May 1, 1934. C. E. O. KRIEGSTEDT 1,957,345

FUSE

Filed April 27, 1932

Fig. 1.

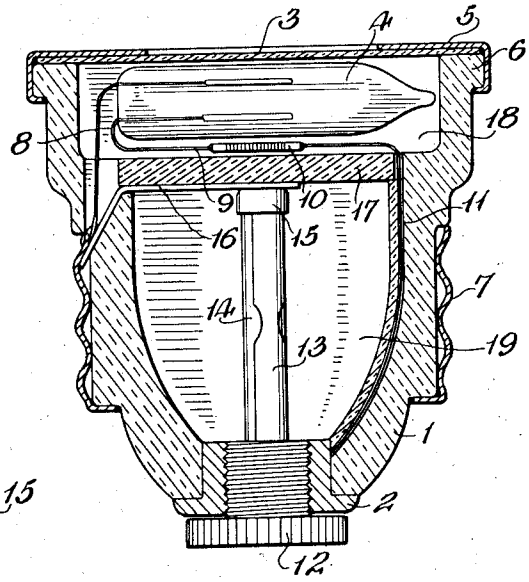


Fig. 2.

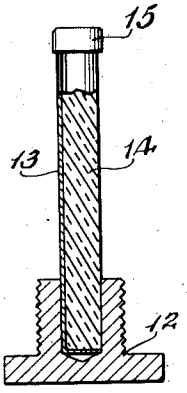


Fig. 3.

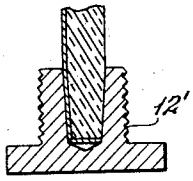
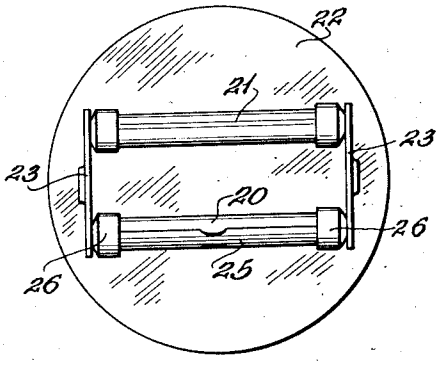


Fig. 4.



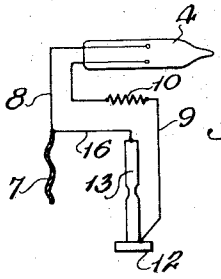


Fig. 5.

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FUSE

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9 Claims. (Cl. 200—121)

The present invention relates to circuit breakers used in connection with electrical wiring systems, and more particularly to that type of cut-out employing a fusible element and a visible signal or indicator, which latter will disclose at a glance, for a reasonable length of time, that the fuse is "blown" or rendered inoperative, having among its principal desiderata a self-contained unit in which the signal or indicating means will be properly protected from the action of the fusible element or the gases given off by the latter when it is blown or ruptured.

A further object of the invention is to provide a circuit breaker or fuse of this character comprising an insulated body having several compartments, one of which is adapted to house a fusible element, and another the signal or indicating element whereby either element will be not only permitted to function without interruption from the operation of the other elements but the gases given off by the fusible element when the latter is blown or ruptured, will have ample room to expand within said body.

A still further object of the present invention is to provide a circuit breaker or fuse of the character aforesaid having a detachable plug which carries and supports a fusible element, whereby when the fusible element is ruptured or blown, the plug may be easily and readily removed from the fuse and a new fusible element substituted therefor.

An equally important object of the present invention is to provide a self-contained, renewable and visible indicating fuse plug comprising a molded casing having a removable contact plug in one end thereof, which carries and supports a fusible element and a display window in the opposite end thereof through which is visible a lamp and a partition separating the fusible element and lamp, whereby the fusible element may properly function without discoloring or in any manner injuring the lamp, and when this fusible element becomes ruptured or blown, a new fuse element may be readily substituted therefor.

A still further object of the present invention is to provide a fuse with a detachable fusible element and lamp or other signalling means, which are capable of being easily and readily removed from the fuse and a new lamp or fusible element substituted therefor should the latter become blown or otherwise rendered inoperative.

Other objects of the invention will be in part obvious and in part pointed out hereinafter.

In order that the invention and its mode of operation may be readily understood by persons skilled in the art, I have in the accompanying illustrative drawing and in the detailed following description based thereon, set out several possible embodiments of the same.

In the drawing:—

Figure 1 is a vertical section through a plug fuse embodying the present invention;

Figure 2 is a vertical section through the contact plug having a fusible element supported thereon;

Figure 3 is a slightly modified form of contact plug and fusible element support;

Figure 4 is a detail plan view of a support having mounted thereon, a removable lamp and fusible element, and

Figure 5 is a diagrammatic view of the electrical circuit employed.

Referring now more particularly to the drawing wherein like corresponding parts are designated by similar reference characters throughout the several views, the numeral 1 indicates the body of the fuse, which is preferably molded from porcelain, having a metallic sleeve 2 secured in one end thereof and its opposite end open and covered by a suitable transparent or translucent means or the mica disk 3 as shown. This mica disk 3 provides a display window for the lamp 4 arranged within the fuse body and the disk is retained upon the fuse body by means of a metallic cover plate 5 which latter is preferably crimped about the bead 6 formed with the casing 1. The usual metallic ferrule or covering 7 is placed about the body 1 of the fuse in order that the fuse may have threaded engagement with an ordinary fuse socket, and a conductor 8 is electrically connected at one end to this spirally grooved covering or terminal 7 and its opposite end is connected to one of the electrodes of the lamp 4. The other electrode arranged within the lamp 4 has electrically connected thereto a conductor 9 and arranged within this conductor 9 is a resistance element 10. This conductor 9 extends through a groove 11 formed within the casing 1 and is electrically connected to the sleeve 2. Adapted to have threaded engagement with the sleeve 2 is a contact plug 12 which latter carries and supports a fusible element or strip 13. A vertically positioned standard 14 which is preferably made of insulated material has one end detachably inserted within a recess formed in the contact plug 12 and a cap 15 is positioned over the upper end of the standard 14, which latter, at times, is capable of having electrical contact with the conductor 16. This conductor 16 is in the form of a strip having one end electrically con-

nected to the spirally grooved terminal 7. The opposite ends of the fusible strip 13 are fastened to the standard 14 by the cap 15 and the insertion of the standard with the strip thereon within the socket of the fuse plug 12, in the manner as is better illustrated in Figure 2 of the drawing, whereupon the intermediate portion of the fuse strip is unattached. In Figure 3 of the drawing, I have illustrated a slightly modified form of contact plug 12' in which a tapered socket is provided for receiving the tapered lower end of the standard 14, whereby when the standard is inserted within the socket, a wedged fit will be effected for removably connecting the standard to the plug 12'.

A partition 17 preferably made of insulating material is supported within the fuse housing dividing the same into compartments 18 in which is arranged the lamp 4 and a relatively larger lower compartment 19 in which is arranged the fusible element. This partition 17 separates the fusible element from the lamp in order that when the fusible element becomes ruptured or blown, the gases given off thereby will not only have ample room to expand within the chamber 19, but will be prevented from coming in contact with the lamp 4 which is likely to not only discolor the lamp but injure the same.

In Figure 4 of the drawing, I have illustrated a slightly modified form of the invention wherein the fuse 20 and the lamp are detachably mounted upon a circular disk 22 which latter could be substituted for the partition 17. The spring clips 23 are carried by and supported upon this disk 22 and they have electrical connection with the conductors 8 and 9. When using this detachable type of lamp and fusible element, it is, of course, unnecessary to use the detachable plug 12 or the fuse element carried thereby and the cover plate 5 may have detachable connection with the casing 1 similar to an ordinary bayonet and slot connection whereby when this cover 5 is removed, access may be readily gained to the lamp or fuse supported upon the disk 22 within the casing whereby should either the fuse or lamp become blown or disrupted, a new one may be substituted therefor. The lamp 21 as herein shown has contact rings formed with the opposite ends thereof, which are in electrical connection with the electrodes of the lamp and the contact clips 23. The fuse 20 as herein shown, comprises a support having a fusible element 25 carried thereby, which fusible element is secured to the support by means of the end clips 26 and these clips 26 are in contact with the spring clips 23. From this construction, it is quite obvious that the current which is being supplied to either one of the clips 23 will take the path of least resistance, which is through the fusible element 25, but should this latter element be broken, the current will then flow through the lamp 21 whereby the glow from the lamp will send forth a signal that the fuse element has been blown.

Whereas I have disclosed a glow lamp containing a low potential mixture of inert gases indicated by the numerals 4 and 21 upon the drawing, it is quite obvious that other types of lamps may be substituted therefor, as preference or conditions may indicate, but, when using the type of lamp as shown, it is necessary to include in the electrical circuit, a resistance 10. This resistance 10 may be made of any suitable material such as paper having a coating of graphite or calcium carbonate, or bakelite, and by increasing or decreasing the resistance, a small lamp containing a low potential mixture of inert gases will serve the purpose herein intended irrespective of the voltage.

From the electrical diagram as illustrated in Figure 5 of the drawing, it is quite obvious that the fusible element 13 is arranged in parallel with the resistance 10, the conductors of the lamp and the electrodes of the lamp. It will also be seen that the conductors of the lamp, electrodes of the lamp and the resistance are in series with the terminals of the fuse. It will, therefore, be further seen that if the fusible element 13 is disrupted or blown, a small quantity of the current will pass through the lamp causing it to glow and then indicate the destroyed condition of the fuse. When the fusible element 13 has been blown or disrupted, and it is desired to renew the fuse plug, it is necessary to first remove the contact plug 12 and then replace the fusible element, whereby upon again inserting the contact plug 12 within the body of the fuse, the latter is again presented for use.

Manifestly, the construction herein shown is capable of considerable modification and such modifications as come within the scope of my claims, I consider within the spirit of my invention.

I claim:

1. A fuse plug comprising a molded casing having its opposite ends opened, a threaded terminal arranged about said casing, a plug terminal arranged within one of the opened ends of said casing, a fusible element carried by said plug terminal, and connected to both terminals arranged upon the casing, a lamp positioned within the casing and electrically connected to the terminals thereof, a partition arranged within said casing for separating said lamp from said fusible element, and a mica covering arranged upon the opposite end of said casing.

2. A fuse plug comprising a molded casing, a spirally grooved terminal positioned about said casing, a removable plug terminal arranged within one end of said casing, a fusible element carried by said plug terminal, a glow lamp containing a low potential mixture of inert gases, a resistance, said resistance and lamp being located within said casing, a partition separating said lamp from said fusible element, said resistance and lamp being in series with said terminals, said fusible element being electrically connected to said terminals, said casing having a sight opening therein, and a mica covering for said sight opening.

3. A fuse plug comprising a hollow molded casing having its opposite ends open, a metallic sleeve positioned within one of the open ends of the casing, a plug terminal having threaded engagement with said sleeve, a fusible element detachably mounted upon said plug terminal, a spirally grooved terminal positioned about said casing, said fusible element being electrically connected with said terminals, a partition arranged within said casing above said fusible element when the latter is positioned therein, a lamp positioned within said casing above said partition and being electrically connected to said terminal, and a transparent covering extending over the opposite open end of said casing.

4. A plug fuse comprising a hollow casing, a threaded shell arranged about said casing, a fusible element removably supported within said casing, a pilot lamp capable of visibly indicating the ruptured condition of said fusible element, and means for separating said fusible element

from said lamp whereby the forces given off by the blowing of said fusible element will be prevented from coming in contact with said pilot lamp.

5. A plug fuse comprising a hollow casing, terminals arranged exteriorly of said casing, a partition arranged within said casing for dividing the same into two compartments, a fusible element removably supported within one of said compartments, a pilot lamp arranged within the other of said compartments, said pilot lamp and fusible member being electrically connected to the terminals of said fuse whereby should the fusible element become blown or ruptured the lamp will visibly indicate the ruptured or blown condition of the fusible element, said casing having an opened end, a mica disk closing the opened end of said casing, and said pilot lamp being located immediately below said mica disk whereby the glow given off by said lamp may be visible through said disk.

6. A plug fuse device comprising a body having a threaded shell and tip contact terminals, a fusible element, means carried by said body and connected across said terminals for visibly indicating the rupture of the fusible element, a plug removably carried by said body and said fusible element being attached to said plug and connected across said terminals thereby normally short circuiting said means.

7. A plug fuse device comprising a body having a recess at the rear end thereof, a fusible element adapted to be longitudinally inserted in said recess, means for removably supporting said fusible element in operative position within said recess and having one end protruding therefrom to serve as a contact for said device, and electrical means connected in shunt with said fusible element for visibly indicating the rupture of the fusible element.

8. A plug fuse device comprising a body having a recess at the rear end thereof, a fusible element adapted to be longitudinally inserted in said recess, a contact plug in said recess for removably supporting said fusible element in operative position and having one end protruding from the body to serve as a contact for said device, and electrical means connected in shunt with said fusible element for visibly indicating the rupture of the fusible element.

9. A fuse comprising a threaded shell, a partition arranged within said shell dividing the same into upper and lower compartments, terminals upon said shell, a fusible element insertable within the lower of said compartments to have contact with said terminals, a lamp completely housed within the upper of said compartments, a resistance in parallel with said fusible element but in series with said terminals and with said lamp, and said shell having a sight opening therein whereby the glow from said lamp may be made visible.

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