Nov. 1, 1949. A. G. BAUER 2,486,380

FUSIBLE EXTENSION CORD PLUG

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Fig. 1.

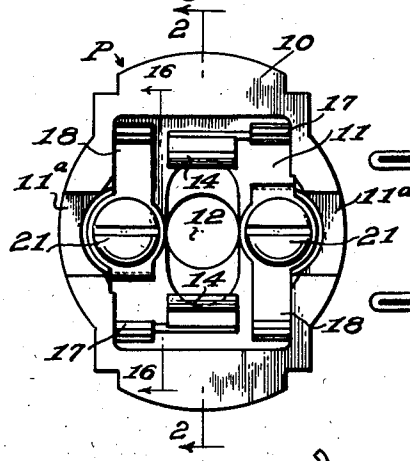


Fig. 2.

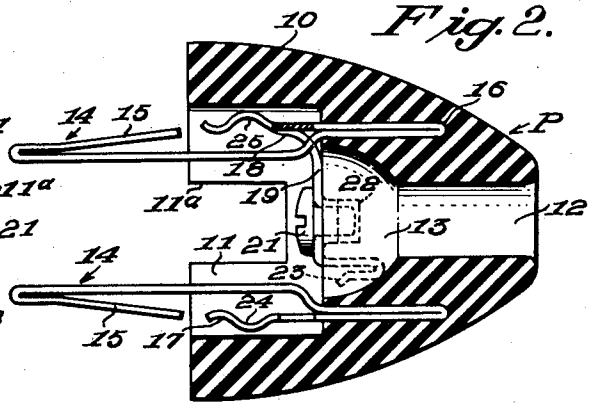


Fig. 4.

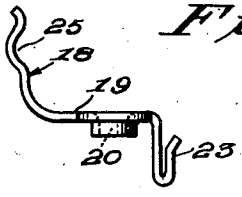


Fig. 5.

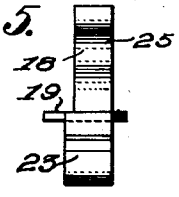


Fig. 7.

Fig. 3.

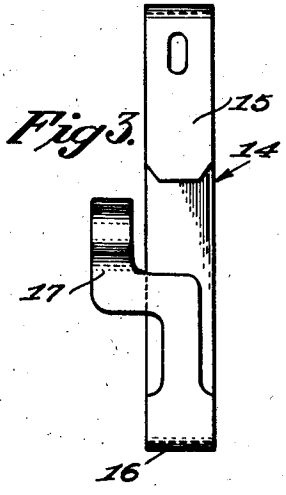


Fig. 6.

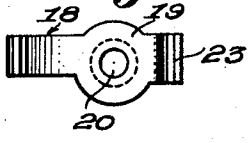
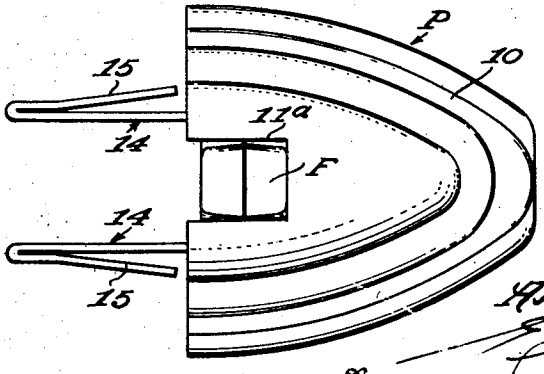


Fig. 8.



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Fig. 9.

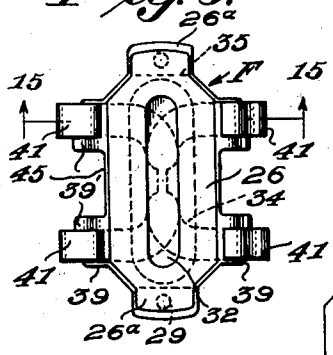


Fig. 10.

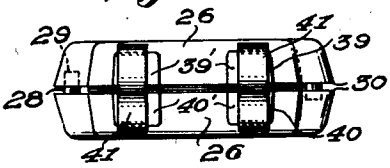


Fig. 11.

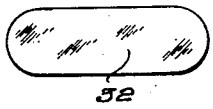


Fig. 12.

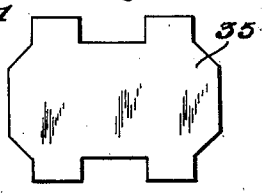


Fig. 13.

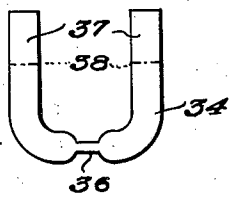


Fig. 14.

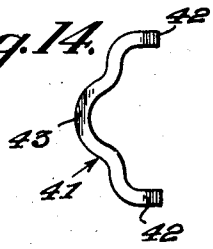


Fig. 15.

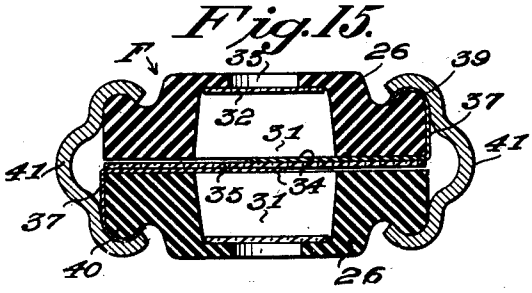


Fig. 16.

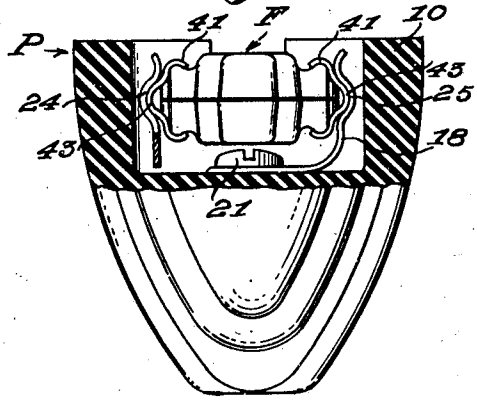
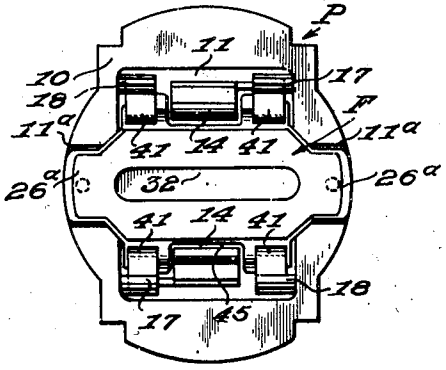


Fig. 17.



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Patented Nov. 1, 1949 2,486,380

UNITED STATES PATENT OFFICE

2,486,380

FUSIBLE EXTENSION CORD PLUG

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Application November 8, 1946, Serial No. 708,547

7 Claims. (Cl. 200—115.5)

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This invention relates to improvements in a quick detachable connecting plug for electric extension cords and the like and to a fuse therefor. The invention is more particularly concerned with a safety attachment plug of this character adapted for use with various electrical appliances, such as lamps, flat-irons, toasters, and the like in which both legs of the extension cord circuit is protected against overload.

An object of the invention is therefore the provision of an improved electrical connection plug having a readily accessible and exchangeable fuse element associated therewith, whereby in the event of an overload or short circuit in the plug circuit causing the fuse to burn, generally referred to as "blow," the blown fuse element may be expeditiously replaced and thereby avoid the delays and inconvenience usually required to detect and then replace one of a number of line circuit fuses which are often located in out of the way places and generally adjacent main line connections, with the consequent danger from errors.

A further object of the invention is the provision of an electric plug having a circuit controlling fuse mounted therein which may be examined and replaced only upon withdrawing the plug from an associated line socket and thereby breaking the plug circuit with the result that the fuse may then be readily examined and replaced without any attendant danger of burn or shock in so doing.

A still further object of the invention is the provision of a one-piece plug having pairs of terminal contacts and the cord binding connection disposed within a recessed chamber in the prong end of the plug, and an insulated fuse member for bridging the contacts and being removably supported within the recessed chamber so as to provide a closure for the chamber and a protecting cover for the contacts and binding cord connections therein.

A still further object of the invention is the provision of an improved electrical plug comprising a body which is preferably constructed in one piece from any suitable insulating material, such as rubber, the body having a relatively deep recess in one end thereof with opposed walls of the recess provided with transversely alined slots opening through the ends of the walls, the plug also having a pair of spaced contacts at each of two opposite sides of the recess with one contact of each pair being integral with a socket engaging prong projecting outwardly from the recess, and the recess being

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adapted to receive a fuse member having end portions removably receivable in the slots for facilitating removal of the fuse by engagement of the end portions by the fingers.

A still further object of the invention is the provision of an improved fuse member having two pairs of spaced contact elements at each side thereof, and a fuse link in electrical connection with one of each pair of contact elements.

A still further object of the invention is the provision of a fuse member embodying a fuse casing member formed with a relatively large chamber therein having a window at each side of the casing and a pair of fuse links within the casing which are visible through the windows whereby the fuse is reversible.

Other objects and advantages of the invention will become apparent in the course of the following description, taken in connection with the accompanying drawings, wherein:

Figure 1 is an end view of the improved plug as observed from the left of Fig. 2, the view being on a substantially enlarged scale;

Fig. 2 is a vertical sectional view as observed in the plane of line 2—2, Fig. 1;

Fig. 3 is an elevational view of one of the plug prongs with its associated contact;

Fig. 4 is a side elevational view of a terminal contact for operative association with the contact of Fig. 3;

Fig. 5 is an elevational view of the structure of Fig. 4 as observed from the right thereof;

Fig. 6 is a top plan view of the terminal contact illustrated in Fig. 4;

Fig. 7 is an elevational view of the plug as viewed from one side thereof;

Fig. 8 is an elevational view of the plug as viewed from an adjacent side thereof with the fuse member shown in operative association therewith;

Fig. 9 is a top plan view of the improved reversible fuse member adapted for operative association with the plug shown in Fig. 2;

Fig. 10 is a side view of the fuse member;

Fig. 11 is a plan view of one of the windows embodied in the fuse member;

Fig. 12 is a plan view of a separator embodied in the fuse member;

Fig. 13 is a plan view of one of the fuse links embodied in the fuse member;

Fig. 14 is an edge view of one of the clips for retaining the shells of the fuse member in cooperating relation, the clip being shown in its

form before clinching the ends thereof over the shells;

Fig. 15 is a transverse section of the fuse member as observed in the plane of line 15—15, Fig. 9, the section being a substantially enlarged scale;

Fig. 16 is a part sectional view of the plug corresponding to Fig. 2 showing the terminal contacts as viewed in the plane of line 16—16, Fig. 1, and showing the fuse member in operative position within the plug;

Fig. 17 is a view corresponding to Fig. 1 but showing the fuse member in operative position within the plug.

All of the views of the drawings as briefly described above show the structure of double actual size except in Figs. 14 and 15 wherein the parts are shown approximately four times their actual size.

Referring now in detail to the drawings, P designates the improved electric cord plug, which, as shown, embodies a one-piece insulated body member 10 provided with a relatively deep and substantially rectangular recess 11 in one end thereof. The body is shown as further provided with a cord receiving aperture 12 opening through the opposite end thereof and which aperture opens into the recess 11 through an elongated portion 13. The body is further provided with slots 11*a* in opposed walls thereof opening into recess 11. While the body 10 may be constructed of any suitable insulation material, it is preferably constructed of rubber which is readily molded to desired shape and unbreakable in the event of impact with hard objects.

This body 10 is also provided with a pair of socket engageable prongs 14 each of which is constructed from a strip of spring brass which is folded over in the provision of yieldable terminal portions 15 for frictional fit within the socket member, and the strip is further bent over in the provision of attaching portions 16 embedded in the body 10. The prongs 14 each further includes a contact 17 disposed laterally of the prong proper, as is clearly indicated in Fig. 3. The contacts 17 are preferably provided as continuations of the strips from which the prongs are formed.

As is indicated in Fig. 1, the contacts 17 are disposed at opposed sides of the body 10 relative to the respective prongs. A pair of terminal contacts 18 are provided at opposite sides of the respective prongs 14 and the terminal contacts include base portions 19 which are provided with tapped apertures 20, formed by extruding the metal from the base portion. The tapped apertures are adapted to receive the cord binding screws 21 whose shanks may extend into the recesses 22, in the body 10. The terminal contacts 18 further include doubled-over foot portions 23 anchored in the body 10.

As is more clearly indicated in Fig. 2, the contacts 17 and terminal contacts 18, which are also preferably of spring brass, include similar rounded grooves 24 and 25 respectively for a purpose later to appear. Also as indicated in Fig. 1, the contacts 17 and 18 are disposed in pairs adjacent the prongs 14 with the contacts of each pair disposed in alinement at opposite sides of the respective prong.

In the use of the plug P an electric cord is entered into or molded in the plug through aperture 12—13 and as shown the two wires of the cord may be individually clamped to the terminal contacts 18 by means of the screws 21. Instead of using the screw type binding post 21 it will

be understood that any well known or approved terminal connections may be substituted, or the cord wires may be soldered directly to the terterminal members 18, without altering the invention.

The construction of the plug, as described and shown in Fig. 1, is such that current cannot be conducted from the prongs 14 to the cord wires through the terminal contacts 18 unless the contacts 17 and 18 adjacent each prong are placed in electrical circuit. As shown this is effected by my improved fuse member F illustrated in detail in Figs. 9 to 15 and shown in operative association with the plug in Figs. 16 and 17. This fuse member embodies a pair of superimposed mating shells 26 having reduced end portions 26*a* which are formed of suitable relatively rigid insulating material.

Each shell is provided with a pin 28 near one end thereof, and a pin receiving recess 29 adjacent the opposite end so that the pins will enter the recesses upon proper registration of the shells and thus act as a centering means for these parts. The shells also have registering plane faces 30 and centrally disposed elongated and relatively deep chambers 31 at the bottoms of which are disposed suitable windows 32 exposed through elongated sight openings 33 in opposed faces of the shells.

A fuse link 34 constructed of a suitable fusible alloy is disposed in engagement with the plane face 30 of each shell 26 and a separator 35, preferably constructed of mica or other suitable thin sheet insulation, is disposed between the fuse links 34, as is clearly indicated in Fig. 15.

Each of the fuse links 34 includes a reduced blow-out portion 36 which is arranged to be visible through a window 32 and each fuse link further includes legs 37 which are bent over as shown by the dotted lines 38 in Fig. 13. It will be noted that the bent over leg portions of one link engage with lugs 39 at one side of one of the shells 26 and with the bent over portions of the other link engaged with the lugs 40 of the other shell 26 at the opposite side thereof.

The entire fuse member is retained in assembled position by means of four brass clips 41, which may be originally of the form shown in Fig. 14 having parallel end portions 42 and ridges 43 engageable with the grooves 24 and 25 of the contacts 17 and 18, when the fuse member is assembled with the plug. The clips 41 may be assembled with the shells 26 by bending or snapping same over the end portions 42, as in Fig. 15, when all the elements of the fuse member are held in assembled relation, with the clips at one side of the fuse member in contact with the legs 37 of one of the fuse links 34, and with the clips at the other side of the fuse member in similar contact with the legs 37 of the other fuse link 34.

The lugs 39 and 40 are provided with shoulders 39' and 40' for more accurate assembly of the fuse links 34 and the clips 41, and as is more clearly indicated in Figs. 9 and 17 the lugs 39 and 40 provide recesses 45 for accommodating the prongs 14 when the fuse member F is operatively associated with the plug P.

While in Figs. 10 and 15 the shell faces 30 are shown in substantially spaced relation, they are in actual practice substantially in contact since the fuse links and separator are very thin and are shown here on an exaggerated scale merely for greater clarity of illustration.

It will accordingly be seen that the fuse mem-

ber F embodies a pair of fuse links insulated from each other by the separator **35** and one of the fuse links is in contact with a pair of clips **41** at one side of the fuse member, and the other fuse link is in contact with the other pair of clips at the other side of the fuse member, whereby upon assembly of the fuse member within the plug, as in Figs. 16 and 17, the contacts **17** will be in electrical circuit with the terminal contacts **18**. The fuse links **34** are preferably of less amperage than the main line fuses and the relatively large chambers **31** provide sufficient air space to meet approved blow-out tests. Furthermore, since the fuse links are visible through the windows **32** their condition can be readily and safely ascertained, as above explained.

It is to be particularly noted that the fuse member F is insertable within and removable from the recess **11** by movement thereof axially of the plug, since the prongs **14** ride in the recesses **45** in the shells **26**, and by reason of such mounting a fuse cannot be inspected or replaced until the plug is withdrawn from a wall or other line socket thereby avoiding any possible danger of burn and shock in examining or replacing the fuse member.

It is to be further noted that the fuse member provides an adequate cover for the binding screws and associated cord ends **21**, and since the reduced shell portions **26***a* seat in the slots **11***a* in the assembled position of the fuse member, the ends of such reduced portions may be grasped by the fingers and the fuse member be easily withdrawn for operative association with the contacts **17** and **18**.

While I have herein disclosed my invention in a preferred form, it is obvious that changes in structure may be resorted to without departing from the spirit of the invention, and I therefore do not desire to be limited to the precise form disclosed beyond the limitations imposed by the following claims.

What I claim and desire to secure by U. S. Letters Patent is:

1. A fuse member comprising a pair of shells of insulating material and having cooperating flat walls, a pair of fuse elements disposed between the walls and insulated from each other, a pair of metallic contact clips disposed at each side of said member and engaged with said shells for holding said fuses between said walls, and each of said fuses being in contact with a pair of said clips.

2. A fuse member according to claim 1 wherein said fuses are insulated from each other by a sheet-like separator of insulating material disposed between the fuses.

3. A fuse member according to claim 1 wherein each of said shells is provided with a chamber opening through the outer wall of the shell, and a fuse viewing window within each chamber and beneath said outer wall.

4. A fuse member comprising a pair of shells of insulating material and each having an elongated chamber opening through a flat face portion thereof and each of said shells provided with a pair of spaced lugs at each side thereof with the lugs of one shell adapted to register with those of the other shell when the said face portions are juxtaposed, a pair of fuse elements disposed between said face portions and each

provided with a pair of legs, the legs of one fuse element being engaged with lugs on one shell and the legs of the other fuse element being engaged with lugs on the other shell at the opposite side of the member, and metallic clips engaged with the lugs and said fuse legs for holding the parts in assembled relation.

5. An attachment plug comprising a body having a recess in one end thereof, a pair of binding posts in the base of said recess, a pair of spaced spring contacts associated with each binding post within said recess and extending in opposite directions to opposite sides of said recess, a chambered member comprising a pair of shells of insulating material and having cooperating flat walls, a pair of fuse elements disposed between the walls and insulated from each other, a pair of metallic contact clips disposed at each side of said member and engaged with said shells for holding said fuse elements between said walls, each of said fuse elements being in contact with a pair of said clips, said chambered member being of a size to substantially fill said recess and overlie said binding posts, and frictionally engage said clips disposed at each side of said member with said spaced spring contacts.

6. An electric plug comprising a one-piece rubber body member having a cord receiving aperture opening through one end thereof, a relatively deep recess in the other end of said member communicating with said aperture, terminals supported by said body member at the bottom of said recess, prongs supported by the body member and projecting therefrom through said recess, a fuse carrying cover for said recess removably supported therein between said prongs and connecting the terminals within the recess, said fuse carrying cover comprising a pair of shells of insulating material and having cooperating flat walls, a pair of fuse elements disposed between the walls and insulated from each other, a pair of metallic contact clips disposed at each side of said member and engaged with said shells for holding said fuse elements between said walls, a transparent window in the wall of one of said shells, and each of said fuse elements having leg portions in contact with a pair of said clips and an intermediate portion underlying said window.

7. In a device of the character described, a fuse member comprising a substantially rectangular body member having a pair of spaced contacts on opposite edges thereof, and substantially U-shaped reversely positioned fuse elements within said body member, the spaced legs of each of said fuse elements being engaged with a pair of contacts.

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