June 14, 1949. R. E. SMITH 2,473,263

ELECTRIC SWITCH

Filed Nov. 12, 1947

Fig. 1.

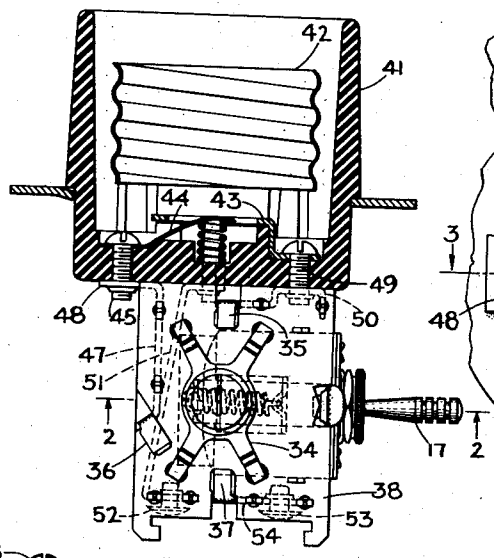


Fig. 2.

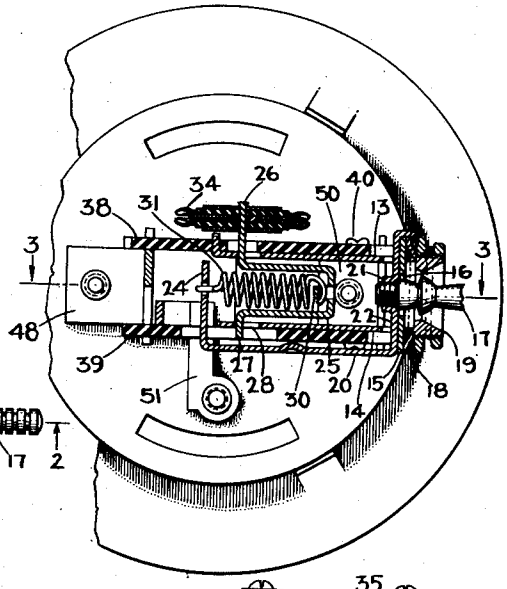


Fig. 3.

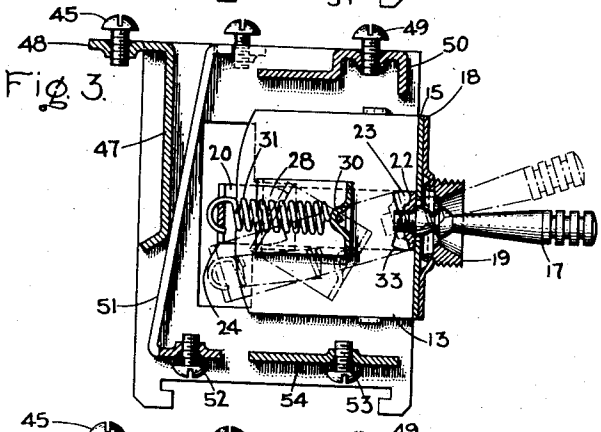


Fig. 4.

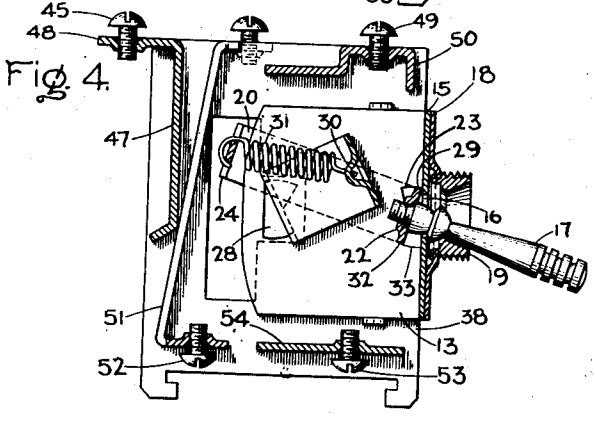


Fig. 5.

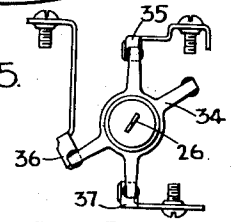


Fig. 6.

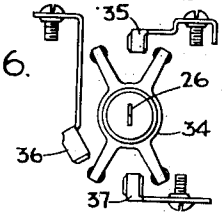
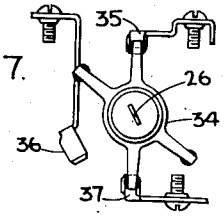


Fig. 7.



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ELECTRIC SWITCH

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Application November 12, 1947, Serial No. 785,234

2 Claims. (Cl. 200—6)

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The present invention relates to an electric switch and more particularly to an electric switch of the lever operated, snap action type providing a plurality of switch positions.

It is an object of my invention to provide an improved three-position, lever operated snap switch. A still further object is to provide a three-position, lever operated, snap switch having a large current carrying capacity, while occupying a relatively small space and having a small number of simple parts. A still further object is to provide a lever operated snap switch particularly adapted for the control of two filament lamps. A still further object is to provide a snap switch for the control of two filament lamps in which the switch operating lever indicates the manner of connection of the lamp filaments to the supply source, thereby indicating the illumination intensity as, for example, "low," "off," and "high." A still further object is to provide an improved snap switch adaptable for mounting in combination with a lamp socket in a lamp socket covering or husk.

The above and other objects of my invention, as well as the details of a preferred embodiment of the same, will appear from the following description taken in connection with the accompanying drawings in which Fig. 1 is an elevation of my switch as mounted on a lamp socket shown in section; Fig. 2 is an enlarged sectional view of my switch taken along the lines 2—2 in Fig. 1; Fig. 3 is a section of the switch mechanism only taken along the lines 3—3 in Fig. 2; Fig. 4 is a sectional view similar to Fig. 3 with the switch elements in a different position and Figs. 5, 6 and 7 show in elevation different positions of the contacts for the various switch positions.

Referring now to the drawing, a switch element supporting member is formed of two spaced parallel plates 13 and 14 joined at one end by a bridge member 15. The bridge member 15 has an opening 16 through which an operating handle 17 may pass. The member 15 may have secured to it or formed integrally with it a plate 18 apertured to receive a hollow switch mounting nozzle 19. An actuating arm 20 is formed as a U-shaped member, one arm 22 of which has a threaded aperture 21 to receive the threaded end of the operating handle 17. The handle is preferably readily removable to facilitate mounting of the switch. The portion 22 passes through slots 23 in the edges supporting plates 13 and 14. The edges of the member 22 act as two pivots about which the arm 20 oscillates when the handle 17 is moved. Bearings for the pivots are conveniently formed by the surface of bridge member 15 which abuts the slots 23. There is thus provided a two point bearing for the actuating member 20. The arm 20 has, at its other extremity, another portion 24 bent at right angles in the same direction and parallel to portion 22, as best seen in Figure 2. An actuated element which also carries the movable contacts of the switch is formed by a U-shaped member 25 having outwardly extending projections 26 and 27 whose edges form pivots about which the member 25 oscillates. The projections 26 and 27 are positioned in openings 28 in the supporting plates 13 and 14, corners of the openings forming bearings for the pivots. The bottom of the U-shaped member 25 is lanced to form an eye 30 into which one end of a coil tension spring 31 is hooked, the other end of the spring being hooked to the portion 24 of the arm 20. There is thus formed a toggle snap action mechanism in which the actuated member 25 moves in the opposite direction to the motion of the actuating member 20.

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In operation, the switch mechanism has three positions. In the intermediate position of the switch, member 22 is seated against the flat surface of the bridging plate 15 and projections 26 and 27 are seated against the flat edges of openings 28. When the switch handle 17 is moved downward as indicated in Fig. 4, member 22 pivots about the edge 29 so that the opposite edge 32 rests against the edge 33 of the opening 23. After the dead center position is passed, the actuated member 25 snaps in the opposite direction into the position shown in Fig. 4. When the switch handle 17 is moved upwards, the reverse action takes place as illustrated by the dot and dash lines in Fig. 3.

The moving contacts of the switch are preferably mounted on the projection 26, as best shown in Fig. 2. In the present embodiment of my invention the moving contact comprises a four-armed spider 34 of conducting material, preferably of double thickness, the two layers being bent outwardly at the ends of the arms to form forked members adapted to engage and make good electrical connection with suitably disposed fixed contact blades. The hub of the spider is directly secured to but insulated from the projection 26 of the actuated member 25. In the illustrated embodiment, three fixed contacts are provided—35, 36, and 37. These are secured to insulating plates 38 and 39 fastened in any suitable manner to the supporting plates 13 and 14. A plurality of small ears such as 40 may, for example, be bent upwardly from the edges of the plates 13

and 14 and pass through holes in the insulating members 38 and 39, after which the ears are spread apart, thus firmly fixing the insulating members to the supporting plates. The stationary contacts may be fastened to the supporting plates in a similar manner. This arrangement of the switch contacts reduces friction to a very small amount.

The positions of the movable contact 34 and the connections made in the various positions of the switch are illustrated in Figs. 5 to 7. In Fig. 6 the switch handle is in its intermediate position as in Fig. 3 and the moving contact 34 does not make connection with any of the stationary contacts, so that the switch is in its "off" position. In Fig. 7 the switch handle has been moved downward as in Fig. 4 so that two arms of the moving contact 34 connect together stationary contacts 35 and 37. It is preferred, when the switch is used for the control of a two filament lamp, to have this switch position connected to energize the low wattage filament of the lamp. Fig. 5 shows the position of the contacts when the switch handle has been moved to its upward position as indicated by the dot and dash lines in Fig. 3. Three of the arms 34 now connect together all three stationary contacts 35, 36, and 37. It is preferred to use this switch position for the energization of both filaments of a two filament lamp whereby a high illumination level is produced.

For the purpose of controlling a two filament lamp, my switch can be mounted directly on a lampholder, preferably of the design shown in Figs. 1 and 2. The lampholder comprises a cylindrical insulating cup 41 having mounted therein three contact elements adapted to connect with the three contact elements on the base of the conventional two filament lamp. These comprise the conducting screw shell 42, a ring contact 43 and a center contact 44. The center contact 44 is held in the insulating cup 41 by means of a screw 45 which simultaneously connects it to one of the switch stationary contacts, in this case 36. The latter is formed at the end of a conducting member 47, the upper end 48 of which is suitably bent, drilled, and threaded to receive the screw 45. Similarly, the ring contact 43 with the aid of screw 49 is fastened into conducting member 50 at the end of which stationary contact 35 is formed. The screw shell 42 is similarly fastened to the base 41 with a screw which threads into conducting member 51 at the end of which there is provided a line connection terminal screw 52. The other line connection is made to the terminal connection screw 53 which is threaded into a conducting member 54 having stationary contact 37 formed at its end. Various features of the lampholder herein illustrated and described are further described and claimed in the copending application Serial No. 774,719 of D. G. Kimball, filed September 18, 1947, for Lampholder, and assigned to the same assignee as the present application.

The switch herein described is very compact in construction, has low operating friction and is readily mounted in a lamp holder support as described.

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

1. An electric switch comprising a pair of spaced parallel plates joined along one pair of edges by a bridging member thereby forming a U-shaped support, a first pair of aligned apertures in said plates adjacent said bridging member whereby said apertures form pivot points adjacent to the mounting surface of the switch and stop surfaces for a U-shaped actuating member, a second pair of aligned apertures in said plates near the opposite edges thereof forming two bearing surfaces, a U-shaped actuating member having one of its arms of the same width as said first apertures and extending through the same for pivotal motion therein adjacent to the mounting surface of the switch and with bearing surface on said bridging member and its other arm extending around one of said plates, a U-shaped actuated member positioned between said plates and having projections extending into said second apertures for pivotal motion therein, one of said projections having contact means secured thereto, and spring means connecting said actuating and actuated members.

2. An electric switch comprising a pair of spaced parallel plates joined along one pair of edges by a bridging member thereby forming a U-shaped support, a first pair of aligned apertures in said plates adjacent said bridging member whereby said apertures form pivot points adjacent to the mounting surface of the switch and stop surfaces for a U-shaped member, a second pair of aligned apertures in said plates near the opposite edges thereof forming two bearing surfaces, a U-shaped actuating member having one of its arms of the same width as said first apertures and extending through the same for pivotal motion therein adjacent to the mounting surface of the switch and with bearing surface on said bridging member and its other arm extending around one of said plates, a U-shaped actuated member positioned between said plates and having projections extending into said second apertures for pivotal motion therein, one of said projections having contact means secured thereto, spring means connecting said actuating and actuated members, a plate having a switch supporting nozzle mounted therein overlying and secured to said bridging member and an operating handle removably threaded into said one arm of said actuating member and extending through said nozzle and through an aperture in said bridging member, said handle being so shaped as to substantially close the said aperture.

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The following references are of record in the file of this patent:

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