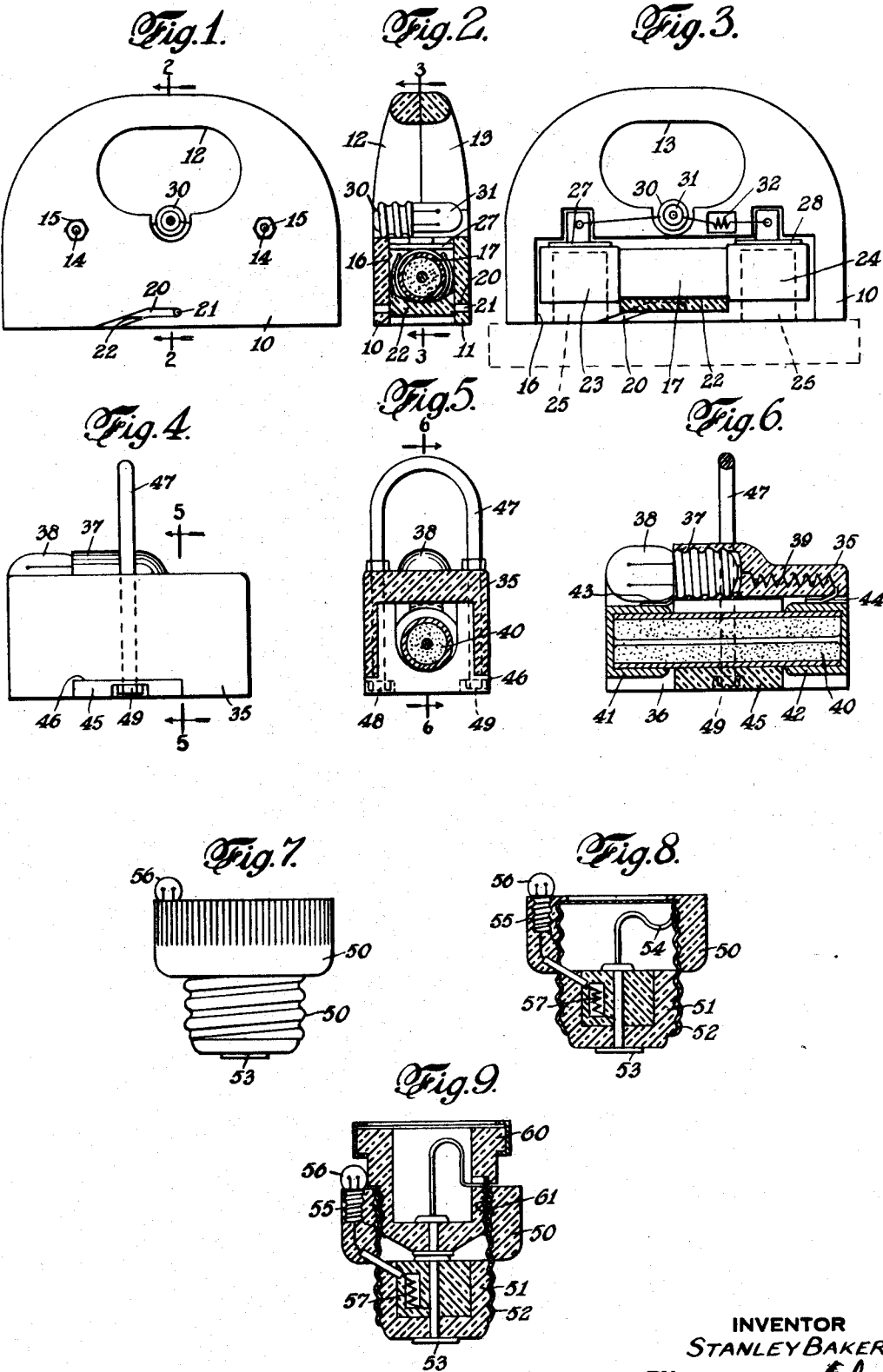


INDICATOR FOR ELECTRIC FUSES

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INDICATOR FOR ELECTRIC FUSES

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The invention relates to fuse indicators, and more particularly such as provide a visible signal, for example an electric light, operable automatically by the rupture of the fusible element and serving thereby also to furnish illumination, if required, in the renewal of the ruptured fuse element.

The invention has for an object the provision of a simple, compact and effective unit embodying the fusible element and the signal element.

Another object of the invention resides in the provision of a unit of this nature which may be disconnected as a whole from the circuit with entire safety from electrical shock, for the purpose of replacement of a blown fuse—all live parts being disconnected.

A still further object of the invention resides in a construction which prevents contact with all sharp edges and particularly contact with exposed live metallic fuse holders adapted to receive the fuse element when of the cartridge type.

In carrying out the invention, a suitable insulation member is arranged to carry an electric fuse or cut-out, an electric lamp and a relatively high resistance, the lamp and resistance being in series with each other and in shunt with the fuse or cut-out. The foregoing elements constitute a complete unit which may be bodily removed from the live portion of the circuit when it becomes necessary to replace the fuse element thereof and of which condition visible notice is given through the illumination of the lamp resulting from its energization when the fuse element fails.

The nature of the invention, however, will best be understood when described in connection with the accompanying drawing, in which:

Fig. 1 is a front elevation of one form of the novel indicator for electric fuses; and Fig. 2 is a vertical section therethrough taken on the line 2—2, Fig. 1 of the drawing, and looking in the direction of the arrows.

Fig. 3 is a longitudinal section through the indicator and taken on the line 3—3, Fig. 2 of the drawing, and looking in the direction of the arrows.

Fig. 4 is a front elevation illustrating a modification in the construction of the indicator, and Fig. 5 is a vertical section thereof taken on the line 5—5, Fig. 4 of the drawing.

Fig. 6 is a longitudinal section taken on the line 6—6, Fig. 5 of the drawing, and looking in the direction of the arrows.

Figs. 7 and 8 are, respectively, an elevation and

vertical section illustrating a further modification; and Fig. 9 illustrates in elevation a still further modification.

Referring to the drawing, more particularly Figs. 1 to 3, the indicator device is shown as constructed of two halves 10 and 11 of insulating material, the upper portion being provided with respective digital recesses 12 and 13 adapted to register when the halves are locked together and to afford a handle or gripping portion for use in installing the fuse in the line or withdrawing it therefrom for replacement of its fusible element when the same is ruptured.

The halves may conveniently be held together by bolts 14 and nuts 15, and are both undercut longitudinally along the bottom to form a recess 16 into which is adapted to be placed and securely held the fuse element 17 which in the particular embodiment is of the cartridge type.

As a convenient means for retaining the fuse element in position in the holder, constituted by the halves 10 and 11, the latter may be provided with like positioned slots 20 having an inclined entrance portion and a horizontal holding portion. These slots are adapted to receive 25 corresponding pins 21 which project in opposite directions from a curved support member 22 designed to fit under the fuse 17 and retain the same in position within the recess 16 when the pins are in the horizontal portion of the grooves 20.

The fuse element is provided with end terminals 23 and 24 designed to fit, when the fuse is put into service, suitable upstanding spring clips or the like 25 and 26, respectively, and as is well understood. Contact brushes 27 and 28, respectively, engage the upper surfaces of the terminals 23 and 24 and are fixedly secured in any suitable manner within one of the halves, as the half 10. This latter half, also, is provided with a suitable socket 30, preferably threaded, to receive an electric lamp 31, the bottoms of the digital recesses 12 and 13 being further cut away to accommodate the socket and lamp, which latter extends transversely over the halves.

Moreover, a relatively high resistance element 32 is imbedded in the insulation material of, for example, the half 10, and is included in series with the said lamp 31; and both are connected in shunt with the respective contact brushes 27 and 28 to place said lamp and resistance in shunt with the fuse element.

Thus, so long as the fuse element remains intact, only a minute current will flow through the shunt circuit including the lamp and resistance,

but if the fuse should fail, the lamp 31 will be illuminated to give visible notice of such failure, so that replacement may be made.

In effecting a replacement, the entire unit is to be withdrawn by disconnecting the fuse portion, or rather the terminals 23 and 24 thereof, from the clips 25 and 26 in grasping the indicator devices at the digital recesses 12, 13 and pulling it away from the said clips. This will disconnect all live parts so that the device may be handled with entire safety from electrical shock, and the fuse element replaced apart from the live clips. This replacement is effected by first sliding the pins 21 downwardly through the slots 20 to release the fuse element 17, then replacing the blown fuse with an effective one, restoring the holding member 22 through re-engagement of the pins in the horizontal portion of the slots, and finally snapping the terminals into their clips.

In Figs. 4 to 6, a somewhat different arrangement for a cartridge type fuse is set forth, the same being constituted of a single block 35 of insulating material. This block is recessed or undercut along the bottom throughout its entire length to provide a longitudinal opening or groove 36 therethrough. The upper portion of the block is provided with a socket 37 to receive an electric lamp 38 designed to project longitudinally over the top of the block, and a resistance 39 in series therewith is imbedded in the upper portion of said block. The lamp and resistance, in turn, are adapted to be connected to the fuse element 40, or rather the end terminals 41 and 42 thereof through brush elements 43 and 44 carried at the bottom of the recess 36 and adapted to contact with said terminals when a fuse is positioned in the block. The lamp and resistance will thus be connected in shunt with the said fuse element.

In order to retain said fuse element 40 in position within the block, as aforesaid, a supporting and guiding strap or plate 45 is located transversely of the same over the bottom of the opening 36, the side walls of the block being recessed as at 46 for this purpose; and the plate may be securely held, while the device is in use, to said block 35 as by means of a U-shaped handle member 47 the legs of which pass through the body 35 and plate 45 and may be secured to the latter by nuts 48 and 49. The exposed lower portion of the end terminals 41 and 42 are designed to fit within suitable spring clips or the like (not shown), as in the previously described embodiment.

When it is desired to replace the fuse element 40, the entire unit is first lifted out of contact with the clips of the line, and the fuse element is then forced longitudinally out through the opening 36, as by pushing inwardly at one end and then grasping the protruding end. Similarly, an effective fuse is installed by inserting the same at the one end of the longitudinal opening and pushing it therethrough until its terminal elements 41 and 42 register with the brushes 43 and 44, respectively, to re-establish the contact with the shunt circuit including the lamp and

resistance. The unit may then be restored to its position in the line in manipulating the same by means of the handle 47.

In Figs. 7 and 8 a screw plug type of fuse is disclosed, the unit being designed to be discarded as a whole when the fuse is blown. In this embodiment, an insulating body 50 is provided with the downwardly threaded extension 51 surrounded by correspondingly threaded terminal 52 for insertion in the usual screw socket (not shown) of a line. A further and axial terminal 53 is provided in the extension at its outer end, as in the usual form of this type of fuse. A fuse element 54 is included between the said terminals, which, if blown, will interrupt the line circuit.

In addition, and in accordance with the invention, there is provided in the head or body portion 50 a screw socket 55 for an electric lamp 56, and a relatively high resistance element 57 is embedded in the extension 51, the lamp and resistance being connected in shunt with the fuse terminals 52 and 53, respectively, whereby, when the fuse element 54 fails, the current will be diverted to the lamp in sufficient amount to illuminate the same. The plug is then to be unscrewed from its line socket and replaced by an effective fuse plug of the same nature; or if of the type in which a plurality of fuse elements is provided a new fuse is positioned.

Furthermore, the fuse element may be in the nature of the well-known fuse plug, as the member 60, Fig. 9, the remainder of the indicator device then serving as an adapter for insertion into the line and internally threaded as at 61 to receive the said plug which is screwed therein. In making a renewal either the plug alone is withdrawn or, preferably, the adapter with plug is removed and the defective fuse plug then unscrewed therefrom and replaced by a new one.

I claim:

1. A screw plug fuse, comprising a head portion provided with a cavity for a fuse element and with a downward extension having a threaded terminal and an axial terminal for contact with a screw socket of the line, the fuse being adapted for connection between said terminals, and a lamp mounted in the wall surrounding the fuse cavity with its axis substantially parallel to the longitudinal axis of the plug and the lamp projecting beyond the end of the head portion opposite its downward extension, said lamp being connected in shunt with the said terminals.

2. A screw plug fuse, comprising a head portion provided with a cavity threaded to receive a screw plug fusible element and with a downward extension having a threaded terminal and an axial terminal for contact with a screw socket of the line, the fusible element being adapted for connection between said terminals, and a lamp mounted in the wall surrounding the fuse cavity with its axis substantially parallel to the longitudinal axis of the plug and the lamp projecting beyond the end of the head portion opposite its downward extension, said lamp being connected in shunt with the said terminals.

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