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Budd et al.

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[54] **SLIDE ACTUATOR FOR TOGGLE SWITCH**

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[21] Appl. No.: **337,546**

[52] **U.S. Cl.** ..... **200/330,** 74/99 R

[51] **Int. Cl.** **H01h 3/02**

[58] **Field of Search**..... 200/172 A, 168 G; 74/99 R, 74/99 A, 103

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[57] **ABSTRACT**

A switch operating slide member for concealing actuator arm wall mounted switches of the type generally known as toggle switches, and for imparting oscillatory or pivotal switch operating movement to the actuator arm when generally straight line movement is imparted to the slide member. The slide member is disposed in a substantially constant attitude in different positions of its sliding movement.

3 Claims, 9 Drawing Figures

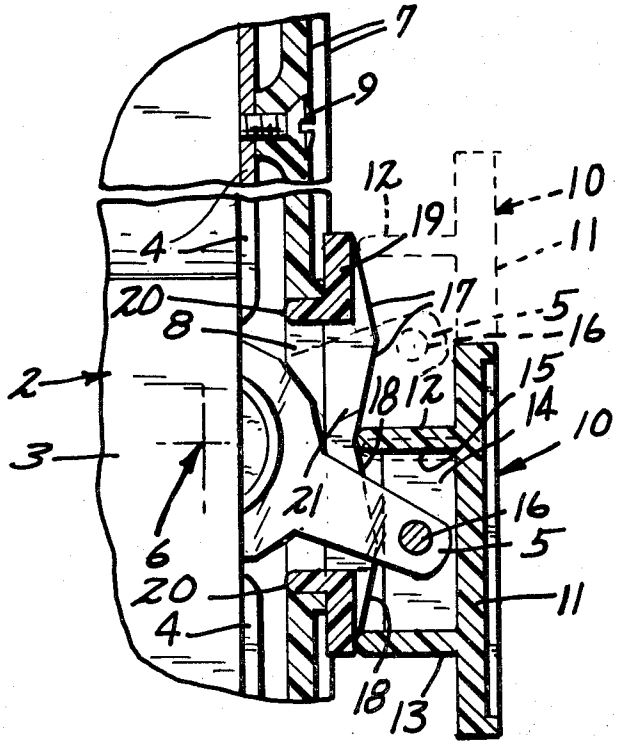


FIG. 1

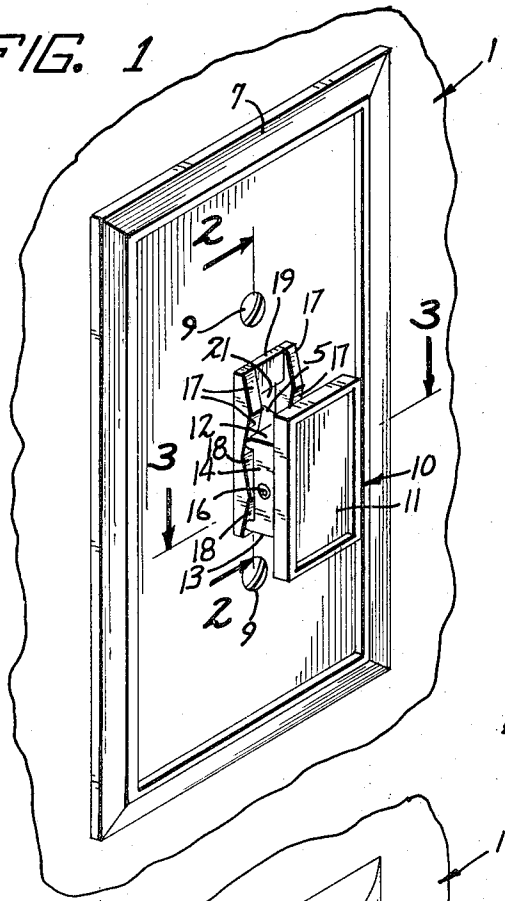


FIG. 2

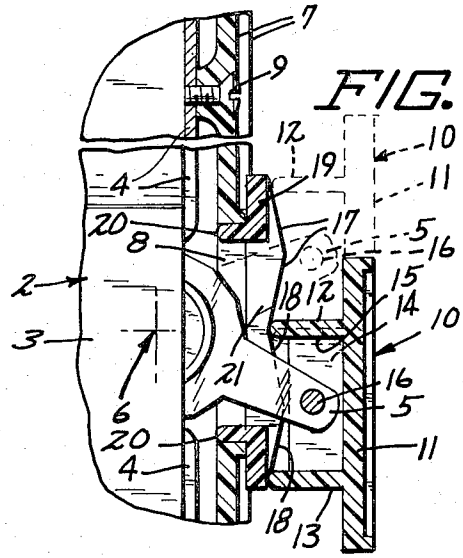


FIG. 3

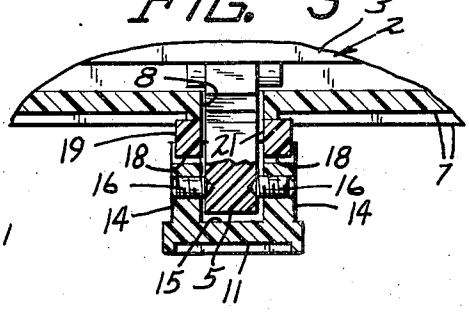


FIG. 4

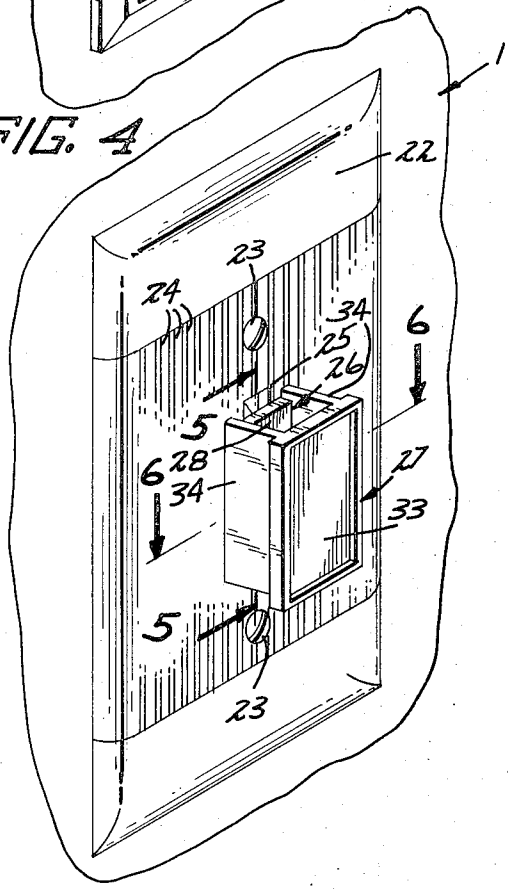


FIG. 5

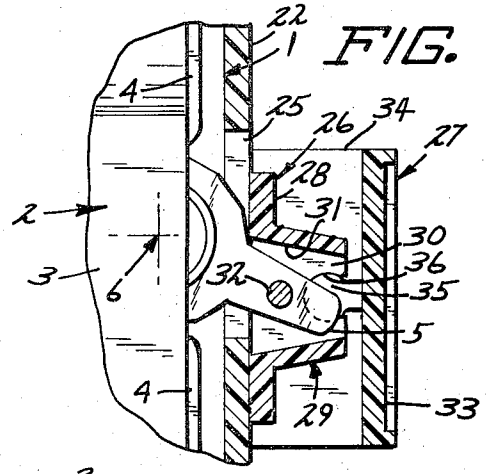
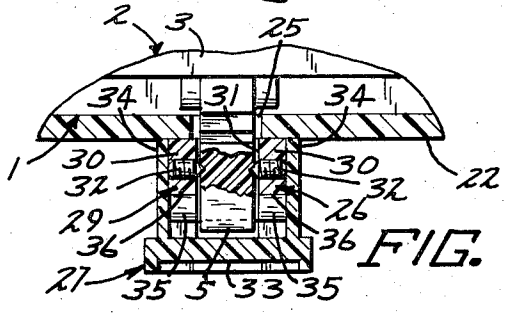


FIG. 6



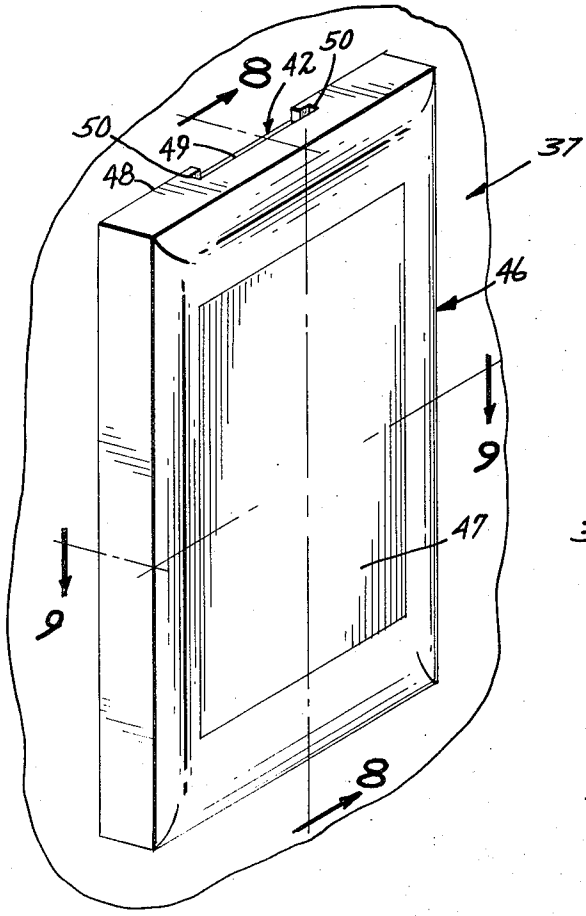


FIG. 7

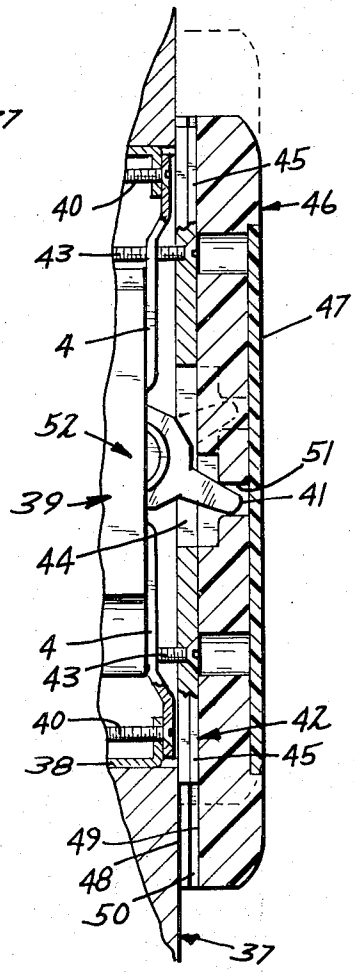


FIG. 8

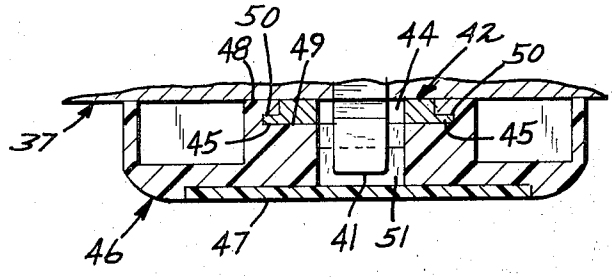


FIG. 9

SLIDE ACTUATOR FOR TOGGLE SWITCH

BACKGROUND OF THE INVENTION

Generally, wall mounted switches of the toggle variety are concealed by decorative cover plates having openings through which project the switch actuator arms which are pivotally swung usually generally upwardly and downwardly between circuit closing and opening positions. Due to their size and shape, these arms do not lend themselves to great variation of design or ornamentation, and are sometimes inconvenient to operate, due to their relatively small size.

SUMMARY OF THE INVENTION

An important object of this invention is the provision of a switched operating device for wall mounted toggle switches that is easy to locate and operate.

Another object of this invention is the provision of a switch operating device which lends itself to a wide variety of ornamental design and which can be inexpensively produced.

To the above ends, we provide a slide block or plate having pivotal engagement with the oscillatory or swinging actuator arm of a wall mounted toggle switch. The slide block slidably engages surface portions associated with a stationary guide plate secured to the switch, these surface portions being disposed to guide the slide block in generally straight line movement in opposite directions generally parallel with the wall in which the switch is mounted. Thus, the slide block is disposed in a substantially constant attitude with the wall in all positions of its movement, and can be produced in various easily grasped shapes capable of a wide variety of ornamentation and design.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary view in perspective of a switch operating device of this invention;

FIG. 2 is an enlarged fragmentary section taken substantially on the line 2—2 of FIG. 1;

FIG. 3 is an enlarged fragmentary section taken substantially on the line 3—3 of FIG. 1;

FIG. 4 is a view corresponding to FIG. 1 but showing a modified arrangement;

FIG. 5 is an enlarged fragmentary detail taken generally on the line 5—5 of FIG. 4;

FIG. 6 is an enlarged fragmentary section taken on the line 6—6 of FIG. 4;

FIG. 7 is a view corresponding to FIGS. 1 and 4 but showing another modified arrangement; and

FIGS. 8 and 9 are enlarged fragmentary sections taken on the lines 8—8 and 9—9 respectively of FIG. 7.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In the wall embodiment of the invention illustrated in FIGS. 1–3, a wall of a room is shown fragmentarily and indicated at 1, a conventional electrical switch of the type generally known as a toggle switch generally indicated at 2 and comprising a body 3 that is provided with a pair of plate-like brackets 4 that are used to support the switch 2 within the usual metallic mounting box or the like, not shown. The switch 2 may be either the mechanical or the silent mercury variety, the same being operated by an actuator arm 5 which is manually oscillated or swung between switch open and switch

closed positions. The arm 5 swings about an axis indicated at 6 in FIG. 2. The switch 2 and the box in which it is mounted, is concealed behind a cover plate 7 of conventional design having a generally rectangular central opening 8 through which the actuator arm 5 projects, the cover plate 7 being secured to the mounting brackets 4 by screws 9, as is customary.

A slide member 10 is disposed laterally outwardly of the cover plate 7, and is formed to provide a generally vertically disposed outer wall 11 generally parallel to the cover plate 7 and wall 1, a pair of generally horizontal upper and lower walls 12 and 13 that project laterally inwardly from the outer wall 11 toward the cover plate 7 and which are joined by a pair of laterally spaced generally vertical side walls 14.

The several walls of the slide member 10 cooperate to define a cavity 15 that opens laterally inwardly toward the switch 2 and which receives the outer end portion of the switch actuator arm 5. The slide member 10 is mounted on the actuator arm 5 by a pair of axially aligned pointed set screws 16 that are screw threaded through suitable openings in the side walls 14 on an axis parallel to the axis 6 of swinging movement of the actuator arm 5. The inner pointed ends of the set screws 16 bite into the material of the arm 5 and mount the slide member 10 for relative pivotal movement therebetween and the arm 5 on the common axis of the set screws 16.

The inner ends of the top and bottom walls 12 and 13 of the slide member 10 are disposed to slidably engage guide surfaces 17 and 18 respectively of a guide member 19 that is mounted on the outer surface of the cover plate 7. Guide member 19 is provided with a pair of vertically spaced lugs 20 that project laterally into the opening 8 in the cover plate 7 adjacent the opposite ends of the opening 8, to hold the guide member 19 against movement relative to the cover plate 7, the guide member 19 defining a generally rectangular opening 21 through which the actuator arm 5 projects.

As the actuator arm is swung between its full line position of FIG. 2 and its dotted line position thereof, by upward and downward movements of the slide member 10, the guide surfaces 17 and 18 slidingly engage the inner ends of the end walls 12 and 13 respectively to guide the slide member 10 in such manner that the slide member 10 remains in a substantially constant attitude relative to the cover plate 7 and wall 1 with the outer wall 11 remaining in substantially parallel relationship to the plane of the wall 1. It will be noted that, although the guide surfaces 17 and 18 are substantially flat, the sloping arrangement of each pair thereof closely approximates a curve or arc having a radius equal to the distance between the axis 6 and the common axis of the pivot or set screws 16. Thus, the slide member 10 deviates very little from a straight line movement between switch-on and switch-off positions. It will be appreciated that the outer wall 11 of the slide member 10 may be of various shapes, and may be variously decorated with any desired ornamentation.

DESCRIPTION OF MODIFIED FORM OF FIGS. 4–6

In the embodiment shown in FIGS. 4–6, the building wall, switch and actuator arm are identical to those of FIGS 1–3, and are designated by identical reference numerals. A cover plate 22 is mounted by means of a

pair of screws 23 similar to the screws 9, the outer surface of the cover plate 22 being flat and smooth, except for ornamentation, such as stripes 24. Further, the cover plate 22 is provided with a switch actuator arm receiving opening 25, similar to the opening 8 in the cover plate 7.

The slide member of FIGS. 4–6 comprises a pair of cooperating inner and outer sections 26 and 27 the former of which comprises a flat base portion 28 and a central laterally outwardly projecting hollow boss 29 having generally vertically disposed parallel side walls 30 and defining an opening 31 for reception of the actuator arm 5. As shown particularly in FIGS. 5 and 6, the base 28 normally lies against the outer surface of the cover plate 22 and is vertically slidable thereon. A pair of aligned set screws 32 are screw threaded in suitable openings through the side walls 30 and have pointed inner ends which engage opposite sides of the actuator arm 5 in the same manner as the above described set screws 16, the common axis of the screws 32 being parallel to the axis 6 of swinging or oscillatory movement of the actuator arm 5.

The outer slide member section 27 is formed to provide an outer wall 33 and a pair of laterally spaced parallel vertically extending side walls 34 that project laterally towards the cover plate 22, the inner edges of the side walls 34 slidably engaging the outer surface of the cover plate 22. Inwardly of the outer wall 33 and adjacent each side wall 34, the outer slide member section 27 is formed to provide a pair of bosses 35 that are adapted to snap into engagement with arcuate notches 36 in the side walls 30 of the inner slide member section 26 to provide limited pivotal and lateral movement of the outer section 27 relative to the inner section 26, on an axis parallel to the common axis of the set screws 32 and to the axis 6. This arrangement permits the outer section 27 to slide along the outer surface of the cover plate 22 while the inner slide member section 26 may travel in a slightly arcuate path about the axis 6. The outer slide member section 27 may tilt slightly during movement from one limit of its movement to the other thereof, but at its opposite limits of movement, the outer wall 33 is disposed in parallel relationship to the outer surface of the cover plate 22 and the adjacent wall 1. In the arrangement of FIGS. 4–6, when the outer section 27 is snapped into engagement with the inner section 26, the outer ends of the set screws 32 are hidden, unlike the outer ends of the set screws 16.

SWITCH OPERATING DEVICE OF FIGS. 7–9

In the arrangement illustrated in FIGS. 7–9, a flat wall 37 is shown as containing a conventional switch box 38 in which is mounted a toggle acting switch 39 similar to the switch 2 and having mounting brackets 4 that are secured to the mounting box 38 by screws 40. The switch 39 is provided with a switch actuator arm 41 that operates in the same manner as the actuator arms 5.

A guide member in the nature of an elongated guide bar 42 is secured to the outer surfaces of the mounting brackets 4 of the switch 39 by means of screws 43, and is provided intermediate its ends with an opening 44 for reception of the actuator arm 41. The guide bar 42 is further provided at its opposite side edges with longitudinally extending tongues 45. A slide member 46 is generally rectangular in shape, and of a size to completely cover the switch 39 and switch box 38, having a generally flat outer surface 47 that is disposed in outwardly spaced parallel relationship to the wall 37. The inner surface 48 of the slide member 46 is formed to provide a vertically extending open ended channel 49 for sliding reception of the guide bar 42, the channel 49 being provided at its opposite sides with inwardly opening grooves 50 for reception of the tongues 45 of the guide bar 42. At its longitudinally central portion, the slide member 46 is formed to provide a recess 51 for reception of the outer end of the actuator arm 41. As the slide member 46 is moved upwardly or downwardly with respect to the switch 39 and guide member 42, engagement of the outer end of the switch arm 41 with the opposite sides of the recess 51 causes the switch arm 41 to oscillate or swing about its axis of swinging movement, indicated at 52 in FIG. 8.

In the embodiment of FIGS. 1–3, only the members 10 and 19 are added to a conventional switch arrangement. In the modification illustrated in FIGS. 4–6, only the members 26 and 27 are added. In the arrangement illustrated in FIGS. 7–9, the customary cover plate of the types indicated at 7 and 22 in FIGS. 1 and 4 are removed and the guide member 42 substituted therefor, the slide member 46 being added.

While we have shown and described a preferred embodiment of our switch operating device, and two modified arrangements, it will be understood that the same is capable of further modification without departure from the spirit and scope of the invention, as defined in the claims.

We claim:

1. A device for operating a switch having means for securing the same on a wall, said switch having an oscillatory arm oscillating about a given axis, said device comprising, a slide member, pivot means mounting said slide member on said actuator arm for pivotal movement of the slide member relative to said actuator arm on an axis parallel to the axis of oscillatory movement of said actuator arm, stationary guide means having spaced apart outer guide surface portions, said slide member including a pair of elements spaced apart in the direction of movement of the slide member for sliding engagement with said outer guide surface portions, said guide surface portions cooperating with said pivot means to hold said slide member in a substantially constant attitude relative to the wall on which said switch is mounted.

2. The switch operating device defined in claim 1 in which said outer guide surface portions each describe a path generally similar to the path of oscillatory movement of the switch actuator arm.

3. The switch operating device defined in claim 1 in which said guide means comprises a cover plate for the switch and having an opening therethrough for said actuator arm and elongated in the direction of oscillatory movement of said actuator arm, and a guide member having said outer guide surfaces thereon and including other portions seated in said elongated opening.

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