May 22, 1956 B. J. JOHANSON 2,747,169

CONTACT FOR PRINTED CIRCUITS

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Fig. 1

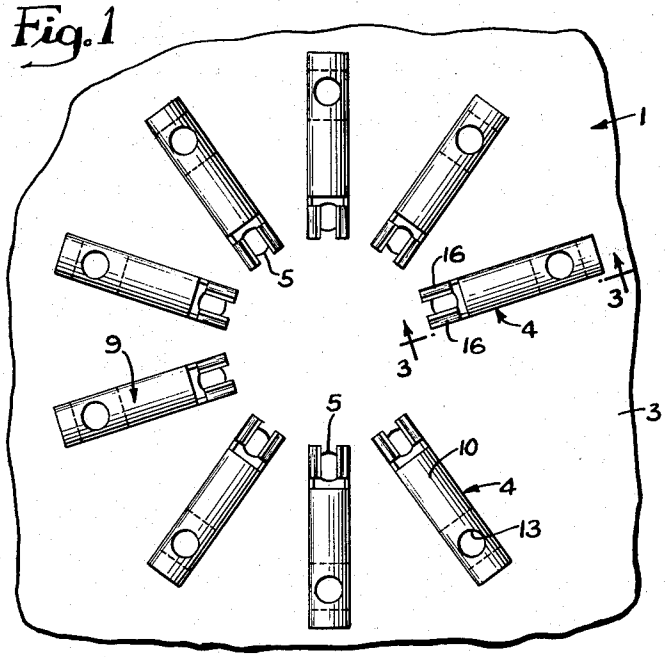


Fig. 3

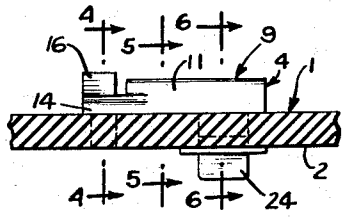


Fig. 4

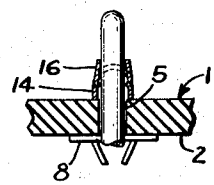


Fig. 2

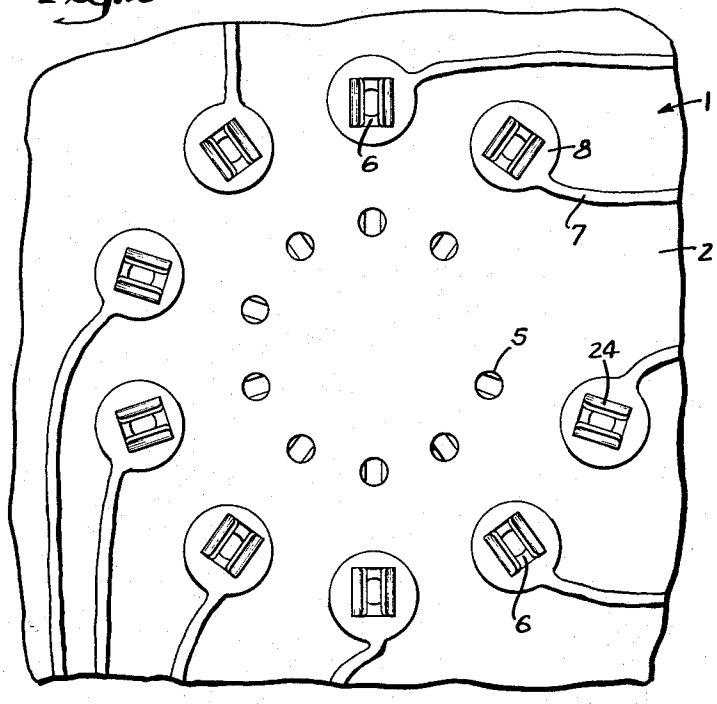


Fig. 5

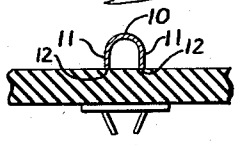
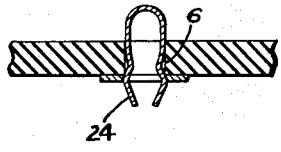


Fig. 6



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Fig. 7

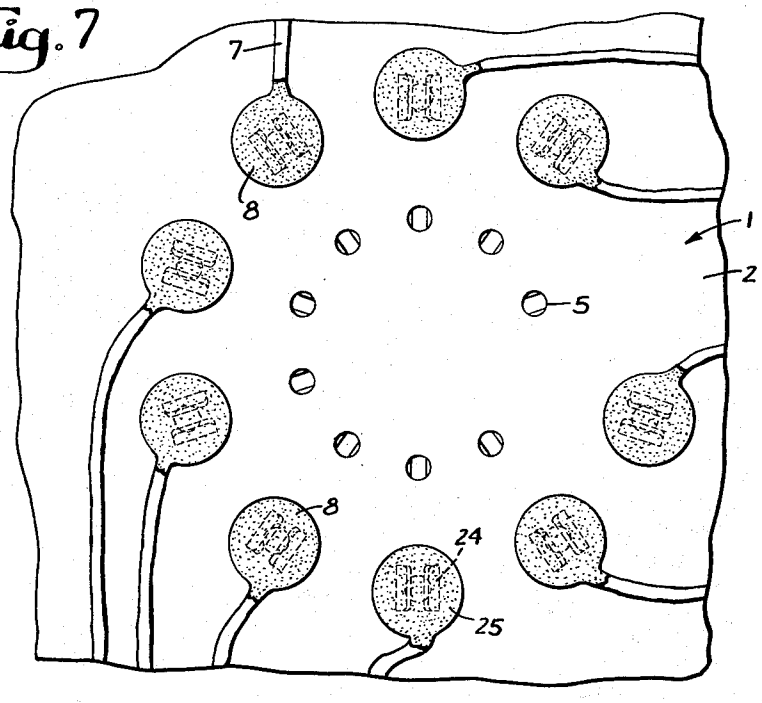


Fig. 8

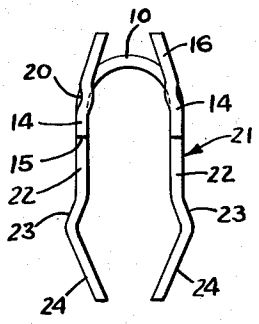


Fig. 9

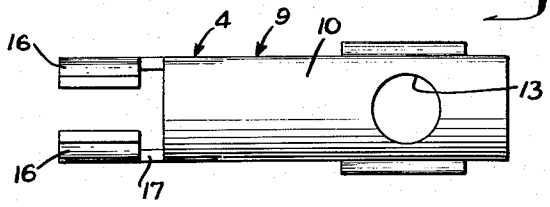
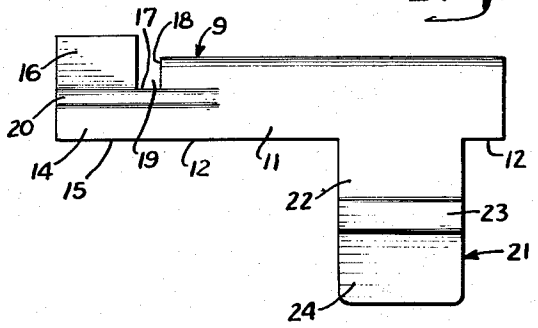


Fig. 10



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United States Patent Office 2,747,169 Patented May 22, 1956

2,747,169

CONTACT FOR PRINTED CIRCUITS

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Application February 20, 1953, Serial No. 337,957

5 Claims. (Cl. 339—258)

This invention relates to an electrical connection wherein metal contact members constructed for electrical connection with terminal prongs for vacuum tubes and the like are secured to a supporting panel in direct soldered connection with printed circuits carried by the panel.

One of the objects of my invention is the provision of a contact member constructed and arranged to be snapped into fastened engagement with a plate or panel of insulating material with portions of the contact member disposed in close proximity to a printed circuit carried by the panel so that the contact member may be bonded in electrical connection to the circuit by emerging said portions of the contact member in a solder bath.

Another object of my invention relates to the construction of the contact member wherein it provides contact portions for efficiently receiving and engaging prong terminals of a cooperating plug unit and also provides attaching portions for effectively securing the contact member in initial assembly with an insulating panel.

Other objects and uses of my invention will be apparent from inspection of the specification and drawings hereinbelow set forth.

Referring to the drawings in which I have illustrated a preferred embodiment of my invention:

Fig. 1 is a bottom plan view of insulating panel carrying my improved contact members,

Fig. 2 is a top plan view of the assembly shown in Fig. 1 and disclosing the printed circuits carried by the upper side of the panel,

Fig. 3 is a section taken along line 3—3 of Fig. 1,

Fig. 4 is a section taken along the line 4—4 of Fig. 3,

Fig. 5 is a section taken along the line 5—5 of Fig. 3,

Fig. 6 is a section taken along the line 6—6 of Fig. 3,

Fig. 7 is a top plan view of the assembly shown in Figs. 1 and 2 with the contact members in soldered connection with the printed circuits,

Fig. 8 is an end view of the contact member per se,

Fig. 9 is a top view of the contact member per se, and

Fig. 10 is a side view of the contact member per se.

Referring to Figs. 1 and 2 of the drawing, I have shown an insulating plate or panel 1 having an upper surface 2 and a lower surface 3 and carrying a plurality of contact members 4. The panel 1, in the illustrative form shown in Fig. 2, has an annular series of apertures 5 each of which may be of circular shape for receiving a terminal prong of a vacuum tube (not shown). The panel also provides an outer annular series of rectangular apertures 6 arranged concentrically of the series of apertures 5 and disposed so that each of the apertures 6 is in cooperating relation with one of the apertures 5. The apertures 6 are of rectangular shape so as to receive opposed attaching elements of the contact members in a manner to be described. The upper surface 2 of the panel carries a plurality of printed circuits 7 each of which, as shown in Fig. 2, preferably provides a terminal portion 8 adjacent the edges of an opening 6 and preferably surrounding the opening.

Referring in detail to the contact member 4, my preferred embodiment provides an elongated body portion 9 of channeled shape. The body 9 comprises a base element 10 and opposed, spaced sidewalls 11 preferably disposed in parallel relation and terminating in free edges 12. The base element 9 may have an opening 13 for receiving the end (not shown) of a lead wire to be soldered to the contact member. Each of the sidewalls 11 has a connecting portion 14 adjacent one end thereof which is disposed substantially in the plane of its respective sidewall 11 and has a lower edge 15 (viewing Fig. 10) forming a continuation of the edge 12 of its respective sidewall. A yieldable prong-engaging portion 16 is integrally joined to the upper edge 17 (Figs. 9 and 10) of each of the connecting portions 14 and are spaced from the end 18 (Fig. 10) of their respective sidewalls 11 by the slots 19 (Fig. 10). The yieldable portions 16 are disposed in facing relation and are movable independently of the remaining portions of the contact member so as to engage a terminal prong (Fig. 4) of a vacuum tube (not shown) inserted therebetween. As a means of strengthening the junction of each yieldable portion 16 with its respective connecting portion 14, a rib 20 is preferably provided at each of the said junctions extending longitudinally of the contact member across the junction into the respective sidewalls 11.

As a means for securing the contact member to the panel 1, there is provided a pair of opposed attaching portions 21—21 integrally joined to the edges 12 intermediate the longitudinal ends of the body 9 so that the edges 12 of each side wall are disposed on opposite sides of its respective attaching portion (Fig. 10). The attaching portions 21 preferably have parallel portions 22 integrally joined to the edges 12, portions 23 diverging from the portions 22 so as to form panel-engaging shoulders and converging portions 24 adjacent the free ends of the attaching portions for leading the attaching portions through an aperture of a supporting panel.

In applying the contact members to the supporting panel 1, the attaching portions 21—21 of each contact member are moved through their respective apertures 6 from a position opposite the lower surface 3 of the panel to engage the shoulders 23 against the upper surface 2 of the panel. During this action, the attaching portions of each contact member will contract during passage through the respective aperture 3 and, because of their inherent resiliency, will expand after the shoulders 23 have passed through the opening to snap the shoulders against the material of the panel 1 adjacent the edges of the aperture. In attached position, the shoulders 23 will either engage the respective terminal portions 8 of the printed circuits 7 or be disposed in close relation to them. It will be noted also that the edges 12 of the sidewalls 11—11 on both sides of the attaching portions integral therewith engage the surface 2 of the panel.

When the contact members are secured to the panel, the prong-engaging portions 16 of each contact member will be aligned with one of the openings 5 so as to grip a tube prong inserted through the opening 5 and passing between the connecting portions 14 into engagement with the prong-engaging portions 16 (Fig. 4) which, normally, are spaced apart a distance less than the diameter of the tube prong.

Prior to application of tube prongs to the contact members, the contact members are fixed in permanent electrical connection with the printed circuits 7. This is preferably accomplished by dipping the top surface 2 of the panel 1 into a solder bath with the result that the solder 25 adheres to the ends of the pairs of attaching portions 16 projecting beyond the surface 2 and the respective adjacent terminal portions 8 of the printed circuits so as to effect firm bonding of the attaching portions 16 to the

printed circuits as shown in Fig. 7. The lead wires (not shown) for the socket device may be connected to the contact members by extending the wire ends of the leads through the openings 13 and then dropping a glob of solder into each of the openings in the manner well known in the art.

Thus, by my invention, I have provided contact members of simple and inexpensive design which may be applied easily to an insulating panel carrying printed circuits and which are arranged relative to the circuits so as to be readily soldered in electrical connection therewith. As a result of my invention in which the contact members are soldered directly into the circuits, the socket insulating body or casting for carrying the contact members which, heretofore, has been conventionally used in vacuum tube and the like connections is eliminated.

Although I have illustrated and described a preferred embodiment of my invention, I do not wish to be limited thereby as the scope of my invention is best defined by the following claims.

I claim:

1. A contact assembly for an electrical connection comprising a supporting panel of insulating material having a prong-receiving opening and a second opening spaced from said prong-receiving opening, said panel having front and rear surfaces, a printed circuit on said front surface having a portion thereof disposed ajacent said second opening, a contact member assembled with said panel having an elongated channel-shaped body portion, comprising a base portion and opposed spaced sidewalls terminating in free edges, said free edges of said sidewalls being equidistant from said base portion so as to engage said rear surface of said panel for their entire lengths, said body having a prong-engaging portion providing prong-engaging elements in alignment with said prong-receiving opening for engaging a prong terminal extended therethrough, and said body portion having an attaching portion integral therewith, said attaching portion having a pair of yieldable elements providing shoulders for engaging the front surface of said panel through said second opening, and said shoulders being disposed adjacent said printed circuit whereby said yieldable elements may be soldered to said printed circuit.

2. A contact member comprising an elongated channeled body portion having a base portion and opposed spaced sidewalls terminating in free edges, a pair of opposed prong-engaging portions at one end of said body portion, each of said prong-engaging portions having a connecting element integrally joined to one of said sidewalls and disposed substantially in the plane thereof and having a free edge forming a continuation of the free edge of said sidewall, and a yieldable element extending from each of said connecting elements and being spaced from its respective sidewall so as to be movable independently thereof for engaging a prong terminal between them, and each of said sidewalls having an attaching element integrally joined to said free edge thereof, said attaching elements being in opposed relation and adapted for fastener engagement with a supporting panel through an opening thereof.

3. The device described in claim 2 in which said attaching elements are yieldable and have shoulders for snap fastener engagement with a supporting panel through an aperture thereof.

4. A contact member comprising an elongated channeled body portion having a base portion and opposed spaced sidewalls terminating in free edges, a pair of opposed prong-engaging elements at one end of said body portion, each of said prong-engaging elements having a connecting element integrally joined to one of said sidewalls and disposed substantially in the plane thereof and having a free edge forming a continuation of the free edge of said sidewall, a yieldable element extending from each of said connecting elements and being spaced from its respective sidewall so as to be movable independently thereof for engaging a prong terminal between them, and each of said prong-engaging elements having a rib portion at the junction of its yieldable element with its connecting element, said rib portion extending longitudinally of the contact member across said junction into said respective sidewall.

5. A contact member comprising an elongated channeled body portion having a base portion and opposed spaced sidewalls terminating in free edges, prong-engaging elements integrally joined to said body portion at one end thereof, and each of said sidewalls having a resilient shouldered attaching element integrally joined to said free edge thereof and extending outwardly therefrom in generally perpendicular relation to the longitudinal axis of said channeled body portion, said attaching elements being in opposed relation and adapted for fastener engagement with a supporting panel through an opening thereof.

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