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ELECTRICAL PLUG AND SOCKET CONNECTION

Filed Jan. 2, 1925

Fig. 1.



Fig. 2.

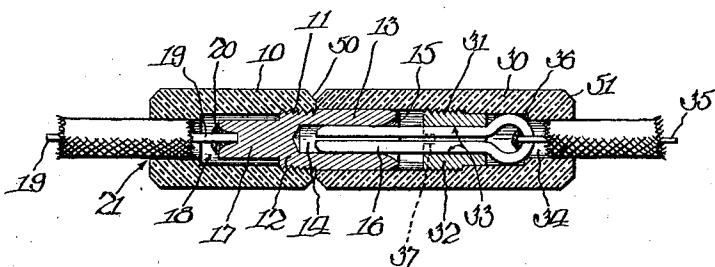


Fig. 3.

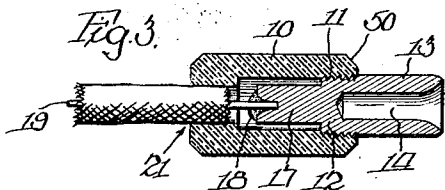


Fig. 4.

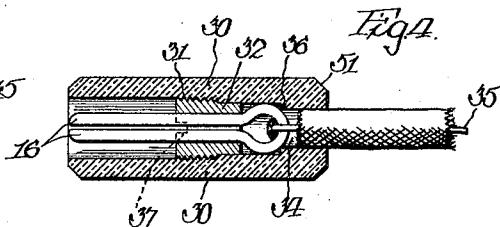


Fig. 5.

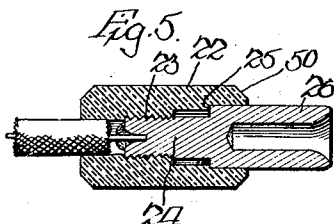


Fig. 6.

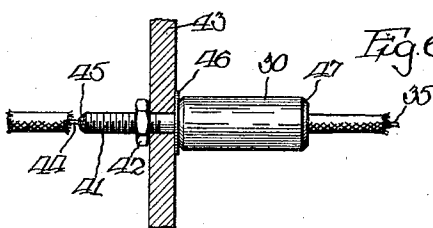
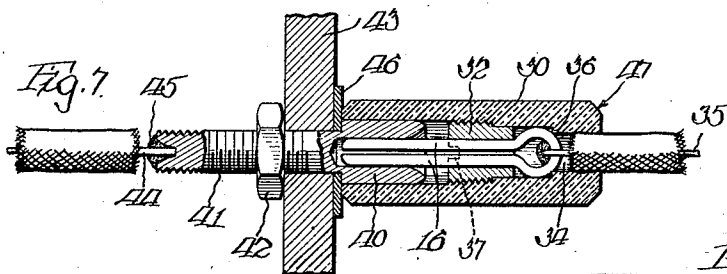


Fig. 7.



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ELECTRICAL PLUG-AND-SOCKET CONNECTION

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This invention relates to improvements in interfitting plug and socket members for making electrical connections. More specifically the present improvements relate to means for making a single connection as distinguished from multiple plug-and-socket devices.

The chief objects are to provide a simple, cheap and highly efficient plug-and-socket device which occupies but small space, which is neat and attractive in appearance, and which may be easily and readily manipulated.

In the drawings Figure 1 shows complete my improved plug-and-socket members in the exact size on the original drawings employed by me for connecting the free ends of lead wires; Fig. 2 is an enlarged medial longitudinal section of the combined device of Fig. 1; Figs. 3 and 4 are sectional views corresponding respectively with the socket and plug members of Fig. 2; Fig. 5 is a sectional view showing a modification of the structure of Fig. 3; Fig. 6 is a view showing the plug and socket members in actual size on the original drawings as employed by me in a form of combined device adapted for use with a panel board or the like; and Fig. 7 is an enlarged sectional view of the device of Fig. 6.

The socket member illustrated in Figs. 1, 2 and 3 comprises a casing or housing member 10 of insulating material. It is preferably cylindrical in form and has a hollow interior open at both ends. At 11 it is interiorly screw-threaded to receive the metallic socket element 12 having a forwardly projecting cylindrical part 13 provided with a coaxial recess or boring 14, preferably flared or gradually enlarged at its outer open end at 15, to receive the contact stem 16 of the plug member. The socket element 12 has a portion adjacent to the cylindrical part 13 which is exteriorly threaded to engage the threaded portion of the housing 10 at 11, and it has a cylindrical stem-like part 17, of a reduced diameter extending well into the hollow interior of the housing 10, and the end of this stem 17 is recessed at 18 to provide a seat for the electrical conduit or lead wire 19 and a body of solder 20 for holding the lead wire strongly and with good electrical connection

to the socket element part 17. The end opening at 21 leading into the casing or housing 10 is preferably just large enough to accommodate easily the insulation-thickened lead wire, and thus the housing member 10 encompasses the rough end of the insulation and the visible union between the insulation and the housing 10 is neat and attractive, a feature of much importance in electrical instrumental work. Furthermore, the insulation on the wire thus serves as a support for the structure carried by it, relieving the soldered portion of the wire of considerable strain and bending when the wire is moved about. The same advantages are had at the right hand end of Fig. 2.

Referring to Fig. 5 the housing member 22 is interiorly threaded at 23 and the stem or reduced portion 24 of the socket element is exteriorly threaded to engage the threads at 23 while an annular seat 25 is provided for the cylindrical projecting part 26 of the socket element.

Referring to Figs. 2 and 4, the plug member comprises a housing or casing 30 which is of the same outer diameter as that of the housing of the socket member. It has a hollow cylindrical interior open at its forward end and of a diameter only slightly larger than that of the cylindrical socket element part 13 whereby the part 13 interfits snugly with the housing member 30. The housing 30 has a part at 31 which is slightly reduced in diameter and which is interiorly threaded to receive the exteriorly threaded supporting member 32, in my practice of metal such as brass. This part 32 has a coaxial hole or boring 33 through it adapted to receive loosely the contact stem 16, which in my practice is in the form of a cotter pin of brass, the legs of which extend well forward beyond the supporting member 32 and to a materially large extent lie within the housing 30. The loose or "floating" character of the split or two-part contact stem provides a very much more satisfactory connection than if it were held rigidly by the supporting member.

The head of the cotter-pin contact stem is accommodated in a portion of the hollow

interior of the housing, which portion is reduced at 34 forming an end opening or passageway for the insulated lead wire 35, which wire is given a turn around the head of the
 5 cotter pin and soldered to it. In providing the passageway 34 of reduced diameter an annular shoulder 36 is formed which prevents the head of the cotter-pin from moving inward when pressure is applied upon the
 10 legs thereof, as by inserting them into the recess 14 of the socket element.

The supporting member 32 is provided with a diametrical sawcut 37 which may be reached by a screwdriver inserted between
 15 the legs of the cotter-pin for assembling it or for removing it should it be desired to replace a worn cotter pin or renew a connection between the cotter pin and the wire.

The structure thus far described is adapted for use where there are free ends of wires to be connected electrically and disconnected from time to time. It will be noted that the relatively long and narrow housing members are only so slightly larger in diameter
 20 than the covered lead wires as not to produce an objectionable mass on the wire; that the parts are very easily united and separated; and that through the double interfit of parts, namely the housing 30 upon the projecting
 25 socket element 13 and the springy legs 16 in the recess 14, an unusually strong joint is effected whereby the parts will not become separated without substantial pulling strains. The structure as a whole is un-
 30 usually small and neat in appearance.

Referring to Figs. 6 and 7, the housing member 30 and associated parts are the same as shown in Fig. 4. The differences to be
 35 noted are in the socket member which includes a cylindrical metallic socket element 40 adapted to interfit nicely with the housing 30 and having a recess for receiving the legs of the contact stem 16 as already described in connection with the corresponding part
 40 13 of Fig. 3. The socket element of Fig. 7 has a cylindrical part or stem 41 of reduced diameter and exteriorly threaded to receive the nut 42 for holding the socket element upon a panel board 43. The end of the stem
 45 41 is recessed to receive the wire 44 and solder 45. The washer 46 is used by me to indicate color, and is merely a piece of fiber of a color corresponding with the small surface 47 on the plug member whereby the per-
 50 son making the connections will have a guide for his operations. In my practice I mark such surfaces as 50 and 51 in Figs. 1 to 5 inclusive with corresponding colors for the same purpose.

60 In certain electrical work it is sometimes desirable to "plug in" not only with the free end of a loose wire, but also with a terminal secured upon a panel board or the like, and in such instances the interchange-
 65 ability of the plug member with the free

and with the secured socket members shown respectively in Figs. 1 and 6 is of advantage.

I contemplate as being within these improvements such modifications and departures from what is herein specifically illustrated and described as fall within the
 70 scope of the appended claims.

I claim:

1. An electrical connection plug of the character described comprising in combination a relatively long and narrow casing of insulating material having a cylindrical hollow interior open at one end and adapted to receive a socket element, a supporting member having a coaxial hole therethrough carried for ready removability within and intermediate the ends of the housing, a headed contact stem loosely positioned in said hole and extending outward beyond the supporting member and lying to a large extent within the housing and with its head on the inner side of the supporting member, the housing having a hole for a conduit wire to extend to the head of the contact stem, the housing member having means for holding the head of the contact member against inward move-
 75 ment.

2. An electrical connection plug of the character described comprising in combination a relatively long and narrow casing of insulating material having a cylindrical hollow interior adapted to receive a socket element, the housing having a portion of its hollow interior slightly reduced in diameter intermediate its ends, said reduced portion being interiorly threaded, an exteriorly-threaded supporting member threaded into said threaded portion of the housing, said supporting member having a hole therethrough coaxial with the hollow interior of the casing, a contact stem in the form of a cotter pin loosely positioned in said hole with the head of the stem on the inner side of the supporting member and the legs thereof extending outwardly beyond the supporting member and to a materially large extent lying within the cylindrical hollow interior of the housing member, the housing having a hollow portion accommodating the head of the stem and a portion holding the head against inward movement and having also a passageway in its end adjacent to said head for a conduit wire to extend to the head of the stem.

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