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2,454,540

ELECTRIC SWITCH

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Fig. 1.

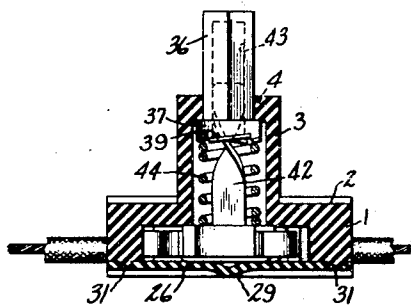


Fig. 3.

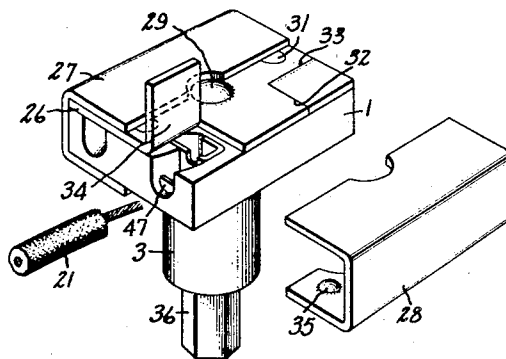


Fig. 2.

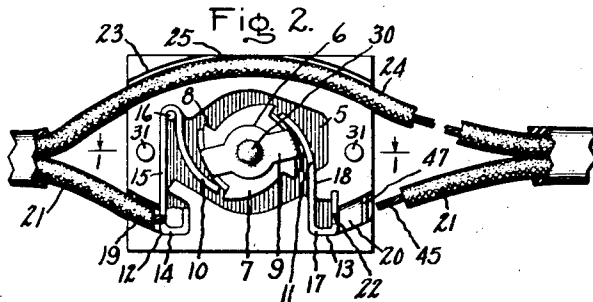


Fig. 5.

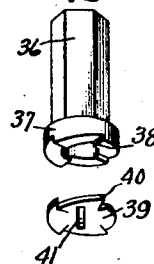


Fig. 4.

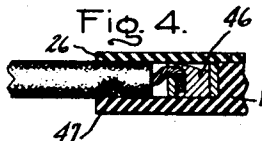


Fig. 7.

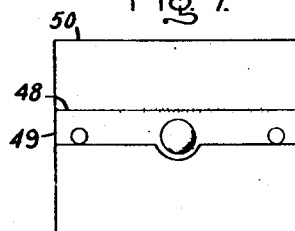
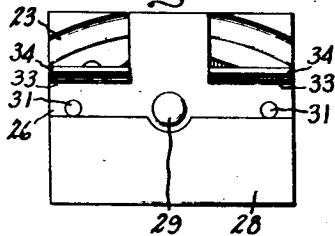


Fig. 6.



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ELECTRIC SWITCH

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10 Claims. (Cl. 200-168)

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The present invention relates to electric switches and especially to what are termed usually canopy fixture switches. Such switches are used primarily in connection with apparatus such as canopy type wall lamps, table lamps, electrical appliances and the like, where it is desired to embody a switch directly in the apparatus for controlling its electrical circuit. It is to be understood, however, that the invention is not limited to switches for such use but may be used wherever found applicable.

One object of my invention is to provide an improved construction and arrangement in a switch of this type which is simple in structure, compact and capable of being manufactured and assembled at low cost.

A further object of my invention is to provide an improved arrangement whereby the conductors are connected to the stationary switch terminals.

Other objects of my invention and the advantages thereof will become apparent from the following specification.

For a consideration of what I believe to be novel and my invention, attention is directed to the following specification and to the claims appended thereto.

In the drawing, Fig. 1 is a vertical sectional view of an electric switch embodying my invention, the section being taken on line I—I, Fig. 2; Fig. 2 is a bottom plan view of the switch with the cover plate removed; Fig. 3 is a perspective view of the switch with one of the cover clamps shown positioned to one side of the switch; Fig. 4 is a detail sectional view showing the arrangement for attaching a conductor to one of the stationary switch terminals; Fig. 5 is a perspective view of two of the switch movement parts; Fig. 6 is a view looking toward the bottom of the switch with one of the cover clamps removed, and Fig. 7 is a view of a modification.

Referring to the drawing, 1 indicates a base of insulating material having a smooth top 2 from the central portion of which projects upwardly a tubular stem or post 3 having an intumed flange 4 at the outer end. In base 1 is a switch cavity 5 in which is located a rotatable contact carrier or switch member 6. It comprises a disk 7 of suitable insulating material having ratchet teeth 8 on its periphery and having attached to it a bridging contact member 9 of suitable conducting material adapted to make contact with stationary switch contacts 10 and 11. The rotation of contact carrier 6 through successive steps of 90° in

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a counter-clockwise direction, as viewed in Fig. 2, successively brings the bridging contact member 9 into and out of engagement with the contact strips 10 and 11. This is a known type of switch movement and requires no further description.

At opposite corners of base 1 are contact terminal cavities 12 and 13. The contact terminal 10 has a U-shaped head 14 positioned in terminal cavity 12. It has also a straight portion 15 which extends along one side wall of cavity 5 and to which the flexible contact end of the terminal is connected. At 16 is a pin around which the flexible contact end of contact 10 flexes. Stationary contact 11 has a U-shaped head 17 positioned in terminal cavity 13. The flexible end of stationary contact 11 flexes across a projection 18 on the adjacent inner side wall of cavity 5. From Fig. 2, it will be seen that the terminal cavities 12 and 13 are in each instance connected with cavity 5 through narrow slots of a width equal to the thickness of the material of stationary contacts 10 and 11. Thus, the terminal cavities form in substance closed pockets in which the terminal heads 14 and 17 are positioned. Communicating with pockets 12 and 13 are passages 19 and 20 for the reception of conductor ends 21. Portions of stationary contact terminals in pockets 12 and 13 extend across the inner ends of passages 19 and 20 and such portions are provided in their bottom edges with notches 22 in which a bared conductor wire may be positioned.

The stationary contact members 10 and 11 are of a width equal to the depth of the cavities so that when positioned in the cavities, their outer edges are flush with the bottom face of base 1.

At the side of base 1 opposite to pockets 12 and 13 is a continuous curved pocket or passage 23 adapted to receive a continuous conductor 24. At its central portion, passage 23 opens out through the side of the base as is indicated at 25.

Positioned on the base is a cover plate 26 held in place by two U-shaped clamps 27 and 28. At the center of cover plate 26 is a depression 29 in which a bead 30 on contact member 9 is pivoted. Cover plate 26 is positioned with respect to the base by means of projecting pins 31 on the base located in openings in the cover. Cover plate 26 is slit along the lines 32 and may be scored along the lines 33 to form doors or covers 34, one at each corner of the switch. These doors are normally held closed by the U-shaped clamps 27 and 28. Clamps 27 and 28 are provided with struck-in beads 35 which engage depressions in base 1

to assist in holding them in position on the base.

Rotary movement may be imparted to the movable contact carrier 6 by any suitable means. In the present instance, it is shown as adapted to be turned by a push button 36 which is rectangular in cross section and extends through a rectangular opening in flange 4. Thus, it can move axially but cannot turn. At its inner end, it is provided with a head 37 on the underside of which are ratchet teeth 38 which form one member of a clutch, the other member of the clutch being formed by a disk 39 having ratchet teeth 40 which cooperate with the ratchet teeth 38. Disk 39 has a slot 41 through which extends a spiral strip 42. The inner end of spiral strip 42 is positioned in an opening in contact carrier member 6 so that the contact carrier member is in substance attached to the lower end of the strip. The outer end of the strip is adapted to slide in a passage 43 in button 36. Positioned between disk 39 and the top surface of movable contact member 6 is a compression spring 44.

When button 36 is pressed inwardly, disk 39 moves with it, the disk being forced down over the spiral strip 42; since the disk and button cannot rotate, the spiral strip is given a one-quarter turn, thus turning the switch member 6 one-quarter revolution. When released, spring 44, which was compressed during the downward movement of button 36, returns the button and disk to their initial positions, the disk now turning relatively to the button by reason of the ratchet tooth arrangement between the disk and the inner end of the button. Successive actuations of the button 36 serves to impart successive one-quarter turns to contact carrier member 6, thus moving the contact member 9 successively into and out of bridging relation to stationary contacts 10 and 11.

The switch structure is assembled from the bottom. The contact button 36 is first dropped into position, after which disk 39, strip 42, spring 44, movable contact member 6, and the stationary contacts 10 and 11 may be positioned in suitable order. When positioned, the cover plate 26 is placed over the bottom of base 1 to hold the parts assembled, after which the two U-shaped clamps 27 and 28 are put into place. The spring 44 is placed under suitable initial tension when the parts are assembled and is held by the cover plate 26. The spring 44 thus holds the movable contact carrier 6 in engagement with the cover plate 26, the bead 30 being positioned in the depression 29.

The switch may be wired with suitable two-conductor cord, such as, for example, what is known in the trade as two-conductor "rip cord" or two-conductor braid covered cord. In any case, as shown in Fig. 2, the two conductors of the cord are first separated and one conductor is cut in two and bared conductor ends are provided, as is indicated at 45. First the clamp 27 may be removed and the two doors 34 at the two corners at this side of the switch lifted to expose the curved pocket or passage 23 sufficiently to permit the conductor to be positioned in it from the side. The way in which this can be done will be clear from Fig. 6. During this operation, the clamp 28 holds the cover plate in position and the construction assembled. After conductor 24 has been positioned in curved pocket or passage 23, the doors 34 are closed and clamp 27 replaced. The clamp 28 is now removed and the doors over the pockets 12 and 13 are opened, thus exposing the two terminal heads 14 and 17.

The conductor ends are then placed in passages 19 and 20 with the bared ends positioned in notches 22 and bent down into the pockets, as is shown clearly in Fig. 4. After being thus positioned, solder as indicated at 46 may be placed in pockets 12 and 13 to fix the bared conductor ends to the terminal heads 14 and 17. Following this, the doors 34 may be closed and the clamp 28 replaced. To provide a strain relief for the conductor ends, I may provide a projection 47 in each of the passages 19 and 20 which, when the doors 34 are closed, bites into the insulation on the conductor somewhat after the manner illustrated in Fig. 4. The clamps 27 and 28 are readily removed by a suitable tool, such as a screwdriver, which may be inserted between the side edge of the base 1 and the intermediate portion of the clamp to pry it off.

Instead of providing doors at the corners of the switch, I may provide on each side of the switch a single continuous door. This is shown in Fig. 7 wherein the score 48 extends entirely across the cover plate 49 (corresponding to cover plate 26 of Fig. 1) to provide a single continuous door 50.

The switch may be attached to a canopy or other support in any suitable manner. For example, the stem 3 may be passed up through an opening in a canopy or support to bring the top of the switch into engagement with the underside of the canopy or support after which a suitable fastener may be applied to the stem on the upper side of the canopy or support.

While I have particularly described my invention as applied to a switch, this being the use I now contemplate for it, it is to be understood that the invention is not limited thereto necessarily but may be used wherever found applicable.

By my construction, I provide a switch which utilizes no screws for connecting the conductors and one into which conductors can be quickly and easily assembled without dismantling the switch mechanism. It is a very simple matter to remove first one clamp and then the other clamp to position the two conductors in the switch. I consider the provision of the doors 34 formed on the cover plate, which are opened to permit of positioning the two conductors and which are then held closed by the clamps, as one important feature of my invention.

Another advantage of the construction is that it comprises a minimum number of parts which are quickly and easily assembled from the bottom of the switch. This means that the switch may be produced at low cost.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof, but I desire to have it understood that the apparatus shown is only illustrative and that the invention may be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A switch or the like comprising a base having a cavity, stationary contacts positioned in the cavity having conductor connecting portions, a cover plate for the cavity having door means positioned to give access to said conductor connecting portions, and a plurality of separately removable clamp means for holding the cover plate on the base and said door means closed, said clamp means having grips sufficient that when one clamp means is removed to give access to contacts for wiring the switch, other of said clamp

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means will hold the cover plate in position on the base.

2. In combination, a switch or the like comprising a base having open pockets, contact members having connecting portions positioned in certain of said pockets, a cover plate having a plurality of doors for covering said pockets, and a plurality of separately removable clamp means each gripping between surfaces thereof the base and a portion of the cover plate including a door, the grip being sufficiently positive that when one clamp means is removed to give access to a door for wiring the switch, other of said clamp means will hold the cover plate in position on the base.

3. In a switch structure, a base having open pockets at a plurality of its corners, stationary switch contacts having ends positioned in at least some of said pockets adapted to have conductors connected thereto, a cover plate positioned on the base having a plurality of doors for covering said pockets, and a plurality of separately removable clamp means for holding said cover plate on the base and said doors closed, said clamp means having grips sufficient that when one clamp means is removed, other of said clamp means will hold the cover plate on the base whereby when a clamp means is removed, a door may be opened to give access to the pockets covered by it.

4. In a switch structure, a base having an open cavity, stationary contacts having contact ends positioned in the cavity and terminal ends positioned at one side thereof, said base having passages in which conductor ends may be positioned for connection to said terminal ends, a movable switch member in the cavity for connecting said contact ends, a cover plate positioned on the base over the cavity which serves to hold the switch parts assembled, said cover plate having a plurality of door means certain of which are in line with said contact ends, and a plurality of separately removable clamp means each gripping between surfaces thereof the base and a portion of the cover plate including a door means, the grip being positive enough that when one clamp means is removed to give access to a door means, other of said clamp means will hold said cover plate on the base.

5. In a switch structure, a base having an open cavity, stationary contacts having contact ends positioned in the cavity and terminal ends positioned at one side thereof, said base having passages in which conductor ends may be positioned for connection to said terminal ends and a continuous passage for a through conductor, a movable switch member in the cavity for connecting said contact ends, a cover plate positioned on the base over said cavity which serves to hold the switch parts assembled and to cover said passages, said cover plate having a plurality of doors in line with said passages, and a plurality of separately removable clamps for holding the cover plate on the base and the doors closed, said clamps having grips sufficient that when one clamp is removed to give access to a door for wiring the switch, other of said clamps will hold said cover plate on the base.

6. In a switch structure, a base having a switch cavity, pockets adjacent the switch cavity on one side of the base, grooves in the base connected with said pockets, a continuous groove in the base on the side of the base opposite said first-named grooves, contact members in the cavity having terminal ends in said pockets, a cover plate on the base which covers said cavity,

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pockets and grooves, said cover plate having a plurality of doors in line with said pockets and grooves, and a plurality of separately removable clamps on opposite sides of said base for holding the cover plate on the base and the doors closed, said clamps having grips sufficient that when one clamp is removed to give access to a door for wiring the switch, other of said clamps will hold the cover plate in position on the base.

7. In a switch structure, a base having a stem on its top side and an open cavity in its bottom, stationary contacts having contact ends positioned in the cavity and terminal ends positioned at one side thereof, walls defining pockets for the terminal ends, said base having grooves connecting with the pockets in which conductor ends may be positioned for connection to said terminal ends, a movable switch member in the cavity for connecting said contact ends, an operating button for the switch member extending through said stem, a cover plate positioned on the bottom of the base over the cavity and pockets which serves to hold the switch parts assembled, said cover plate having door means in line with said contact ends, and a plurality of separately removable clamps for holding the cover plate on the base and the door means closed, said clamps having grips sufficient that one clamp may be removed to give access to said pockets while other of said clamps hold the cover plate in position on the base.

8. In a switch structure, a base having an open cavity, stationary contacts having contact ends positioned in the cavity and terminal ends positioned at one side thereof, said base having passages in which conductor ends may be positioned for connection to said terminal ends and a continuous passage for a through conductor, a movable switch member in the cavity for connecting said contact ends, a cover plate positioned on the base over said cavity which serves to hold the switch parts assembled and to cover said passages, said cover having a plurality of doors in line with said passages, and a plurality of U-shaped separately removable clamps each gripping between surfaces thereof the base and a portion of the cover plate including a door, the grip being positive enough that when a clamp is removed to give access to certain of said passages, other of said clamps hold the cover plate on the base.

9. In a switch structure, a base having a switch cavity in its bottom, walls defining pockets adjacent the switch cavity on one side of the base and grooves connected with said pockets, walls defining a continuous groove adjacent the switch cavity on the other side of the base, contact members in the cavity having terminal ends in said pockets, a cover plate on the base which covers said cavity, pockets and grooves, said cover plate having a plurality of doors in line with said pockets and grooves, and separately removable U-shaped clamps on opposite sides of said base, each such clamp gripping between surfaces thereof the base and a portion of the cover plate including a door, the grip being positive enough that when a U-shaped clamp is removed from the base to give access to one side of the base for wiring the switch, other of said U-shaped clamps hold the cover plate on the base.

10. In an electric switch, a base having an open cavity at its central portion and wiring recesses on opposite sides thereof, a switch structure mounted in said cavity including stationary contacts having terminal ends positioned in at least

some of said wiring recesses, a cover plate positioned on the base over the cavity which serves to hold the switch structure assembled in the base, said cover plate having doors on opposite sides which cover said wiring recesses, and removable clamp means on each side of the base each of which clamps a portion of the cover plate including a door to the base, the clamping grip being sufficient that when a clamp means on one side is removed to give access to a door, the clamp means on the other side will hold the cover plate in position to maintain the switch structure assembled in the base.

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