

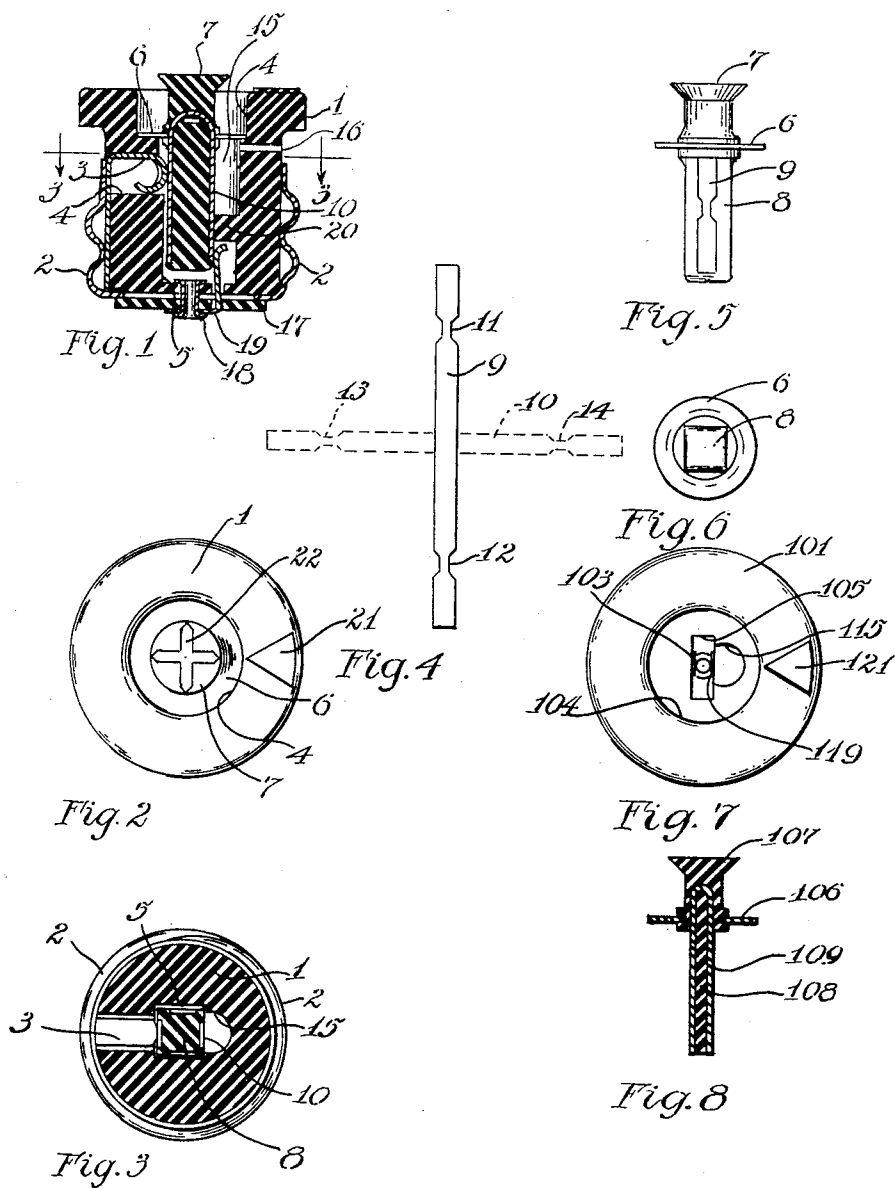
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RENEWABLE ELECTRIC FUSE

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RENEWABLE ELECTRIC FUSE

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The present invention relates to an electrical fuse unit, and more particularly to a fuse unit having a replaceable plug portion carrying a plurality of fuse elements and insertable in a receptacle to selectively bring any of said fuse elements into electrical engagement with contacts mounted in said receptacle.

The broad idea of an electrical fuse unit is known not to be new, even where such unit carries a plurality of replaceable fuse units, but so far as is known at present none of the previous constructions embody the features or advantages found in the present construction and to be hereinafter set forth.

An object of the present invention is to make an improved and simplified renewable electric fuse device.

A further object is to make an improved electrical fuse device, comprising a socketed receptacle and a fuse carrying element removably insertable in the socket in said receptacle in a plurality of positions to selectively bring each of a plurality of fuse elements carried by said fuse carrying element into electrical contact with contact members in said receptacle.

In order to attain these objects there is provided, in accordance with one of the features of the present invention, a receptacle preferably of glass or other transparent material, having a socket therein and having a pair of contact members exposed interiorly of said socket.

A plug, shaped to be insertable in said socket in a plurality of predetermined positions is provided with fuse elements mounted to bring a different portion of fuse between said receptacle contacts in each of a plurality of predetermined positions of said plug in said receptacle.

These and other features of the invention will be more fully set forth in the following description and the accompanying drawing, wherein:

Figure 1 is a vertical sectional view of a fuse unit embodying the present invention,

Figure 2 is a top view of the unit shown in Figure 1,

Figure 3 is a transverse sectional view on the line 3—3 of Figure 1,

Figure 4 is a plan view of a strip of fusible conductor metal, a second strip as used in one embodiment of the invention being indicated in dotted lines,

Figure 5 is a view in side elevation of a fuse-carrying plug as used in the device shown in Figures 1 to 3 inclusive.

Figure 6 is a lower end view of the plug shown in Figure 5,

Figure 7 is a top view of a receptacle modified to receive the plug shown in Figure 8, and,

Figure 8 is a transverse sectional view of a modified form of fuse plug.

Referring to the drawing in detail, a receptacle 1 is preferably of glass or other transparent material. A threaded metal shell 2 encloses the lower portion of the receptacle in a conventional manner, and is provided with a metal contact spring 3 which projects through the wall of the receptacle 1 into an axially disposed central recess 5 of the receptacle. This recess as here illustrated is of general rectangular shape as best shown in Figure 3, and has a circular enlarged portion 4 at its upper end to receive a collar 6 of a fuse carrying plug 7 when the plug 7 is inserted in the central recess. The lower portion of the plug below the collar 6 is preferably of rectangular shape as indicated by the numeral 8 so as to be insertable in the rectangular recess 5 in a plurality of positions, but to be non-rotatable therein.

A pair of fuse elements 9 and 10, each of which is provided with two narrow fusing portions 11 and 12, and 13 and 14, respectively, are moulded into the sides of the plug 7 as best shown in Figure 3. The fuse strips are each bent to form an inverted U as shown in Figure 1.

It will be noted that when the plug 7 is inserted in the receptacle 1 as shown in Figure 1 that the contact 3 is on the opposite side of the plug 7 from a lower contact spring 19. Due to this method of construction the current flows from the contact 19 up over the curved central portion of the fuse strip in the head of the plug and down the other side of the fuse strip to the contact 3. Thus when a fuse blows it will blow on the opposite side of the plug from the contact spring 3.

The collar 6 can be of mica or other suitable material, which when discolored by the blowing of a fuse will give a visual indication thereof on the collar. To accomplish this a circular lateral enlargement of the central recess 5 of the receptacle 1 is provided as at 15 and extends to a depth at least equal to the depth at which the narrow portion of the fuse strip lies when the fuse carrying plug 7 is inserted in the receptacle as shown in Figure 1. When a fuse blows the smoke and gases caused thereby will fill the space 15, discoloring the portion of the collar above the recess 15, and the excess gases will escape through a vent opening 16 to the atmosphere. The fact that the fuse blows on the opposite side of the plug from the contact 3, in addition to protecting the contact 3 from the gases pro-

duced by the blowing of the fuse, will, on the blowing of the first fuse of each pair, leave an intact fuse on the side engaged by the contact spring 3, so that in withdrawing the plug 7 the contact spring 3 will be drawn across the intact portion of the fuse strip, thereby tending to clean it of any deposit and also to reduce the wear on the contact spring 3.

A wall 20 is provided between the bottom of the recess 15 and a lower contact spring 19 to protect the spring 19 from the gases caused by the blowing of a fuse. The lower contact spring 19 is riveted to a disk 17 which in turn is riveted to the base of the receptacle 1 by a rivet 18 which also forms a base contact for the receptacle 1. The disk 17 holds the threaded metal shell 2 in position and the contact spring 19 passes through openings provided therefor in the disk 17 and the base of the receptacle 1.

The operation of the device is as follows: the unit, assembled as shown in Figure 1 is threadedly inserted in a fuse box in a well known manner, and completes an electrical circuit thereby until an overload occurs sufficient to blow the fuse. Upon the blowing of a fuse a visual inspection of the fuses in the fuse box will indicate the blown fuse by a discoloration of the mica collar as above set forth. Thereupon the plug 7 of that fuse is withdrawn and by glancing at the fuse element the condition of the fuse can be checked with absolute certainty. If the fuse is blown the plug can be turned and reinserted to bring a new fuse element into the circuit, or, if all of the fuse elements have been burned out, a new plug can be inserted in the receptacle.

In case the condition which caused the fuse to blow has not been remedied when the plug is reinserted with the new fuse strip in position, the fuse will again blow and this will be indicated by a flash which will be visible through the collar 6. The collar 6 will protect the fingers of the operator from being burned if the fuse should blow while the plug is being inserted since the slight expansion of gases caused by the blowing of a fuse will have a ready avenue of escape through the vent opening 16, and the collar 6 will be well within the circular upper portion of the central recess before contact is completed with the lower contact spring 19.

An indicating mark 21 in the form of an arrow head indicates the side of the receptacle where the fuse is in circuit, and a cross 22 or other suitable representation on top of the plug 7 indicates the position of the fuse strips in the plug.

A modified construction is shown in Figures 7 and 8 of the drawing. In this construction a lower portion 108 of a plug 107 is of thin rectangular cross section and has but one fuse strip 109 providing two fuses. The opening or central recess 105 in a receptacle 101 is of a size and shape to receive the portion 108 of the plug 107 in either of two positions to bring either portion of the fuse strip into contact with the contact members 103 and 109. The parts of the modified construction shown in Figures 7 and 8 are numbered one hundred higher than the corresponding parts of the construction illustrated in Figures 1 to 6 inclusive.

The device provides a simple, efficient, and extremely inexpensive fuse construction. It is contemplated that the receptacles will be sold in packages with a plurality of fuse plugs with each receptacle, and also that the plugs will be sold separately for replacements. In this manner a set of receptacles will last an ordinary operator

indefinitely, and all that will be necessary is the occasional replenishing of the supply of inexpensive fuse plugs, each of which provides a plurality of fuses.

While the visible indication provided by the mica collar 6 in conjunction with the recess 15 is considered a feature of the invention, it is not essential to the successful operation of the device as will be apparent to one skilled in the art. In fact several persons well skilled in the art have stated that in view of the fact that the withdrawal and inspection of the present fuse plugs is so simple and positive that they would prefer this method of inspection. If desired therefore the collar 6 can be of opaque material and the recess 15 can be omitted from the construction, although it is considered desirable to have some shield or sealing means to protect the fingers of the operator in case a fuse should blow while the plug is being inserted.

I claim:

1. A renewable fuse device comprising a recessed receptacle, a pair of electrical contact members mounted one on each side of said recess, a plug, a fuse element carried thereby to have a portion thereof exposed on opposite sides of said plug, said plug being insertable in said recess to bring said fuse into engagement with said contact members.

2. A renewable fuse device comprising a recessed receptacle, a pair of contact elements mounted in said recess, a plug removably insertable in said recess to be nonrotatable therein, said plug having fuse means positioned to engage said contact elements on insertion of said plug in said recess, and a translucent collar carried by said plug and adapted to close said recess on insertion of said plug to restrain the escape of gases therefrom and to serve as a window to indicate the condition of said fuse means.

3. A renewable fuse device comprising a receptacle having a recess therein, said recess having a lateral extension carried to the upper end of said main recess, a pair of contact members in said recess, a fuse carrying plug removably insertable in said recess to bring a fuse carried by said plug into engagement with said contacts, and a translucent collar carried by said plug and having a portion thereof above said recess extension to be exposed to a discharge of gases therefrom to indicate the condition of said fuse.

4. A renewable fuse device comprising a receptacle having a recess therein, said recess having a lateral extension carried to the upper end of said main recess, and terminating above the lower end of said main recess, a pair of contact members mounted one at the lower end of said main recess below said extension, and the other adjacent the upper end of said main recess and on the opposite side from said extension, a plug insertable in said main recess in a plurality of positions, fuse means mounted on said plug to align with said recess extension and to engage said contact members in each position of insertion of said plug, and a translucent collar carried by said plug and having a portion thereof above said recess extension to be exposed to a discharge of gases therefrom to indicate the condition of said fuse.

5. A renewable fuse device comprising a receptacle having a recess therein a plug insertable in said recess in a plurality of positions to be non-rotatable therein, said plug having a U shaped fuse element with a leg thereof exposed on each side of said plug, and having a plurality of

5 narrow fusing portions therein, and a pair of
contact members mounted to project into said
recess on opposite sides thereof to engage said
strip, one of said contacts being above the height
of the narrow fusing portion of said strip and the
other contact being below the height of said nar-
row fusing portions, to place one of said narrow
fusing portions in circuit with said contacts in
each position of insertion of said plug.
10 6. A renewable fuse device comprising a re-
cessed receptacle, a pair of electrical contact

members mounted one on each side of said recess
in longitudinally offset relation a plug insertable
in said recess to be non-rotatable therein, a fuse
element carried by said plug to have a portion
thereof exposed on opposite sides of said plug, 5
said fuse having a portion of reduced cross-sec-
tional area positioned above the lowermost con-
tact member and on the opposite side of said
plug from the uppermost contact member when
said plug is inserted in said receptacle. 10

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