March 8, 1932. W. B. AMMERMAN 1,848,924

MULTIPLE FUSE PLUG

Filed Feb. 25, 1930

Fig. 1.

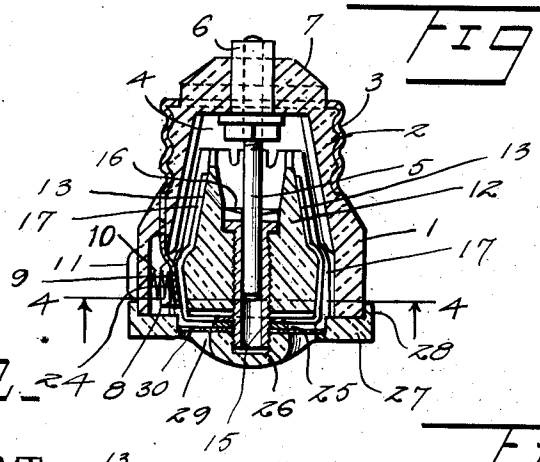


Fig. 2.

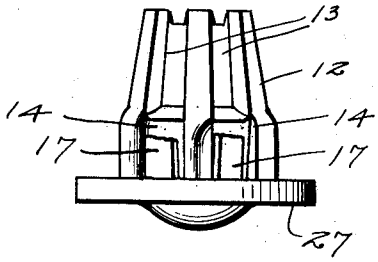


Fig. 3.

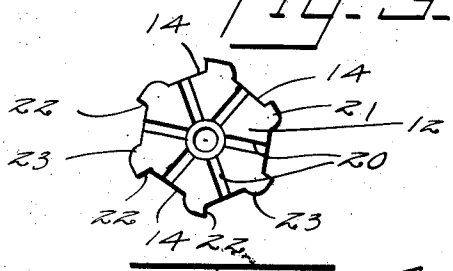


Fig. 5.

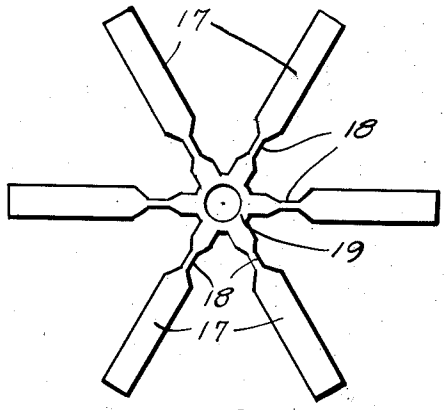


Fig. 4.

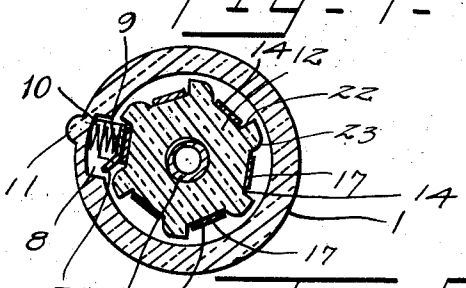


Fig. 6.

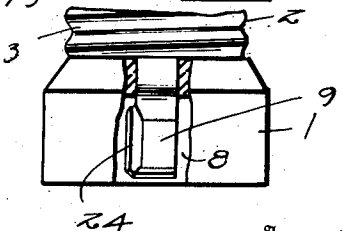
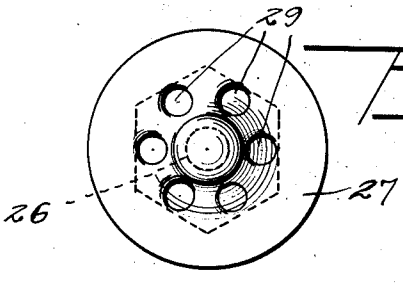


Fig. 7.



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UNITED STATES PATENT OFFICE

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MULTIPLE FUSE PLUG

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This invention relates to improvements in fuse plugs and has for its primary object to provide an improved type of fuse plug wherein a plurality of conductor elements of fusible material are provided which may be moved into position in the circuit as needed to take the place of an element which has been fused by a short circuit.

Another object of the present invention is to provide in a fuse plug of the above described character means whereby each of the fusible elements may be viewed without disassembling or moving any part of the plug so that it may be readily determined whether or not the fusible member in the electrical circuit is burned out or intact.

Still another object of the invention is to provide a plug having a removable core which is rotatably mounted in the plug body and which carries a plurality of fusible members any one of which may be placed in circuit by imparting a partial rotation to the core.

Other objects and advantages of the present invention will become apparent as the description of the same proceeds and the invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings, forming part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawings but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:—

Figure 1 shows the multiple fuse plug embodying the present invention in longitudinal section.

Figure 2 is a view in side elevation of the core per se of the plug showing in two of the longitudinal recesses thereof portions of the fusible strips of the plug.

Figure 3 is a view in top plan of the plug core with the cap thereof removed.

Figure 4 is a sectional view through the plug on the line 4—4 of Figure 1.

Figure 5 is a plan view of the fuse strips employed in the plug showing the same before bending about the core.

Figure 6 is a detailed side elevation of the plug shell with a portion thereof broken away to show the spring pressed contact tongue therein.

Figure 7 is a top plan view of the plug cap.

Referring more particularly to the drawings wherein like numerals of reference indicate corresponding parts throughout the several views, the numeral 1 indicates generally the shell of the multiple fuse plug embodying the present invention, the same being reduced at 2 as in the usual manner and having the metallic sleeve 3 secured thereabout and formed to provide the usual threads to facilitate the introduction and holding of the plug in a receiving socket.

The shell 1 has a tapered chamber 4 extending thereinto from the larger or head end and into this chamber there extends a central contact post 5 which passes through and is secured in the sleeve 6 which is embedded in the bottom 7 of the shell in the manner shown in Figure 1. This contact post and sleeve make electrical connection with the central contact in the bottom of the socket into which the plug is placed, the sleeve 3 making contact with the corresponding shell of the socket in the usual manner.

The inner wall of the shell 1 at the outer or head end thereof is provided with a recess 8 which opens into the chamber 4 and in this recess is mounted a spring tongue 9, one end of which is embedded in the body of the shell and extends through for electrical connection with the sleeve 3. Interposed between the tongue 9 and the adjacent wall of the recess 8 is a spring 10 which normally urges the tongue into the chamber 4. Upon the outer face of the wall of the shell adjacent the chamber 8 an enlargement or boss 11 is formed so that the location of the contact tongue 9 may be readily determined when renewing a burned out fuse strip of the plug.

Rotatably mounted in the chamber 4 of the shell is a fuse strip carrying core 12 which, as shown in Figure 2, is slightly ta-

pered from a point intermediate its ends to one end, the other portion of the core being substantially straight. This core is provided along the tapered portion with a plurality of relatively deep grooves 13 and along the straight portion it is provided with a plurality of shallow grooves 14 each of which is, of course, in alignment and in communication with a deep groove 13 so that continuous grooves are formed longitudinally of the core. The outer ends of the grooves 14 are slightly deeper than the inner ends where they merge with the grooves 13, as shown in Figure 1, so as to form a slightly raised portion against which the spring contact 9 may firmly bear to maintain the core in position.

The core 12 is centrally bored to receive an exteriorly threaded sleeve 15, the sleeve being inserted into the bore of the core from the inner end thereof and when in position the head 16 thereof is deeply embedded in the inner end of the core as shown in Figure 1, the other end of the sleeve projecting from the outer end of the core as is also shown in this figure.

While any number of fusible metallic strips may be provided for application to the core 12 I have shown, as in Figure 5, a unit consisting of six fusible strips each of which is indicated by the numeral 17. As shown each of these strips 17 is connected by a reduced or narrow portion 18 with an apertured central portion 19. In fitting the core 12 with a group of fuse strips 17 the unit of strips is so placed against the outer end of the core as to align the aperture of the central portion thereof with the bore through which the sleeve 15 passes so that the sleeve will extend through the portion 19 of the unit of fuse strips. The reduced portions 18 of the fuse strips will then extend radially across the outer end of the core 12, each one lying over and longitudinally of a groove 20 which is formed in the end of the core as shown in Figure 3. Each of these grooves communicates at its inner end with the passage or bore through the core 12 and at its outer end opens into a groove 14 in which a portion 17 of the fuse strip lies.

As shown in Figure 3, the ribs 21 which are formed longitudinally of the core 12 by reason of the cutting therein of the grooves 14 are provided upon one side with a straight wall as at 22 and upon the opposite side with a rounded wall as at 23.

When the core 12 is in position in the shell 1 as shown in Figure 1 the central contact post 5 will fit in the sleeve 15 and the resilient contact tongue 9 will position in one of the grooves 14 and bear against a fuse strip 17 lying therein. The side of the contact tongue 9 adjacent a rounded wall 23 is turned outwardly slightly as indicated at 24 so that no opposition will be made thereby to the turning of the core 12 in a clockwise direction. Any attempt to turn the core 12 in a counter-clockwise direction, however, will be opposed by the engagement of the other edge of the spring tongue 9 with the adjacent straight wall 22 of a rib 21.

After the unit of fuse strips 17 is placed upon a core 12 in the manner described a thin nut 25 is threaded onto the sleeve 15 and the projecting end of the sleeve is then threaded into a suitably threaded opening 26 formed in the central part of the under face of a cap member 27.

The cap 27 is of slightly greater diameter than the head end of the shell 1 and it is provided with an outer surrounding flange 28 which receives this end of the shell as shown in Figure 1. At its central portion the cap 27 is recessed slightly to conform to and receive the outer end of the core 12 and this recessed portion of the cap has formed therethrough a plurality of sight openings 29 corresponding in number to the fuse strips 17, the reduced portion 18 of each of which is viewable through a sight opening in the assembled plug. In the assembled plug there is interposed between the cap 27 and the core 12 a mica sheet 30 which, while permitting the viewing of the fuse strips therebeneath, will not burn when a fuse strip melts and will prevent the escape of sparks or flame from the interior of the plug. The grooves 20 in the outer end of the core permit the escape of any gases which may form under the cap as a result of the burning of a fuse strip.

From the foregoing description it will be readily seen that when the load of current in a circuit in which one of the fuse strips 18 is placed increases to a dangerous point so that the strip melts in the usual manner and cuts off the current flow all that is necessary to re-establish the circuit is to rotate the cap 27 slightly until a second fuse strip is brought into position for contact with the resilient tongue 9. By viewing the reduced portions 18 of the contact strips through the mica covered windows 29 of the cap it can be readily determined how many of the fuse strips remain for use and by bringing one of the unfused strips around to a position adjacent the indicating lug 11 on the side of the shell a new fuse strip will be known to be in the proper position for establishing a new circuit.

It will also be readily seen from the foregoing that with a multiple fuse plug of the character herein described after the unit of fuse strips has been used up it will be unnecessary to discard the entire plug as new cores may be obtained for substitution for a core carrying a burnt out series of fuse strips.

Having thus described my invention, what I claim is:

1. A multiple fuse plug, comprising a shell open at one end, a contact sleeve surrounding the shell, a center contact in the closed end of

the shell, a flexible contact within the shell in electrical connection with said sleeve, a body rotatably mounted in the shell, a fuse unit formed from a single body, comprising a plurality of strips joined to and radiating from a center portion and each having a fusible portion, said center portion being mounted on the outer end of the body and having electrical connection with the center contact and said strips being formed to extend longitudinally of the body along the side thereof for selective contact with the flexible contact, and a cap connected with the body and closing the open end of the shell and having window openings each exposing the fusible portion of a strip.

2. A multiple fuse plug, comprising a shell open at one end and having a contact sleeve thereabout, a center contact at the other end of the shell and including a pin extending longitudinally through the shell, a body in said shell having a bore receiving said pin to facilitate the rotation of the body about the pin, a unit comprising a plurality of fuse strips connected to a center portion, said portion being positioned upon an end of the body and said strips being bent to lie against the side thereof between the same and the shell, said portion being in electrical connection with said center contact, a cover for the open end of the shell connected with the body for rotation therewith, and a fixed contact in electrical connection with said sleeve and arranged for engagement with a selected one of said strips.

3. A multiple fuse plug, comprising a shell open at one end, a contact sleeve surrounding the shell, a center contact in the closed end of the shell, a flexible contact within the shell in electrical connection with said sleeve, a body rotatably mounted in the shell, a unit comprising a plurality of fuse strips joined to and radiating from a center portion, said center portion being mounted on the outer end of the body and having electrical connection with the center contact and said strips being formed to extend longitudinally of the body along the side thereof for selective contact with the flexible contact, a cap connected with the body and closing the open end of the shell, and means interposed between said strips and carried by the rotatable body coacting with the flexible contact to permit rotation of the body in one direction only.

4. A multiple fuse plug, comprising a shell open at one end, a contact sleeve surrounding the shell adjacent the opposite end, a central contact in the said opposite end and including an elongated pin extending longitudinally through the shell, an elongated plug body insertable into the shell through the open end and having a metallic sleeve extending longitudinally therethrough and receiving said pin, said body being rotatable about the pin and said sleeve being threaded at the end adjacent the open end of the shell, a spring pressed contact tongue mounted in a recess in the inner wall of the shell and electrically connected with said first mentioned sleeve, a fuse unit comprising an apertured central portion adapted to receive the threaded end of the second mentioned sleeve and a plurality of radially extending strips bent to extend along the side of the body for selective engagement by said spring pressed contact, a nut threaded onto said second mentioned sleeve and removably holding the fuse unit on the body, and a cap adapted to cover the open end of the shell and having said second mentioned sleeve threadedly connected therewith, said cap and body being rotatable as a unit to bring a desired contact strip into engagement with the spring pressed contact.

5. A multiple fuse plug comprising a shell having a sleeve for facilitating the mounting of the plug in a socket and a central contact including a post extending longitudinally through the shell, a core rotatably mounted in the shell and having a central sleeve receiving said post and making electrical contact therewith, a resilient contact tongue within the shell having electrical connection with said first mentioned sleeve, said core being provided with a series of longitudinally extending grooves in its side face and a series of radially extending grooves in its outer end each communicating with a first mentioned groove, a plurality of fusible contact strips disposed in each of said longitudinal grooves and each having electrical connection with said second mentioned sleeve, and a cap carried by the core and receiving the adjacent end of the shell, each of said radial grooves of the core being disposed beneath a portion of a fusible strip and acting to permit the escape of gases formed by the burning of a strip thereover.

6. A multiple fuse plug comprising a shell having a sleeve for facilitating the mounting of the plug in a socket and a central contact including a post extending longitudinally through the shell, a core rotatably mounted in the shell and having a central sleeve receiving said post and making electrical contact therewith, a resilient contact tongue within the shell having electrical connection with said first mentioned sleeve, said core being provided with a series of longitudinally extending grooves in its side face and a series of radially extending grooves in its outer end each communicating with a first mentioned groove, a plurality of fusible contact strips disposed in each of said longitudinal grooves and each having electrical connection with said second mentioned sleeve, a cap carried by the core and receiving the adjacent end of the shell, each of said radial grooves of the core being disposed beneath a portion of a fusible strip and acting to permit the escape of gases formed by

the burning of a strip thereover, said cap being provided with a plurality of sight openings each disposed over a portion of the strip lying over a radial groove, and a non-fusible transparent element disposed over each sight opening.

7. A multiple fuse plug, comprising a cylindrical shell having one end exteriorly threaded, a contact body encasing said threaded end, the shell being open at the end opposite the contact body, a central contact member mounted in the end of the shell opposite the open end, a post extending longitudinally in the shell and carried by said contact member, a core adapted to fit into the shell from the open end and having a central bore, a metallic lining in said bore arranged to receive said post and having one end projecting beyond the outer end of the core, a fuse unit comprising a ring-like central portion having the extended end of said lining body passed therethrough and having a plurality of fuse strips formed integral therewith and bent to extend longitudinally of the side face of the core, resilient means for establishing contact between a selected one of said strips and said first mentioned contact, and a cap threaded onto the extended end of said liner and adapted to turn with the core on said post.

In testimony whereof I hereunto affix my signature.

WILLIAM B. AMMERMAN.