

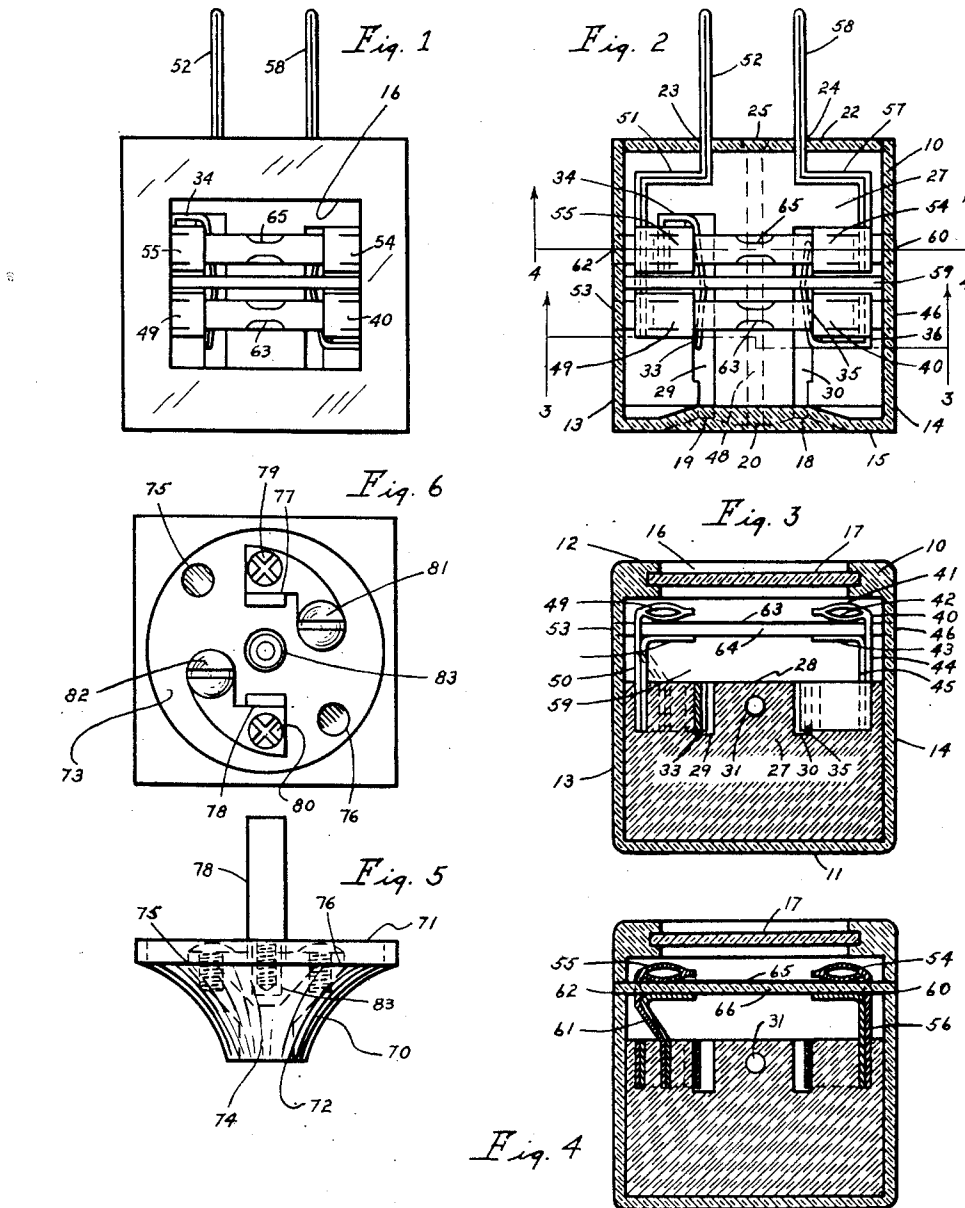
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ELECTRIC OUTLET FUSE PLUG

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ELECTRIC OUTLET FUSE PLUG

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This invention relates generally to electric connectors and is particularly directed to a fused electrical connector for disposition in a local electric circuit.

The particular embodiment of the present invention, which is illustrated in the drawings and which will be described hereinafter in greater detail, comprises generally a casing having a window, a supporting body within the casing, and fuse holders mounted in the supporting body and adapted to removably retain a fuse within the casing adjacent to the window for visual access through the latter, and means for connecting the fuse in a circuit.

While there are similar, fused connectors for disposition in local electric circuits in the prior art, such devices have all been subject to one or more serious disadvantages. For example, in prior art devices it has been extremely difficult to ascertain the condition of the fused element, frequently requiring awkward body positions of the observer, or disassembly of the device. Further, prior devices often did not permit of fuse element replacement, or if such was possible, it presented a safety hazard to both the operator and surrounding structure.

Accordingly, it is one object of the present invention to provide a fused connector of the type described, which overcomes the above-mentioned difficulties, and in which one or more fuse elements may be readily, and simultaneously viewed, while the connector is in use, so that it is unnecessary to remove or otherwise manipulate the fused connector to determine the condition of the fuse elements. Further, the fused connector of the present invention permits visual inspection of the connection between the connector device and associated circuit to determine if proper contact is being made, also without requiring removal of the device from its operative position or other manipulation thereof. As necessary handling of the fused connector is thus reduced to a minimum, it will be apparent that the danger of shock, fire and the like are also minimized.

Another object of the present invention is to provide a fused connector having the features and advantages mentioned in the foregoing paragraph, in which the fuse elements may be quickly and easily removed and replaced by unskilled persons, with or without removal of the connector from its operative position. Moreover, removal and replacement of the fuse elements may be accomplished with complete safety as the connector remains in its encased condition; and, disassembly of the connector, while a simple procedure, may only be achieved after complete detachment of the connector from a source of electric energy.

It is a further object of the present invention to provide a fused electrical connector having the characteristics indicated above, which is simple in construction and durable in use, and which can be manufactured and sold at a reasonable cost.

Other objects of the present invention will become apparent upon reading the following specification and

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referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

In the drawings:

Fig. 1 is a front view showing a fused electrical connector constructed in accordance with the present invention.

Fig. 2 is a front sectional view of the connector of Fig. 1 showing the interior construction thereof.

Fig. 3 is a sectional view taken substantially along the line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken substantially along the line 4—4 of Fig. 2.

Fig. 5 is a side elevational view showing a plug connector adapted for use with the fused connector of the present invention; and

Fig. 6 is a front elevational view showing the plug connector of Fig. 5.

Referring now more particularly to the drawings, and specifically to Figs. 1—4 thereof, the embodiment of the invention illustrated therein comprises a generally rectangular casing 10, preferably fabricated of insulating material, and having a rear wall 11, front wall 12, side walls 13 and 14, and an end wall 15. The front wall 12 is formed with a generally rectangular through opening or window 16 in which is mounted a transparent sheet of glass or other suitable transparent material 17. Formed in the end wall 15 are a pair of parallel spaced through slots or openings 18 and 19, and an aperture or hole 20, disposed spacedly between the slots. The other end of the casing 10, the top in Fig. 2, is preferably open, and provided with a cover plate 22 which is removably arranged in closing relation with respect to the open casing end. The cover plate or end closure 22 is also provided with a pair of parallel spaced through slots 23 and 24, and an intermediate aperture or hole 25.

Disposed within the casing 10, substantially conformably therein, is a generally rectangular block or mounting body 27, which is preferably fabricated of suitable insulating material. The body 27 is illustrated as having its rear, side and end surfaces in abutting engagement with the rear, side and end walls of the casing 10, the front surface 28 of the body being spaced from the front wall 12 of the casing and its window 17. The body 27 is formed or molded with a pair of parallel spaced passageways or recessed portions 29 and 30 which extend through the slots 19 and 18, respectively, into the body and open forwardly through the front body surface 28 in underlying relation with respect to the window 17. A through bore 31 is provided longitudinally in the body 27 in registry with the end wall aperture 20 and cover plate aperture 25.

Arranged longitudinally within the passageway 29 is a resilient contact strip or arm 33 which has a U-shaped end portion 34 embedded in the body 27 adjacent to and spaced from the end closure 22 and side wall 13. A similar resilient contact strip or arm 35 is arranged longitudinally within the passageway 30 and includes a U-shaped end portion 36 embedded in the body 27 adjacent to and spaced from the end wall 15 and side wall 14.

A fuse holder 40 is disposed within the space between the body 27 and front casing wall 12 adjacent to and facing away from the side wall 14. The fuse holder 40 includes an upper jaw 41 having a resilient, depressed central portion 42 and a lower jaw 43 spaced below the upper jaw. The jaws 41 and 43 are preferably fabricated of metal or other suitable conductive material and include angulated portions 44 and 45 which combine to

define a supporting stem extending into and secured within the body 27 to the U-shaped portion 36 of the contact arm 35. A side wall opening 46 is formed in the wall 14 in substantial alignment with the space between the jaws 41 and 43 of the fuse holder 40, for a purpose appearing hereinafter. A fuse holder 49, substantially the same in construction as the fuse holder 40 is arranged in facing spaced relation with respect to the latter adjacent to the casing side wall 13. The supporting stem 50 of the fuse holder 49 extends into the body 27 and is secured therein to a prong extension 51. Stated otherwise, the prong 52 which extends from the body 27 outwardly through the cover plate slot 23 includes an offset extension 51 embedded in the body 27 and electrically connected to the stem 50 of the fuse holder 49. In substantial alignment with the space between the jaws of the fuse holder 49, and also in substantial alignment with the opening 46 in the side wall 14, is provided an opening 53 in the side wall 13.

A pair of fuse holders 54 and 55, each substantially the same in construction as the fuse holders 40 and 49, are arranged in facing spaced relation with respect to each other and disposed alongside of the latter fuse holders so as to be visible simultaneously therewith through the window 17. The fuse holder 54 includes a supporting stem 56 which extends into the body 27 and is electrically secured therein to an extension 57 of the prong 58. That is, the prong 58 projects from the body 27 outwardly through the cover plate opening 24 and includes an offset extension 57 which is secured to the fuse holder stem 54. An opening 60 is formed in the side wall 14 in substantial alignment with the space between the jaws of the fuse holder 54 in the same manner as the opening 46.

As best seen in Fig. 4, the stem 61 of the fuse holder 55 is offset inwardly so as to extend into the body 27 at a point spaced from the prong extension 51 and thus be insulated by the body from the prong extension. Further, the offset end of the supporting stem 61 is electrically connected to the U-shaped end portion 34 of the contact arm 33; and, an opening 62 is provided in the side wall 13 in substantial alignment with the opening 60 and the space between the jaws of the fuse holder 55.

As best seen in Fig. 3, a fuse element 63, carried by a fuse supporting bar 64 extends between the facing pair of fuse holders 40 and 49 and has its opposite ends extending through and beyond the spaces between the fuse holder jaws and adjacent to the side wall openings 46 and 53. That is, as best seen in Fig. 4, the supporting strip of the upper jaw of each fuse holder is apertured in alignment with the adjacent side wall opening to permit the sliding insertion of a fuse, defined by the fuse strip and supporting bar. A like fuse 65 having a supporting bar 66 is slidably insertable through one of the side wall openings 60, 62 so as to extend between and be frictionally supported by the fuse holders 54 and 55. It will be noted that the resilient gripping action of the fuse holder jaws serve to retain the fuses in their proper contacting condition and accessible to view through the window 17. Obviously, replacement of a fuse may be accomplished by merely inserting a new fuse through one of the side wall openings, which operation also serves to eject the old fuse.

In order to maintain the above-described device in its assembled condition, a fastener 48 may be inserted through the end wall opening 20, the body bore 31 and the cover plate aperture 25 to tie the cover plate in its closing relation with respect to the casing. Further, disassembly of the device may be readily effected by removal of the fastener, and withdrawal of the body 27. Obviously, such withdrawal will effect removal, as a unit, of the supporting body, the fuse holders, fuses, contact arms, prongs and prong extensions. If desired, a separator plate 59 may be disposed between the facing pairs of fuse holders to obviate the possibility of arcing or the like. Such plate is,

of course, readily removable with the above-mentioned unit.

In Figs. 5 and 6 are shown a plug connector which is adapted for assembly and use with the fused connector described hereinabove. The plug connector includes a body 70 which tapers or decreases in section from its front end 71 to its rear end 72, and which has its front end circularly recessed, as at 73. A bore 74 extends inwardly from the rear body end and is internally bifurcated, so as to open through the body front end in the passageways 75 and 76. Mounted within the front end recess 73 of the body 70 are a pair of insertion prongs 77 and 78, which are secured to the body by rivets or the like 79 and 80. Threaded binding posts 81 and 82 are electrically connected to the prongs 77 and 78, respectively, and disposed adjacent to the passageways 75 and 76 for connection to wire extending through said passageways. Centrally of the front end recess 73 is provided a tapped, blind bore 83, for a purpose appearing presently.

When the plug connector of Figs. 5 and 6 is arranged with its insertion prongs 77 and 78 extending into the passageways 29 and 30, the bore 83 will be in registry with the end wall opening 20, so that a fastener (not shown) may be extended inwardly through the cover plate opening 25, passageway 31, opening 20 and threadedly engaged within the bore 83 to hold the plug connector in its assembled relation with the fused connector.

It will now be apparent that the condition of the fuse elements 63 and 65 will be immediately, and simultaneously apparent by observation through the window 17, without detachment of the fused connector from its operative position. That is, with the prongs 52 and 58 inserted into a conventional outlet socket, and a plug connector inserted in the passageways 29 and 30, the window 17 and fuse elements remain in full view. Further, the presence, absence or other condition of contact between the plug connector prongs 77 and 78 with the contact arms 33 and 35 may also be determined by observation through the window 17, without detachment or other disarrangement of the circuit parts. However, the fused connector of the present invention, which has been illustrated and described as an outlet fuse plug, may not be disassembled without removal from disposition across a source of electrical energy. That is, the prongs 52 and 58 must be withdrawn from the outlet socket to permit removal of the fastener, which is required before disassembly. As the path of current is from the prong 58 through the prong extension 57, the fuse holder 54, fuse element 65, fuse holder 55, contact arm 33, load circuit, contact arm 35, fuse holder 40, fuse element 63, fuse holder 49, prong extension 51 and prong 52, it will be appreciated that removal of the prongs from an outlet socket will permit safe handling for disassembly or otherwise.

From the foregoing, it is seen that the present invention provides an outlet fuse plug or fused connector which fully accomplishes its intended objects, and which is well adapted to meet practical conditions of use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. An outlet fuse plug comprising a casing having a front wall, a rear wall, two opposite side walls, an end wall integral with the front, rear and side walls and an opposite removable end wall, a transparent window in the front wall, an insulating, supporting body removably disposed within said casing against said rear wall and spaced from said casing window, there being a pair of parallel spaced passageways extending inwardly through one end wall of said casing and into said supporting body

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for receiving a plug connector, a contact disposed longitudinally within each of said passageways, a first pair of spaced fuse-strip holders adapted to support a first fuse-strip in the space between said window and body and each having a conductive mounting stem extending into and secured in said body, one of said stems being connected to one of said contacts, a second pair of spaced fuse-strip holders adapted to support a second fuse-strip alongside of said first fuse-strip in the space between said window and body and each having a conductive mounting stem extending into and secured in said body, one of the stems of said second pair of fuse-strip holders being connected to the other of said contacts, and a pair of prongs electrically connected respectively to the other fuse-strip holder of each pair of fuse-strip holders and projecting outwardly through said removable end wall of said casing for insertion into a socket.

2. An outlet plug according to claim 1, in combination with a removable cover plate on said other casing end wall, whereby said supporting body, contacts, fuse-strip holders, mounting stems and prongs may be inserted into and withdrawn from said casing as a unit.

3. An outlet fuse plug according to claim 2, in combination with a fastener extending inwardly through said other casing end for removably holding said cover plate in closing relation with respect to said other casing end.

4. An outlet fuse plug according to claim 3, wherein said fastener extends through and beyond said one casing end for securing engagement in a plug connector.

5. A fused electrical connector comprising a casing having a front wall, a rear wall, two opposite side walls, an end wall integral with the front, rear and side walls, and an opposite removable end wall, a transparent window in one of said side walls, an insulating supporting

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body removably disposed within said casing against said rear wall and spaced from said window, a first pair of spaced fuse holders adapted to support a first fuse-strip in the space between said window and body and each having a conductive mounting stem extending into and secured in said body, a second pair of spaced fuse holders adapted to support a second fuse-strip alongside of said first fuse-strip in the space between said window and body and each having a conductive mounting stem extending into and secured in said body, means extending through an end wall for connecting one stem of each pair of fuse holders across a source of electrical energy, and means extending through an end wall for connecting the other stem of each pair of fuse holders across an electrical load.

6. A fused electrical connector according to claim 5, each of said fuse holders comprising a pair of spaced jaws adapted to support and frictionally retain a fuse-strip in position adjacent to said window, there being at least one opening formed in said casing adjacent to each pair of fuse holders to permit the insertion and withdrawal of a fuse-strip into and out of its supported relation with respect to said fuse holders.

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