Jan. 18, 1966 E. A. GREASLEY 3,230,496

SOCKET FOR ELECTRIC JACK PLUGS

Filed Nov. 4, 1963 2 Sheets-Sheet 1

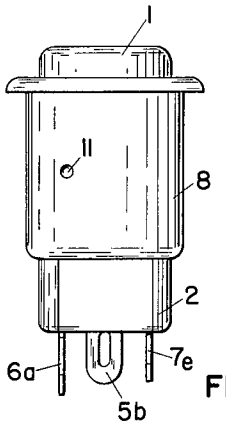


FIG. 1

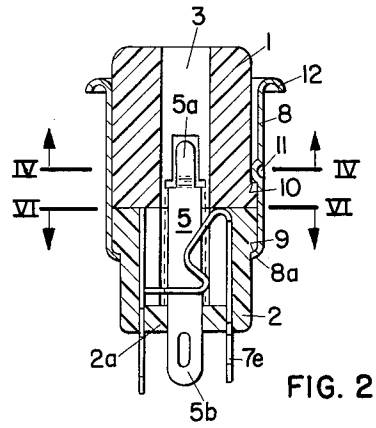


FIG. 2

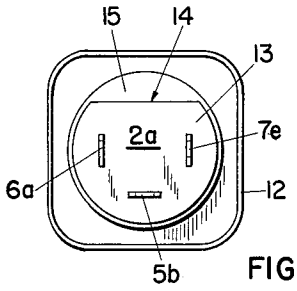


FIG. 3

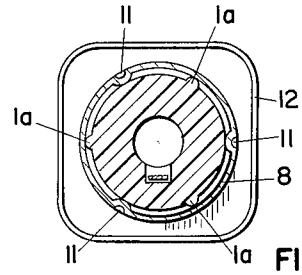


FIG. 4

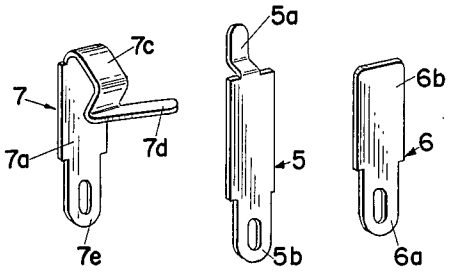


FIG. 5

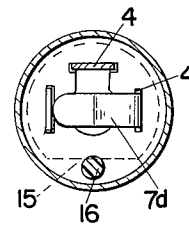


FIG. 6

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SOCKET FOR ELECTRIC JACK PLUGS

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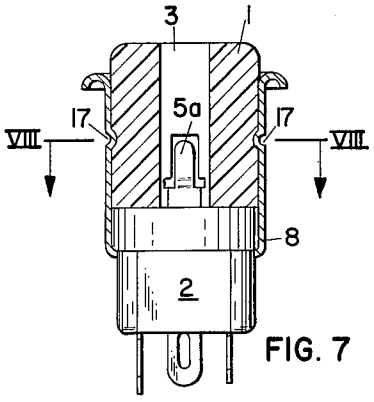


FIG. 7

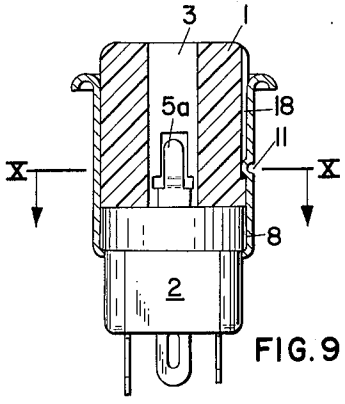


FIG. 9

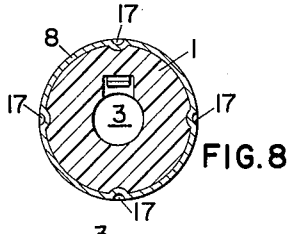


FIG. 8

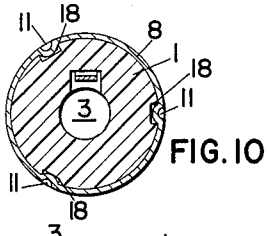


FIG. 10

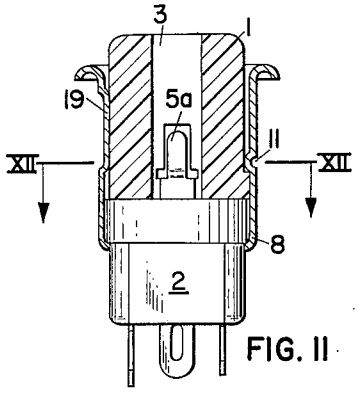


FIG. 11

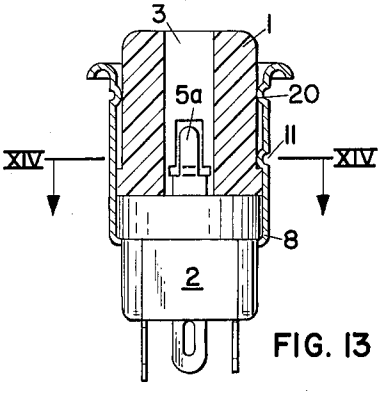


FIG. 13

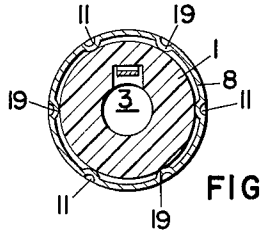


FIG. 12

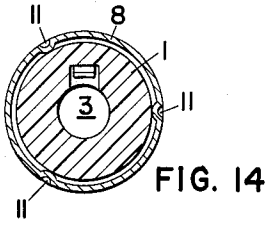


FIG. 14

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3,230,496

SOCKET FOR ELECTRIC JACK PLUGS

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Claims priority, application Great Britain, Nov. 2, 1962, 41,535/62
16 Claims. (Cl. 339—176)

The present invention relates to an improved socket for receiving what is termed a "jack" plug, that is a plug in which the pin (which is inserted in the socket) is divided along its length into two co-axial contact making portions which are insulated one from the other.

Existing forms of sockets for jack plugs are quite complicated in their construction and due to their intricate nature are difficult to assemble and for this reason are expensive to produce. One object of the present invention is to eliminate this disadvantage and provide a socket which is comparatively easy to assemble.

Another drawback experienced with known forms of sockets is that particular care has to be exercised to ensure that the contact members are adequately insulated from one another and accordingly another object of the invention is to provide a socket which ensures the necessary insulation of the contacts without complicating the construction of the socket.

A still further drawback experienced with known forms of sockets is that the contacts, normally of strip form, are easily bent or distorted and it is therefore a still further object of the invention to provide an arrangement in which the risk of distortion of the contacts is completely eliminated.

Broadly, according to the present invention, there is provided a socket for a jack plug which comprises a body party consisting of two co-axial hollow members or moldings of insulating material bridged and held inseparable by an outer sleeve, the bore of one of said members constituting an aperture for the reception of a jack plug and the other having its bore formed with two or more axially directed channels or grooves for slidingly receiving contact strips or fingers prior to assembly of the members and being formed with an end wall having openings through which the ends of the contact strips may project for connecting them in an electric circuit the first-mentioned hollow insulating member forming a socket for a jack plug and the part of the outer sleeve surrounding same being adapted to co-act in such a manner that the member is retained centralized in said sleeve.

As the strips are enclosed in the body part and not exposed there is no risk of them becoming distorted, and as they are positively located in the said grooves there is no risk of short circuit.

To enable the invention to be clearly understood, a preferred embodiment thereof will now be described by way of example with reference to the accompanying drawings, wherein:

FIGURE 1 illustrates the socket in elevation.

FIGURE 2 is a vertical section.

FIGURE 3 is an underneath plan view.

FIGURE 4 is a transverse cross section taken on the line IV—IV of FIGURE 2.

FIGURE 5 illustrates the contact strips in perspective.

FIGURE 6 is a transverse section taken on the line VI—VI of FIGURE 2.

FIGURES 7, 9, 11 and 13 are vertical sections illustrating various ways in which the insulating member which receives a jack pin is held centralized in the outer sleeve, and FIGURES 8, 10, 12 and 14 are horizontal sections taken on the lines VIII—VIII; X—X; XII—XII and XIV—XIV of FIGURES 7, 9, 11 and 13 respectively.

Referring to the drawings, the socket comprises a body part consisting of two coaxial, substantially cylindrical, hollow members or moldings **1** and **2** of insulating material. The axial bore or aperture **3** of the member **1** is intended to receive a jack plug and the member **2** constitutes a housing formed with an axial bore aligned with the aperture **3**, and having at least the same cross-section. Three parallel channels or grooves **4** extend longitudinally or axially of the part **2** are circumferentially spaced about the axis, communicate with the axial bore, and are adapted to receive the contact strips illustrated in FIGURE 5.

The first contact **5** is cranked at one end **5***a* so that when it is slid into the member **2** the cranked end **5***a* extends into the bore **3** in the member **1** so that this crank end **5***a* is contacted by the outer co-axial contact making portion of the pin of an electric plug. The other end **5***b* constitutes a solder tag.

The second contact strip **6** is shorter than the first contact strip **5** so that it does not project into the aperture **3** and comprises a narrow portion **6***a* forming a tag and a wider portion **6***b*, the latter being intended to be engaged by a third contact strip **7** about to be described.

This third contact strip **7** comprises a main part **7***a* which engages in its associated groove in the body member **2** and one end **7***c* is bent back V-fashion and the end of this bent back portion is bent laterally at **7***d* so as to bridge the inside of the body member **2** and make contact with said second contact strip **6** until such time as the jack plug is inserted when it makes contact with the outer end or extremity of the pin of the jack plug. The end **7***e* forms a solder tag. Preferably, this third contact strip **7** is made of a hard springy material such as Phosphor bronze or beryllium-copper.

The fitment of the strips **5**, **6** and **7** in the channels or grooves **4** ensures that they are positively located and that the parts in said grooves are insulated from one another.

The contacts **5**, **6** and **7** when slid fully into their respective grooves **4** pass through slots in an end wall **2***a* of the member **2** so that the solder tags **5***b*, **6***a* and **7***e* project to the outside of said member **2**.

After the strips **5**, **6** and **7** have been slid into their respective grooves in the body member **2** during assembly of the socket, a metal outer sleeve **8** is engaged over the two parts so as to hold the members in axial abutment and one end **8***a* of the sleeve **8** is turned under a shoulder **9** on the member **2** so as to prevent axial movement of the sleeve in one direction, that is in an upward direction as viewed in FIGURES 1 and 2. The member **1** is formed with a shoulder **10** constituting a ledge over which can be engaged pressed out dimple-like parts **11** of the sleeve **8** so as to prevent axial displacement of the sleeve in the opposite direction. The upper or outer end of the sleeve **8** is formed with a square flange **12**. To prevent turning movement of the member **2**, the latter is formed on its circumferential face with a flat **13** which is contacted by a straight edge **14** on an inturned portion **15** at the lower or inner end of the sleeve **8**. The member **1** is interlocked with the member **2** by forming the member **2** with a pin or peg **16** which engages in an aligned hole in the member **1**.

It is most important that the hollow insulating member **1** should be positively retained centrally within the sleeve **8** and for this reason the member **1**, as clearly shown in FIGURE 4, is formed on its outer surface with circumferentially spaced apart longitudinal centralizing ribs **1***a* which co-act with the inner face of the sleeve and so ensures that the member **1** is always concentrically disposed within the sleeve **8**.

Alternatively, as shown in FIGURES 7 and 8, the member **1** may be held centralized in the sleeve **8** by making the member **1** a close fit in the sleeve **8** and, when the member is fitted in the sleeve forming dimple-like indents **17** in the sleeve which are forced or impressed into the material at the surface of the member **1**.

Another method of centralizing the member **1** in the sleeve **8** is illustrated by FIGURES 9 and 10 and consists in forming the member **1** on its outer face with circumferentially spaced apart longitudinal grooves **18** in which engage the dimple-like parts **11** (referred to hereinafter) which prevent axial displacement of the sleeve in a downward direction.

As shown in FIGURES 11 and 12, centralizing of the member **1** in the sleeve **8** may alternatively be achieved by forming the inner face of the sleeve **8** with circumferentially spaced apart longitudinal ribs **19** which engage the outer surface of the member **1**, the ribs **19** being staggered with respect to the dimpel-like parts **11**. This arrangement in effect is a reverse arrangement of that described with reference to FIGURE 4.

Refering lastly to FIGURES 13 and 14, centralizing of the member **1** within the sleeve **8** is achieved by forming the outer face of the sleeve **8** with a circumferential groove or indent to provide an inwardly directed circumferential rib **20** which engages the outer face of the member **1**. Alternatively, the rib **20** may be constituted by circumferentially spaced apart dimple-like indents.

I claim:

1. A socket for receiving an electric jack plug comprising, in combination:

(a) a first socket member of insulating material having an axis and an axially extending circumferential outer surface, and being formed with an axial bore therethrough;

(b) a second socket member of insulating material having an axis and an axially extending circumferential outer surface, and being formed with an axial bore of a cross section at least equal to the cross section of the bore in said first member, said second member including an end wall extending transversely of said bore thereof and substantially closing one end thereof;

(c) sleeve means having outer and inner axially extending circumferential faces, respective axially offset portions of said inner face engaging said outer surfaces of the socket members for securing the socket members in axially abutting engagement and in axial alignment of said bores thereof,

(1) said bores being axially aligned, and said members jointly constituting receptacle means for receiving in conforming engagement a portion of a jack plug axially inserted through said bores;

(2) said second socket member being formed with a plurality of axially directed channels passing through said end wall and communicating with the bore of said second member; and

(d) a plurality of contact strips respectively received in said channels, each of said strips having one terminal portion in said receptacle means and another terminal portion projecting outward from said end wall.

2. A socket according to claim **1**, wherein said outer surface of said first member is formed with circumferentially spaced apart axial centralizing ribs which abut against the inner face of the sleeve means, whereby said first member is held centralized in said sleeve means.

3. A socket according to claim **1**, wherein said first member closely fits the sleeve means and the latter is formed with indents which are impressed into the material of said surface of said first member, whereby said first member is held centralized in said sleeve means.

4. A socket according to claim **1**, wherein said outer surface of said first member is formed with circumferentially spaced apart longitudinal grooves, and said sleeve means include a plurality of dimple-like projections on said inner face thereof, said projections extending inwardly of the grooves, whereby said first member is held centralized in said sleeve means.

5. A socket according to claim **1**, wherein said inner face of the sleeve means includes a plurality of circumferentially spaced apart longitudinal ribs which engage said outer surface of said first member, whereby said first member is held centralized in said sleeve means.

6. A socket according to claim **1**, wherein said outer face of the sleeve means is formed with a circumferential groove, and said inner face thereof is formed with a corresponding inwardly directed circumferential rib engaging said outer surface of said first member, whereby said first member is held centralized in said sleeve means.

7. A socket according to claim **1**, wherein each socket member is formed with an external circumferential shoulder, and respective axial end portions of the sleeve means engage said shoulder to prevent axial displacement of the sleeve means in either direction.

8. A socket according to claim **1**, wherein said circumferential outer surface of the second member is formed with a flat, and an adjacent end portion of the sleeve means includes an inturned part having a straight edge engaging said flat to prevent turning of the second member about said axis.

9. A socket according to claim **8**, wherein said socket members have respective abutting portions in interlocking engagement in such a manner that the first member is held against turning relatively to the second member.

10. A socket according to claim **9**, wherein the interlocking portions of said members include a pin integral with one of the members and engaging a hole in the other of said members.

11. A socket as set forth in claim **1**, wherein said outer surfaces of said socket members are axially aligned.

12. A socket as set forth in claim **1**, wherein said inner face and said outer surfaces are substantially cylindrical about the common axis of said socket members.

13. A socket as set forth in claim **12**, wherein said outer surfaces have substantially the same diameter.

14. A socket as set forth in claim **1**, wherein said one terminal portion of one of said strips axially extends into the bore of said first socket member.

15. A socket as set forth in claim **1**, further comprising interengaging means on said sleeve means and on each of said members for preventing relative axial movement of said sleeve means and of said members.

16. A socket as set forth in claim **1**, wherein each of said socket members is a unitary body of said insulating material.

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