United States Patent

Hughes

[15] **3,678,236**

[45] **July 18, 1972**

[54] SWITCH HOLDER AND GUARD

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[22] Filed: **April 23, 1971**

[21] Appl. No.: **136,894**

[52] **U.S. Cl.** .....**200/169 PB,** 200/61.79
[51] **Int. Cl.** **H01h 9/20**
[58] **Field of Search** .....200/61.79, 169 PB, 168 H

[56] **References Cited**

UNITED STATES PATENTS

2,787,680	4/1957	Anderson	200/61.79
3,186,981	6/1965	De Ronde	200/169 PB
2,856,477	10/1958	Schultz	200/61.79

Primary Examiner—H. O. Jones
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[57] **ABSTRACT**

A hold down and guard device for a push button switch, secured to a support by mounting means through which the push button projects. The hold down and guard device has a body presenting surfaces engageable with complementary surfaces on the mounting means for the switch to hold the device in a fixed position with respect to the push button and switch and has a further portion which is fixed with respect to the body and projects over the push button to hold the button depressed or to prevent it from being unintentionally or accidentally depressed. The device may consist of a single unitary element such as a metal stamping or may be provided with means on the further portion thereof movable with respect to the body into a position to actuate the switch.

10 Claims, 5 Drawing Figures

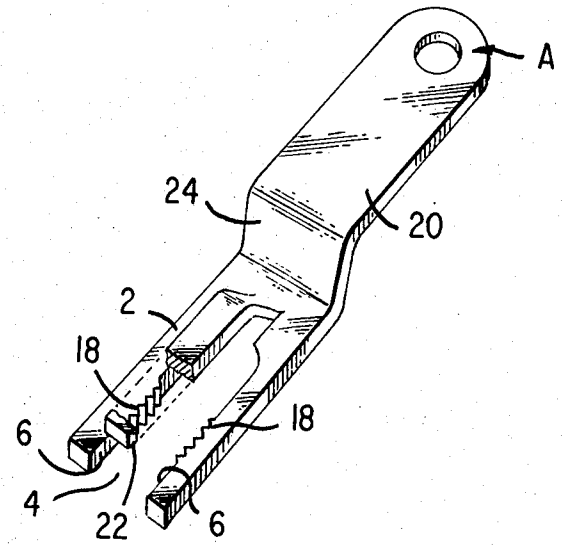


Fig. 1.

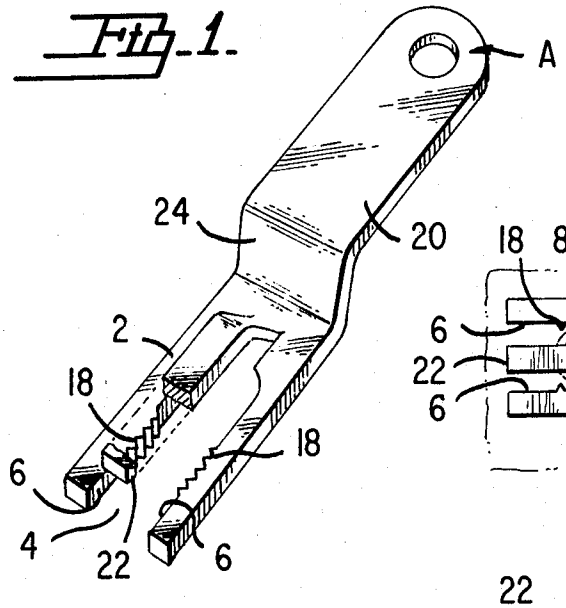
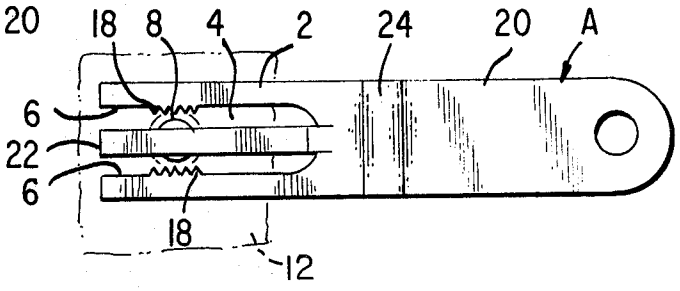


Fig. 2.



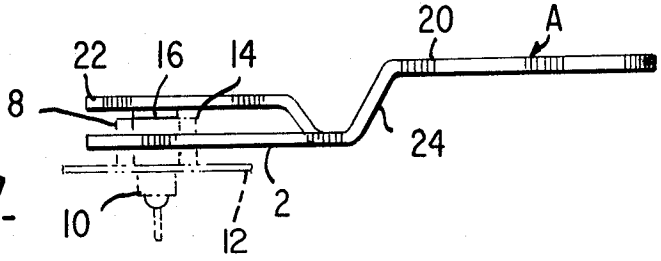


Fig. 3.

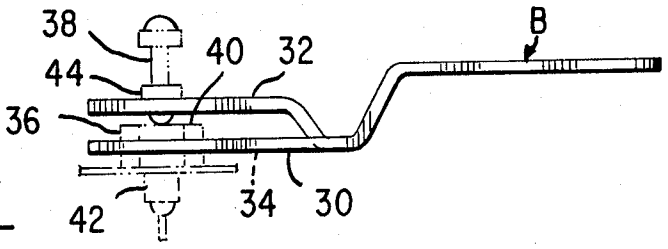


Fig. 4.

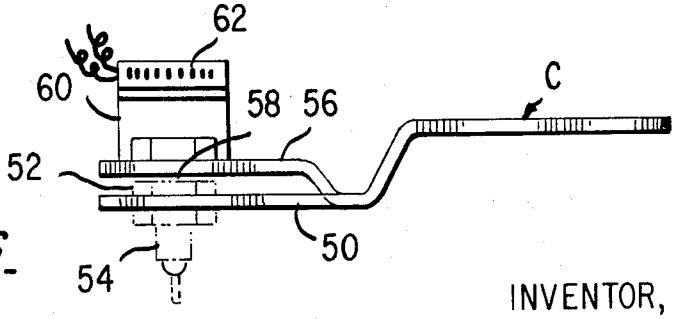


Fig. 5.

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SWITCH HOLDER AND GUARD

FIELD OF THE INVENTION

There are many situations wherein a push button switch must be held depressed under certain conditions while being released for movement under under other conditions. For this purpose it has been suggested that hold-down devices be provided to temporarily hold the switch button depressed as exemplified by U.S. Pat. Nos. 2,786,911; 2,787,680; 2,873,333; and 3,186,981. However, such prior art devices embody several separate parts which must be fabricated and assembled in a manner which materially increases their cost. Moreover, while the parts are relatively movable, they do not provide for adjustment or operation thereof in a varied manner.

THE PRESENT INVENTION

In accordance with the present invention, various types of guards or hold down devices for push button switches are provided which are adapted for ready application to installed push button switches. In one preferred form of the present invention, the device consists of a single unitary member which may be formed as a metal stamping for example, and can be applied to and removed from the switch and its mounting means without disturbing the installation in any way. Further, in accordance with another form of the invention, it is possible to provide the device with an element movable to various positions to afford adjustment or controlled operation of the push button switch.

The advantages of the present invention are preferably attained by providing the hold down or guard device with a body having a slot therein presenting opposed inwardly facing surfaces engageable with complementary surfaces on mounting means by which the switch is secured to a support. The device can then be applied to and removed from a push button switch or the like without unscrewing or dismantling any of the parts of the installed switch assembly.

The body of the device further includes a portion which which extends over the slot in the body and into a position above the push button to prevent undesired operation of the push button or to hold the button depressed.

In some embodiments of the invention, the portion of the hold down device which projects over the slot in the body may be provided with an adjusting screw or with actuating means such as an electrically controlled element or timer, including means movable into and out of position to depress the push button.

THE DRAWINGS

FIG. 1 is a perspective view illustrating one typical embodiment of the present invention;

FIG. 2 is a plan view of the device shown in Figure 1 as applied to the mounting means of a push button switch;

FIG. 3 is a side elevation of the assembly shown in Figure 2;

FIG. 4 is a view similar to Figure 3, illustrating an alternative form of the present invention; and

FIG. 5 is a side elevation of a further alternative embodiment of the present invention.

PREFERRED EMBODIMENT OF THE PRESENT INVENTION

In that form of the invention chosen for purposes of illustration in Figures 1, 2 and 3, the hold down device is in the form of a single unitary element which may be a metal stamping, molded plastic member or the like, and has a flat body 2 formed on one end with a slot 4 presenting opposed inwardly facing surfaces 6. The device is designed to be applied to mounting means 8 by which a push button switch 10 is secured to a support 12. The mounting means 8 may include a nut 14 or the like surrounding the push button 16 of the switch 10. The opposed sides 6 of the slot 4 are then spaced apart or otherwise formed to embrace and firmly engage complementary surfaces on the mounting means such as the flats on opposite sides of the nut 14 or knurled surfaces on some other retaining element of the mounting means 8. The surfaces 6 further may be provided with inwardly projecting teeth 18 for establishing a firm contact between the device and the mounting means to secure the device fixedly in place with respect to the mounting means, switch and push button 16.

A handle 20 formed integral with the body 2 of the hold down or guard device extends from the end of the body opposite to that in which the slot 4 is formed and preferably is located in a plane parallel to the plane of the body 2 but offset vertically from the body. It is then possible to push the body forcibly into retaining engagement with the nut 14 or other part of the mounting means by placing the open end of the slot adjacent the nut 14 and moving the body toward the nut or to the left as seen in Figures 2 and 3 to a position wherein the teeth 18 on the opposed sides 6 of the slot 4 frictionally engage the nut 14.

The device has a portion 22 which preferably is in the form of a tongue which is struck up from the plane of the body 2 and extends over the slot 4 and into a position wherein the tongue will cover and protect the push button against accidental operation or may engage and hold the push button 16 depressed. The tongue or portion 22 of the device is preferably located in a plane parallel to the body 2 and is spaced vertically therefrom a distance which will depend upon the distance which the push button must be depressed to operate the switch. It will, thus, be apparent that the device will normally be made in various individual and predetermined sizes and shapes to fit and be securely applied to mounting means of predetermined size and to switches wherein the push button projects a predetermined distance above the mounting means, or must be depressed a predetermined distance to actuate the switch to which it is applied. However, as shown in Figure 3, the tongue or portion 22 is preferably secured to the body 2 of the device by an inclined connection 24 which, if desired, may be deformed to raise or lower the tongue 22 with respect to the body 2. In this way, the tongue 22 may be adjusted in its position to serve as a guard for the push button of any switch with which it is used or it may be depressed a sufficient distance to assure closure of the switch. The material of which the hold down device is formed should, therefore, be of such strength or stiffness as to prevent undesired outward deflection of the tongue 22 under the action of the push button it engages to an extent to preclude operation of the switch.

Since the distance to which a push button may project above the switch mounting means may vary with different switches or in different installations, it is sometimes desirable to provide the hold down device with an element which is movable toward and away from the plane of the body of the device. Thus, as shown in Figure 4, the device may have a body 30 with a tongue or portion 32 which projects over the slot 34 in the body which receives the mounting means 36 for the switch. The portion 32 than may be provided with a screw 38 or other means adjustable in its position with respect to the body 30 and portion 32 for engagement with the push button 40 of the switch 42. The screw 38 may be secured in an adjusted position on the portion 32 by means of a retaining nut 44 or the like so as to assure proper or desired depression of the push button when the hold down device is applied thereto.

In some installations and for some purposes, it may be desired to cause a switch to be operated at a predetermined time or for a selected period of time, as for example, when operating a series of switches in a programmed manner for control of a machine or mechanism. In such installations, a device, such as that shown in FIG. 5, may be employed. The body 50 of such a device may be formed as described in connection with the device of FIG. 1, 2 and 3, so as to be applied to and held in a fixed position with respect to the mounting means 52 by which a switch 54 is secured to a support. The tongue or portion 56 of the body which projects over the push button 58 of the switch 54 may then be provided with a mova-

ble element **60** for engaging and actuating the push button **58**. The element **60** may be actuated by control means **62** mounted or the portion **56** and for this purpose, the control means may be a timing device, solenoid, or other electrically responsive means as required for any particular purpose.

When using any of the various embodiments of the invention shown and described above, the device may be readily applied to and removed from push button switches already installed in equipment without disassembling or removing the switch and its mounting means in order to utilize the device. It is therefore possible to selectively apply the devices to equipment in a minimum of time and without disturbing the assembly or setting of any part of the equipment. Furthermore, the device is extremely simple and economical to produce and use.

While several typical and preferred forms of the invention have been shown in the drawing and described above, it will be apparent that the construction is capable of many modifications and changes in its form and application. In view thereof, it should be understood that the particular embodiments of the invention disclosed are intended to be illustrative only and are not intended to limit the following claims.

I claim:

1. In combination with a switch having a push button surrounded by mounting means serving to secure the switch to a support, a guard device adapted to be applied to said mounting means after the switch has been installed on the support, said guard device comprising a body having a portion with a slot therein presenting spaced, inwardly-facing surfaces movable into retaining engagement with surfaces of said mounting means, said body having a further portion offset vertically with respect to the slot portion of the body and extending over the slot therein into a position over said push button to prevent undesired operation of the push button.

2. The combination as defined in claim **1** wherein the inwardly facing surfaces of said slot are provided with inwardly projecting teeth.

3. The combination as defined in claim **1** wherein said body has a handle portion extending in a direction opposite to said slot for moving said guard device into retaining engagement with surfaces on said mounting means.

4. The combination as defined in claim **3** wherein said handle portion is offset vertically from the slotted portion of said body.

5. The combination as defined in claim **1** wherein said guard device is a unitary member.

6. The combination as defined in claim **1** wherein said further portion of the body has a movable element carried thereby engageable with the switch push button to hold said push button depressed.

7. The combination as defined in claim **6** wherein said element is movable into and out of a position to hold said push button depressed.

8. The combination as defined in claim **7** wherein said element is electrically controlled.

9. The combination comprising a push button switch, mounting means for securing said switch to a support, and a guard device adapted to be applied to said mounting means after said switch has been mounted on said support, said guard device consisting of a body having an opening therein presenting surfaces frictionally engageable with complementary surfaces on said mounting means to hold said body fixedly in place in a predetermined position with respect to said mounting means and push button, and button engaging means on said body extending over said button and into position to hold said button depressed.

10. The combination as defined in claim **9** wherein said guard device is a unitary metal stamping having a body located in one plane with integral button engaging means located in a parallel plane.

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