Jan. 13, 1953 C. E. GILBERT 2,625,576

SOCKET CONNECTOR

Filed March 7, 1947 2 SHEETS—SHEET 1

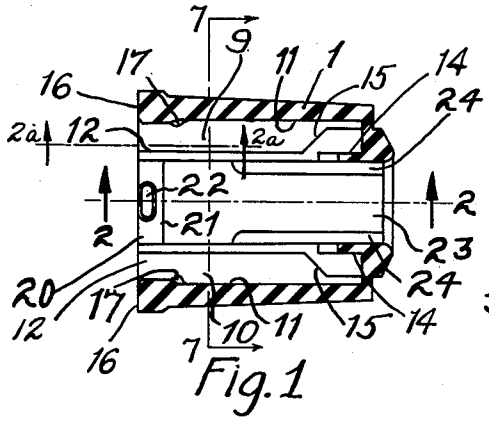


Fig. 1

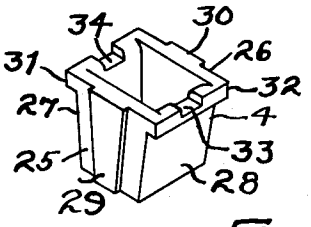


Fig. 3

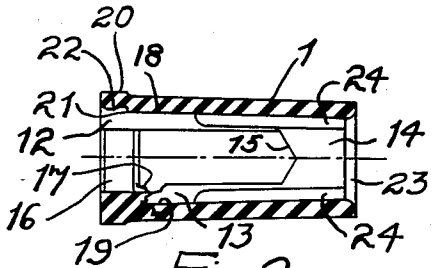


Fig. 2

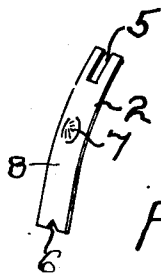


Fig. 4

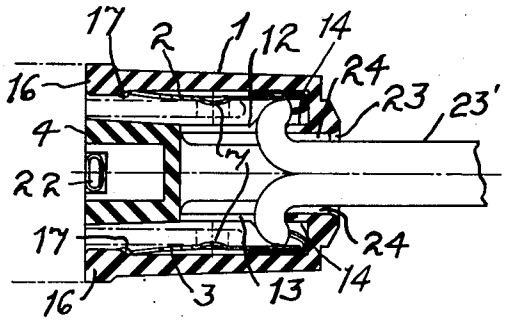


Fig. 5

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Filed March 7, 1947 2 SHEETS—SHEET 2

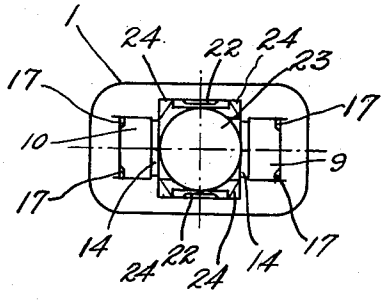


Fig. 6

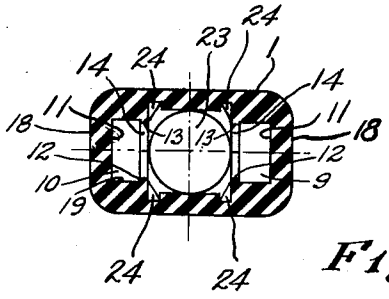


Fig. 7

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2,625,576

SOCKET CONNECTOR

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4 Claims. (Cl. 173—332)

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The invention relates to a new and useful improvement in electrical connectors of the type used for making an electrical connection between two electrical conductor cords where one of said cords, for instance, is connected to an electrical supply outlet and the other to an electrical appliance.

The main object of the invention is to provide an electrical connector of the type above referred to which can be made of a minimum number of parts and produced at a minimum of cost, and in which the contact elements thereof may be securely positioned and held in the connector body in correct alignment, and also in secure contact with a connector cord, without the use of screws, rivets, or other securing devices.

A further object is to provide an electrical connector construction in which the contact elements thereof may be removably positioned in the connector body, and the connection of the conductor cord to the contact elements is a step in the assembly of the connector itself.

A further object is to provide an electrical connector which can be easily disassembled and assembled again without the exercise of any particular mechanical skill.

In the drawing—

Figure 1 is a longitudinal cross-sectional view of the connector body utilized in carrying out the objects of my invention;

Figure 2 is a cross-sectional view of the connector body, the upper portion of the figure being a cross-section of Figure 1, taken on the line 2—2 of Figure 1, looking in the direction of the arrows and the lower portion of the figure being a cross-section taken on the line 3—3 of Figure 1, looking in the direction of the arrows;

Figure 3 is a perspective view of an insert member which may be used in the connector assembly;

Figure 4 is a perspective view of one of the electrical contact elements used in the construction; and

Figure 5 is a longitudinal cross-sectional view of the connector in its assembled condition.

Figure 6 is a plan view of the upper open end of the connector with the insert member removed therefrom.

Figure 7 is a transverse section of the connector taken on the line 7—7 of Figure 1, looking in the direction of the arrows.

As particularly shown in Figure 5, the preferred form of the complete electrical connector, made in accordance with the invention, consists of four parts, namely, the connector body 1, the contact elements 2 and 3, and the insert member 4.

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The connector body 1 may be molded from any suitable rigid insulating material. The contact elements 2 and 3 are formed of conducting material and may be made by stamping the same out of a strip of such conducting material and so that they are formed in a slightly bowed shape, as indicated in Figure 4, and are provided with a rectangular-shaped slot 5 at one end, a triangular shaped cutout portion 6 at the other end, and a raised projection 7 on the side face 8 thereof.

The interior of the connector plug body is molded so that it is formed with two longitudinally extending recesses 9 and 10, which are adapted to have the contact elements 2 and 3 positioned therein, and also to receive the contact elements of another conductor plug when such plug is to be connected to the connector. The inner ends of the recesses 9 and 10 are closed, and the upper ends thereof open through the larger open end of the connector body. Each recess is rectangular in shape and has an outer, solid side wall 11 and an inner partial wall comprised of the spaced flange members 12 and 13 which extend the entire length of the recesses and are connected together at their lower ends by a short wall portion 14, which is formed with a triangular shaped slot 15 therein. The outer side walls 11 of said recesses, at their upper ends, are provided with a projecting part 16, which forms a shoulder 17, the purpose of which will be more fully pointed out hereinafter. The recesses formed within the connector body, as above described, are made of substantially the same width as the width of the contact elements 2 and 3. The side walls 18 and 19, of the connector body, between the flanges 12 and 13, are provided with the reduced areas 20 which provide the ledges 21 on the interior of the said side walls. Formed on the side faces of the reduced areas 20, are the rounded, slightly protruding portions 22.

The connector body is also provided with an opening 23, which communicates with the interior thereof, and through which an electrical conductor cord 23' may be inserted. Positioned around the opening 23 are four triangular-shaped reinforcing strips 24 which extend upwardly in the connector body, as most clearly shown in Figure 1.

In the assembly of the connector, I preferably utilize a hollow insert member 4, shown in Figure 3, although such insert member may be eliminated from the construction, if desired. When said insert member forms part of the assembly, it provides a better insulated construction for

the connector body. This insert member is made substantially rectangular in shape and is molded of insulating material and so that it is formed with the sides 25, 26, 27, and 28. The outer faces of the sides 25 and 26 are formed with the raised portions 29 and 30, the side edges of which are adapted to have a sliding fit between the spaced flanges 12 and 13, which form the partial inner walls for the recesses 9 and 10. The sides 27 and 28 of the insert member terminate at their upper ends in the outwardly-extending flanged portions 31 and 32, which are provided with the transverse grooves 33 and 34 therein. The lower faces of these outwardly-extending flanged portions 31 and 32 of the insert member are adapted to engage the ledges 21 formed in the side walls 18 and 19 of the connector body, and the grooves 33 and 34 of said flanged portions are adapted to engage with the rounded, slightly protuding portions 22, formed on the cutout portion 20, of said side walls when the said insert member is in assembled relation with the connector body. The rounded, slightly protruding portions 22 are indicated more clearly in the upper portion of Figure 2, and extend only slightly outwardly from the side walls of the connector body so that when the hollow insert member 4 is forced into the connector body they will slide past the flanged portions 31 and 32 of the insert member and will become seated in the grooves 33 and 34 thereof when said insert member is fully positioned with respect to the connector body.

To assemble the electrical connector, and to connect it to an electrical conductor cord, the ends of the two insulated conductors of the cord are first separated and the insulation removed therefrom. Then the bared ends of the cord are inserted into the connector body through the opening 23 until they project a short distance above the open end of the connector body. The lower ends of the contact elements 2 and 3, which are provided with the triangular-shaped cutout portions 6, are then caused to engage the bared ends of the conductor cord, and the contact elements, with their bowed-out sides facing inwardly of the connector body, are manually inserted into the recesses 9 and 10, with the result that the bared wire ends of the conductor cord will become folded around the lower ends of the contact elements and forced down into the recesses and gripped in the triangular-shaped cutout portions 6 thereof. When the contact elements are fully inserted in their recesses in the connector body, the projections beside slots 5 at the other ends thereof are caused to be snapped under and to engage the shoulders 17 of the thickened parts of the side walls 11, and the contact elements will thus be held in a locked resilient position within the recesses so as to provide a resilient contact surface to engage with the contact elements of an electrical plug which may be inserted into the recesses of the connector body. The projection 7, which is formed on the bowed face of the contact elements, will provide an additional surface for insuring a proper electrical contact between the plug contact elements and the contact elements of the connector body. When the contact elements 2 and 3 are inserted in the recesses formed in the connector body, the insulated portions of the connector cords which are just beyond the bared ends of said cords, will be forced into the triangular-shaped slots 15 in the wall portions 14, at the lower end of the recesses, become wedged therein, and will be bent sharply over the edges of said slots. This will effect a secure locking of the conductor cord in the connector body, and if the cord should be unduly pulled at any time, the strain will be absorbed by the insulated portions of the cord and will be removed from the non-insulated ends thereof.

After the connector body is assembled with the contact elements and the conductor cord, the insert member 4 may be positioned in the connector body, if desired. The insert member is inserted into the connector body in such manner that the side edges of the raised portions 29 and 30, of its sides 25 and 26, will be slidingly engaged between the edges of the spaced flange members 12 and 13, and then it is forced downwardly into the connector body until the outwardly-extending flanged portions 31 and 32, of the sides 27 and 28, engage with and are seated on the ledges 21 formed on the side walls 18 and 19 of the connector body. When the insert member is thus positioned in the connector body, the rounded, slightly protruding portions 22 formed on the side walls 18 and 19 of the connector body wall become engaged in the grooves 33 and 34 of the outwardly-extending flanged portions 31 and 32 of the insert member, and the insert member will thus be securely locked in place in the connector body.

It will be seen that in the above-described construction of the electrical connector of my invention, the contact elements can be quickly and easily securely positioned in the connector body without the use of rivets or other securing means and can also be easily removed therefrom for replacement, if necessary, and the entire connector can be readily assembled and disassembled without employing any special tool and by any person of average intelligence. In disassembling the parts of the connector, all that is required is to insert a pointed instrument into the connector body and pry out the insert member 4, if it is used in the assembly, and then use the same instrument to dislodge and remove the contact elements. Also, the construction provides an efficient electrical connector for providing an extension conductor cord between a conductor cord attached to an electrical supply cord and a cord attached to an electrical appliance.

What I claim is:

1. An electrical connector comprising a one-piece rigid molded body provided with a central aperture therethrough and a pair of internal recesses which are adapted to receive the contact blades of an electric plug and which are closed at one end and open at the other end and separated from said central aperture by a pair of flanges spaced from each other and which form the inner partial walls of said recesses, a shoulder formed on the outer wall of each recess, adjacent the open end thereof, a pair of electrical contact blades positioned respectively within said recesses and each consisting of a strip of resilient conducting material having means provided at one end for making electrical contact with a wire of an electrical conductor cord and means at its other end for engaging the shoulder on the outer wall of its recess, said body having reduced wall portions formed about one part of said central aperture and providing ledges on said walls, projections extending from said reduced wall portions, and a molded closure member removably positioned in said central opening and seated on said ledges and having means for engaging with

said projections to lock said closure member within said central aperture.

2. An electrical connector comprising a rigid one-piece molded body having a central aperture therethrough and a pair of internal recesses which are adapted to receive the contact blades of an electric plug therein, said recesses being open at one end and closed at the other end and separated from said central aperture by a partial wall consisting of spaced flanges, a shoulder formed on each of the outer walls of said recesses adjacent the open end of each recess, an electrical conductor cord positioned in said central aperture having the bared ends of its wires extending adjacent to the closed ends of said recesses, a pair of electrical contact blades each consisting of a strip of resilient conducting material having a triangular-shaped slot formed at one end for gripping and holding the bared end of one of said wires in its recess, the other end of each said strip being slotted, each strip being bowed and positioned in its recess with the triangular-shaped slotted end engaging a conductor wire in the closed end of its recess and the other slotted end engaging the shoulder on its recess, the strip being removably retained in its said position by its resilience, said body having reduced portions formed in the wall surrounding one part of said central aperture and forming ledges in said wall, a projection extending from each said reduced wall portion, and a molded insert member removably inserted in said central aperture and seated on said ledges, said member having slotted wall means engaging with said projections and raised side faces, the edges of which slidingly engage between the spaced flanges of said recesses.

3. An electrical connector comprised of a rigid one-piece insulated body having a pair of longitudinal recesses formed therein which are open at one end and closed at the other end and which are adapted to receive the contact blades of an electric plug therein, each of said recesses having a partial inner wall comprised of longitudinally-extending spaced flange members joined together at one end by a transversely-extending wall provided with a triangular-shaped slot therein, said body also having a central longitudinal aperture separated from said recesses by said flange members for the introduction of an electrical conductor cord, an electrical conductor cord positioned in said central longitudinal aperture and having a pair of wires with insulated end portions positioned respectively in the triangular-shaped slots of said transversely-extending walls and bared wire end portions extending respectively in said recesses, a pair of electrical contact blades each removably seated in one of said recesses and consisting of a strip of resilient electrical conducting material stressed into a bowed shape and formed with a slot at one end and with a triangular-shaped cutout portion at the other end for gripping the end of one of said wires and for holding the same against the walls of its recess, and a shoulder on the outer wall of each of said recesses, the under-side of which engages with the slotted end of a contact blade when seated in its recess to resiliently hold the said blade seated against longitudinal movement.

4. An electrical connector consisting of a one-piece rigid insulated body having a pair of longitudinally-extending recesses formed therein which are open at one end and closed at the other end and which are adapted to receive the contact prongs of an electric plug therein, each of said recesses having an inner wall comprised of longitudinally-extending flange members spaced apart from each other and joined together at one end by a transversely-extending wall formed with a triangular-shaped cutout notch therein, said body having a central longitudinally-extending aperture separated from said recesses by said flange members, an insulated electrical conductor cord having its wire ends positioned in one portion of said central longitudinal aperture and with the insulated portions of its wire ends positioned respectively in the triangularly-shaped notches of the transversely-extending walls and the bared wire portions of said cord ends extending into respective ones of said recesses, a pair of electrical contact blades removably seated in said recesses, each of said blades being bent into a bowed shape and having a slotted end portion and a triangular-shaped notched end portion and a raised contact projection formed on one face thereof, a shoulder formed on the inner face of the outer wall of each of said recesses near the open end thereof, the under-side of each said shoulder engaging with the slotted end of one of the contact blades to hold said blade in its recess against longitudinal displacement, reduced portions formed in the wall surrounding one end portion of said central longitudinal aperture forming ledges in said wall, a projection formed on each of said reduced wall portions, a molded insert piece removably positioned in the end portion of said central longitudinal aperture and seated on said ledges, said member being provided with slots for engaging respectively with the projections formed on said reduced wall portions and also having raised side faces, the edges of which slidingly engage between the longitudinally-extending flange members which form the inner walls of said recesses.

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