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W. KNIPPING ETAL

3,247,479

SOCKET DEVICE FOR OVERLOAD RESPONSIVE MEMBERS

Filed Aug. 28, 1962

Fig. 1

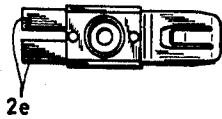


Fig 2

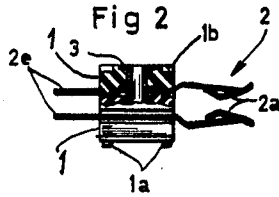


Fig. 3

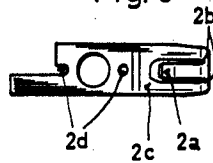


Fig. 4

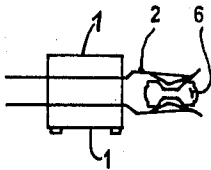


Fig. 6

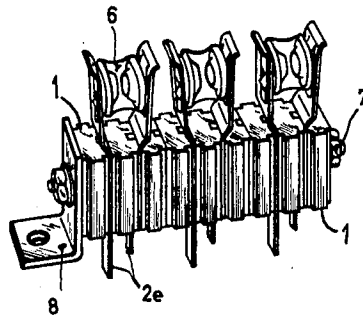


Fig. 5

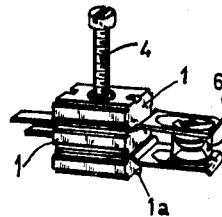


Fig. 7

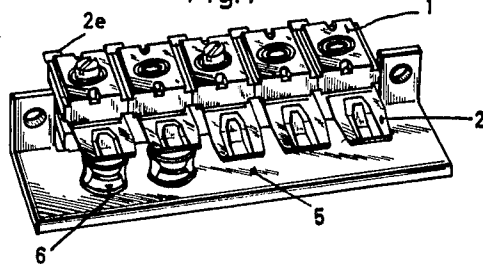
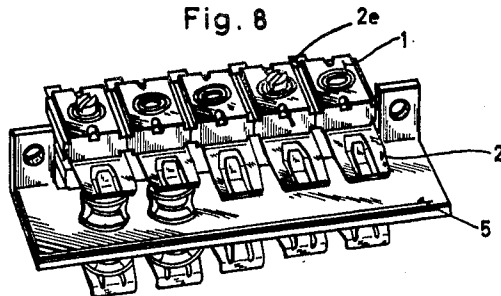


Fig. 8



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SOCKET DEVICE FOR OVERLOAD RESPONSIVE MEMBERS

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3 Claims. (Cl. 339-147)

The invention disclosed herein is concerned with a socket device for holding button-shaped overload responsive members, which device is particularly adapted for mass production.

It is for the mass production of such sockets desirable that they are composed of as few as possible individual parts which permit ready assembly in simple manner. Socket devices for button-shaped overload responsive members should also be made so as to save space and to permit diverse electrical connections, depending upon the use to which the devices are put. Another requirement which is frequently posed is that the individual sockets are adapted for use in various combinations whenever assemblies are desired which comprise a plurality of socket units.

The present invention satisfies these requirements by assembling in layers identically constructed insulating parts between which are disposed likewise identically constructed leaf springs with tongue-like contact means, the individual parts of single sockets being held together preferably by riveting. The leaf springs with their tongue-like contact parts, are appropriately formed by punching or stamping operations.

In order to secure the individual parts of a socket assembly against angular displacement, the respective insulating members are on one wide side thereof provided with peg-like projections and on the other wide side with corresponding recesses, whereby the pegs of one insulating member engage into the recesses of an adjacent insulating member, with leaf springs disposed between the respective insulating members, such leaf springs having holes formed therein for the passage of the pegs.

The socket according to the present invention is particularly adapted for mass production because it requires only two component parts, namely, an insulating part and a leaf spring, making it also possible to produce in desired combinations socket assemblies required in practical applications.

In order to provide for different terminal connections, the ends of the leaf springs, facing away from the respective socket parts, may be formed to provide soldering terminals or terminals for solder-free wiring, or may be formed as plug terminals.

The structure according to the invention, in which the parts are assembled in layers, facilitates low cost production, particularly when it is desired to combine a plurality of socket units in a series assembly. The socket units may thereby be arranged above one another or, with the use of a mounting bar or the like, alongside one another. In the event that a series assembly is to be provided in this manner, having a common ground potential for all socket units thereof, the mounting bar which is common to all socket units may take the place of one of the leaf springs of the respective units. The socket units may

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thereby be arranged only on one side of the mounting bar or on both sides thereof.

Further details of the invention will appear from the description which is rendered below with reference to the accompanying drawing.

FIGS. 1 to 4 are different views showing an individual socket unit partially in elevation and partially in sectional representation;

FIG. 5 shows an individual socket unit in perspective view; and

FIGS. 6, 7 and 8 show series assemblies of socket units, arranged respectively above one another and alongside one another.

The individual socket unit shown in FIGS. 1 to 4 comprises structurally identical insulating members 1 between which are disposed likewise structurally identical leaf springs 2, each leaf spring having a tongue-like contact part 2a. The insulating members and the leaf springs are held together by means of a rivet 3. In order to secure the individual assembled parts against angular displacement, the respective insulating members 1 are on one wide side thereof provided with recesses 1b and on the other wide side with peg-like projections 1a, the latter extending in the assembled unit through holes 2d formed in the respective leaf springs and engaging into the recesses of the respective adjacent insulating member.

The tongue-like contact part 2a of each leaf spring extends inwardly from the torsion web 2b and is over such web connected with the root 2c of the respective leaf spring. The characteristic curve of the leaf spring thus corresponds to that of an arcuately shaped bending spring. A relatively great displacement path of the spring is in this manner obtained despite small dimensions of the spring parts. A further advantage of this construction of the springs resides in that the tongue-like contact parts retain within given limits their inclinations and therewith the contacting requirements with respect to the overload responsive members, such as indicated in FIGS. 4 and 5 by numeral 6, which are to be inserted between respective pairs of springs, even in the presence of somewhat different dimensions of the overload responsive members.

The tongue-like contact parts 2a are angularly shaped in wedge-like manner, whereby an overload responsive member 6 which is inserted between a pair of the springs is caused to snap into its position therebetween, the wedge-like formation of the contact tongues resulting in contact engagement with the overload responsive member at a plurality of points thereof. This is particularly apparent from FIG. 4.

As illustrated in FIG. 3, the end 2e of each leaf spring 2 is offset with respect to the longitudinal axis of the latter whereby, upon the assembly of two such leaf springs in opposed relation to receive a generally button-shaped overload responsive member between the opposed tongue-like contact part, the ends 2e which extend from the end thereof which face away from the socket-forming parts thereof, will be disposed in staggered relation, as apparent from a reference to FIGS. 1, 5 and 6, facilitating the connection thereto of the line conductors to be associated therewith. As will be apparent from the drawing, such ends may be utilized as tabs, plug terminals, or the like.

The fastening of the individual socket unit is effected by means of a screw 4, indicated in FIG. 5, also showing an overload responsive member 6 inserted into its position between the springs. The peg-like projections 1a indicated in FIG. 5 serve for securing the individual

socket assembly against angular displacement on a desired mounting part (not shown).

A plurality of individual socket units of this kind can be arranged to form a series assembly such as indicated in FIG. 6. The individual parts of the respective sockets are disposed or stacked one above the other and are held in assembly by means of a common bolt 7 which takes the function of the screw 4 in the individual assembly of FIG. 5. The angle member 8 serves for fastening the assembly upon a desired mounting (not shown).

In the event that a common ground potential is to be provided for all sockets of an assembly, the corresponding socket units can be arranged alongside one another on a mounting bar 5, as shown in FIGS. 7 and 8 and secured thereto by respective screws 4, in the manner illustrated in FIG. 5, only several screw heads being illustrated in FIG. 7 and in FIG. 8. Since the mounting bar is common for all socket units, it can serve to take the place of one of the leaf springs of each unit. The mounting bar 5 is equipped with socket units only on one side thereof, while identically referenced mounting bar of FIG. 8 is equipped with socket units on both sides thereof. The mounting bar can be utilized for providing the ground connection in each of these embodiments.

Changes may be made within the scope and spirit of the appended claims which define what is believed to be new and desired to have protected by Letters Patent.

We claim:

1. A socket device for supporting and electrically contacting button-shaped overload responsive elements, comprising a plurality of identically constructed insulating members of generally rectangular shape, constructed to stack, one upon the other, each member having peg-like projections extending outwardly from one face thereof and corresponding openings aligned therewith disposed in the opposite face thereof, whereby the projections of one member may mate with the openings in an adjacent member stacked therewith, an elongated leaf spring having a terminal portion at one end thereof, of reduced width compared with the width of the remainder of the leaf, and offset laterally with respect to the longitudinal axis thereof, the opposite end of said leaf spring having a tongue-like contact part extending away from said end and disposed to resiliently engage one contact side of such an overload responsive element and thereby provide mounting support therefor, said leaf spring having openings therein arranged to receive such peg-like projections when such leaf spring is disposed between two

stacked insulating members, whereby such stacked members and the spring disposed therebetween are secured against angular displacement with respect to one another, hollow rivet means extending transversely through said members and an opening in said leaf spring for securing the latter and said members in cooperative assembled relation, and a cooperable contact member disposed opposite said tongue-like contact for engaging and contacting the opposite side of such an overload responsive element engaged with said first mentioned contact and thereby complete the mounting of such overload responsive element.

2. A socket device according to claim 1, wherein said cooperable contact comprises a leaf spring constructed identical with said first mentioned leaf spring, and disposed between the adjacent insulating member associated with said first leaf spring and a further insulating member identical with the other insulating members, the tongue-like contact parts of said leaf springs being disposed in opposition and said terminal portions disposed in staggered relation, said rivet extending through all of said insulating members and said leaf springs operative to secure said parts in assembled relation.

3. A socket device according to claim 1, wherein said cooperable contact is in the form of a flat plate on which the adjacent insulating member is seated, and screw means extending through said hollow rivet and secured to said plate for retaining said plate and remaining parts in cooperative assembled relation.

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