

S. BRANTINGSON
PUSH BUTTON SWITCH

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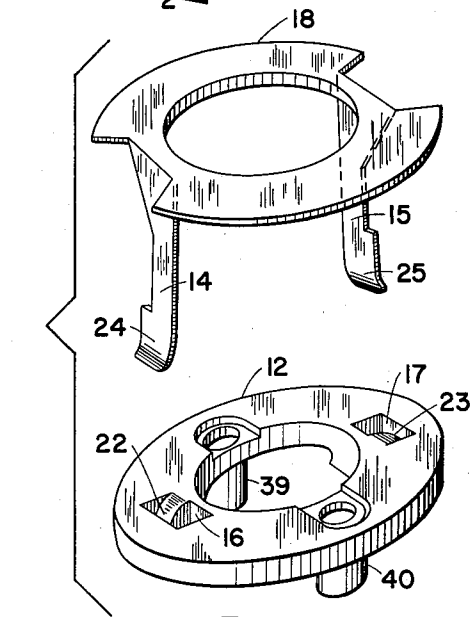
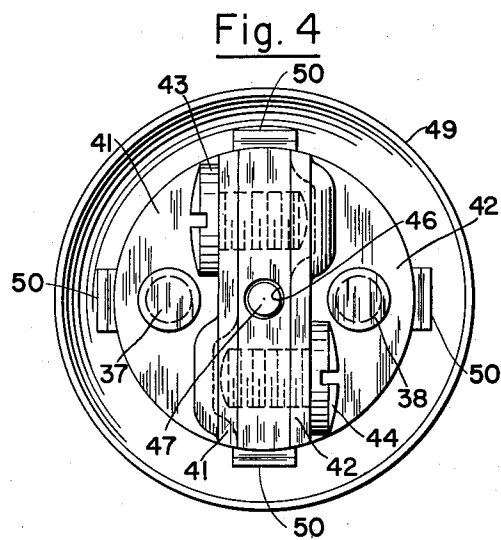
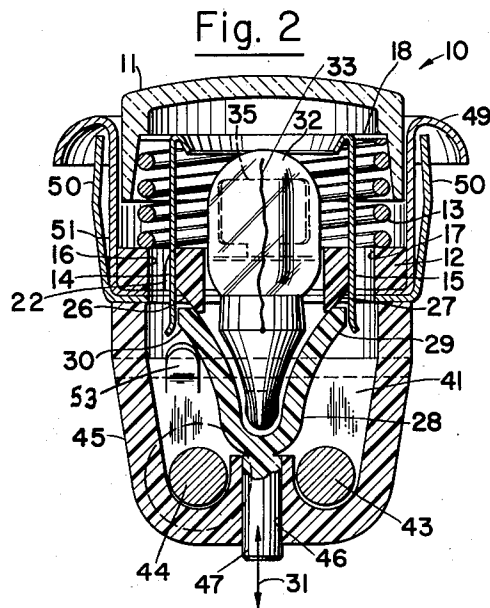


Fig. 3



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PUSH BUTTON SWITCH

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Fig. 5

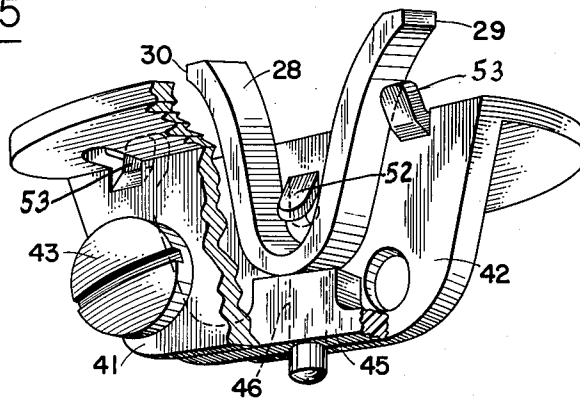


Fig. 6

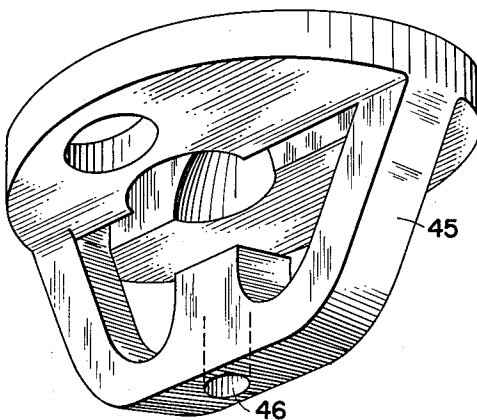
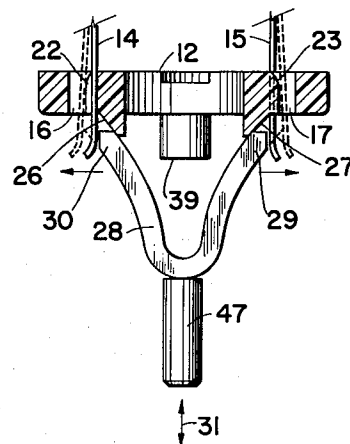


Fig. 7



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PUSH BUTTON SWITCH

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7 Claims. (Cl. 200—159)

This invention relates to improvements in pushbutton electrical switches. The switch of this invention incorporates novel features facilitating the assembly thereof into a compact, positively acting, trouble free unit, which may be readily separated in a simple manner, for repair or replacement of the light bulb or other parts thereof. The switch is so designed that the parts thereof will automatically interlock for initial assembly and use and, after separation of the parts for repair or other purpose, they may be readily again automatically interlocked. Other objects and advantages will appear from the description below and from the accompanying drawings, wherein:

Fig. 1 is a vertical, transverse sectional view of a push button switch embodying the invention,

Fig. 2 is a further sectional view thereof, taken at line 2—2 of Fig. 1,

Fig. 3 is an exploded perspective view of a plate and disc used in carrying out the invention,

Fig. 4 is a bottom plan view, taken at line 4—4 of Fig. 1,

Fig. 5 is a fragmentary, perspective view of parts of the device of the invention, shown in assembled relation,

Fig. 6 is a perspective view of an insulating bearing which may be used in carrying out the invention, and

Fig. 7 is a schematic view showing the manner in which the spring fingers, shown in normal position interlocking the parts in Figs. 1 and 2, may be displaced for separation of the parts, pursuant to the invention.

As shown in the drawings, switch 10 of the invention comprises a button 11 formed of light permeable material, normally urged away from a plate 12, Fig. 3, by spring 13, separating said parts for a predetermined distance determined by the length of flexible fingers 14, 15 passing through apertures 16, 17 of the plate 12. Said fingers 14, 15 are secured in predetermined spaced relation to the button 11 as for example, by forming the fingers 14, 15 unitarily with a disc 18 (Fig. 3) which in turn is force-fitted or otherwise secured to the inner end 19 of button 11 (Fig. 1). Complementary means are provided such that the button will be initially interlocked with the plate by the fingers 14, 15 while being movable as required in pushing the button to effect completion of the circuit through the wires 20, 21 to the device to be actuated by the button on depressing the button against the pressure of the spring 13, and opening said circuit on relieving the pressure.

The plate 12 is preferably provided with ears 22, 23 extending partially into the apertures 16 and 17, the upper surfaces of said ears being curved or otherwise inclined downwardly. The fingers 14, 15 are provided with offset ends 24, 25 (Fig. 3) so that, on assembly of the button movably on the plate 12 as above mentioned, the ends 24, 25 of the fingers will first slide over the downwardly directed surfaces 22, 23 of the ears and will then snap beneath the lower ends of said ears, interlocking the parts by this complementary interengaging means. The plate 12 is provided with cam surfaces 26, 27 adja-

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cent the lower ends of the apertures 16 and 17, and a movable member 28 (Figs. 2, 5 and 7) is provided made of flexible material so that when said member is moved in the direction of the arrow 31 (Fig. 2) the free ends thereof will engage the cam surfaces 26, 27 and will cam thereon and move outwardly against the offset ends 24, 25 of the fingers 14, 15, deflecting said fingers from the planes of the ears 22, 23 so that the button 11 and attached fingers 14, 15 may be separated from the plate 12 and other parts of the button, to facilitate replacement of the light bulb 32 (Fig. 1) or to open the switch for any other reason. The bulb 32 is a miniature one having electric leads 33, 34 which are positioned in and make contact with the brackets 35, 36 which also frictionally hold the bulb and which have electrical connection, as through the rivets 37, 38 fixed to the depending tubular posts 39, 40 of the plate 12, with posts 43, 44. Plate 12 is preferably made of insulating material and is secured by said rivets to the conductor plates 41, 42 (Fig. 5) to which the circuit wires 20, 21 are connected as through the binding posts 43, 44. The plates 41, 42 are maintained electrically insulated by an intermediate bearing plate 45 (Figs. 6, 2 and 5) which is positioned intermediate the plate 12 and the contact plates 41 and 42, the parts being assembled by the rivets 38 (Fig. 1). The bearing plate 45 is provided, at the lower end thereof, with an aperture 46 (Figs. 2 and 6) in which the stud 47 unitarily formed at the lower end of the U-shaped movable member 28, may reciprocate (arrow 31, Fig. 2).

Member 28, in the form shown in Fig. 7, is Y-shaped and the free ends 29 and 30 thereof are adapted to have camming engagement with the cam surfaces 26, 27 of the plate 12 as above mentioned, the opposite stud end 47 is, as mentioned above, adapted to reciprocate in the aperture 46 of said bearing plate 45. In addition to the brackets 35, 36 which are shown as in Figs. 1 and 2 secured to the plate 12 by the rivets 38, a casing 49 (Figs. 1 and 2) may be provided in the form of a shell secured by said rivets intermediate the parts (Figs. 1 and 2) the button 11 being movably telescopically received in the casing 49 and partially projecting therefrom. A plurality of springs 50 may also be secured (Figs. 1 and 4) to the switch so that the switch may be inserted into an aperture of slightly greater diameter than the body portion 51 of the casing 49, the springs 50, extending outwardly therefrom, providing a friction fit enabling the ready and firm insertion of the switch in a suitable aperture and enabling the easy removal thereof. The plates 41, 42 may be provided with stop studs 52 directed toward each other to prevent excess upward movement of the member 28 in the switch (Fig. 5).

In the operation of the device of the invention, on pushing the button 11, the fingers 14, 15 move downwardly into contact with means such as the contact studs 53 (Figs. 5 and 2) on the plates 42 to complete the circuit to the device to be controlled; on releasing pressure on the button, the disc 18 and thereby its fingers 14, 15 will be moved upwardly by spring 13 and out of contact with the studs 53.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A push button switch comprising a plate having apertures therethrough, a push button, flexible fingers secured at one end to said push button member and passed through the plate apertures, complementary means on the plate and fingers interlocking them on depressing the button toward the plate and moving said fingers through the plate apertures, spring means engaging the plate and button and holding the button away from the plate, and means positioned in said switch below the plate and movable toward the plate and into engagement with the finger ends extending through the plate aper-

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tures for disengaging said finger ends from said complementary plate means so that said button and fingers may be separated from the plate.

2. In a push button switch as set forth in claim 1, said means movable toward the plate comprising a U-shaped member having outturned free ends to engage the finger ends.

3. In a push button switch as set forth in claim 1, said plate being formed adjacent said apertures thereof with cam surfaces directed away from the apertures through which the fingers pass and said means movable in said switch comprising a U-shaped flexible member aligned with said cams so that when said member is moved, the free ends thereof will engage said cams and expand outwardly and into engagement with said fingers and will move said fingers out of engagement with the complementary interengaging means on the plate so that the button and fingers may be separated from the plate.

4. A push button switch comprising a plate having apertures therethrough, a push button member, flexible fingers secured at one end to said push button member and passed through the plate apertures, complementary means on the plate and fingers interlocking them on depressing the button toward the plate and moving said fingers through the plate apertures, spring means engaging the plate and button holding the button away from the plate, electrical terminal parts secured to the plate, in insulated spaced relation and in line with the apertures of the plate and normally spaced from the position of the lower ends of the fingers when the spring is not com-

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pressed, so that on depressing the button against the pressure of said spring, said fingers will be moved into contact with said electric terminal parts, completing the circuit therethrough, and means positioned in said switch below the plate and movable toward the plate and into engagement with the finger ends extending through the plate apertures for disengaging said finger ends from said complementary plate means so that said button and fingers may be separated from the plate.

5. In a push button switch as set forth in claim 4, means for securing a light bulb within said switch beneath the button said button being made of light permeable material.

6. In a push button switch as set forth in claim 1, means in said switch to limit the movement of said means positioned in the switch toward the plate.

7. In a push button switch as set forth in claim 1, a stud at the closed end of the U-shaped member and defining therewith a Y-shaped member, and a bearing secured to said switch below the plate slidably receiving said stud, the parts being so proportioned that the free end of said stud protrudes from the bearing to facilitate moving said stud and thereby the U-shaped member into engagement with said fingers.

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