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HANDLE FOR ENCLOSED ELECTRIC SWITCH INCLUDING
A LOCKING SLIDE FRICTIONALLY POSITIONED
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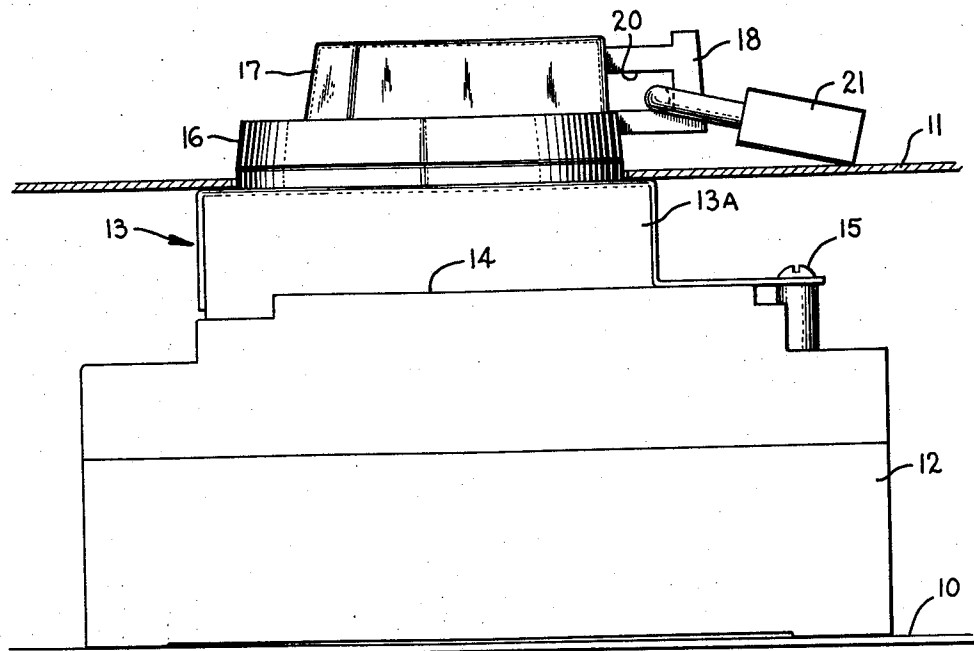


Fig. 1

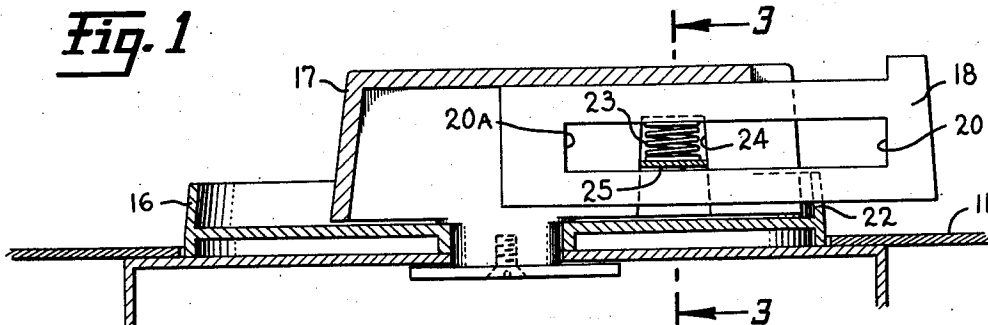


Fig. 2

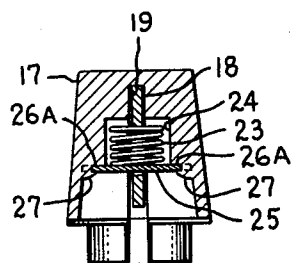


Fig. 3

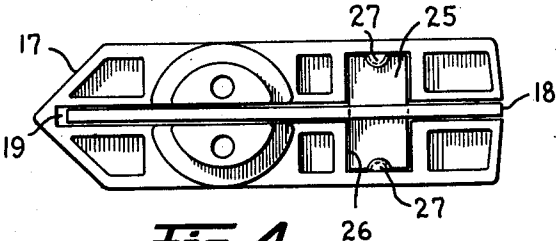
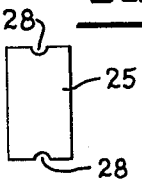


Fig. 4

Fig. 5



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HANDLE FOR ENCLOSED ELECTRIC SWITCH INCLUDING A LOCKING SLIDE FRICTIONALLY POSITIONED

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5 Claims. (Cl. 200-44)

My invention relates to electric switches and particularly to a handle construction for an enclosed electric switch.

Enclosed electric switches, consisting of an electric switch contained within an outer steel enclosure, of the type referred to herein, include operating handles carried by or projecting through a door or cover of the outer enclosure and operable from outside the enclosure. Such handles ordinarily include locking or interlocking means for maintaining the handle in predetermined desired positions. In accordance with one widely-used type of construction, such handles are provided with a locking slide which may be caused to project outwardly from the handle proper into a position in which it prevents movement of the handle, and in which position it may be locked such as by means of a padlock. Such handle locking slides, according to the prior art, have been spring biased to a position in which they do not interfere with ordinary operation of the switch. Such biasing, while it is convenient to permit normal operation of the switch, makes it difficult to withdraw the locking slide to locking position, and also to insert a locking device such as a padlock, since the slide whenever released will be moved by the biasing means to its retracted position.

It is an object of the present invention to provide an operating handle for an enclosed electric switch including a locking slide which will frictionally maintain any desired pre-set position.

It is another object of the present invention to provide a switch handle including a locking slide which is resiliently retained with respect to the handle so that accidental or random movement of the locking slide, such as by forces exerted on one or more padlocks inserted in the locking slide, will not damage or interfere with subsequent operation of the locking slide.

It is another object of the invention to provide such a construction which is inexpensive to manufacture and dependable in operation.

In accordance with the invention, a switch handle is provided including a handle body having an elongated cut or slot extending therein from one end and disposed and arranged to receive a blocking slide of flat sheet metal in edgewise relation. The locking slide has an elongated central opening through which one or more padlocks may be inserted when the slide is withdrawn from the handle. For the purpose of resiliently biasing the locking slide to frictionally retained engagement with respect to the handle, and also for providing a stop to limit outward movement of the locking slide, a trapped spring is provided extending at right angles to the direction of movement of the slide and retained in place by a retaining plate held in place by deforming portions of the handle proper. The arrangement is such that the biasing spring exerts a force on the locking slide pushing it upwardly into engagement with the bottom of the handle slot, thereby frictionally retaining the slide with respect to the handle.

The invention will be more fully understood from the following detailed description, and its scope will be pointed out in the appended claims.

In the drawings,

FIGURE 1 is a side elevation view of an enclosed electric switch incorporating the invention, portions of the outer enclosure being broken away;

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FIGURE 2 is a sectional view of the handle construction of FIGURE 1;

FIGURE 3 is a sectional view taken substantially on the line 3-3 of FIGURE 2;

FIGURE 4 is a bottom plan view of the handle of the invention, and

FIGURE 5 is a view of a spring retainer member of the handle assembly.

In the drawings, the invention is shown as incorporated in an enclosed electric control device comprising an enclosure 10 having an openable cover 11 and including an electric control device comprising an electric circuit breaker 12 having a casing of insulating material. While an electric circuit breaker is shown for purposes of illustration, it will be understood that the invention is equally usable with other types of electric control devices, such as electric switches. The control device 12 includes an operating handle, not shown, projecting from the top wall thereof. For the purpose of operating the handle of the control device, a mechanism, indicated generally at 13, is mounted on the top wall 14 of the control device 12 by suitable means such as by screws 15.

The operating mechanism 13 includes a metallic supporting pan 13A, supporting and enclosing the operating mechanism proper. A raised circular ridge or rim 16 is supported on the top of the plate 13A, and an elongated generally rectangular operating handle 17 is supported within the rim 16 for twisting or rotational movement. The operating handle 17 is movable between "on" and "off" positions as indicated in FIGURE 2, and includes an elongated flat locking slide 18, having an elongated central opening 20, which, when the slide is pulled out of the handle 17 is adapted to receive one or more padlocks such as 21.

The operating handle 17 is provided with an elongated centrally located slot 19 in which the slide 18 is closely but slidably received. When the slide 18 is withdrawn, as shown in FIGURE 2, it will be observed that the slide extends through a notch 22 in the guard ring 16, thereby preventing turning of the handle. In addition, as may be seen in FIGURE 2, when the slide is withdrawn from the handle 17, it overlies the cover 11 and prevents opening of the cover 11 when the handle is locked.

For the purpose of resiliently retaining the slide with respect to the handle 17 and limiting its outward movement therefrom, there is provided a compression spring 23 which is trapped in a generally cylindrical recess or hole 24 in the handle 17 by means of a retaining plate 25, as shown in FIGURES 3 and 4. As seen particularly in FIGURE 4, a generally rectangular recess 26 is provided in the handle 17 contiguous with the recess 24 and the slot 19.

Assembly is accomplished as follows. The compression spring 23 and retaining plate 25 are placed within the opening 20 of the slide 18. This combination is then inserted in the handle 17 so that the slide 18 enters the slot 19, the spring 23 enters the recess 24, and the retaining plate 25 enters the rectangular recess 26.

For the purpose of retaining the entire assembly in place in the handle, the recess 26 is provided with a pair of raised semi-circular ribs 27 in the opposite side walls, and the plate 25 is provided with correspondingly positioned notches 28 (see FIGURE 5). Following the insertion of the parts as described, the ribs 27 are deformed downwardly so as to extrude a portion of the metal thereof 17 over the plate 25, locking it in place. This also locks the spring 23 and the slide 18 in position.

It will be observed that the compression spring 23 in the complete device acts against the plate 25 at one end and against the slide 18 at its other end, pushing the slide 18 upwardly into engagement with the bottom wall of the slot 19. The opening 20 is preferably dimensioned

so that the upper edge of the slide 18 engages the bottom wall of the slot 19 before the bottom edge of the opening 20 engages the retaining plate 25. The slide 18 is thus resiliently maintained in parallel relation with the bottom wall of the slot 19.

When the retaining plate 25 is inserted in the recess 26, its motion is limited by the shoulders 26a which form the bottom of the rectangular recess 26.

It will be observed that outward movement of the slide 18 with respect to the handle 17 is limited by the retaining plate 25 which is engaged by the end wall 20a of the slot 20.

With this construction, the slide 18 frictionally retains itself in any pre-set position so that vibration or gravity is incapable of causing inadvertent movement of the slide. In addition, the absence of any bias on the slide 18 inwardly or outwardly of the handle 17 makes it easier to operate slide 18 since it is not necessary to work against such bias, and also simplifies the use of padlocks such as lock 21.

While only one form of the invention has been shown, it will be readily appreciated that many modifications thereof may be made, and it is therefore intended by the appended claims to cover all such modifications as fall within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An electric control device including a manually operable handle, said handle having an elongated slot cut lengthwise therein from one end, a locking slide member slidably retained in said slot, resilient spring means biasing said slide member against a wall of said slot, and means retaining said resilient spring means in position, said retaining means also acting as a stop means to limit outward motion of said locking slide.

2. An electric switch comprising a generally planar support member, an operating handle pivotally supported on said support member for rotation about an axis extending substantially perpendicular to said support member, an elongated locking slide member of flat sheet material slidably supported in said handle member and movable into and out of said handle member in a direction extending parallel to said planar support member, means frictionally retaining said locking slide member in said handle member and limiting motion of said slide member outwardly from said handle comprising an elongated opening in said locking slide, said opening being elongated in a direction parallel to said generally planar member, a retaining plate extending through said elongated opening transversely of said locking slide and fixedly supported with respect to said handle member, a compression spring having one end supported on said retaining plate and having its other end acting on said locking slide, whereby to bias said locking slide against the bottom wall of said slot in said handle, said retaining plate also serving to limit outward movement of said locking slide with respect to said handle.

3. An electric switch comprising a generally planar support member, an operating handle pivotally supported on said support member for rotation about an axis substantially perpendicular to said support member, an elongated locking slide supported in said handle member for movement between a retracted and extended position, said locking slide having a pair of opposed elongated spaced apart portions, a retaining plate fixedly mounted in said handle and extending transversely between said spaced apart portions, a compression spring having one end supported on said plate and the other end bearing on the opposite one of said spaced apart portions and biasing said locking slide against an elongated bearing surface of said handle.

4. An electric control device comprising a generally planar supporting surface, an operating handle mounted for rotation on said supporting surface on an axis extending substantially perpendicular thereto, a locking slide supported in said operating handle for slidable movement outwardly therefrom in a direction extending substantially parallel to said supporting surface, an opening in said locking slide, said opening being elongated in the direction of sliding movement of said locking slide, a supporting plate extending transversely of said opening and having its major planar surfaces substantially parallel to said supporting surface, means fixedly attaching said supporting plate to said operating handle whereby said plate is adapted to act as a stop for outward movement of said locking slide, and a compression spring between said supporting plate and said locking slide, said compression spring biasing said locking slide against a surface which is fixed with respect to said operating handle whereby said locking slide is frictionally retained in position against minor forces such as vibration or gravity against sliding movement with respect to said handle.

5. An electric switch comprising a support, an operating handle pivotally mounted on said support for rotation about an axis extending substantially perpendicular to said support, an elongated slot extending into said handle, a locking slide of relatively wide thin flat material slidably supported in said slot, said locking slide having an elongated opening therein, a compression spring within said handle, said compression spring being within said elongated opening in said slide, said compression spring exerting a force against said locking slide urging said locking slide against the bottom wall of said slot, said compression spring being supported by a generally planar retaining member extending transversely of said locking slide within said elongated opening, said retaining member being fixed with relation to said handle.

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