Nov. 22, 1938. J. J. BOGAERTS 2,137,872

ELECTRIC SWITCH CABINET

Filed July 21, 1936

Fig. 1.

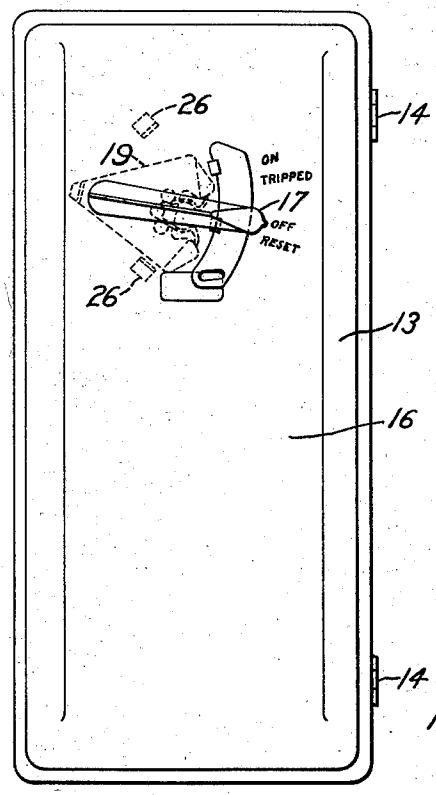


Fig. 2.

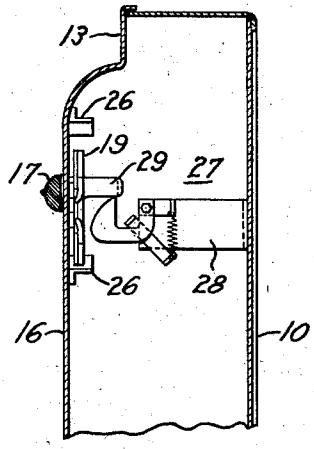


Fig. 3.

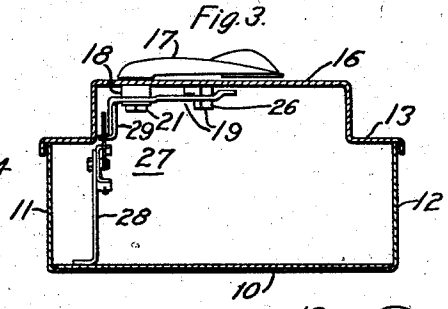


Fig. 4.

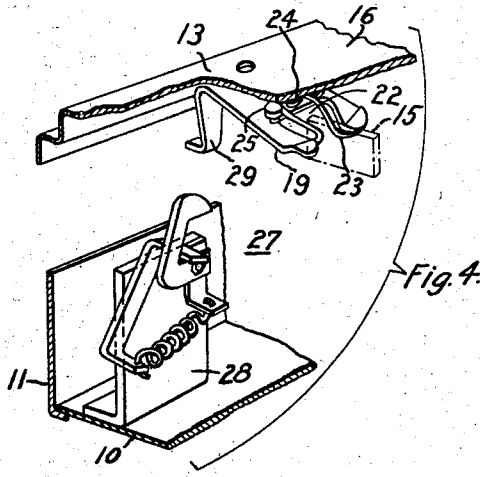


Fig. 5.

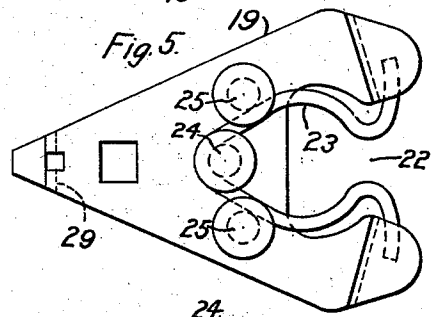
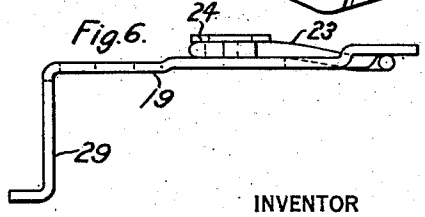


Fig. 6.



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ELECTRIC SWITCH CABINET

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Application July 21, 1936, Serial No. 91,669

8 Claims. (Cl. 200—172)

My invention relates, generally, to cabinets for enclosing electric switches and automatic circuit breakers and, particularly, to devices for operating circuit breakers which are enclosed in boxes or cabinets.

The copending application of G. R. Runke and H. S. Gano, Serial No. 8,658, filed February 28, 1935, describes and claims an electric switch enclosing cabinet having a device for operating the switch handle, which is disposed inside the cabinet, by means of an operating handle on the exterior of the cabinet. The aforementioned operating device comprises an operating plate, disposed on the innerside of the cabinet door to engage the switch handle. The operating plate is actuated about a pivot point by an operating handle mounted on the outside of the door and secured to the operating plate.

While the operating plate was so constructed that breakage of the switch handle by twisting was prevented, experience has proven that the switch handles are sometimes broken as a result of the operating handle on the exterior of the cabinet being struck a sudden blow by the operator.

Therefore, the object of the present invention, generally stated, is to provide an improved device for operating an electric switch or circuit breaker which is enclosed in a cabinet.

A more specific object of the invention is to prevent the breakage of the switch handle by the impact resulting from a sudden blow on the operating device.

Another object of the invention is to provide an actuating device for an enclosed circuit breaker unit which will resiliently operate the circuit breaker handle in either direction.

Other objects of the invention will be explained fully hereinafter or will be apparent to those skilled in the art.

According to the preferred embodiment of the invention, a metal cabinet for enclosing a circuit breaker unit is provided with a hinged door. An operating plate is disposed on the innerside of the door for actuating the circuit breaker handle. The operating plate is carried by a shaft to which an operating handle is secured on the outside of the door. The operating plate is provided with an opening for receiving the circuit breaker handle and a V-shaped spring member is secured to the plate with the arms of the spring so disposed in the opening that they resiliently engage the switch handle when the plate is moved in either direction about its pivot point.

For a fuller understanding of the nature and objects of the invention, reference may be had to the following detailed description, taken in conjunction with the accompanying drawing, in which:

Figure 1 is a view, in front elevation, of a circuit breaker cabinet and operating device embodying my invention;

Fig. 2 is a longitudinal sectional view through a portion of the cabinet, showing a view, in side elevation, of the operating device;

Fig. 3 is a transverse sectional view through the cabinet, showing a view, in end elevation, of the operating device.

Fig. 4 is an exploded view, in enlarged perspective, of portions of the cabinet, showing the operating device and the circuit breaker handle;

Fig. 5 is an enlarged view, in front elevation, of the operating plate and spring, and

Fig. 6 is an enlarged view, in end elevation, of the plate and spring shown in Fig. 5.

Referring now to the drawing, the cabinet shown comprises a back wall 10 and side walls 11 and 12, which may be joined to the back wall in any suitable manner. A door 13 may be secured to the cabinet at one side by hinges 14 and at the other side by a latching mechanism hereinafter described.

In the embodiment of the invention illustrated, an automatic circuit breaker having a rectangular handle 15 may be enclosed within the cabinet. The circuit breaker is preferably of the type fully described in the copending applications of H. J. Lingal, Serial Nos. 600,624 and 637,749, filed March 23, 1932, and October 14, 1932, respectively, and assigned to the Westinghouse Electric & Manufacturing Company. However, any suitable circuit breaker or electric switch unit may be utilized.

As shown, the door 13 of the cabinet is provided with a raised portion or dome 16 into which the handle 15 of the circuit breaker projects. An operating handle 17 is mounted on the exterior surface of the dome 16. The handle 17 is provided with a shaft which extends through a bushing 18 in the door 13 and a triangular operating plate 19 is secured to the shaft inside of the housing by means of a nut 21 on the end of the shaft.

The operating plate 19 is provided with a slotted opening 22 in one side thereof for receiving the handle 15 of the circuit breaker, as shown in Fig. 4. In this manner, the circuit breaker may be operated from the exterior of the cabinet by actuating the handle 17 about its pivot point which causes the operating plate 19 to actuate the

breaker handle 15, thereby operating the circuit breaker.

In order to prevent breakage of the handle 15 by the impact resulting from a suddent blow on the operating handle 17 by the operator, I have provided a flexible spring 23, of a V-shape, which may be secured to the plate 19 by a rivet 24. As shown in Fig. 5, additional rivets 25 are provided in the plate for retaining the arms of the spring 23 in their proper position in the slot 22. The arms of the spring are bent inwardly near their ends, thereby providing curved surfaces for engaging the sides of the rectangular breaker handle 15, which reduces the friction between the spring 23 and the breaker handle and also prevents twisting of the breaker handle as it is actuated about its pivot point.

It will be noted that the contour of the spring 23 is similar to that of the slotted opening provided in the plate described in the foregoing application of G. R. Runke and H. S. Gano. The ends of the spring arms may be bent outwardly and downwardly to pass under the plate 19 at the sides of the slot 22. The end portions of the plate may be raised slightly to receive the ends of the spring, as shown in Figs. 5 and 6. In this manner the plate and the spring function to prevent the door 13 from being closed unless the breaker 15 is in its proper position between the arms of the spring 23.

In order to limit the travel of the plate 19 in either direction, stop members 26 are secured to the cover 13. The stops are so disposed that the sides of the plate will strike them when the handle 17 has traveled its maximum distance. The spring 23 is designed to have sufficient stiffness to operate the breaker under normal conditions, but when subjected to abnormal conditions the flexible spring member will deflect and limit the force applied to the breaker handle to a predetermined value that is safe to apply to the handle. When this limit is reached the plate 19 engages the solid stops 26 which are capable of withstanding considerable abuse. Upon removal of the abnormal operating conditions the flexible spring returns the plate to its normal operating position. In this manner the resiliency of the spring 23 prevents breakage of the handle 15 and permits the handle to be operated in either direction in the usual manner.

With a view to preventing the door 13 of the cabinet from being opened while the circuit breaker is in the closed position, an interlocking device 27 is disposed on a partition 28 in the cabinet to engage an inwardly extending arm 29 on the operating plate 19. As described in the copending application of G. R. Runke and H. S. Gano, the interlocking device is so constructed that the arm 29 is released when the handle 17 is moved to either the "off" or the "reset" positions, to permit the door to be opened.

From the foregoing description it is apparent that I have provided a simple and efficient mechanism for operating a circuit breaker or electric switch which is enclosed in a cabinet. Furthermore, the device is so constructed that injury to the apparatus by abuse on the part of the operator is prevented, thereby effecting a saving in the cost of maintaining the apparatus.

Since many modifications may be made in the apparatus and arrangement of parts without departing from the spirit and scope of my invention, I do not wish to be limited other than by the scope of the appended claims.

I claim as my invention:

1. In an electric switch enclosing cabinet having back and side walls and a door, in combination, a switch unit having an oscillating handle disposed inside the cabinet, an operating handle mounted on the exterior surface of the door and having a shaft extending through the door, a plate secured to the shaft inside of the cabinet and disposed substantially parallel to the door, and resilient means on the plate and having arms disposed substantially parallel to the plate for actuating the switch handle by means of the handle on the exterior of the cabinet, said arms cooperating with said plate to prevent closure of the door unless the switch handle is in its proper position between said arms.

2. In an electric switch enclosing cabinet having back and side walls and a door, in combination, a switch unit having an oscillating handle disposed inside the cabinet, an operating handle mounted on the exterior surface of the door and having a shaft extending through the door, a plate secured to the shaft inside of the cabinet and disposed substantially parallel to the door, and resilient means secured to the plate and having arms disposed substantially parallel to the plate for engaging the switch handle to operate the switch by means of the handle on the exterior of the cabinet, the ends of said arms extending outwardly to prevent closure of the door unless the switch handle is in its proper position between said arms.

3. In an electric switch enclosing cabinet having back and side walls and a door, in combination, a switch unit having an actuating handle disposed inside the cabinet, an operating handle mounted on the exterior surface of the door and having a shaft extending through the door, a plate secured to the shaft inside of the cabinet and disposed substantially parallel to the door, said plate having an opening therein for receiving the switch handle, and resilient means having arms disposed in said opening substantially parallel to the plate for engaging the switch handle to operate it by means of the handle on the exterior of the cabinet, the ends of said arms extending beyond the edges of said opening to prevent closure of the door unless the switch handle is in its proper position between said arms.

4. In an electric switch enclosing cabinet having back and side walls and a door, in combination, a switch unit having an actuating handle disposed inside the cabinet, an operating handle mounted on the exterior surface of the door and having a shaft extending through the door, a plate secured to the shaft inside of the cabinet and disposed substantially parallel to the door, said plate having a slotted opening therein for receiving the switch handle, and a spring of substantially a V-shape secured to said plate and having its arms disposed in said opening substantially parallel to the plate for engaging the switch handle to resiliently actuate it by means of the handle on the exterior of the cabinet, the ends of said spring arms being bent outwardly underneath said plate to prevent closure of the door unless the switch handle is in its proper position between the arms of the spring.

5. In an electric switch enclosing cabinet having back and side walls and a door, in combination, a switch unit having a handle of a rectangular shape disposed inside the cabinet, an operating handle mounted on the exterior surface of the door and having a shaft extending through the door, a plate secured to the shaft inside of the cabinet and disposed substantially parallel

to the door, said plate having a slotted opening therein for receiving the switch handle, a spring of substantially a V-shape secured to said plate at the apex of the spring, the arms of said spring extending into said opening substantially parallel to the plate to engage the sides of said switch handle, and means disposed in said plate on the outside of said spring arms to retain them in position, whereby the switch handle is resiliently actuated by means of the operating handle on the exterior of the cabinet.

6. In an electric switch enclosing cabinet having back and side walls and a door, in combination, a switch unit having a handle of a rectangular shape disposed inside the cabinet, an operating handle mounted on the exterior surface of the door and having a shaft extending through the door, a plate secured to the shaft inside of the cabinet and disposed substantially parallel to the door, said plate having a slotted opening therein for receiving the switch handle, a spring of substantially a V-shape secured to said plate at the apex of the spring, the arms of said spring having inwardly extending portions disposed substantially parallel to the plate for resiliently engaging the sides of said switch handle, and means disposed in said plate for engaging said spring arms to retain them in position, whereby the switch handle is actuated by means of the operating handle on the exterior of the cabinet.

7. In an electric switch enclosing cabinet having back and side walls and a door, in combination, a switch unit having an oscillating handle disposed inside the cabinet, an operating handle mounted on the exterior surface of the door and having a shaft extending through the door, means operable by the shaft and disposed inside of the cabinet for connecting the shaft to said switch unit handle and actuating said switch unit handle upon movement of the handle on the exterior of the cabinet, said connecting means including a pair of resilient arms disposed for movement in a plane substantially parallel to the door and means requiring the proper operative relationship of said operating handle, said connecting means and said switch unit handle when the door is in fully closed position.

8. In an electric switch enclosing cabinet having back and side walls and a door, in combination, a switch unit having an oscillating handle disposed inside the cabinet, an operating handle mounted on the exterior surface of the door and having a shaft extending through the door, means operable by the shaft and disposed inside of the cabinet for connecting the shaft to said switch unit handle and actuating said switch unit handle upon movement of the handle on the exterior of the cabinet, said connecting means including a rigid member secured to the shaft inside of the cabinet and disposed for movement in a plane substantially parallel to the door and including a pair of resilient arms for engaging the switch unit handle and disposed for movement in a plane substantially parallel to the door, and said connecting means having means requiring proper operative relationship of said operating handle, said connecting means and said switch unit handle when the door is in fully closed position.

JOHN J. BOGAERTS.