

[54] **SOCKETS**

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339/208

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[58] Field of Search **339/191-193,**
339/198, 206-210, 184, 186

[56] **References Cited**

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[57] **ABSTRACT**

A socket having a circular bed, which consists of two separable sections put together into a unitary body with a separator interposed therebetween, each of said sections having electrical connecting parts fitted therein before it is put together with the other section.

3 Claims, 5 Drawing Figures

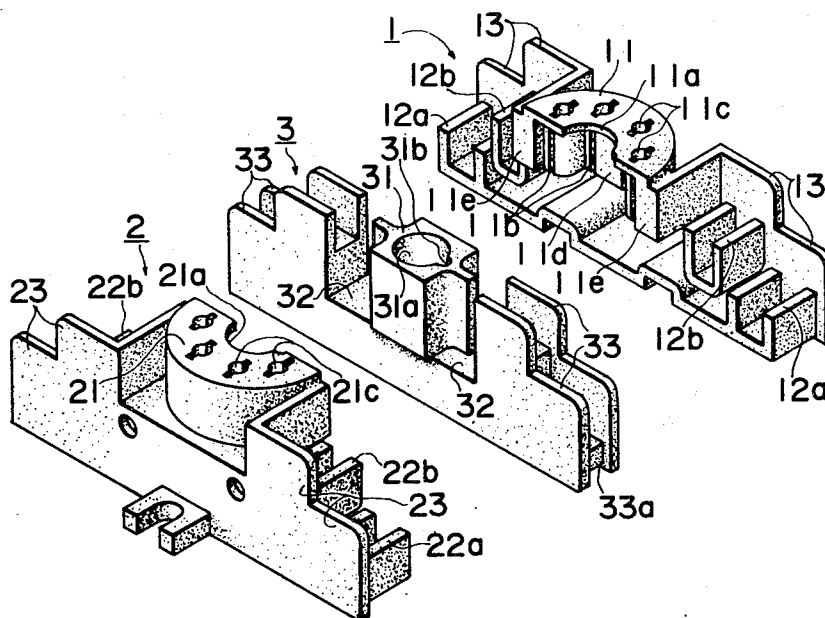


FIG. 1

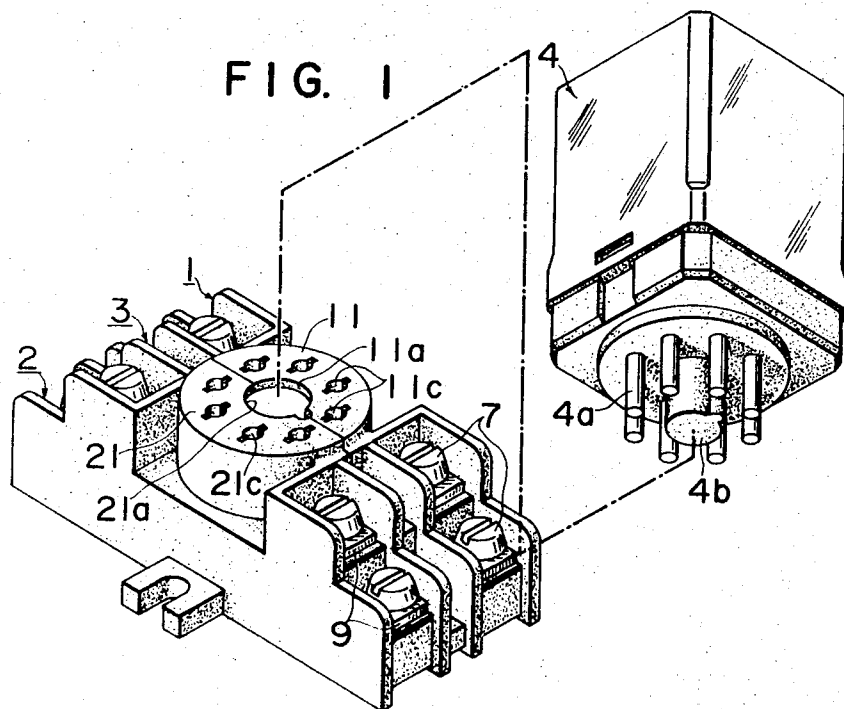


FIG. 2

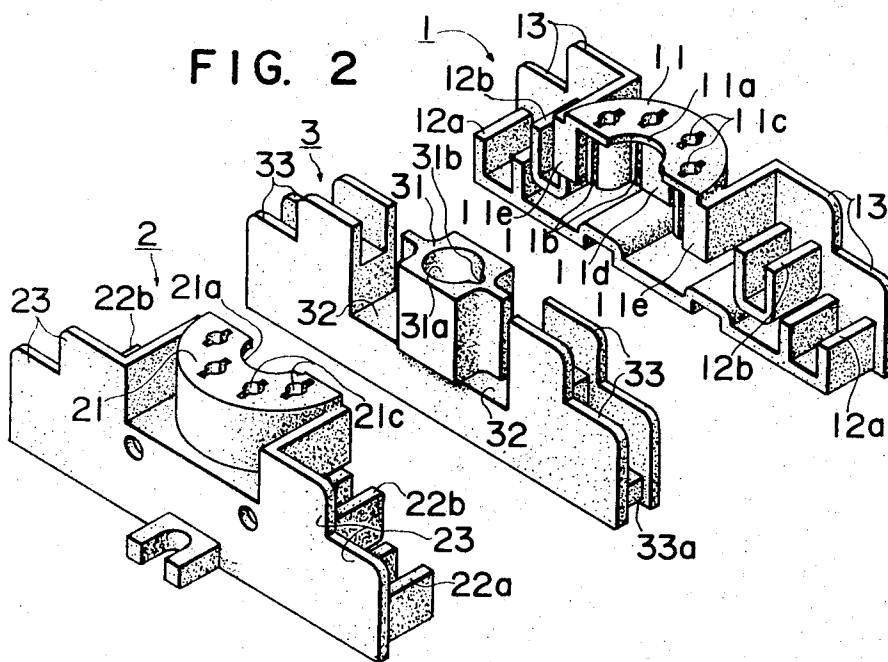


FIG. 3

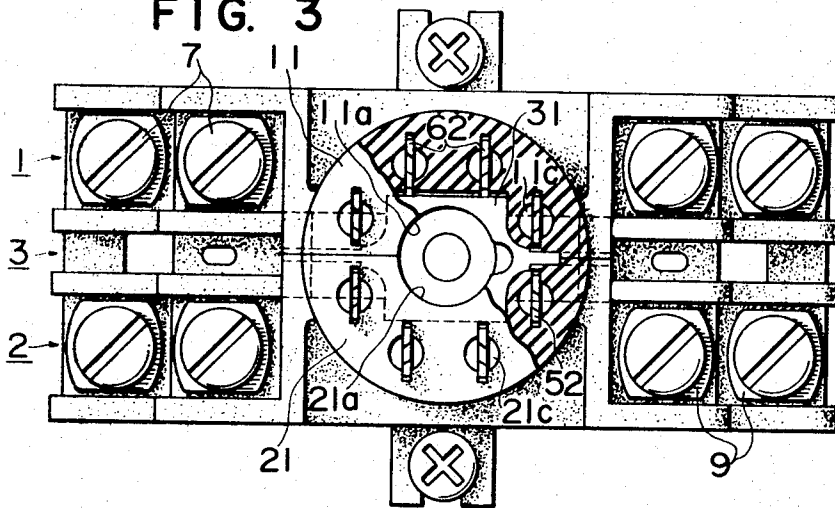


FIG. 4

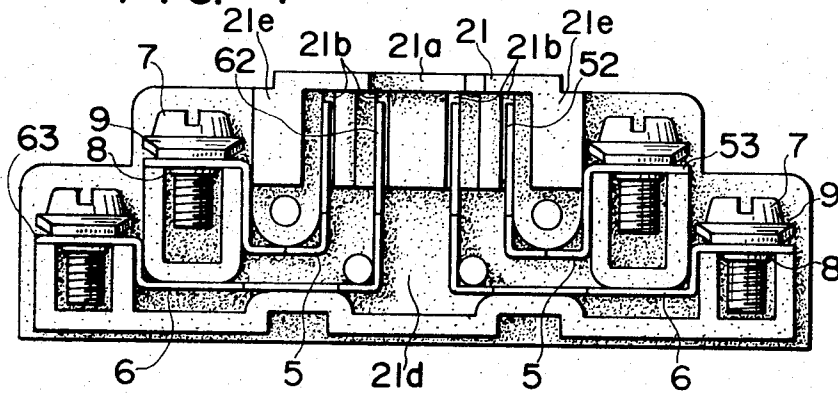
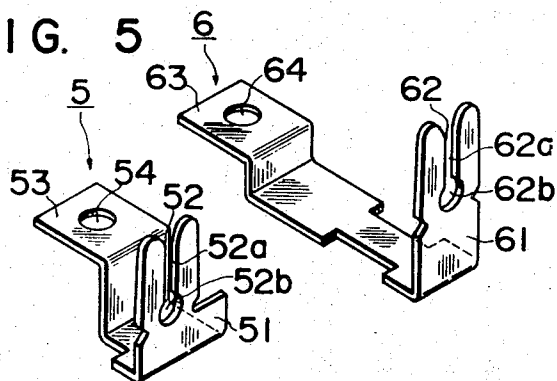


FIG. 5



SOCKETS

This invention relates to sockets.

A socket used for mounting small electrical equipment, such as a relay or timer, thereon is generally varied in shape depending upon whether the connecting terminals of the equipment to be mounted are arranged in an annular shape or parallel rows. Namely, in case of the former arrangement of the connecting terminals it is usual that the base of the socket is formed in a substantially circular shape and terminal insertion holes for receiving the connecting terminals of the associated equipment are arranged in an annular shape around a guide stem receiving hole, while in case of the latter arrangement, the base of the socket is formed in a substantially rectangular shape and terminal insertion holes are arranged in said substantially rectangular base rectilinearly and in a plurality of parallel rows. The present invention proposes novel sockets of particularly the former type which has a substantially circular base and terminal insertion holes formed in said base and arranged in an annular shape.

Conventional sockets of this type have had a substantially circular insulating base at the center thereof and stepped terminal mounts on both sides of said base, said base being formed therein at a predetermined interval with a plurality of terminal insertion holes which are arranged annularly around a guide stem receiving hole and respectively being open in the upper surface of said base. In each of the terminal insertion holes is disposed a metallic connecting part for electrical connection with each terminal of an equipment to be mounted, and said metallic connecting part is in turn connected, as by a bolt or welding, to metallic parts provided on the terminal mount. These prior art sockets have had the disadvantage that, since the main body of the socket consisting of the base and terminal mounts is moulded of an insulating moulding material into a unitary piece, skill is required in the operations of inserting the metallic connecting parts in each terminal insertion hole and connecting said connecting parts to the metallic parts on the terminal mount and furthermore, these metallic parts tend to become loosened or fall off the socket after they have been mounted, all of which adds to the working time and manhours and renders the production of the socket inefficient.

It is, therefore, the object of the present invention to provide a socket having a circular base, which consists of two separable sections put together into a unitary piece with a separator interposed therebetween, each of said sections having electrical connecting parts fitted therein before it is put together with the other section.

According to the present invention, there is provided a socket comprising two separable sections and a separator, each of said sections being open at one side and having a substantially semicircular base formed at the center thereof and stepped terminal mounts formed on both sides of said base, said base being formed therein with terminal insertion holes for receiving the respective terminals of an equipment to be mounted, said terminal insertion holes being open at their top ends in the upper surface of said base and being arranged in a substantially semiannular shape, said base, terminal insertion holes and terminal mounts being open at the same side as the opening of said section, said sections being put together into a unitary piece with their open sides facing each other and with said separator interposed

therebetween, said separator being so shaped as to close the open sides of said base and terminal mounts.

With the construction of the subject socket described above, since the socket is composed of the separable two sections and separator, and the electrical connecting parts can be mounted at the desired positions in each of the socket sections before said socket sections and separator are put together, the assembly of the socket can be achieved with high efficiency, without requiring a skill in the connecting parts mounting operation as has been required heretofore. In the past, this type of socket giving a circular base at the center thereof has restricted the equipment to be mounted to those which have terminals arranged in an annular shape and accordingly, the terminal receiving holes of the socket must have been arranged also in an annular shape. This has created the fixed idea that the socket cannot be divided into sections, which has heretofore swayed strongly the opinion of those engaging in the production of this type of socket. The present inventors have achieved the invention based on an idea which completely overturns such fixed ideas. Because of the difficulty in the connecting parts mounting operation, it has been impossible to produce this type of socket on a mass production basis, but according to the invention it becomes possible to employ a mass production system in a rational manner in the manufacture of the socket and a great advantage can be achieved in the assembly work.

The invention will be better understood, and other features will become apparent, from the following more detailed description and accompanying drawings, wherein:

FIG. 1 is a perspective view of a relay and a relay socket;

FIG. 2 is an exploded perspective view of the relay socket;

FIG. 3 is a plan view, partially broken away, of the relay socket;

FIG. 4 is a front view of the socket section; and

FIG. 5 is a perspective view of the metallic connecting parts.

In the drawings, reference numerals 1 and 2 designate socket sections moulded of an electrical insulating material. These socket sections respectively have substantially semicircular bases 11, 21 at the center thereof and stepped terminal mounts 12a, 12b and 22a, 22b on both sides of said bases. The bases 11 and 12 respectively have formed therein concentric semicircular cutouts 11b and 21b. Reference numerals 11b and 21b respectively designate relay terminal insertion holes which are open at their top ends in the upper surface of the bases to form insertion openings 11c and 21c for the pin terminals 4a of a relay 4. The relay 4 shown in FIG. 1 has 8 pin terminals 4a arranged in an annular shape around a guide stem 4b. The aforesaid terminal insertion holes 11b and 21b, and therefore, the insertion openings 11c and 21c, of the bases 11 and 21 are arranged in an annular shape at a predetermined interval, each in register with each of said pin terminals. The terminal insertion holes 11b and 21b, and the terminal mounts 12a, 12b and 22a, 22b are open at one side of the respective socket sections, while the other sides of the terminal mounts are closed by separators 13 and 23 respectively, each of which has an upper edge profile complementary to the upper edge profile of said terminal mounts. Reference numeral 3 designates

nates a separator which has formed at substantially the center thereof a post 31 having a hole 31a formed at the center for receiving the guide stem 4b of the relay 4. A vertical guide groove 31b is formed in the wall of the hole 31a. The height of the post 31 is made slightly smaller than the height of the socket sections 1 and 2. Therefore, after the socket sections 1, 2 and the separator 3 are put together, the post 31 will be enclosed in a space formed by cavities 11d and 21d formed in the open sides of the bases 11 and 21, with the central hole 31a only being exposed to the outside through the cut-outs 11a and 21a. Windows 32, 32 are formed on both sides of the post 31 and further two parallel separator walls 33, 33 are formed outwardly of said respective windows for closing the open sides of the terminal mounts 12a, 12b and 22a, 22b of the socket sections 1, 2. Between the outer end portions of the parallel separator walls 33, 33 are interposed bridging blocks 33a respectively for securing fittings (not shown) by which the relay 4 is secured after it has been mounted on the socket. The windows 32, 32 are formed at such locations and in such a size that vertical surfaces 11e and 21e on the open sides of the bases 11 and 21 are received and mated with each other therein. Therefore, when the socket sections 1, 2 are put together, even with the separator 3 interposed therebetween, the vertical surfaces 11e and 21e of both bases 11, 21 are mated with each other, and one completely circular base is formed by said bases 11 and 21.

Reference numerals 5 and 6 designate metallic connecting parts respectively. As shown in FIG. 5, these metallic connecting parts respectively have upright arms 51 and 61 at one ends thereof which constitute pin receiving terminals 52 and 62 for electrical connection with the pin terminals 4a of the relay 4. The pin receiving terminals 52 and 62 respectively have slits 52a and 62a formed substantially centrally thereof and substantially circular openings 52b and 62b formed at the bottom ends of said slits. The open edges of the slits 52a, 62a are rounded to facilitate insertion and removal of the pin terminals 4a into and from the slits 52a, 62a. The connecting parts 52, 62 also respectively have horizontal arms 53 and 63 at the other ends thereof, which are formed with through-holes 54 and 64 for the insertion of terminal securing bolts 7 respectively. In assembling the socket, the vertical arms 51 and 61 at one ends of the connecting parts 5 and 6 are fitted into the holes 11b and 21b of the bases 11 and 21, and the horizontal arms 53 and 63 at the other ends thereof are located on the upper surfaces of the terminal mounts 12b, 22b and 12a, 22a respectively, by hand or other means. After fitting the connecting parts 5, 6 tightly into the respective socket sections 1 and 2 in the manner described, the bolts 7 are screwed into the respective terminal mounts 12a, 12b and 22a, 22b with seat members 8 and washers 9 interposed therebetween. The seating members 8 may be eliminated in the event when the through-holes 54 and 64 are formed

with internal threads. Thereafter, the socket sections 1 and 2, each having all of the accessories thus mounted therein, are arranged with their open sides facing each other and put together and tightly combined, with the separator 3 interposed therebetween. In this case, since the post 31 of the separator 3 is lower in height than the bases 11 and 21, and the windows 32, 32 are formed on both sides of the post 31, as stated above, the post 31 is enclosed in the bases 11 and 21, and said bases 11 and 21 are mated with each other at their open sides. Thus, a base of a shape near a complete circle can be formed. Then, the socket sections 1 and 2 thus combined are tightened together by pins (not shown) extending through the body of thus completed socket from one side thereof.

Although the present invention has been described and illustrated herein with a reference to a socket for an electrical equipment having pin terminals, it will be obviously understood that the invention is applicable also to any other sockets, provided that they are used for mounting electric equipments having terminals arranged in an annular shape.

What we claim is:

1. A socket for electrically connecting an electrical device such as a relay whose terminals are arranged in an annular fashion to respective external leads comprising:

first and second sections each formed of an electrical insulating material and being of generally rectangular cross section,

each said section defining at its upper surface a substantially semi-circular base between its end portions and with its diameter lying substantially coplanar with an open side of said section, said base having formed therein semi-annularly disposed terminal insertion apertures for receiving said terminals,

each said section further defining a plurality of terminal mounting means each connected electrically with a respective terminal insertion aperture, and a separator element also formed of an electrical insulating material,

said socket being assembled with said first and second sections having their respective open sides facing each other and with separator means interposed therebetween,

said separator means closing said open sides of both said first and second sections.

2. The socket of claim 1 wherein said separator means defines an aperture having a longitudinal slot for receiving a keyed protuberance on the electrical device.

3. The socket of claim 2 wherein said portion of said separator means defining said keyed slot lies below the surface of said base into which open said terminal insertion apertures.

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