Oct. 31, 1944. C. T. EVANS 2,361,535

SAFETY SWITCH

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Fig. 1

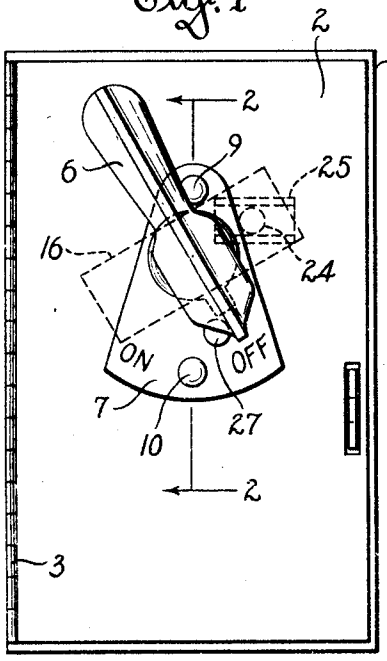


Fig. 2

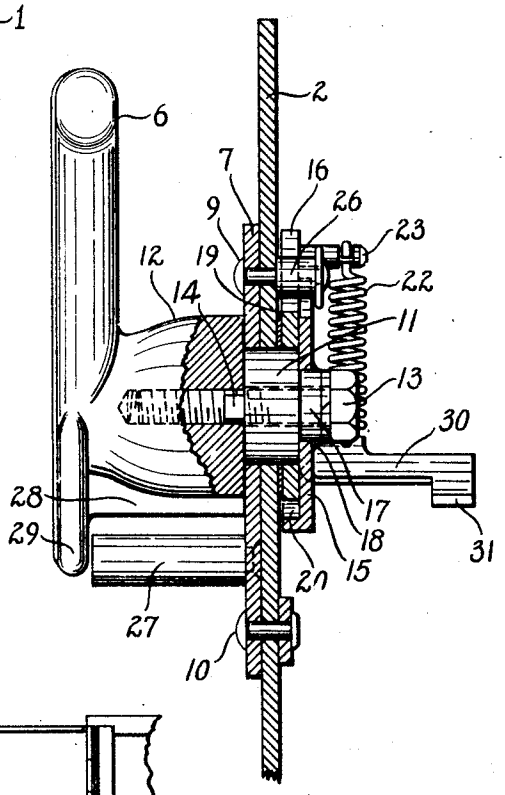
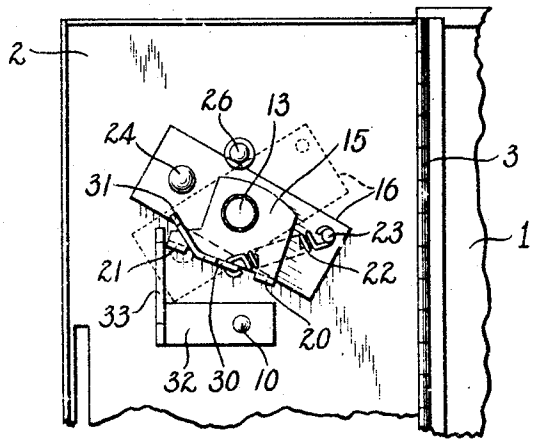


Fig. 3



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Fig. 4

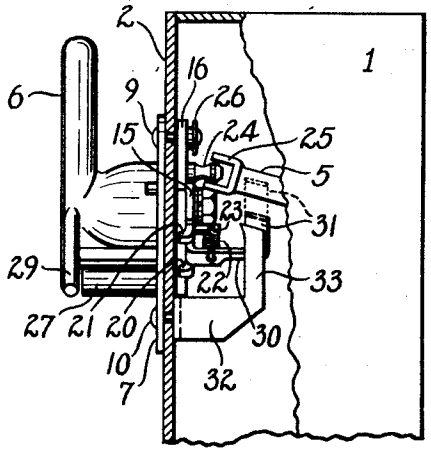


Fig. 5

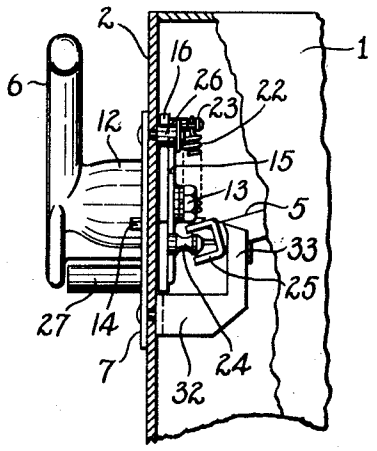
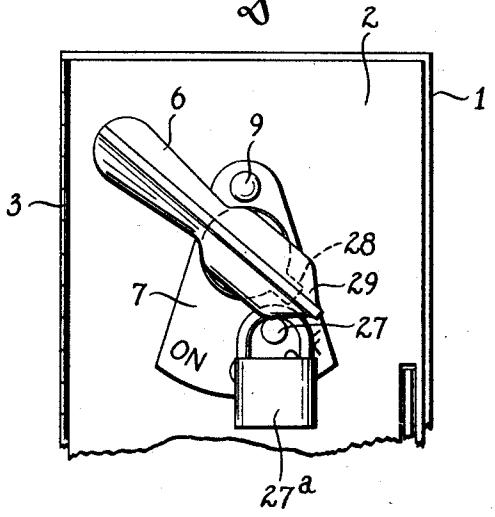


Fig. 6



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SAFETY SWITCH

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Application July 28, 1943, Serial No. 496,465

5 Claims. (Cl. 200—50)

This invention relates to safety switches, and is particularly applicable to enclosed safety switches of the front operated type.

The invention has among its objects to provide an improved safety locking mechanism for enclosed switches of the type having a hinged front cover and an oscillatable operating handle mounted upon the cover.

Another object is to provide a safety mechanism for switches of the aforesaid type which enables locking of the switch lever in a special position by means of one or more padlocks to maintain the switch in off position and to prevent opening of the front cover.

Another object is to provide an improved safety mechanism for switches of the aforesaid type which is exceedingly simple, rugged and inexpensive in construction, positive and reliable in operation and which can be readily applied to existing types of switches without substantial alteration of the switch structure or the enclosing casing therefor.

Various other objects and advantages of the invention will hereinafter appear.

The accompanying drawings illustrate an embodiment of the invention which will now be described, it being understood that various modifications may be made in the embodiment illustrated without departing from the spirit and scope of the appended claims.

In the drawings,

Figure 1 is a front elevational view of an enclosed front operated safety switch embodying the invention, the operating handle for the switch being shown in "off" position;

Fig. 2 is an enlarged fragmentary sectional view on lines 2—2 of Fig. 1 with the switch operating handle in "on" position;

Fig. 3 is a fragmentary view of the switch cabinet shown in Fig. 1, the door of the cabinet being in open position;

Figs. 4 and 5 are fragmentary side views partly in section of the switch shown in Fig. 1 illustrating the switch operating handle and its associated parts in "off" and in "on" position, and

Fig. 6 is a fragmentary front view similar to that shown in Fig. 1 illustrating the switch operating handle in locked position.

Referring to Fig. 1, the same illustrates a box enclosing cabinet 1 having a front cover 2 which is secured to one of the side walls of the cabinet by a hinge 3 to permit the cover to be swung to open and closed positions. Any suitable form of switch is mounted within the cabinet 1, the switch employed being preferably of the snap type and being provided with a forwardly extending pivoted operating lever 5 having an "off" position shown in Fig. 4 and an "on" position shown in Fig. 5. Cover 2 carries an operating mechanism for switch lever 5 including a vertically disposed operating handle 6 which is mounted upon the exterior of cover 2 to swing in a plane parallel to the face of said cover.

More specifically an indicator plate 7 is secured to the front face of cover 2 by rivets 9 and 10, and as shown in Fig. 2 said indicator plate and cover are bored to receive a rotatable stub shaft 11. Operating handle 6 has a rearwardly extending hub 12 formed on the lower end thereof which is secured to the front end of stub shaft 11 by a screw 13. As shown in Fig. 2 screw 13 extends through a center opening in shaft 10 ad threads into a tapped opening in hub 12, and the face of said hub is slotted to receive a tongue projection 14 formed on the front end of said shaft.

A latch plate 15 and a switch operating plate 16 are mounted upon the rear end of stub shaft 11, said operating plate being rotatably supported intermediate its ends upon said shaft and being disposed at right angles to handle 6, as shown in dotted lines in Fig. 1. Latch plate 15 is fixed to a projecting portion 17 of reduced diameter on the rear end of stub shaft 11 by a weld 18 and operating plate 16 is supported between said latch plate and cover 2 and has a spacing washer 19 interposed between the same and the rear face of said cover. Latch plate 15 is provided with forwardly extending projections 20 and 21 for engaging operating plate 16 on the underside thereof. Projections 20 and 21 are located to engage operating plate 16 at points on opposite sides of the axis of shaft 11 and are also arranged to permit a limited degree of rotation of handle 6 and shaft 11 with respect to said operating plate. As shown in Fig. 3, projection 20 on latch plate 15 is normally held in engagement with operating plate 16 by a spring 22 having one end connected to said latch plate and its opposite end connected to a pin 23 fixed to said operating plate.

Operating plate 16 has a rearwardly extending pin 24 mounted adjacent one end thereof and when the door 2 is in closed position said pin engages within a horizontally disposed channel member 25 secured to the front end of switch operating lever 5 to provide for operation of said lever upon rotation of said plate. A stop 26 fixed to the rear face of cover 2 by rivet 9 limits rotation of operating plate 16 in opposite direc-

tions between the extreme positions illustrated in full and dotted lines in Fig. 3.

As is apparent from the foregoing, upon clockwise rotation of operating handle 6 from the "off" position shown in Fig. 1 into the position marked "on" operating plate 16 is rotated by projection 20 on latch plate 15 from the full line position into the dotted line position shown in Fig. 3 to effect movement of switch operating lever 5 from the "off" position shown in Fig. 4 into the "on" position shown in Fig. 5. Upon counterclockwise rotation of operating handle 6 away from the position marked "on" in Fig. 1 operating plate 16 is engaged by projection 21 on latch plate 15 and is rotated into the full line position shown in Fig. 3 for return of switch operating lever 5 to the "off" position shown in Fig. 4.

As hereinbefore set forth, the projections 20 and 21 on latch plate 15 are arranged to permit a limited degree of rotation of handle 6 and shaft 11 with respect to operating plate 16, and projection 20 is normally held in engagement with said operating plate under the action of spring 22. Thus when switch lever 5 is in "off" position operating handle 6 is capable of being moved beyond the "off" position shown in Fig. 1 into the position shown in Fig. 6 against the action of spring 22. As will now be set forth, operating handle 6 is adapted to be locked in the position shown in Fig. 6, and means is provided for locking cover 2 in closed position upon movement of said operating handle into this position.

Indicator plate 7 has a forwardly extending pin 27 fixed to the front face thereof upon which a padlock 27a may be hung to lock operating handle 6 in the position shown in Fig. 6. The hub 12 of operating handle 6 has a rib 28 formed on the underside thereof and the front end of said hub is provided with a downwardly extending tail projection 29. As is apparent from Fig. 1, when operating handle 6 is in "off" position rib 28 acts as an obstruction to prevent hanging of a padlock upon pin 27. However, upon movement of operating handle 6 into the position shown in Fig. 6 clearance is provided between rib 28 and pin 27 to permit hanging of a padlock upon said pin, and as is apparent when a padlock is locked upon said pin the hasp thereof engages rib 28 to lock said operating handle against clockwise movement into "off" position. When operating handle 6 is locked in the position shown in Fig. 6 the tail projection 29 thereof is located in front of pin 27 and acts as an obstruction to prevent removal of the padlock from the front of said pin. Upon movement of operating handle 6 into "on" position the tail projection 29 is moved out of obstructing relation with the front end of pin 27, to prevent securement of a padlock upon said pin. In the embodiment illustrated pin 27 is of such length as to permit hanging of a plurality of padlocks thereon.

As shown in Figs. 3 and 4, latch plate 15 is provided with a rearwardly extending portion 30 having an upwardly extending lock projection 31 formed on the rear end thereof. Lock projection 31 is arranged to cooperate with the channel member 25 on operating lever 5 and when handle 6 is locked in the position shown in Fig. 6 said lug projection is positioned as shown in dotted lines in Fig. 4 to engage the rear side of said channel member and thereby prevent cover 2 from being moved into open position. However, when operating handle 6 is in "off" position lock projection 31 is located below the channel member 25, as shown in full lines in Fig. 4, to permit opening of cover 2.

Also as shown in Figs. 3 and 4, a bracket 32 is secured to the rear face of cover 2 by rivet 10, said bracket being provided with an upwardly extending lock projection 33. As shown in Fig. 5, when switch lever 5 is in "on" position channel member 25 is located in front of lock projection 33 to lock cover 2 in closed position.

What I claim as new and desire to secure by Letters Patent is:

1. In an enclosed electric switch, in combination, a switch cabinet having an openable front cover, a switch operating handle mounted upon said cover and movable between "off" and "on" positions and also capable of limited movement beyond "off" position into a third position wherein the same is adapted to be locked, and a forwardly extending pin mounted upon the front of said cover upon which a padlock may be hung to block movement of said operating member from said third position into "off" position, the front end of said pin being obstructed by said handle when said handle is in said third position to prevent removal of a padlock hung upon said pin.

2. In an enclosed electric switch, in combination, a switch cabinet having an openable front cover, a switch operating handle mounted upon said cover and movable between "off" and "on" positions and also capable of limited movement beyond "off" position into a third position wherein the same is adapted to be locked, and a forwardly extending pin mounted upon the front of said cover upon which a padlock may be hung to block movement of said operating member from said third position into "off" position, the front end of said pin being obstructed by said handle when said handle is in said third position to prevent removal of a padlock hung upon said pin and being unobstructed by said handle upon movement of said handle into "on" position.

3. A switch cabinet having an openable front cover, a switch mounted within said cabinet, an operating handle for said switch rotatably mounted upon the front of said cover and movable between "off" and "on" positions, and also movable beyond "off" position into a third position wherein the same is adapted to be locked to maintain said switch in "off" position, a forwardly extending pin mounted upon the front of said cover upon which a padlock may be hung to block movement of said operating member from said third position into "off" position, means associated with said operating handle for locking said cover in closed position upon movement of said operating handle into said third position and means associated with said cover for locking the same in closed position upon movement of said switch handle into "on" position.

4. A switch cabinet having an openable cover, a switch mounted within said cabinet, an operating handle for said switch mounted upon said cover and rotatable between "off" and "on" positions and also rotatable beyond "off" position into a third position wherein the same is adapted to be locked to prevent operation of said switch, a forwardly extending pin mounted upon the front of said cover upon which a padlock may be hung to maintain said operating handle in said third position, and means associated with said operating handle for locking said cover in closed position upon movement of said operating handle into said third position.

5. A switch cabinet having an openable front cover, a switch mounted within said cabinet, an operating handle for said switch rotatably mounted upon the front of said cover and movable between "off" and "on" positions and also movable beyond "off" position into a third position wherein the same is adapted to be locked to prevent movement of said switch out of "off" position, a forwardly extending pin fixed to the front of said cover upon which a padlock may be hung to maintain said operating handle against movement from said third position into "off" position, the front end of said pin being obstructed by said operating handle when said operating handle is in said third position to prevent removal of a padlock hung upon said pin, and means associated with said operating handle for locking said cover in closed position upon movement of said operating handle into said third position.

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