

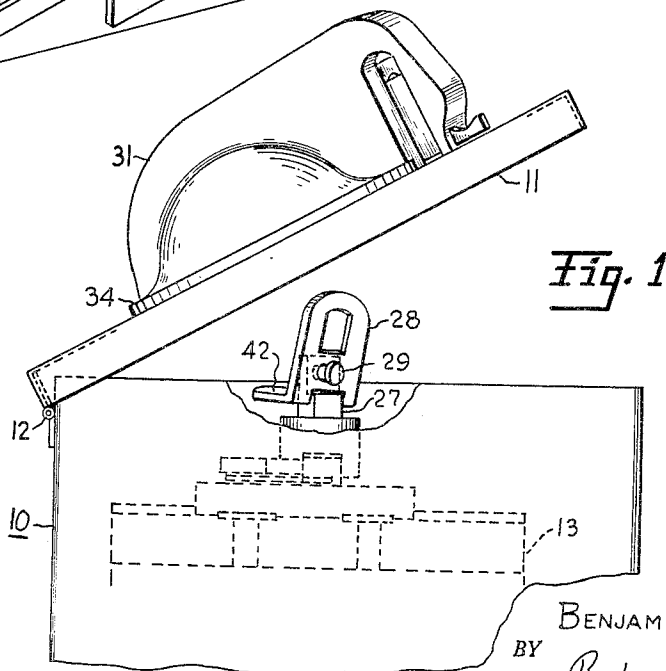
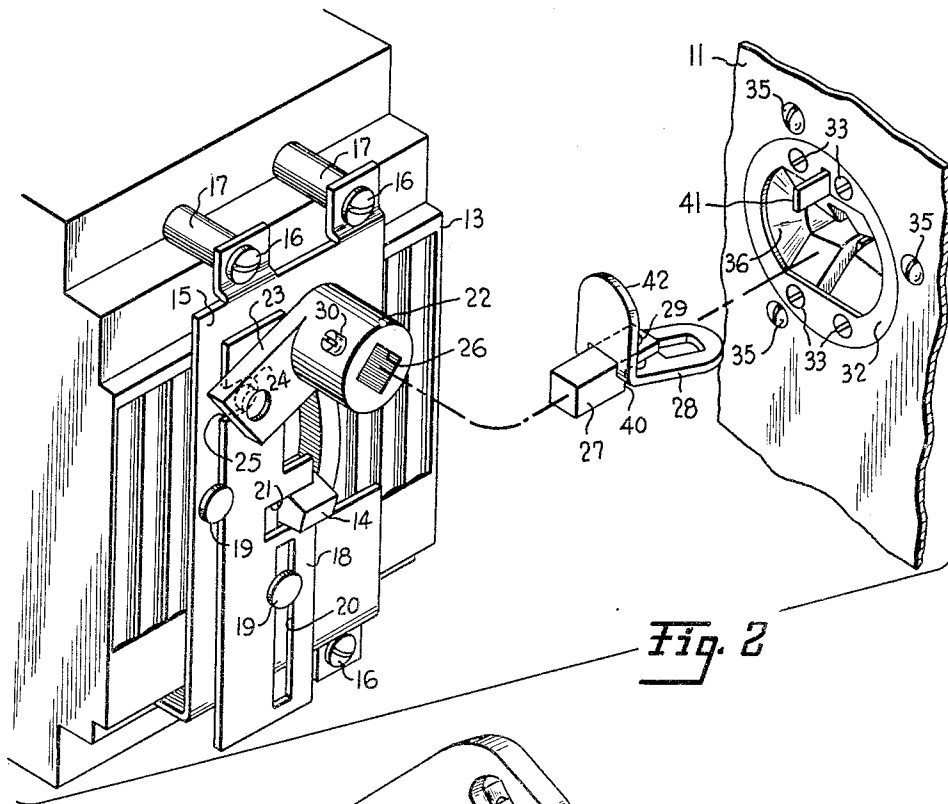
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2,961,501

ENCLOSED ELECTRIC SWITCH

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ENCLOSED ELECTRIC SWITCH

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2 Claims. (Cl. 200—50)

My invention relates to enclosed electric switches and particularly to operating means for such enclosed switches.

In accordance with the prior art, such for example as Patent No. 2,512,505, issued June 20, 1950 to R. N. Rowe, and assigned to the same assignee as the present invention, enclosed electric switches are commonly provided mounted in a metallic enclosure having an openable hinged cover. The electric switch contained within the enclosure has its own operating handle, and means is provided, carried by the cover of the enclosure, for operating the enclosed switch from outside without opening the cover.

In accordance with the construction provided in the aforementioned Rowe patent, an operating member is provided which is rotatably supported upon the enclosure cover and contains a recess which is adapted to fit over an operating shaft portion attached to the enclosed switch or circuit breaker. Since the cover of the switch moves on an arc about its hinges when opened and closed, while the operating member of the electric switch or circuit breaker projects perpendicularly from the back wall of the enclosure, difficulty is sometimes experienced in having the switch handle fit over the projected end of the operating member, causing breakage, etc. The problem is especially acute in switch constructions which are relatively small and in which the operating member of the enclosed switch is positioned relatively close to the hinge line of the cover.

It is an object of the present invention to provide an enclosed switch operating means which provides for the ready interengagement of a switch handle carried by an enclosure cover and an operating member contained within the enclosure and positioned relatively close to the hinge line of the cover.

It is another object of the invention to provide such a construction which will minimize the adverse effect of manufacturing errors and variances.

It is a further object of the invention to provide such an operating means which is low in cost and easy to manufacture.

In accordance with the invention, an enclosed switch assembly is provided comprising a generally rectangular enclosure and an electric switch mounted on the back wall of the enclosure and having an operating member projecting generally perpendicularly from the back wall thereof toward the open front wall. A hinged cover is provided for the enclosure, carrying a rotatable operating handle having a recess in the underside thereof registering with a corresponding aperture in the cover and adapted to fit over the operating member of the enclosed switch when the cover is closed. The invention further comprises the provision of a flexible portion on the outermost portion of the operating member which can readily adapt itself to the position of the operating handle during its intermediate portion of its movement as it moves toward closed circuit position and which, nevertheless, provides an effective interconnection between the operating

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handle and the operating member when the cover is closed.

The invention will be better understood by reference to the following detailed description and drawings and its scope will be pointed out particularly in the appended claims.

In the drawings:

Figure 1 is a partial side elevation view of an enclosed electric switch device incorporating the invention;

Figure 2 is an exploded perspective view showing portions of the electric switch of Figure 1.

In the drawings, the invention is shown as incorporated in an enclosed electric control device comprising a generally rectangular metallic enclosure or box 10 having a cover 11 hinged thereto by suitable hinges 12 along one side. An electric circuit control device comprising an electric circuit breaker 13 is mounted in the enclosure on the back wall thereof by suitable means, not shown, and includes an actuating handle 14 which is movable reciprocally in an arc between "off" and "on" positions in conventional manner. Operating mechanism is mounted on the casing of the circuit breaker 13 to permit operation of the actuating handle 14 by rotational movement, and comprises a supporting plate 15 mounted on the enclosing casing of the circuit breaker 13 by suitable means such as by bolts 16 and spacers 17. The plate 15 has slidably mounted thereon a plate 18 which is guided for reciprocating movement by means of headed guide members 19, one of which engages the edge portion of the sliding plate 18 and the other of which engages edge portions of an elongated aperture 20 in the plate 18. The plate 18 also includes a slot 21 disposed to receive a portion of the actuating handle 14 to cause actuation of this handle upon reciprocation of the sliding plate 18.

A rotatable member 22 is also supported on the plate 15 and has an extension 23 carrying a pin 24 which engages a slot 25 in the sliding plate 18 to cause reciprocation of the plate 18 upon movement of the rotatable member 22. The rotatable member 22 also includes a non-circular axial opening 26 in the end portion thereof adapted to receive a short shaft 27. The shaft 27 has a shoulder 40 at its outer end, upon which there is loosely supported an L-shaped extension 28, retained thereon by means of a rivet 29 fixedly carried by the extension 28. The shaft 27 is retained in the rotatable member 22 by suitable means such as by a set screw 30.

The cover 11 of the enclosure is provided with an operating handle 31 which is rotatably supported in a circular aperture in the cover 11, being retained thereon by means of a retaining plate 32 attached to the insulating portion of the handle by suitable means such as by screws 33, the plate 32 acting as an enlarged flange preventing the withdrawal of the operating handle 31 through the aperture in the cover. The operating handle 31 also includes a cam plate 34 mounted on the outer surface of the cover by means of screws 35, see Figure 1, having their head portions on the inner side of the cover.

The detailed construction of the operating handle 31 as regards interlocking functions and lockable functions may be of any suitable conventional type. For convenience, a construction has been shown similar to that shown in the above mentioned Rowe Patent 2,512,505. The operating handle 31 also includes a tapered recess 36 in the inner side thereof, registering with the opening in the cover 11, and adapted to fit over the outer portion of the extension 28. While the recess 36 is tapered at its outer extremity portion, it is dimensioned to fit relatively closely over the operating member 28 at its inner portion. The handle 31 also includes a projection 41 adapted to engage and be depressed by portion 42 of the extension 28.

In accordance with the present invention, the operating

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portion 28 of the operating member is loosely mounted upon the shaft 27 and readily adjusts itself to the changes in angle of the operating handle as the cover is opened or closed. Although the handle 31 assumes various rotational positions and although the cover 11 is opened or closed when the switch handle is in the "on" or the "off" position, the outer portion 28 of the operating member always adjusts itself to the recess 36 without damage to the parts. It has also been determined that the loose mounting of the extension 28 makes it possible to hinge the cover 11 on any side of the enclosure 10 desired, without causing interference between the extension 28 and the handle 31.

While I have disclosed only one particular embodiment of my invention, it will be readily appreciated that many modifications thereof may be made by those skilled in the art and I, therefore, intend 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 enclosed electric switch comprising a generally rectangular metallic enclosure having a back wall and an open front wall, an electric control device mounted in said enclosure and having an operating member projecting toward said open front wall, a cover for said enclosure hingedly supported on a side wall thereof and disposed to close said open front wall, a rotatable handle member supported in an aperture in said cover and having a tapered recess in the inner surface thereof adapted to

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fit over the outer portion of said operating member when said cover is closed, said recess comprising a generally rectangular straight walled inner portion and a generally V-shaped tapered wall outer portion, said operating member comprising a shaft portion extending generally perpendicular to the back wall of said enclosure, said operating shaft having a shoulder portion thereon, a generally L-shaped extension on said operating shaft of sheet metallic material having an aperture therein fitting over the outer portion of said operating shaft, means loosely retaining said L-shaped operating extension on said shaft comprising a headed stud passing through said L-shaped extension and permitting relative movement of said L-shaped extension to said shaft whereby said L-shaped extension is pivotally movable to a limited extent in an arc extending in a plane generally perpendicular to the back wall of said enclosure.

2. An enclosed electric switch as set forth in claim 1 wherein said handle member also includes a projection adjacent said recess and disposed and arranged to engage a portion of said L-shaped extension as said cover is closed.

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