Oct. 1, 1957 E. CARDONE 2,808,485

FUSED PLUG CONSTRUCTION

Filed July 23, 1956

Fig. 1

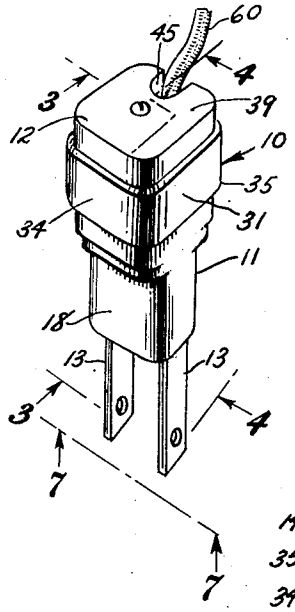


Fig. 3

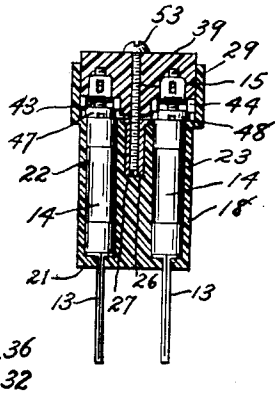


Fig. 2

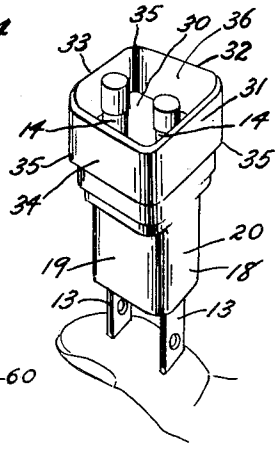
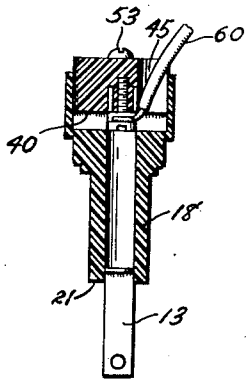


Fig. 4



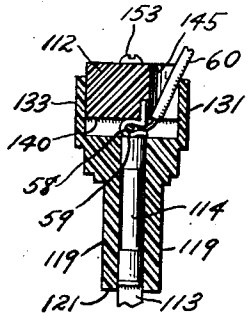
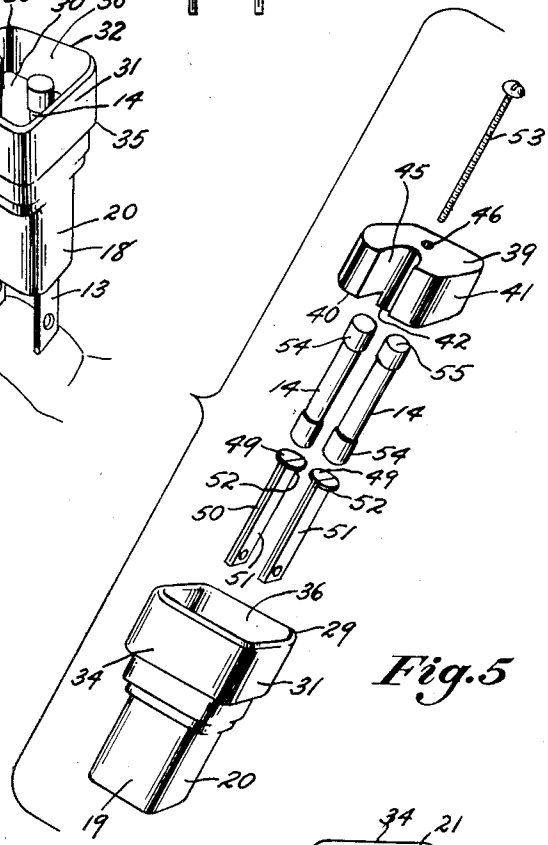


Fig. 6

Fig. 5



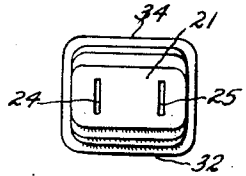


Fig. 7

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FUSED PLUG CONSTRUCTION

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4 Claims. (Cl. 200—115.5)

This invention relates generally to the field of electrical appliance plug construction, and more particularly to an improved fused plug having self-contained cartridge fuses of a capacity substantially lower than the fuse capacity of the circuit with which the appliance is used.

Such devices are known in the art, and provide additional protection for the appliance in that the circuit is broken when the amperage rating of the appliance is exceeded, rather than when the amperage limit of the line is reached. Additional convenience is also present, in that the location of the blown fuse is readily ascertainable and the same may be replaced without disconnecting the entrance switch of the building in which the appliance is used.

It is among the principal objects of the present invention to provide an improved fused plug construction of the class described in which the cartridge fuse member or members may be conveniently manually ejected from the plug body for inspection or replacement.

Another object of the invention lies in the provision of improved fused plug construction in which substantially all springs or other substantially resilient parts have been eliminated, thereby facilitating the assembly and disassembly of the plug when required.

A further object of the invention lies in the provision of fused plug construction in which the cost of fabrication may be of a reasonably low order, with consequent wide sale, distribution and use.

Still another object of the invention lies in the provision of improved means for securing the ends of electrical conductors while the construction is in a partially disassembled condition with increased facility and complete concealment of the ends of the terminal after subsequent assembly.

Still another object of the invention lies in the provision of structure of the class described which may be assembled or disassembled using only ordinary skill, and without resort to special tools.

A feature of the invention lies in the fact that only a single threaded means is required for maintaining all of the component parts of the device in assembled condition.

Another feature of the invention lies in the provision of improved resilient means for engaging the ends of electrical conductors, thereby making it unnecessary to tighten threaded means upon the same as is generally required in conventional construction.

These objects and features, as well as other incidental ends and advantages, will become more clearly apparent during the course of the following disclosure, and be pointed out in the appended claims.

On the drawing, to which reference will be made in the specification, similar reference characters have been employed to designate corresponding parts throughout the several views.

Figure 1 is a view in perspective showing an embodiment of the invention.

Figure 2 is a similar view of the embodiment in partially disassembled condition, showing the means for manually ejecting cartridge fuse members, which comprise parts of the embodiment.

Figure 3 is a central vertical longitudinal sectional view of the embodiment as seen from the plane 3—3 on Figure 1.

Figure 4 is a vertical central transverse sectional view partially in elevation, as seen from the plane 4—4 on Figure 1.

Figure 5 is an exploded view in perspective of the embodiment.

Figure 6 is a central vertical fragmentary sectional view corresponding in most respects to that seen on Figure 4, but showing an alternate form of the embodiment.

Figure 7 is a bottom plan view as seen from the plane 7—7 on Figure 1.

In accordance with the invention, the device, generally indicated by reference character 10, comprises broadly: a main body element 11, a cap element 12, a plurality of receptacle engaging prong elements 13, a plurality of fuse elements 14 and interconnecting means 15.

The main body element 11 is formed from any suitable electrically insulative material, as for example hard rubber, Bakelite, phenolic resins, or the like. It includes a lower fuse retaining member 18 bounded by side surfaces 19, end surfaces 20 and a bottom surface 21. Fuse retaining bores 22, 23 are disposed in parallel relationship, each terminating at the lower end thereof within the body of the retaining member 18. Rectangular slots 25 and 24 extend upwardly from the bottom surface 21 to communicate with the bores 22 and 23 respectively. A smaller centrally disposed bore 26 is provided with a fixed metallic thread bearing member 27 which provides means for the interconnection of the main body element 11 and the cap element 12.

An upper cup-shaped member 29 is formed integrally with the fuse retaining member 18, the lower surface 30 thereof forming the upper terminal of the bores 22 and 23. The cup-shaped member includes four peripheral side wall members 31, 32, 33 and 34, respectively, each of which is joined by a curved interconnecting portion 35 of relatively small radius. The members 31—34 form a recess 36 into which the cap element 12 may be disposed.

The cap element 12, like the main body element 11 is preferably of molded construction, and includes an upper surface 39, a lower surface 40 and side surfaces 41. A projecting member 42 forms terminal recesses 43 and 44, a conductor channel 45 communicating with both of the recesses. A centrally disposed bore 46 accommodates a threaded bolt 53 which engages the thread bearing member 27 which acts as a corresponding nut. The conductor engaging members 47 and 48 may be of well known screw type, and are positioned such that the head portions thereof will overlie the ends of the fuse retaining bores 22 and 23 when the device 10 is fully assembled.

The prong elements 13 are best seen on Figures 4 and 5 of the drawing, and are preferably formed from planar brass stock, although if desired the same may be cast. Each element 13 includes a first shoulder portion 49, elongated portions 50 and 51 and a second shoulder portion 52. The shoulder portions 49 and 52 are generally semi-circular to conform to the cylindrical bores 22 and 23.

The fuse elements 14 are preferably standard cartridge type fuses having metallic end cap portions 54. The elements 14 are of a length such that when the prong elements 13 are positioned within the bores 22 and 23 as shown on Figure 3 wherein the elongated portions 50 and 51 project through the slots 24 and 25, respectively,

the end surfaces 55 are substantially co-planar with the surface 30.

In the assembly of the device 10, the end portions 59 of a conventional conductor 60 are secured to the conductor engaging members 47 and 48 as shown on Figures 1 and 4, a secure electrical connection being obtained by the tightening of the screw portions thereof. The cap element 12 is then inserted into the recess 36, following which the bolt 53 is engaged with the threaded member 27 as shown on Figure 3. Tightening of the screw serves to bring the heads of the screw portions of the conductor engaging members 47 and 48 into direct contact with the end surfaces 55 of the fuse element 14, pressure being transmitted through the fuse elements to maintain the prong elements 13 in rigid position with respect to the main body element 11. Excessive tightening is prevented by engagement of the projecting member 42 with the surface 30. Thus, through the tightening of a single bolt 53, the entire device is maintained in mechanical and electrical contact. Force is transmitted through the head of the bolt 53 to the cap element 12, to assure positive electrical contact between the conductor engaging members 47 and 48 and the upper cap portions 54 of the fuse elements 14. The same force is transmitted through the fuse elements to result in positive electrical contact between the lower end cap portions of the fuse element and the shoulder portions 49 and 51 of each of the prong elements 13. This same force firmly seats the prong elements 13 at the end of the fuse retaining bores 22 and 23 so that engagement of the device with a wall or other electrical receptacle is a simple matter of insertion.

Upon the blowing of a fuse, or if it is desired to examine the condition of the fuses, the bolt 53 is removed permitting the cap element 12 to be disconnected from the main body element 11. The fuse elements 14 may then be partially or fully ejected as shown on Figure 2 of the drawing by merely pushing inwardly upon the prong elements 13 the desired amount. In the position shown on the drawing, the fuses may be then examined or removed without difficulty to be replaced by similar fuses.

If desired, the fuse retaining bores of the device may be formed to have a rectangular cross section, the portions 49 and 52 formed to correspond, in the interest of facilitating the engagement of the portions 50—51 in the slots 24—25.

Turning now to the alternate form of the embodiment as shown on Figure 6 of the drawing, parts corresponding to those of the principal embodiment have been designated by similar reference characters with the additional prefix "1," thereby avoiding needless repetition.

The alternate form of the embodiment differs from the principal form in the provision of resilient clips, one of which is indicated by reference character 58, which replaces the screw type conductor engaging members 47 and 48. The clips 58 are preferably molded into the cap element 12 at the time the same is formed, and is of such configuration as to lightly grip the bared end of the conductor 60 owing to natural resilience. Positive electrical connection is obtained by the clamping effect of the cap element 112 against the main body element 111 which partially deforms the clips so that they exert an additional squeezing action upon the end 59 of the conductor.

I wish it to be understood that I do not consider the invention limited to the precise details of structure shown and set forth in this specification, for obvious modifications will occur to those skilled in the art to which the present invention pertains.

I claim:

1. Electrical plug construction comprising: a body element having an elongated bore therein, said bore being open at a first end thereof and terminating at a second end thereof at an inner surface disposed substantially at right angles with respect to the axis of said bore; said body element having a slotted passage extending from said surface outwardly of said body; a receptacle engaging prong element slideably disposed within said slotted passage and having a shoulder portion on the inner end thereof engageable with said inner surface; a cartridge fuse member disposed within and substantially filling said bore, a first end of which is engageable with said shoulder portion of said prong element; a cap element threadedly associated with said body element in such manner as to at least partially cover said open end of said bore and to contact a second end of said fuse member; whereby tightening of said cap with respect to said body element serves to urge said first end of said fuse member against said shoulder portion of said prong element, and said shoulder portion of said prong element to bear against said inner surface of said bore.

2. Electrical plug construction comprising: a body element having an elongated bore therein, said bore being open at a first end thereof and terminating at a second end thereof at an inner surface disposed substantially at right angles with respect to the axis of said bore; said body element having a slotted passage extending from said surface outwardly of said body; a receptacle engaging prong element slideably disposed within said slotted passage and having a shoulder portion on the inner end thereof engageable with said inner surface; a cartridge fuse member disposed within and substantially filling said bore, a first end of which is engageable with said shoulder portion of said prong element; a cap element threadedly associated with said body element; said cap element having means for engaging the end of an electrical conductor, said means being positioned upon said cap element so as to at least partially cover said open end of said bore whereby tightening of said cap element with respect to said body element may serve to urge said last mentioned means to contact a second end of said fuse member and in turn cause said fuse member to bear against said shoulder portion of said prong element and said shoulder portion of said prong element to bear against said inner surface of said bore.

3. Electrical plug construction comprising: a body element having an elongated bore therein, said bore being open at a first end thereof and terminating at a second end thereof at an inner surface disposed substantially at right angles with respect to the axis of said bore; said body element having a slotted passage extending from said surface outwardly of said body; a receptacle engaging prong element slidably disposed within said slotted passage and having a shoulder portion on the inner end thereof engageable with said inner surface; a cartridge fuse member disposed within and substantially filling said bore, a first end of which is engageable with said shoulder portion of said prong element; a cap element threadedly associated with said body element; said cap element having screw means for engaging the end of an electrical conductor, said means being positioned upon said cap element so as to at least partially cover said open end of said bore whereby tightening of said cap element with respect to said body element may serve to urge said last mentioned means to contact a second end of said fuse member and in turn cause said fuse member to bear against said shoulder portion of said prong element, and said shoulder portion of said prong element to bear against said inner surface of said bore.

4. Electrical plug construction comprising: a body element having an elongated bore therein, said bore being open at a first end thereof and terminating at a second end thereof at an inner surface disposed substantially at right angles with respect to the axis of said bore; said body element having a slotted passage extending from said surface outwardly of said body; a receptacle engaging prong element slideably disposed within said slotted passage and having a shoulder portion on the inner end

thereof engageable with said inner surface; a cartridge fuse member disposed within and substantially filling said bore, a first end of which is engageable with said shoulder portion of said prong element; a cap element threadedly associated with said body element; said cap element having clamping means for engaging the end of an electrical conductor, said means being positioned upon said cap element so as to at least partially cover said open end of said bore whereby tightening of said cap element with respect to said body element may serve to urge said last mentioned means to contact a second end of said fuse member and in turn cause said fuse member to bear against said shoulder portion of said prong element and said shoulder portion of said prong element to bear against said inner surface of said bore.

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