May 31, 1932. N. J. WALSH ET AL 1,860,876

ELECTRICAL SWITCH

Filed May 1, 1930

Fig. 1.

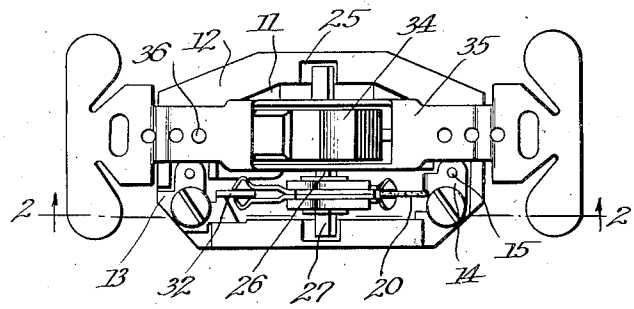


Fig. 2.

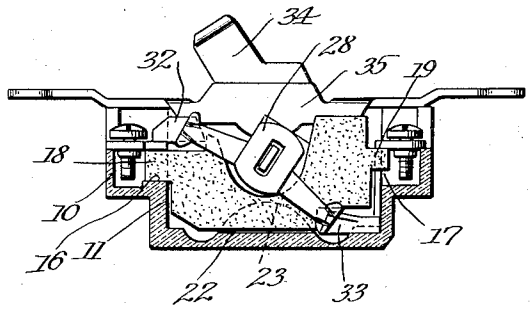
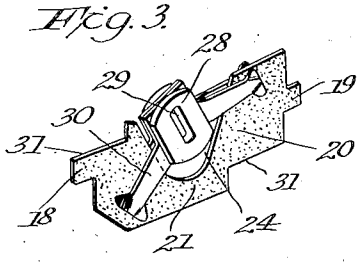


Fig. 3.



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UNITED STATES PATENT OFFICE

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ELECTRICAL SWITCH

Application filed May 1, 1930. Serial No. 448,993.

This invention relates to new and useful improvements in electrical switches, and more particularly to the type known as snap or toggle switches involving an oscillatory commutator or switch element.

An important object of the invention is to provide a simplified construction for snap switches which enables the parts thereof to be rapidly assembled without special care and attention to fine adjustments of the parts or the work ordinarily incident to the mounting and assembly of the device. In this simplified construction, the switch or commutator blade is loosely mounted and, in order to insure proper movement of the switch blade into engagement with the stationary contacts, means are provided for guiding the movement of the switch blade.

Another important object of the invention is to provide means for mounting such guide means securely in the switch casing in a manner to prevent its accidental displacement and to insure its being retained in proper cooperative relationship with the stationary contacts.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the drawings forming a part of the application and wherein like numerals are employed to designate like parts throughout the several views:

Figure 1 is a top plan of a switch embodying the invention.

Figure 2 is a longitudinal section taken on the line 2—2 of Figure 1, and

Figure 3 is a perspective view showing the switch or commutator blade associated with the guide element.

Referring now more particularly to the drawings, the numeral 10 designates a switch casing of porcelain or any other suitable insulating material having a cavity 11 therein for the reception of a switch mechanism. The outer or relative top surface 12 of this casing is suitably recessed at opposite ends thereof for the support and attachment of stationary contact pieces 13 and 14, each having the usual binding post screw and being secured to the casing by means of the well known screws 15 extending through the casing from the back thereof. The end walls of the cavity 11 immediately beneath the stationary contact pieces 13 and 14, are provided with longitudinally aligned slots or slits 16 and 17, as best seen in Figure 2 to receive lugs 18 and 19 provided at opposite ends of a guide 20. This guide may assume various different forms and may be constructed from any suitable dielectric material, but, in the present instance, is illustrated as a thin, stiff sheet of insulating material. The lower edge portion 21 of this guide sheet is received in a relatively narrow slot 22 provided in an arcuate embossed portion 23 on the bottom of the cavity 11. This slot 22 extends longitudinally of the cavity 11 and is arranged, of course, in alignment with the slots 16 and 17. The edge of the guide sheet opposite the edge 21, intermediate its ends, is provided with a cut-out portion 24 for a purpose which will presently appear.

To form a support for the switch mechanism directly upon the insulating walls of the casing 10, the side walls of the cavity 11 are provided with grooves 25 having V-shaped bottoms. An oscillatory yoke 26 has laterally extending flat trunnions 27 for support upon the V-shaped bottoms of the grooves 25. In this manner, the oscillatory yoke is fulcrumed substantially on knife-edge portions for rendering the oscillatory yoke easily shiftable from side to side.

One of these trunnions 27 forms a loose mounting for a switch blade assembly 28 which has an opening 29 larger than the cross-section of the trunnion 27, so as to be loosely mounted thereon and capable of lateral play. This switch blade assembly is, of course, insulated from the trunnion, and includes switch arms 30 of conducting material, extending in opposite directions on opposite sides of its axis. Each arm 30 is a multi-ply element of resilient material, and is preferably composed of a pair of juxtaposed resilient plates normally engaging one another, but parted upon engagement with their respective stationary contacts 13 and 14 to clasp the same. The resilient plates of each arm 30 are adapted to straddle the

guide sheet 20 and move freely across the same to be guided into engagement with the stationary contacts 16 and 17.

Diagonally opposite corners 31 of the guide sheet are removed or cut away to permit the contacting ends of the switch arm 30 to engage and clasp their respective stationary contacts when the switch blade is disposed in "on position." It will be noted that the stationary contact 13 is provided with a contact wing 32 overhanging the edge of the cavity 11 in the path of movement of the switch blade, and is arranged directly above the outer corner 31 of the guide sheet, while the other stationary contact 14 is provided with a portion depending into the cavity 11 and terminating at its lower end in an angularly disposed contact wing 33 arranged in the removed corner 31 of the guide sheet 20. Obviously, these cut-away diagonal corners of the guide sheet, permit the ends of the switch arms 30 to engage with the stationary contact wings 32 and 33, and the cut-out portion 24 of the sheet permits of the switch blade assembly being disposed in proper cooperative relation therewith. It will also be obvious that the guide sheet 20 being straddled by the switch blade assembly, will accurately guide the switch arms into engagement with the stationary contact wings, regardless of the fact that the switch blade assembly is loosely mounted upon the oscillatory yoke trunnion 27.

As is customary in this type of switch, the oscillatory yoke 26 is snapped first from one position to another by means of the well known type of spring arrangement between the bridge of the oscillatory yoke and operating lever or button 34 which is pivotally mounted in a bridge plate 35, spanning the cavity 11 and secured to the walls of the casing by means of screws 36 extending through the casing from the back thereof.

In this preferred form of the invention, the guide sheet 20 is made of laminated phenolic material but, obviously, any other suitable insulating material may be employed. This guide sheet 20 is associated with the switch casing before the snap toggle mechanism is assembled therein, by sliding the projecting lugs 18 and 19 down into the slots 16 and 17, respectively, of the casing. The stationary contact pieces 13 and 14 are then attached to the casing so that they overlap the lugs 18 and 19, and close the upper open ends of the slots 16 and 17, so as to prevent accidental displacement of the guide sheet. The inner edge 21 of this sheet is, of course, seated in the longitudinal slot 22 provided in the embossed portion 23 of the base, as explained hereinbefore, and this three-point engagement with the guide sheet retains it perfectly parallel to the side walls of the casing and in a plane at right angles to the axis of the trunnions 27 of the oscillatory yoke, so that it will properly guide the arms of the oscillatory switch element 28 into engagement with the stationary contacts and, at the same time, prevent excessive wabbling of the switch blade assembly 28 on the trunnion 27. By reason of this bracing and guiding of the oscillatory switch blade by the guide element 20, the switch blade can be loosely mounted on the trunnion 27, and no special care and attention is required to make the connection of the switch blade with the oscillatory yoke with the result that an expensive connection between these two parts is entirely eliminated.

It will, of course, be obvious that instead of forming this insulated guide 20, as an element separate and distinct from the insulated casing 10, it may be formed or mounted integral with the casing in the form of a thin-web integral with the bottom and ends of the casing with its diagonally opposite corners removed or otherwise formed to permit proper electrical connection between the oscillatory switch blade and the stationary contacts.

It is to be understood that various changes in the size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the appended claims.

We claim:

1. A snap switch mechanism comprising a casing having a cavity, the end walls of said cavity having slots and stationary contacts, a guide member extending longitudinally in said cavity and having its ends received in said slots, said contacts overlapping said slots to prevent vertical displacement of said guide, an oscillatory multi-ply contact blade loosely mounted for lateral play and having its plies straddling said guide member, said guide member having its diagonally disposed corners removed for the projection of said stationary contacts and for engagement of the plies of said contact blade with the stationary contacts, and operating means for said blade connected therewith.

2. A snap switch mechanism comprising a casing having a cavity, the end walls of said cavity having slots and stationary contacts, a guide member extending longitudinally in said cavity and having its ends received in said slots, said contacts overlapping said slots to prevent vertical displacement of said guide member, an oscillatory multi-ply contact blade loosely mounted for lateral play and having its plies straddling said guide member, and operating means for said blade associated therewith.

3. A snap switch mechanism comprising a casing having a cavity, the end walls of said cavity having slots and stationary contacts, a guide member extending longitudinally in said cavity and having its ends received in said slots, said contacts overlapping said slots to prevent vertical displacement of said guide.

an oscillatory contact blade mounted on an axis between its ends and including a pair of juxtaposed arms arranged upon opposite sides of said guide member, said guide member having an intermediate cut-away portion in which the intermediate portion of the contact blade operates, and operating means for said blade associated therewith.

In testimony whereof we have hereunto set our hands.

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