April 19, 1932. H. J. HAMMERLY 1,854,404

ELECTRIC SWITCH

Filed March 11, 1931

Fig. 1.

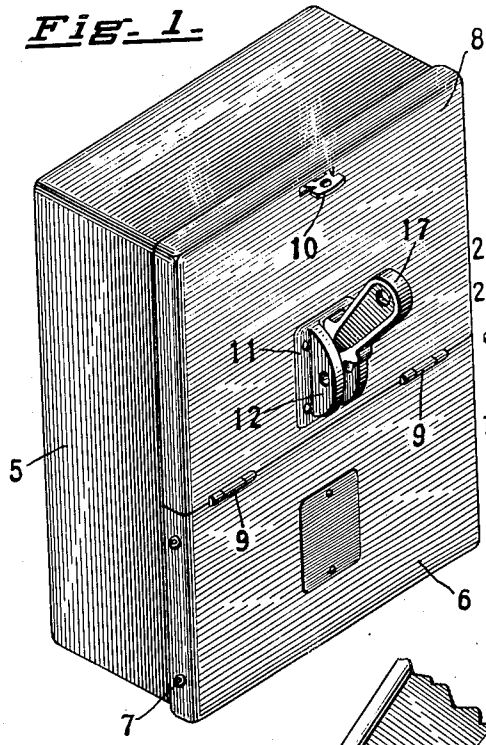


Fig. 2.

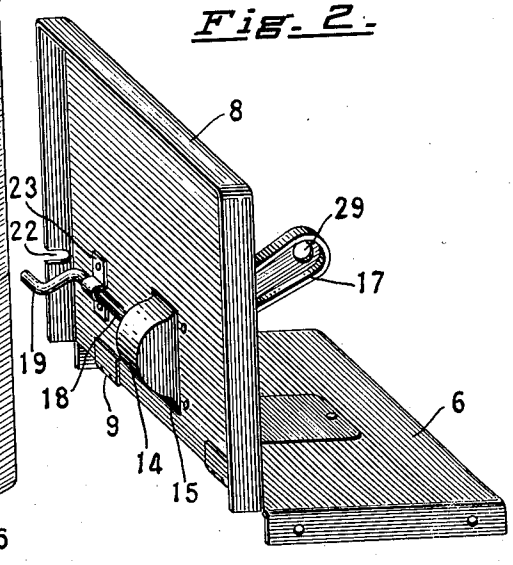


Fig. 3.

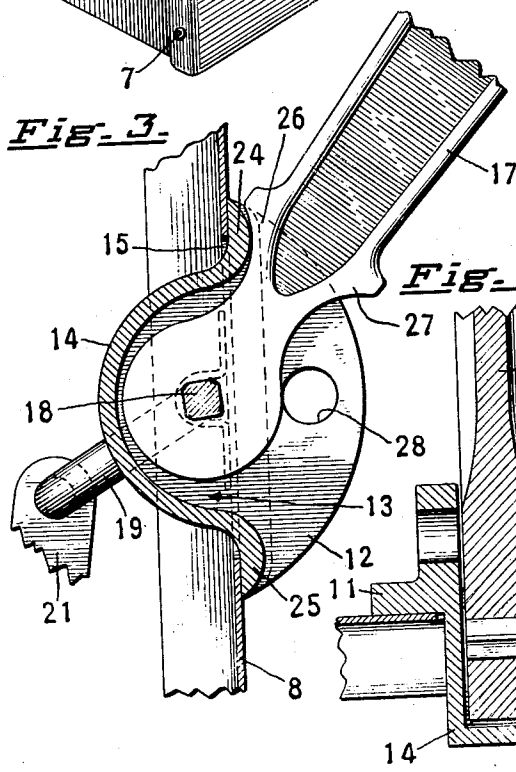
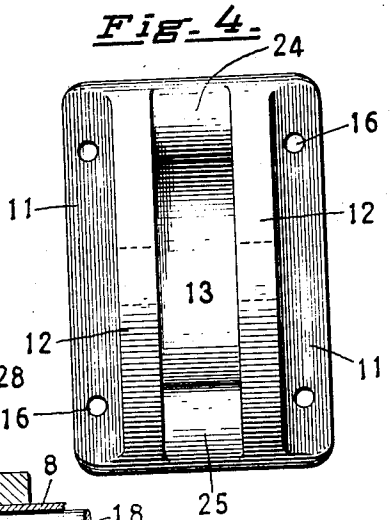


Fig. 5.

Fig. 4.



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1,854,404

UNITED STATES PATENT OFFICE

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ELECTRIC SWITCH

Application filed March 11, 1931. Serial No. 521,709.

My invention relates to enclosed electric switches and in particular to the means for manually operating the same by means of an external handle.

It is highly important that the interior mechanism and contacts of enclosed switches be protected from the entrance of dust or insects and that there shall be no openings in the enclosing box to allow the escape of gas or flame in the event of a short circuit or the blowing of a fuse within the box.

It is desirable that the operating handle for this class of switch shall be mounted on the front of the box cover where it is freely accessible for manual operation and where there can be no doubt as to its connection with the switch within the box as is sometimes the case where a number of side-handle operated switches are mounted adjacent to each other.

Is is desirable that the operating handle shall be amply rugged and substantial in proportions and provided with rigid stops in order that the operator may vigorously throw the switch to its "on" and "off" positions without fear of straining or injuring any part of the construction.

It is also desirable that the operating handle shall be so connected with the switch throwing mechanism that there will be no strain on the box parts or tendency to force the cover open in the operating movements of the handle.

For convenience in connecting the wires to the switch terminals, in instances where the handle is positioned at the front of the switch box, it is desirable that the handle shall have a readily detachable connection with the switch operating mechanism in order that the handle and the entire cover may be removed.

In constructions which include a hinged cover for the box, it is desirable that the handle be mounted on the cover and so connected with the switch throwing mechanism that the cover may be opened and carry the handle with it without disturbing any of the connections between the handle and the switch throwing mechanism.

An important requirement of a front projecting operating handle is that it shall be so arranged with respect to the interior switch mechanism that its projecting end will lay as close as possible to the plane of the box cover in both its "on" and "off" positions in order to provide the maximum passage space between the handle and any panel board or other structure that may be positioned in front of the switch. This feature is also important with respect to packing and shipping the switches.

It is further desirable that a switch operating handle shall be provided with means for operating the switch by means of a hook or pole when the switch is mounted horizontally on a ceiling or on a high side wall and it is very important that means shall be provided for locking the switch in the "on" or "off" positions with one or more padlocks in order to protect electricians who may be working in any way on the same circuit.

The object of my invention is to provide a construction in which the forementioned desirable features are combined in a rugged and practical manner.

The invention relates particularly to the type of switches illustrated in my co-pending application No. 519,329 filed March 2, 1931 and in my application No. 519,328 filed March 2, 1931.

As the invention relates to the box and the actuating handle it will be unnecessary to illustrate and describe the switch mechanism although details of one form of switch actuating mechanism will be found in said application.

In its preferred form the box is provided with a cover formed in two parts, one of which is secured or fixed to the box and adapted to cover the switch mechanism per se. The upper part of the cover is hinged to the lower part and carries the actuating handle. The fuses (not shown) are adapted to be mounted in the upper part of the box. The handle is mounted in a socket secured to the hinged part of the cover and connected to a rock shaft on the inside, and the shaft is in turn connected to the switch actuating mechanism.

Fig. 1 is a perspective view of a construction embodying my invention.

Fig. 2 is a perspective view of the cover separate from the box.

Fig. 3 is an enlarged vertical sectional view showing a fragment of the handle and the supporting socket and cover.

Fig. 4 is a front view of the socket member.

Fig. 5 is a cross sectional view showing the handle and its mounting.

The box 5 may be of any suitable type usually of sheet metal and provided with a cover formed of two parts. The lower part 6 is secured to the box by a number of screws 7 and the upper part 8 is hinged at 9 to the lower part so that it can be swung down to permit access to the fuse receiving portion of the box. A spring latch 10 is preferably provided to engage the upper edge of the cover and this may be sealed or locked as is customary.

The socket member is provided with side flanges 11 and outstanding ribs 12—12 between which is a recess 13. This recess is closed at the rear by a wall 14 which projects through an opening 15 in the cover. This socket may be secured in place by rivets extending, for instance, through holes 16 and through the cover. A handle 17 is mounted on a shaft 18 which extends into the recess 13 and by which the shaft is rotated. This shaft has an offset crank 19 adapted to be detachably inserted in the end 21 of a link connected to the switch actuating mechanism (not shown). One flange of the cover may be notched at 22 to permit the shaft to be inserted through the side of the socket into the inner end of the handle. An additional bearing 23 may be provided for the shaft if desired.

The socket member is provided with shoulders 24 and 25 adapted to serve as abutments for the shoulders 26 and 27 of the handle when throwing the switch into the "on" or "off" position.

The side walls 12 are preferably provided with one or more openings such as 28 to permit the insertion of one or more padlocks or other form of sealing device for locking the switch in either the off or open circuit position when so desired.

The handle itself is preferably provided with an opening 29 to facilitate the operation of the switch by means of a hook or other implement.

The socket is preferably formed of a one piece metal casting. The socket not only affords an adequate support for the actuating handle but it effectively prevents the entrance of dirt or insects into the switch case and also is free of openings through which sparks or flame might pass when the switch is opened or when the fuses blow.

By removing the screws 7 the lower half of the cover may be raised for the purpose of inspecting the switch per se and by releasing the latch 10 the cover may be removed so that the entire switch mechanism may be inspected without disturbing the switch itself or any of the connections or the switch may be readily removed if desired.

I claim:

1. In a switch, a box, a cover for said box, a handle construction secured to said cover and including a socket extending through the cover with and having laterally projecting flanges at the edges of the socket, a handle in said socket and a crank shaft secured inside of the cover and connected to said handle through a wall of said socket to form a pivotal mounting for said handle.

2. In a switch, a box, a cover for said box formed in two parts, one of which is hinged to the other and one of which is movable, a handle construction secured to the movable part of said cover and including a socket having a recess and extending through a part of the cover, a handle in said recess and a crank shaft secured inside of the cover and connected to said handle through a wall of said socket to form a pivotal mounting for said handle.

3. In a switch, a box, a cover for said box, a handle construction secured to the cover and including a socket having a recess and extending through the cover and having a laterally projecting surrounding flange, a handle in said recess and a crank shaft secured inside of the cover and connected to said handle through a wall of said socket to form a hinge joint for said handle.

4. In a switch, a box, a cover for said box, a handle construction secured to said cover and including a socket extending through an opening in the cover and having laterally projecting flanges for overstanding the edges of the opening and a handle hinged in said socket, said socket having projecting flanges perforated to receive locking means for said handle.

5. In a switch, a box having a cover formed in two parts, one part of which is hinged to the other part, and a handle construction secured to one of the cover parts and including a socket extending through one part of the cover and a handle hinged in said socket.

6. In a switch, a box, a cover for said box and having a flange, a handle construction secured to the cover and including a socket extending through a part of the cover and a handle hinged in said socket and having a crank shaft secured inside of the cover and connected to said handle through a wall of said socket, said flange having a slot and said crank shaft being removable through said slot.

7. In a switch, a cover and a handle construction secured to it and including a socket extending through the cover with flanges at the edges of the socket and a handle hinged in

said socket and having a crank shaft secured inside of the cover and connected to said handle through said socket.

8. In a switch, a box having a cover formed in two parts, one of which is hinged to the other, and a handle construction secured to the movable part and including a socket extending through a part of the cover and a handle hinged in said socket and having a crank shaft secured inside of the cover and connected to said handle through said socket.

9. In a switch, a cover having a flange and a handle construction secured to the cover and including a socket extending through a part of the cover and having a surrounding flange and a handle hinged in said socket and having a crank shaft secured inside of the cover and connected to said handle through said socket.

10. In a switch, a cover and a handle construction secured to it and including a socket extending through an opening in the cover and with flanges overstanding the edges of the opening and a handle hinged in said socket, said socket having projecting flanges perforated to receive locking means for the handle.

11. In a switch, a box having a cover formed in the two parts, the upper part of which is hinged to the lower part, and a handle construction secured to the upper part and including a socket extending through the upper part of the cover and a handle hinged in said socket.

12. In a switch, a cover having a flange and a handle construction secured to the cover and including a socket extending through a part of the cover and a handle hinged in said socket and having a crank shaft secured inside of the cover and connected to said handle through said socket, said flange having a slot and said crank shaft being removable through said slot.

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