

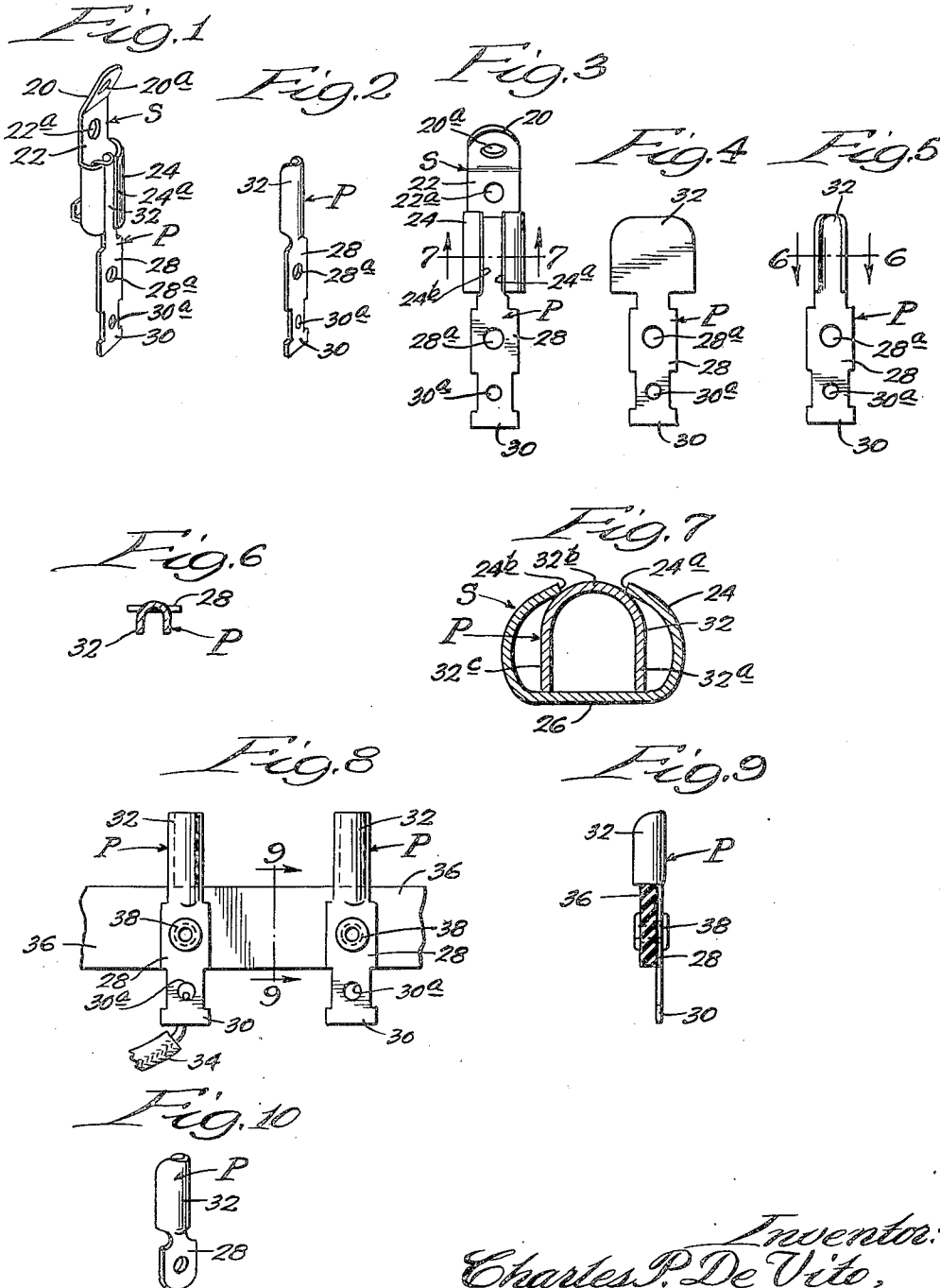
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C. P. DE VITO

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ELECTRICAL PLUG AND SOCKET COMBINATION

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Inventor:
Charles P. De Vito,

By *Charles P. De Vito, Dore, Borthen, Spengenberg,*
Attorneys.

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ELECTRICAL PLUG AND SOCKET COMBINATION

Charles P. DeVito, Chicago, Ill., assignor to Alcon Metal Products, Inc., Chicago, Ill., a corporation of Illinois

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My invention relates to an improved electrical plug and socket combination and an improved plug for use therewith.

Heretofore electrical plug-in devices have employed plugs in the form of sleeves, commonly designated "tube pins." When a wire is soldered to a plug of this type, it must be soldered to the interior wall thereof, a requirement that makes sturdy soldered connections difficult to accomplish. Moreover, plug and socket assemblies using these sleeve type plugs normally establish only three lines of contact and in many instances there is no assurance that the plug will always be inserted in the same orientation relative to the socket, thereby giving rise to an additional problem of random variations in electrical resistance.

In accordance with the present invention the foregoing disadvantages of sleeve-type plug and socket assemblies are overcome by providing a plug member of U-shaped cross-section. This member has a rounded intermediate portion which engages the edges of the slotted portion of the socket when the plug is inserted. The plug is of size to spring the socket to cause the latter to urge the leg portions of the plug against the interior thereof, thus establishing a four-line contact between the plug and socket and assuring a uniform orientation of these members relative to each other. Moreover, the U-shaped plug is provided with a flat tab which is readily accessible for sturdy soldering.

It is therefore a general object of the present invention to provide an improved plug and socket combination, and a plug for use therewith, and to which wires may be readily soldered.

Further it is an object of the present invention to provide an improved plug and socket combination, and a plug for use therewith, in which a four-line snug contact is established between the plug and socket members and in which these members mate only in predetermined orientations relative to each other.

Still another object of the present invention is to provide a plug and socket combination and a plug for use therewith, which embodies only stamped parts susceptible to inexpensive mass production and which do not involve close tolerances.

My invention further resides in providing an improved plug and socket combination, and a plug for use therewith, achieving the foregoing objects and which have features of construction, combination and arrangement rendering them simple and inexpensive in construction, reliable

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in operation, and readily mounted on associated equipment to the end that a device of maximum utility is achieved.

The novel features which I believe to be characteristic of my invention are set forth with particularity in the appended claims. My invention itself, however, both as to its organization and method of operation will best be understood by reference to the following description taken in connection with the accompanying drawings, in which:

Figure 1 is an isometric view of a plug and socket in assembled relationship and embodying the present invention;

Figure 2 is an isometric view like Figure 1 but showing only the plug portion of the structure;

Figure 3 is a front elevational view of the structure of Figure 1;

Figure 4 is a developed view of the plug portion of the structures of Figures 1 and 3;

Figure 5 is a front elevational view of the plug of Figure 4 in the formed condition;

Figure 6 is a cross-sectional view through the axis 6-6, Figure 5;

Figure 7 is a cross-sectional view through the axis 7-7, Figure 3;

Figure 8 is a side elevational view of a terminal strip having a pair of plugs like that of Figure 5 attached thereto;

Figure 9 is a cross-sectional view through axis 9-9, Figure 8, and

Figure 10 is an isometric view of an alternative embodiment of the plug portion of the present invention.

As shown in Figure 1 the plug and socket combination of the present invention includes a socket member S which receives the plug member P. The former member is made from a flat strip of conducting metal such as brass, which is stamped to the desired developed shape and then formed to the shape shown. Specifically, this member includes a bent up end tab 20 having an opening 20a to receive the hooked end of a wire or the like for soldering. An intermediate portion 22 is adjacent the tab 20 and has an opening 22a which may, for example, receive a rivet by which the socket S is attached to a suitable insulating mounting member.

The socket S defines a tube portion 24 adjacent the intermediate portion 22. This portion is formed by bending up the edges of the sheet metal piece forming the socket to define a pair of opposed edge portions 24a and 24b, Figure 7. As shown in Figure 7, the structure thereby defines a tube having a longitudinal slot defined by

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the edges 24a and 24b and which has a flat portion 26 diametrically opposed to the slot.

The plug P is also formed from a stamping of conducting metal such as brass which is of the developed shape shown in Figure 4. This stamping includes a spade portion 32 which is adjacent the mounting portion 28 which in turn is adjacent the connecting or terminal portion 30. The open edge portions of the spade section 32 are bent over as shown in Figures 2, 5, 6, and 7 to define a portion having a U-shaped cross-section, as indicated specifically in Figures 6 and 7.

The U-shaped portion shown in Figure 7 includes a pair of parallel legs 32a and 32c which rest against the flattened portion 26 of the socket S. A rounded intermediate section 32b connects these legs and engages the edges 24a and 24b of the socket S.

The mounting portion 28 of the plug P has an opening 28a, Figures 3 and 4, to receive a rivet or like device operable to hold the plug on a suitable support such as an insulating member. In Figures 8 and 9 the rivets 33 are received in the openings 28a of the plugs P and extend through suitable openings in the insulating strip 36 to hold the plugs P snugly against that strip. The bent over portions of the spade part 32 of plug P rest snugly against the upper edge of the strip 36 and thereby hold these plugs against rotational movement about the axes to the respective rivets 33.

The plug P has an extended tab portion 30 to which a soldered connection may readily be made. Such a connection is shown in Figure 8 where the wire 34 is received in the portion 30 of one of the plugs P and is hooked through the opening 30a as shown. Since the portion 30 is flat and readily accessible, it is a simple matter to achieve an effective soldered joint.

Figure 10 shows a modified embodiment of the plug P wherein the tab 30 is omitted and the tab 28 defines a lug suitable to receive solder. This form of the plug P is particularly useful where it is unnecessary to mount the plug on an insulating block.

If desired, a plurality of the sockets S may be molded or otherwise attached in aligned relationship to a single insulating body or frame. Similarly a plurality of plugs P may be mounted in mating relationship with each of the sockets so arranged to define a plug assembly capable of being received in the entire group of sockets. In this fashion a plurality of connections may be made with a single plug and socket assembly.

It will be observed from Figure 7 that when the U-shaped portion of the plug P is inserted into the portion 24 of socket S, the socket S is sprung and the edges 24a and 24b deflected in the direction of the legs 32a and 32c of the plug P. This provides a snug engagement between each of these edges and intermediate portion 32b of plug P and, in addition, resiliently urges the leg portions 32a and 32c against the flattened bottom section 26 of the socket S. As the plug and

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socket combination is used, wiping action will take place against the edges 24a and 24b of the socket S and the legs 32a and 32c of the plug P, thus providing a four-line contact that is kept clean by insertions and removals of the plug and socket.

While I have shown the preferred construction of my invention with a rounded intermediate portion 32b between legs 32a and 32c, Figure 7, it will be evident that other shapes capable of deflecting the edges 24a and 24b of socket S in the direction of legs 32a and 32c will accomplish the desired snug fit. Specifically, the legs 32a and 32c may be connected by an intermediate portion 32b having an inverted V-shaped cross-section, against which the edges 24a and 24b rest.

While I have shown and described particular embodiments of my invention it will, of course, be understood that I do not wish to be limited thereto since many modifications and alternative constructions may be made without departing from the true spirit and scope of my invention. I therefore intend by the following claims to cover all such modifications and alternative constructions as fall within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An electrical plug and socket combination comprising a socket defining a resilient slotted tube, a plug comprising a conducting member having a U-shaped cross-section having substantially parallel legs and a bent-over intermediate section and fitting snugly in said socket with said intermediate section received in the slotted portion of said tube and said legs engaging the interior wall thereof opposite to the slotted portion to spring said socket in the direction of said legs and establish a snug four-line connection.

2. An electrical plug and socket combination comprising a socket defining a resilient slotted tube and having a relatively flat portion diametrically opposed to the slot thereof, a plug comprising a conducting member of U-shaped cross-section having like substantially parallel legs joined by a rounded intermediate portion and fitting snugly in said socket with said intermediate portion received in the slotted portion of said tube and said legs engaging said relatively flat portion thereof to spring said socket and establish a snug four-line connection.

CHARLES P. DE VITO.

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