April 8, 1924. 1,489,712

C. D. PLATT

SAFETY SWITCH

Filed Dec. 16, 1922 2 Sheets-Sheet 1

Fig. 1.

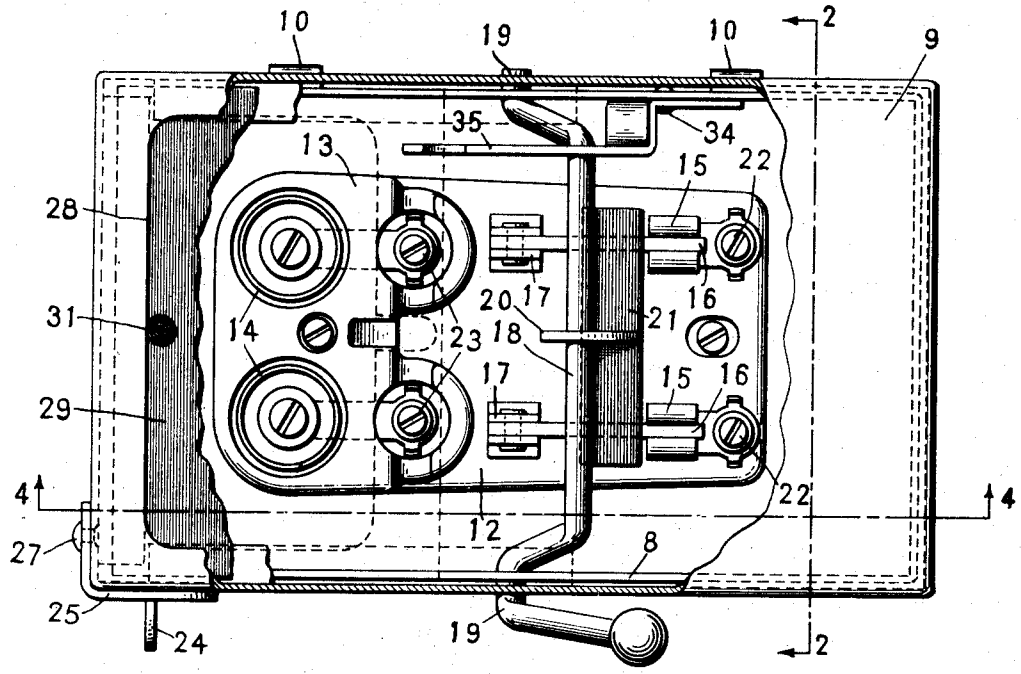


Fig. 2.

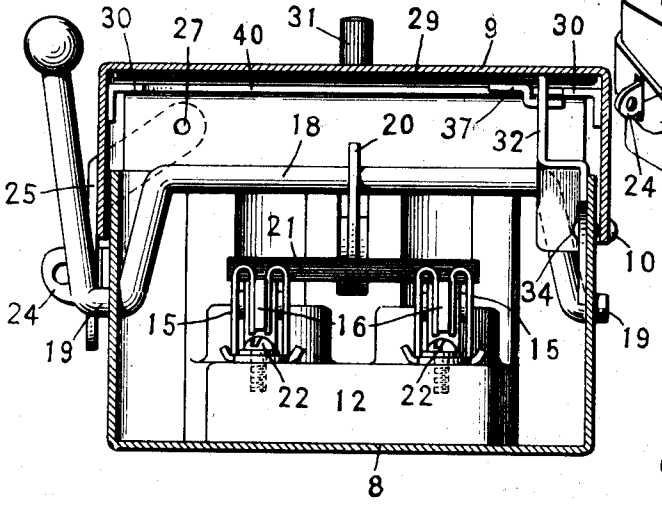
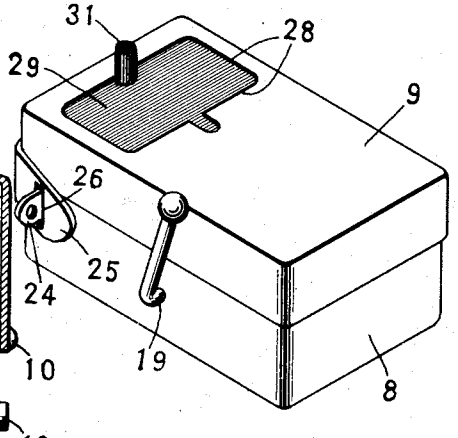


Fig. 3.



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Fig. 4.

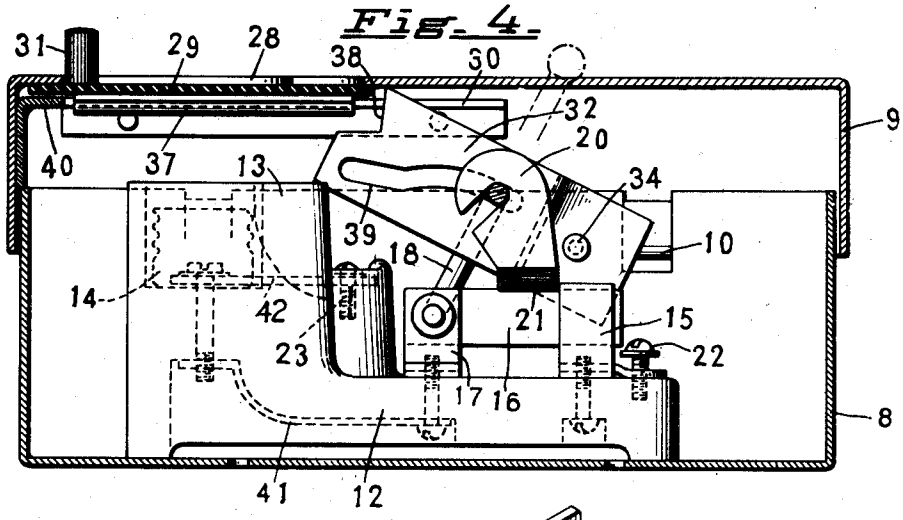


Fig. 7.

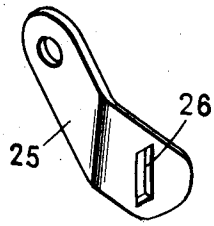


Fig. 6.

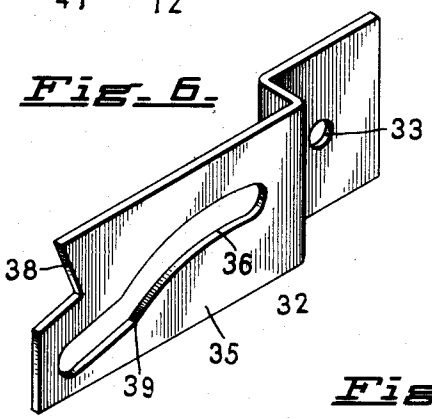
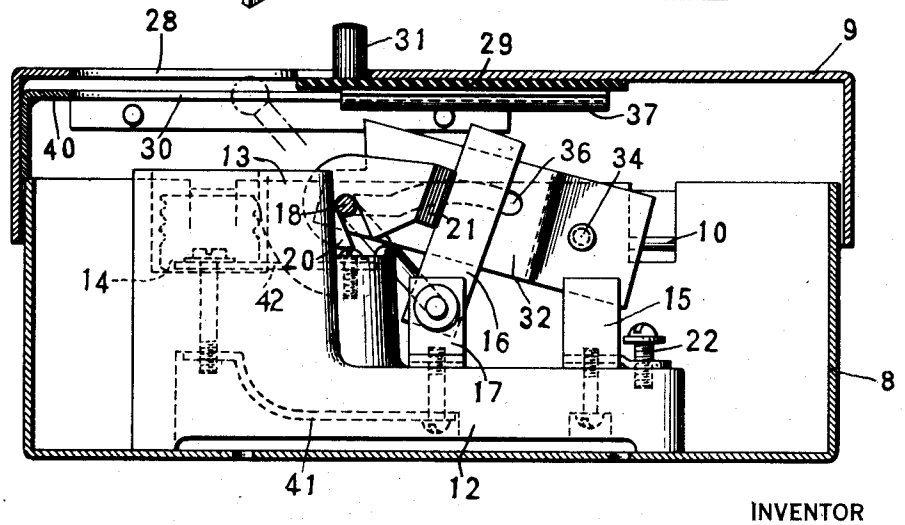


Fig. 5.



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UNITED STATES PATENT OFFICE.

CLARENCE D. PLATT, OF BRIDGEPORT, CONNECTICUT.

SAFETY SWITCH.

Application filed December 16, 1922. Serial No. 607,266.

To all whom it may concern:

Be it known that I, CLARENCE D. PLATT, a citizen of the United States of America, and residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented new and useful Improvements in Safety Switches, of which the following is a specification.

This invention relates to safety switches of the enclosed type in which the casing cover has an aperture through which access may be had to the fuses when the switch box is closed and in which a sliding panel is provided to close the aperture.

An object of the invention is to provide a simple, rugged cheaply manufactured switch of this type including a latch member which positively prevents the opening of the panel when the switch contacts are closed and which prevents the closing of the switch contacts when the panel is open.

Another object is to provide a panel mounting to render impossible the stealing of current by means of passing a wire through the aperture in the cover when the panel is open and then closing the panel over the wire so as to then close the switch.

Figure 1 is a plan view of the switch, a portion of the cover and panel being broken away.

Fig. 2 is a sectional end view taken on the line 2—2 of Fig. 1.

Fig. 3 is perspective of the switch casing.

Fig. 4 is a sectional side view taken on the line 4—4 of Fig. 1 showing the switch contacts and panel closed.

Fig. 5 is a view similar to Fig. 4 showing the panel and switch contacts open.

Fig. 6 is a perspective view of the panel locking latch plate and

Fig. 7 is a perspective of a cover locking hasp.

I have illustrated my invention as embodied in a simple double pole enclosed switch having a casing 8 and a cover 9 hinged thereto as at 10. The casing has the usual side and end walls and the cover has corresponding flanges adapted to overlie the respective walls of the casing when the cover is closed. Secured to the bottom wall of the casing is a switch base 12 of any desired insulating material. At the high left hand end 13 (Figs. 1 and 4) of the base I provide the usual recesses 14 to house two fuse sockets and fuses. Near the right hand end of the low portion of the base there are secured two fixed contacts 15 with which co-operate movable contacts or blades 16 pivotally supported on posts 17 also secured to the base. The blades are operated by an operating bar or crank 18 pivoted in the side walls of the casing as at 19—19 and connected by a hook 20 to an insulating cross bar 21 which is secured to the blades 16.

The incoming line conductors may be connected to the fixed contacts 15 by means of binding screws 22 while the load conductors may be secured to binding screws 23 located intermediate the contacts 15 and the fuse sockets and connected to the latter as by conducting strips 42. The posts 17 are connected to the fuse sockets by strips 41 After the switch has been installed and these connections made, the cover is closed, and locked to prevent tampering with the switch. I provide cover fastening mechanism consisting of an angle lug 24 secured near one end of the front wall of the casing, and a hasp 25 to cooperate therewith. The hasp is desirably formed of a strip of sheet metal punched at one end to accommodate a rivet and at its other end having a slot 26 through which lug 24 extends when the cover of the casing is closed. The hasp is bent so that the two end portions lie in perpendicular planes, thus permitting the punched end to be pivotally secured to one end flange of the cover as by a rivet 27. As seen in Figs. 1 and 3 the hasp will extend around the corner of the casing, lying flat thereagainst and providing a snug fastening for the cover. Lug 24 may be punched to hold a padlock or a seal which will prevent lifting the hasp.

To give access to the fuses for the replacement of fuses when the cover is locked, the cover is provided with an aperture over the fuse end of the base having edges 28 in approximate registry with the fuse recesses, see Fig. 5. A panel 29 to normally close this aperture is slidably supported close to the under surface of the cover by guide rails 30 mounted on the side flanges of the cover. A button 31 near the front edge of the panel facilitates operation of the panel and also acts as a stop to limit opening and closing movement thereof.

In order to prevent one replacing a fuse from coming in contact with a live conductor, and further to prevent any alteration in the switch connections when the

cover has been locked shut, I provide means to prevent opening of the panel when the switch contacts are in the closed circuit position, and to prevent closing of the switch while the panel is open. For this purpose I pivot to the side wall of the casing a locking latch plate 32 consisting preferably of a sheet metal strip. One end of this latch plate is punched as at 33 to accommodate a rivet 34 by which said end is pivoted to the casing. The body portion 35 of the plate is offset from the pivoted end and preferably lies in a plane approximately parallel thereto (Figs. 1, 2 and 6). The amount of this offset is sufficient to permit the crank portion of operating bar 18 to extend through a slot 36 in the body of the plate. As shown in Fig. 4 the upper free corner of the latch lies adjacent the rear edge of panel 29 in its path of movement when the contacts are closed and thus prevents opening of the panel so long as the line current is connected to any part of the switch accessible through the panel when open. Since considerable tolerance must be allowed in the manufacture of switches of this type, it might occur in some switches that the corner of the latch 32 would not lie close enough to the cover to prevent opening of the panel. I therefore secure a downwardly depending member such as the angle bar 37 longitudinally of the inner face of panel 29 and approximately co-extensive therewith and lying in the plane of the offset part 35 of the latch 32. (Fig. 2). Thus even if the rear edge of panel 29 should pass the corner of latch 32, the rear end of bar 37 would abut the vertical edge 38 of the latch which would thus prevent appreciable opening movement of the panel.

To permit opening of the panel when the switch contacts are open, I construct the edges 36 of the slot in latch 32 so that the contact opening movement of operating bar 18 will withdraw the latch from the path of movement of the panel and its member 37. To ensure full opening of the contacts before the latch is withdrawn, I make one end portion of slot 36 arcuate about the crank axis as a center when the switch is closed, so that initial contact opening movement of crank 18 leaves the latch unmoved until the corner 39 is reached by the bar. From this point on, the slot 36 extends outwardly from the crank axis so that further opening movement of bar 18 withdraws latch 32 from the position shown in Figs. 2 and 4 to that shown in Fig. 5. The panel 29 is then free to open, but the fuse sockets are dead and the line terminals 22 are inaccessible.

If an attempt be made to close the switch while the panel is open, (Fig. 5) a small closing movement of crank 18 will raise the latch 32 into engagement with member 37 which positively prevents further closing movement of the operating crank. In some safety switches having apertured covers and panels, it has been possible to steal current by connecting conductors to the fuse sockets while the panel is open and leading the conductors out between the front edge of the panel and the cover, as there is always some clearance between these parts, and the relatively thin sheet metal of the box and panel can be easily bent to make a big enough opening. I prevent this by providing a guard plate 40 at one end of the cover and just below the same, the cover and plate cooperating to form so narrow a slot to receive the forward edge of the panel as to render it impossible to pass a conductor around the edge of the panel when it is closed as shown in Fig. 4. This guard plate preferably consists of an angle piece secured to the end flange of the cover, and having its bottom edge positioned to abut against the end wall of the casing to limit the closing movement of the cover.

While I have described one embodiment of my invention in detail, it is to be understood that this is merely for the sake of clearness, and that some of the parts may be positioned differently or dispensed with entirely without departing from the spirit of the invention as defined by the appended claims.

It will be noted that the fuse-receiving terminals are seated in recesses in the high end of the base, that the strap connections 41 are located in recesses in the under side of the base and that the terminals 42 extend from the fuse recesses through openings in one side of the high part of the base so as to locate the binding screws 23 in a position where they are not easily accessible through the opening in the box cover, thus, when the cover is closed there are no accessible terminals or live parts in the fuse end of the box.

Claims:

1. In a safety switch, a casing, a cover for the casing having an aperture, a sliding panel on the cover to close said aperture, a fixed contact, a movable contact, a bar to operate the movable contact, and a latch plate pivoted inside of the casing and actuated by the operating bar to prevent the opening of the sliding panel when the switch is closed.

2. In a safety switch, a casing, a cover for the casing having an aperture, a sliding panel on the cover to close said aperture, a fixed contact, a movable contact, a handle to operate the movable contact, and a latch pivoted within the casing and actuated by the operating handle to prevent the closing of the switch when the panel is open.

3. In a safety switch, a casing, a cover for the casing having an aperture, a panel slidable to open or close the aperture, a fixed contact, a movable contact, a crank

pivoted in the casing and operatively connected to the movable contact, and a slotted latch plate pivoted to swing into engagement with the panel when the switch is open and to form an abutment for the end of the panel when the switch is closed, said crank extending through the slot in said plate and being arranged to move the plate into said latter position to prevent opening of the panel when the switch is closed.

4. In a safety switch, a casing, a cover for the casing having an aperture, a panel slidable to open or close the aperture, a fixed contact, a movable contact, a crank pivoted in the casing and operatively connected to the movable contact, a latch pivoted to the casing and lying in the path of movement of and adjacent the closed panel when the switch is closed to prevent opening of the panel, the latch having a slot through which the operating crank extends, one portion of the edges of said slot being arcuate about the crank axis, and another portion of said edges extending outwardly from said axis, whereby initial contact opening movement of the crank leaves the latch unmoved and further movement of the crank withdraws the latch from the path of movement of the panel to permit opening thereof.

5. In a safety switch, a casing, a cover for the casing having an aperture, a panel slidable to open or close the aperture, a fixed contact, a movable contact, a crank pivoted in the casing and operatively connected to the movable contact, a latch pivoted to swing in a plane parallel to the plane of movement of the movable contact, a downwardly depending member carried by the inner face of the panel and in the path of movement of the latch when the panel is open, the latch having operative connection with the crank whereby switch closing movement of the crank will move the latch into engagement with said depending member to prevent closing of the switch when the panel is open.

6. In a safety switch, a casing having side and end walls, a cover for the casing, said cover having an aperture, a sliding panel to close the aperture, and a plate rigidly secured to the cover and cooperating therewith to form a narrow slot to receive the forward edge of the panel when closed.

7. In a safety switch, a casing having side and end walls, a hinged cover comprising a body portion and side and end flanges adapted to overlie the respective walls of the casing, said cover having an aperture near one end, a panel overstanding the edges of the aperture to close the same, guide rails on the side flanges of the cover to support the panel close to the body of the cover, and an angle piece secured to one end flange of the cover, the bottom edge of the angle abutting the end wall of the casing to limit closing movement of the cover, and the free edge of the angle lying close to the lower surface of the panel when in closed position to cooperate with the cover in forming a narrow slot to receive the front edge of the panel.

8. In a safety switch, a casing, a cover hinged thereto and having an aperture, a sliding panel to close the aperture, a guard plate secured to the cover and spaced below the same approximately the thickness of the panel, the guard plate cooperating with the cover to form a narrow slot to receive the forward edge of the panel when in closed position, a fixed contact a movable contact, a bar to operate the movable contact, and means actuated by the bar to prevent opening of the panel when the contacts are closed.

9. In an electric switch, a casing having an apertured cover, a sliding panel to close the aperture, an insulating base having a high end under and approximately coextensive with the aperture, a recess in the high end of said base under the aperture, a fuse socket having contacts in the recess, a switch mounted on the low portion of the base, line terminals connected to one side of the switch, a conductor lying in a recess in the bottom of the base to connect one of the fuse socket contacts to the other side of the switch, a load circuit terminal between the high end of the base and the switch, a conductor extending through an opening in said end to connect another fuse socket contact to the load terminal, and means to prevent opening of the sliding panel when the switch is closed whereby no live conducting parts will ever be accessible through the aperture in the cover.

CLARENCE D. PLATT.