

April 4, 1961

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2,978,613

LOCKOUT DEVICE FOR SWITCH PANELS

Filed Feb. 6, 1959

FIG. 1.

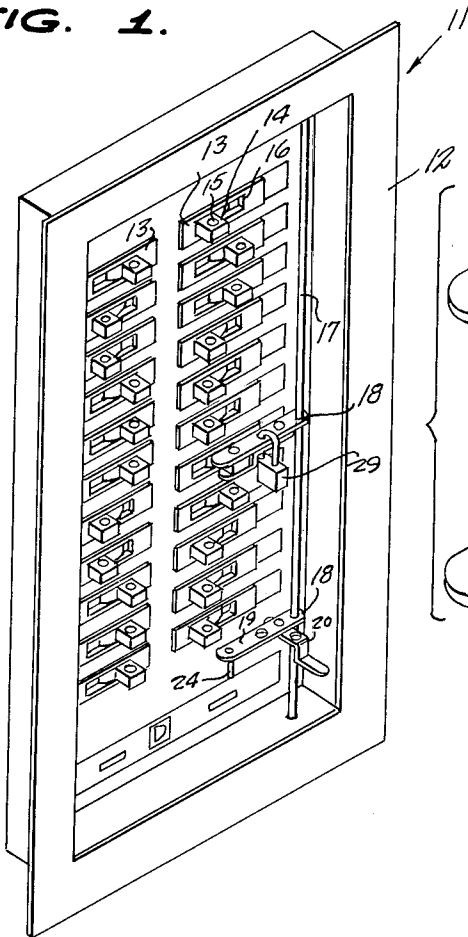


FIG. 2.

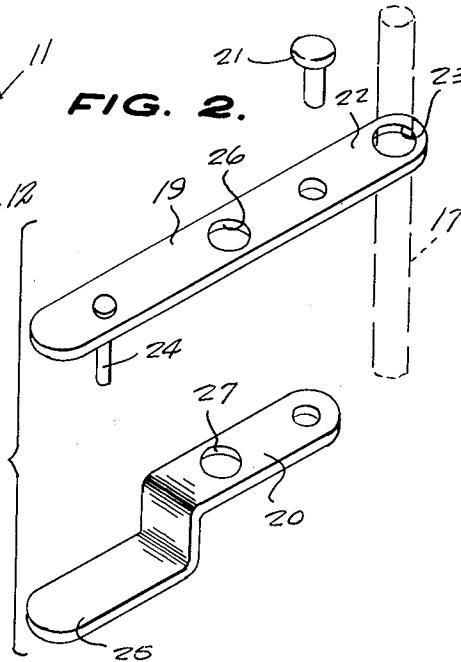


FIG. 4.

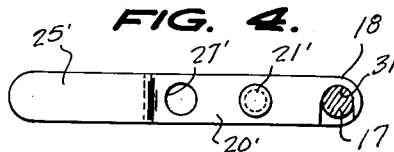


FIG. 5.

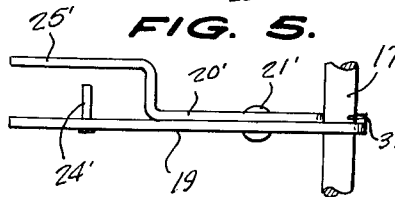
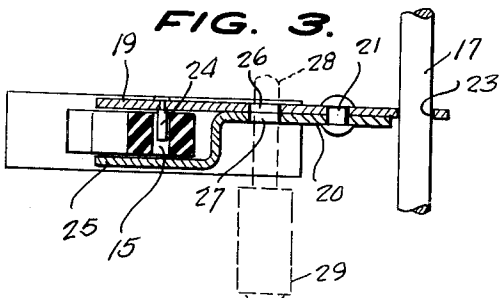
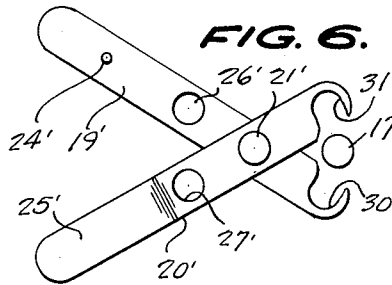


FIG. 6.



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LOCKOUT DEVICE FOR SWITCH PANELS

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Filed Feb. 6, 1959, Ser. No. 791,591

3 Claims. (Cl. 317-119)

This invention relates to safety devices for electric switches, and more particularly to means to lock out a selected switch in a switch panel assembly to prevent the operation of the selected switch but to allow operation of the remaining switches in the switch panel assembly.

A main object of the invention is to provide a novel and improved safety device for use in locking out selected switches of a switch panel assembly while allowing operation of the remaining switches, the device being simple in construction, being easy to install, and providing positive assurance that the switch on which it is used will not be closed while the device is engaged therewith and locked.

A further object of the invention is to provide an improved lockout device for use on a switch panel assembly of the type provided with a plurality of separately operable switches, the device being inexpensive to manufacture, being durable in construction, and allowing complete accessibility to all of the switches in the switch panel assembly except the switches selected to be locked.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a perspective view of a switch panel assembly provided with safety lockout devices according to the present invention.

Figure 2 is an enlarged perspective view of one of the lockout devices employed in the switch panel assembly of Figure 1, the parts thereof being shown in separated positions.

Figure 3 is an enlarged horizontal cross sectional view taken through one of the switch lockout devices of Figure 1, the device being shown lockingly engaged with a switch to prevent movement of the switch operating member thereof.

Figure 4 is a top plan view of a modified form of switch locking device according to the present invention, the locking device being engaged with an anchoring rod forming part of a switch panel assembly, the anchoring rod being shown in cross section.

Figure 5 is a front elevational view of the structure shown in Figure 4.

Figure 6 is a top view of the switch locking device of Figures 4 and 5 shown with its arms in separated positions.

Referring to the drawings, and more particularly to Figures 1, 2 and 3, 11 generally designates a switch panel assembly comprising a supporting housing 12 in which are mounted two rows of vertically aligned switches 13, the vertical rows of switches being arranged in side-by-side relationship, as shown. Each of the switches 13 is provided with a switch operating element 14 which projects forwardly and which is formed with a transversely extending aperture 15, the aperture being vertical as viewed in Figure 1.

The switch operating elements 14 are movable in slots 16 provided in the respective switch bodies to positions

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adjacent the respective ends of the slots 16, each switch being open when the switch operating element 14 is adjacent one end of the slot 16 thereof and being closed when the operating element of the switch is adjacent the opposite end of said slot.

Thus, the operating elements 14 of the right hand row of switches 13 are in switch-closing positions when they engage the left ends of their associated slots 16 and are in switch-opening positions when they engage the right ends of their associated slots 16.

Designated at 17 is a rod member which is mounted in the cabinet 12 laterally adjacent to and parallel to the right hand row of switches 13. The rod member 17 is rigidly secured in any suitable manner in the switch panel housing 12. A similar rod member may be provided at the left side of the cabinet for use in association with the left hand vertical row of switches 13.

Slidably mounted on the vertical rod member 17 are a plurality of switch locking assemblies 18, each assembly comprising a pair of arms 19 and 20 which are pivotally connected together, as by a connecting rivet 21. The upper arm 19 has a portion 22 which is formed at its end with an aperture 23, the anchoring rod 17 being slidably engaged in said aperture. At its opposite end portion the arm 19 is provided with a transversely extending locking pin 24 which is engageable in the locking aperture 15 of a selected switch operating element 14 when said operating element is in its "open" position. Thus, the arm 19 is of sufficient length so that when it is extended horizontally at the level of a selected switch 13, its locking pin 24 is engageable in the operating element 14 of the selected switch, being receivable in the aperture 15 of said operating element with the operating element in switch-opening position, namely, disposed adjacent the right end of the guide slot 16 of the switch.

The cooperating arm 20 is formed with the offset end portion 25 which is parallel to and spaced from the arm 19 by a sufficient distance to slidably receive an operating element 14 therebetween, as shown in Figure 3.

Arms 19 and 20 are formed with registrable apertures 26 and 27 which may receive the bight element 28 of a conventional padlock 29, so that the arms 19 and 20 may be locked in opposing positions and in locking engagement with a selected switch-operating element 14, as illustrated in Figure 1, to insure that the associated switch 13 will not be closed by an unauthorized person.

When it is desired to lock a selected switch in an open position, the arm 19 of one of the locking assemblies 18 is swung so that its locking pin 24 is engaged in the aperture 15 of the switch-operating element, the associated lower arm 20 being swung outwardly to permit the member 19 to be freely moved so that its locking pin 24 may enter the opening 15 of the selected operating element. The lower arm 20 of the locking device 18 is then swung so that it is parallel to the upper arm 19, whereby the offset portion 25 extends adjacent the bottom surface of the operating element 14, the operating element being thus received between the arms 19 and 20 in the manner illustrated in Figure 3. The bight portion 28 of the padlock 29 is then engaged through the registering apertures 26 and 27, and the padlock is locked closed so that it cannot be opened except by an authorized person possessing the proper key.

A plurality of locking assemblies 18 may be provided on the anchoring rod 17 to enable a desired number of switches 13 to be simultaneously locked in open conditions.

It will be understood that the anchoring rod employed at the left side of the switch housing 12 will be suitably spaced so that its associated locking assemblies 18 will be properly spaced to engage the operating elements 14

of the adjacent vertical row of switches to lock said operating elements in open positions when desired.

Referring now to the form of the invention illustrated in Figures 4, 5 and 6, 13' generally designates a portable switch locking assembly which may be employed in place of the locking assemblies 13 illustrated in Figure 1. The locking assemblies 13' are arranged so that they are detachable from the anchoring rod 17 and may be carried by the persons desiring to utilize same. Each locking assembly 13' comprises a pair of pivotally connected arms 19' and 20', the arm 19' being straight and the arm 20' having the offset end portion 25' spaced from the arm 19' by a sufficient distance to slidably receive a switch-operating element 14 therebetween. The straight arm 19' is provided with a transversely extending locking pin 24' engageable in the locking aperture 15 of a selected switch-operating element. The arms 20' and 19' are pivotally connected together at their intermediate portions by a rivet 21'. The portions of arms 19' and 20' opposite the locking pin 24' are formed with opposing notches 30 and 31 which are registrable and which are of sufficient size to engage around an anchoring rod 17, as illustrated in Figures 4 and 5. Thus, when the arms 19' and 20' are disposed in alignment with each other, the anchor rod 17 will be lockingly engaged by the opposing notches 30 and 31.

Arms 19' and 20' are formed with registrable locking openings 26' and 27' which register with each other when the arms are in their aligned superimposed positions illustrated in Figures 4 and 5 and which may receive the bight portion of a padlock in the same manner as described in connection with the form of the invention illustrated in Figures 1, 2 and 3.

When it is desired to lock a selected switch-operating element 14 in its open position, the arms 19' and 20' are spread apart, as illustrated in Figure 6, and the locking pin 24' of the arm 19' is engaged through the locking aperture 15 of the switch-operating element. The anchor rod 17 is disposed between the opposing notches 30 and 31, as illustrated in Figure 6. The arms 19' and 20' are then rotated so that they are in aligned positions with the offset portion 25' disposed opposite the arm 19' and with the selected switch-operating element 14 received therebetween. In this position the opposing notches 30 and 31 lockingly engage around the anchor rod 17 and the locking apertures 26' and 27' are in registry. The bight portion of a padlock may then be engaged through the registering apertures 26' and 27' and the padlock may be snapped shut to secure the locking device and to prevent closing of the selected switch until the padlock is removed.

While certain specific embodiments of an improved switch locking device have been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. In a switch panel assembly, a support, a row of switches mounted on said support in alignment, said switches having parallel operating elements slidable on

said support, a rod member mounted on said support parallel to said row of switches and transverse to said operating elements, a locking member comprising a pair of pivotally connected arms, means slidably and pivotally connecting one of said arms to said rod member for adjustment therealong, said arms having respective opposing portions extending parallel to and spaced to receive a selected switch-operating element therebetween, means on one of said portions lockingly engageable with the selected switch operating element, and means to releasably lock the arms against relative pivotal movement when said arms are substantially in alignment with each other with the selected switch-operating element received between said opposing portions and lockingly engaged by said second-named means.

2. In a switch panel assembly, a support, a row of switches mounted on said support in alignment, said switches having parallel operating elements slidably mounted with respect to said support, a rod member mounted on said support parallel to said row of switches and transverse to said operating element, a locking member comprising a pair of pivotally connected arms, one of said arms having an opening slidably receiving said rod member for adjustment therealong, said arms having respective opposing portions spaced to receive a selected switch-operating element therebetween, means on one of said portions lockingly engageable with the selected switch-operating element, and means to releasably lock the arms against relative pivotal movement when said arms are substantially in alignment with each other with the selected locking element received between said portions and lockingly engaged by said first-named means.

3. In a switch panel assembly, a support, a row of switches mounted on said support in alignment, said switches having parallel operating elements slidably mounted with respect to said support, a rod member mounted on said support parallel to said row of switches and transverse to said operating elements, a locking member comprising a pair of arms pivotally connected together, one of said arms having an end portion extending beyond the pivotal connection and formed with an opening slidably receiving said rod member for adjustment therealong, the other arm having an end portion offset with respect to said one of the arms so that said arms are spaced to receive a selected switch-operating element therebetween, a transverse locking pin on the other end of said one arm opposing said offset end portion and being lockingly engageable with the selected switch-operating element, and means to releasably lock the arms against relative pivotal movement when said arms are substantially in alignment with each other with the selected locking element received between the arms and lockingly engaged by said locking pin.

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