

May 31, 1966

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3,254,191

WALL MOUNTED SWITCHING DEVICE AND OPERATING LEVER

Filed Jan. 6, 1964

2 Sheets-Sheet 1

FIG. 1.

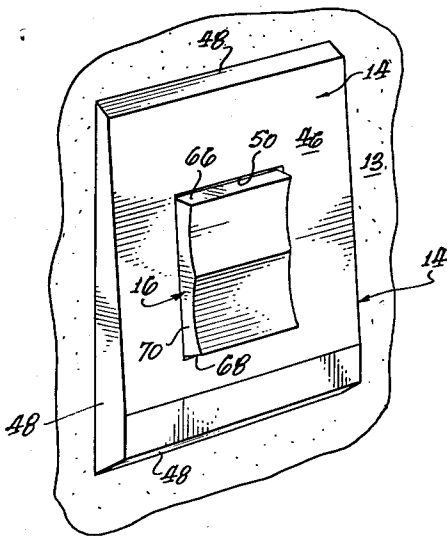


FIG. 2.

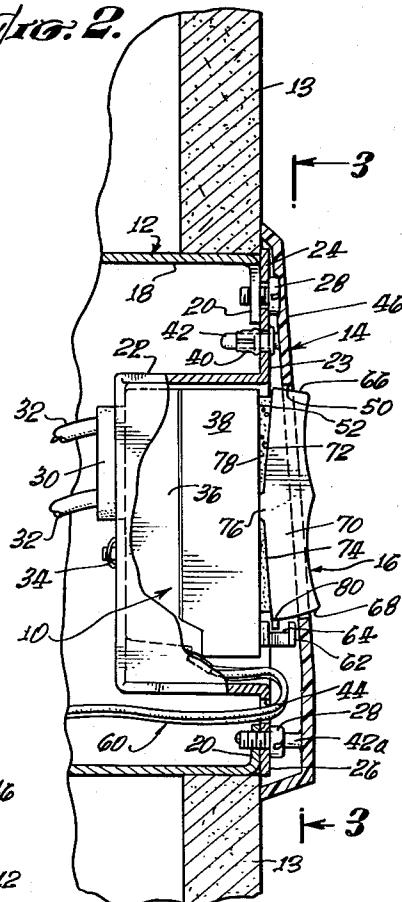


FIG. 3.

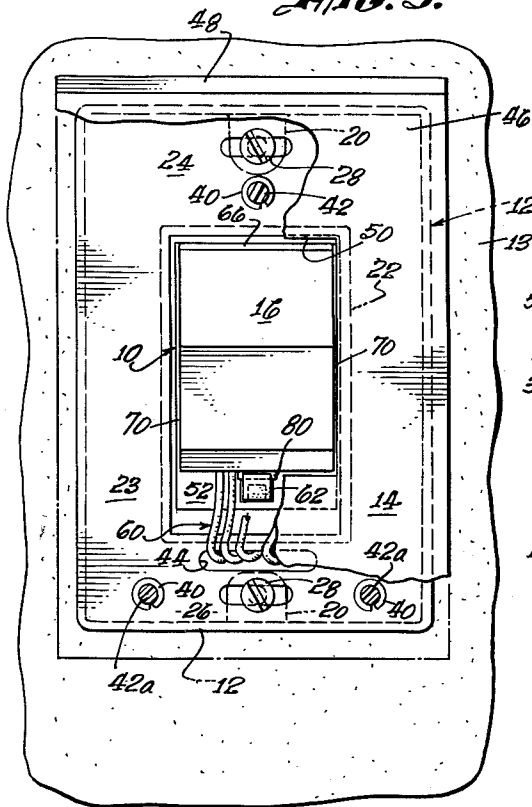


FIG. 6.

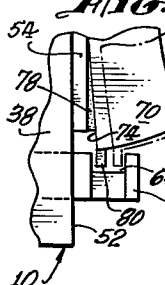
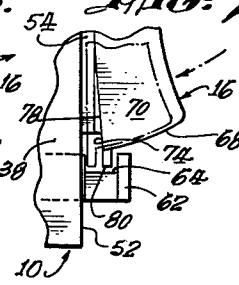


FIG. 7.



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Fig. 4.

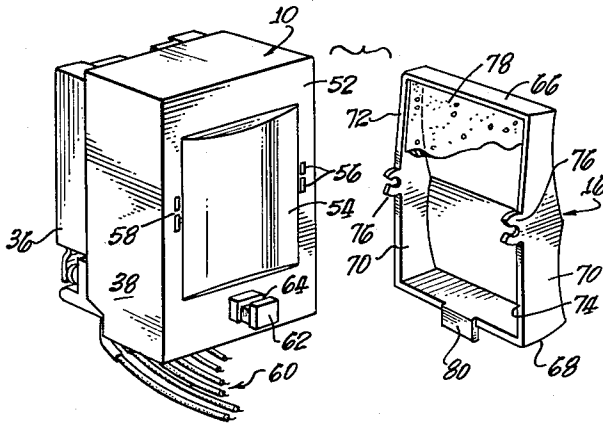


Fig. 5.

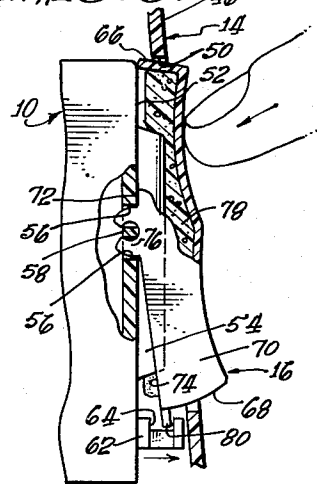


Fig. 8.

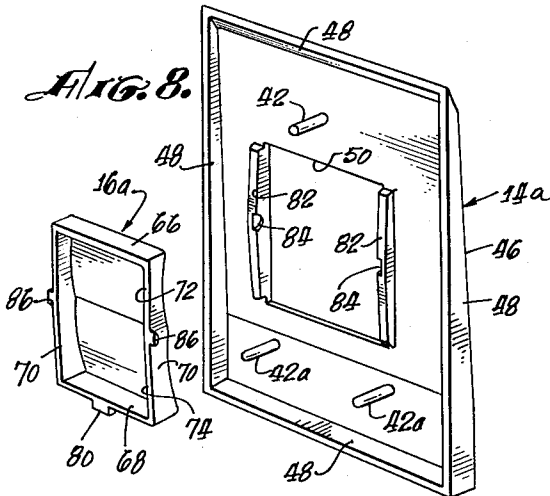
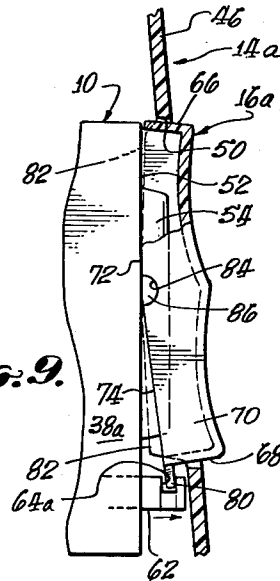


Fig. 9.



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WALL MOUNTED SWITCHING DEVICE AND OPERATING LEVER

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14 Claims. (Cl. 200—172)

The present invention relates to switch or relay assemblies having manual operating handles. More particularly, the present invention relates to switch or relay combinations comprising means mounted externally of a receptacle in a hole in a wall or panel for operating the control button or lever of a switch or relay supported internally of said receptacle.

While the present invention has particular advantages when utilized in conjunction with relay or switch means which may be operated alternatively, either from a remote control or directly at the receptacle in which the relay or switch means is supported, it is also of obvious utility with simple switch means and advantages relative to both types of usages will be discussed herein.

In conventional simple switch arrangements, the entire switch assembly customarily includes a control button or lever as a built-in part of the assembly. The assembly also generally includes a strap extending longitudinally thereof, the strap having openings for mounting screws utilized to mount the assembly in a wall box with the switch controlling button or lever extending outwardly of the wall box. A cover plate or escutcheon is mounted on the wall to cover the wall box, the plate or escutcheon having an opening through which the switch controlling button or lever protrudes. Such arrangements are disadvantageous in that standard switches are available in only a few colors such as ivory and brown and (less often) in black. Therefore the decor of the rooms in which such assemblies are used is adversely affected by limitation to these colors either in causing bad color combinations or forcing conformity with such colors in decorating. The present invention provides means whereby switch assemblies may be operated by an auxiliary operating button which is not, per se, a part of the switch assembly but is part of a separate cooperating face plate-operating lever assembly which may be provided in any desired color and which may be designed to have a better appearance than the standard switch-escutcheon plate arrangements.

Secondly, it is characteristic of existing arrangements that the switch controlling button or lever is a closely related basic component of the switch. It is intimately associated with the current carrying components and when a short circuit or arcing occurs, the operator is subject to shock. The present invention provides a second insulating operating member between the finger of the user and the electrical components, and is thus effective in obviating this disadvantage of the conventional switch-switch controlling lever arrangement.

It is also true that the switch controlling levers of conventional switches are relatively costly, as compared with either components of the switch assemblies since they must be of insulating material and of comparatively decorative appearance. When a switch breaks or burns out the entire structure, including the switch controlling lever must be replaced. Under the arrangement of the present invention the switch within the wall box may be provided with economical, non-decorative control buttons or levers of minimal relative cost (since they are not visible in normal use) so that replacement of switches may be less expensive than in the past.

The present invention is also applicable to relays of a type having a button or lever extending through the cover whereby they may be operated mechanically where located as well as by electrical impulse from remote positions. Relays of this type are illustrated in co-pending

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United States patent application Serial No. 197,503, filed May 24, 1963, by Kenneth Reiner, Roger W. Forburger and William H. Stoneman.

All of the remarks above relating to switch structures and to the advantages provided by the present invention relative to the manual operation thereof apply as well to relays of the type mentioned in the preceding paragraph. Moreover, in view of the special nature of such relays certain other ancillary advantages are achieved by the present invention in that it is effective to deaden the sound of relay operation and in that it is possible to provide arrangements wherein the externally visible operating lever does not move if the relay is actuated by an impulse from a remote location.

The advantages of the present invention are achieved by the provision of switches or relays wherein the controlling button or lever extends outside the switch or relay housing and has a notch in the outwardly extending portion, and by the provision of an auxiliary operating lever which has a lug adapted to be engaged within said notch and which is rockably mounted adjacent to or on the switch or relay in a manner to extend through an opening in an outer face plate, for engagement by the finger of an operator so that rocking of the lever causes movement of the controlling button or lever of the switch or relay.

Therefore, it is an object of the present invention to provide improved means for the manual actuation of switches or relays.

Another object of the present invention is to provide improved switching device-operating lever combinations wherein the switching device may be discarded and replaced without requiring that the operating lever be replaced.

Yet another object of the present invention is to provide improved combinations of remotely operable wall box-retained relay devices of the type which have operating buttons extending outwardly of the casings thereof with manual operating means adapted to be mounted externally of a wall and mechanically linked to such relays for manual operation thereof.

Still another object of the present invention is to provide wall mounted switching device-operating lever combinations wherein the operating lever and the wall box cover surrounding it may be of decorative appearance and of any desired color to match the decor of the room.

A further object of the present invention is to provide improved combinations of remotely operable wall box-retained relay devices of the type which have operating buttons extending outwardly of the casings thereof with manual operating means mounted externally of the wall, wherein said externally mounted operating means do not move when the relay is actuated remotely to cause the operating button of the relay to move.

These and other objects and the advantages attendant thereto will become apparent from the following detailed description, taken in conjunction with the accompanying drawings, in which like reference numerals are related to like parts throughout, and wherein;

FIGURE 1 is a perspective view of an assembly according to the present invention, showing the same as mounted in a wall;

FIGURE 2 is an enlarged sectional view taken through the assembly of FIGURE 1; with parts broken away for clarity of illustration;

FIGURE 3 is a front view of the assembly of FIGURES 1 and 2, taken along line 3—3 of FIGURE 2, and with parts broken away to illustrate internal details;

FIGURE 4 is an exploded perspective view of the switching device and operating lever utilized in the assembly shown in FIGURES 1, 2 and 3 and 5;

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FIGURE 5 is an enlarged elevational view of a detail of FIGURES 1, 2 and 3, illustrating the relationship of the switching device and operating lever of FIGURE 4 in one extreme position of the operating lever, and having parts sectioned and broken away as necessary for clarity of illustration;

FIGURE 6 is a fragmentary view of the lower portion of FIGURE 5 showing the operating lever in a neutral rest position with the operating button of the switching device in its "on" position;

FIGURE 7 is a view similar to FIGURE 6 showing the operating lever in its neutral rest position with the operating button of the switching device in its "off" position;

FIGURE 8 is an exploded perspective view of a cover plate assembly and an operating lever, illustrating a modification under the present invention; and

FIGURE 9 is a view similar to FIGURE 5 of the FIGURES 1-7 modification, showing the operating lever of the FIGURE 8 device in one of its two extreme positions.

Referring now to the drawings, it may be seen that there are illustrated therein two examples of constructions according to the present invention, FIGURES 1 to 7 relating to one form thereof and FIGURES 8 and 9 to another.

Referring now to the FIGURES 1 to 7 type of construction, a switching device operating lever assembly according to the present invention comprises a switching device 10, means generally designated at 12, for supporting the switching device internally of a wall or panel 13, a face plate or escutcheon plate 14, and an operating lever 16, with the switching device mounted internally of the wall or panel 13, and of the plate 14, and with the operating lever 16 having a surface extending externally thereof or adapted to be operated from an external position.

The mounting means 12 (see FIGURE 2) may comprise a wall box 18 of the type generally used to mount switches or outlets in walls or panels. Such boxes are usually provided, as in the illustrated case, with upper and lower attachment tabs, as at 20, which have openings adapted to receive screws for mounting electrical parts within the wall box. In the illustrated case, an internal receptacle 22 of smaller size than wall box 18 is mounted therein, the receptacle 22 having an enlarged forward face flange 23 adapted to cover substantially the entire opening of the wall box and having an upper portion 24 and a lower portion 26. Appropriately positioned apertures in upper and lower portions 24, 26 permit attachment of receptacle 22 to the wall box 18 by insertion of screws 28 through screw openings in the attachment tabs 20, as shown.

The rear wall of the receptacle 22 is provided with an opening of a size sufficient to accommodate an insulating plug 30 through which electrical wiring 32 may be introduced, for connection to the switching device 10 which is supported within the receptacle 22.

The rear wall of the receptacle 22 may be also provided with a second smaller opening for co-operation with any suitable means for supporting the switching device 10 in the receptacle 22, such means being shown at 34. The preceding description of means for mounting a switching device in the receptacle 22 and the means for leading electrical wiring thereto has been expressed in general terms in order to accentuate the fact that the present invention is of a scope to include any type of switching device. However, the actual illustrated example is of a switch or relay of the type disclosed in the aforementioned United States patent application, Serial No. 197,503, and the base portion 36 thereof is relatively permanently attached in the receptacle 22 so that the switching or relay body portion 38 may be plugged into the base for electrical and mechanical connection thereto, as described in said aforementioned copending application.

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The upper portion 24 of the forward flange 23 of the receptacle 22 is provided with a clutch type annulus 40 which is adapted to receive an integral attachment post 42 on the face plate 14, and the lower portion 26 of the flange 23 is similarly provided with a pair of annular clutches 40 adapted to receive attachment posts 42a integral with the face plate 14, in order to firmly position the face plate relative to the remainder of the assembly, as best shown in FIGURES 2 and 3. The lower portion 26 of flange 23 is also provided with a slot 44 to permit the passage of wires (to be described hereinafter).

The face plate or escutcheon 14 has forward wall 46 and side and end walls 48, the general combined effect being to space the forward wall away from the flange 23 of receptacle 22 to provide an enclosed space for the means of connection thereof to the wall box 18. While the precise shape of the plate 14 is not a feature of the present invention it should be noted that a wide range of aesthetic configurations could be used. In the illustrated examples a generally pyramidal shape is shown, with the top and bottom walls sloping inwardly, and with the lower end of the face plate having a thicker aspect than the top thereof to provide an arrangement substantially different in appearance from conventional face plates. The forward wall 46 has a generally centrally disposed opening 50 therein, of a shape and size to accommodate the operating lever 16. While the specific shape of the opening 50 and of the operating lever 16 are not significant they are shown as rectangular in the illustrative examples herein.

The switching device 10 may be of any desired size or shape, it being essential to the practice of the present invention only that the outer wall thereof be of such configuration relative to the shape of the operating lever 16 as to cooperate therewith for the purpose herein described. In the illustrated examples, the switching device has an outer wall which has a flat peripheral portion 52 and a centrally located raised portion 54. The peripheral portion 52 is provided with opposed pairs of openings 56, on either side of raised portion 54, as best seen in FIGURE 4. The spacing of the openings 56 of each pair is such as to provide a bar 58 therebetween, to serve as a means for mounting the operating lever 16 for oscillating motion. The thickness of the switching device 10 is such, relative to the depth of receptacle 22, that the outer surface 52 of the switching device is disposed substantially in the plane of the forward face flange 23 of the receptacle and of the wall or panel 13. In passing it should be noted that, in the illustrative example, a plug-in relay 38, per se, as shown in the left hand portion of FIGURE 4, includes electrical connections through a switch (not shown) which are connected to high voltage (110 v.) wires 32 when the body portion 38 is plugged into base portion 36, as shown in FIGURE 2. Such relays also contain solenoid means operable from remote positions by low voltage, the wiring for which is designated by wires 60. It is an important feature of the present invention that the switching device, whether or not of the specific type disclosed herein for illustrative purposes, has a control button 62 extending outwardly through the forward wall of the casing of the switching device. The control button 62 is directly connected with switch means internally of the switching device 10 so that reciprocal motion of the button 62 in directions into and away from the interior of the switching device (to left and right, respectively, as in FIGURES 2, 5, 6, 7 and 9) is always caused by or causes closing and opening of the switch means inside the casing of the switching device. The operating button 62 is provided with a notch 64 in the surface thereof which faces toward the raised portion 54 of the front surface of the switching device 10. The length of the notch 64 is a significant feature of the FIGURES 1 to 7 modification and will be specifically discussed hereinafter.

The operating lever 16 comprises a main body of planform configuration such as to freely fit within and match

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the opening 50 in the front face 46 of the plate 14. The forward surface of lever 16 may be planar or comprised of curved top and bottom sections (as illustrated) to delineate "on" and "off" push areas and for aesthetic purposes. The operating lever 16 is of hollow construction. In the orientation shown in the drawings, the operating lever has a top wall 66, a bottom wall 68 and side walls 70. Side walls 70 taper slightly rearwardly from the top and bottom walls 66 and 68 toward the horizontal center of lever 16 so that the planar edge 72 of the upper half of the lever is angularly related to the similar planar edge 74 of the lower half of the lever. At substantially the center side walls 70 (where edges 72 and 74 meet), each of the side walls 70 is provided with opposed bearing projections 76.

The bearing projections 76 each comprises a pair of hook shaped lugs the ends of which are spaced from one another a distance very slightly less than the thickness of the bar 58 on the flat peripheral portion 52 of the switching device 10. Accordingly, the operating lever 16 may be assembled in position by pressing the bearing projection 76 over the bars 58, so that the projections expand over and grip the bar 58.

It should be noted that the general configuration and size of the operating lever 16 are such that it entirely encloses the raised center 54 of the forward wall of the switching device and that the stop edges 72 and 74 engage the flat periphery 52 of said forward wall. Due to the previously described angular relationship of the stop edges 72 and 74 to one another the operating lever 16 has slight oscillating or pivoted movement about the bar 58, from the position shown in dotted lines in FIGURE 7 (when the lower portion of the operating lever is depressed) to the position shown in FIGURE 5 (when the upper portion of the operating lever is depressed). A resilient pad 78 of foam rubber or the like is housed within the operating lever 16 (as best seen in FIGURE 5) and the said resilient pad 78 may be glued or otherwise attached in position within the operating lever. It is the function of the resilient pad 78 to return the operating lever to a centrally disposed normal inoperative position after each actuation and the lever is shown in this position in FIGURE 2, and in solid lines in FIGURES 6 and 7.

The bottom wall 68 of the operating lever 16 is provided with a projection 80, and the said projection 80 is inserted into the notch 64 in the assembled relationship of the parts. It is highly desirable that the operating lever 16 have a normal inoperative position which is the same whether the switching device is in the "on" position or in the "off" position. Otherwise stated it is desirable that the operating lever have a central inoperative position which is the same whether the manual operating button 62 is in its outermost position (as in FIGURE 6) or in its innermost position (as in FIGURE 7). For this purpose the resilient pad 78 functions to return the operating lever 16 to a central normal inoperative position since it is compressed against the raised portion 54 when the lever 16 is operated (as in FIGURES 5, 6 or 7) and it returns lever 16 to the normal solid line position of FIGURES 6 and 7 or of FIGURE 2, as it restores itself to undistorted condition after the operating force is removed. For the purpose of permitting appropriate freedom of movement of the operating lever 16 to achieve this result the notch 64 in the manual operating button 62 is of a length which is very slightly larger than the sum of the distance moved by the manual operating button 62 in operating the switching device between open and closed positions and the thickness of the projection 80. It should therefore be apparent that when the operating lever 16 is actuated to move the switching device to its "off" position (as in FIGURE 7) the projection 80 will engage the left hand edge of the notch 64 (in the orientation shown in the drawings) and move the button 62 to the position shown in FIGURES 2 and 7. FIGURE 7 shows (in dotted lines) the position of the operating lever 16 as the operating

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force is applied thereto. After the operating force is removed the resilience of the pad 78 returns the operating lever to its normal position and the relative positions of the operating lever 16, projection 80 and the notch 64 are then as shown in solid lines in FIGURE 7 and as in FIGURE 2.

If the upper portion of the operating lever 16 is depressed to the position shown in FIGURE 5 (and in dotted lines in FIGURE 6) the manual operating button 62 is moved to the position shown in FIGURES 5 and 6, and when the actuating force is removed the parts assume the rest position shown in solid lines in FIGURE 6. Study of FIGURES 6 and 7 will reveal that remote actuation of the switch device which would cause the movement of the manual operating button 62 cannot cause any movement of the operating lever 16. Thus, the manual operating button 62 can move from the "on" position of FIGURE 6 to the "off" position of FIGURE 7 without causing movement of the operating lever 16 since the notch 64 is of a length which is greater than the degree of movement and the thickness of the projection 80. It will also be seen that if the operating lever is depressed in a direction tending to move the switching device to a condition in which it already reposes that such movement will have no effect whatever on the manual operating button 62. Thus, if the parts are in the position shown in FIGURE 6 and the upper portion of the operating lever is depressed to the position shown in FIGURE 5, no movement of the manual operating button 62 can occur and the switching device will remain unaffected. Conversely, with the parts in the position of FIGURE 7, i.e. with the switching device in its "off" condition, depression of the lower portion of the operating lever 16 to the position shown in dotted lines can cause no movement of the manual operating button 62 and therefore will be ineffective to change the condition of the switching device.

FIGURES 8 and 9 illustrate variations of construction under the present invention, these variations consisting of a different means for pivotally mounting the operating lever and of an alternate type of engagement between the projection 80 on the operating lever and the notch in the button 62 whereby the lever and button always move with one another at each actuation of the switching device.

The modification of FIGURES 8 and 9 comprises the same essential combination described in connection with FIGURES 1 to 7 except for the fact that the face plate 14a and the operating lever 16a are of such construction that they provide a different pivotal securement of the operating lever in position relative to the switching device and the face plate. To this end the face plate 14a of FIGURE 8 is provided with vertical flanges 82 along the longitudinal edges of the opening 50. The flanges 82 are tapered forwardly from their centers to their upper and lower edges as shown. The facing internal surfaces of the rails 82 are provided with opposed semi-cylindrical notches 84. The operating lever 16a is in all respects similar to the operating lever 16 of the FIGURES 1 to 7 modification except in that it does not include a resilient pad, nor does it have the bearing projections 76 of the operating lever 16. Instead, it is provided with centrally disposed opposed outwardly projecting semi-cylindrical journal lugs 86. It should be apparent that in the assembled relationship of the parts, as shown in FIGURE 9, the journal lugs 86 are received in the bearing notches 84, and that when the face plate and operating lever are attached to the wall or panel 13 the stop edges 72 and 74 of the operating lever 16a co-operate with the peripheral portion 52 of the outer wall of the switching device 10 in the same manner as does the operating lever 16 of FIGURES 1 to 7. It should be noted that the arrangement of FIGURES 8 and 9 may be used whether or not the switching device is provided with openings 56.

FIGURE 9 further illustrates a variation in the relationship of the manual operating button 62 which may be used if desired. In the FIGURE 9 example, the operat-

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ing button 62 is shown as having a notch 64a which is only slightly wider than the projection 80 so that each movement of either the operating lever 16a or the operating button 62 will cause equivalent movement of the other, as distinguished from the lost motion arrangement disclosed and described in conjunction with FIGURES 1 to 7.

From the above it may be seen that the present invention provides structures wherein the face plate and operating lever may be of a different variety of colors and of pleasing decorative appearance not available in present conventional switch devices. Moreover, structures according to the present invention provide means whereby the user is better insulated from electrical shock than in conventional switching arrangements and wherein operation of the switching device from remote positions is not effective to cause such movement of the operating lever as to be disconcerting to persons in the area.

Obviously devices according to the present invention could be made of a wide variety of materials and in a great degree of variation in size, shape and relationship of specific elements thereof, the examples specifically disclosed and described herein being by way of illustration and not being intended to be limiting in any way. Accordingly, it should be understood that the invention is not to be limited by the specific illustrated examples but rather by the scope and language of the appended claims.

What is claimed is:

1. In combination, a switching device having an outer casing, an operating button for controlling said switching device, said button extending outwardly of one wall of said casing adjacent an edge of said wall, an operating lever of lesser area than that of said wall, means mounting said lever on said wall for pivoted movement relative thereto, the operating lever having angularly related inner edge surfaces on either side of said mounting means to provide said pivoted movement and to limit the amount thereof by abutting against said wall, and interengaging means on one end of said lever and on said button whereby movement of the lever causes movement of the button.

2. In combination, a casing, switching means mounted in said casing, an aperture in one wall of said casing, said switching means including a switch device and a longitudinally movable operating button extending through said aperture and connected to said switch device for moving with the switch device to open and closed positions; an operating lever of lesser area than said wall, means mounting said operating lever on said wall for pivoted movement relative thereto, the operating lever having angularly related inner edge surfaces on either side of said mounting means to provide said pivoted movement and to limit the amount thereof by abutting against said wall, and interengaging means on one end of said lever and on said button whereby movement of the lever causes movement of the button.

3. The combination of claim 2 wherein at least the outer margin of said one wall of the casing is flat and planar, wherein said aperture is adjacent an edge of said wall through said planar margin and wherein the said angularly related surfaces of the operating lever engage the flat and planar margin of the wall to limit the degree of pivoted movement of the lever.

4. The combination of claim 3 wherein the mounting means of said lever are on opposed outer marginal portions of said wall on a line perpendicular to the longitudinal dimensions of the operating lever, and the aperture and the operating button extending through said aperture are positioned adjacent one end of said lever.

5. The combination of claim 4, wherein the interengaging means on said lever and on said button comprise a notch on the surface of said button which faces said operating lever and a lug extending longitudinally outwardly from said one end of the lever, said lug being engaged in said notch.

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6. The combination of claim 5, wherein the mounting means of said lever comprise opposed pairs of openings on the outer margin portions of said wall, each opening of each pair being spaced slightly from the other opening of that pair to provide a pivot journal therebetween; and wherein each of the side walls of said lever between the angularly related surfaces thereof is provided with a pair of spaced ears extending therefrom, said ears being of a size and spacing to be accommodated in said openings, said ears being inserted into said openings whereby to form bearings operating upon said pivot journals to provide said pivoted mounting.

7. The combination of claim 5, wherein the mounting means of said lever comprises a face plate, said face plate having an opening of a size and shape to accommodate said operating lever, a pair of inwardly directed parallel rails on either side of said opening and spaced to engage parallel outer margin portions of said wall, said rails being provided with opposed semi-cylindrical bearing notches at the longitudinal centers thereof, said operating lever having outwardly directed journal lugs engaged in said bearing notches and means securing said face plate in a position relative to said casing wherein said rails engage the opposed outer planar margins of said wall.

8. The combination of claim 5 wherein the said operating button is mounted to reciprocate longitudinally a given distance in operating the switch device between its "on" and "off" conditions and wherein the said notch is of a longitudinal extent slightly larger than the sum of said given distance and the thickness of said lug.

9. The combination of claim 8 wherein said wall of the casing has a raised portion internally of the planar margin of the wall; wherein said operating lever is hollow to provide a chamber overlying said raised portion; and wherein a resilient pad is retained in said chamber; whereby the said is distorted upon each actuation of the lever and returns the lever to a neutral position after the actuating force is removed from the lever.

10. The combination of claim 8 wherein said switching means contains a solenoid mechanically linked to the switch device whereby the said switch device may be remotely actuated, such remote actuation causing movement of the operating button but not of the operating lever from its neutral position.

11. In combinations of the type wherein an electrical instrumentality is mounted within a conventional wall box of the type usually mounted inside an opening in a wall or panel, in which the wall box has attachment tabs substantially in the plane of the wall or panel for the support of said electrical instrumentality within the wall box, and in which a face plate is attached to the electrical instrumentality to cover the opening in the wall or panel; the improvement comprising a receptacle adapted to be attached to the attachment tabs of the wall box; said receptacle having flanges extending outwardly from the open side thereof in the plane of said open end at least at the upper and lower edges of said open side, said flanges each having an opening, said openings being adapted to receive means for fastening said flanges to the attachment tabs of the wall box, a switching device mounted in said receptacle, said switching device having a casing including an outer casing wall substantially in the plane of the open side of said receptacle, switching means mounted in said casing, an aperture in said outer casing wall, said switching means including a switch device and a longitudinally movable operating button extending through said aperture and connected to said switch device for moving with the switch device to open and closed positions; an operating lever, means mounting said operating lever on said outer casing wall for pivoted movement relative thereto, the operating lever having angularly related inner edge surfaces on either side of said mounting means to provide said pivotal movement and to limit the amount thereof by abutting against said outer casing wall, cooperating interengaging means on

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one end of said lever and on said button whereby movement of the lever causes movement of the button, and a face plate attached to said flanges, said face plate being of a size to completely cover the wall box and having an opening of a size and shape to accommodate the operating lever.

12. The improvement of claim 11 wherein said co-operating interengaging means comprise a notch on the surface of said button which faces one end of said operating lever and a lug extending longitudinally outwardly from said end of the operating lever, said lug being engaged in said notch.

13. The improvement of claim 12 wherein the means mounting the operating lever on the outer casing wall comprises opposed pairs of openings on the marginal portions of said casing wall, each opening of each pair being spaced slightly from the other opening of that pair to provide a pivot journal therebetween; and wherein each of the side walls of said lever between the angularly related inner edge surfaces thereof is provided with a pair of spaced ears extending therefrom, said ears being of a size and spacing to be accommodated in said openings, said ears being inserted into said openings whereby to

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form bearings operating upon said pivot journals to provide said pivoted mounting.

14. The improvement of claim 12, wherein the means mounting the operating lever on said outer casing wall comprise a pair of inwardly directed parallel rails on either side of the opening in the face plate, said rails being spaced to engage parallel outer marginal portions of said casing wall, said rails being provided with opposed semi-cylindrical bearing notches at the longitudinal centers thereof, said operating lever having outwardly directed journal lugs engaged in said bearing notches, and means securing said face plate in a position relative to said casing wherein said rails engage opposed outer marginal portions of said casing wall to hold the operating lever in operative position.

References Cited by the Examiner

UNITED STATES PATENTS

3,036,185	5/1962	Wiley et al.	200—172
3,081,390	3/1963	Lasar	200—172

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HERMAN O. JONES, *Assistant Examiner.*