Feb. 14, 1950 F. J. ROUKOS, JR 2,497,470

MULTIPLE ELEMENT FUSE

Filed June 7, 1946

Fig 1

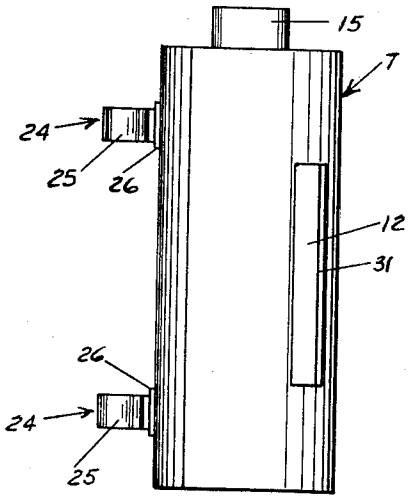


Fig 2

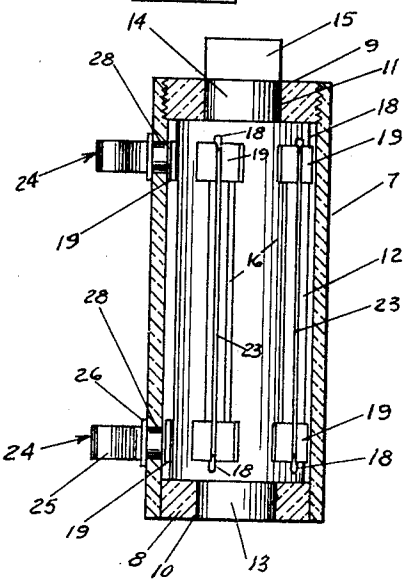


Fig 3

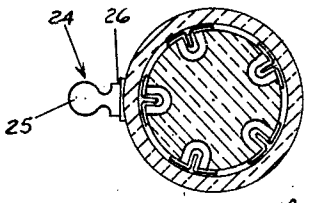


Fig 5

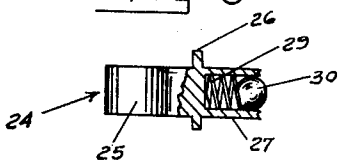


Fig 6

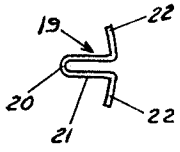
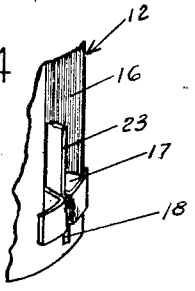


Fig 4



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MULTIPLE ELEMENT FUSE

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2 Claims. (Cl. 200—125)

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My invention relates to improvements in multiple element fuses, especially although not necessarily for automobile lighting systems, and the primary object of my invention is to provide a practical, efficient, and low-cost device of this nature which can be installed in place of the usual single fuses in the usual contact brackets provided therefor, and includes means to readily connect in circuit a new fuse element whenever the element in use blows out.

Another important object of my invention is to provide a multiple element fuse of the character indicated above which comprises a substantially dust proof protective casing in which a revoluble core is enclosed, on which a plurality of fuse elements in the form of strips are removably mounted in conductive spring metal clips, so that blown out strips can be readily replaced.

Other important objects and advantageous features of my invention will be apparent from the following detailed description and accompanying drawings, wherein a presently preferred embodiment of my invention is set forth merely for illustrative purposes.

In the drawings—

Figure 1 is a side elevation of the multiple element fuse.

Figure 2 is a transverse section taken through the casing and showing the rotatable core in side elevation.

Figure 3 is a horizontal section taken on an intermediate plane through Figure 1.

Figure 4 is a fragmentary perspective view on an enlarged scale, showing the side of the lower part of the rotatable core and the manner of association of the lower end of one of the replaceable fuse elements with a clip.

Figure 5 is an enlarged side elevation, partly broken away, of one of the combined connector lugs and contactors, and,

Figure 6 is a top plan view on a similarly enlarged scale of one of the clips.

Referring to the drawings in detail, my improvement in multiple element fuses comprises the generally cylindrical casing 7 of appropriate insulating material having the fixed end 8, and the threadably removable end 9, these ends being formed with relatively large axially aligned circular openings 10 and 11, respectively.

A cylindrical insulating material core 12, slightly smaller in diameter than the inside of the casing 7, has at one end the axial cylindrical extension 13 turning in the opening 10 of the casing end 8, and the elongated axial cylindrical extension 14 having an inner portion turning in

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the opening 11 of the removable casing end 9, and an exposed outer portion 15 formed as a finger grip enabling manual rotation of the core 12 in the casing.

The outer ends of the core 12 work close to the inner sides of the casing ends 8 and 9, and the sides of the core are formed with a plurality, in the herein illustrated case of five longitudinal substantially parallel relatively wide grooves 16 which extend between points adjacent to the outer ends of the core. The troughs of the grooves 16 are preferably rounded, as indicated in Figure 3, with their ends 17 plane and right angular and slotted at 18 to accommodate fuse element clips 19.

The fuse element clips 19, as shown in Figure 6, comprise flat metal strips bent U-shaped to provide the curved bight portion 20 having the substantially parallel legs 21 on the outer ends of which are outwardly and rearwardly curved flanges 22. The clips 19 are mounted in the slots 18 in each end 17 of each groove 16 by forcing the U-shaped part into the slots 18 so that the flanges 22 lie conformably along the curved outer surface of the core 12 at the sides of the slots 18 and at the outer ends of the grooves 16, as shown in Figure 4.

The aperture between the clip legs 21 at their outer ends serves the double purpose of providing entrance for the replaceable fuse element strips 23 and providing a stop recess for the ball contact of the combined connector lugs and contactors hereinafter described.

The fuse element strips 23 are flat parallel sided lengths of appropriate fuse material capable of withstanding sufficient pressure for their insertion into and removal from frictional engagement between the legs 21 of the clips 19 at their opposite ends.

The combined connector lugs and contactors 24 are of suitable conductive metal and comprise the cylindrical heads 25 to snap into the usual fuse clips provided in automobile lighting systems and elsewhere, in replacing therein the conventional cylindrical single element fuses. Flanges 26 are provided inwardly of the heads 25 to engage the outside of the casing 7, while squared hollow shanks 27 fitting in accommodating openings 28 formed in the side of the casing opposite the circles of clips 19 on the cylinder 12 contain springs 29 exerting constant outward pressure upon contactor balls 30 which roll on the exterior of the cylinder 12. The casing 12 is provided with a longitudinal inspection opening 31 on the side opposite the connector lugs 24,

enabling visually determining the condition of the fuse strips 23. The opening 31 is preferably positioned so that when the mutiple fuse is installed the opening will be downward or in some other protected position so that dust and dirt will be prevented from entering the casing therethrough.

The cylinder 12 is adapted to be turned by its handle 15 until the ball contactors 30 snap into the holding depressions defined by the openings between the outer ends of the legs 21 of the clips 19, so that reliable electrical contact is made with the clips related to the fuse elements 23, and idle rotation of the cylinder 12 is precluded. Whenever a fuse element 23 in use blows out, restoration of the electrical circuit concerned is made simply by turning the handle 15 until the two ball contactors 30 engage as described with another pair of clips 19 with which an unblown fuse strip 23 is associated. Whenever desired the core 12 may be removed by removing the casing end 9 and the blown out fuse strips replaced with fresh ones.

What is claimed is:

1. A multiple fuse assembly adapted to be substituted for the single fuse in the terminal clips of a fuse block, said multiple fuse assembly comprising an insulated tubular cylindrical casing having a pair of longitudinally spaced conductive contactors mounted having heads projecting radially from the exterior of said casing and formed for engagement with the fuse block clips whereby the assembly is supported on the fuse block with said contactors electrically connected to the fuse block clips, said cylindrical casing comprising ends formed with axially aligned cylindrical openings, a cylindrical insulated core having reduced cylindrical end portions journalled in said cylindrical openings, one of said end portions being extended and formed to provide a handle for manually rotating said core within said casing, said core being formed at equal circumferential intervals with longitudinal recesses of substantial width terminating at their opposite ends in relatively narrow longitudinal slots, conductive clips removably inserted in said slots, said clips comprising opposed elements arranged to be compressed toward each other upon insertion in the slots, longitudinally elongated fusible strips positioned in said recesses with their opposite ends removably clamped between the opposed elements of the related clips inserted in slots, and contacts on said contactors within said cylindrical casing, each contact embodying a ball, and a spring operatively connected to said ball for urging the latter into engagement with the clip aligned therewith and seat between the opposed elements of said aligned clip to thereby establish positive electrical engagement of the ball contacts with the clips aligned therewith and resist vagrant rotation of said core while said contacts are engaged with the clips of a fusible strip.

2. In a changeable fuse assembly involving a plurality of selectively usable fuses, a tubular cylindrical casing, a cylindrical core journalled in said casing and having a handle at one end for rotating the core relative to the casing, said core being formed in its surface with a plurality of circumferentially spaced longitudinally extending recesses, said recesses terminating at their opposite ends in relatively narrow slots, V-shaped spring clips having legs normally tensioned away from each other and removably inserted in said slots so as to be compressed toward each other, fusible strips positioned along and within said recesses with their opposite ends extending into the slots at the opposite ends of the recesses and removably inserted between and clamped in place by the legs of the related spring clips inserted, whereby said fusible strips can be removed for replacement by removing the related spring clips from their slots, and longitudinally spaced contactors mounted on said tubular cylindrical casing, each of said contactors having a ball contact, and a spring operatively connected to said ball contact for urging the latter into engagement with the spring clip aligned therewith, said core being rotatable relative to said casing to align the spring clips of different fusible strips with said contacts, the outer ends of the legs of said clips when in place in their slots being sufficiently spaced from each other to provide notches in which said contactor contacts seat to provide positive electrical engagement with the clips and resist vagrant rotation of said core relative to said casing.

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