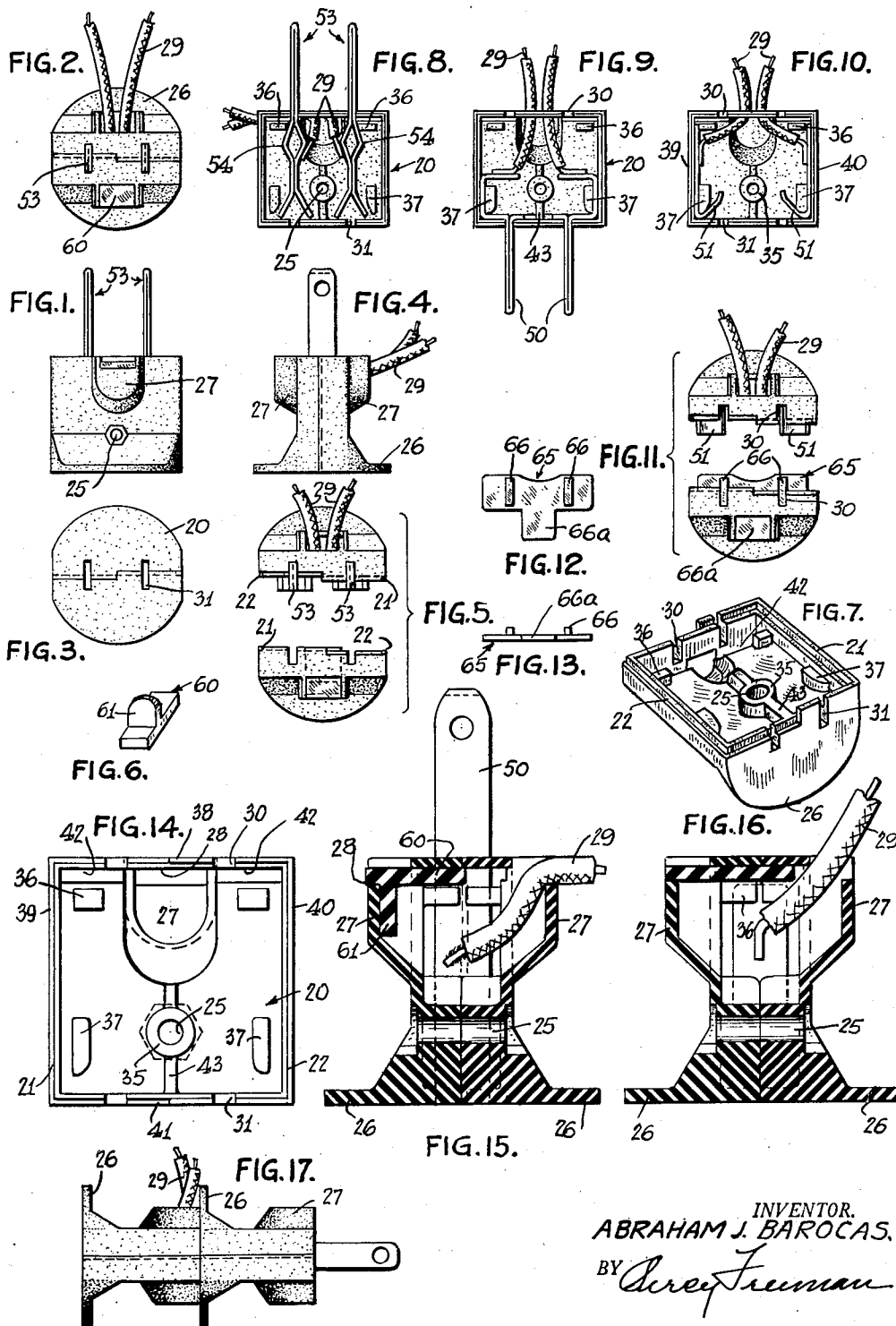


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SPLIT PLUG BODY SUITABLE FOR HOUSING A PLURALITY OF
DIFFERENT ELECTRICAL CONTACT ELEMENTS
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SPLIT PLUG BODY SUITABLE FOR HOUSING
A PLURALITY OF DIFFERENT ELECTRICAL
CONTACT ELEMENTS

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2 Claims. (Cl. 173-334)

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This invention relates to molded split plug body suitable for housing any of a plurality of pairs of different electrical contact elements.

This invention relates to the construction rather than mode of use of electrical plugs including male plugs, female plugs, and combined male and female plugs or connectors.

It is the principal object of this invention to provide a construction which is adaptable for use either as a male plug, or as a female plug, or as a combination male and female plug.

In conventional constructions, the male plug body member is made in one mold, the female body is made in another but different mold and a connector body is made in still another mold. In the present invention, a single mold or series of molds is used for the manufacture of a single body which is adapted to house selectively, the male terminals, the female terminals and the combination terminals which are both male and female.

One of the important features of this construction resides in the fact that the prongs of the male plug end of the combination terminal or contact member are integral with the female contact members. Hence, an electrical connection made with the male contacts is also made ipso facto with the female contacts, and the advantages that flow from this fact are obvious.

Still another object of this invention is the provision of a construction as described, which has at least two openings through which the wire connections may be selectively drawn.

A further object of this invention is the provision of a construction as above described, which is usable in connection with any conventional type of plug or connector construction.

A still further object is the provision of a construction which will make it possible to mold two halves of plugs above described, in a single mold, both halves being identical and thus reversible.

Other objects of this invention will become apparent from an examination of the drawing in the light of the following specification.

A preferred embodiment of this invention is shown in the accompanying drawing, in which:

Fig. 1 is a front view of a male plug, showing its two prong members.

Fig. 2 is a top plan view thereof, showing the prongs head-on and showing the two wire conductors extending through an opening in the housing.

Fig. 3 is a bottom plan view thereof, showing the openings formed therein.

Fig. 4 is a side view of the device, showing the

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two prongs in line and also showing the wire conductors extending from the housing.

Fig. 5 is a partly exploded view of the device seen in Fig. 2, both halves of the plug being separated, and showing the filler for closing undesired openings.

Fig. 6 is a perspective view of a filler or insert member used in one of the assembly variations of the present embodiment.

Fig. 7 is a perspective view showing one of the duplicate halves of the plug body.

Fig. 8 is an inside view of one of the housing members, showing a pair of combined male and female contact members disposed therein.

Fig. 9 is a view similar to that of Fig. 8, but showing a pair of male contact members disposed in the housing.

Fig. 10 is another view similar to that of Fig. 8, but showing a pair of female contact members disposed within the housing.

Fig. 11 is another partly exploded view, similar to that of Fig. 5, of the assembly shown in Fig. 10.

Fig. 12 is a face view of an insert or filler used in the assembly shown in Fig. 11.

Fig. 13 is an edge view thereof.

Fig. 14 is an enlarged inside view of the housing member.

Fig. 15 is a longitudinal section through the complete assembly of which a part is shown in Fig. 8.

Fig. 16 is a similar section through the entire assembly of which a part is shown in Fig. 10.

Fig. 17 is a side view of a pair of combination members of the type shown in Fig. 8, showing said members in connection with each other.

The construction herein claimed comprises a pair of identical complementary housing members 20. Each member is provided with a ridge or flange 21 along one of its sides and along one-half of each end and a corresponding rabbet 22 formed along its opposite side edge and the other half of each end. It will be noted especially in Figs. 3 and 5, that when two identical housing members 20 are brought together face to face, their respective flanges 21 will engage their respective rabbets 22 to position the two members in place with respect to each other and prevent a twisting movement between them.

It will be noted in Fig. 1 that each of the housing members 20 is provided with a transversely extending hole 25 which is enlarged at its outer end to form a hexagonally-shaped approach to the main portion of the hole proper. This hexagonal portion serves as a seat for a hexagonally-shaped nut to prevent it from rotating.

A screw extends through the corresponding hole in the other of the two housing members 20 and enters hole 25 first mentioned above to engage the nut in the hexagonally-shaped seat. It is by this means that the two housing members may be held together and twisting or pivotal movement between the two members will be prevented, as has above been indicated, by the tongue and groove construction along the side edges of the two members, above described.

Reference to Fig. 14 will disclose the fact that each housing member 20 is a substantial square in appearance when viewed from the inside. A side edge view, however, as shown in transverse section in Fig. 15, and a bottom view, as appears in Fig. 3, indicates that at its back end each housing member 20 is provided with a substantially semi-circular portion 26 so that when the two cooperating housing members are brought together, the back end thereof assumes a substantially circular form. The mid-section of the housing member may be reduced in size, as shown in Fig. 15, but at its forward end a hollow boss 27 bulges outwardly therefrom. The forward end of boss 27 has an opening 28 formed therein and it is through this opening that wires 29 may be made to extend. See Figs. 5 and 15.

It will be seen in Fig. 14 that each housing member 20 is provided with a pair of notch openings 30 at its forward end and a corresponding pair of notch openings 31 at its back end, the forward notches being in alignment with the rear notches. When the two housing halves are brought together, as shown for example, in Fig. 3, the pair of rear notches 31 in each housing member registers with the corresponding pair of notches in the other housing member to form a pair of substantially rectangular slots in the back end of the assembly. The same is true of the notches 30 in the front end of the housing members 20. Each pair of notches 30 registers with the other pair when the two housing members are brought together, and they form a pair of substantially rectangular openings in the forward end of the housing corresponding to those in the back end, as shown in Fig. 3.

On the inside, each housing member 20 is provided with an annular boss 35 which surrounds hole 25, a pair of substantially rectangular lugs 36, and a pair of elongated lugs 37. It will be noted in Fig. 14, that lugs 36 are disposed at the front end of the housing member 20, one in each corner thereof, and spaced both from the front and side walls 38, 39, and 40 respectively. The second pair of lugs 37 are disposed at the back end of the housing member 30, one in each corner thereof, said lugs being spaced both from the side walls 39 and 40 and from the back wall 41 of the housing. Adjacent the front wall 38, and between said wall and lugs 36, is a pair of grooves 42. Each of these constructional features plays an important role in the assembly of the several parts of the present device, as will hereinafter become apparent.

It will be appreciated that when the two identical housing members 20 are brought together as shown, for example in Fig. 15, lugs 36 on the one part will become aligned with the corresponding lugs on the other housing part and the same is true of lugs 37. Annular bosses 35 will also line up with each other to form a substantially tubular member through which the screw holding the two housing parts together extends. It will also be seen in Fig. 14 that each housing part 20 is provided with a rib 43 and that this

rib extends substantially from the back wall 41 of the housing to the annular boss 35. It occupies a central position between the two lugs 37 and between the two notches 31. Its function will also shortly become apparent.

The device will now be described in connection with its use solely as a male plug member such as is shown in Fig. 9. It will be noted in that figure that a pair of prongs 50 is provided and that these prongs extend through the rear openings in the back of the housing. Each prong 50 comprises a strip of brass or other suitable metal which extends around one of the lugs 37, between said lug and the side and back walls, and thence extends outwardly through the appropriate back wall hole, and it is then bent back upon itself to enable it to re-enter the housing through said hole, and it is then bent sidewardly along the back wall until it abuts centrally disposed lug 43. That part of prong 50 which lies between lug 37 and one of the side walls of the housing prevents a lateral movement of the prong once it is installed. The abutment of the flange end of the prong against centrally-extending lug 43 also serves to prevent lateral movement of the prong. And that portion of the prong which is disposed between lug 37 and the rear wall of the housing prevents longitudinal movement of the prong, either forwardly or backwardly. One of the conductors 29 is soldered or in any other conventional way affixed to the inner end of each prong member 50. Conductor 29 then extends into the hollow boss and out through opening 28 formed therein.

Prongs 50 are spaced a conventional distance apart, and they are of a conventional length, reference now being made to those portions of the two prongs which are folded back upon themselves and which lie exteriorly of the housing. Hence, they may be used in connection with any conventional type of outlet or receptacle.

In Fig. 10, the device is shown partly assembled for use as a female plug member. It will be seen in said figure that it is provided with a pair of substantially J-shaped contact members 51 which are connected at their inner ends of soldering or in any other conventional manner to electrical conductors 29. The longitudinal portions of said contact members 51 lie between lugs 37 and the side walls 39 and 40 of the housing member. The curved portion of these J-shaped contact members extends around these lugs 37 and into the space behind the slots in the back end of the housing. It is evident from this construction that when a pair of prongs, such as prongs 50, are inserted into the housing through the rear slot openings 31, they will slidably engage the curved ends of the J-shaped female contact members 51. As has above been mentioned in connection with the male prong members shown in Fig. 9, lugs 37 lock the J-shaped contact members 51 in place between said lugs and the side and back walls of the housing. Unlike the construction shown in Fig. 9, however, contact members 51 are also held in their proper places by means of lugs 36 which engage the top ends of said J-shaped members between said lugs and the side walls of the housing. If it should be desired, the top ends of contact members 51 may be extended to abut the front wall of the housing. This would further position the contact members 51 and prevent them from becoming dislodged.

As has above been indicated with respect to prongs 50, the back slots of the housing are

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spaced a conventional distance apart to enable a pair of conventionally spaced prongs on a conventional plug to enter the housing through said slots. Since the curved contact ends of contact members 51 are disposed immediately behind these back slots, it is clear that contact would be made with them by the prongs of a conventional plug. And inasmuch as prongs 50 extend from these back slots, it is clear that an assembly, such as is shown in part in Fig. 9, may be made to engage an assembly, such as is shown in part in Fig. 10.

Referring now to Fig. 8, it will be seen that a pair of combination male and female contact members 53 is carried within the housing hereinabove described. This combination contact member comprises a strip of a conventional contact material such as brass or copper which is folded upon itself to form the male contact end, and it is bent or spread part at its opposite end to form the female contact end. The male or prong ends extend through the slots formed in the front wall of the housing and the females end lie inside the housing opposite the slots in the back wall thereof. A pair of bends 54 is formed in the body of said combination contact members 53 immediately below the prong or male portions and inside of the housing in which they are disposed. It will be noted in Fig. 8 that lugs 36 engage these bends 54 to assist in positioning combination contact members 53 in their housing. Although the lower or female ends are free to spread apart to accommodate the prong members of a plug, they are nonetheless sufficiently confined by lugs 37 to prevent them from twisting out of operative position in their said casing. Centrally-disposed lugs 43 prevents twisting of said contact members 53 in the opposite direction. Bends 54 serve two additional functions. It is to these bends that wires 29 are soldered or otherwise affixed. It is also these bends which provide the female ends of said contact members 53 with sufficient resilience and springiness to perform their necessary function.

It will be understood that the device shown in Fig. 8 is a combination male and female connector. This may be seen in Fig. 17 where the connector on the right side of the two members therein shown is this combination member last above described. The member to the left of the combination member in Fig. 17 is the male connector shown in Fig. 9. Fig. 17 is intended to illustrate the manner in which the combination male and female member shown in Fig. 8 may be used. It is not, however, intended to limit the scope of its use. It will be noted, for example, in Fig. 8, that the combination member is provided with wires 29. These wires need not necessarily be used should it be desired to conduct current through the male prongs of the combination member, as seen in Fig. 17. On the other hand, these wires may be used to provide a secondary circuit in parallel. Still another method by which this combination method may be used would be to feed current into said member through said wires, and the prongs thereon may be utilized in a secondary circuit in parallel, although this secondary circuit may, if desired, be in series with the main circuit. The possible combinations in the use of this combination member is virtually limitless, and the possible combinations above described are intended merely to serve as illustrations. The use of the members shown in Figs. 6, 12, and 13 may now be described. It has above been stated that the housing comprises a pair of identical housing members, each of which has a

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hollow boss and an opening extending through the boss, through which the wires may be drawn. It has been stated that the wires may be drawn through either of said openings, depending upon the individual requirements of any particular case. When the wires are drawn through one of said openings and the combined male and female contact elements are used, it is desirable that the other opening 28 be closed to prevent the entry of foreign matter into the housing. Insert or filler members 60 or 65 may accordingly be used for this purpose. It will be seen that the member 60 comprises a rectangular-shaped plate having a flange 61 formed transversely thereof, nearer one of the ends of the rectangle than the other. Reference to Fig. 15 will show how this insert is mounted in the housing to close up the unused opening 28. The flange portion 61 extends into the hollow of boss 27 and the rectangular plate portion bears against the front wall of the housing and extends into the unused opening 28. There is a tight fit between said insert 60 and the housing, and once inserted in place it remains in place until intentionally removed therefrom.

The second insert 65 serves substantially the same purpose as the first insert, and it is used when the male or female plug is assembled. This filler or insert 65 comprises a substantially T-shaped member having a pair of spaced lugs 66 formed thereon, transversely of the cross piece of the T. The leg 66a of the T extends into the unused opening 28. The cross piece rests in grooves 42 between the front wall of the housing and lugs 36. The transverse lugs 66 on said insert project into the slotted openings in the front wall of the housing. It will be observed that this insert may be held in place very tightly in that it not only closes the unused opening 28 but it also closes the unused slotted openings 30 in the front end of the housing.

It will be understood from the foregoing that the invention herein claimed is susceptible of a great many variations, not only variations in combination as has above been indicated, but also variations in construction and form. For example, the outer shape which the two housing parts are shown to assume in the drawing may be changed to suit one's aesthetic sense without doing violence to any of the essential features of the invention. The specific material of which the device may be made is not critical and any material which is conventionally used in the manufacture of plugs may be used to equal advantage in connection with the present invention. Other variations will become apparent to those skilled in the art.

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

1. An electrical plug body comprising a pair of identical complementary halves, each half having a flange along one of its side edges and along one half of each end extending upwardly from the surface which is to abut its complementary half, and a rabbet formed along its opposite side edge and along the other half of each end, the flanges and rabbets being complementary to interengage when two halves of the body are assembled, each body half being hollow and having a pair of through openings through both of its end walls communicating with the hollow space in said body, four lugs extending up into said space adjacent the four corners of said body half and spaced apart from the side walls

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and from each end wall of said body, said plug body being thus adapted to receive selectively, a pair of female contact members, a pair of male contact members, and a pair of combined male and female contact members, and each body half

2. An electrical plug body comprising a pair of identical complementary halves, each half having a flange along one of its side edges and along one-half of each end extending upwardly from the surface which is to abut its complementary half, and a rabbet formed along its opposite side edge and along the other half of each end, the flanges and rabbets being complementary to interengage when two halves of the body are assembled, each body half being hollow and having a pair of through openings through both of its end walls communicating with the hollow space in said body, four lugs extending up into said space adjacent the four corners of said body half and spaced apart from the side walls and from each end wall of said body, said plug body being thus adapted to receive selectively, a pair of female contact members, a pair of male contact members, and a pair of combined male and fe-

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male contact members, and each body half having a lateral opening through its bottom wall for entrance of conductors, and a replaceable closure member which closes one of said lateral openings.

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