Sept. 19, 1933. C. H. COLE 1,927,335

CARTRIDGE FUSE

Filed July 30, 1932

Fig. 1.

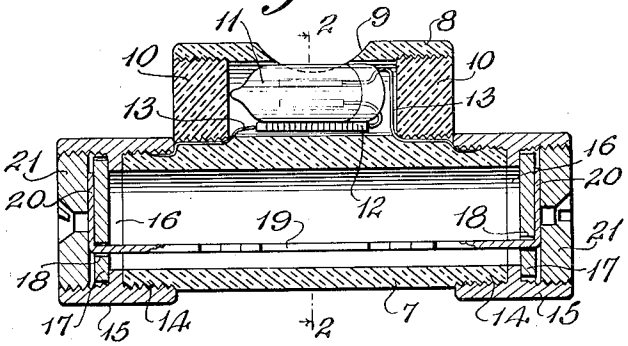


Fig. 2.

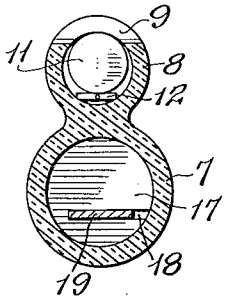


Fig. 3.

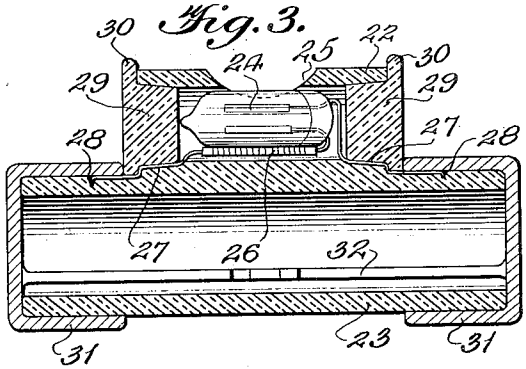


Fig. 4.

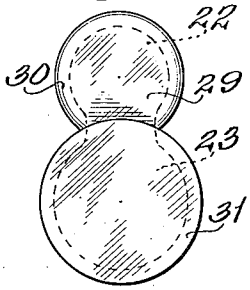
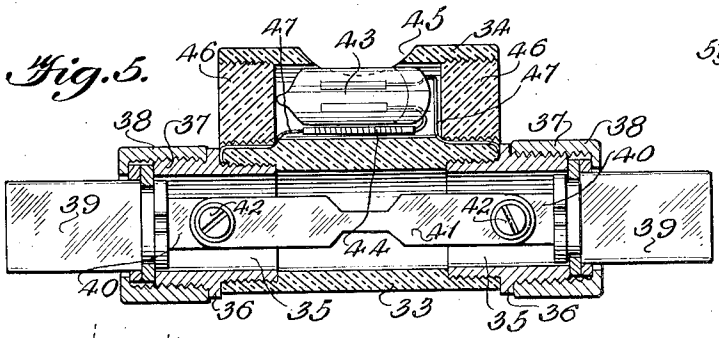


Fig. 5.



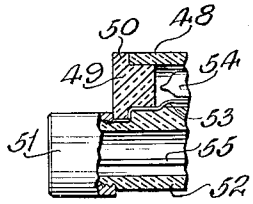
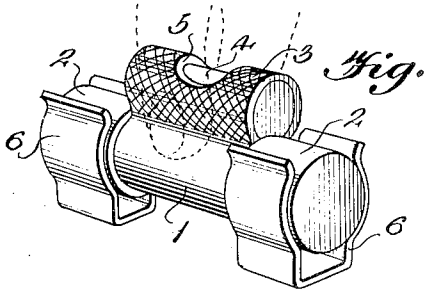


Fig. 6.

Fig. 7.



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CARTRIDGE FUSE

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Application July 30, 1932. Serial No. 626,752

5 Claims. (Cl. 200—121)

This invention relates to electric fuses and more particularly to a fuse of the cartridge type having associated therewith visible means for indicating when the fuse has been burned out. One object of the invention is to provide a fuse of this character having a body portion in which the indicator is located and a side extension serving not only as a carrier for a visible indicator but also serving as a handhold by means of which the fuse may be grasped and easily inserted or removed without danger of a person's fingers contacting with terminals at the end of the fuse and causing an electric shock to be received.

Another object of the invention is to provide a cartridge fuse having a side extension formed integral with its tubular body of insulation thereby producing a fuse which is cheap to make and very strong and eliminates danger of the side extension being broken lose if it is difficult to withdraw the fuse from terminal clips of the fuse box.

Another object of the invention is to permit the ends of the side extension or auxiliary compartment to be tightly closed and plugs constituting closures for the same firmly held in place by metal terminals carried by end portions of the body.

Another object of the invention is to provide a fuse having a visible indicator associated therewith energized when the fusible strip of the fuse is burned through and to permit terminals of the fuse to be removed and a new fuse strip set in place when necessary without disturbing the visible indicator.

Another object of the invention is to provide a fuse of the cartridge type which is very simple in construction, cheap to manufacture and very strong and durable and efficient in its operation. The invention is illustrated in the accompanying drawing wherein:

Figure 1 is a longitudinal sectional view through one specific embodiment of the invention;

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

Figure 3 is a longitudinal sectional view through a modified form of fuse;

Figure 4 is an end elevation of the fuse shown in Figure 3;

Figure 5 is a longitudinal sectional view showing the invention embodied in a cartridge fuse of the blade type;

Figure 6 is a fragmentary sectional view of a fuse having a slightly different construction from that shown in Figure 1;

Figure 7 is a perspective view showing a fuse of the improved construction in use.

This improved fuse is of the cartridge type used in electric installation and consists broadly of a tubular body 1 of insulation in which a fusible strip is disposed between terminals 2 carried by ends of the body and a side extension 3 of insulation formed integral with the body and constituting an auxiliary chamber or compartment in which is located a glow lamp or other visible indicator 4 adapted to be energized when the fusible strip is burned through. A sight opening 5 is formed in the side extension in order that the glow lamp may be seen and the side extension 3 serves not only to form an auxiliary compartment in which the glow lamp is located but also as a handhold in order that the fuse may be readily grasped between the terminals 2 and removed from the clips 6 or set in place without danger of a person's fingers contacting with the clips or terminals of the fuse and causing a shock to be received. The side extension is preferably roughened in order that it will not be liable to slip from between a person's fingers during insertion or removal of the fuse. Therefore, the glow lamp will not be liable to be broken by the fuse slipping from a person's hand and dropping upon a floor.

The fuse illustrated in Figures 1 and 2 is of the type provided with a removable fuse strip and consists of a body 7 formed of any suitable insulating material such as porcelain, fiber, hard rubber, or any other material desired. The side extension 8 is also of insulating material and formed integral with the body 7 during molding thereof, as shown in Figure 2. Therefore, this side extension which extends longitudinally of the body and is of less length, will be firmly anchored to the body and when the side extension is grasped and a pull exerted in order to detach the fuse from the clips 6 there will be no danger of the side extension breaking loose. A sight opening 9 is formed intermediate the length of the side extension and the end portions of the side extension are internally threaded to receive threaded plugs 10 serving as closures for ends of the auxiliary compartment defined by the side extension. Before the plugs 10 are screwed into place a glow lamp 11 having a resistance 12 associated therewith is thrust into the auxiliary compartment and by referring to Figures 1 and 2, it will be seen that the glow lamp and its resistance extend longitudinally in the auxiliary compartment and fit snugly therein so that they will be firmly held in place.

Conductors 13 for the glow lamp extend out-

wardly through ends of the auxiliary compartment and when the plugs 10 are screwed into place the conductors will be prevented from moving out of their proper positions. The ends of the conductors extend along threaded end portions 14 of the cylindrical body 7 and make contact with metal sleeves 15 which are threaded upon the body and form portions of end terminals for the fuse. Each of these sleeves has an internal annular flange 16 which bears against an end of the tubular body and against each flange fits a metal disk 17 formed with a transversely extending slot 18. The strip 19 of the fusible metal extends longitudinally through the main compartment defined by the cylindrical body and has its end portions passed through slots of the disk 17 after which the projecting ends of the fuse strip are bent to form anchors 20 held in flat contacting engagements with outer faces of the disks 17 by metal caps or heads 21 which are threaded into the outer end portions of the sleeve 15. It will thus be seen that the conductors 13 and end portions of the fuse strip 19 make contact with the terminals carried by the body and ordinarily current will pass from one terminal to the other by way of the fuse strip whereas if the fuse strip becomes burned through the current will then pass through the glow lamp and resistance 12 by way of the conductors 13 and the glow lamp will be illuminated. The illumination of the glow lamp which can be clearly seen through the sight opening will indicate that the fuse strip of the fuse has been burned through and the fuse can then be grasped by its side extension and detached from the clips 6. It is then merely necessary to remove the caps 21 and disks 17 and a new fuse strip can be easily applied and the fuse reassembled. The side extension not only permits the fuse to be held and easily applied to or detached from the clips without danger of a shock being received but also permits the fuse to be easily held and prevented from turning in a person's hand while the caps 21 are being screwed into place or removed. Since the sleeve 15 slightly overlaps the outer end of the plug 10 the plug will be held in place and prevented from working loose.

I have therefore, provided a fuse of the cartridge type having a removable fuse strip and a visible indicator, the fuse strip and indicator being located in separate compartments and the glow bulb constituting the visible indicator prevented from being damaged by hot gases or the shock of an explosion when the fuse strip is burned through. I have further provided a fuse of such construction that the fuse strip may be renewed without disturbing the glow lamp and in addition have provided a fuse having its cylindrical body of insulating material formed with a side extension defining an auxiliary compartment to receive the glow lamp and in addition serving as a handhold by means of which the fuse may be easily handled and set in place or removed without danger of a shock being received.

In the embodiment of the invention illustrated in Figures 3 and 4 the side extension 22 defining the auxiliary compartment and serving as a handhold is formed integral with the body 23 of insulating material and within the auxiliary chamber is placed a glow lamp 24 corresponding to the lamp 11 and viewed through the sight opening 25. A resistance 26 corresponding to the resistance 12 is associated with the lamp 24 and conductors 27 extend outwardly through ends of the auxiliary compartment with their extended end portions terminating in bent ends forming spurs or anchors 28 seated in the depressions formed in portions of the body 23 which project beyond ends of the side extension. Ends of the auxiliary compartment are closed by plugs 29 which have wedging fit within the side extension and each plug has its outer end portion enlarged to form a circumferentially extending flange 30 projecting radially of the plug. These flanges extend radially from ends of the side extension about the circumference thereof and constitute abutments serving very effectively to prevent a person's fingers from slipping off of ends of the extension and engaging the terminals 31 or clips 6. The terminals 31 are in the form of metal caps which fit tightly about the extended end portions of the body and serve not only as terminals overlapping and securing extended ends of the conductors 27 but also bear against outer ends of the plugs 29 and secure the plugs in place. The strip 32 of fusible material extends longitudinally in the main compartment defined by the cylindrical body and has its ends anchored to heads of the metal caps or terminals 31 in a conventional manner. In this form of the invention the glow lamp will be illuminated to indicate when the fuse strip 32 has been burned through but the fuse strip cannot be renewed and the entire fuse must be discarded and a new one set in place.

The fuse illustrated in Figure 5 is of the knife blade type and its body 33 and side extension 34 are similar in construction to that shown in Figure 1 except that ends of the body terminate flush with ends of the side extension and are internally threaded to receive externally threaded metal sleeves 35 taking the place of the sleeve 15 and formed with external flanges 36 which bear against ends of the body when the sleeves are screwed into place. These sleeves 35 extend from ends of the body and beyond the flanges 36 are externally threaded to receive collars 38 by means of which the blades 39 are held firmly in place. These blades have inner tongues 40 to which ends of the strip of fusible material 41 are secured by bolts or other suitable fasteners 42 and therefore, when the fuse strip 41 is burned through the blades may be easily released and a new fuse strip applied.

A glow lamp 43 corresponding to the lamp 11 together with a resistance 44 is mounted within the auxiliary compartment defined by the side extension 34 in such position that the glow lamp may be seen through the sight opening 45 and ends of the auxiliary compartment are closed by plugs 46 which are screwed into place and can be easily removed when necessary. Conductors 47 extend outwardly between the plugs 46 and walls of the auxiliary compartment and ends of the conductors are bent over against end edges of the body where they are engaged by the flanges 36 which firmly grip them and establish a good connection between the terminals of the plug and the conductors, in order to permit current to pass through and illuminate the glow lamp when the fuse strip is burned through.

The modified construction illustrated in Figure 6 is very similar to that shown in Figure 1 except that ends of the side extension 48 instead of being closed by threaded plugs are closed by plugs 49 which are thrust into the auxiliary chamber. Each of these plugs has a circumferentially extending flange 50 about its outer end to engage an end of the side extension and limit inward movement of the plug and since the

sleeves of the metal terminals 51 bear against the outer ends of the plug they will be firmly held in place. The terminals 51 are similar in construction to those shown in Figure 1 and when they are screwed upon the end portions of the body 52, they engage outer ends of the conductors 53 leading from the glow lamp 54 and permit current to pass through the glow lamp when the fuse strip 55 is burned through.

It will thus be seen that in all of the embodiments illustrated and described there has been provided a fuse of the cartridge type having a fuse strip extending longitudinally in a main compartment between terminals carried by the body and a glow lamp mounted in an auxiliary compartment formed with a sight opening and having conductors extending out of the auxiliary compartment and engaged with the terminals of the body in order that current may pass through the glow lamp and associated resistance to illuminate the lamp when the fuse strip is burned through.

I claim:—

1. A fuse comprising a tubular body of insulation having a tubular side extension formed integral therewith and extending longitudinally of the body and constituting a hand hold, the side extension being formed with a sight opening, plugs closing ends of said side extension, terminals carried by end portions of said body and closing the same, a fuse strip extending longitudinally in said body between said terminals, and a glow lamp in said side extension having conductors extending to the terminals.

2. A fuse comprising a tubular body of insulation having a tubular side extension formed integral therewith and extending longitudinally of the body and constituting a hand hold, the side extension being formed with a sight opening, plugs closing ends of said side extension, terminals closing ends of said body and each including a sleeve fitting about the body and engaging a plug to retain the plug in place, a fuse strip extending longitudinally in said body and anchored to said terminals, and a glow lamp in said side extension having conductors extending outwardly through ends of the extension and secured between end portions of the body and sleeves of the terminals.

3. A fuse comprising a tubular body of insulation having a tubular side extension formed integral therewith and extending longitudinally of the body and constituting a handhold, the side extension being formed with a sight opening, plugs closing ends of said side extensions, terminals closing ends of said body and each including a sleeve engaged with an end portion of the body, a fuse strip extending longitudinally in said body between said terminals, and a glow lamp in said side extension having conductors extending outwardly from the extension and engaged with said terminals.

4. A fuse comprising a tubular body of insulation having a tubular side extension formed integral therewith longitudinally of the body and constituting a handhold, plugs of insulation closing ends of the side extension and having marginal portions extended to form abutment flanges about the ends of the side extension projecting radially therefrom and serving to prevent a person's fingers slipping off ends of the extension when grasping the same, terminals closing ends of said body and each having a sleeve fitted about the body between an end of the body and the side extension, and a glow lamp in the side extension having conductors extending out through ends of the side extension and engaged by sleeves of the terminals.

5. A fuse comprising a tubular body of insulation having a tubular side extension formed integral therewith longitudinally of the body and constituting a handhold, plugs of insulation closing ends of the side extension, the side extension being formed with a sight opening, a glow lamp in the side extension having conductors extending out from ends of the side extension, terminals closing ends of said body and each including a sleeve carried by the body and gripping a conductor, a closure carried by said sleeve, and a fuse strip extending longitudinally in the body with its end portions engaged with closures of the terminals.

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