Oct. 16, 1951 J. G. COLES 2,571,837

ELECTRIC SWITCH OPERATING DEVICE

Filed June 15, 1948

FIG. 1.

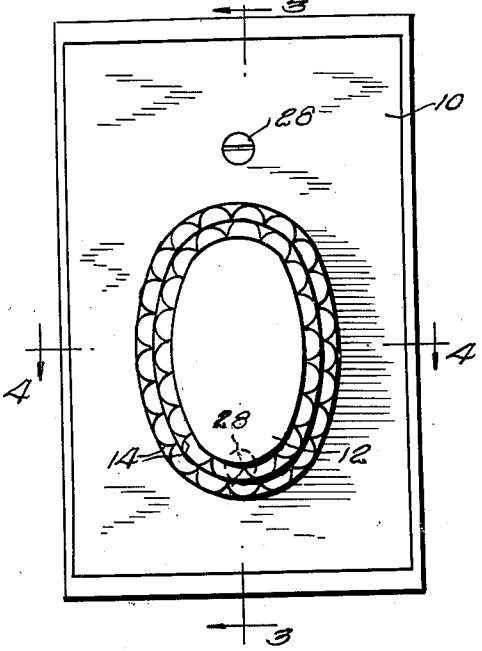


FIG. 2.

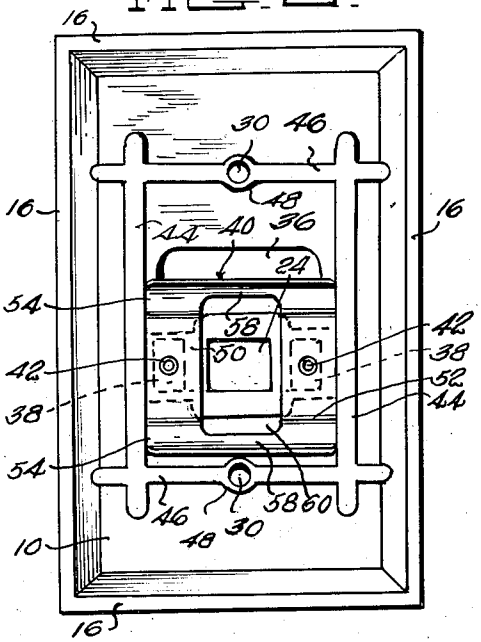


FIG. 3.

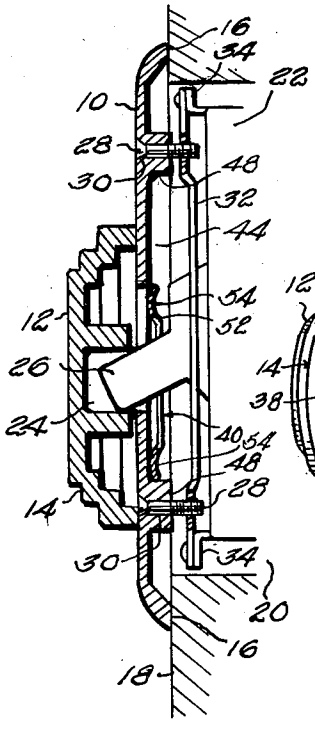


FIG. 4.

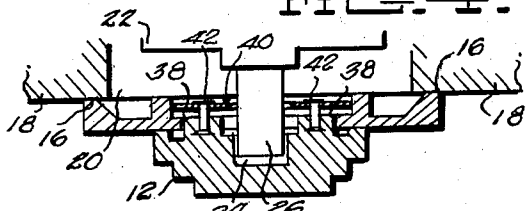
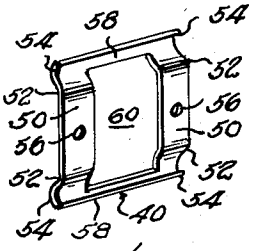
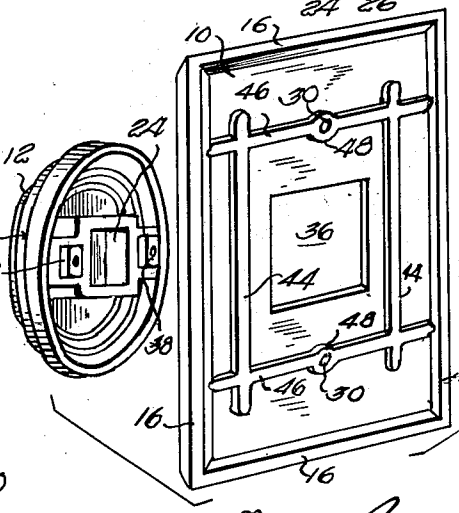


FIG. 5





Inventor
JACOB G. COLES

By Raymond W. Cobb

Attorney

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ELECTRIC SWITCH OPERATING DEVICE

Jacob G. Coles, New York, N. Y.

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4 Claims. (Cl. 200—172)

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The present invention relates generally to electric switches and is more particularly directed to an improved decorative switch placque and switch operator adapted to be used in place of the usual wall type switch plate or escutcheon.

This invention in general constitutes an improvement upon the electric switch manipulating means disclosed in my prior Patent 2,172,731, issued September 12, 1939, and accordingly embodies the desirable features provided thereby together with certain new and additional advantages to be hereinafter more fully set forth.

As described in detail in my prior patent, Number 2,172,731, referred to above, the usual snap-action wall switch is intended to provide a rapid make-and-break in its associated electrical circuit but in spite of this fact it has been observed that sparking sometimes occurs of sufficient intensity to pass through the usual toggle slot thereby shocking or burning the person operating the switch. The switch manipulating means illustrated in my said prior patent accordingly was developed to overcome this difficulty and to that end provided a rather large handle member adapted to cooperate with the usual switch toggle arm or lever but being of such dimensions as to completely overlie the toggle slot. By reason of this construction it was also found that the external appearance of the switch could be considerably enhanced by providing ornamental decorations upon the exposed portions thereof and furthermore, the switch was rendered more easily operable in the dark.

While as previously indicated the present invention contemplates the above enumerated advantages provided by the improved construction disclosed by my prior patent, Number 2,172,731, the present invention further aims to provide a switch operating device embodying additional improvements of a type which both render the switch more satisfactory in operation and also lend themselves more readily to the rapid large-scale production of such devices upon a mass or volume basis.

Accordingly, the principal object of the present invention is to provide an improved switch operating device of the type described embodying substantially a minimum number of working parts and being otherwise of relatively simplified construction thereby lending itself more readily to the purposes of large-scale production.

Another and more specific object of the invention is to provide an improved switch operating device of the type described embodying a more rigid construction and especially overcoming any

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tendency of the switch operating member to rotate relative to its base or wall plate.

The foregoing as well as numerous other objects and advantages of the present invention together with a clearer understanding of the precise nature thereof will become more readily apparent to one skilled in the art from a consideration of the following detailed specification taken in conjunction with the accompanying figures of drawing illustrating a preferred embodiment thereof, wherein:

Figure 1 is a front elevational view of an improved switch operating device in accordance with the present invention;

Figure 2 is a rear elevational view of the switch operating device of Figure 1;

Figure 3 is a longitudinal cross-sectional view through the device taken substantially along the line 3—3 of Figure 1;

Figure 4 is a transverse cross-sectional view through the device taken substantially along the line 4—4 of Figure 1; and

Figure 5 is an exploded perspective view particularly illustrating the relationship between the three major elements of the device.

Referring now in somewhat more detail to the various figures of the drawing and in particular to Figure 1 thereof, there is disclosed an improved switch operating device having a generally flat rectangular plate or base 10 on which is slidably mounted an oval shaped switch operating member 12. The operating member 12 is appreciably larger than the usual switch toggle lever and is preferably provided with a suitably decorated outer surface which may take any of a number of forms and which is designated generally by reference numeral 14. Both the base 10 and the switch operating member 12 are preferably formed entirely of a molded plastic material having suitable insulating properties and in practice each of these elements is formed as a single operation by injection molding of a suitable thermo-plastic material.

As shown particularly in Figure 3, the base 10 is provided with marginal edge portions 16 adapted to engage the surface of a wall 18 adjacent the usual cavity 20 within which is mounted the switch box or housing 22. As shown in this figure as well as in Figure 5, the switch operating member 12 is generally hollow and is provided with a centrally located pocket 24 constituting an open inner cavity for the purpose of receiving the toggle arm or lever 26 projecting from the switch box 22. The base 10 is held in position on the wall in any convenient

manner as by means of screws or bolts 28 extending through countersunk apertures or holes 30 formed along the longitudinal center line of the base and threadedly engaged within suitable holes formed in the usual longitudinal mounting bracket 32 which in turn is secured as at 34 to the front wall of the switch housing 22.

The switch operating member 12 is arranged for limited sliding movement in a longitudinal direction along the front surface of the base 10 and to this end the base is provided with a relatively large rectangular aperture 36 in its central portion through which project lugs 38 formed at the opposite sides of the cavity 24 in the member 12 and adapted to abut the upper and lower edges of the aperture 36 to limit the linear movement of the member 12. In order to resiliently retain the member 12 against the outer or front surface of the base 10 there is provided a spring designated generally by reference numeral 40 which is slidable along the rear or inner surface of the base 10 and is preferably rigidly secured to the lugs 38 in any convenient manner as by means of rivets 42 or the like. The spring 40 is of a very special construction as will be hereinafter more fully set forth and it will be noted that this spring overlies the aperture 36 in such manner that the member 12 may be moved between its upper and lower limit positions while being simultaneously resiliently and continuously urged against the front surface of the base 10.

The inner surface or face of the base 10 as shown particularly in Figures 2 and 5 is provided with intersecting pairs of longitudinal and transverse mold strips 44 and 46, respectively, preferably formed integrally at one side of the base 10 during the molding operation. As shown in these figures the mounting holes 30 which receive the bolts 28 are located in such manner as to project through the upper and lower transverse mold strips 46, respectively, the latter being somewhat enlarged at these locations as indicated by reference numeral 48. It will thus be apparent that by virtue of this construction I have provided for increased strength at the critical mounting points of the assembled device by utilizing portions of the transverse mold strips 46 which at the same time accomplish the additional function of increasing the strength and rigidity of the base 10 of the device.

As indicated above, the spring 40 is of very special construction and by referring particularly to Figures 2 and 5 it will be noted that this spring is of unitary construction and is formed in the shape of a generally open rectangle. The main leaf portions 50 at opposite sides of the spring 40 are bent inwardly adjacent their ends as indicated by reference numerals 52 and are then reversely curved in an upward direction at their terminal portions to form smoothly rounded runners 54 adapted for sliding engagement with the inner surface of the base 10. Suitable apertures 56 are provided at approximately the midpoints of the leaves 50 for the purpose of receiving the rivets 42 hereinabove referred to which securely hold the spring 40 to the lugs 38 of the operating member 12. The spring 40 likewise includes cross members 58 at each end which are preferably integral and rigid with the leaf portions 50 and are similarly curved to carry out the smoothly rounded contours of the runners 54 so that in overall effect the spring 40 is rectangular in shape with a large central aperture or cut away portion 60.

In assembling the device the operating member 12 is placed against the outer or front face of the base 10 with the lugs 38 projecting through the aperture 36 at opposite sides of the latter. The spring 40 is then placed against the rear or inner face of the base 10 and the leaves 50 firmly secured to the lugs 38 by means of the rivets 42 which pass through the apertures 56. It will be particularly noted in Figures 2 and 4 that when the device is thus assembled the spring 40 substantially completely fills the space between the longitudinal mold strips 44 transversely of the base 10 while at the same time providing a substantial amount of unobstructed working space between the transverse mold strips 46 so that the spring 40 and operating member 12 may be freely moved longitudinally of the base 10. This construction is particularly emphasized for the reason that the engagement of the outer longitudinal edges of the spring 40 in slidable abutting relationship with the respective inner edges of the longitudinal mold strips 44 constitutes substantially the sole guiding means for the member in its linear movement. Thus the mold strips 44 in addition to performing their function of strengthening the base 10 likewise serve as guides for the member 12 and by reason of the unitary construction of the spring 40 and its rigid engagement at two points with the member 12, the latter is substantially prevented from rotating relative to the base 10.

Although the operation of the device will be largely apparent from the foregoing description it may be briefly noted that as shown in Figure 3 the completely assembled device is adapted to be substituted for the usual wall switch plate or escutcheon and is so dimensioned as to conceal the wall cavity 20 when in operative position. Thus it is only necessary to remove the wall switch plate or escutcheon which is usually provided and then by means of the screws or bolts 28 to mount my improved device upon the same bracket 32 in the usual manner. During this mounting or substitution operation the member 12 may be suitably adjusted in such manner that the switch toggle arm or lever 26 will be properly received within the cavity 24. Thereafter as the operating member 12 is moved longitudinally of the base 10 which is now secured to the switch housing or box 22, the toggle arm 26 will be snapped back and forth in the usual manner but without at any time exposing the operator to an open path leading to the electrical contacts or connections of the switch proper.

Throughout the foregoing description an effort has been made to emphasize the simplicity of the present construction by reason of which my improved device is so readily adapted to the purposes of large-scale mass production. Thus it will be noted that each of the mold strips 44 and 46 serves a dual function in providing for increased rigidity of the base 10 and at the same time serves either to in effect elongate and strengthen the mounting holes 30 or, in the case of the longitudinal strips 44, to guide the linear movement of the switch operating member 12. In like manner the construction of the unitary spring 40 is extremely simple and yet is admirably adapted, in conjunction with the strips 44, to provide the desired straight line motion of the switch operating member 12. As indicated above, each of the members 10 and 12 may be readily formed in a single injection molding or die casting operation while the spring 40 may be mass produced of steel or other ma-

terial in a number of different ways such as, for example, by means of progressive dies. In like manner the entire device may be rapidly assembled with a minimum amount of labor so that the entire unit may be manufactured and sold at extremely low cost.

Obviously numerous other modifications, alterations, and deviations from the specific structure disclosed herein solely for the purpose of illustration will occur to one skilled in the art and it is to be understood that various changes in size, shape, and materials of construction may be made without departing from the spirit or scope of the invention.

Having thus described my invention, what I claim as novel and desire to secure by Letters Patent of the United States is as follows:

1. Means for actuating an electric switch having movable operating means, comprising a base arranged over the switch and provided with an aperture through which the operating means projects, said base having an inner face provided with spaced parallel guides, an actuating member having an inner face slidable over the adjacent face of said base and having portions engageable with said operating means to operate the switch upon movement of said actuating device parallel to said guides, and a spring engaging the inner face of said base and secured to said actuating member through said aperture, said spring engaging the inner face of said base at points spaced apart longitudinally of said guides and having spaced parallel edge portions engaging said guides throughout a substantial portion of the lengths thereof to prevent rotation of said spring relative to said base.

2. Means for actuating an electric switch having operating means projecting therefrom, comprising a base having an aperture of substantial size, said base having an inner face provided with a pair of parallel spaced guides, an actuating member having a portion engaging said operating means to operate said switch upon linear movement of said actuating device in a given line, and a spring having spaced portions perpendicular to said guides engageable against the inner face of said base, said spring being fixed to said actuating means through said aperture and having spaced elongated edge portions respectively engaging said guides to predetermine linear movement of said actuating member corresponding to said given line and to prevent rotation of said spring relative to said base.

3. Actuating means for an electric switch having an operating lever projecting therefrom, comprising a base having an aperture of substantial size through which said lever projects, said base having an inner face and being provided with integral parallel guide ribs projecting from said inner face, an actuating member slidable over the outer face of said base and provided with a recess receiving the end of said lever to actuate the latter and operate the switch upon movement of said actuating member in a given line, and a spring arranged against the inner face of said base and fixed to said actuating member through said aperture, said spring having parallel elongated portions perpendicular to said ribs engaging the inner face of said base, said spring lying wholly between said ribs and having elongated parallel edges slidable along said ribs to predetermine linear movement of said actuating member corresponding to said given line and to prevent relative rotation of said member relative to said base.

4. Operating means for an electric switch having an operating lever projecting therefrom, comprising a base provided with a generally rectangular substantially central aperture of substantial size, said base having an inner face provided with spaced parallel ribs lying outwardly of and spaced from opposite sides of said aperture, an actuating member slidable over the outer face of said base and having a recess receiving said lever to operate the switch upon movement of said actuating member in a given line, and an integral spring having a relatively large central opening of generally rectangular shape defined by side members and transverse portions connecting said side members and constituting said spring, said side members being fixed to said actuating member through the aperture in said base, the remote edge portions of said spring perpendicular to said side members being convexly curved at the side adjacent the inner face of said base and being slidable over such face, the remote edges of the side members of said spring being parallel and elongated and engageable against the inner edges of said guides to predetermine linear movement of said actuating member corresponding to said given line and to prevent rotation of said actuating member relative to said base.

JACOB G. COLES.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,172,731	Coles	Sept. 12, 1939
2,382,738	Moyses	Aug. 14, 1945