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M. ALDEN

2,353,628

ELECTRIC CONNECTOR

Original Filed Aug. 3, 1940

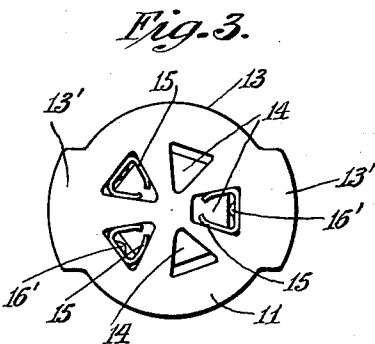
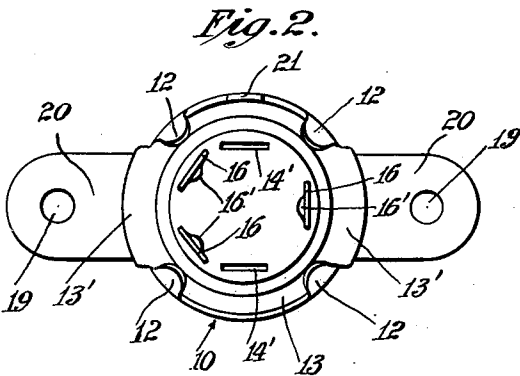
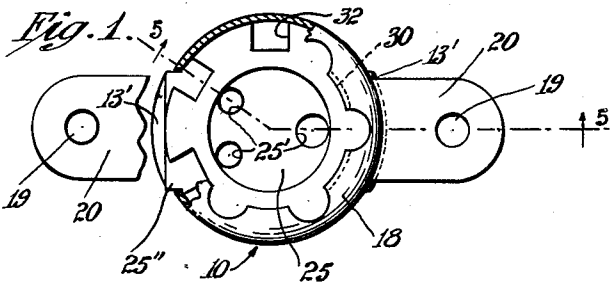


Fig. 4.

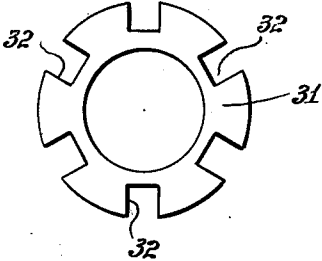
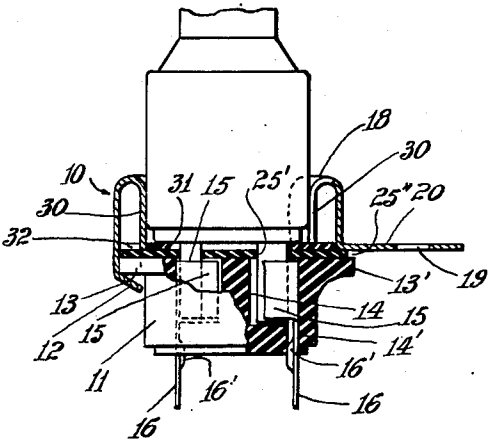


Fig. 5.



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ELECTRIC CONNECTOR

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5 Claims. (Cl. 173—332)

This invention relates to a socket and plug combination for interconnecting electrical circuits and is a division of application Serial Number 350,485, filed August 3, 1940. More particularly it relates to the socket of such a combination as used for the connection of electrical circuits which are carrying radio frequency currents, or which may be connected or exposed to such currents, so that complete shielding of the circuits is desirable.

One object of my invention is to provide a plug and socket combination in which complete shielding of both portions exists when the plug has been inserted in the socket.

Another object of this invention is to provide a structure of the type described in which the shielding circuits of the two portions will be effectively and automatically connected together when the plug is inserted into the socket.

Yet a further purpose of my invention is to provide a compact and inexpensive plug and socket connector which shall afford a secure connection, both mechanical and electrical, between not only the insulated circuits passing therethrough, but also between the shielding portions of the circuits passing therethrough.

Referring now to the drawing for the purpose of better explaining my invention:

Fig. 1 is a top plan view of one form of my invention having certain parts broken away.

Fig. 2 is a bottom plan view of the structure of Fig. 1, illustrating a method of fastening the body and the shield of my socket into a single unit.

Fig. 3 is a top plan view of the insulating body of the socket proper, showing the contacts in place.

Fig. 4 is a plan view of the locating ring used with this form of socket.

Fig. 5 is a side elevation, partly in section, showing the assembly of the plug and part of the socket of my invention, illustrating the manner in which the shielding portions of these two members are automatically connected together upon the insertion of the plug into the socket, taken on the planes of the line 5—5 of Fig. 1.

Referring now to Figs. 1, 2 and 3, the metallic shield 10 of the socket surrounds the top of the insulating body 11, and is fastened thereto by means of ears 12 which may be bent over the rim 13 of the insulating body, as indicated in Fig. 2. This rim has lateral projections 13' to determine its angular relationship with respect to shield 10.

Body 11 is provided with recesses or apertures

14, for the reception therein of suitable contact members 15, adapted to receive the prongs of a plug inserted into the socket. I prefer to provide apertures sufficient in number for the maximum

number of contacts which may be employed with any particular socket and then to place within these apertures only the number of contacts which I desire to use—three being shown in the present instance. The lower portions of these contact members may be formed in the shape of tabs or wiring lugs 16, extending through the rear surface of the socket body for the purpose of affording external connection to the contact members. These tabs may have embossed portions 16' as shown in Fig. 2, to aid in retaining them in the slots 14', extending from recesses 14 to the bottom of the socket, while allowing considerable play to the upper end of the contact so that the latter may adjust itself to the entering prong of a plug.

These tabs 16 may optionally be provided with apertures (not shown) extending therethrough for the easier fastening thereto of conductors. The metal shield 10 may conveniently be formed with a rim 18 extending around its periphery, and also may have apertures 19 extending through lateral portions 20 of the shield, which apertures may be utilized to attach the socket to a panel or other support. Additional tabs 21 may depend from the lateral portions of the shield, and may be provided with holes (not shown), for the fastening thereto of grounding conductors, either to furnish a ground to the socket itself or to one or more of the socket contacts, or to afford a ground to some other member of an assembly.

A cover washer 25 of insulating material is interposed between the top of body 11 and the metal shield. This washer is provided with apertures 25' correspondent to the apertures 14, so as to guide the plug prongs into proper relation with the contact members 15 and with angular locating projections 25'', registering with projections 13' of the body proper. The contacts may conveniently be made slightly shorter than the apertures 14, so that washer 25 will not touch the tops of the respective contacts and thus make short leakage paths therebetween.

As shown in detail in Fig. 5, the metal shield covering a large part of the socket may be formed of a single integral piece of metal, shaped so as to have lateral extensions 20, and a dependent connecting tab 21 (Fig. 2). Ears 12 are bent over the rear of the socket body on opposite sides of the projections 13', 13' and 25'', 25'' so as to

hold them firmly within the shield body and prevent rotation. The upper edge of the upwardly extending rim 18 has a series of fingers 30 which are bent inwardly until they are almost parallel to the inner surface of the rim.

As shown in Figs. 1 and 4, I provide a ring 31, of insulating material, the periphery of which is provided with a series of indentations 32. This ring lies on top of the insulating washer 25, and the fingers 30 of the metal shell then fit into the indentations in such fashion as to firmly hold the ring in place. This ring serves to aid in the location of the prongs of a plug, at the time that it is being inserted into the socket, and also to prevent accidental contact between the prongs of the plug and the metal shell of the socket, which might give rise to short-circuits of an undesirable nature, when a plug is being inserted. When a plug has been inserted until the prongs rest upon the surface of the washer 25, they are so positioned by the ring 31 that a revolving motion of the plug will guide the prongs of the plug into their proper apertures 25' in the washer 25.

Fig. 5 also illustrates the firm contact which is made between the shielding circuits of the socket and of the plug, when once the latter has merely been inserted into the socket. Especially it is to be noted that the termination of the plug shield lies within the turned-over rim 18 rather than merely abutting it, so that the possibility of open space existing between these two portions of the shielding, by a slight lateral displacement of the plug is completely eliminated, a fault frequently found in existing structures of this type.

I claim:

1. A radio socket comprising a base of molded insulation having contact containing recesses open from above and terminal outlet slots open below and having a laterally projecting flange at its upper edge, a metallic supporting member having a tubular body one end of which as lugs embracing the upper edge of the base and interlocked with said flange, the other end of the tubular body having intumed resilient ears for gripping the cylindrical body of a plug when its prongs are inserted into the contact recesses.

2. A prong contact socket including an elongated cylindrical insulating body having an an-

nular flange at one end thereof, and having elongated recesses in said flanged end, an insulating disc on the surface of the recessed end of the body having openings aligned with the recesses, an insulating guide ring on said disc around said openings and a metallic shield member having a cylindrical body portion extending outwardly from the flanged end of the elongated body and embracing said flanged end, said disc and ring, integral lugs on the shield member for holding the parts together and integral intumed resilient fingers in interlocking engagement with the ring and adapted to resiliently engage the body of an inserted plug member.

3. A radio socket comprising a tubular metallic shield member having a cylindrical shell with intumed resilient fingers for gripping the body of an inserted plug and shielding the same and an insulating body having recesses containing contacts to be engaged by the prongs of the inserted plug, said shield member embracing said body around said contacts and shielding the circuits thereof.

4. A radio socket comprising a base formed of insulating material and having circumferentially spaced recesses open at their upper ends to receive the prongs of an inserted plug, contacts mounted in said recesses to be engaged by the prongs and having wire terminals beneath the base, a laterally projecting flange on said base, a tubular metallic supporting shield member having portions embracing said flange and having intumed resilient fingers above the base forming means for receiving and gripping the body of the inserted plug when the prongs of the plug are in engagement with the contacts in the base, said shield member serving automatically to shield the parts of the socket and the plug when the plug is inserted.

5. A radio socket comprising a tubular metallic shield member having a cylindrical shell with intumed resilient fingers for gripping the body of an inserted plug and shielding the same and an insulating body having recesses containing contacts to be engaged by the prongs of the inserted plug, said shield member embracing said body around said contacts and shielding the circuits thereof, said shield member having grounding lugs integral therewith.

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