

May 7, 1940.

T. BIRKENMAIER

2,199,908

FUSE SWITCH

Filed March 5, 1934

2 Sheets-Sheet 1

FIG. 1.

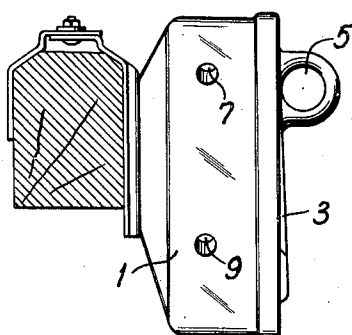


FIG. 2.

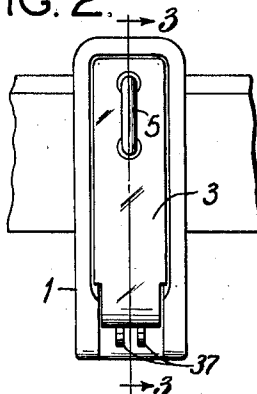


FIG. 5.

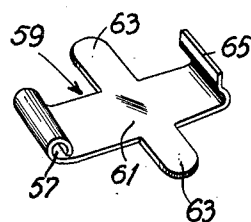


FIG. 3.

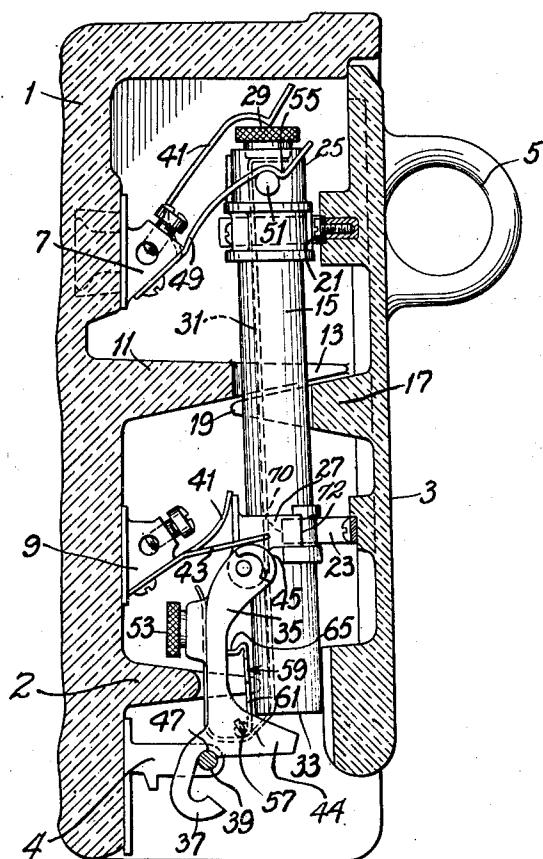
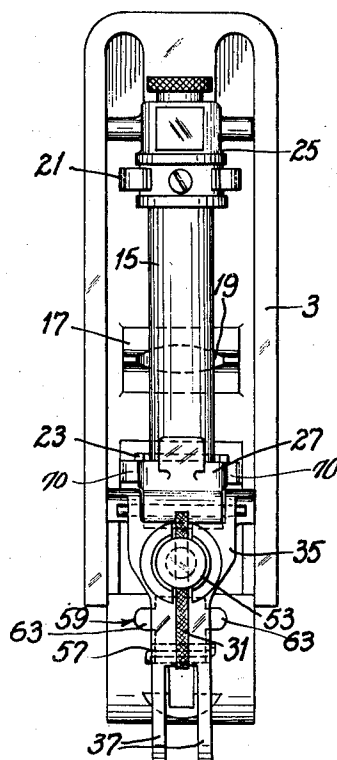


FIG. 4.



Theodore Birkenmaier,
Inventor.
Delos S. Haynes.
attorney.

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FIG. 6.

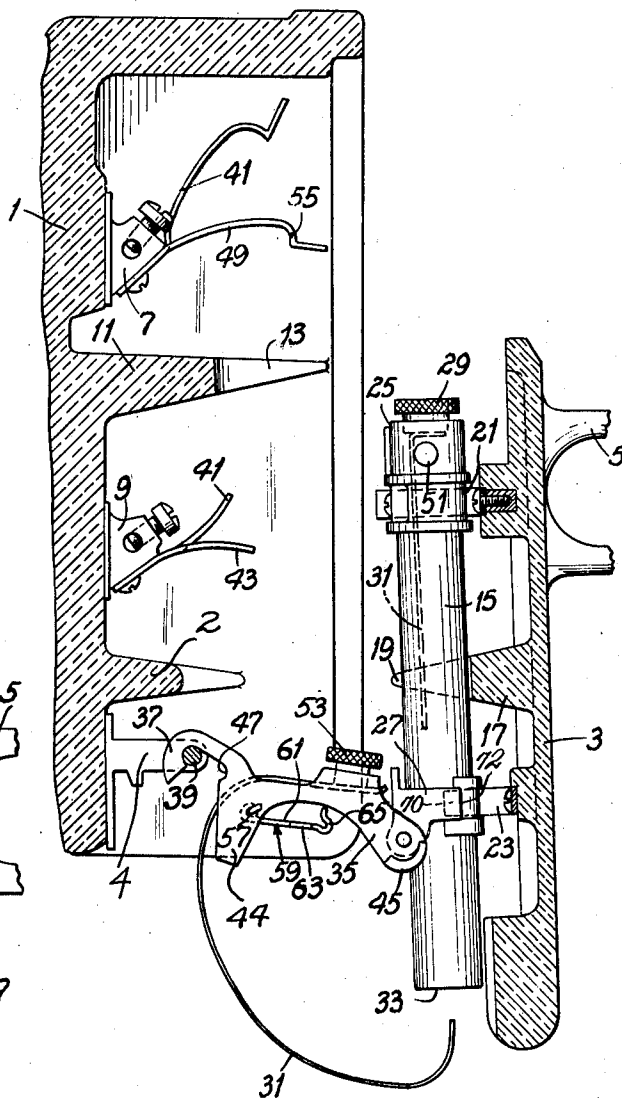
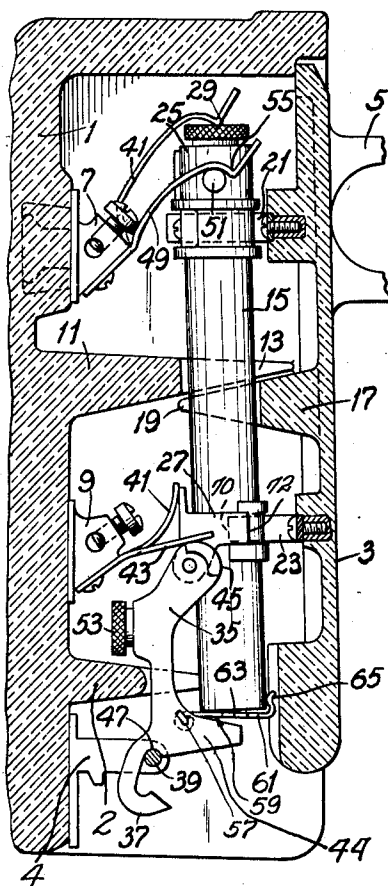


FIG. 7.



Theodore Birkenmaier,
Inventor.
Delos S. Haynes,
Attorney.

UNITED STATES PATENT OFFICE

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FUSE SWITCH

Theodore Birkenmaier, St. Louis, Mo., assignor to
W. N. Matthews Corporation, St. Louis, Mo., a
corporation of Missouri

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5 Claims. (Cl. 200—114)

This invention relates to fuse switches, and with regard to certain more specific features, to a collapsible type of fuse switch.

Among the several objects of the invention may be noted the provision of a collapsible type of fuse switch wherein a fuse cartridge is attached to a door of a fuse carrying box; the provision of apparatus of this class wherein arrangement is made whereby said door may be maintained in a closed position, even though the cartridge is not in operative condition, thereby preventing deleterious weathering and the like; the provision of apparatus of the class described wherein the otherwise open-end fuse cartridge is closed during non-use; and the provision of apparatus of this class which is simple in construction and reliable in operation. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structures hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which is illustrated one of various possible embodiments of the invention:

Fig. 1 is a side elevation showing the device as a whole;

Fig. 2 is a front elevation taken from the right of Fig. 1;

Fig. 3 is a vertical section taken through the apparatus showing a closed door and a fused cartridge;

Fig. 4 is an inside view of a door, showing a fuse cartridge attached thereto, the same being viewed from the left in Fig. 3;

Fig. 5 is a perspective detail of a latch;

Fig. 6 is a view similar to Fig. 3 showing a released position of parts; and,

Fig. 7 is a view similar to Fig. 3 showing the arrangement of parts wherein the fuse cartridge is arranged for non-use and wherein the door of the device is shown in closed position.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring now more particularly to Fig. 1, there is shown at numeral 1 a box composed of insulating material such as porcelain with which is adapted to cooperate a non-hinged door 3, the latter also being composed of insulating material although not necessarily of the same material as the box 1. An eye 5 on the door permits the

application of a line tool or the fingers for making a closure or opening of the door.

Within the box 1 are line terminals 7 and 9 separated by a septum 11 having a saddle portion 13 for receiving therein the shank of a tubular cartridge 15. The door 3 has a similar septum 17 having a saddle 19. The septums 11 and 17 are adjacent one another when the door of the box is closed on the box and form a complete barrier.

The cartridge 15 is held to the door 3 by means of spring clips 21 and 23, the former attaching to the upper terminal engaging element 25 of the cartridge 15 and the latter to a lower terminal engaging element 27. The clips 21 and 23, as indicated in the drawings, are of the class which hold by friction, thus making the cartridge removable from the door without special tools. The outer, crimped ends 10 of the lower clip 23, in holding position, rest behind shoulders 72 in the terminal-engaging element 27. Clamping means 29 is provided for holding one end of a fuse link 31 at the upper end of the cartridge 15, said link 31 passing out of the open lower end 33 of the cartridge.

In order to hold the lower end of the link 31, there is hinged to the terminal engaging element 27, a sideward leg 35 which is downwardly formed as a pair of hooks 37. The hooks 37 pivotally engage a pin 39 which is attached to the back of said box 1 by means of an anchor 4. The hooks 37 are so formed that, not only is hinging possible, but a lateral lost motion is also possible, as will be shown. A barrier 2 is provided above the anchor 4. The anchor 4 also forms a stop against which ears 44 subsequently strike.

Spring clips 41 on the line terminals 7 and 9 swingingly engage the respective terminal engaging elements 25 and 27. A spring leaf 43 on the lower terminal 9 also presses against ears 45 on said leg 35, to normally press said leg so that the upper end 47 of the hook 37 is forced against the pivot pin 39, that is, when the device is in closed position. At this time a leaf spring 49 is also engaged and sprung upwardly by gudgeons 51 on the upper terminal engaging element 25.

In order to prevent the leg 35 from rotating with respect to the cartridge 15, under the above conditions, the lower end of the fuse 31 is threaded between the pair of hooks 37 and ears 44 as shown in Figure 4 and under a clamp screw 53 on said leg 35. By clamping the fuse 31 with a slight tension, the downward pressure effected by the leaves 43 and 49 maintains the member 35 in a rigid condition with respect to the car-

tridge 15. The position of the parts are then as shown in Figure 3. It will be noted that the fuse cartridge in effect carries the door and holds it in such a position that the otherwise open front of the box 1 is closed against weathering and the like.

When the fuse 31 blows, that tension which theretofore held the leg 35 in the position adjacent cartridge 15, disappears, and hence the cartridge 15 and the leg 35 are free to assume the alternate angular positions shown in Figure 6, the leaf springs 49 and 43 having resulted in the projection of the cartridge downwardly as shown. The cartridge having the door 3 fastened thereto, takes the door with it. The final position assumed by the parts is not that shown in Figure 6, these moving until they hang with the ears 44 against the anchor 4. A lineman on the ground, seeing the cartridge and the door hanging from the box, is immediately made aware of the fact that the fuse has blown. He may then unhook the leg 35 from the pin 39, re-fuse the cartridge, thereby bringing the leg toward the cartridge, and apply the cartridge-door unit to the initial position shown in Figure 3, thereby re-fusing the line. It will be noted in this connection that an indentation 55 in the upper leaf spring 49 prevents the gudgeons 51 from moving forwardly when in connected position.

It will be seen from the above that without further construction, it would be impossible to hold the door in closed position unless the device were fused. However, it is sometimes desirable to temporarily leave an unfused box on the pole or the like, as when a customer's line is open for a period, but under such circumstances, it is not desirable that the door be off of the box or even open. That is to say, it is desirable that the "dead" box have a closed door.

In order to accomplish the ends set forth in the paragraph above, I pivot at point 57 on the legs 35, a latch 59 having the shape shown in Fig. 5. This latch consists in the hinged portion 57, a central closure portion 61, ears 63 by means of which it may be manipulated, and a spring clip 65 adapted to engage the end of the cartridge as shown in Figure 7.

When not in use the clip 59 is folded up between the cartridge and leg 35 as shown in Figures 3, 4 and 6; whereas when it is in use, it is placed in the position as shown in Figure 7 wherein it, instead of the fuse link, serves the function of holding the leg 35 toward the cartridge 15. Thus it is possible to apply the cartridge terminal engaging elements to the line terminals and effect closure of the door of the box without subsequent collapse between the cartridge and the leg 35. This attains the desired end of having a closed door on the box, although the same is out of operating condition, and, at the same time effecting closure of the low end of the cartridge whereby insects and the like are prevented from entering and building nests, webs and the like.

To recondition the switch for operation after it has been out of commission temporarily, it is quite easy to turn the clip 67 upwardly into the position shown in Figure 3 and apply a fuse in the manner above described.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in carrying out the above constructions without departing from the scope of the invention, it is intended that

all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A fuse switch comprising a housing, line terminals therein, one element of a hinge therein, a removable fuse cartridge having terminal engaging elements adapted to associate with said line terminals, a door for the housing carried by the cartridge, a second element on said hinge movably associated with said cartridge and electrically contacting one of the terminal engaging elements, a fuse link connecting a terminal engaging element with the second element of the hinge member which is also movable on the cartridge, to hold the same substantially rigid with respect to the cartridge, resilient means associated with the housing adapted to press the cartridge so as to tension said link when said terminal engaging elements engage said line terminals, said tensioned link preventing movements of the cartridge and door away from closed position, and a latch associated with said hinge element on the cartridge adapted to hold said hinge element in position as it is held by the tensioned fuse, whereby the box may be closed by said door although the device is not fused.

2. A fuse switch comprising a housing, line terminals therein, one element of a hinge therein, a removable fuse cartridge having terminal engaging elements adapted to associate with said line terminals, a door for the housing carried by the cartridge, a second element on said hinge movably associated with said cartridge and electrically contacting one of the terminal engaging elements, a fuse link connecting a terminal engaging element with the part of the hinge member on the cartridge to hold the same substantially rigid with respect to the cartridge, resilient means associated with the housing adapted to press the cartridge so as to tension said link when said terminal engaging elements engage said line terminals, said tensioned link preventing movements of the cartridge and door away from closed position, and a latch associated with said hinge element on the cartridge adapted to hold said hinge element in position as it is held by the tensioned fuse, whereby the box may be closed by said door although the device is not fused, said cartridge having an open lower end and said latch closing said open end when the latch is in operative position.

3. A fuse switch comprising a fuse cartridge, line terminals, terminal engaging elements on the cartridge adapted to engage said line terminals, hinge means having a member pivoted to the cartridge and adapted in one position to maintain the engaging elements of the cartridge in contact with said line terminals and otherwise to permit release thereof, a fuse link which when connected with the engaging elements on the cartridge is adapted to maintain said pivoted member on the cartridge in said position to maintain contact but when blown permitting said release, and latch means adapted to hold said pivoted means on the cartridge in such a position that the cartridge is adapted to remain closed.

4. A fuse switch comprising a fuse cartridge, line terminals, terminal engaging elements on the cartridge adapted to engage said line terminals, hinge means having a member pivoted to the cartridge and adapted in one position to maintain the engaging elements of the cartridge

in contact with said line terminals and otherwise to permit release thereof, a fuse link which when connected with the engaging elements on the cartridge is adapted to maintain said pivoted member on the cartridge in said position to maintain contact but when blown permitting said release, latch means adapted to hold said pivoted means on the cartridge in such a position that the cartridge is adapted to remain closed, said hinge means hingedly but removably mounting the cartridge.

5. A fuse switch comprising a housing, line terminals therein, one element of a hinge therein, a removable fuse cartridge having terminal engaging elements adapted to associate with said line terminals, a door for the housing carried by the cartridge and separate from the housing and adding its gravity effect to that of the cartridge, a second element on said hinge movably associ-

ated with said cartridge, a fuse link connecting with a terminal engaging element and holding the movable element on the cartridge substantially rigid with respect to the cartridge, and resilient means associated with the housing adapted to press the cartridge so as to tension said link when said terminal engaging elements engage said line terminals, said tensioned link preventing movement of the cartridge and door away from closed position but permitting such movement when the link is blown, the gravity effect of the door aiding that of the cartridge upon opening movement, means permitting removal of said second element of the hinge from the hinge element on the housing, whereby the door and the cartridge may be applied and removed as a unit, and means for separating the cartridge and the door without tools.

THEODORE BIRKENMAIER.