Fig. 1.

Fig. 2.

Fig. 3.

Inventor:
Fred G. Von Hoorn,
by Harry E. Dunham,
His Attorney.
GUARD MEANS FOR ELECTRIC SWITCHES
Fred G. von Hoorn, Bridgeport, Conn., assignor
to General Electric Company, a corporation of
New York
Application February 12, 1937, Serial No. 125,406

4 Claims. (Cl. 70—203)

My invention relates to guard means for electric switches or circuit breakers, more particularly to means for protecting electric switches or circuit breakers against accidental or unauthorized operation and has for an object the provision of simple and inexpensive means of this character.

Electric switches and circuit breakers are often mounted in receptacles or housings with the operating handle or lever of the switch projecting through the cover of the housing which serves as a face plate for the switch. Such housings or face plates have heretofore been provided with channel-like guards for the operating lever, the sides of the guard being provided with apertures for receiving locking or sealing means such as padlocks for preventing unauthorized or accidental operation of the switch lever. Something is yet to be desired, however, in guard means of this character because of the wide variety of uses to which such enclosed switches are applied.

For example, it may be desirable in some cases to guard the switch against accidental or inadvertent operation while at the same time providing for emergency operation independently of the seal or padlock. In other cases, such as for example as in public or semi-public buildings, it may be desirable to render the switch completely tamper-proof and inaccessible for operation except upon the removal of the padlock or seal. It is accordingly a further object of my invention to provide simple and reliable guard means of this character capable of affording a predetermined degree of protection, depending upon the character of the switch installation.

In carrying out my invention in one form, I provide a channel-like guard member which is substantially U-shaped in cross-section and comprises parallel side walls connected together adjacent their respective opposite ends by spaced apart yoke members. Detachable means, such for example as screws threadedly engaging the yoke members and the face plate on the electric switch, are provided for securing the guard member to the face plate so that the operating lever of the switch extends into the space between the yoke members, the side walls extending outwardly from the face plate substantially parallel to the path of movement of the switch operating lever. These side walls are provided with suitable apertures for supporting a locking bar or bolt in the path of movement of the operating lever, the locking bar being retained by a suitable padlock or seal.

Thus, the operating lever is protected against accidental or inadvertent operation, while the threaded detachable means permit ready removal of the channel-like guard member to provide for emergency operation of the switch.

In addition, I provide a hood-shaped cover for the guard member which completely houses the guard member when in its closed position, so that the detachable means are inaccessible. The side walls of this cover member are provided with apertures for receiving the locking bar or bolt so that when the cover member and the locking bar are assembled and locked by means of a padlock or seal, the switch lever is inaccessible for operation except upon removal or destruction of the padlock or seal.

For a more complete understanding of my invention, reference may now be had to the drawing in which Fig. 1 is a perspective view of an enclosed electric switch provided with guard means embodying my invention; Fig. 2 is an elevation view of the switch shown in Fig. 1 with the cover or hood applied to the guard means; and Fig. 3 is a detail perspective view of the cover or hood, together with the cooperating hinge plate for mounting the cover.

Referring now to the drawing, I have shown my invention as applied to a combined manual and automatic circuit breaker of the type described and claimed in my copending application Serial No. 50,907, filed November 21, 1935, entitled "Circuit breakers", which application is assigned to the same assignee as the present invention. As shown, this circuit breaker 10 is supported within an enclosing casing 11 having a cover or face plate 12, the circuit breaker 10 being provided with a supporting plate 13 (Fig. 2) which cooperates with suitable brackets 14 extending inwardly from the walls of the casing 11. As shown, the walls of the casing 11 are provided with suitable "knockouts" for permitting wiring of the circuit breaker.

The circuit breaker 10, as more fully described in my above referred to application, is provided with a shoulder portion 15 surrounding the pivot operating lever or handle 16. When the circuit breaker is supported on the brackets 14, as shown, this shoulder portion 15 and the operating lever 16 extend through a suitable aperture in the face plate 12.

In order to protect the operating lever 16 against accidental or inadvertent operation, I provide a channel-like guard member which comprises a pair of substantially parallel side walls 17 which are connected together adjacent their respective opposite ends by spaced yoke members.
the guard member thus being substantially U-shaped in cross-section. Suitable screws 18 which extend through the yoke members 16, the face plate 12, and the supporting member 13, as shown best in Fig. 2, detachably secure the guard member to the face plate 12 with the yoke members 16 and the face plate 12 in face-to-face relation and with the operating lever 16, extending through the space between the yoke members so that the side walls 17 extend substantially parallel to the path of movement of the operating lever. As shown, each of the side walls 17 is provided with an aperture 20 arranged to receive a locking bolt or bar 21 which extends across the guard member in the path of movement of the operating lever 16, one extending end of the bar 21 being provided with an enlarged head 22 and the other end being provided with an aperture for receiving the haup of a padlock or seal 24. With the guard member and the locking bar thus assembled on the face plate 12, it will be apparent that the operating lever 16 is locked against movement between its operating positions, and thus accidental or inadvertent operation of the lever 16 is prevented. At the same time, however, operation of the lever 16 may be accomplished in an emergency simply by withdrawing the screws 18 so as to permit bodily removal of the guard from the face plate 12. After the operating lever has been moved to the desired position, the guard may be replaced and the screws reinserted so as to retain the guard in its proper locking position. As stated above, it is sometimes desirable to render the switch entirely tamper-proof; that is, to prevent operation of the switch under all conditions except upon removal of the padlock or seal 24. For this purpose I provide a hood-shaped cover 25 arranged telescopically to enclose the channel-like guard so as to render the detachable means or screws 18 inaccessible. This cover member 25 is preferably hingedly connected to one end of the guard member by means of a hinged plate 26 which is secured to one of the yoke members 16 by the associated screw 18 and which is provided with hinge fingers 27 which extend outwardly beyond the end of the yoke member 16 and then inwardly to the face plate 12. These hinged fingers extend through suitable apertures 28 in one end of the hood-shaped cover 25 so as hingedly to mount the cover for movement between the closed position shown in heavy lines in Fig. 2 and the open position shown in broken lines in Fig. 2. As shown, the side walls of the cover member 25 are provided with enlarged apertures 29 through which the locking bar 21 extends when the cover is in its closed position, thus to lock the cover against movement to its open position.

It will be apparent now that when the cover 25 is in its open position, the detachable means or screws 18 are accessible and accordingly the guard may be removed from the face plate 12 for emergency operation of the lever 16, as described above. When the cover member 25 is in its closed position, however, these screws 18 are inaccessible and the switch may then be operated only upon removal of the padlock 24 and the locking bar 21. Furthermore, since the cover or face plate 12 is secured to the casing 11 by the screws 19, it will be apparent that when the hood 25 is locked into closed position the circuit breaker terminals and the wiring connections (not shown) within the casing 11 are also inaccessible except upon removal of the padlock 24. Thus the hood 25 not only prevents tampering with the operating lever 16, but also prevents tampering with the circuit-breaker connections.

Thus, I have provided a simple and reliable guard means for providing different degrees of protection depending upon the type of use to which the switch is applied. What I claim as new and desire to secure by Letters Patent in the United States is:

1. In an electric switch having a face plate and an operating lever extending therethrough for movement between a plurality of operating positions, the combination of a channel-like guard member substantially U-shaped in cross-section and comprising parallel side walls connected adjacent their respective opposite ends by spaced yoke members, detachable means for securing said yoke members to said face plate in face-to-face relation therewith so that said operating lever extends into the space between said yoke members and so that said side walls extend substantially parallel to the path of movement of said operating lever, a locking bar disposed in aligned apertures in said side walls and extending across said channel in the path of movement of said operating lever, sealing means for preventing unauthorized removal of said locking bar, said guard member and said locking bar thereby preventing operation of said lever between said operating positions, and a hood-shaped cover member for entirely enclosing said guard to render said detachable means inaccessible, said cover member having apertures in the side walls thereof through which said locking bar extends whereby said switch is rendered entirely tamper-proof, said operating lever being accessible for operation only upon removal of said sealing means.

2. In an electric switch having a face plate and an operating lever extending therethrough for movement between a plurality of operating positions, the combination of a channel-like guard member substantially U-shaped in cross-section and comprising parallel side walls connected adjacent their respective opposite ends by spaced yoke members, detachable means for securing said yoke members to said face plate in face-to-face relation therewith so that said operating lever extends into the space between said yoke members and so that said side walls extend substantially parallel to the path of movement of said operating lever, a locking bar disposed in aligned apertures in said side walls and extending across said channel in the path of movement of said operating lever, sealing means for preventing unauthorized removal of said locking bar, said guard member and said locking bar thereby preventing operation of said lever between said operating positions, and a hood-shaped cover member hingedly connected to one end of the guard member by means of a hinged plate which is secured to one of the yoke members and which is provided with hinge fingers which extend outwardly beyond the end of the yoke member and then inwardly to the face plate.

In the preferred embodiment of the invention as shown in the accompanying drawings, the switch is of the interrupter type and comprises the combination of a channel-like guard member substantially U-shaped in cross-section and comprising parallel side walls connected adjacent their respective opposite ends by spaced yoke members, detachable means for securing said yoke members to said face plate in face-to-face relation therewith so that said operating lever extends into the space between said yoke members and so that said side walls extend substantially parallel to the path of movement of said operating lever, a locking bar disposed in aligned apertures in said side walls and extending across said channel in the path of movement of said operating lever, sealing means for preventing unauthorized removal of said locking bar, said guard member and said locking bar thereby preventing operation of said lever between said operating positions, and a hood-shaped cover member hingedly connected to one end of the guard member by means of a hinged plate which is secured to one of the yoke members and which is provided with hinge fingers which extend outwardly beyond the end of the yoke member and then inwardly to the face plate.

In the preferred embodiment of the invention as shown in the accompanying drawings, the switch is of the interrupter type and comprises the combination of a channel-like guard member substantially U-shaped in cross-section and comprising parallel side walls connected adjacent their respective opposite ends by spaced yoke members, detachable means for securing said yoke members to said face plate in face-to-face relation therewith so that said operating lever extends into the space between said yoke members and so that said side walls extend substantially parallel to the path of movement of said operating lever, a locking bar disposed in aligned apertures in said side walls and extending across said channel in the path of movement of said operating lever, sealing means for preventing unauthorized removal of said locking bar, said guard member and said locking bar thereby preventing operation of said lever between said operating positions, and a hood-shaped cover member hingedly connected to one end of the guard member by means of a hinged plate which is secured to one of the yoke members and which is provided with hinge fingers which extend outwardly beyond the end of the yoke member and then inwardly to the face plate.

In the preferred embodiment of the invention as shown in the accompanying drawings, the switch is of the interrupter type and comprises the combination of a channel-like guard member substantially U-shaped in cross-section and comprising parallel side walls connected adjacent their respective opposite ends by spaced yoke members, detachable means for securing said yoke members to said face plate in face-to-face relation therewith so that said operating lever extends into the space between said yoke members and so that said side walls extend substantially parallel to the path of movement of said operating lever, a locking bar disposed in aligned apertures in said side walls and extending across said channel in the path of movement of said operating lever, sealing means for preventing unauthorized removal of said locking bar, said guard member and said locking bar thereby preventing operation of said lever between said operating positions, and a hood-shaped cover member hingedly connected to one end of the guard member by means of a hinged plate which is secured to one of the yoke members and which is provided with hinge fingers which extend outwardly beyond the end of the yoke member and then inwardly to the face plate.

In the preferred embodiment of the invention as shown in the accompanying drawings, the switch is of the interrupter type and comprises the combination of a channel-like guard member substantially U-shaped in cross-section and comprising parallel side walls connected adjacent their respective opposite ends by spaced yoke members, detachable means for securing said yoke members to said face plate in face-to-face relation therewith so that said operating lever extends into the space between said yoke members and so that said side walls extend substantially parallel to the path of movement of said operating lever, a locking bar disposed in aligned apertures in said side walls and extending across said channel in the path of movement of said operating lever, sealing means for preventing unauthorized removal of said locking bar, said guard member and said locking bar thereby preventing operation of said lever between said operating positions, and a hood-shaped cover member hingedly connected to one end of the guard member by means of a hinged plate which is secured to one of the yoke members and which is provided with hinge fingers which extend outwardly beyond the end of the yoke member and then inwardly to the face plate.
member substantially U-shaped in cross-section and comprising parallel side walls connected adjacent their respective opposite ends by spaced yoke members, detachable means for securing said yoke members to said face plate in face-to-face relation therewith so that said operating lever extends into the space between said yoke members and so that said side walls extend substantially parallel to the path of movement of said operating lever, a locking bar disposed in aligned apertures in said side walls and extending across said channel in the path of movement of said operating lever, sealing means for preventing unauthorized removal of said locking bar, said guard member and said locking bar thereby preventing operation of said lever between said operating positions, a hinge plate secured to one of said yoke members by said detachable means, said hinge plate including a hinge-finger extending outwardly from said yoke member and inwardly to said face plate, and a hood-shaped cover member having an aperture in one end thereof cooperating with said hinge finger hingedly to mount said cover on said guard member for movement between open and closed positions, said cover member when closed entirely housing said guard member to render said detachable means inaccessible, said cover member having aligned apertures in the side walls thereof for receiving said locking bar, whereby said cover may be locked in said closed position to render said switch entirely tamper-proof, said operating lever then being accessible for operation only upon removal of said sealing means and said locking bar.

4. In an electric switch having a face plate and an operating lever extending through an aperture in the face plate for movement between a plurality of operating positions, the combination of a guard member for said operating lever provided with side walls on opposite sides of said lever, detachable means for securing said guard member to said face plate with said side walls extending substantially parallel with the path of movement of said operating lever, said detachable securing means requiring a tool for manipulation thereof to attach or detach said guard member, and said side walls being provided with apertures oppositely disposed with respect to each other, an enclosing member covering said detachable means and provided with apertures aligned with the apertures in said side walls, a bar disposed in said apertures in the path of movement of said operating lever, and locking means for preventing ready removal of said bar.

FRED G. VON HOORN.