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ELECTRIC CONTACT TERMINAL

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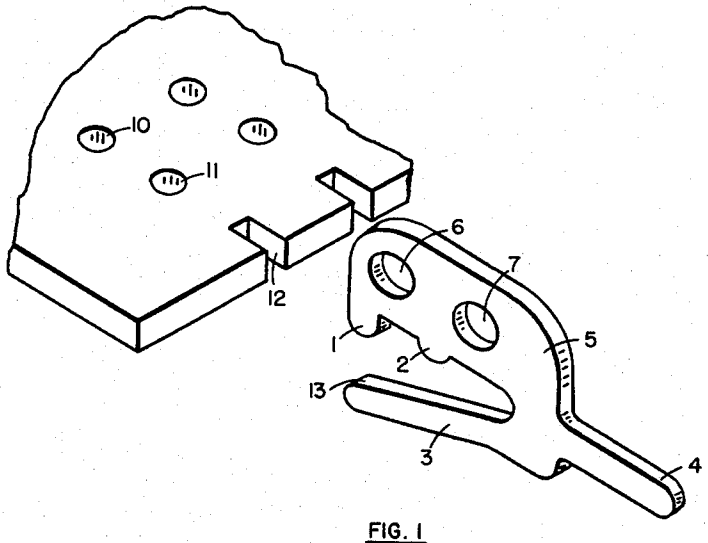


FIG. 1

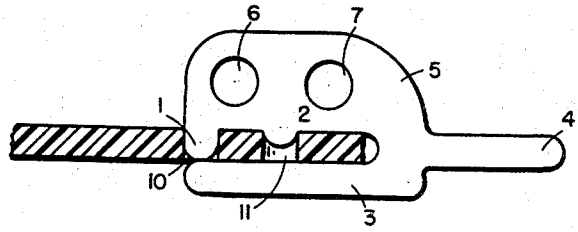


FIG. 2

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ELECTRIC CONTACT TERMINAL

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4 Claims. (Cl. 339—220)

This invention relates to an electric contact terminal and more particularly to an electric contact terminal for use with an insulated terminal board which can easily be attached thereto.

Generally, where electric contact terminals are attached to terminal boards such attachment is accomplished by either riveting or screwing the terminals to the board or by a clamping method involving some type of attaching lugs which are clamped along the surface of the terminal board. These methods of attachment have several disadvantages.

First, they limit the spacing between adjacent terminals. This is because it is necessary to keep adjacent terminals insulated from each other. As the mounting lugs or rivets, to assure strength, are generally made of metal, their location adjacent to the contact terminals necessitates greater spacing between these terminals. In modern complicated equipment very often a great multiplicity of contact terminals are required. As spacing requirements are often critical, it is highly desirable to limit spacing between contact terminals.

Secondly, it is often difficult to get riveted or lug mounted terminals to withstand rugged use requirements. Broken off terminals are often a serious maintenance problem.

Thirdly, installation of riveted and lug mounted terminals is often more difficult and time consuming than the installation of the terminals herein described.

The device of this invention comprises a flat, substantially U-shaped electrical terminal which is swaged into clamping engagement with a dielectric terminal board which acts as a support.

The contact terminals of this invention require neither lugs, screws, nor rivets. No holding members of any type are required in the spaces between adjacent terminals. The spacing between such terminals is therefore limited only by the thickness of the contact terminal itself.

Good holding action is obtained with little likelihood of breakage. By using contact terminals of reasonable thickness made of a durable metal, most of the breakage difficulties of riveted and lug mounted terminals are overcome.

The device of this invention is very simple to install and is well suited to mass-production techniques. To attach a contact terminal to a terminal board merely requires a simple single bending in the thickness plane of the terminal board.

It is therefore an object of this invention to provide an improved contact terminal for use in conjunction with a terminal board.

It is a further object of this invention to allow for minimum spacing between adjacent contact terminals attached to a terminal board.

It is a still further object of this invention to permit the attachment of a greater number of terminals to a given terminal board.

It is still another object of this invention to facilitate the attachment of contact terminals to terminal boards.

It is still a further object of this invention to provide a contact terminal attached to a terminal board which will be less liable to detach from this board when subjected to stresses and strains.

Other objects of this invention will become apparent from the following description taken in connection with the accompanying drawings in which:

Fig. 1 is an isometric drawing of a contact terminal of this invention and a portion of an insulated terminal board used therewith, and

Fig. 2 is an elevation view of a contact terminal attached to a terminal board.

Referring to Fig. 1 which shows an unattached contact terminal and terminal board, the contact terminal is substantially flat and has a support piece or body portion 5. Two small protrusions or lugs 1 and 2 extend from the support piece in its surface plane and substantially perpendicular to the longitudinal axis of the contact terminal. The longitudinal axis is here defined as the axis which is parallel to the longest dimension of the terminal and to the surface plane of the terminal board when the contact terminal is attached thereto. A finger 3 extends angularly from the support piece 5 in the surface plane of the terminal. This finger forms an acute angle with the longitudinal axis of the terminal and has a board contacting surface 13 thereof spaced from protrusions 1 and 2 in face opposition thereto. As indicated, it lies in the same plane as these protrusions. A contact arm 4 extends from the support piece substantially along the longitudinal axis of the contact terminal. Eyes 6 and 7 in the support piece may be used for the attachment of wires or leads of components (not shown) which are mounted on the terminal board. For each contact terminal, there are two apertures 10 and 11 in the terminal board which are fabricated to mate with protrusions 1 and 2. These apertures are made so the protrusions will fit snugly therein. The terminal board further has a series of slots 12, one for each contact terminal. These slots are cut so that they are approximately equal in width to the thickness of the contact terminals so that each terminal will fit snugly between the walls of its slot. The slots facilitate alignment and securing of the contact terminals.

Referring now to Fig. 2 which shows a contact terminal attached to a terminal board, the two protrusions 1 and 2 are inserted in terminal board apertures 10 and 11 respectively. Finger 3 has been swaged or bent in the thickness plane of the terminal board to firmly clamp the contact terminal thereto. The contact terminal is held in alignment by this clamping action combined with the holding action of slot 12 (see Fig. 1) in the terminal board and the mating protrusions and apertures. The finger 3 can readily be bent to bring the contact terminal in clamping engagement with the terminal board with pliers or by use of a suitable swaging tool. A whole row of terminals can be clamped down simultaneously with a suitable tool.

Only one protrusion on the contact terminal and only one mating aperture in the terminal board are absolutely necessary. This is because alignment can be accomplished by combining the mating action of a single aperture and protrusion with that of the closely fitting terminal board slot 12 and contact terminal sides. Additional mating protrusions and apertures however will tend to strengthen the bond between the terminal board and contact terminal. The terminal board slot is not essential if more than one mating protrusion and aperture are used in view of the aligning capabilities of a plurality of such protrusions and apertures operating together.

The terminal board can be fabricated of any suitable dielectric material. Contact terminals can be fabricated

of any suitable electrically conductive material. To assure suitable strength for the particular application, contact terminals should be made of a durable metal which is thick enough to withstand as much stress as the application dictates. For precision electrical requirements, contact terminals can be plated with gold or silver.

The eyes 6 and 7 for attaching wires and the leads of components to are but one example of a means for accomplishing such a purpose. Any suitable connecting device may be substituted therefor. The contact arm 4 is similarly not esesntial to the device of this invention and any contact means that the application demands can be utilized. The device of this invention can be utilized in any situation where mating of a contact terminal with an insulated board is required.

Although the invention has been described and illustrated in detail it is to be clearly understood that the same is by way of illustration and example only and is not to be taken by way of limitation, the spirit and scope of this invention being limited only by the terms of the appended claims.

I claim:

1. A contact terminal comprising a flat substantially Y-shaped deformable member formed of electrically conductive material having a first fixed leg portion including at least one protrusion extending from said first portion in the broad surface plane of said member, having a second deformable leg portion substantially opposite and facing said first leg portion, and having a contact arm extending in a direction to form the base stem of said Y-shape, the longitudinal axis of said arm being parallel with the longitudinal axis of said first fixed leg portion, said second leg portion extending in the broad surface plane of said member, the surface of said second leg portion facing said first leg portion being continuously planar, the broad surfaces of said second leg portion at the end thereof proximate to said contact arm being materially narrower as measured normal to the longitudinal axis thereof than the adjacent broad surfaces of said first leg portion as measured normal to the longitudinal axis of said first leg portion whereby said second leg portion is adapted to be bent toward said first leg portion and said protrusion in clamping engagement with a support inserted between said leg portions.

2. In combination, a flat substantially Y-shaped electrical terminal having a first fixed and a second deformable leg portion forming the fork of said Y-shape and a contact arm forming the base stem of said Y-shape, at least one protrusion extending from said first leg portion toward said second leg portion in the broad surface plane of said terminal, and a substantially flat terminal board formed with at least one aperture through its broad surfaces, said protrusion being received within said aperture, the longitudinal axis of said contact arm having a predetermined fixed angular relationship to one of the broad surfaces of said terminal board, means including a second protrusion extending from said first leg portion and a second aperture in said terminal board positioned to receive said second protrusion to prevent rotation of said terminal, said second leg portion being bent toward said terminal board for clamping said terminal on the opposite broad surfaces of said board, the surface of said second leg portion facing said terminal board being continuously planar, the broad surfaces of said terminal being perpendicular to the broad surfaces of said terminal board, the broad surfaces of said second leg portion at the end thereof proximate to said contact arm being considerably narrower as measured normal to the longitudinal axis thereof than the adjacent broad surfaces of said first leg portion as measured normal to the longitudinal axis thereof.

3. In combination, a flat substantially Y-shaped electrical terminal having a first fixed and a second deformable leg portion forming a U-shape and a contact arm extending in a direction substantially opposite to the direction of extension of said leg portions, at least one protrusion extending from said first leg portion toward said second leg portion in the broad surface plane of said terminal, the surface of said second leg portion facing said first leg portion being continuously planar and a substantially flat terminal board formed with at least one aperture and a slot through its broad surfaces, said protrusion being received within said aperture, a portion of the broad surfaces of said terminal being contiguous with the thickness surfaces forming the sides of said slot, the longitudinal axis of said contact arm having a predetermined fixed angular relationship to one of the broad surfaces of said terminal board, the broad surfaces of said terminal being perpendicular to the broad surfaces of said terminal board, the broad surfaces of the part of said second leg portion at the end thereof proximate to said contact arm being materially narrower as measured normal to the longitudinal axis thereof than the adjacent broad surfaces of said first leg portion as measured normal to the longitudinal axis thereof.

4. In combination, an electrically insulated terminal board and a substantially flat electrical contact terminal, said terminal board having two opposite surfaces formed with at least two apertures therein, said contact terminal having a contact arm extending therefrom, the longitudinal axis of said arm being parallel to one of said terminal board surfaces, said contact terminal having a fixed leg portion formed with at least two protrusions extending perpendicular to the longitudinal axis thereof, said protrusions being inserted in said apertures and said fixed leg portion being in contact with one of said terminal board broad surfaces, said contact terminal further having a deformable finger extending along the longitudinal axis thereof, the broad surfaces of said finger at the end thereof proximate to said contact arm being materially narrower as measured normal to the longitudinal axis thereof than the adjacent broad surfaces of said fixed leg portion as measured normal to the longitudinal axis thereof, the surface of said finger facing said protrusions being continuously planar, said planar surface of said finger being contiguous with the other of said terminal board broad surfaces, whereby said terminal is held in clamping engagement with said terminal board.

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