July 9, 1935. R. G. SHERWOOD 2,007,313

CARTRIDGE FUSE

Filed Dec. 9, 1932

Fig. 1.

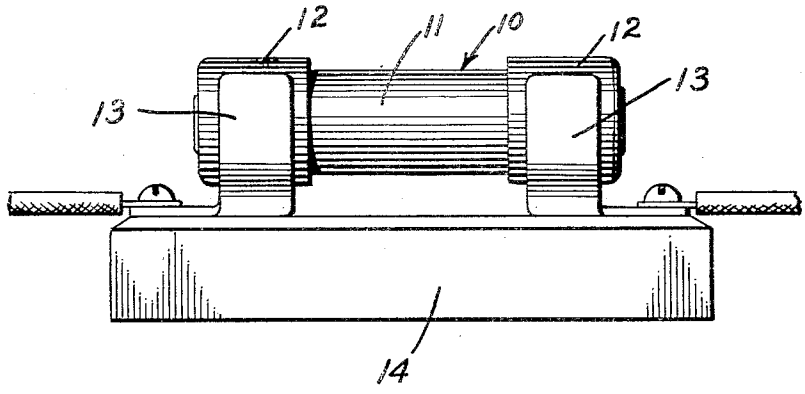


Fig. 2.

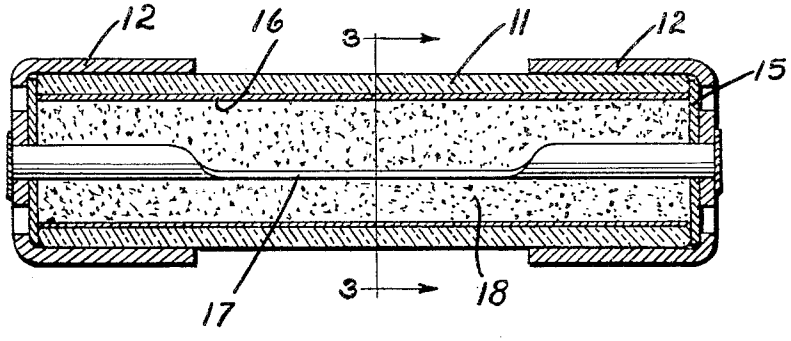
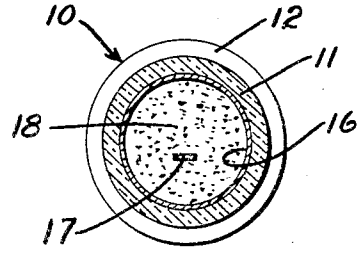


Fig. 3.



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CARTRIDGE FUSE

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Application December 9, 1932, Serial No. 646,538

1 Claim. (Cl. 200—131)

This invention relates to improvements in fuses and more particularly to cartridge fuses such as are employed to protect electrical circuits.

Fuses of this type have heretofore been made by using a fibre barrel to the opposite ends of which brass contact caps were secured. These caps are connected by a fuse wire which melts when an overload occurs in the circuit. Such fuses have proven highly satisfactory for the service in which they have been employed but the principal drawback to the use of such fuses is that due to the lack of transparency of the fibre barrel it is impossible to determine which fuse in a bank of fuses has blown. As a result much time and patience is expended in restoring a line on which a fuse has blown to working condition.

The object of the present invention is to enable the user by a simple visual examination to determine which fuse or fuses in a bank have blown.

The above and other objects may be attained by employing my invention which embodies among its features forming the barrel which encloses the fuse wire of transparent material and protecting the transparent barrel from injury by the heat generated by the blowing of the fuse.

Fig. 1 is a side view in elevation of a fuse constructed in accordance with this invention;

Fig. 2 is an enlarged longitudinal sectional view through the fuse shown in Fig. 1; and

Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 2;

Referring to the drawing in detail, my improved fuse designated generally 10 comprises a tubular barrel 11 of transparent material such as the heat-resisting glass disclosed in U. S. Letters Patent No. 1,304,623 issued May 21, 1919, to Sullivan and Taylor, to the opposite ends of which are secured metal caps 12 which as shown in Fig. 1 are received in clips 13 carried by an insulating block 14. Interposed between the inner faces of the end walls of the caps 12 and the ends of the barrel 11 are disks 15 of fibrous material. A lining 16 of transparent material such as a thin sheet of mica rolled into cylindrical form lies adjacent the inner side of the barrel 11 and serves as an armor which protects the barrel from injury by the heat generated by the blowing of the fuse. Soldered or otherwise secured at opposite ends to the caps 12 is a fuse wire 17 which is formed of an easily fused material such as a lead alloy so that when an overload occurs on the line the wire 17 will melt and break the circuit.

While it is not an essential to the operation of my invention, I find it desirable to fill the barrel 11 with a finely divided arc quenching material 18 such as magnesium oxide commonly known to the trade as Shamva so that when the fuse wire 17 melts any arc which may tend to form between the ends of the blown fuse wire will be speedily extinguished. The introduction of this finely divided material I find does not affect the ability of the user to readily detect the blown fuse where relatively high overloads are encountered as there is sufficient discoloration of the blown fuse to make it readily distinguishable from those which are still conducting. However, for lesser overloads, I find it desirable to incorporate within it a coloring material which is dispersed throughout the Shamva when the fuse blows. While I do not wish to be restricted to any specific coloring material nor method of employing it, I find it convenient to make a paste by mixing selenium oxide and sodium silicate and then apply a drop of this mixture directly to the fusible link 17 at or near the point where it is expected to blow. With the blowing of the link, the heat generated vaporizes the selenium and produces a decided red color which is dispersed throughout the Shamva filler and in some instances will be found adhering to the glass. Such a method of coloring has been found satisfactory when the overload necessary to blow the fuse has been as little as 10%.

Obviously I may if I find it desirable form the lining 16 of a suitable transparent material other than mica, for instance, I may use a thin glass tube which will fit within the barrel 11 preferably in slightly spaced relation thereto to increase the thermal resistance between them. While in the case of the glass inner tube little if any discoloration may be experienced, the fact that the fuse has been blown can be readily detected by the fact that the inner tube will have been cracked or crazed by the heat.

While in the foregoing I have shown and described the preferred embodiment of my invention, it is to be understood that minor changes in the construction, combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

What I claim is:

A fuse including a barrel of transparent material, metal caps at opposite ends of the barrel, a fuse wire within the barrel and electrically connecting the caps, a thin transparent heat resisting lining in intimate contact with the interior of the barrel throughout its entire length to protect the latter from injury by the heat generated by the blowing of the fuse wire, arc quenching material filling the space within the lining and coloring oxide carried by the fuse wire and adapted to be vaporized by the heat generated by the blowing of the fuse and dispersed throughout the arc quenching material.

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