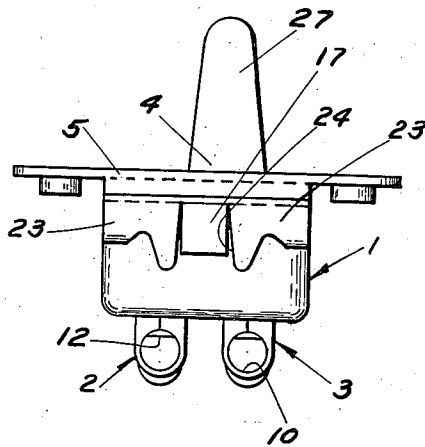


Fig. 2.

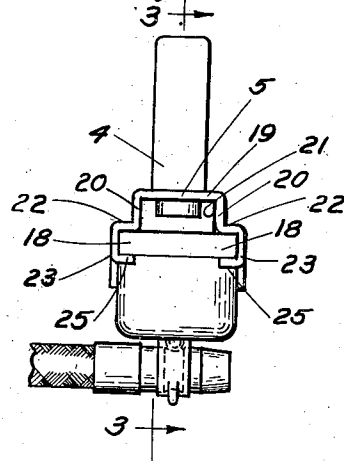


Fig. 3.

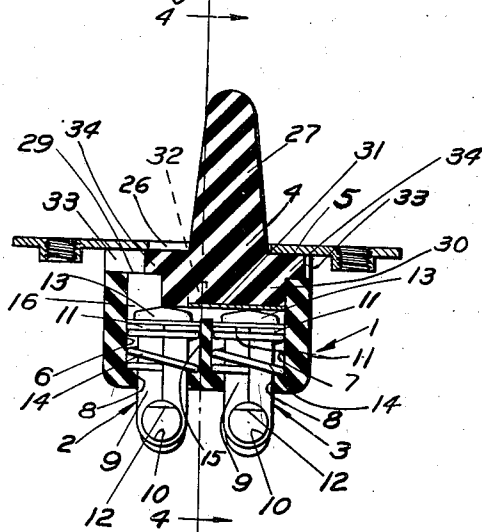
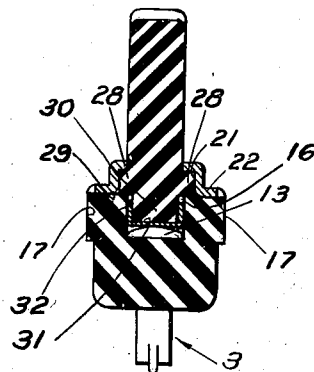


Fig. 4.



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UNITED STATES PATENT OFFICE

2,256,295

ELECTRIC SWITCH

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5 Claims. (Cl. 200—164)

This invention relates generally to electric switches, and more particularly to relatively small switches of the slide type that are used in automobiles, other vehicles, and appliances.

One object of the invention is to construct a switch which includes in combination, a housing of insulating material, spaced apart spring pressed contact means, an actuating member carrying a bridge member which is engageable with said contact means, and a mounting member for the switch.

Another object of the invention is to provide a longitudinal guideway in the housing, and one in the mounting member which cooperate to receive and guide the actuating member above referred to. More specifically the actuating member is provided with an enlargement having shoulders formed thereon that slide within the guideway formed within the mounting member and at times along the upper extremity of the housing, and a projecting portion carrying bridge means slidable within the guideway provided in the housing.

Another object is to provide a slot in the mounting member through which the handle of the actuating member extends, and provide an opening adjacent the junction between the ends of the housing and the mounting member, and provide extensions on the enlargement of the actuating member whereby to assist in maintaining said slot covered from beneath so as to conceal from view the switch mechanism, and also to alternately close said openings when the actuating member is reciprocated to turn the switch either on or off.

A further object is to locate the contact means whereby the contact portions formed thereon project within the longitudinal guideway provided in the housing of insulating material.

A still further object of the invention is to design and construct a durable switch that consists of few parts, which can be easily made and rapidly assembled economically on a commercial basis.

Many other objects and advantages of the invention will appear after considering the description hereinafter set forth in connection with the drawing annexed hereto.

Referring to the drawing wherein the various parts of the switch are designated by numerals: Figure 1 is a side view in elevation of the switch;

Figure 2 is an end view of the switch shown in Figure 1, with a terminal attached to one of the contact means;

Figure 3 is a section taken substantially on line 3—3 of Figure 2, disclosing the switch mechanism, and excluding the terminal; and

Figure 4 is a section taken substantially on line 4—4 of Figure 3 showing other details of construction.

Referring to the drawing, numeral 1 generally designates the housing of the switch; 2 and 3 the spaced apart spring pressed contact means reciprocally mounted on the housing 1; 4 is the actuator; and 5 is the mounting plate whereby the switch may be mounted with respect to a suitable support, such as the pillar of an automobile.

The switch housing is preferably constructed of a moulded insulating material, and is provided with a pair of spaced apart cylindrical wells 6 and 7, and the bottom wall of the housing is provided with a pair of spaced apart rectangular apertures 8 which communicate with the wells 6 and 7 as clearly shown.

The contact means 2 and 3 are reciprocally mounted in the wells 6 and 7, respectively. Since each of the contact means 2 and 3 are identical, a description of one will suffice. Each contact means is preferably comprised of two parts, each part being constructed from a single piece of sheet metal. The outer part is comprised of two channel portions formed into a tubular body as indicated at 9, having a terminal receiving aperture 10 adjacent its outer extremity, and circular two-part flanges 11 formed adjacent its inner extremity. The inner part of the contact means is arranged within the outer tubular part 9, and one end is provided with a looped detent portion 12 that cooperates with the terminal receiving aperture 10, and the other end is provided with an enlarged conical contact portion 13. As clearly shown, the enlarged contact 13 is provided with a substantially circular flange that is adapted to abut the flanges 11 on the tubular part 9, and both flanges are of a size to slidably engage the walls of a well for guidance. Since the apertures 8 are rectangular in shape and the contact means are preferably rectangular in cross-section, and project through the apertures 8, rotation of the contact means 2 and 3 is prevented. A helical spring 14 is arranged in each well and encircles a contact means, one end of the spring engaging the flanges 11, and the other end the bottom of the well. By this arrangement both contact means are normally urged inwardly. An integral partition 15 formed within the housing separates the contact means from each other.

Each of the contact means 2 and 3 is of a character whereby to receive a terminal of the snap type, clearly shown in Figure 2. The terminal shown is in wide commercial use, and is adapted to be received in a terminal receiving aperture 10, with the detent portion 12 cooperating with the cove or groove in the terminal in order to resiliently retain the terminal in place. When the terminal is inserted in an aperture of a contact means, the outer tubular part 9 of the contact means is moved outwardly with respect to the inner part, causing the flanges 11 provided on the outer part and the flange provided on the inner part to separate, but, the helical springs 14 nevertheless still function to hold the terminal in place and normally urge each of the contact portions 13 bodily inwardly to engage the bridge means.

The housing is further formed with a longitudinal guideway 16, preferably rectangular in shape, and is also formed with bosses 17 adjacent its side walls, and integral corner projections 18, the purposes of which will be described later.

Referring now to the construction of the mounting member 5, the same is preferably formed to include an elongated substantially flat portion 19, having angular side walls 20, of a shorter length which together provide a channel or longitudinal guideway 21 preferably substantially rectangular in cross-section. The mounting plate is further formed with outwardly extending shoulder portions 22, and angular depending portions 23, which together provide a longitudinal channel of a larger size than the first, adapted to receive the upper extremity of the housing. As clearly shown, the portions 23 are elongated so as to engage and reinforce the side walls of the housing. The portions 23 are also spaced apart to provide a bifurcation 24 adapted to receive the bosses 17, and are provided with fingers 25, which are bent under to engage the corner projections 18 formed on the housing. The mounting plate is thus held in a fixed or firm position on the housing 1. The flat portion 19 of the mounting plate is provided with a longitudinal rectangular slot 26 through which extends the elongated tapered handle or knob 27 which forms a part of the actuating member 4.

The actuator 4 is constructed of insulating material and is preferably formed with an enlargement adjacent its lower extremity. The enlargement is formed to provide a pair of shoulders 28, which slide within the guideway 21 and along the upper extremity or flat surface 29 of the housing 1, and a longitudinal projection 30, preferably rectangular or square in cross-section, is adapted to slide within the guideway 16 formed in the housing. The lower surface of the projection 30 is preferably recessed so as to receive the bridge means or contact plate 31 in order to locate same flush with the lower surface of the projection 30. The contact plate 31 is provided with a pair of fingers 32 which straddle said projection and fit in notches provided therefor in the projection in order to assist in holding the plate in place. As clearly shown, the enlarged contact portions 13 forming part of the contact means 2 and 3 are urged into the guideway 16 by the springs 14 whereby to cooperate with the contact plate 31, and said springs also function to cause the upper flat surface of the enlargement to normally bear against the bottom of the guideway 21.

Referring to Figure 3, the mounting member 5 is preferably made with open ends as indicated at 33, and these openings are alternately closed by the integral extensions 34 formed on the enlargement when the actuator is moved to either of its two positions, and also assist to maintain the rectangular slot 26 covered from beneath whereby to conceal from view the inner parts of the switch. These extensions 34 also serve to increase the bearing surface in order to further prevent any possible tilting of the actuating member. As clearly shown in Figure 3, the switch is in open circuit position, since the contact plate 31 is only in contact with the enlarged contact 13 of the contact means 3. When the actuator 4 is moved to the left, the contact plate will also slidably engage the other enlarged contact on the contact means 2, and thereby close the circuit.

Any suitable means may be employed to limit the travel of the actuator member in each direction, but as illustrated, the ends of the longitudinal projection 30 are adapted to butt against the end walls of the housing. The switch may be mounted in any suitable manner with respect to a support, but in the present instance the end extremities of the mounting plate 5 are provided with threaded openings through which means may be extended in order to secure the switch in the desired position.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of the invention; and, therefore, I do not wish to be understood as limiting myself to the exact form, construction, arrangement, and combination of parts, herein shown and described.

What I claim and desire to secure by Letters Patent is:

1. A switch including in combination; a housing provided with wells and apertures cooperating with said wells; a pair of contact means, each having a contact portion arranged within a well and a portion extending through an aperture and having a terminal receiving aperture therein; a spring encircling each of said contact means; said housing being further formed with a guideway with said contact portions extending therein, bosses adjacent its side walls and projections at the corners thereof; an actuator provided with a handle at one extremity, and an enlargement at the other extremity, said enlargement being formed to provide shoulders and a longitudinal projection, the latter carrying bridge means adapted to cooperate with said contact portions; a mounting plate for said switch provided with a slot through which said handle extends, and formed to provide a pair of channel portions; one of said channels cooperating with the guideway in said housing whereby to receive said shoulders and said longitudinal projections; and the other portion receiving the upper extremity of said housing and provided with bifurcations receiving said bosses, and fingers which are clamped over said corner projections.

2. A switch including in combination; a housing provided with wells and apertures cooperating with said wells; a pair of contact means, each having a contact portion arranged within a well and a portion extending through an aperture and having a terminal receiving aperture therein; a spring encircling each of said contact means; said housing being further formed with a guideway with said contact portions extending there-

in, bosses adjacent its side walls and projections at the corners thereof; an actuator provided with a handle at one extremity, and an enlargement at the other extremity, said enlargement being formed to provide shoulders and a longitudinal projection, the latter carrying bridge means adapted to cooperate with said contact portions; a mounting plate for said switch provided with a slot through which said handle extends, and formed to provide a pair of channel portions; one of said channels cooperating with the guideway in said housing whereby to receive said shoulders and said longitudinal projections; and the other portion receiving the upper extremity of said housing and provided with bifurcations receiving said bosses, and fingers which are clamped over said corner projections; said mounting plate being further formed with an opening at each end thereof, and extensions formed on the enlargement of said actuator adapted to alternately close said openings when the actuator is moved back and forth, and also assist in maintaining said slot in said mounting plate covered from beneath.

3. A mounting member for a switch, including a flat portion, portions extending upwardly therefrom to provide a channel on one side of said flat portion for an actuator, shoulder portions extending in a plane substantially parallel to said flat portion and outwardly with respect to said upwardly extending portions, and portions projecting at an angle to said shoulder portions whereby said shoulder portions and said projecting portions provide a channel on the other side of said flat portion of a size somewhat larger than the channel first mentioned for embracing part of a switch housing.

4. A switch including in combination; a housing provided with wells and apertures cooperating with said wells; a plurality of yieldable contact means, each of said contact means having a contact portion arranged within a well and a portion extending through an aperture and an end to which a terminal may be secured; said housing being further formed with a guideway with a said contact portion extending therein, bosses adjacent its side walls and projections at the corner thereof; an actuator provided with a handle at one extremity and an enlargement at

the other extremity, said enlargement being formed to provide shoulders and a longitudinal projection, the latter carrying bridge means adapted to cooperate with said contact portions; a mounting plate for said switch provided with a slot through which said handle extends, and formed to provide a pair of channel portions; one of said channels cooperating with the guideway in said housing whereby to receive said shoulders and said longitudinal projections, and the other portion receiving the upper extremity of said housing and provided with means for receiving said bosses, and further means which are clamped over said corner projections whereby to hold said parts in assembly.

5. A switch including in combination; a housing provided with a well and apertures cooperating with said well; a plurality of yieldable contact means, each having a contact portion arranged within the well and a portion extending through the aperture and having a portion to which a terminal may be connected; said housing being further formed with bosses adjacent its side walls and projections adjacent the corner thereof; an actuator provided with a handle at one extremity and an enlargement at the other extremity; said enlargement being formed to provide shoulders and a longitudinal projection, the latter carrying bridge means adapted to cooperate with said contact portions; a mounting plate for said switch provided with a slot through which said handle extends, and formed to provide a pair of channel portions; one of said channels cooperating with said well in said housing whereby to receive said shoulders and said longitudinal projection, and the other portion receiving the upper extremity of said housing and provided with means receiving said bosses, and further means which are clamped over said corner projections; said mounting plate being further formed with an opening adjacent at least one end thereof, and extensions formed on the enlargement of said actuator adapted to alternately close said opening when the actuator is moved back and forth, and also assist in maintaining said slot in said mounting plate covered from beneath.

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