Aug. 15, 1939 S. M. DEL CAMP 2,169,962

ELECTRICAL CONNECTION

Filed Nov. 30, 1937

Fig. 1

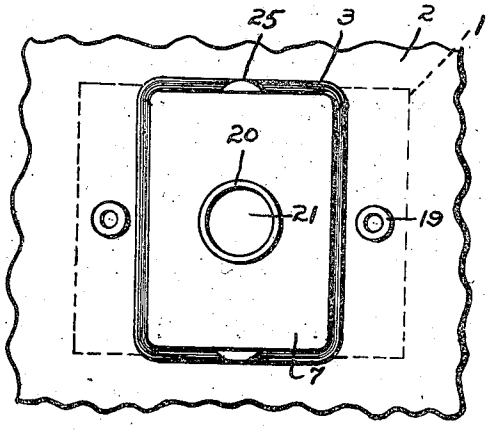


Fig. 2

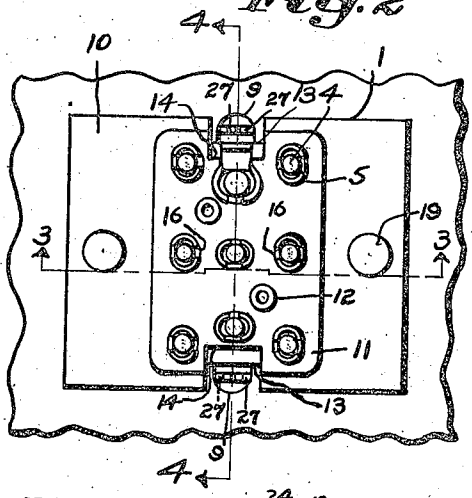


Fig. 3

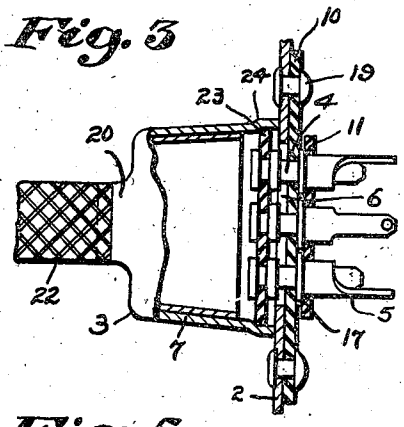


Fig. 4

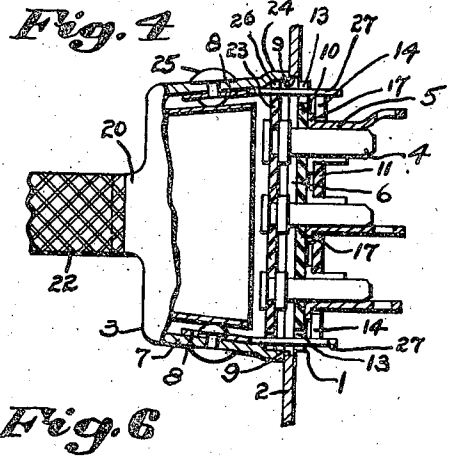


Fig. 5

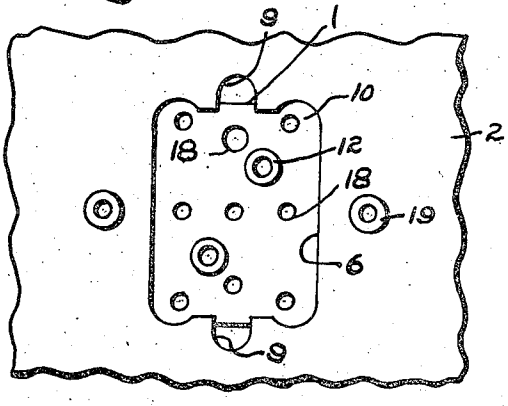
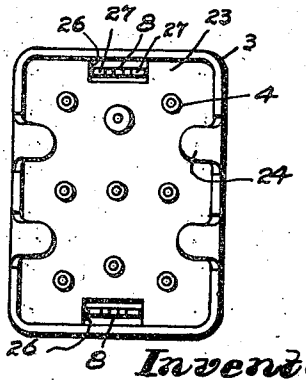


Fig. 6



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UNITED STATES PATENT OFFICE

2,169,962

ELECTRICAL CONNECTION

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Application November 30, 1937, Serial No. 177,246

3 Claims. (Cl. 173—332)

My invention relates to improved plug and socket members wherein one of the members is secured to a metal supporting panel and the other member is provided with a shield in electrical connection with the panel whereby the last-mentioned member is shielded against external electrical disturbances.

In the drawing, which represents a preferred embodiment of my invention:—

Figure 1 is a top plan view showing my plug and socket member electrically connected and disposed on opposite sides of a metal supporting panel;

Fig. 2 is a bottom view of the installation shown in Fig. 1;

Fig. 3 is a fragmentary section taken along the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary section taken along the line 4—4 of Fig. 2;

Fig. 5 is a front elevation showing a supporting panel with the socket member of my device secured thereto; and

Fig. 6 is a bottom view of the plug member of my device.

Referring to the drawing, I have shown a socket member 1 secured to one face of a metal supporting panel 2 and a plug member 3 disposed on the other side of the supporting panel 2 from the socket member 1 and having contact prongs 4 in electrical connection with contact terminals 5 of the socket member through an aperture 6 in the supporting panel. The plug member 3 has a metal cup-shaped shield 7 of any suitable shape and attaching members 8 in electrical connection with the shield 7. The attaching members 8 are adapted to engage the metal supporting panel 2 through apertures 9, which, in my preferred form, are disposed adjacent the aperture 6 whereby electrical contact is established between the shield 7 and the supporting panel.

The socket member of my device, as most clearly illustrated in Figs. 2, 3, 4 and 5, comprises a plurality of insulating plates secured together and contact terminals carried by one or more of the insulating plates of the assembly. My preferred form of socket member includes an upper insulating plate 10 and a lower insulating plate 11 secured together through any suitable means, such as the rivets 12 (Figs. 2 and 5). The upper plate 10 has a notch 13 in each of the opposed sides thereof and the plate 11 has a notch 14 on each of its sides corresponding to the notched sides of the plate 10 (Figs. 2 and 4). The socket contact terminals 5 are carried by the insulating plates and each terminal extends through an aperture 16 (Fig. 2) of the insulating plate 11 and is firmly secured to the plates, in my preferred device, by means of a flange portion 17 (Fig. 4) disposed between the plates 10 and 11 when the plates are in assembled relation. The plate 10 has apertures 18 in alignment with the prong-receiving portions of the contact terminals 5 to allow entrance of the prongs of the cooperating plug member into the contact terminals. The socket member 1 of my device is secured to the metal supporting panel 2 through any suitable means, such as the rivets 19, with the prong-receiving openings 18 of the insulating plate 10 intersecting the major opening 6 of the panel 2 (Fig. 5). At the same time the notches 13—13 and 14—14 of the respective insulating plates 10 and 11 are disposed opposite the openings 9—9 of the panel (Figs. 2 and 4) so as to allow the attaching means 8—8 of the plug member to pass entirely through the panel to a position, if it is so desired, beyond the insulating plates of the socket member, as most clearly shown in Fig. 4.

Referring to the plug member 3 of my device, the metal shield 7 is cup-shaped in form and provided with a cylindrical neck portion 20 at one end having an opening 21 which is wide enough to allow a wire or group of wires to pass into the shield for attachment to the contact prongs 4. A metallic shield 22 (Figs. 3 and 4), or other form that covers insulated wire, may be drawn over or into the neck 20 and soldered or otherwise permanently secured to the shield. An insulating plate 23 is affixed to the bottom of the cup-shaped shield 7 through means of lugs 24 (Fig. 6) integral with the open end of the shield and bent over to clamp the plate 23 within a narrow peripheral ridge 25 formed adjacent the open end of the shield (Figs. 2 and 4). The contact prongs 4, adapted for contact with the cooperating contact terminals 15 of the socket member, are anchored to the plate 23. In order that electrical contact may be established between the cup-shaped shield 7 and the supporting panel 2 when the plug and socket members are in connected relation, I have provided attaching members 8, which are preferably two in number, as shown in Figs. 4 and 6. The attaching members 8, in my preferred form, have an end portion secured to sides of the shield 7 in any suitable manner, as by rivets 25 (Fig. 4), and a free end portion extending through apertures 26 (Figs. 4 and 6) in the insulating plate 23 and beyond the plate 23 a sufficient distance for complete engagement with the supporting panel 2 through the apertures 9—9. The free end of each of the attaching members 8 is bifurcated so

as to form a pair of yieldable arms 27. The pairs of yieldable arms 27 are normally wider than the widest dimension of the respective openings 9 with the result that the arms 27 of each pair are compressed to pass through the openings 9, after which action they expand to engage firmly the material surrounding the aperture, as most clearly shown in Fig. 2. The arms 27 of each pair are preferably inclined at their outer edges whereby they may be cammed toward each other to permit easy insertion of the pairs into their respective apertures.

In connecting the plug and socket members, prongs 4 of the plug member are aligned with the prong-receiving apertures 18 of the plate 10 of the socket member, and, at the same time, pairs of yieldable arms 27 of the attaching members of the plug member take a position in alignment with the respective openings 9 in the supporting panel 2. During movement of the prongs 4 into engagement with the socket contact terminals 15, the pairs of yieldable arms 27 pass through the openings 9 so as to engage the material of the panel 2 surrounding the apertures in the manner which has been described. When the plug and socket members are in final connection, the wire covering 22 and the shield 7 are completely grounded to the panel 2 whereby the plug member is completely shielded from external interferences.

I am aware that the stud and socket parts of the respective members could be interchanged and many other modifications made without departing from the spirit and scope thereof and for that reason my invention is best defined by the following claims.

I claim:

1. An electrical device comprising, in combination, plug and socket members and a metal supporting panel having a large opening and a smaller opening on one side thereof, said socket member being secured to said panel and having insulating plates carrying socket contact terminals intersecting said large opening, said plug member being disposed on the other side of said supporting panel from said socket member, said plug member having a hollow metal shield, a plurality of stud contact terminals extending beyond said shield into cooperative fastening engagement with said socket terminals and a yieldable conducting member secured to said shield, said conducting member being engaged and disengaged with said panel by direct axial movement thereof through said small opening whereby said shield and said panel are electrically connected and disconnected.

2. An electrical device comprising, in combination, plug and socket members and a metal panel having a large opening and a smaller opening on one side thereof, said socket member being secured to said panel and having insulating plates carrying socket contact terminals intersecting said large opening, said plug member being disposed on the other side of said supporting panel from said socket member, said plug member having a hollow metal shield, a plurality of stud contact terminals extending beyond said shield into cooperative fastening engagement with said socket terminals and a conducting member electrically connected to said shield, said conducting member having a pair of yieldable arms engaged and disengaged with said panel through direct axial movement thereof through said smaller opening whereby said shield and said panel are electrically connected and disconnected.

3. An electrical device comprising, in combination, plug and socket members secured to opposite sides of an apertured metal panel, said members having contact terminals for electrical engagement through the aperture of said panel, one of said members having assembled insulating plates carrying the respective contact terminals of said member, attaching means extending through one of said insulating plates and said panel for securing said last-mentioned member to said panel, the other of said members having a metal shield and a yieldable conducting member electrically connected with said shield, said conducting member extending beyond an end of said shield and engaging said metal panel whereby said shield and said panel are electrically connected together.

SCIPIONE M. DEL CAMP.