

Aug. 11, 1964

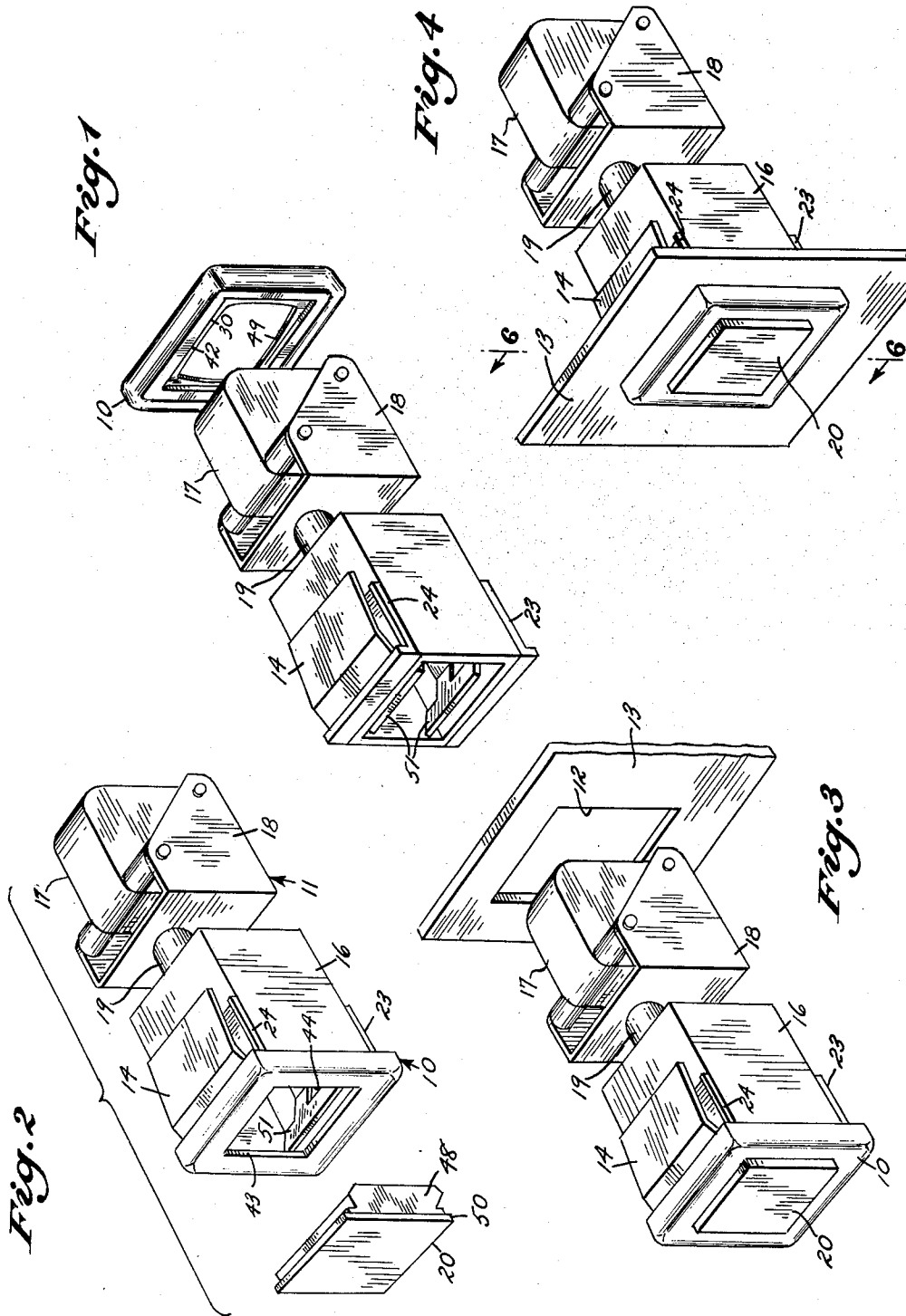
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3,144,539

METALLIC REINFORCED SWITCH BOOT

Filed Jan. 18, 1961

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Fig. 5

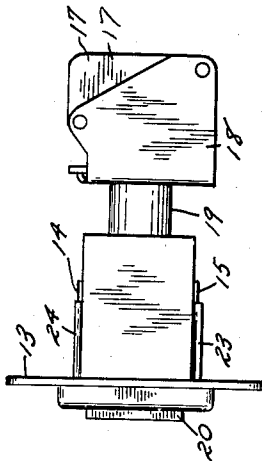


Fig. 6

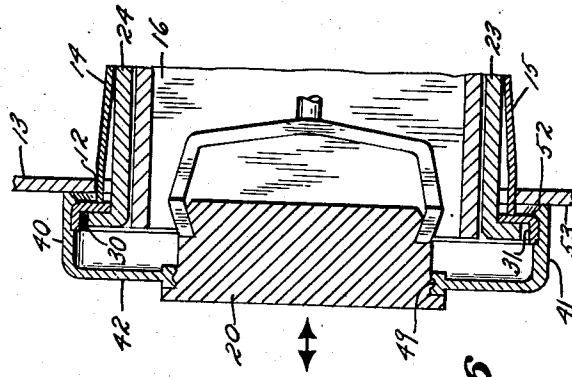


Fig. 7

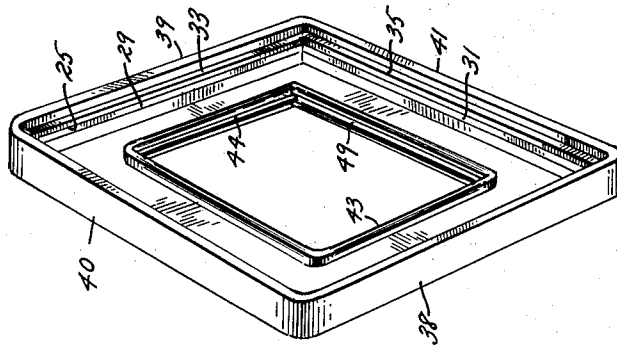


Fig. 8

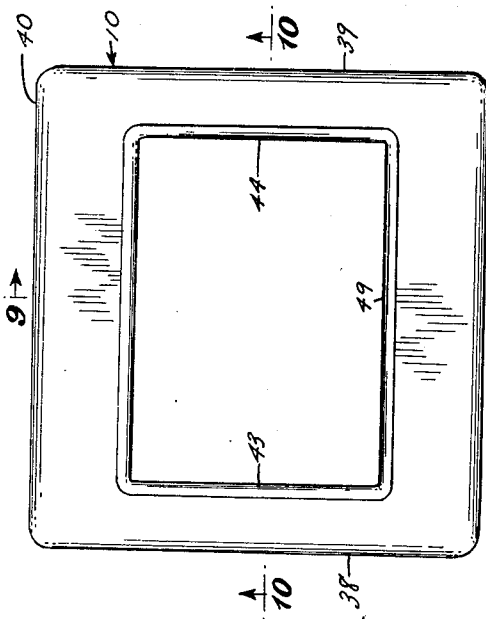


Fig. 9

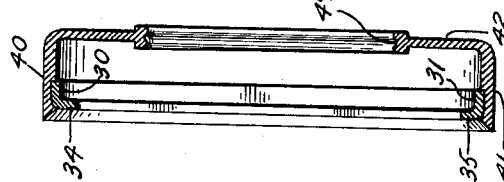
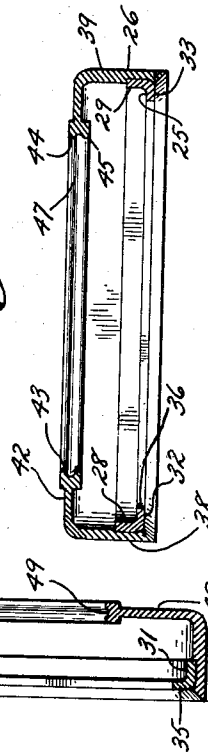


Fig. 10



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METALLIC REINFORCED SWITCH BOOT

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1 Claim. (Cl. 200-168)

This invention relates generally to the field of hermetic sealing devices, and more particularly to an improved switch boot adapted to be used in conjunction with a panel-mounted push button type switch.

Devices of this type are generally known in the art, and usually include a resilient rubber or synthetic resinous member bonded to a threaded nut member, in such manner that it may be installed upon a threaded shank used to support a switch within an opening in a panel. While such devices are useful, they are not of universal application, and where, for example, an illuminated type switch is employed which is not maintained within an opening in a panel by threaded means, completely covering the exposed portion of the switch would prevent the illumination from remaining visible to the user.

It is therefore among the principal objects of the present invention to provide an improved sealing boot particularly adapted for illuminated type push button operated switches which will effect a complete hermetic and moisture-proof seal surrounding the exposed portions of the push button while permitting full visibility of the push button itself.

A further object of the invention lies in the provision of an improved switch boot of the class described, and possessed of the above advantages, in which the cost of fabrication may be of a reasonably low order, with consequent wide sale, distribution and use.

A still further object of the invention lies in the provision of an improved boot for illuminated switches of the class described which may be readily and conveniently installed in permanent association with the switch, and which, in installed condition, effects a permanent flexible seal between the exposed illuminated button and the outer surface of the panel in which the switch is installed.

Another object of the invention lies in the provision of an improved boot of the class described which will permit easy removal and installation of the above-mentioned push-button for replacement of the illuminating means disposed therebeneath.

Another object of the invention lies in the provision of a boot of the class described having flexible sections above and below the actual sealing ribs, to protect said ribs from damage during installation and removal.

A feature of the invention lies in the attractive appearance afforded by the boot in installed condition.

These objects and features, as well as other incidental ends and advantages, will more fully appear in the progress of the following disclosure, and be pointed in the appended claim.

In the drawings, to which reference will be made in the specification, similar reference characters have been employed to designate corresponding parts throughout the several views.

FIGURE 1 is an exploded view in perspective of an illuminated push button type switch in conjunction with an embodiment of the invention.

FIGURE 2 is a similar view in perspective showing the sides opposite that seen in FIGURE 1.

FIGURE 3 is a fragmentary view in perspective showing the installation of the embodiment within an opening in a metallic panel.

FIGURE 4 is a fragmentary view in perspective showing the switch in completely installed condition within the panel.

FIGURE 5 is a side elevational view of the embodi-

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ment as seen from the right hand portion of FIGURE 4.

FIGURE 6 is an enlarged fragmentary longitudinal sectional view as seen from the plane 6-6 in FIGURE 4.

FIGURE 7 is a view in perspective of the sealing device embodying the invention in detached condition.

FIGURE 8 is a front elevational view thereof.

FIGURE 9 is a transverse sectional view as seen from the plane 9-9 in FIGURE 8.

FIGURE 10 is a transverse sectional view as seen from the plane 10-10 in FIGURE 8.

In accordance with the invention, the device, generally indicated by reference character 10, is employed in conjunction with a flange-mounted push button indicator switch of well-known type, generally designated by reference character 11. The switch 11 is resiliently mounted in an opening 12 in a metal panel 13 by spring members 14 and 15. The switch includes an indicator element 16 and a switch element 17, there being projecting means 18 interconnecting the elements 16 and 17 through a short cylindrical housing 19. The push button 20 is usually of a transparent synthetic resinous material positioned in a rectangular opening 21 in a housing 22 which surrounds illumination means (not shown). Angle brackets 23 and 24 position the switch 11 within the opening 12. The device 10 includes a metallic frame element 25 and a resilient element 26 bonded thereto.

The metallic frame element 25 may be formed as a metallic stamping, and is shown in the accompanying drawing as of generally rectangular configuration, although it will be understood by those skilled in the art to which the invention relates that the configuration of the elements 25 and 26 may be altered according to need. The element 25 includes four side members 28, 29, 30 and 31 and four base members 32, 33, 34 and 35, defining a rectangular opening 36 corresponding in size to the opening 12.

The resilient element 26 is preferably formed from silicone rubber or other synthetic material possessing similar properties. It includes sidewalls 38, 39, 40 and 41 and a top wall 42 defining a rectangular opening 43, the unstressed configuration of which is slightly less than the cross sectional shape of the button 20. The opening 43 includes upper and lower molded flanges 44 and 45, respectively, the outer surfaces 47 of which engage the side surfaces 48 of the button 20 immediately below an outwardly extending lip 50, there being formed between the flanges 44 and 45 an air pocket 49 which, if desired, may be filled with a suitable lubricant, to facilitate installation and removal of the push-button 20.

The device is installed upon the switch 11 preferably at the time of installation of the switch 11 within the opening 12 in the panel 13, folding the resilient element 26 about itself and expanding the opening 36 to the point where the frame element 25 will pass. In this condition, the frame element 25 is positioned over the angle brackets 23-24, following which the switch 11 is inserted in the opening 12 to be retained therein by the resilient members 14 and 15. The resilient element 26 is then returned to its original condition, following which the button 20 is pressed into position to be retained by resilient means 51. As best seen in FIGURE 6, it will be observed that the tapered free edge 52 is maintained in deformable contact with the outer surface 53 of the panel 13, and a continuous seal is effected about the button 26. In this condition, light emanating from behind the panel 13 may be visible through the transparent button 20, and the button may be depressed against resilient returning means (not shown) without interrupting the seal.

I wish it to be understood that I do not consider the invention limited to the precise details of structure shown and set forth in this specification, for obvious modifica-

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tions will occur to those skilled in the art to which the invention pertains.

I claim:

In combination, a switch housing, a panel having an opening, said housing extending through said opening, said housing having a principal axis, an actuating button disposed within said housing for slidable axial movement and extending outwardly of said opening in said panel, said housing having angle brackets engaging said opening in said panel, a hermetically sealing boot including: a frame element and a resilient element interconnected therewith, said frame element including a peripheral base member having a substantially centrally disposed opening therein corresponding in configuration to the opening in said panel, and at least one side wall having an outer surface disposed substantially at right angles with respect to said base member, said resilient boot element having at least one side wall having an inner surface secured to said outer surface of said side wall of said frame ele-

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ment, and extending to a free edge disposed in a plane beneath said frame element, and a top wall integral with said side wall, and having an opening disposed therein corresponding in configuration to said exposed button; said resilient element being positioned upon said housing in such manner that said frame element is disposed to surround said angle brackets, said free edge being thereby pressed against said panel, and said opening in said resilient element engaging the periphery of said actuating button.

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