May 10, 1932. H. H. WERMINE 1,858,197

ELECTRIC PLUG CONNECTER

Filed March 15, 1928

Fig.1

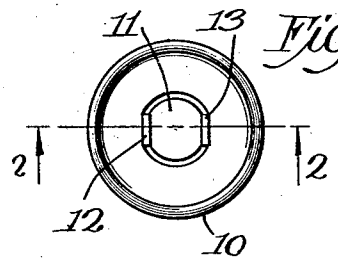


Fig.5

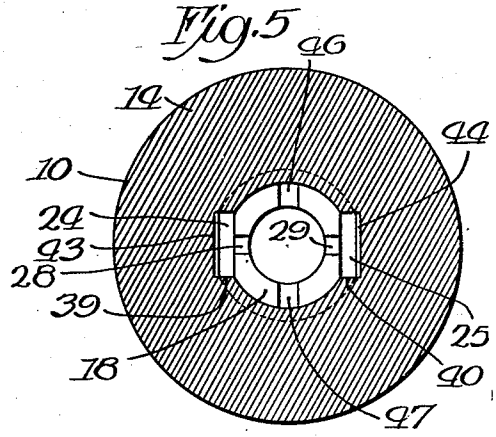


Fig.2

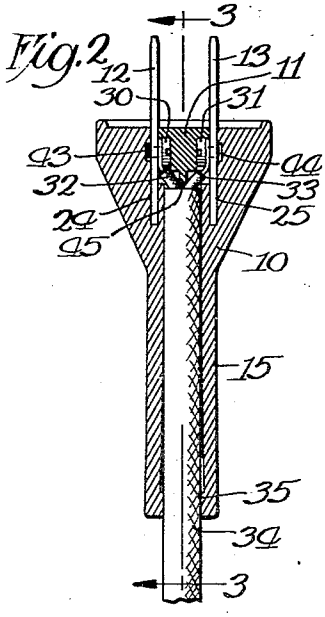


Fig.3

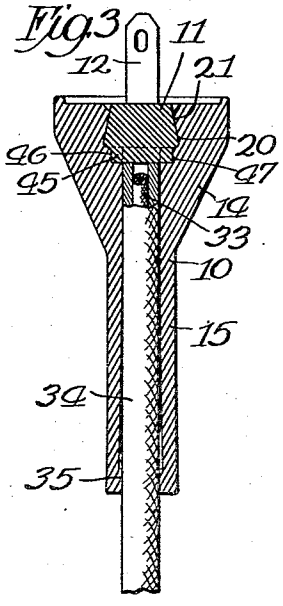


Fig.4

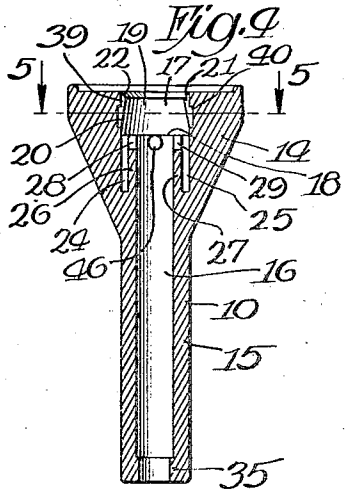


Fig.6

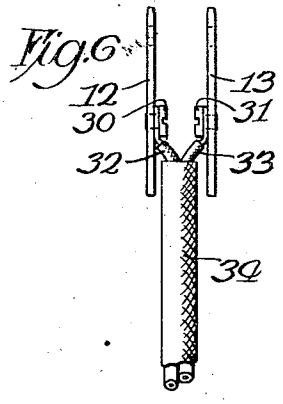


Fig.7

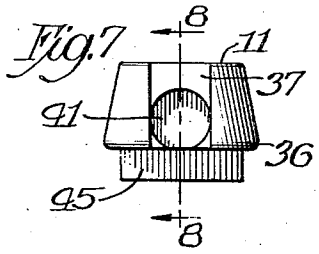
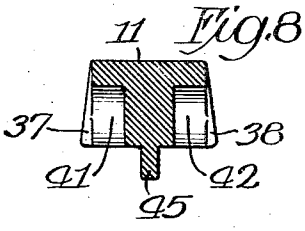


Fig.8



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UNITED STATES PATENT OFFICE

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ELECTRIC PLUG CONNECTER

Application filed March 15, 1928. Serial No. 261,780.

This invention relates to electric plug connecters and particularly to a portable separable plug connecter such as is used for connecting an electrical device to an electric current supply line.

One object of the invention is to provide a practically unbreakable connecter plug of simple construction which can be economically manufactured at a low cost. Another object is to provide a connecter of the above described type which is formed of but a few parts of relatively simple construction and which may be easily assembled to form the complete plug. Still another object of this invention is to provide means in a plug connecter of the type above mentioned for preventing displacement of the contact elements, and to prevent accidental short circuits within the connecter plug.

A still further object of this invention is to provide a connecter plug in which the connections between the conducters and contacts are entirely enclosed within the plug. Further objects and advantages of the invention will become apparent by reference to the following specification and accompanying drawings, in which drawings I have illustrated my invention as applied to a male plug connecter.

In the drawings:

Fig. 1 is an elevation of the front end of the connecter.

Fig. 2 is a section on the line 2—2 of Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a section through the main body portion of the plug and corresponds to the section shown in Fig. 2.

Fig. 5 is a section on an enlarged scale on the line 5—5 of Fig. 4.

Fig. 6 is an elevation showing a step in the assembly of the connecter plug.

Fig. 7 is an elevation on an enlarged scale of an element of the plug, and

Fig. 8 is a section on the line 8—8 of Fig. 7.

Referring now to the drawings, my improved electric plug connecter includes a main body member 10 preferably of resilient insulating material such as rubber, a closure plug 11 also preferably of rubber, and a pair of contact prongs 12 and 13. The main body member 10 is preferably formed with an enlarged front end portion 14 and an elongated shank portion 15, through which head and shank portions an aperture 16 extends. The front end of the aperture 16 is preferably enlarged as at 17 so as to provide a forwardly facing annular seat 18. The wall 19 of the enlarged portion 17 of the aperture is preferably undercut as shown at 20 so as to provide an annular shoulder 21 adjacent the front end of the body member, the front end of the shoulder 21 being preferably beveled as shown at 22 for a purpose which will presently appear.

The parallel inner end portions of the contact prongs 12 and 13 respectively fit in long narrow parallel recesses 24 and 25 provided in the front end portion of the body member 10. The recesses 24 and 25 are located in the seat 18 and are preferably spaced radially outwardly away from the aperture 16 and are disposed substantially diammetrically opposite each other. Portions 26 and 27 of the body member are disposed intermediate the aperture 16 and the respective receses, and these portions are notched as shown at 28 and 29 for facilitating connection of electric conductors to the respective contact prongs. Each of the contact prongs is preferably provided with means in the form of screws 30 and 31 having relatively large heads and threaded into the respective contact members so that the ends of the conductors 32 and 33 may be clamped against the contact prongs.

The portions of the conductors 32 and 33 adjacent the respective contact prongs extend through the notches 28 and 29 so that the conductors may be connected to the prongs without sharply bending the former. The conductors are preferably enclosed in a tubular casing or sheathing 34 of weatherproof insulating material such as rubber, thereby forming a duplex conductor cord and the same is preferably built up so as to be substantially round in cross section, so that the aperture 16 in the body member will be practically filled by the cord. The thin wall portions 26 and 27 are supported or reinforced by the interposed end portions of the duplex cord. The shank 15 may be provided

adjacent its outer or rear end with an annular inwardly projecting shoulder 35, which shoulder will be effective to fit snugly about the duplex cord and serve to produce a practically weatherproof joint between the rear end of the shank and the cord.

The closure plug 11 is made to fit snugly within the enlarged portion 20 of the aperture in the body member, the sides of the plug being tapered so as to form an enlarged end portion 36 which will fit behind the annular shoulder 21 of the body member so that the plug or closure is interlocked with the body member. Thus, the parts are locked and maintained in assembled relation by reason of the superior transverse dimension of a portion of the body part 11 relative to the corresponding dimension of the front end of the enlarged aperture portion 20. The closure is, in the present instance, provided with grooves 37 and 38 on opposite sides which cooperate with grooves 39 and 40 which extend through the shoulder 21 of the body member, to receive the contact prongs. The grooves 39 and 40 in the body member are in effect continuations of the recesses 24 and 25 of the body member. The plug thus serves to close the grooves or recesses 39 and 40 and to cooperate therewith in positioning the respective prongs. The plug is also preferably provided with recesses 41 and 42 which receive the heads of the binding screws 30 and 31 which project inwardly from the inner faces of the contact prongs 12 and 13. The body member 10 may also be recessed as indicated at 43 and 44 to receive the outer ends of the binding post screws 30 and 31. A rib or fin 45 depending from the bottom of the closure plug 11 is provided for separating the conductors as best shown in Fig. 2. Recesses 46 and 47 are provided in the seat 18 of the plug to receive the opposite ends of the rib so that the conductors cannot work past the ends of the rib, and thereby possibly contact with each other within the connecter plug body.

It will be apparent that the closure plug 11 may be seated in the enlarged portion 17 of the aperture in the body member because of the fact that the body member is, as above noted, formed of resilient material such as rubber. According to the present invention, I prefer to make the closure plug 11 also of rubber so that both the closure and body portion are relatively distortable and assembling of the two parts is thereby facilitated. Obviously either part alone might be made of resilient or distortable material, while the other part is of firm or hard material. When the closure plug 11 is assembled or interlocked with the body member, it will be understood that the closure plug will not readily come out of its place. The contact prongs 12 and 13 are incidentally locked in place, that is, held against withdrawal from the plug because of the seating of the heads 30 and 31 of the binding post screws in the recesses 41 and 42 of the closure plug.

It will be observed that the two parts 10 and 11 when assembled, constitute a housing for the connection between the conductors and the prongs. The recesses in part 10 or the recesses in part 11, depending upon the method of assembly, serve to initially position the prongs prior to the assembly of the two parts of the housing.

I am aware that changes may be made in the form construction and proportion of parts used in constructing a plug according to my invention without departing from the spirit of my invention, the scope of which should be determined by reference to the following claims which I desire to have construed as broadly as possible consistent with the state of the art.

I claim as my invention:

1. In a connecter of the class described, the combination of a body member having an aperture extending therethrough and a recess in the front end of said body member, said recess being spaced radially outwardly and separated from said aperture by a portion of the body member, a contact prong having its inner end portion seated in said recess, and its outer end portion projecting outwardly from the front end of the body member, a conductor disposed in said aperture and connected to said contact prong and a closure member for the front end of said aperture, serving with the body member to enclose the connection between the conductor and prong, said closure member having interlocking engagement with the body member and said body member and closure member being relatively distortible so as to permit such interlocking parts to be so assembled.

2. In a connecter of the class described, the combination of a body member having an aperture extending therethrough and a recess in the front end of the body member, said recess extending longitudinally of the body member and being spaced radially outwardly and separated from said aperture by a portion of the body member, a substantially straight contact prong having its inner end portion seated in said recess and its outer end portion projecting outwardly beyond the front end of the body member, an electric conductor extending thorugh said aperture and having its inner end connected to said contact prong, a closure member interlocked with said body member for closing the front end of said aperture, serving with said body member to enclose the connection between the conductor and prong, said closure member and body member being relatively distortible so as to permit said interlocking parts to be so assembled.

3. In a connecter of the class described, the combination of a body member having an

aperture extending therethrough and a long narrow recess extending substantially parallel with said aperture and opening to the front end of said body member, said recess being spaced radially outwardly and separated from said aperture by a portion of the body member, a contact prong having its inner end portion seated in said recess, and its outer end portion projecting outwardly from the front end of the body member, a conductor disposed in said aperture, and connected to said contact prong, and a closure member for the front end of said aperture, secured to said body member and serving with the latter to enclose the connection between said conductor and contact prong.

4. In a connecter of the class described, the combination of a body member having an aperture extending therethrough and a recess extending substantially parallel with said aperture and opening to the front end of said body member, said recess being separated from the aperture in the body member by a portion of the latter, a contact prong having its inner end portion seated in said recess, a conductor disposed in said aperture, means projecting from the contact prong for connecting the forward end of said conductor to said contact prong, and a closure for the front end of said aperture, said closure being secured to said body member and provided with a recess for receiving said connecting means and thereby serving to prevent endwise displacement of the contact prong.

5. In a connecter of the class described, the combination of a body member of resilient insulating material, said body member having an aperture extending therethrough and a forwardly opening recess in its front end portion, said recess extending lengthwise of the body member and being separated from said aperture by a portion of said body member intermediate the recess and aperture, a contact prong having its inner end portion removably seated in said recess and having its outer end portion projecting outwardly from the front end of the body member, a conductor disposed in said aperture and connected to said contact prong, and means interlocked with said body member, serving to prevent displacement of said contact prong.

6. In a connecter of the class described, the combination of a body member having an aperture extending therethrough, the front end portion of said body member being provided with an undercut annular shoulder substantially concentric with the front end of said aperture, and said body member also being provided with a recess disposed substantially parallel with said aperture, opening towards the front end of the body member, and separted from the aperture by a portion of the body member disposed intermediate the recess and aperture, a contact prong having its inner end portion disposed in said recess and its outer end portion projecting outwardly from the front end of the body member, a conductor disposed in said aperture and connected to said prong, and a closure for the front end of said aperture interlocked with said undercut annular shoulder, said body member and closure being relatively distortible and thereby permitting said interlocked parts to be assembled.

7. In a connecter of the class described, the combination of a body member having an aperture extending therethrough, the front end portion of said body member being provided with an undercut annular shoulder substantially concentric with the front end of said aperture, and said body member also being provided with a recess disposed substantially parallel with said aperture, opening towards the front end of the body member, and separated from the aperture by a portion of the body member disposed intermediate the recess and aperture, a contact prong having its inner end portion disposed in said recess and its outer end portion projecting outwardly from the front end of the body member, a conductor disposed in said aperture, means projecting radially inwardly from said contact prong for connecting the front end of said conductor to said contact prong, and a closure for the front end of said aperture interlocked with said undercut annular shoulder and provided with a recess for receiving said connecting means, thereby locking said contact prong against outward endwise displacement, said body member and closure being relatively distortible and thereby permitting said interlocked parts to be assembled.

8. In a connecter of the class described, the combination of a body member having an aperture extending therethrough, an undercut annular shoulder adjacent the front end of the body member and a forwardly facing annular seat spaced rearwardly from said shoulder, said body member being provided with a recess extending substantially parallel with said aperture and opening forwardly through said annular seat, said recess being separated from the aperture by a portion of the body member disposed intermediate said aperture and recess, a contact prong having its inner end portion seated in said recess and its outer portion projecting forwardly from the front end of said body member, a conductor disposed in said aperture and having its front end connected to said contact prong, a closure for the front end of said aperture comprising a member adapted to be seated on said outwardly facing seat and interlocked with said undercut shoulder, the latter being effective to maintain the closure seated on said annular seat and said closure and body member being relatively distortible so as to permit said interlocked parts to be so assembled.

9. In a connecter of the class described the combination of a body member of resilient insulating material, said body member having an aperture extending therethrough and a pair of diametrically oppositely disposed recesses adjacent the front end of the body member and spaced radially outwardly from said aperture, a relatively thin wall of body material being disposed intermediate each recess and said aperture, contact prongs having inner end portions respectively seated in said recesses and outer end portions projecting forwardly from the front end of the body member, a duplex conductor cord fitting in said aperture and having a portion disposed intermediate said thin walls so as to support the same, the adjacent ends of the conductors of said duplex cord being respectively connected to said contact prongs, and a closure for the front end of said aperture, interlocked with said body member and serving with said body member to enclose the connections between said conductors and contact prongs.

10. In a connector of the class described, the combination of a body member having an aperture extending therethrough, an undercut annuular shoulder adjacent the front end of the body member and a forwardly facing seat spaced rearwardly from said shoulder, said body being provided with a pair of diametrically oppositely disposed recesses adjacent the front end of the body member and spaced outwardly from said aperture, contact prongs having inner end portions respectively seated in said recess and outer end portions projecting forwardly from the front end of the body member, a pair of conductors disposed in said aperture and having their front ends respectively connected to said contact prongs within the body member, and a closure for the front end of said aperture, seated on said outwardly facing seat and interlocked with said annular shoulder, said closure being provided with a fin extending inwardly therefrom for preventing contacting of the front ends of the respective conductors, and said body member being provided with oppositely disposed recesses opening to said seat for receiving opposite end portions of said fin.

11. An electric plug connecter comprising a body and a pair of independent, spaced contact prongs projecting from the front end of said body, said body including a plurality of independent parts, one of which is an outer member formed of resilient, substantially non-breakable, insulating material, and arranged to interlock with another body part to maintain such parts in assembled relation, the resilient part being distortible to permit assembly and disassembly of said parts, said body being provided with an opening fitting and receiving a duplex electric conductor and with seats spaced radially from said opening on opposite sides thereof for receiving inner end portions of said contact prongs, said body parts cooperating to maintain said prongs in operative position.

12. In a connecter of the class described, the combination of a body member of resilient insulating material, said body member having an aperture extending therethrough and a pair of diametrically, oppositely disposed recesses spaced rearwardly from the front end of the body member and spaced laterally outwardly from said aperture, contact prongs having inner end portions respectively seated in said recesses, and outer end portions projecting forwardly from the front end of the body member, a duplex conductor cord disposed in said aperture and having its front ends connected to said contact prongs, and a closure for the front end of said aperture, interlocked with said body member and serving therewith to enclose the connection between said conductors and contact prongs.

HUGO H. WERMINE.