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C. C. BARBER
ELECTRICAL CONTACT MEMBER

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FIG. 1

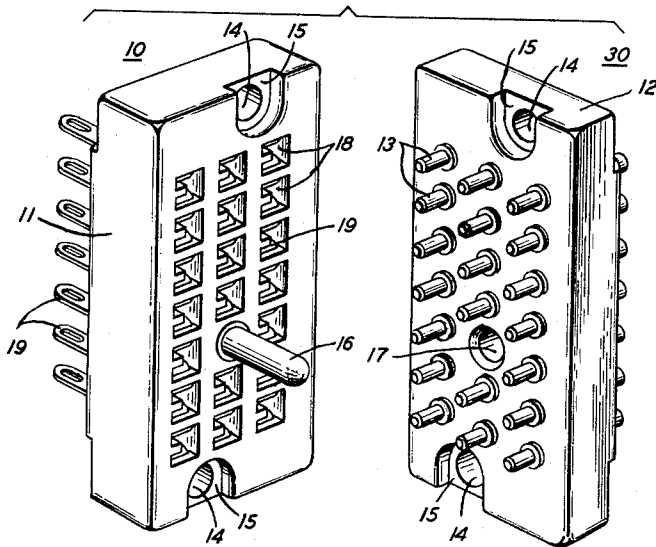


FIG. 2

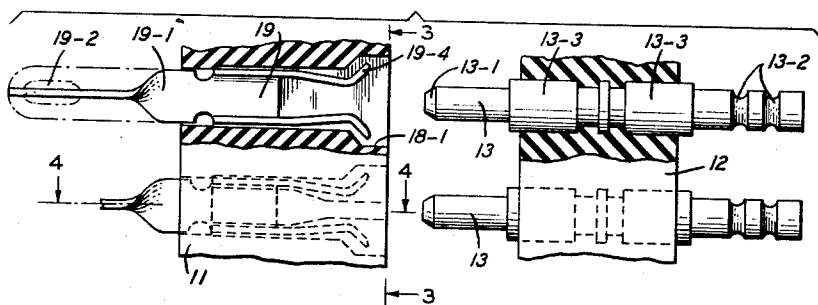


FIG. 3

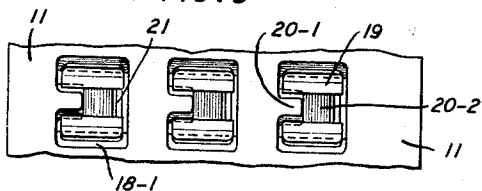
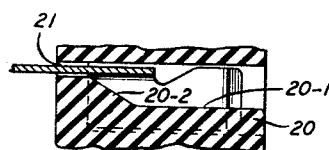


FIG. 4



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1 Claim. (Cl. 339—64)

This invention relates to electrical contact members and, more particularly, to multiple connectors for connecting together a plurality of electrical circuits.

Connectors of the type embodying the present invention comprise mating plug and jack members. Devices of this type, as heretofore constructed, possess several defects and disadvantages which render them unsatisfactory for use in many instances, particularly where it is necessary to connect and disconnect the plug and jack members frequently. These disadvantages arise chiefly due to misalignment between the plug pins and the jack contacts, often causing a pin to butt against its associated contact to bend or collapse it. Also, misaligned plugs and jacks may result in poor electrical connections therebetween.

Accordingly, it is a main object of the present invention to improve multiple electrical connectors.

Another object of this invention is to eliminate the possibility of damage while mating misaligned plug and jack members of a multiple connector.

A further object of this invention is to provide an improved connector construction which lends itself readily for embodiment in multiple assemblies, and which may be economically produced.

These and other objects of this invention are obtained in one illustrative embodiment thereof comprising mating jack and plug members. The jack member includes an insulating block having a plurality of cavities or orifices extending therethrough in each of which is floatingly mounted an electroconductive spring contact of the two-petal type. Each jack cavity has a rib member which extends along, and is an integral part of, one wall thereof.

Mounted on the jack member is a pin which is intended to engage with a hole on the plug member and which serves to guide the plug and jack together. Misalignment difficulties in bringing the mating members together are eliminated by the guide pin and the cooperative interrelationship between the contacts and the rib members.

The ribs restrict the float of the bifurcated contact members and define their minimum separation. Each rib also locates the effective pin receiving portion of a cavity off-center with respect to its associated pin and restricts the freedom to rotate the plug member about the single guide pin while bringing the pins and contacts together into engagement. Further, the two-petal contacts are oriented to restrict pin movement to a direction approximately parallel to them. This orientation prevents a contact pin from crushing a contact member as the plug and jack are rotated about the guide pin into alignment preceding their actual engagement.

While the ribs restrict the float of the contacts and define their minimum separation, they allow sufficient contact movement to absorb the maximum misalignment between pins and contacts expected from controlled manufacturing variations. Thus, in one illustrative em-

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bodiment of this invention, floating crush-proof self-aligning contacts are provided.

Each rib has a portion parallel to the guide pin and another portion displaced at an angle thereto. The latter portion is located toward the bottom of each cavity and is angled toward a rearwardly opening slot therein to serve as a means for piloting or funneling the contact pieces into the cavities during their assembly with the insulating block.

Thus, it is a feature of this invention that a novel multiple connector design is provided having ribbed cavities and floatingly mounted contacts therein which in combination insure proper alignment between the contacts and their mating plug pins.

A further feature of this invention resides in the provision of a rib member which may be considered to have two parts. One part extends parallel to the guide pin, projects from a cavity wall, and helps to define the pin receiving portion of a cavity. The second rib portion is integrally related to the first part, forms an angle therewith, and extends toward a rearwardly opening slot in a cavity bottom.

A complete understanding of this invention and of these and other features thereof may be gained from consideration of the following detailed description and the accompanying drawing, in which:

Fig. 1 is a perspective view of jack and plug members of the type used in one specific illustrative embodiment of this invention;

Fig. 2 is an enlarged side view of a portion of the jack and plug of Fig. 1, with parts thereof broken away to show more clearly the position of the contact and pin members;

Fig. 3 is a side view along the line 3—3 of the portion of the jack shown in Fig. 2; and

Fig. 4 is a sectional view along the line 4—4 of the portion of the jack shown in Fig. 2.

Referring now to the drawing, Fig. 1 shows mating jack and plug members, 10 and 30 respectively, which are detachably connectable. Both the jack body or block 11, and the plug body or block 12, are made of a material having good insulation properties, and possessing good mechanical strength. The blocks are advantageously moulded, the plug pins 13 having the plug block 12 moulded about them to form a unitary block-pin structure.

Holes 14 and recesses 15 are provided on both the jack 10 and the plug 30 to facilitate securing them to a panel, a bracket, a chassis or any other mounting member without having the securing members interfere with the bringing of the jack and plug blocks together into intimate contact. The jack guide pin 16, mounted in the jack block 11, is designed to fit within a guide hole 17 in the plug body 30 to aid in directing the jack and plug together into precise registry.

The jack block 11 has a plurality of cavities 18 extending therethrough. While any number and arrangement of cavities may be provided, the illustrated embodiment of the invention shows a block having 20 cavities arranged in parallel rows, and a plug block having correspondingly arranged pins. Floatingly mounted in each cavity 18 is an electroconductive contact member 19 of the two-petal type.

Turning now to Fig. 2, there is shown in enlarged detail contacts 19 and pins 13 mounted, respectively, in portions of the jack and plug blocks of Fig. 1. The contacts 19 may advantageously be made of gold plated phosphor bronze. However, any resilient conductive material may be used for their manufacture. The rearwardly projecting portion 19-1 of each contact is twisted after being loaded into a cavity in order to se-

cure it therein in a floating manner. The dot-dash outline of the rearwardly projecting portion indicates its shape prior to being twisted, and shows an opening 19-2 therein which is intended to facilitate the connection of electrical conductors thereto. The pin receiving portion of each contact includes two opposed and spaced apart petals or faces with outwardly flared ends 19-4.

Each cavity 18 contains recessed portions 18-1, which, besides providing a mount for a contact 19, provide the flared contact ends 19-4 with space to expand freely without being distorted when a pin 13 is inserted therebetween.

The contact engaging end 13-1 of each pin 13 is shaped and chamfered to facilitate its entrance into an associated contact and to prevent snagging thereon, and the opposite end of each pin advantageously contains grooves 13-2 to facilitate the securing of electrical conductors thereto. Each pin has an irregular outline between the portions 13-3 to insure rigid anchoring of the pins in the material of the plug block 12.

Fig. 4 shows a rib member 20 which may be considered to have two portions. One portion 20-1 locates the effective pin receiving portion of a cavity off-center with respect to its associated plug pin. This portion 20-1 also restricts the float of a contact element with respect to the center line of a cavity and defines the minimum separation between petals while allowing sufficient contact movement to absorb the maximum misalignment between a pin and its contact. The portion 20-1 insures that a pin will not crush its associated contact petals under any circumstances. The second rib portion 20-2 is positioned at an angle to the first mentioned portion 20-1, and serves to pilot a contact element into a slot 21 during loading of the jack cavities 18.

The two-petal contacts, the off-center location of the cavities, the orientation of the contacts, and the introduction of a rib in each cavity result in a new and improved multiple connector in which butting or snagging between pins and contact petals, particularly during

rotation of the plug block about the guide pin just prior to the engagement of the plug and jack members, is eliminated.

It is to be understood that the above described arrangement is but illustrative of the principles of this invention. Numerous other arrangements may be devised by those skilled in the art without departing from the spirit and scope of this invention.

What is claimed is:

- 10 A jack body for floatingly mounting a plurality of pin-receiving contact members, said jack body including a plurality of apertures extending therethrough, each of said apertures having recessed portions at one end thereof, rib members formed integrally with said jack body
- 15 and extending laterally into each of said apertures, each rib means including a first portion extending from the recessed portions end of an aperture in parallel relationship to the walls of said aperture to a first zone intermediate the ends of said aperture, and a second rib
- 20 means portion extending from said first zone to a second zone adjacent the other end of said aperture, said second rib means portion being disposed at an angle to the walls of said aperture, whereby said second rib means portion facilitates the mounting of a contact member by directing the inserted end thereof through said
- 25 jack body, and whereby the pin-receiving portions of a mounted contact member extend into said recessed portions and are freely expandable therein.

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