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2,041,685

SWITCH BOX

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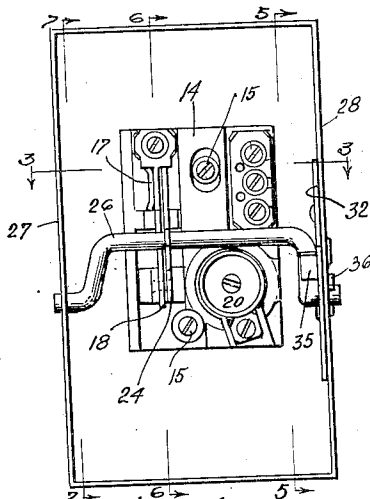


Fig. 4.

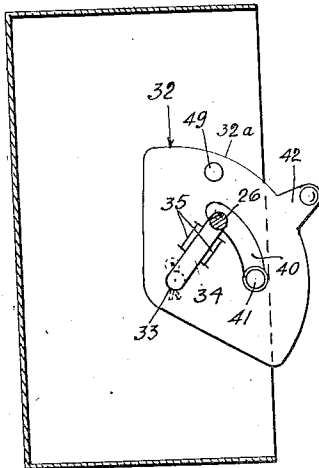


Fig. 5.

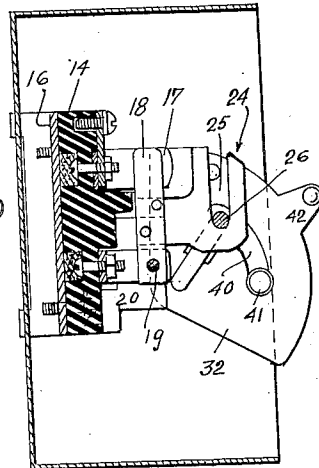


Fig. 6.

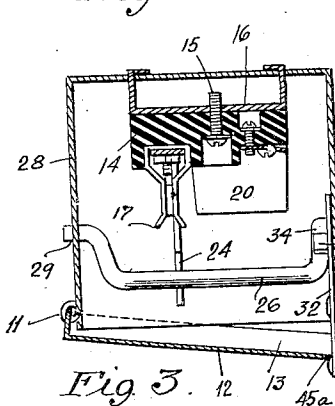


Fig. 3.

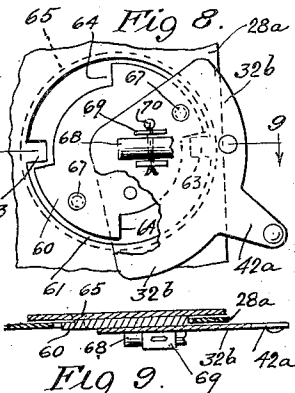


Fig. 8.

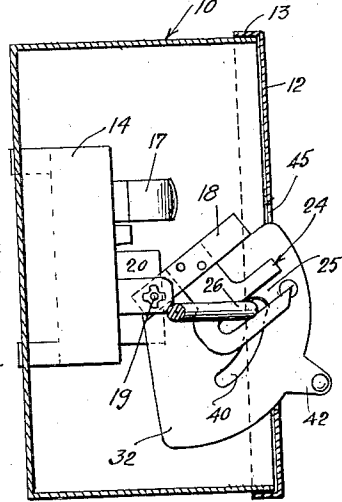


Fig. 7.

Fig. 1.

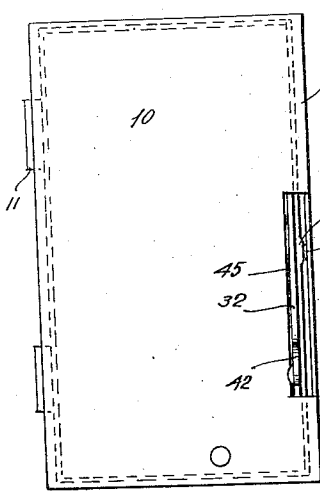
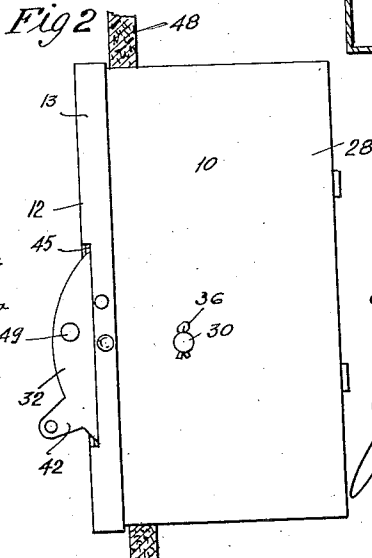


Fig. 2.



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UNITED STATES PATENT OFFICE

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SWITCH BOX

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1 Claim. (Cl. 200—168)

This invention has reference to enclosed electric switches such as are used in service wires on consumers' premises, and the invention will be described with this typical use in view but without implied limitation thereto as the invention will be understood to be applicable to many other situations.

Such devices consist generally of a sheet metal box having a hinged door, and an electrical switch mounted inside the box and adapted to be operated by means of some manual member extending through a wall of the box, so that the switch can be operated with the switch box door closed. These boxes are adapted to be mounted on a wall at a suitable location on the consumers' premises. In a prior type of box the manual switch operating member extends through a side wall of the box, thereby precluding the possibility of setting the box back into a plaster or other wall. It is frequently desirable, however, to set the box back into the wall, and attempts have accordingly been made to provide suitable switch operating mechanisms that can be operated from the front of the box. This necessitates a slot in the hinged box door through which a forwardly extending switch operating member may project, and if the door is to swing from one side of the box, as is preferable, this door slot must be of sufficient width that the slot edges will clear such a manual member when the door is swung open. It is, however, a requirement of the Underwriter's standards that open slots will not be permitted. The difficulty mentioned is sometimes avoided by swinging the door from the top or bottom of the box, in which instance the vertically extending door slot need not of course be of a width considerably greater than that of the switch operating member; but it is highly desirable that the door swing from the side of the box whenever possible, since a door swung from the bottom is liable to fall and hang open if not tightly closed, and a door swung from the top must be braced in its upper position in order to work on the interior of the box.

It is accordingly an object of my invention to provide a simple and inexpensive switch box and switch operating mechanism that is operable from the front of the box, so that the box may be embedded as deeply as desired into a plaster wall, and that is provided with a door which swings from one side of the box but which has no open slot of a width objectionable under underwriters requirements.

The present invention will best be understood without further preliminary discussion from the following detailed description of a present pre-

ferred embodiment thereof, reference for this purpose being had to the accompanying drawing, in which:

Fig. 1 is a front elevation of the switch box with the door closed;

Fig. 2 is a side elevation of the switch box showing it imbedded in a plastered wall;

Fig. 3 is a section taken on line 3—3 of Fig. 4;

Fig. 4 is a front elevation of the switch box with the hinged door open;

Fig. 5 is a vertical section taken on line 5—5 of Fig. 4;

Fig. 6 is a vertical section taken on line 6—6 of Fig. 4;

Fig. 7 is a section taken on line 7—7 of Fig. 15, the switch however being moved to open position;

Fig. 8 is a fragmentary view showing a modified mounting for the manual switch operating member; and

Fig. 9 is a section on line 9—9 of Fig. 8.

In the drawing numeral 10 designates generally the switch box, which may be formed as usual of sheet metal, said box having hinged at one vertical edge, at as 11, a front door 12. Door 12 has flanges 13 that fit over the edges of the box, as shown. A door catch may be provided by pressing out engageable projections 12a and 12a on the box side wall and the door flange, respectively. A porcelain switch base 14 is shown fastened by screws 15 to a platform 16 mounted on the rear wall of the box. This switch has spring contacts 17 and a switch blade 18 pivoted at 19 below contacts 17 so as to swing upwardly to engage said contacts, and to swing downwardly to open position (Figs. 6 and 7). The switch base is also shown with a fuse socket 20 and with the usual electrical terminals which will not be necessary to describe.

For operation of the switch blade there is fastened thereto an insulated, hook-like member 24 having a slot 25 that extends substantially parallel to the direction of switch blade 18. Engaging in this slot is a crank member 26, opposite pivot ends of which are mounted to rotate in the two sides 27 and 28 of the box, as shown at 29 and 30.

The novel means which I provide for moving the switch operating crank from the front of the box are embodied, in my preferred construction, as follows. Mounted flush against the inside surface of the box wall 28, on the side opposite door hinge 11, is a sector shaped plate 32. This plate has a hole 33 which takes the outwardly projecting pivot end of the crank shaft, and the

arm portion 34 of the crank shaft comes against the inner surface of the plate 32 and is taken between a pair of lugs 35 projecting therefrom. To retain the crank shaft in proper position relative to plate 32 its corresponding end may be provided with a cotter pin 36 just outside the side of the box. Thus plate 32 is mounted for rotative movement on the axis of the journalled ends of the crank shaft, and operatively engages an arm of the crank shaft to cause said shaft to rotate with it.

Plate 32 is formed with an arcuate slot 40 which receives a stud 41 carried by the side of the box, this slot and stud limiting rotative movement of the plate. The outer edge 32a of plate 32 is formed on an arc about its mounting on the pivoted crank shaft end as a center, and the radius of said arc is such that the arcuate edge of the plate projects somewhat forwardly of the front surface of the box, as shown. At substantially the center of this curved edge 32a the plate is provided with a projecting finger piece 42 by which the switch is operated.

It will be obvious that movement of switch operating member 32 between the upper and lower positions shown respectively in Figs. 6 and 7, operates the crank to switch blade 18 between closed and open positions.

The front door 12 of the box is provided at its swinging edge with a vertical slot 45, of just sufficient width to clear operating member 32 as the door is swung closed (see Fig. 3). The inner edge 45a of the door slot approaches plate 32 comparatively closely when the door is in closed position, clearance being allowed only sufficient for manufacturing tolerances. It will be seen that when the door is in closed position, the slot "overlaps" or extends outwardly beyond the side wall of the box (Fig. 1), the door flange 13 at the edge of the box being spaced from the box side wall. The length of door slot 45 is just sufficient to take the arcuate plate 32. It will be obvious that by this construction the switch operating member or plate 32 substantially fills that portion of the door slot that opens into the interior of the box in all positions of plate 32, the small clearance tolerance allowed between said plate and the inner edge of the slot not being sufficient to be objectionable under underwriter's standards.

The switch box as now described is capable of being set well back into a wall, and in Fig. 2 is shown set back into a plaster wall 48. No difficulty arises if the projecting crank shaft ends 29 and 30 should happen to be imbedded in the plaster wall, as they easily free themselves when the switch is operated.

As a means for locking the switch in open position, the plate 32 is provided with a hole 49 (see Figs. 2 and 5), in which a padlock may engage, said hole being so located that it is outside the box only when the switch is in open position. Thus it will be understood that when the switch is

padlocked the member 32 cannot be thrown to the positions of Figs. 5 and 6 to close the switch.

In Figs. 8 and 9 I have illustrated a variational form of switch operating member. The arcuate switch operating member is here designated at 32b, and its finger piece at 42a. This member 32b works adjacent the side wall 28a of the box, and the switch box door closes over it, in the same manner as does the plate 32 of the other form, but the mounting of plate 32a and its connection with the crank shaft 26 are modified. Plate 32b is fastened to a disk 60 that works in a round opening 61 in the box side wall 28a. Wall 28a has diametrically opposed lugs 63 extending inwardly in opening 61, and disk 60 is cut away on its two opposite sides as at 64 to provide a limited working space for lugs 63 as the disk rotates. On the outside of disk 60 is a disk 65, of a diameter just larger than opening 61, and plate 32b, disk 60 and disk 65 are fastened together as by rivets 67. The inner disk 60 is made of slightly thicker material than is the wall of the box to give free rotation of the assembly—for instance, the box may be of 16 gauge material and the disk of 18 gauge material. It will be readily understood how the assembly rotates in the side wall of the box, and how engagement of the ends of the cut out portions 64 of disk 60 limits rotation of the assembly to the angle desired. The arm 68 of crank shaft 26 is in this case taken between lugs 69 of plate 32b and is fastened therein as by means of a cotter pin 70.

It will now be understood that I have provided a simple, inexpensive switch box which is operable from the front, so that the box may be set back into a wall, and which has a door arranged to swing from one vertical side of the box and provided along its swinging edge with a novelly arranged door slot adapted to take the forwardly projecting switch operating member which is pivoted adjacent the side of the box opposite the side at which the door is hinged, that portion of the door slot which opens into the box interior being substantially filled by the switch operating member, and the remainder of the slot overlapping the side of the box.

I claim:

A switch comprising a box having parallel side walls, a movable switch operating member within the box adjacent the inside surface of one of said walls, said member projecting forwardly of the front plane of the box, and a door hinged to the opposite side wall of the box, said door having a slot in its free edge of a width sufficient to pass the switch operating member as the door is swung closed, the inner edge of said slot being so disposed as to approach comparatively closely to the inside surface of the switch operating member when the door is closed, and the excess width of the slot on the opposite side of the switch operating member overlapping the side wall of the box when the door is closed.

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