May 25, 1937. B. R. HERMANN 2,081,813

ELECTRIC CUT-OUT

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Fig. 1.

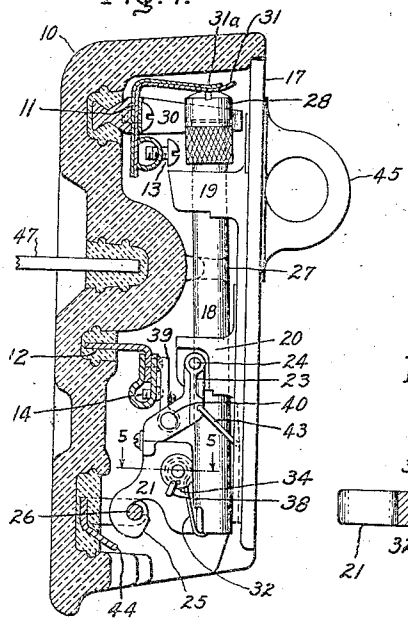


Fig. 2.

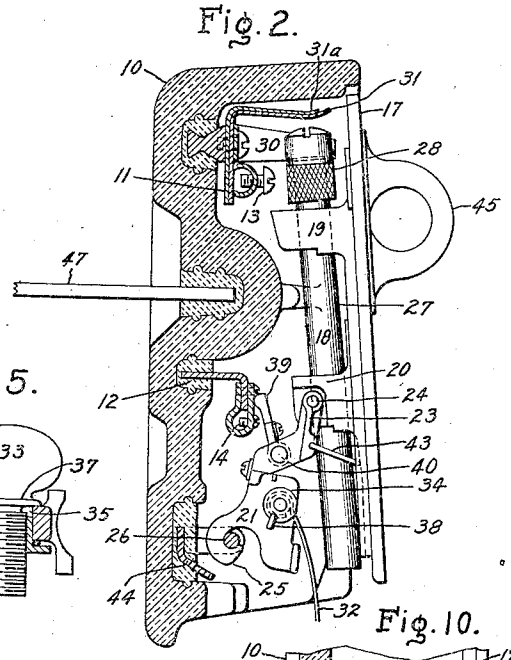


Fig. 5.

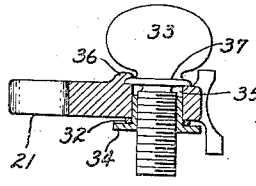


Fig. 3.

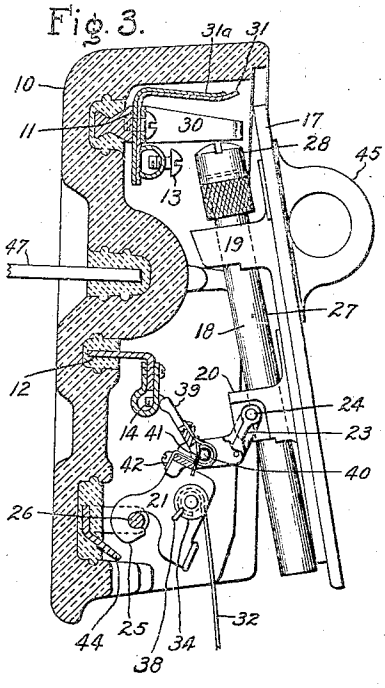


Fig. 4.

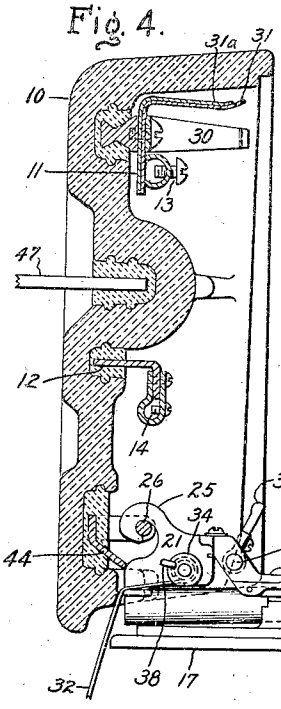


Fig. 10.

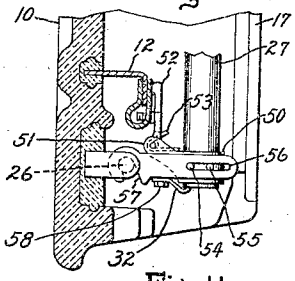
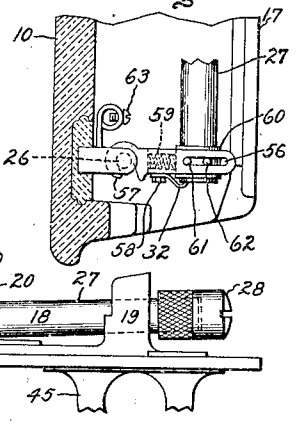


Fig. 11.



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Fig. 6.

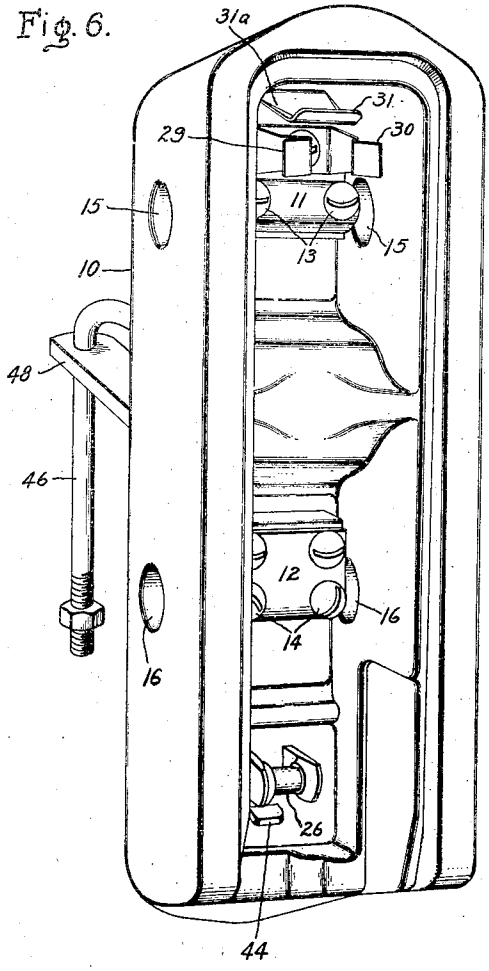


Fig. 7.

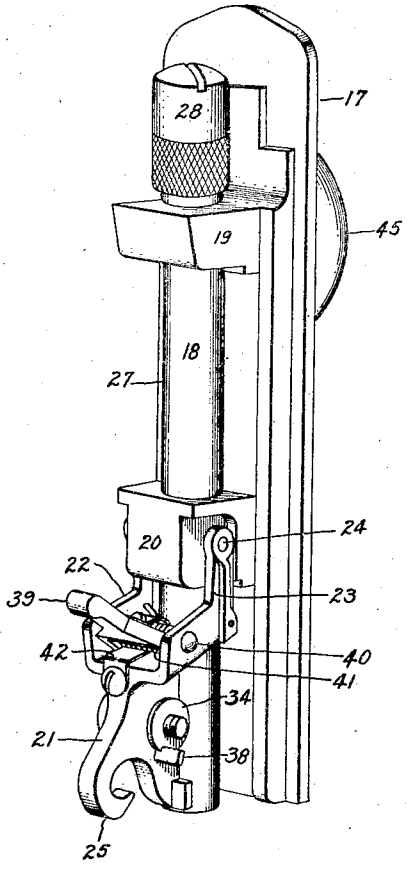


Fig. 8.

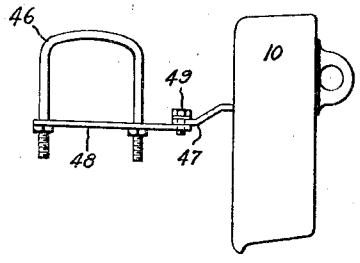
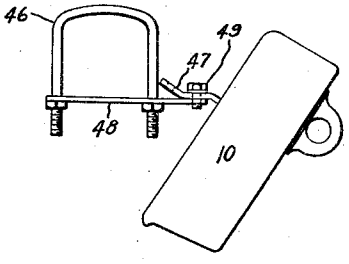


Fig. 9.



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UNITED STATES PATENT OFFICE

2,081,813

ELECTRIC CUT-OUT

Benjamin R. Hermann, Pittsfield, Mass., assignor to General Electric Company, a corporation of New York

Application June 7, 1934, Serial No. 729,427

7 Claims. (Cl. 200—114)

My invention relates to an electric cut-out and more particularly to an electric cut-out combined with a fuse of the expulsion type.

An object of my invention is to provide an improved combination fuse and cut-out in which the cover of the cut-out is moved upon operation of the fuse to give an indication that the fuse has blown.

Another object of my invention is to provide a cut-out which may be readily altered to cause the combined fuse to drop out of engagement entirely from the contact terminals upon operation of the fuse instead of merely moving to give an indication of the operation of the fuse.

What I consider to be novel and my invention will be better understood by reference to the following specification and appended claims when considered in connection with the accompanying drawings in which Fig. 1 is a side sectional view of my improved fuse and cut-out with the fuse intact and the cut-out in the closed position; Fig. 2 is a similar sectional view after the operation of the fuse in which the cover of the cut-out has moved to indicate the condition of the fuse; Fig. 3 is a side sectional view after the operation of the fuse and its initial movement out of engagement with the upper contacts; Fig. 4 is a side sectional view with the cut-out in the open position after operation of the fuse; Fig. 5 is a detailed sectional view along lines 5—5 of Fig. 1 taken in the direction indicated by the arrows; Fig. 6 is a perspective view of the cut-out with the cover removed; Fig. 7 is a perspective view from the rear of the cover; Fig. 8 is a side view of the cut-out and fuse mounted in position on the cross arm of a pole; Fig. 9 is a similar side view of the cut-out mounted in an alternate position at an angle to the vertical; and Figs. 10 and 11 are detail views of modified forms of support for the cover and fuse.

Referring to the drawings, 10 indicates a casing of porcelain or similar insulating material in which is carried two stationary contacts 11 and 12. Conductors are adapted to be connected to contacts 11 and 12 by means of binding screws 13 and 14 respectively. As better indicated in Fig. 6 the conductors connected to contacts 11 and 12 pass through openings 15 and 16 respectively which are located in the side walls of casing 10. A cover 17 is provided for casing 10 and carries a fuse 18 of the expulsion type in upstanding portions 19 and 20 of insulating material integral with the cover 17. A metal lever 21 supports cover 17 and has arms 22 and 23 which are pivotally connected to the upstanding portion 20 of cover 17 by means of a pin 24. Lever 21 is provided with a hook 25 which passes over a pivotal pin 26 secured in casing 10. Fuse 18 consists of a tube 27 of insulating material with a contact cap 28 secured to its upper end. As better indicated in Fig. 1, when the cover is closed contact cap 28 of fuse 18 passes between two latching fingers 29 and 30 and engages an end contact finger 31 all of which are connected to contact 11. Contact finger 31 is backed by a spring member 31a which provides the desired contact pressure. A fuse link located in tube 27 is connected to the contact cap at one end and has a conductor 32 which extends from the bottom of the tube and is connected to lever 21 by means of a thumb screw 33 and nut 34, as better indicated in Fig. 5. It may be seen by reference to Fig. 5 that thumb screw 33 is loosely held in an opening 35 of lever 21 by means of a projection 36 which is spun over a shoulder 37 provided on the thumb screw. Conductor 32 is clamped between nut 34 and lever 21. As best indicated in Fig. 1, lever 21 is held in close engagement with tube 27 of fuse 18 by the tension of the fuse link. Lever 21 is held in this position so long as the fuse link remains intact. To prevent a loosening of this connection between the fuse 18 and lever 21, by rotation of thumb screw 33 and nut 34, a projecting pin 38 is provided from the side of lever 21 which fits within a slot provided in nut 34. Lever 21 and the lower end of the fuse link are electrically connected to the lower contact 12 by means of a contact finger 39 which is pivotally connected to lever 21 at 40. As indicated in Figs. 3 and 7, a spiral spring 41 is interposed between lever 21 and contact finger 39 to provide the desired contact pressure and also to urge cover 17 and its connected parts to the open position. To insure good electrical connection between the contact finger 39 and lever 21, a copper strip 42 is connected at its opposite ends to the contact finger 39 and the lever 21. A stirrup 43 is provided pivotally connected to lever 21 and loosely surrounding fuse tube 27 to limit the relative movement between the tube and lever. By reference to Fig. 2, it may be seen that upon operation of the fuse link, conductor 32 is blown from the open end of tube 27 and thus releases the tension which secures lever 21 in engagement with tube 27 and permits movement of the cover 17 under the bias of spring 41 until movement is stopped by stirrup 43. This partial movement of the cover 17 gives a visual indication of the operation of the fuse. The movement permitted

by stirrup 43 is not sufficient to cause disengagement between the contact cap 28 of the fuse 18 and the latching fingers 29 and 30 secured to the upper contact 11. Thus the cover is only moved a small amount at the bottom which however is quite sufficient to give an obvious indication of the operation of the fuse. In some cases it may be desirable to permit the cover to open completely, in which case the stirrup 43 is removed. As better indicated in Fig. 3, the initial movement of the cover 17 is substantially longitudinal until the contact cap 28 of the fuse 18 moves completely out of engagement with the latching fingers of the upper contact 11. The cover 17 and fuse 18 then rotate about the lower pivotal pin 26 to the full open position, as indicated in Fig. 4. A stop 44 is secured adjacent pivotal pin 26 to engage lever 21 in the open position to prevent hook 25 of lever 21 jumping from pin 26 and permitting cover 17 dropping to the ground. Cover 17 and fuse 18 may then be removed from casing 10 by disengagement of the hook 25 from the pivotal pin 26. For manual opening of the cut-out, cover 17 is provided with a handle 45. Casing 10 is adapted to be supported on the cross arm of a pole by means of a U-shaped clamp 46. Casing 10 is provided with a metal bar 47 extending from the rear with a bend at an angle of approximately 25° to the horizontal. Bar 47 is connected to bar 48 of clamp 46 by means of bolt 49. As indicated in Figs. 8 and 9, clamp 46 may either be connected to a portion of bar 47 which extends horizontally or with the angular portion of the bar to suspend the casing at an angle. It is desired in some cases to support the cut-out at an angle so that when the cover is in the open position, it may be examined from a location beneath the cut-out, and so that the parts of the cut-out within the casing are better protected from rain, sleet and snow. In Fig. 10 a modified form of my invention is indicated in which the cover is only adapted to move to indicate operation of the fuse and it may not be converted to permit the fuse to drop out from engagement with the contact terminals completely. In this modification a metal sleeve 50 surrounds the lower end of fuse tube 27 and has an integral projection 51 to which contact finger 52 is pivotally connected. Contact finger 52 engages the lower contact terminal 12. A spiral spring 53 is located between contact finger 52 and projection 51 to provide the desired contact pressure and also to bias the cover 17 to the open position. Sleeve 50 is provided with two projecting pins 54 and 55 from each side of the sleeve which slidably engage a slot 56 in a hook 57. Hook 57 is adapted to pivotally support fuse tube 27 and cover 17 on pivotal pin 26. Conductor 32 is connected to hook 57 by means of a nut 58 and secures cover 17 in the closed position with pin 54 in engagement with the left hand end of slot 56. Upon operation of the fuse, the conductor 32 is blown from the lower end of tube 27 and releases the connection between the fuse tube and hook 57. Spring 53 then moves cover 17 and fuse tube 27 to the right until stopped by engagement of pin 55 with the right hand end of slot 56. By this arrangement, a combined cut-out and fuse is provided to give a definite indication of the operation of the fuse, at the same time maintaining the cover in a protective position with respect to the casing to prevent deterioration of the contact surfaces due to atmospheric conditions. A similar modification is shown in Fig. 11 except that a compression spring 59 is located directly in hook 57 and engages a sleeve 60 which surrounds the lower end of tube 27 and has similar projecting pins 61 and 62 which slidably engage slot 56. The lower contact terminal is integral with the pivotal pin 26 to which a conductor may be connected by means of binding screw 63. The operation is the same as the operation of the device indicated in Fig. 10.

From the foregoing it may be seen that a combined cut-out and fuse is provided in which the cover is adapted to open from the bottom by a slight amount upon operation of the fuse to give a visual indication of this operation. By this arrangement the cover is still sufficiently closed to protect the stationary contacts of the cut-out from atmospheric conditions which might interfere with the subsequent operation of the cut-out such as, for example, the formation of sleet on the contact surfaces or deterioration of the contact surfaces. In addition, the cut-out may be readily altered so that the cover will completely open upon operation of the fuse and thus give a more certain indication of its operation.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An electric cut-out comprising a casing of insulating material, stationary contacts carried by said casing, a cover pivotally connected to said casing, a fuse carried by said cover, means to connect said fuse between said stationary contacts, and means to cause said cover to open partially without separating the connection of said fuse from said contacts upon operation of said fuse.

2. An electric cut-out comprising a casing of insulating material, stationary contacts secured to said casing, a cover for said casing, a fuse carried by said cover, a lever pivotally connected to both said cover and said casing, a fuse link rigidly securing said lever to said fuse, spring means urging said cover to the open position, and means to limit the movement of said cover upon operation of said fuse.

3. An electric cut-out comprising a casing of insulating material, contacts secured to said casing, a cover, a fuse carried by said cover, a contact cap engaging spring contact fingers extending from one of said stationary contacts, a lever pivotally connected to said cover and said casing, a contact finger pivotally connected to said lever and urging said cover to the open position, a fuse link connected to said lever and securing it rigidly to said cover, and means to limit the movement of said cover on operation of said fuse.

4. An electric cut-out comprising a casing of insulating material, stationary contacts secured to said casing, a cover, a fuse carried by said cover, a contact cap connected to one end of said fuse and adapted to engage spring contact fingers extending from one of said stationary contacts, a fuse link located in said fuse and having a conductor extending from the lower end of said fuse, a lever pivotally connected to said cover and said casing, means to connect said conductor to said lever to rigidly secure it to said cover, a spring contact finger engaging the other of said stationary contacts and pivotally connected to said lever, means to cause said cover to open upon operation of said fuse, and means to limit the opening movement of said cover.

5. A cut-out for an electric circuit, including in combination, stationary contact means, a movably mounted fuse device including a fusible element, means movably engageable with said

stationary contact means for connecting said fusible element between the stationary contact means, and means operative upon rupture of said fusible element to open the electric circuit for effecting movement of said fuse device toward an open position without complete disengagement of said connecting means from said stationary contact means.

6. An electric cut-out comprising a casing of insulating material, stationary contacts carried by said casing, latching fingers and a resilient contact finger connected to one of said stationary contacts, a cover for said casing, a fuse carried by said cover, a lever pivotally connected to both said cover and said casing, a fuse link rigidly securing said lever to said fuse, spring means urging said cover to the open position, and means to prevent complete disengagement of said fuse from said latching fingers upon operation of said fuse.

7. An electric cut-out comprising a support, stationary contacts secured to said support, a fuse adapted to be connected to said stationary contacts, a lever pivotally connected to said support and said fuse, spring means urging said fuse to the open position, a conductor connected to said fuse and said lever to prevent opening of the fuse, means to release the connection between said fuse and said lever upon operation of the fuse, and means adapted to be connected to the lever to permit partial movement of said fuse and prevent complete disengagement of said fuse from said stationary contacts.

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