Nov. 18, 1930. W. J. LUSE 1,781,786

MULTIPLE SCREW FUSE PLUG

Filed April 2, 1926

Fig. 3.

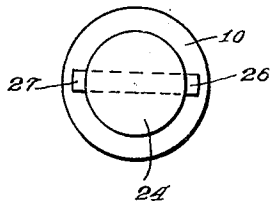


Fig. 4.

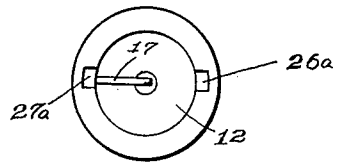


Fig. 5.

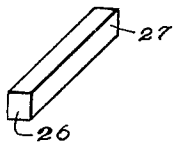


Fig. 2.

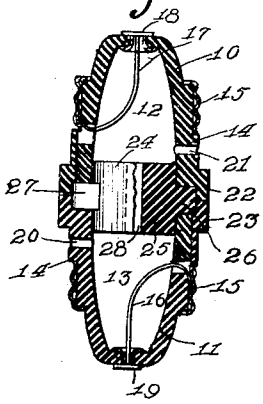


Fig. 1.

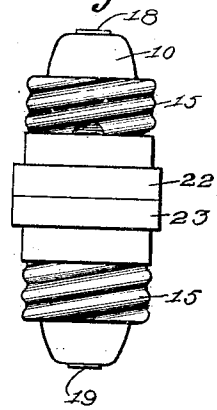


Fig. 7.

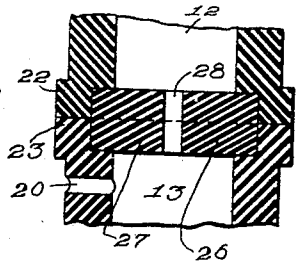


Fig. 6.

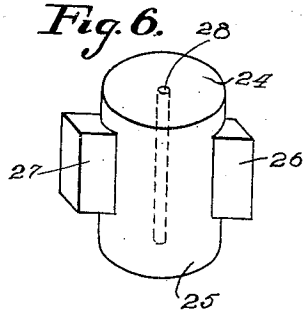


Fig. 8.

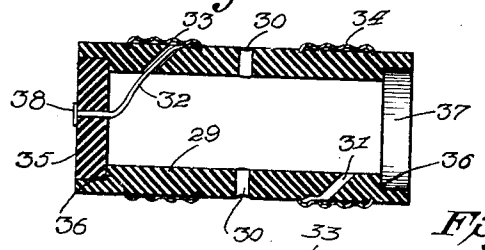


Fig. 9.

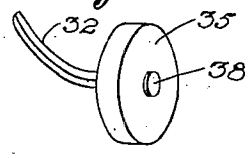
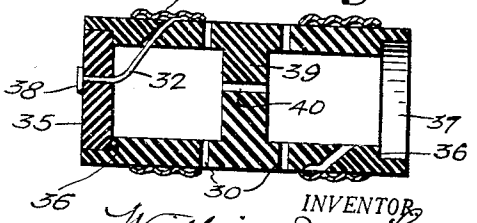


Fig. 10.



INVENTOR

William J. Luse

Patented Nov. 18, 1930 1,781,786

UNITED STATES PATENT OFFICE

WILLIAM J. LUSE, OF NEW YORK, N. Y.

MULTIPLE-SCREW FUSE PLUG

Application filed April 2, 1926. Serial No. 99,224.

This invention relates to improvements in electrical fuses and more particularly to fuse plugs, and has for its object to provide a simple, efficient, inexpensive device of this character that is constructed to have a longer life, greater utility for emergency purposes, and less embarrassing to fuse plug operators than other types of fuse plugs.

It is a matter of daily occurrence in all quarters having electrical devices, appliances and fittings and consuming electrical current, for people concerned with the operation thereof to experience embarrassment and handicap due to the short-circuiting of the electrical circuit, or the disruption of the same circuit. A convenient means in which attention is directed to such electrical circuit disturbances, and at the same time in which to prevent over burdening said circuit with heavy duty is by means of fuse plugs screwing into the customary sockets. The "blowing" of a fuse in any circuit results in the lights going out, or in a cessation of operation of an electrical device whose current supply is stopped by this fuse "blowout".

My invention relates to the type of fuse plugs known as the screw fuse plugs which are standard fittings. When fuses of this type blow out, many persons fail to locate this as the source of power depletion, and look to other causes, and sometimes call in electrical service men to look into the source of trouble. Even those who are conversant with fuse plug functioning, in cases of emergency must remind themselves to keep in reserve a supply of extra fuse plugs, so that when some blow out they can be replaced. Often at night, Sundays and during holidays fuses blow out, and there is none in reserve, nor can extra or additional fuse plugs be purchased; in this event a great source of nuisance exists that cannot be quickly remedied.

One of the objects of the present invention is to provide a multiple fuse plug having interchangeably serviceable fuse ends either of which may be reversed to provide an emergency fuse. In carrying out this purpose I provide an economical, simple, fool-proof construction of double fuse plug, devoid of intricate parts, free from short-circuiting connections, having no parts that get out of order, and designed to save expense in fuse plug maintenance.

Another object of my invention is to provide a two fuse point single plug easy to manipulate by those uninitiated as well as initiated in electrical work and trouble detection,—a double fuse plug always ready to provide a permanently associated emergency fuse plug, simply by reversing the plug and screwing the other end into the fuse box.

A still further object of the invention is to provide a unitary two point fuse plug wherein use may be made of two identically constructed fuse plugs, joined together and united permanently in a manner not to allow the separation of the two plugs, so that a single, homogeneous, continuous fuse plug is provided.

Another object of the present invention is to save perplexing situations as where it becomes necessary in the dark, because a fuse blew out, to locate the particular fuse in question in order to replace this with a good fuse. My multiple fuse screw plug, may be screwed into a fuse box from either end, and instantly restores a disrupted circuit. Therefore in testing fuses to locate the bad one time and worry is saved in the act of unscrewing one end of my new plug, turning it around and screwing the other fuse end into fuse box; if the light is restored it shows that the fuse just changed to outside projecting position relatively to fuse box is the bad one and the new fuse end is the good one. Otherwise the trouble is with another and different fuse in the same line.

With the above and other objects in view my invention consists in the combination, arrangement and details of construction disclosed in the drawings and specifications and then more particularly pointed out in the appended claims.

In the drawings, wherein similar reference characters designate similar parts thruout the respective views,

Figure 1 is a plan view of one form of my multiple fuse plug,

Figure 2 is a longitudinal section thereof,

Figure 3 is an end view of one section of a two-section fuse plug, showing a binding member inserted thereinto,

Figure 4 is an end view of Figure 3 with the binding member removed,

Figure 5 is a perspective view of a binder member,

Figure 6 is a perspective view of another form of binder member,

Figure 7 is a fragmental detail view of two plug sections connected by a binder member,

Figure 8 is a longitudinal view of another form of multiple fuse plug,

Figure 9 is a perspective view of a closure for my novel plug, and

Figure 10 shows a modified form of the structure illustrated in Figure 8.

Referring to the drawings which merely illustrate the best forms of my invention now known to me, I show the various parts of my invention. In carrying out my invention I aim to provide means mounted internally of two similarly shaped screw threaded fuse plugs or fuse plug sections 10 and 11, and interlocking the same against accidental separation or displacement. I also provide a non-conducting member or means having a press fit with the open end of each plug section 10 and 11 and carrying means so engaging these sections as not only to cause their confronting edges to contact, but enabling one fuse plug to rotate in unison with the other fuse plug, to avoid one fuse plug becoming released from the other as the innermost plug is screwed into or out of the fuse box.

I take the two similarly sized, shaped and constructed screw threaded fuse plugs of standard make designated 10 and 11, having the internal bores 12 and 13 respectively and register their edges or flanges 22 and 23 in contacting relation to close both fuse plugs. It will be understood that these fuse plugs will be made from porcelain or any other non-conducting material, and will be formed with diametrically opposite notches 26^a and 27^a, the corresponding notches 26^a and 27^a of each plug registering so that I am enabled to insert snugly, firmly and with a snug fit a fibre block the ends 26 and 27 of which will simultaneously project into the sets of recesses 26^a and 27^a of both plugs. This unites both fuse plug sections together permanently and form means concealed within these plugs so that only the seam where they join is visible outside the device.

As it is highly practicable and desirable to provide an insulated partition with a small vent hole in its center to divide the single fuse plug thus obtained into two separate but intercommunicating chambers, this is accomplished by forming preferably integrally upon the block having the ends 26—27 a non-conducting plug having ends 25 and 24 which extends beyond and in opposite directions from the center of this binding member or block 26—27. The unitary binding member and combined partition is shown in Figure 6 where it will be seen that a hole 28 is formed clear thru and axially of the completed partition or plug serving as a vent hole. Each fuse plug section of the completed multiple fuse unit has its own vent hole 20 and 21 respectively located on either side of the partition; these chamber vents allow the escape of the intensive heated gases that are emitted when a fuse is blown, especially where a high amperage is used in the circuit line. The hole 28 in the partition plug provides an emergency exit and avenue of escape for the gases of either chamber into the other, thus allowing and permitting a larger circulation of air and an increased explosion chamber. It will also be noticed that my combined plug uniter and partition also serves to reinforce the center of the unitary multiple fuse plug which my invention provides and at its center it needs reinforcement as sometimes when a bad fuse calling for replacement sticks in the fuse box it may be necessary to apply a wrench to firmly unseat it and the wrench would best engage the center of the multiple plug.

The usual fusible elements 16 or 17 are employed to provide two fuse points at the opposite ends of my plug, and they consist of the wires shown in Figure 2 designed to melt when the load impressed upon the circuit is too strong. I permanently close the opposite ends of my plug by means of a non-conducting material, so as to avoid removing these fuse ends, as inexperienced persons could easily damage the plug by not properly connecting the fuse ends to the terminals. In the closed ends of my unitary plug I connect in a conventional manner the tubular contacts or contact points 18 or 19 respectively to which the fuse wires are soldered or otherwise electrically connected, the other ends of these fuse wires being soldered or connected to the threaded contact collars that are permanently and irremovably connected externally to each of the opposing ends of this plug. Openings (not designated) allow the fuse wires to connect with these contact collars in the usual manner. These contact collars 15 are spaced apart from each other so as not to electrically connect with each other.

In this form of construction the plug is pressed into the open ends of the two fuse plugs, while the diametrically oppositely extending ears 26 and 27 are consecutively pressed with some force first into the recesses 26^a and 27^a of one plug section and then into the other.

I also provide another type of multiple double fuse end screw plug equally well adapted to provide interchangeably reversible fuse ends, but in this case I form the plug of one piece of non-conducting material. Figures 8 and 9 illustrate this new type.

The plug is preferably formed of uniform diameter thruout its length having a series of suitably located vent holes 30 disposed preferably centrally thereof. I chamfer each of the opposite ends of this tube as shown in the right hand end of Figure 8 to provide a counterseat 37 for receiving with a press fit a preferably fibre or other non-conducting disk or plug 35 which is limited in movement by the annular shoulder 36 formed in a plane with the counterseat 37. It is of great significance that these plugs 35 are counter sunk so as to be completely concealed and disposed wholly within the plug because they are not made to be removed and will not come out accidentally. The screw collar contacts 33 are provided and engage externally at opposite ends of the plug and have connected thereto in a manner already explained the fuse wires 32 which are also electrically and operatively connected to the outer contact points 38 secured into the fibre plugs or disks 35. It will be seen that the readily bendable fuse wires 32 as shown in Figure 9 may be shaped and bent to be inserted thru the holes 31 in this type of plug to join the collar contacts 33, after which the plug 35 is forcibly driven home into counterseat 37.

In Figure 10, the structure illustrated is substantially the same as in Figure 8 except that there is added to the structure of Figure 8 a partition such as shown generally in the preceding figures. The partition is designated 39 and has a vent hole 40. In practice this partition is made integral with the tubular body 29.

From the foregoing it will be seen that I have provided a simple two fuse point plug, that is positive in operation, that can only be blown twice even where there are crossed wires, which cost less to produce than two separate fuse plugs; which provides two reversible emergency plugs as a single unit; which makes one fuse act as a reserve fuse while the other is working; which avoids continuous blowing of fuses and damaging of meters or circuit lines; and which is practicable. I do not however limit myself to the exact details disclosed herein but claim all variations falling within the scope of the appended claims.

I have hereinbefore referred to the device as shown in Figures 8 and 10 as tubular for the reason that in both of these figures, the insulating body of the device is of hollow cylindrical form. In Figure 8, the hollow cylindrical form provides a straight through passage extending from one of the plugs to the other, but in Figure 10 a partition is introduced intermediate the ends of the plug. The term hollow cylinder as used in the appended claims obviously describes the tubular or hollow cylindrical structures of both of these figures whether the partition is present or not.

What I desire to claim and secure by Letters Patent is:—

1. A device of the character described embodying a continuous, non-conducting hollow cylindrical body having a circular interior and provided intermediate its ends with vent openings extending through its wall, countersunk seats at the opposite ends of said body, an insulating stopper seated in each countersunk end of the body with the outer face of each stopper flush with the corresponding end of the body and permanently secured to the body against removal, an annular threaded metallic sleeve embracing the body adjacent each end thereof and free from engagement with the stoppers, said sleeves being permanently secured to the body against removal, a contact terminal at the center of each stopper, and fusible material connecting each contact terminal with the corresponding threaded sleeve.

2. A device of the character described embodying a hollow insulating cylindrical member having a circular interior, threaded sleeves externally permanently mounted at the opposite ends thereof, fusible electric elements connected with said sleeves and located internally of said member, closures independent of said sleeves, for closing the member permanently at its opposite ends independently of the sleeves, and electrical contacts mounted on said closures and secured to said fusible elements, said fusible elements being non-accessible in the finished device.

3. A device of the character described comprising a hollow cylindrical body of insulating material having a circular interior and provided intermediate its ends with a cross axial partition permanent with respect to the tubular body, said body having bent holes therein through which gases may unobstructedly escape directly into the outer atmosphere and the body being provided at its opposite ends with countersunk seats, a stopper associated with each countersunk seat, a contact terminal in the center of each stopper, a metal sleeve encircling the body adjacent each end and free from engagement with the adjacent stopper, and fusible material connecting each contact terminal with the corresponding sleeve.

4. A device of the character described embodying a hollow cylindrical body of non-conducting material provided with a circular interior, a pair of non-conducting inter-fitting end pieces permanently closing the opposite ends of the body and immovably held to the body, threaded metallic shells embracing and permanently secured to the opposite ends of the body and free from contact with the end pieces, a contact terminal at the center of each end piece, and fusible material connecting each contact terminal with the corresponding shell.

5. A device of the character described em-

bodying a hollow cylindrical body of non-conducting material provided with a circular interior, a pair of non-conducting interfitting end pieces permanently closing the opposite ends of the body and immovably held to the body, threaded metallic shells embracing and permanently secured to the opposite ends of the body and free from contact with the end pieces, a contact terminal at the center of each end piece, fusible material connecting each contact terminal with the corresponding shell, and across axial partition extending across the interior of the tubular body intermediate the ends thereof.

6. A device of the character described comprising a single length of non-conductive hollow cylindrical tubing made with open ends and provided in its wall with vent holes and said tubing having a circular interior, an annular metallic threaded sleeve embracing each end portion of the tube and permanently secured thereon, a closure permanently closing each of said open ends and permanently secured independently of the sleeves to the tubing against removal therefrom, an electrical contact terminal at the center of each closure and a length of fusible material connecting each contact terminal with the corresponding metal sleeve.

7. A reversible double end fuse comprising a single length of non-conducting hollow cylindrical tubing with open ends having a circular interior and provided in its exterior wall with vent holes through which exploded gases can unobstructedly escape laterally in all directions directly to the outer atmosphere, an annular metallic threaded sleeve embracing each end portion of the tubing and permanently secured thereon, a pair of insulating end caps having a centrally located perforation therein permanently secured at each opposite end of the hollow cylindrical tubing against rotation or displacement in any direction, centrally located metallic contacts in each end cap for securing fusible members thereto, a fusible member attached to the center metallic contact member of each cap and passing through the interior of the hollow cylindrical tubing and through the wall of said tubing to the metal sleeve, whereby the fusible members are locked in an inaccessible position in the interior of the hollow cylindrical body to preclude substitution within the fuse of undesirable metals or articles in lieu of burnt out fusible members.

8. A device of the character described embodying a hollow cylindrical body of non-conducting material provided with a circular interior, a pair of non-conducting end pieces permanently closing the opposite ends of the circular body and immovably held to the body against rotation or separation displacement, threaded metallic shells embracing and permanently secured to the opposite ends of the body, a single contact terminal at the center of each end piece, fusible material connecting each single contact terminal through the body of non-conducting material with the corresponding shell, and a cross axial partition extending across the interior of the tubular body intermediate the ends thereof, said hollow cylindrical body being provided with vent openings in its side wall for the unobstructed escape of internal gases.

9. A device of the character described comprising a single length of non-conducting hollow cylindrical tubing having a circular interior, an annular metal threaded sleeve embracing each end portion of the cylindrical tubing and permanently secured thereon, a closure of insulating material permanently secured to each end of the tubing against displacement in any direction, centrally located contacts in each closure, and an electric fuse element connected to each contact and the corresponding metal sleeve through the interior of the tubing, whereby said electrical fuse elements are located in inaccessible positions within the interior of the cylindrical tubing, said non-conducting hollow cylindrical tubing having in the circumferential walls thereof unobstructed perforations forming vent holes through which gases generated in the plug may be vented laterally in all directions.

10. A device of the character described embodying a hollow cylindrical body of non-conducting material provided with a circular interior, a pair of non-conducting end pieces permanently closing the opposite ends of the circular body and immovably held to the body against rotation or separation displacement, threaded metallic shells embracing and permanently secured to the opposite ends of the body, a single contact terminal at the center of each end piece, fusible material connecting each single contact terminal through the body of non-conducting material with the corresponding shell, and a cross axial partition extending across the interior of the tubular body intermediate the ends thereof, said hollow cylindrical body being provided with vent openings in its side wall for the unobstructed escape of internal gases, and said cross axial partition being also provided with a vent opening through which gases may pass from the interior of one end of the cylindrical body to the other end and vice versa.

In witness whereof he has hereunto set his hand this twenty seventh day of March, 1926.

WILLIAM J. LUSE.