March 6, 1934. C. MILLER 1,949,806

PUSH BUTTON SWITCH CONSTRUCTION

Filed Dec. 16, 1930

Fig. 1.

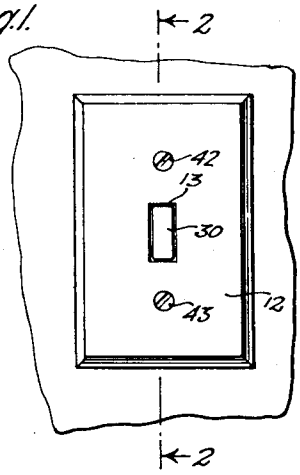


Fig. 2.

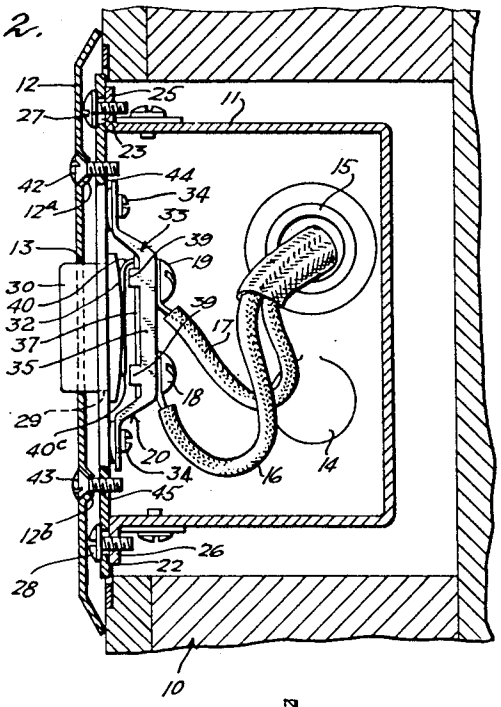


Fig. 3.

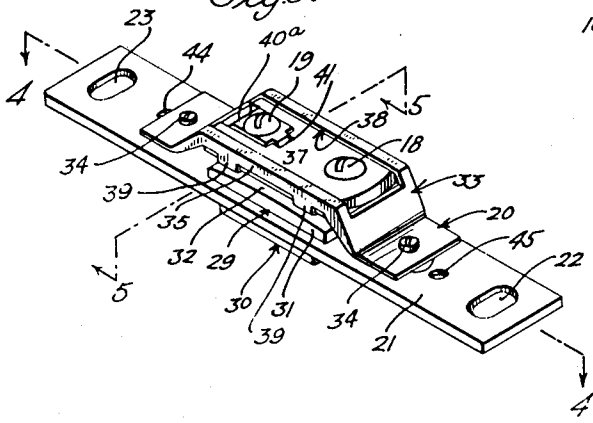


Fig. 4.

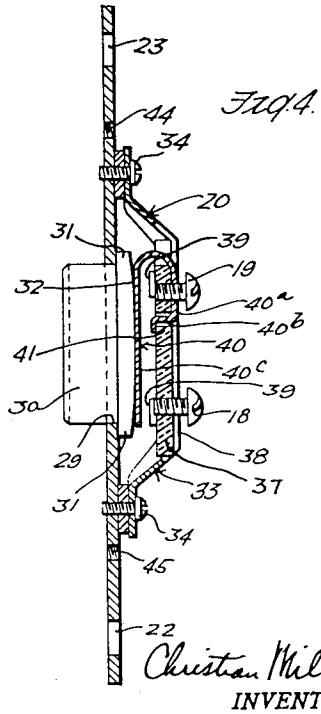
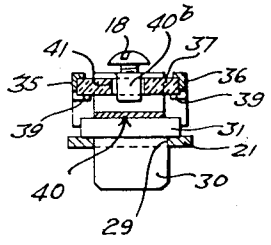


Fig. 5



Christian Miller
INVENTOR

BY Janney, Blair & Curtis
ATTORNEY

Patented Mar. 6, 1934 1,949,806

UNITED STATES PATENT OFFICE

1,949,806

PUSH BUTTON SWITCH CONSTRUCTION

Christian Miller, New York, N. Y., assignor to Edwards and Company, Inc., a corporation of New York

Application December 16, 1930, Serial No. 502,650

1 Claim. (Cl. 200—159)

This invention relates to circuit-controlling devices and more particularly to push button switches.

One of the objects of this invention is to provide a simple, practical and dependable push button switch intended for use particularly in low voltage signaling circuits such as in door-bell or annunciator circuits. Another object is to provide a push button switch construction that is simple, inexpensive, and highly expedient to install. Another object is to provide a construction of the above-mentioned character that will be well adapted for utilization therein of various parts and structures that are now known as "standard" parts. Other objects will be in part obvious or in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts as will be exemplified in the structure to be hereinafter described and the scope of the application of which will be indicated in the following claim.

In the accompanying drawing in which is shown one of various possible embodiments of my invention,

Figure 1 is a front elevation of the construction as completely installed in a wall of a room for example;

Figure 2 is a vertical central sectional view on an enlarged scale, as seen along the line 2—2 of Figure 1;

Figure 3 is a perspective view of a push button switch unit as seen substantially from the rear thereof;

Figure 4 is a central vertical sectional view, as seen along the line 4—4 of Figure 3, and

Figure 5 is a vertical transverse sectional view, as seen along the line 5—5 of Figure 3.

Similar reference characters refer to similar parts throughout the several views in the drawing.

Referring now to the drawing and more particularly to Figure 2, there is generally indicated at 10 a wall into a suitable recess in which is fitted and suitably secured a standard sheet metal conduit box 11 of the type usually employed in house wiring installations and adapted to be covered by a plate 12 (see also Figure 1) of sheet metal or bakelite, for example, of suitable color or finish, the cover 10, as is clearly shown in Figures 1 and 2, overlapping the box 11 and the recess in the wall 10. The plate 12 is of standard construction and is provided with a rectangular substantially centrally positioned opening 13 through which, in the ordinary use of the plate 12, the usual pivoted switch handle projects.

The conduit 11 is provided with suitable knock-outs, one of which is shown at 14 adapted, when removed, to permit the connection to the box of a metal conduit 15 through which the relatively low voltage conductors 16 and 17 (Figure 2) of the bell or buzzer circuit or the like are brought into the conduit box 11.

The metal or other suitable conduit 15 and the conduit box 11 are first installed and the appropriate wiring run through the conduit and into the conduit box. The conductors 16 and 17 are then connected, as by the binding screws 18 and 19 (see Figures 3 and 4) to a push button switch unit generally indicated at 20.

Unit 20 is made up of a relatively heavy sheet metal strap 21 provided with transversely extending slots 22 and 23 adapted to overlap the upper and lower flanges 25 and 26 of the conduit box 11 so that screws 27 and 28, passed through the slots 23 and 22, respectively, and threaded into the flanges 25 and 26, respectively, may secure the strap 21 and associated mechanism across the front open face of the box 11.

The strap 21 is provided with a substantially centrally positioned rectangular opening 29 of substantially the same dimensions as the opening 13 in the face plate 12 (Figures 1 and 2) and projecting through the opening 29 is a push button 30 generally of a rectangular shape (see Figures 3, 4 and 5) but provided with a peripherally extending flange 31 (see Figures 4 and 5) adapted to abut against the rear face of the strap 21 and limit the extent of movement of the button 30 in a direction toward the left, as viewed in Figures 2 and 4. The rear end face of the button 30 is curved in the direction of the length of the rectangular button 30, as is clearly indicated at 32 in Figures 2 and 4.

A substantially U-shaped sheet metal frame generally indicated at 33 is secured to the rear face of the metal strap 21 as by screws or rivets 34. The frame 20 is of sheet metal and is stamped to provide side walls or flanges 35 and 36 (Figures 3 and 5) between which is received, as is better shown in Figure 5, a generally rectangularly shaped member 37 of insulating material such as fiber, hard rubber, or the like, the frame 33 being cut away as at 38 (Figure 3) so as to expose the rear face of the insulating block 37. Suitable ears 39, preferably integrally formed with the side flanges 35 and 36, are bent over and upon the insulating block 37 (see Figures 4 and 5) and securely hold the latter in place.

The binding screws 18 and 19 are threaded into the insulating block 37 (see Figure 4), binding screw 19, however, passing through a suitable opening in the end portion 40^a of a contact-bridging spring 40, one end of which 40^b (see Figures 4 and 5) passes through an aperture 41 in the insulating block 37 whence it is bent over, as is clearly shown in Figure 4. From the rear or right-hand face of the insulating block 37, the contact spring 40 bends over and around one end of the block 37 (see Figure 4) whence it is extended to provide a contact-bridging portion 40^c that overlaps the binding screw 18. This portion 40^c is engaged by the curved face 32 of the rectangular button 30 and due to its inherent resiliency, being made preferably of a metal like phosphor-bronze, holds the button 30 in the position shown in Figure 2 and holds itself (portion 40^c) away from the inner end of the binding screw 18.

When conductor 17 (Figure 2) is tightly secured by the head of binding screw 19, it is brought into good electrical contact with the portion 40^a of the contact-bridging spring 40, the other side of the circuit, conductor 16, being clamped between the head of binding screw 18 and the face of insulating block 37.

The push button switch unit 20 will be seen to be of inexpensive construction and its parts capable of inexpensive manufacture and rapid assembly. Moreover, the rectangular push button 30 is made to coact with the overhanging portion 40^c of the contact spring 40 so as to insure that the latter is brought into engagement with the binding screw 18, when depresed, irrespective of whether button 30 is bodily moved toward the right, as viewed in Figures 2 and 4, or is simply tilted, the curved face 32 of the button 30 insuring nicety of action under these conditions.

The conductors 16 and 17 having been secured to the switch unit 20, the latter may now be secured in place, as above described, in the conduit box 11, as by screws 27 and 28. The circuit may be tested, the wall finished off as by plastering, painting, or the like, whence the parts are ready to receive the face plate 12.

The face plate 12 is provided with two countersunk openings 12^a and 12^b (see Figure 2) adapted to have passed therethrough screws 42 and 43 threaded into suitable openings 44 and 45 in the strap 21; these openings, however, are so related to each other and to the rectangular openings 13 and 29 in the face plate 12 and in the strap 21, respectively, that the two rectangular openings 13 and 29 are brought into alinement with each other and their alined side walls coact to guide and hold the rectangular push button 30 in its bodily and/or rocking movements. Preferably, these alined openings are so shaped and proportioned that rocking movement of the button 30 about an axis extending at right angles to the plane of the paper, as Figure 2 is viewed, may freely take place, while rocking or tilting movement of the button 30 as the latter is viewed in Figure 2, is substantially precluded.

In operation the elongated button 30, extending or projecting through a standard face plate 12, is simply depressed either centrally or at either end thereof, whereupon the portion 40^c (Figure 4) of the contact-bridging spring 40, is carried into engagement with the binding screw 18, thus closing the circuit.

It will thus be seen that there has been provided in this invention a construction in which the various objects hereinabove noted, together with many thoroughly practical advantages, are successfully achieved. It will be seen that the construction is simple and inexpensive and makes it possible to utilize standard and readily available and likewise inexpensive parts.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth, or shown in the accompanying drawing, is to be interpreted as illustrative and not in a limiting sense.

I claim:

A push button unit adapted to be mounted in a conduit box, said unit including, in combination, an elongated metal support having a centrally positioned opening therein and having means at its ends for securing it to the conduit box, a face plate detachably secured to the front side of said elongated metal support and spaced therefrom and having an opening therein alined with said first-mentioned opening, a U-shaped sheet metal member secured to the rear side of said metal support, circuit-controlling means carried by said sheet metal member and including a contact spring and an insulating member, said sheet metal member holding said circuit-controlling means in a position wherein said contact spring is juxtaposed to said first-mentioned opening, and a flanged push button projecting from the space between said circuit-controlling means and said metal support through said alined openings to be guided thereby and having the flange thereof projecting on the rear side of said metal support to limit the outward movement of said button under the urge of said contact spring.

CHRISTIAN MILLER.