June 11, 1946. R. J. PERALTA 2,401,958

MULTIPLE ELECTRIC FUSE PLUG

Filed Jan. 26, 1944

Fig. 1.

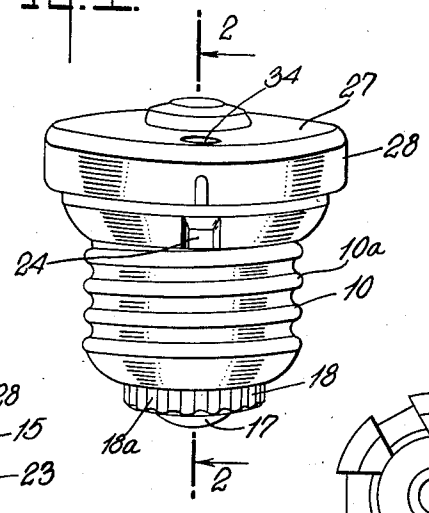
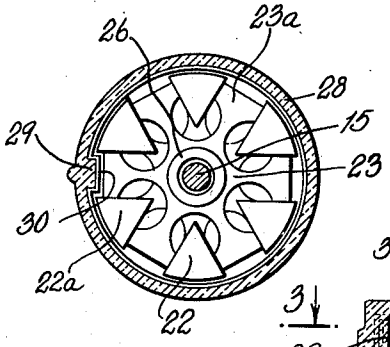


Fig. 3.



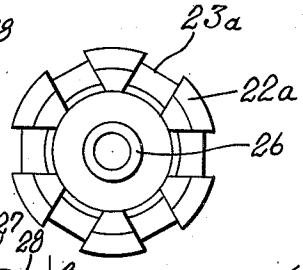


Fig. 4.

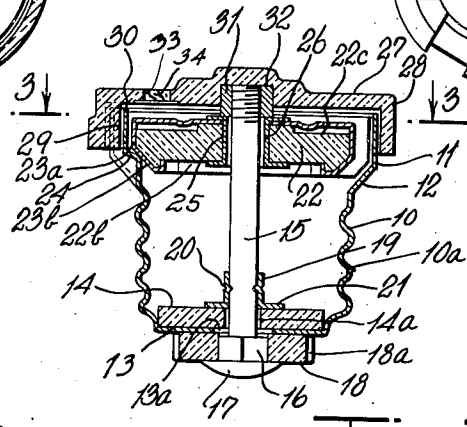


Fig. 2.

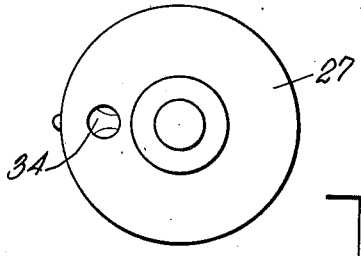


Fig. 5.

INVENTOR
Roberts J. Peralta
BY Kenyon & Kenyon
ATTORNEYS.

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MULTIPLE ELECTRIC FUSE PLUG

Roberto J. Peralta, Mexico City, Mexico

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9 Claims. (Cl. 200—125)

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This invention relates to the industry of electric fuse plugs, particularly in regard to novel and useful improvements in multiple-type fuse plugs. A detailed and exact description of these improvements, from which there can be appreciated not only the novel features but also the advantages and differences with respect to existing multiple-type fuse plugs, is made hereinafter.

Broadly my invention provides for a multiple fuse plug in which the main body consists of a one-piece shell of simple construction, the design of which is well-known for this purpose. At the bottom of this shell there is a large hole which admits the passage of a combination assembly and contact screw which extends the length of the shell and beyond its open end. This screw may be of any type suitable for the application but I provide preferably for the use of a screw with a smooth, rounded head and a squared shank which locks to an insulating washer with a knurled edge, which can be used to loosen or tighten the screw. Inside the shell there is an insulating spacer which serves not only as a centering guide for the screw but which also insulates it from contact with the metallic walls of the shell which forms the main body.

A holding device for this spacer is mounted on the body of the screw to prevent undue movement of the spacer along the length of the screw. The upper part of the screw passes through a lobed disc which has a predetermined number of lobes or salients between which are located the fuse elements, which themselves are formed to fit the shape of the disc. Both the disc and the fuse body have holes in the center through which the aforementioned screw passes. The disc preferably should be made from certain materials which may be asbestos, porcelain, cardboard, plastic, or any other satisfactory electrically insulating material. The disc will have a cross-section somewhat in the shape of a truncated cone such that its minor base will set against a lap or shoulder of the shell which has a widened upper part. This widened part of the shell is provided with an inward depression which will fit between two of the lobes of the disc, between which also a fuse element extends.

This indentation of the shell serves to receive a key or boss in the cap of the plug which will prevent rotation of the shell with regard to the cap when the assembly screw is tightened or loosened from the bottom or when the plug is screwed into place.

Accordingly, one of the principal objects of this invention is to provide a fuse plug of the

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type indicated whose cap cannot be removed without removing the entire plug from its socket.

Another object of this invention is to provide a fuse plug of the type indicated whose shell is constructed of one piece which serves as one contact for the device, and which also serves as a setting for the cap which locks with it to prevent rotation between the two.

Another object of this invention is to provide a disc or fuse-holder element for such a fuse plug, so designed in form and in relation to its assembly in the shell and contact arrangement that it is impossible for a person changing a blown fuse to change its position haphazardly or inadvertently.

Another object of this invention is to provide a multiple fuse mounted on a disc or holder which can be sold to the public ready for use, so that the only material that is wasted when a fuse is completely blown is the disc or fuse holder element, thus effecting considerable economies in metal and materials and cost of labor in the production and use of fuse plugs.

Another object of this invention is to provide a cap which covers the fuse element and which provides visual means directly aligned over the fuse element of the multiple fuse which is in use. In this way it is possible to determine that a fuse is blown without removing the plug or cap. The cap prevents sputtering of the fused metal in the event it is placed in its socket under conditions of a short circuit.

To the accomplishment of the foregoing and such other objects as hereinafter may appear, this invention consists in the novel construction and arrangement of parts hereinafter described and then sought to be defined in the appended claims, reference being had to the accompanying drawing forming a part hereof, which shows merely for the purposes of illustrative disclosure a preferred embodiment of the invention, it being expressly understood, however, that changes may be made in practice within the scope of the claims without digressing from the inventive idea.

In the drawing, in which similar reference characters denote corresponding parts:

Fig. 1 is a perspective view of the improved plug;

Fig. 2 is a vertical section taken along line 2—2 of Fig. 1 and viewed in the direction of the arrows;

Fig. 3 is a transverse section taken along line 3—3 of Fig. 2 and viewed in the direction of the arrows;

Fig. 4 is a bottom plan view of the assembly of the multiple fuse and multiple lobed support therefor, and

Fig. 5 is a top plan view of the device shown in Fig. 1.

In the drawing, 10 indicates the metallic shell having formed threads 10*a* to fit the plug socket, and an upper part 11 open and widened with a bevelled supporting section or seat 12, and with a lower flange portion 13 having a hole or opening 13*a*. 15 indicates a screw which has a lobed shank 16 that is squared or of any other shape which will key to another body. The screw has a smooth, rounded head 17 designed to minimize the possibility of locking with the slotted head of the screw or other contact which is generally used at the bottom of a plug socket. An insulating washer 18 is provided on the locking shank 16 of the screw. This washer is suitably knurled or grooved at 18*a* to facilitate its rotation and with such rotation the rotation of screw 15. In the lower section 13 an insulating spacer 14 having a hole 14*a* in the center and having a diameter substantially equal to the inside diameter of the lower part of the shell 10 is centered on the screw 15 in such a way as to leave the disc 14 free to rotate on it. A holding means 19, such as a nut or pressed clip 20 grips the body of the screw 15 and holds the insulating spacer 14 in its proper position by means of a skirt or washer 21.

In the widened upper portion 11 of the shell there is located a lobed disc 22 whose lobes or salients 22*a* extend to the largest diameter of the disc which is equal or substantially equal to the diameter of the upper opening 11. The elements 23*a* of the multiple fuse 23 are folded over between the lobes 22*a* of the disc 22 which serves as the fuse-holder, there being as many fusible elements 23*a* as there are spaces between lobes 22*a*. A depression or indentation 24 in the widened upper portion 11 of the shell 10 fits between any two consecutive lobes 23*a* and bears against the folded end 23*b* of one of the elements 23*a* of the multiple fuse 23. The fuse in general has spider-like shape. The fuse holder 22 has a cross-section substantially the same as that of the upper part 11 of the shell 10 which has a bevelled section or seat 12. Thus the form of disc 22 is essentially that of a truncated cone, with its smaller or lower base 22*b* facing downwardly and its upper or larger base 22*c* facing upwardly. The centered hole 25 in the fuse-holder disc 22 is fitted with an eyelet 26 which permits the passage of the screw 15 which extends slightly beyond the upper base 22*c* and which serves as a bearing for the cap contact. The eyelet 26 also serves to rivet the fuse 23 to the disc 22.

The cap 27 has a flat upper surface with a peripheral skirt 28 which fits over the outside of the widened portion of the shell 11. A projection or boss 29 on the inside of this cap fits into an indentation or notch 30 on the portion 11 of body 10 to lock the cap 27 against rotation when the screw 15 is screwed into a nut 31 provided in hole 32 in the center of the inside of the cap, which hole preferably does not extend to the outer surface of the cap. When the screw 15 is tightened into nut 31 it draws the latter into contact with eyelet 26 and forms one of the electrical contacts with fuse 23. Finally, the flat surface of the cover 27 has an opening 33 covered with transparent material 34 which serves as a window for observing whether or not the fusible element 23*a* of the multiple fuse 23 which is in use is blown.

In use the assembled device is threaded into the fuse socket of an electric line and need not be changed until observation through the window 34 indicates that the portion 23*a* of the fuse element is blown. When this occurs, the plug is unscrewed from the socket. Then disc 18 is rotated to loosen screw 15 from the cap 27 so that the latter can be lifted to expose fuse holder disc 22. The latter is lifted on screw 15 and rotated sufficiently so that when again lowered on the screw, the indentation 24 will lie between another pair of lobes 22*a* and in contact with a hitherto unused element 23*a* of the fuse 23. The cap 27 is then replaced with the window overlying the last named fuse element 23*a* and the washer 18 rotated to retighten the screw 15 into the threaded hole 31 thereby tightening the cap on the body.

The device can then be rescrewed into the socket and used until the fuse blows again. The operations just described are then repeated. When all elements 23*a* of the fuse 23 have blown out, the disc 22 is removed and replaced by a similar disc having unblown fuse elements. The only waste, therefore, is the fuse body 22. This is usually very cheap. Even the fuse body can be reutilized by placing thereon a fresh fuse element 23. However, its loss per se is negligible. Great saving is therefore accomplished with the device described since the main fuse parts can be used over and over again indefinitely. The screw 15 through nut 31 and eyelet 26 forms one of the fuse contacts and the body 10 through indentation 24 forms the other fuse contact.

In accordance with the above it will be appreciated that by means of this invention it is possible to achieve all of the objects outlined, as well as many others of greater detail but not of lesser importance, which have not been outlined. Inasmuch as it is difficult and impracticable to limit my rights to those specific details which can be illustrated and described herein, it is intended that my rights in connection with this invention will be interpreted in the general scope and spirit of the following claims.

What is claimed is:

1. Improvements in multiple electric fuse plugs comprising a multiple fuse holder, a metallic main contact body consisting of a one-piece shell having a widened portion at its top in which said fuse holder is mounted and a flared portion forming a seat, a multiple fuse in said holder, a cap supported upon said widened portion, a center nut capable of serving as an electrical contact fitted within said cap and adapted to bear firmly against said fuse and to press said fuse holder against said seat, this pressure establishing electrical contact with said fuse at its center, and said body having an indentation capable of making electrical contact with a chosen portion of said fuse to complete an electric circuit through said portion, and means engageable with said nut to effect the said firm bearing of said nut against said fuse element and to effect electrical contact between said indentation and said chosen portion of said fuse.

2. A device as per claim 1, in which said main body is threaded in a portion thereof and in which said fuse holder is multi-lobed, and in which said indentation is adapted to project between pairs of said lobes and into contact with the portion of said fuse in use lying between said lobes.

3. A device as per claim 1, in which said cap has an opening for visual observation aligned with the portion of said fuse in use, and said cap

has an inward boss and said widened portion of said body has an indentation into which said boss extends to lock said cap and body against rotation but permit removal of said cap from said body when the engageable means is disengaged from the nut.

4. A device as per claim 1, in which the means engageable with the nut includes an assembly screw, said screw being introduced from the bottom of said main body, said screw having a smooth rounded head, and a locking shank, means to insulate said screw from said body, and an insulating washer fitted on said locking shank for loosening and tightening said screw.

5. A device as per claim 1, in which the last-named means thereof includes an assembly screw, a centering spacer carried on said screw and positioned within said main body and lying on a lip provided on said body, and means to prevent movement of said spacer along the length of said screw.

6. A device as per claim 1, in which the last-named means thereof includes an assembly screw, said screw being introduced from the bottom of said main body, said screw having a smooth rounded head and a locking shank, means to insulate said screw from said body and a washer fitting tightly in locked relationship on said locking shank to prevent movement or rotation between said screw and said washer and for loosening and tightening said screw.

7. Improvement in multiple electric fuse plugs comprising a multi-lobed fuse holder, fuse elements carried thereby, a metallic main contact body consisting of a one-piece shell having a threaded portion, a widened portion above the threaded portion in which said fuse holder is contained and a flared portion joining the threaded and widened portions and serving as a seat for said fuse holder, said flared portion having an indentation adapted to project between pairs of lobes of the fuse holder for establishing electrical contact with any desired one of the fuse elements carried by said fuse holder, a cap member supported upon said widened portion of said shell, a contact member carried by said cap member and adapted to engage the fuse elements, and means to effect pressure engagement between said indentation and any desired one of the fuse elements and between said contact member and said fuse elements.

8. Improvements in multiple electric fuse plugs

comprising a multi-lobed fuse holder, fuse elements carried thereby, a metallic main contact body consisting of a one-piece shell having a threaded portion, a widened portion above said threaded portion in which said fuse holder is contained, and a flared portion joining the threaded and widened portions and serving as a seat for said fuse holder, said flared portion having an indentation adapted to project between any desired pair of lobes of said fuse holder for establishing electrical contact with a desired one of the fuse elements carried by said fuse holder, a cap member supported upon said widened portion of said shell, a nut member carried by said fuse holder and adapted to engage all the fuse elements and a screw extending axially through said body and into threaded engagement with said nut member, and means for insulating said screw from said body, said screw serving when screwed into said nut to maintain tight contact between said nut member and all of said fuse elements and between the desired one of said fuse elements and said indentation, and said body and screw serving as electrical terminals for said fuse plug.

9. Improvements in multiple electric fuse plugs comprising a multi-lobed fuse holder, fuse elements carried thereby, a metallic main contact body consisting of a one-piece shell having a threaded portion, a widened portion above the threaded portion within which said fuse holder is contained and a seat portion joining the threaded and widened portions and serving as a seat for said fuse holder, said seat portion having an indentation adapted to project between pairs of lobes of the fuse holder for establishing electrical contact with any desired one of the fuse elements carried by said fuse holder, a cap member supported upon said widened portion of said shell, a nut member carried by said cap member and serving as a contact engageable with the fuse elements, threaded means for tightening said cap member on said shell and for effecting pressure engagement between said nut member and said fuse elements and between said indentation and a chosen one of said fuse elements, said widened portion of said body having an indentation, and a boss on said cap member engageable with said last-named indentation to prevent rotation of said cap member with respect to said body.

ROBERTO J. PERALTA.