

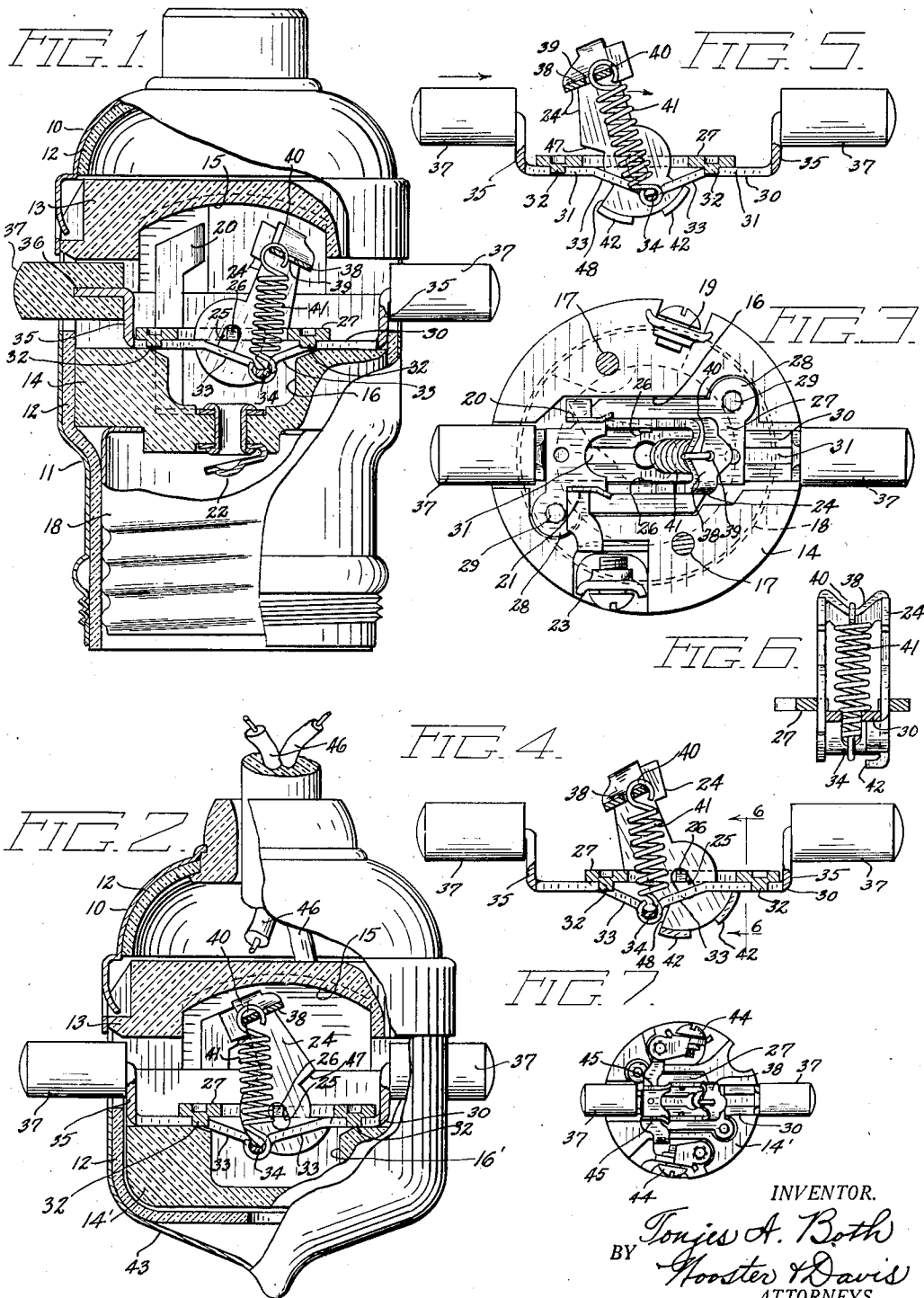
Oct. 6, 1925.

1,556,069

T. A. BOTH

PUSH BUTTON SWITCH

Filed Aug. 14, 1922



UNITED STATES PATENT OFFICE.

TONJES A. BOTH, OF STRATFORD, CONNECTICUT, ASSIGNOR TO THE CONNECTICUT ELECTRIC MANUFACTURING COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT.

PUSH-BUTTON SWITCH.

Application filed August 14, 1922. Serial No. 581,566.

To all whom it may concern:

Be it known that I, TONJES A. BOTH, a citizen of the United States, residing at Stratford, county of Fairfield, State of Connecticut, have invented an Improvement in Push-Button Switches, of which the following is a specification.

This invention relates to electrical switches and has for an object to provide an improved switch and mechanism for operating the same which will be simple in construction and, therefore, relatively cheap to manufacture and will not be readily gotten out of order in use, which may be quickly and easily assembled, and which will be reliable in operation.

With the foregoing and other objects in view I have devised the construction illustrated in the accompanying drawing, in which—

Fig. 1 is a partial elevation and a partial sectional view of the lamp socket showing my switch applied thereto.

Fig. 2 is a similar view showing its application as a pendent switch.

Fig. 3 is a top plan view of the switch mechanism.

Fig. 4 is a sectional view through the switch mechanism removed from the mounting showing it at rest or in one of its extreme positions.

Fig. 5 is a similar view showing the position of the parts immediately before movement of the switch element.

Fig. 6 is a transverse section substantially on the line 6—6 of Fig. 4, and

Fig. 7 is a top plan view of the switch mechanism and the means of connection for the form shown in Fig. 2, this view being on a smaller scale.

Referring to the form shown in Fig. 1, I have shown a socket shell comprising two telescoping sections 10 and 11 secured in assembled position by any suitable catch mechanism, not shown. This shell is lined with the usual paper or fibre insulating lining 12, and mounted within the shell is the switch supporting mechanism comprising two insulating blocks 13 and 14 provided with opposed recesses 15 and 16 respectively within which is mounted the switch mechanism, the blocks being secured together by any suitable means such as screws

17 which screws also secure the threaded lamp socket and outer contact 18 to the lower insulating block. These screws further secure one of the binding posts 19 to the insulating block and connects the same with the threaded socket.

Within the chamber formed by the two recesses 15 and 16 are mounted two stationary contact elements 20 and 21, the contact 20 being connected with the center contact 22 carried by the lower block 14 and the other contact 21 having electrical connection with the binding post 23. The lead wires, not shown, are connected to the binding posts 19 and 23 so that the circuit is through the binding post 19 to the socket 18, to the lamp through the central contact 22, to the switch contact 20, across movable switch element when the switch is closed to contact 21, and binding post 23 to the other wire.

The switch element is adapted to engage between the two stationary contacts 20 and 21, and comprises a substantially U-shaped member 24 provided with elongated openings 25 in the opposite sides thereof to receive pivot lugs 26 carried by the supporting plate 27. This plate has two diametrically opposite lugs 28 through which screws 29 may be extended to secure the plate within the recess in the lower block. This plate is substantially rectangular and has a substantially rectangular opening through the center upon the opposite sides of which the lugs 28 are located. The switch element is substantially the same width as this opening and is adapted to be placed within the same with the lugs 28 extending into the openings 25, the element having sufficient resiliency to allow the sides or legs thereof to be pressed toward each other sufficiently to snap over these lugs and then retain the same in position thereon.

Mounted to slide on the lower side of the plate 27 is the switch operating element or slide 30. This slide has longitudinally extending slots 31 in which projections 32 struck downwardly from the plate 27 may extend and provide guiding means for this slide. This slide is bent downwardly, substantially V-shaped adjacent the center thereof as shown at 33 and is provided at the apex of this V with a crossbar 34 con-

necting the opposite sides of the slide. The opposite ends of the slide are bent upwardly at 35 and then horizontally, as shown at 36, to provide supports for the push button elements 37 one of which may be black and the other colored if desired to indicate the position of the switch.

The connecting bar 38 of the switch element 24 is at the opposite end of this element from the openings 25 and is provided with an opening 39 to receive the looped end 40 of a coil spring 41, the other end of the spring being connected to the crossbar 34. As this spring is applied under tension, it will securely hold the slide 30 against the underside of the plate 27 at the same time acting as an operating mechanism for the switch element in a manner presently to be described, no other securing means outside of the projections 32 being necessary to secure the slide in position. One of the sides of the switch element 24 is provided with curved inwardly projecting lugs 42 which coact with the undersides of the inclined portions 33 of the slide 30 to give the initial movements to the switch element in a manner which will be described under the operation. The sides of the switch element are also cut away to provide stop shoulders 47 and 48 adapted to contact with the upper and lower faces of the plate 27, and act as stops to limit the movement of the switch element in opposite directions.

In the form shown in Figs. 2 and 7 the lower section 43 of the shell is closed and the lamp connections are omitted, the application shown in this figure being for a pendant switch. Two binding posts 44 are connected with the two stationary switch contacts 45 and with the lead wires 46, the circuit being from one binding post through the switch element to the other when the switch is closed as will be obvious. The switch element and the means for operating it are the same as that shown in connection with the lamp socket.

The operation is as follows:

Assuming the switch is closed, or in the position shown in Figs. 2 and 4, pressing on the left push button will move the slide 30 to the right as viewed in these figures. This will move the crossbar 34 and the lower end of the spring to the right about the upper end of the spring as a pivot until the axis of the spring passes through the center of the pivot lugs 26. This movement will stretch the spring somewhat and as soon as its axis passes through the center of the switch pivots its pull on the crossbar of the switch element will be transferred to the opposite or right hand side of these pivots and will snap the upper end of the switch element to the right or clockwise, as viewed in these figures, to the open position, provided the stationary contacts are located on the left

hand side as is the case with the switches shown in the drawing. It will be obvious that, after the switch has been moved to the right hand position as shown in Figs. 1 and 3, pressure on the right hand push button and movement of the slide 30 to the left will again swing the lower end of the spring and its axis will pass through the pivot for the switch element and the spring will operate to swing the switch counterclockwise, the action being the same as above described except in the reverse direction.

In order to insure that the contact element will not freeze to the stationary contacts, in other words in order to insure the switch operating, I preferably do not rely on the spring to impart the initial movements but provide a positive acting means for imparting these initial movements. Referring to Figs. 4 and 5, when the slide 30 is moved to the right to the position shown in Fig. 4, the switch element 24 is stationary until the axis of the spring passes through the pivot for the switch element. At this time the inclined surface of the right hand side of the downward bend 33 of the slide contacts with the upper edge of the right hand lug 42, as shown in Fig. 5, and it will, therefore, be obvious that further movement of the slide 30 to the right will push downwardly on this lug and tend to turn the switch element clockwise or impart an initial movement thereto. Movement of the slide in the opposite direction after the switch has been opened will cause the same operation between the left hand part of the downward bend 33 and left hand lug 42 to give the initial movement of the switch in the opposite direction.

It will be apparent from the foregoing description that the switch is very simple in construction and may be easily and quickly assembled comprising but comparatively few parts and so will not likely be easily gotten out of order. Also, it will impart a quick or snap action to the switch element, give a quick make and break, and there is no danger of failure to operate as the element is positively given an initial movement.

Having thus described the nature of my invention, what I claim is:

1. In a device of the character described, a support comprising a substantially flat plate, a switch element pivoted on said plate, and means for operating the switch element including a spring, said element being provided with spaced stop shoulders arranged to coact with the opposite sides of the plate to limit the movement of the element in either direction.

2. In a device of the character described, a support comprising a substantially flat plate having an opening therethrough, a switch element pivoted in said opening, a reciprocable slide, and operating means from

the slide to the switch element including a spring, said element being provided with spaced stop shoulders arranged to coact with the opposite sides of the plate to limit the movement of the element in either direction.

3. In a device of the character described, a support, a switch element pivoted to said support and extending on one side thereof, a movable slide on the opposite side of said support, guiding means on the support for the slide, and a spring connected to the slide and to the switch element on the opposite side of the support from the slide, said spring being arranged to operate the switch element upon movement of the slide and also to retain the slide on said support.

4. In a device of the character described, an insulating block, a supporting plate secured to said block, a switch element pivoted to the plate and extending to one side thereof, a slide on the opposite side of the plate and having a longitudinal slot, projections on the plate extending into said slot to provide guide means for the slide, an operating spring connecting the slide and switch element, and means for operating the slide.

5. In a device of the character described, a supporting plate provided with an opening therethrough, pivot lugs on the opposite sides of said opening, a substantially U-shaped, resilient switch element provided with spaced legs having openings to receive said lugs, a slide between the legs of the switch element, and an operating spring secured to the slide and to the connecting bar of the switch element.

6. In a device of the character described, a support having an opening therein, a substantially U-shaped switch element pivoted in said opening, one of the legs of the said element having a notch therein to provide opposed stop shoulders, said shoulders being positioned to coact with opposite sides of the support to limit the movements of the element in opposite directions, and means for rocking the element on its pivot.

7. In a device of the character described, a support, a switch element pivoted to said support, a slide provided with a surface inclined to the plane of the slide, operating means connecting the slide and the switch element, and means on the switch element adapted to coact with the inclined surface on the slide to impart an initial movement to the switch element upon movement of said slide.

8. In a device of the character described, a support, a switch pivoted to the support, a slide, an operating spring for the switch connecting the slide and switch, said slide being provided with a cam surface, and means carried by the switch adapted to co-operate with the cam surface upon move-

ment of the slide to impart an initial movement to the switch.

9. In a device of the character described, a support, a switch element pivoted to said support, a movable slide provided with surfaces inclined to the plane of the slide and in opposite directions, a spring for operating the switch element connected to said element and to the slide between the inclined surfaces, and lugs on the switch element adapted to coact with the inclined surfaces on movement of the slide to impart an initial movement to the switch element.

10. In a device of the character described, a support, a reciprocable slide, a switch element, means for operating said switch element from the slide including a spring, said slide being provided with a cam surface, means carried by the switch element arranged to coact with said cam surface for imparting an initial movement to said element, and stop shoulders on the element adapted to coact with the support to limit the movement of the element in either direction.

11. In a device of the character described, a reciprocable slide, a switch element, means for operating the switch element from the slide including a spring, said slide being provided with a surface inclined to the plane of the slide, and means carried by the switch element arranged to coact with the inclined surface for imparting an initial movement to the switch element.

12. In a device of the character described, a support having an opening therein and pivot lugs on opposite sides of said opening, a substantially U-shaped switch element having the legs thereof pivoted on said lugs, a movable slide between the legs of the switch element, and spring operating means connecting the switch element and the slide.

13. In a device of the character described, a support having an opening therein and pivot lugs on opposite sides of said opening, a substantially U-shaped switch element having the legs thereof pivoted on said lugs, a movable slide between the legs of the switch element provided with surfaces inclined to the plane of the slide and in opposite directions, a spring for operating the switch element connected to said element and the slide, and lugs on the switch element arranged to coact with the inclined surfaces on movement of the slide to impart initial movements to the switch element.

14. In a device of the character described, a movable switch element, a movable slide provided with surfaces inclined to the plane of the slide and in opposite directions, a spring for operating the switch element connected to said element and the slide, and means carried by the switch element arranged to coact with said inclined surfaces

on movement of the slide to impart initial movements to the switch element.

15. In a device of the character described, a movable switch member, a movable slide member, one of said members being provided with surfaces inclined to the plane of the slide in opposite directions, means carried by the other member arranged to engage

said inclined surfaces on movement of the slide to impart initial movements to the switch member, and a spring for operating the switch member connected to said member and the slide. 10

In testimony whereof I affix my signature.

TONJES A. BOTH.