

March 27, 1962

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3,027,434

SWITCH

Filed Sept. 7, 1960

2 Sheets-Sheet 1

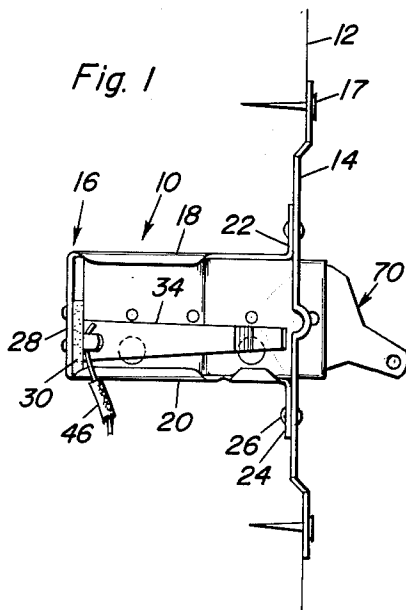
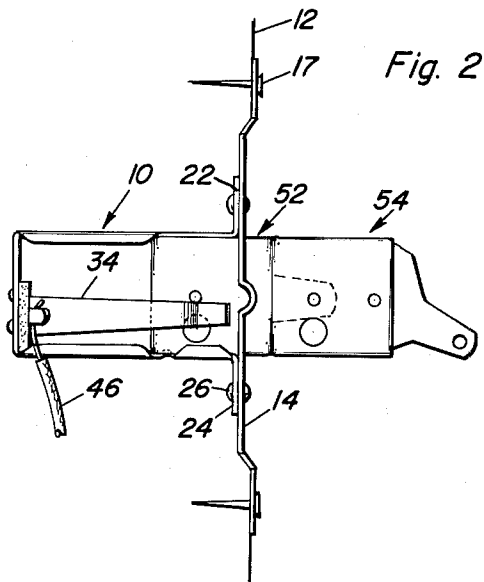
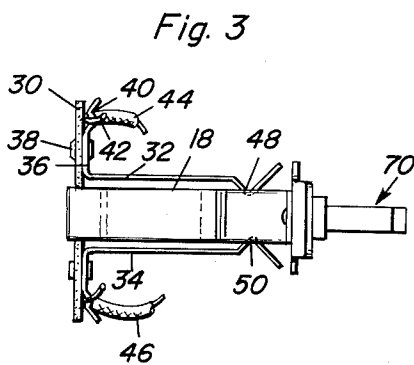
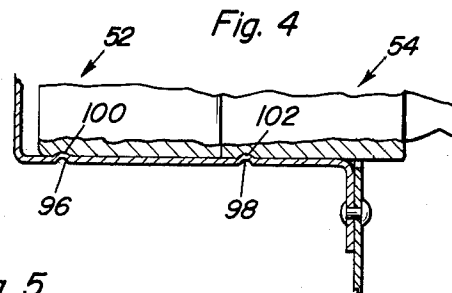


Fig. 5

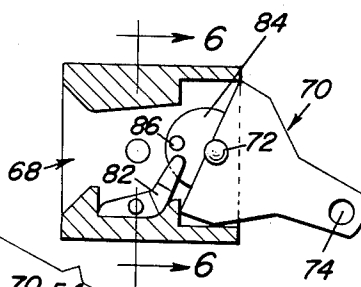
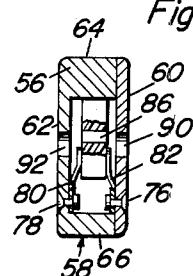
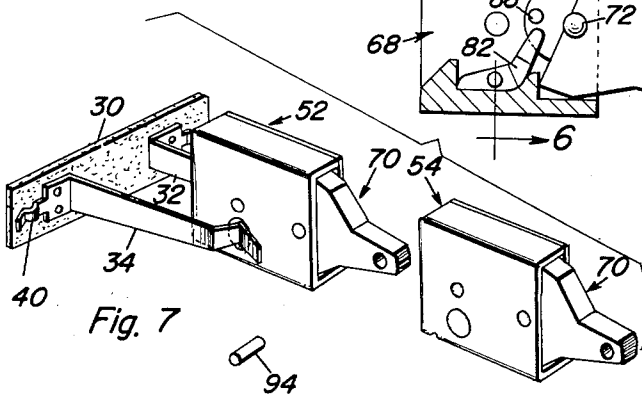


Fig. 6



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Fig. 8

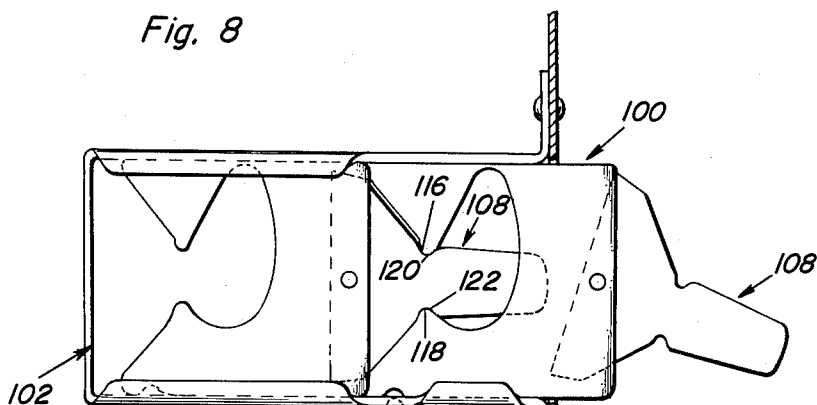


Fig. 9

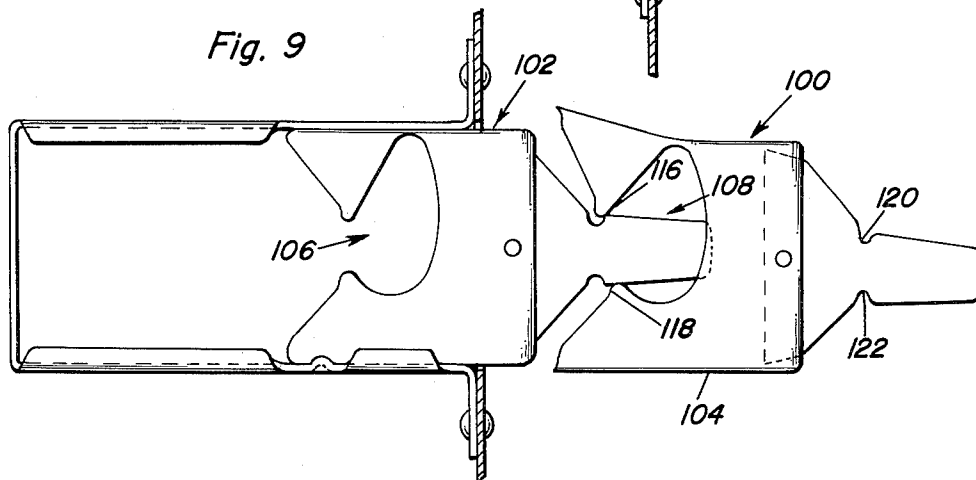
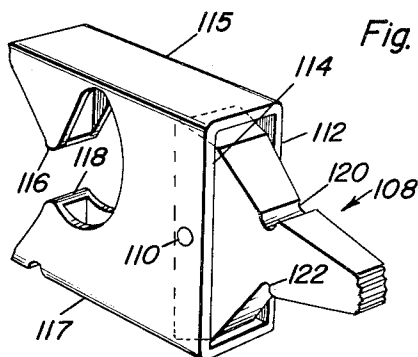


Fig. 10



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3,027,434
SWITCH

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This invention relates generally to electrical equipment and more particularly to a novel switch assembly which finds great utility as a standard light switch or such in housing circuits.

Home owners generally keep a supply of replaceable fuses on hand in case a fuse burns out and power in a particular circuit is lost. Although instances of malfunctioning of switches are less frequent than those instances when fuses blow, it occurs sufficiently often to present a problem to the home owner. When switches do break down, it is generally necessary to remove the wall plate, disconnect the conductors from the switch, and replace the switch. In most instances, replacement switches are not readily available. Moreover, if there are no readily available means of light, the replacement job can be exceptionally difficult.

In the light of the above, it is the principal object of the invention herein to provide a novel switch assembly wherein a plurality of individual switch units may be mounted within a mounting frame in a manner that will enable an unused switch unit to be placed in operative position when the unit in operative position malfunctions.

It is a more particular object of this invention to provide a novel switch assembly wherein a particular switch mounting frame is secured to a wall or such with the mounting frame being of such a construction that it may slidably receive individual switch units therein. The units may be received in stored or operative positions with the units slidable from a stored position into an operative position. Each of the units is provided with spaced contacts which may be bridged by a bridging element carried by a pivotally mounted switch actuator. The spaced contacts of the unit are aligned with spring contacts secured to the mounting frame. When the switch unit is moved into operative position, the spaced contacts thereof move into electrical engagement with the spring contacts to which are connected the conventional electrical conductors.

It is a still more particular object of this invention to provide a novel switch construction wherein a mounting frame is provided and slidably receives a plurality of tandem arranged switch units. The units define both a rearwardly opening cavity and a forwardly extending actuator and the actuator of a rearward unit extends into and is releasably attached to the adjacent forward unit in the rearwardly opening cavity thereof. By merely pulling the forwardmost unit outwardly, all of the units therebehind are moved forwardly with the second unit moving into the operative position wherein the spaced contacts thereof are electrically engaged with the spring contacts.

It is a still more particular object of this invention to provide a novel switch construction which is relatively inexpensive to manufacture and exceedingly simple to install. Moreover, the switches are durable in construction and reliable in operation and will enable the home owner to replace faulty switches in a manner much simpler than heretofore known.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawing forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a side elevational view of the switch assembly illustrating the forwardmost switch unit in the

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operative position with the switch unit to the rear thereof in the stored position;

FIGURE 2 is a side elevational view showing the units pulled partially from the mounting frame with the second unit now in the operative position;

FIGURE 3 is a top plan view of the switch assembly showing the two switch units within the mounting frame;

FIGURE 4 is an enlarged fragmentary sectional view particularly illustrating the positioning means employed between the switch unit and mounting frame for assuring the proper positioning of the unit;

FIGURE 5 is a vertical sectional view taken through one of the switch units showing the manner in which the spaced contacts thereof may be bridged by an element carried by the actuator;

FIGURE 6 is a vertical sectional view taken substantially along the plane 6—6 of FIGURE 5;

FIGURE 7 is a perspective view of a pair of switch units showing the manner in which the switch actuator of a rear unit may be releasably attached in the housing of an adjacent forward unit;

FIGURE 8 is a side elevational view of a modified form of the invention illustrating the forwardmost switch unit in the operative position with the switch unit to the rear thereof in the stored position;

FIGURE 9 is a side elevational view of the modified form of invention showing the forwardmost switch unit removed from the mounting frame and particularly showing the means releasably attaching the switch units together;

FIGURE 10 is a perspective view of one of the modified switch units.

Attention is now called to the drawings wherein the switch assembly 10 is illustrated. The switch assembly 10 is to be mounted in an opening in the wall 12 and for that purpose a wall plate 14 is provided, held to the wall by fasteners 17. Extending rearwardly from the plate 14 is a mounting frame 16 which includes an upper channel member 18 and a lower channel member 20 spaced therefrom. Each of the channel members 18 and 20 define upstanding ends 22 and 24 which are secured to the plate 14 by fasteners 25. A rear wall 28 bridges the channel members 18 and 20 and supports an insulator 30 which extends outwardly therefrom.

Carried by the insulator 30 on either side of the channels 18 and 20 are spring contacts 32 and 34 respectively. Each of the spring contacts 32 and 34 includes a rear perpendicular leg 36 secured to the insulator 30 by fastener 38. The leg 36 terminates in a clip portion 40 adapted to electrically contact a lead 42 adjacent the insulator 30. Conductor 44 connected to one side of the line is connected to the spring contact 32 while conductor 46 connected to a second side of the line is connected to spring contact 34. The spring contacts 32 and 34 are urged toward each other and define inwardly offset portions 48 and 50 whose function will be more particularly realized below.

A pair of switch units 52 and 54 are slidably received between the channel members 18 and 20 and between the spring contacts 32 and 34. Particular attention is called to FIGURES 5 and 6 wherein detail views of the switch units are set forth. Each of the units includes a housing 56 comprising member 58 and side wall 60. The member 58 includes a wall 62 and a pair of laterally projecting legs 64 and 66. Wall 60 is terminally secured to the legs 64 and 66 spaced from the wall 62. A cavity 68 is thereby defined between the walls 60 and 62 and the legs 64 and 66. The cavity 68 opens rearwardly. A switch actuator 70 is pivotally supported on pin 72 which is secured between the walls 60 and 62. The switch actuator 70 extends forwardly from the housing 56. The

switch actuator 70 defines an opening 74 at the forward-most portion thereof.

First and second fixed contacts 76 and 78 extend through the walls 60 and 62 respectively and are terminally secured to terminals 80 and 82 which are inherently resilient and urged toward each other. The spring terminals 80 and 82 bear against a semi-cylindrical reduced portion 84 at the rear of the actuator 70. The reduced portion 84 carries a bridging element 86 therein. It will be appreciated that when the actuator 70, shown in FIGURE 5, is pivoted counterclockwise about the pin 72, the bridging element 86 is moved into bridging relationship with respect to the spring terminals 80 and 82. Aligned openings 90 and 92 are defined in the walls 60 and 62. The actuator 70 of unit 52 is receivable in the cavity 68 of unit 54 and a pin 94 is receivable through the aligned openings 90 and 92 of the walls 60 and 62 of the unit 54 and also through the openings 74 of the actuator 70 of the unit 52. The pin 94 therefore releasably secures the units 52 and 54 together in tandem.

In normal use of the switch, the two units 52 and 54 are installed into the mounting frame 16 as is illustrated in FIGURE 1. The units 52 and 54 are inserted through the plate 14 toward the rear wall 28 and are positioned properly by virtue of the projections 96 and 98 in the lower channel 20 which are received in depressions 100 and 102 in the units 52 and 54 respectively.

When the units 52 and 54 are received in the mounting frame 16 in the manner shown in FIGURE 1, the inwardly directed portions 48 and 50 of the spring contacts 32 and 34 engage the fixed contacts 78 and 76 respectively of the unit 54. It will be appreciated that the unit 54 is therefore disposed in the mounting frame 16 in an operative position while the unit 52 is disposed in an inoperative position. The inwardly directed portions 48 and 50 apply potential to the contacts 78 and 76 from the conductors 44 and 46. In order to operate the switch, the actuator 70 is pivoted counterclockwise so as to carry the bridging element 86 into bridging relationship across the spring terminals 80 and 82. If for any reason the switch unit 54 breaks down, it need be merely pulled forwardly out from the plate 14. Of course, this will carry the switch unit 54 forwardly and the contacts 78 and 76 of the unit 52 will then move into electrical contact with the inwardly directed portions 48 and 50 of the spring contacts 32 and 34. The pin 94 may then be pressed out of the aligned openings 90, 74, and 92 so as to enable the removal of the switch unit 54 from the unit 52. The unit 52 is then in proper operating position and counterclockwise movement of the actuator 70 thereof will operate the switch.

Attention is now called to FIGURES 8-10 wherein a modified form of the invention is illustrated. The modified form of invention is substantially identical to that already discussed and differs only in the manner in which the switch units are detachably secured together. A pair of units 100 and 102 are illustrated. Each unit includes a housing 104 formed of some deformable and resilient material, as rubber or plastic. Each housing defines a rearwardly opening cavity 106 and a forwardly projecting actuator 108 pivoted on pin 110 supported between walls 112 and 114. The walls define projections 116 and 118 adjacent the cavity 106. Defined on opposite sides of each actuator are depressions 120 and 122. The projections 116 and 118 extend toward one another with the projections of a forward unit 100 receivable in the

depressions 120 and 122 of a rearward unit. Each of the walls 112 and 114 of the housing 104 are substantially U-shaped with the projections 116 and 118 projecting inwardly toward each other from the legs 115 and 117 of the U-shape. As noted, the housings are formed of some deformable and resilient material which permits the legs 116 and 117 to be spread, as in FIGURE 9, so as to permit the projections 116 and 118 to be snapped on to a rear actuator or removed therefrom.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A switch assembly including a mounting frame having a pair of spaced spring contacts, at least two switch units each having a pair of terminals slidably mounted in said frame, one of said units having its pair of terminals between and in engagement with said spring contacts.

2. The combination of claim 1 wherein each of said switch units comprises a housing defining a rearwardly opening cavity and a forwardly projecting switch actuator.

3. A switch assembly including a mounting frame having a pair of spaced spring contacts, and switch units slidably insertable into said frame between and in engagement with said spring contacts, each of said switch units comprises a housing defining a rearwardly opening cavity and a forwardly projecting switch actuator, means for removably attaching a plurality of said units in tandem with the switch actuator of a rearward unit received in the cavity of an adjacent forward unit.

4. The combination of claim 3 wherein said removable attaching means includes an opening in a forward housing unit, an opening in the switch actuator of an adjacent rearward unit alignable with said housing opening, and a pin located in said aligned openings.

5. The combination of claim 1 wherein each of said switch units comprises a housing having a pair of said terminals in opposed walls thereof, a switch actuator pivotally mounted in said housing and projecting forwardly therefrom and bridging means carried by said actuator within said housing electrically engageable with said spaced contacts.

6. The combination of claim 5 wherein said spring contacts are in alignment with said terminals when said switch units are slidably inserted in said frame.

7. The combination of claim 6 including cooperating positioning and retaining means carried by said frame and said units enabling the proper positioning of said units within said frame whereby said spring contacts will electrically engage said spaced contacts.

8. The combination of claim 3 wherein said housings are deformable and resilient and include spaced legs having inwardly directed projections, and depressions in said actuators for receiving said projections.

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