I. MARCUS.

ELECTRIC FUSE.

APPLICATION FILED NOV. 27, 1916.

1,265,223. Patented May 7, 1918.

FIG. 1.

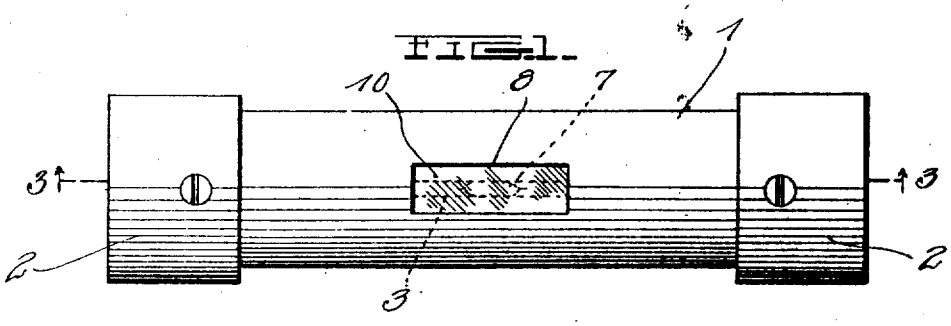


FIG. 2.

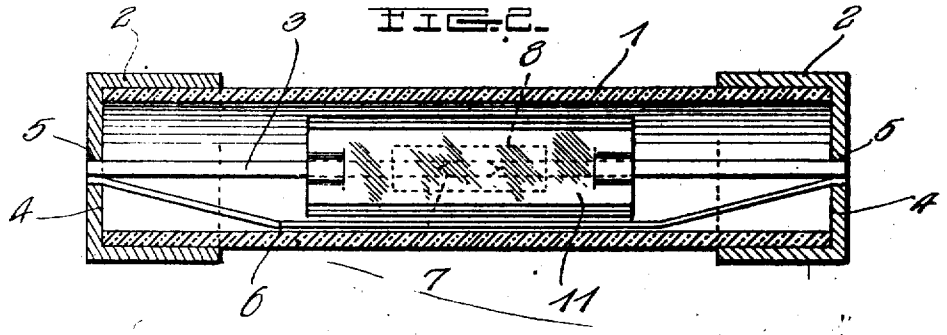


FIG. 3.

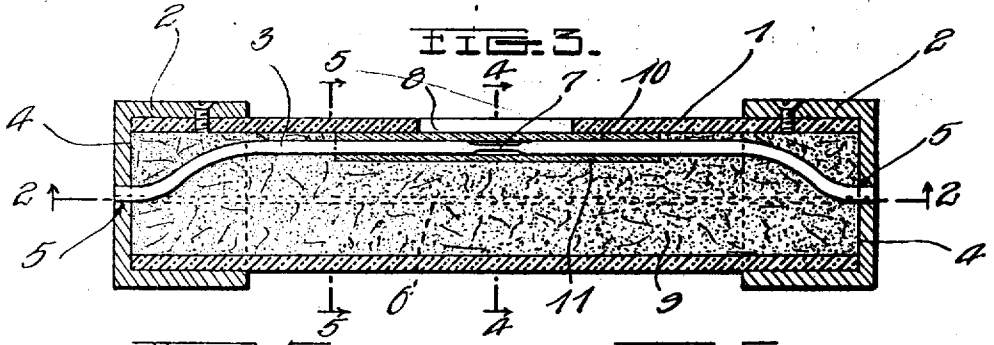


FIG. 4.

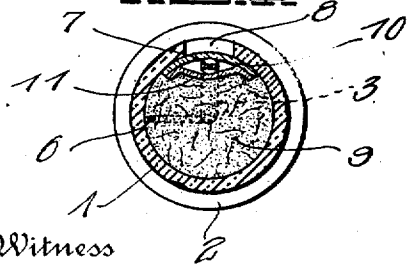
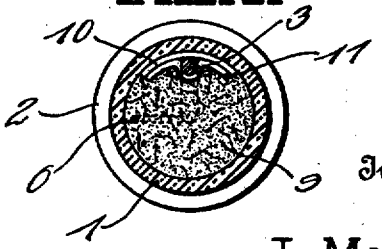


FIG. 5.



Witness

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ELECTRIC FUSE.

1,265,223. Specification of Letters Patent. Patented May 7, 1918.

Application filed November 27, 1916. Serial No. 133,704.

To all whom it may concern:

Be it known that I, ISRAEL MARCUS, a citizen of the United States, residing at Winthrop, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Electric Fuses; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in electric fuses or cut-outs whereby an electric circuit is broken whenever the amount of electricity passing through the fuse is greater than can be safely carried by the circuit of which said fuse is a part.

The primary object of the present invention is to provide a fuse, the fuse wire of which is so weakened at one point that the severance of the wire is bound to occur at this point when there is an overload on the circuit.

A secondary object is to provide a simply constructed fuse having a sight opening in one wall of the casing thereof through which it can be determined whether or not the fuse wire therein is broken.

With these and other objects in view the invention resides in the novel features of construction, combination and arrangement of parts which will be hereinafter more particularly described and claimed and shown in the drawings wherein:

Figure 1 represents a side elevation of a fuse constructed in accordance with my invention;

Fig. 2 is a horizontal longitudinal section on the line 2—2 of Fig. 3;

Fig. 3 is a sectional view on a plane at right angles to Fig. 2 on the line 3—3 of Fig. 1; and,

Figs. 4 and 5 are transverse sections taken respectively upon the lines 4—4 and 5—5 of Fig. 3.

Referring more particularly to the several figures of the accompanying drawing wherein the details of the invention are clearly shown, the numeral 1 designates a preferably cylindrical casing formed of fiber or any other cheap material which is not readily combustible and 2 the caps of copper or brass which close the open ends of the casing. These caps 2 which form the contact portions of the fuse are of any preferred formation, such as the construction illustrated and are adapted to be disposed between the spring contact fingers disposed upon a switch board or the like.

The interior construction of this improved fuse is shown clearly in Figs. 2 and 3 wherein it will be seen that a fuse 3 of relatively large diameter connects the bases 4 of the cap members 2, the ends of said wire 3 preferably being inserted through circular openings 5 in the center of the portions 4 of said caps and soldered. This fuse wire 3 is formed of lead or other soft metal having a low melting point. When the fuse is in operation although the major portion of the current passes through the large fuse wire 3, a portion of said current will pass through a supplemental fuse wire 6 of German silver wire, said wire being of very small diameter so as to give it a rather high resistance. The purpose of this supplemental fuse wire 6 will hereinafter be more particularly pointed out.

I have discovered that by materially weakening the fuse wire at a certain point it will always break at this point when the current of electricity rises above the safety point. In the present device I carry out this idea by flattening or otherwise materially reducing the cross sectional area of the fuse wire 3 at a point substantially midway its ends as shown at 7. Thus when the current passing through the wire 3 becomes too great, the excess heat will melt the wire at the point 7. Opposite this point 7 a sight opening 8 is formed in the wall of the cylinder or tube 1 of the casing so that it can always be seen whether or not the fuse will conduct the electricity.

Since it is necessary to fill in the space within the cylinder 1 not occupied by the fuse wire with powdered asbestos or other non-combustible substance 9, the sight opening 8 is covered by a sheet or plate of mica 10 extending beyond the sides of the opening and is cemented to the inner wall of the tube, thus conforming to the curvature of said wall as shown in Figs. 4 and 5. In order to allow the central portion of the fuse wire 3 to be readily seen from the opening 8, said wire is bent laterally toward the side of the tube containing the opening. This formation is seen from Fig. 3 wherein it will be noted that said wire is substantially bowed throughout its length.

It is essential that the powdered asbestos be prevented from sifting between the fuse wire 3 and the sight opening 8, therefore an additional sheet or plate of mica 11 is disposed around the inside of the fuse wire 3 and has its longitudinal edges cemented to the first mentioned plate 10 or to the adjacent portion of the wall of the cylinder 1.

From the foregoing description it will be seen that an extremely simple fuse has been produced whereby one may readily and positively determine whether or not it is capable of conducting electricity. In other words by simply glancing through the sight opening 8 it can be noted whether or not the fuse wire is broken at the point 7. The supplemental fuse wire 6 whose ends are also connected to the metallic caps 2 prevents the main fuse wire from sparking or sputtering when it is burning through. As soon as the main wire 3 is broken at the point 7 the full charge of the current must pass through the supplemental wire 6, it however immediately melts due to the great heat generated when the electrical circuit is broken. Various changes may be made in the positions of the sight openings in the different types of fuses as well as the means for reducing the cross sectional area of the fuse wire 3 at a particular point, without departing from the principles of the invention as outlined in the claims.

I claim:

A device of the class described comprising a cylindrical casing having a rectangular slot disposed midway its ends, caps fitted over the ends of said casing having centrally alined apertures, a pair of non-combustible transparent plates positioned over said slot, one of said plates being transversely curved to conform to the curvature of the inner wall of said casing and the other having its central portion bulged away from said first mentioned plate, a fuse wire having a reduced middle portion disposed between said plates in the space formed by said bulge, the ends of said fuse wire being bent laterally and disposed in the apertures in said caps, a second fuse wire disposed within the apertures in the caps and positioned at substantially right angles to said first mentioned wire whereby to prevent sparking when said first mentioned fuse wire is blown and loose non-combustible material disposed in said casing to fill the same and space said wires.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ISRAEL MARCUS.

Witnesses:
MARGARET L. FERRINS,
JAMES A. WATERS.