Sept. 15, 1953 H. H. MOHRING 2,652,466

COMBINED FUSE AND INDICATOR

Filed Feb. 29, 1952

Fig. 1

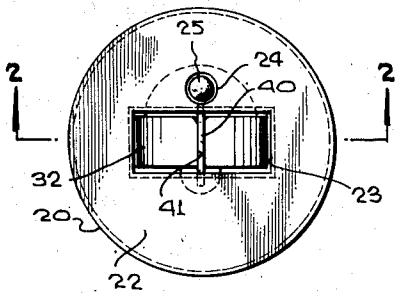


Fig. 4

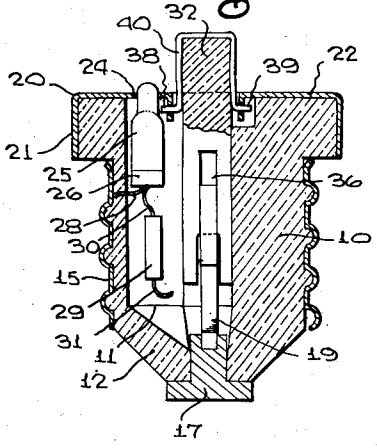


Fig. 2

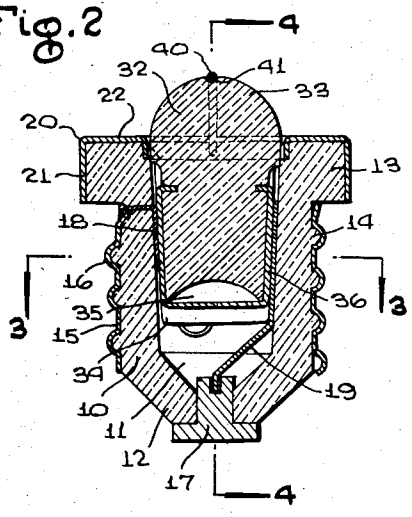


Fig. 5

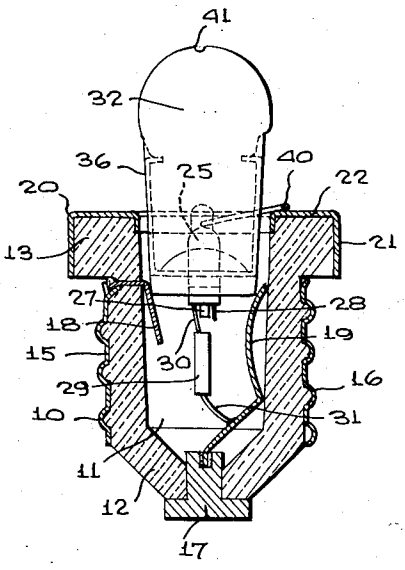
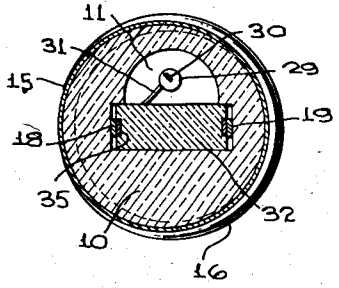


Fig. 3



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COMBINED FUSE AND INDICATOR

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2 Claims. (Cl. 200—121)

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This invention relates to an improved fuse plug assembly of the type which incorporates a lamp for indicating the condition of the fuse.

It is among the objects of the invention to provide an improved fuse plug assembly including a plug body, a replaceable fuse mounted in the body, and a glow lamp mounted in the body to be energized only when the fuse is absent or defective; which will fit into a socket provided for a conventional plug type fuse; which provides a replaceable fuse of less expensive construction than the usual plug type fuse and one which is easier to replace; which is entirely safe and fireproof; and which is simple and durable in construction, economical to manufacture, and positive and effective in operation.

Other objects and advantages will become apparent from a consideration of the following description and the appended claims in conjunction with the accompanying drawing wherein:

Figure 1 is a top plan view of a fuse plug assembly illustrative of the invention;

Figure 2 is a cross sectional view on the line 2—2 of Figure 1;

Figure 3 is a cross sectional view on the line 3—3 of Figure 2;

Figure 4 is a cross sectional view on the line 4—4 of Figure 2; and

Figure 5 is a cross sectional view similar to Figure 2, but showing the parts in a different relative position from that illustrated in Figure 2.

With continued reference to the drawing, the fuse assembly comprises a plug body 10 of electrically insulative material and of cylindrical shape having a bore or recess 11 therein opening through one end of the body, the other end of the body being closed by an end wall 12 of partly conical shape. An outwardly projecting annular lateral flange 13 is provided around the open end of the body 10 and the outer cylindrical surface of the body between the flange 13 and the end wall 12 is provided with a screw thread formation 14 of substantially semicircular cross sectional shape. A thin walled shell 15 of cylindrical shape and of suitable electrically conductive sheet material, such as sheet brass, closely surrounds the body 10 between the flange 13 and the end wall 12 and is provided with a screw thread formation 16 receiving the screw thread formation 14 on the shell and adapted to thread into a fuse plug receptacle of known construction.

A center contact 17 of electrically conductive material extends through the end wall 12 of the body centrally of the end wall and has a flat

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head portion on its outer end overlying the adjacent end portion of the end wall 12 of the body.

A first strip 18 of electrically conductive resilient material is connected at one end to the shell 15 at the end of the latter adjacent the flange 13 and extends through an aperture in the wall of the body 10 and along the side of the recess 11 longitudinally of the body and in a direction from the flange 13 toward the end wall 12 of the body. A second strip 19 of electrically conductive resilient material is secured at one end to the center contact 17 at the end of the latter within the body and extends along the side of the recess 11 opposite the strip 18 and longitudinally of the body and in a direction from the end wall 12 toward the flange 13 of the body.

As is particularly illustrated in Figure 3, the portion of the recess 11 receiving the strips 18 and 19 is of elongated, rectangular cross sectional shape and the strips 18 and 19 are disposed along the opposed narrower sides of this portion of the recess. The recess includes a lateral extension of semicircular cross sectional shape extending from one of the wider sides of the portion of rectangular cross sectional shape for a purpose to be presently disclosed.

A cover 20 of suitable material, such as thin sheet metal, is disposed on the open end of the body 10 and has a cylindrical flange portion 21 closely surrounding the flange 13 of the body and an end wall portion 22 which overlies the open end of the body 10 in covering relationship to the open end of the semi-circular extension of the recess 11 in the body. This cover has an aperture 23 of elongated, rectangular shape registering with the rectangular shaped portion of the recess 11 and a small hole 24 opening into the semi-circular extension of the recess 11.

A glow lamp 25 is mounted in the extension of the recess 11 and extends at its end remote from its base 26 through the aperture 24 in the cover 20, so that the lamp is clearly visible from the exterior of the flanged end of the housing.

A conductor 28 is connected at one end to the shell 15 and at its other end to the lamp 25 and holds the lamp in position projecting through the aperture 24 in the cover, and an electrical resistance element 29 of extremely high resistance is connected at one end to the other side of the lamp 25 by a conductor 30 and connected at its other end to the strip 18 by a conductor 31.

The glow lamp 25 is preferably a gas filled lamp, a lamp filled with neon gas being preferred, having spaced apart electrodes therein, one of which

is connected to the conductor 28 and the other to the conductor 30 whereby the lamp is caused to glow when supplied with electrical energy at sufficient voltage.

A plug 32 of elongated, rectangular cross sectional shape has a semi-circularly rounded end 33. Its other end is recessed to provide a groove 34 extending between the narrower sides thereof and a partly cylindrical recess 35 extending inwardly of the inner side of the groove 34 between the narrower sides of the plug. The plug is tapered in width from its rounded end to its recessed end and the portion of the recess 11 of rectangular cross sectional shape is correspondingly tapered from its open end toward the closed end of the body, so that the plug 32 will fit tightly into the corresponding portion of the recess.

The plug 32 is provided with shallow grooves extending one along each of the narrower sides thereof from the recessed end of the plug to a location intermediate the length of the plug and terminating in inwardly extending notches, and a strip 35' of fuse material has its end portions offset and inserted in the notches in the narrower sides of the plug. This strip extends along the shallow grooves in the narrower sides of the plug and across the recessed end of the plug within the recess 34 and is of substantially U-shaped form, as is particularly illustrated in Figure 2. The bight portion of the fuse strip extending across the secured end of the fuse plug 32 is notched intermediate its length in a manner well known to the art to provide in this strip a portion of predetermined electrical resistance which will burn out if the fuse is subjected to a current overload of a predetermined value.

The plug 32 is insertable through the aperture 23 in the cover 20 into the rectangular portion of the recess 11 and between the strips 18 and 19, so as to bring the portions of the fuse strip 36 extending along the narrower sides of the plug into firm, electrically conductive contact with the strips 18 and 19 as illustrated in Figure 3.

The cover 20 is provided at respectively opposite sides of the aperture 23 in the cover and substantially midway the length of the longer sides of this aperture with downwardly or inwardly extending apertured ears 38 and 39 received in grooves provided in the adjacent end of body 10, and a U-shaped bail 40, formed of suitable wire, has laterally outwardly offset end portions pivotally received one in each of the ears 38 and 39, so that the bail extends over the rounded end portion of the plug 32. The plug 32 is provided at the mid-length location of the cylindrically rounded end surface thereof with a notch 41 which receives the bight portion of the bail 40 when the plug is fully inserted into the body 10 to firmly secure the fuse plug in operative position in the body with the fuse strip 36 in electrically conductive engagement with the contact strip 18 and 19.

As long as the plug is properly positioned in the body 10 and the fuse strip 36 is intact, the electric current will flow through the fuse strip and the lamp 25 will not glow because the resistance unit 29 will force so much of the current to flow through the fuse strip that insufficient voltage will be impressed on the lamp 25 to illuminate the lamp. However, if the fuse strip is ruptured, then the entire voltage will be impressed on the lamp 25 causing the lamp to glow and indicate that the fuse has blown. The lamp will also glow if the circuit is completed with the plug 32 removed, thereby enabling an electrician to determine the fuse to which a particular circuit is connected in a wiring system.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are, therefore, intended to be embraced therein.

What is claimed is:

1. In a fuse plug, an insulated body having a receptacle entering end and another end, said body being provided with a central recess opening through said other end of the body, said central recess being elongated in the direction of the receptacle entering end of the body and terminating in longitudinally spaced relation thereto, a center external contact on said entering end of the body having a portion extending through said entering end into said recess, conductive strips extending longitudinally along opposite sides of said recess, one of said strips being connected at one end to said portion of the center contact and having a free end, a conductive shell mounted around the exterior of said body, the other of said conductive strips having an end connected to said shell and another end unconnected with said center contact, said recess having a lateral extension at one side thereof and located between said conductive strips, said extension opening into said recess, a glow lamp supported in said extension, said glow lamp having one side thereof connected to said shell and another side connected to said other conductive strip, and a removable plug fitting said recess and disposed therein, said plug having a fuse element including side portions extending along opposite sides of said plug in engagement with said conductive strips and a bight portion extending between and connected to said side portions, the side of said plug exposed in the recess extension serving as a wall bounding the open side of the recess extension.

2. In a fuse plug, an insulated body having a receptacle entering end and another end, said body being provided with a central recess opening through said other end of the body, said central recess being elongated in the direction of the receptacle entering end of the body and terminating in longitudinally spaced relation thereto, a center external contact on said entering end of the body having a portion extending through said entering end into said recess, conductive strips extending longitudinally along opposite sides of said recess, one of said strips being connected at one end to said portion of the center contact and having a free end, a conductive shell mounted around the exterior of said body, the other of said conductive strips having an end connected to said shell and another end unconnected with said center contact, said recess having a lateral extension at one side thereof and located between said conductive strips, said extension opening into said recess, a glow lamp supported in said extension, said glow lamp having one side thereof connected to said shell and another side connected to said other conductive strip, and a removable plug fitting said recess and disposed therein, said plug having a

fuse element including side portions extending along opposite sides of said plug in engagement with said conductive strips and a bight portion extending between and connected to said side portions, the side of said plug exposed in the recess extension serving as a wall bounding the open side of the recess extension, a cover on said other end of said body, said cover having an opening registering with the open end of said recess and having a portion closing the open end of the recess extension, and means mounting said

glow lamp on the last mentioned portion and exposing the glow lamp to view from said other end of the body.

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