May 26, 1942. H. ALTSCHULE 2,284,599

MULTIPLE FUSE

Filed Feb. 24, 1941

Fig. 1.

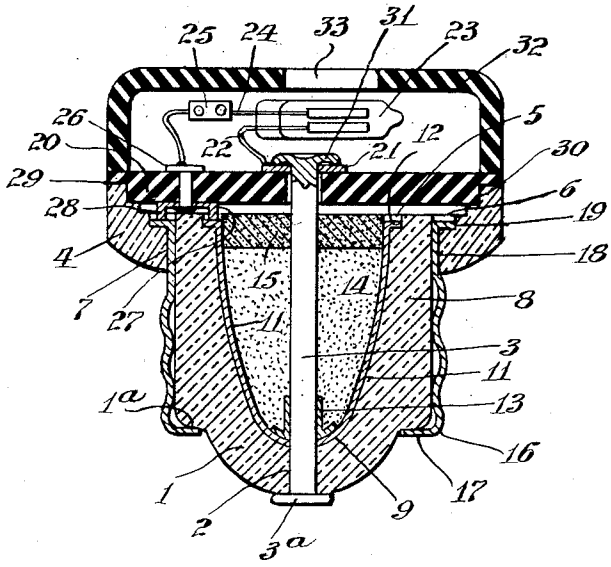


Fig. 2.

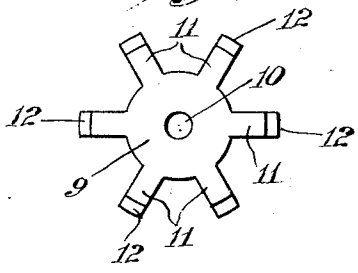
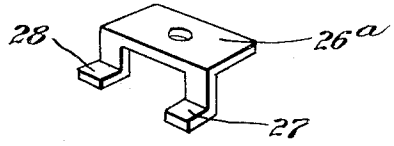


Fig. 3.



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MULTIPLE FUSE

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Application February 24, 1941, Serial No. 380,122

3 Claims. (Cl. 200—125)

This invention relates to new and useful improvements in multiple fuses, and particularly in plug fuses of the indicator type.

It is the object of the present invention to provide a plug type multiple indicator fuse which can be readily assembled of simple and inexpensive parts, and which will withstand the fusing of the links.

With this object in view, I shall now describe a preferred embodiment of the invention and certain modifications thereof.

In the drawing,

Fig. 1 is a vertical cross-section of the multiple fuse plug;

Fig. 2 is a top plan view of a portion of the fusible link used; and

Fig. 3 is a perspective view of the wiper employed.

1 is a base partly enclosing the explosion chamber and having a central perforation 2 in its bottom through which a copper rivet 3 projects with a head 3*a* resting against the bottom. The base has an outside shoulder 1*a* near the bottom and an outwardly flaring rim or flange 4.

Two concentric annular grooves are provided in the upper surfaces of the base 1 and the rim 4; the first groove 5 opening into the chamber and the second groove 6 spaced therefrom. There are six equidistant vertical perforations like 7, through the flange 4 adjacent the side wall 8 of the base 1, said perforations communicating with the groove 6.

In assembling the fuse, first the rivet 3 is inserted through the central perforation in the base 1, then a spider 9 formed of easily fusible material is placed within the chamber with the rivet 3 projecting through the central perforation 10 in the spider. The spider is provided with six equally spaced legs 11, each about $\frac{3}{16}$ of an inch wide and fitting within vertical grooves formed in the inside surface of the chamber. These grooves are in alignment and are of the same width as the perforation 7 through the flange 4. The spider is pushed down over rivet 3 until it is conformed to the shape of the chamber. The projecting free ends of the legs 11 are bent at right angles as indicated at 12 to lie flat against the bottom of groove 5. An eyelet 13 is then slipped over the rivet 3 bearing against the spider 9, whereupon the chamber is filled with arc-quenching powder 14 which is kept from spilling out by a centrally perforated stopper 15 in the mouth of the opening.

The next operation in the assembling of the fuse is to place a screw-threaded contact shell of brass 16 over the outside of the base 1. The lower end of the shell is turned in at 17 to engage shoulder 1*a* on the base 1. The upper end of shell 16 terminates in six equally spaced prongs 18, each about $\frac{3}{16}$ of an inch wide and registering with the six openings 7 cut through flange 4. These prongs 18 project through the openings 7 and the free ends are bent down as indicated at 19 to lie against the bottom of the groove 6.

The rotatable cover for the base is assembled as follows: A cap 20 is provided with a central perforation surrounded by a metal washer 21 fastened to cap 20. One lead-in wire 22 of an electric, e. g., gaseous discharge lamp 23 is soldered to the washer 21. The second lead-in wire 24 is connected to the end of a resistor 25, the other end of which is soldered to an eyelet 26 passing through cap 20 and holding in place a contactor 26*a* having two wipers 27 and 28.

The rim of the cap 20 is recessed as indicated at 29 and fits over a shoulder 30 formed in the flange 4. When the cover is placed over the base, the rivet 3 will pass through the central perforation of 20, wiper 27 will ride in groove 5, and wiper 28 in groove 6. As a final operation, the free end of rivet 3 is headed over as indicated at 31 and the lamp 12 and resistance 24 enclosed within a casing 32 fastened to the cap 20 by any suitable means (not shown), e. g., flanges projecting from 20 resiliently clamping the cap, and through an opening 33 of which the lighting of the lamp may be observed.

The cover 20 may now be rotated until the wipers 27, 28, respectively, contact with the turned-out end 12 of a link 11 and the turned-out end 19 of a prong 18 of shell 16. If the plug is now screwed into a fuse socket through rivet head 3*a* contacting therewith, rivet 3, fuse link 11, wiper 27, connector 26*a*, wiper 28, contact shell 19, 18, 16 to the screw-threaded shell of the fuse socket.

When there is an abnormal current surge in the power mains, the link 11 will fuse, a weakened or bridged portion thereof being provided within the explosion chamber. Owing to the presence of arc-quenching powder 14 in this chamber, none of the parts of the plug will be injured and the gases generated will slowly leak out between the loosely fitting cover in the base.

When the low resistance path above described and including one of the legs 11 of the fusible link is thus broken, then the gaseous discharge lamp will light by current flowing from the central contact of the fuse socket through the rivet 3, washer 21, lead-in wire 22, the electrodes of

the lamp 23, lead-in wire, resistor 25, eyelet 26, connector 26a, wiper 28, shell 19, 18, 16, to the screw-threaded shell of the fuse socket.

The lighting of lamp 23 indicates that a fuse has blown whereupon the cover 20 is rotated until wipers 27, 28 engage, respectively, the portions 12 and 19 of the next prong 18 and fusible link 11.

Other modifications will be obvious to those skilled in the art without departing from the spirit of the invention defined in the claims.

What is claimed is:

1. In a multiple fuse plug, a base and a rotatable cover therefore enclosing a chamber, said base having an outwardly projecting rim; a screw-threaded metal shell surrounding the base and projecting through said rim; a plurality of fusible links against the wall of said chamber with their ends projecting on top of said rim; two wiping contacts fastened to said cover and cooperating with the ends of the links and the shell projecting above said rim; a rivet projecting through said base and cover to hold them together; insulation around said rivet in said chamber; a resistor connected with one of said wiping contacts; and an electric lamp connected between the rivet and the resistor.

2. In a multiple fuse plug, a base partly enclosing a chamber and having a flaring rim with a first annular groove therein surrounding the opening of the chamber and a second annular groove adjacent the first groove and having a plurality of openings through the flaring rim, there being corresponding vertical grooves in the inside surface of the chamber extending from the first annular groove to the bottom; a screw-threaded metal shell surrounding the base and having prongs projecting through said perforations into the second groove; a spider of fusible material having a leg in each vertical groove with the free ends projecting into the first annular groove; a rotatable cover for said base seated on the rim; a connector fastened to said cover and having two wipers, one projecting within the first and the second within the second annular groove; a rivet projecting through and holding together the base, spider and cover, arc-quenching material filling the chamber; a resistor connected with said connector; and an electric lamp having two lead-in wires, one connected with said rivet and the second with said resistor.

3. In a multiple fuse indicator plug, a base partly enclosing a chamber perforated through the bottom, having a shoulder projecting from the outside wall near the bottom and a rim flaring to the outside with a first annular groove in the top of the rim surrounding the chamber, and a second annular groove adjacent the first groove and having six openings through the flaring portion of the rim, there being six vertical grooves in the chamber extending from the first annular groove to the opening in the bottom, said six vertical grooves and six openings being in alignment with one another; a screw-threaded metal shell surrounding the sides of the base with a turned-in flange at one end engaging said shoulder, and six equally spaced prongs projecting from the other end through said perforations into the second groove where they are bent at right angles to cover the bottom of the groove; a spider of fusible material having a central perforation aligned with the perforation in the bottom of the base and six legs, one in each vertical groove with the free end bent at right angles against the bottom of the first annular groove; a rotatable cover for said base seated on the perimeter of the flaring rim and a central perforation; a connector having two wipers, one projecting within the first and the second within the second annular groove; an eyelet for fastening said connector to the bottom of said cover with its wipers in alignment with said annular grooves; a metal washer fastened to the top of the cover around the other perforation; a rivet projecting through the perforations in said base, spider and cover, having one head engaging the bottom of the base and a second head engaging said washer; an eyelet on the rivet bearing against said spider; arc-quenching powder filling the chamber; a stopper for keeping the powder in place; a gaseous discharge lamp having two lead-in wires, one connected with said washer; a cap for covering said lamp having an opening and fastened to said cover; and a resistor within said cap and connected between the second lead-in wire and the first mentioned eyelet.

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