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INSULATED ELECTRICAL TERMINAL

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FIG. 1

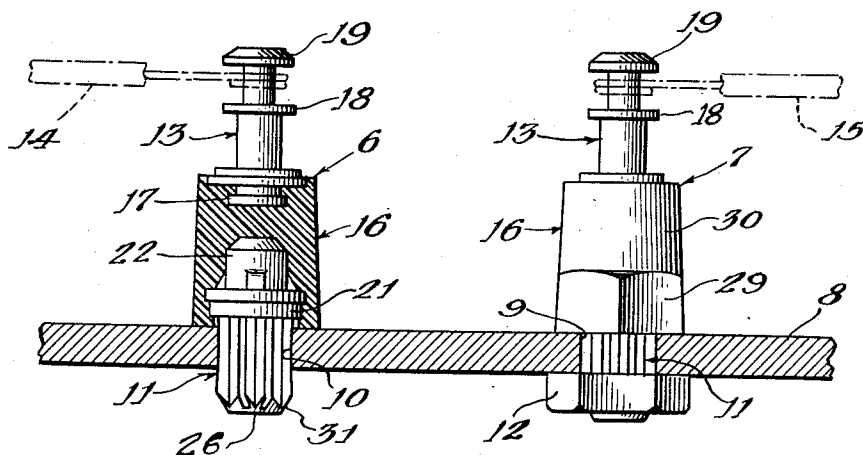


FIG. 2

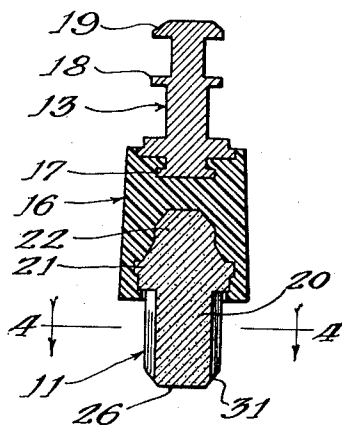


FIG. 3

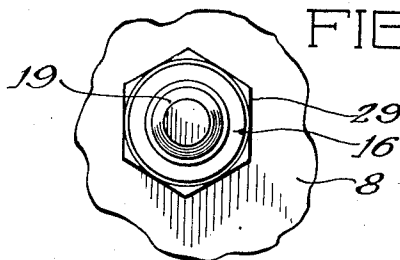


FIG. 4

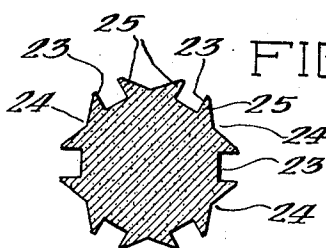
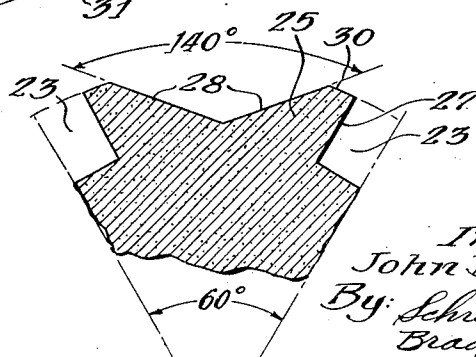


FIG. 5



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4 Claims. (Cl. 339—125)

This invention relates to an insulated electrical terminal and, more particularly, to a terminal structure which can easily and quickly be secured to an apertured base against loosening by vibration and the like.

The principal object of this invention is to provide a new and improved insulated electrical terminal structure.

Another object is to provide a terminal structure having a novel attaching member for securing the structure to an apertured base.

Another object is to provide an insulated terminal structure having a fluted nylon attaching member or post permitting the mounting of the terminal against loosening by vibration and the like by forcing the post into an aperture.

A further object is to provide a multi-part terminal structure formed by molding to provide a unitary structure having a body of plastic, chosen for its good dielectric properties, molded about a metallic terminal post and an attaching post of plastic, chosen for its physical properties of permitting firm attachment of the unitary structure to an apertured base.

Other objects, features, and advantages of the present invention will be apparent from the following description of a preferred embodiment illustrated in the accompanying drawings, in which:

Figure 1 is an elevational view of a pair of terminals attached to a base illustrating the base in section and one of the terminals partly in section;

Figure 2 is a vertical sectional view through one of the terminal structures;

Figure 3 is a broken plan view of one of the terminals in Figure 1;

Figure 4 is a transverse sectional view through the attaching member of the terminal taken substantially along line 4—4 in Figure 2; and

Figure 5 is a fragmentary enlarged sectional view of a portion of the attaching member illustrating the form of the fluted periphery thereof.

The drawings illustrate the terminal structure in one preferred form with Figures 1 through 3 being enlarged over the actual size of the terminal about 2½ to 3 times. The views of Figures 4 and 5 are respectively more greatly enlarged in order to better illustrate the structure form.

The electrical terminals may be used in any electrical or electronic equipment wherein it is desired to provide a post to which multiple wires may be attached or where a support for wiring is required. One of the features of the present terminal structure is that it may be quickly and easily attached to any apertured base by merely forcing the terminal in place. As illustrated in Figure 1, a pair of terminals 6 and 7, respectively, are shown attached to a base plate 8 in which there is formed apertures 9 and 10. The terminal structures are the same, but are attached to the base in two different manners. The terminal on the left has its attaching post 11 passing through the aperture 9 and frictionally gripping the

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base plate 8. The terminal 7 also has its attaching member or post 11 extending through the aperture 9; however, it has a nut 12 threaded upon the post to hold the terminal in place.

The particular form of the attaching post 11 permits the terminal structure to be attached to a base by frictionally forcing the post through an aperture as illustrated in the left-hand side of Figure 1 or the use of threads in a nut or in an aperture as illustrated on the right-hand side of Figure 1. The particular form of the attaching post is specifically chosen to permit selection of the means of attaching it to a base. Each terminal has a metallic terminal post 13, which may be of brass covered with solder or of other metal in order to receive electrical wiring 14 and 15 shown in dotted lines. The terminal posts and attaching posts are each molded into a body 16 of plastic, particularly chosen for its good dielectric properties.

The sectional view of Figure 2 shows the structure of the terminal in which the body 16 is molded about the spaced ends of the terminal post 13 and attaching post 11. Preferably, the body 16 may be formed of a thermosetting plastic, such as melamine, since this material has very low moisture absorption properties. A specific example of the melamine resin preferred is No. 592 sold by the American Cyanamid Company.

The particular form of the terminal post 13 may be chosen as desired. However, the inclusion of a collar-like boss 17 on one end may assist in the firm molding of the body 16 to the post. The upper end of the post may be provided with a collar 18 and a cap 19 between which wires may be easily placed for attachment to the post.

The attaching member or post 11 is preferably formed of nylon material which is molded to have a fluted exposed shank which serves the purpose of permitting ready attachment of the structure to an apertured base. The shank 20 has a collar 21 intermediate its ends so that the inner portion 22 of the shank may be molded in the body 16. In manufacturing the terminal, it is preferred to first form the terminal post and attaching post and then mold the body 16 around both, held in proper spaced relation. The attaching post is also molded of nylon or other thermoplastic resins having similar physical properties. The particular form of the exposed shank 20 is illustrated in Figures 4 and 5. A plurality of square section grooves 23 are alternately arranged with obtuse angled grooves 24 forming a plurality of triangular fillets 25 about the periphery of the shank. The grooves and fillets extend longitudinally of the shank and are formed in a mold so that a knock-out plunger may be forced against the terminal end 26 to remove the molded part from the cavity. The alternate arrangement of the grooves 23 and 24 forms adjacent triangular fillets 25 which might be referred to as being generally of fishtail shape in section. The specific form of these fillets and grooves contributes to the property of the shank permitting ready attachment of the terminal structure to a base. It is preferred to chamfer the leading end of the attaching post to provide a beveled surface 31 for guiding the post into an aperture.

Referring particularly to Figure 5, it will be noted that triangular fillet 25 is, in fact, not precisely triangular but has one short side 27 extending toward the center of the post and an opposite side 28 corresponding to the hypotenuse of the triangle more exposed. The side 27, of course, is one side of the square section groove whereas the side 28 is one side of the obtuse angled groove referred to. The outer surface 30 between the sides 27 and 28 is generally on an arc of a circle enclosing the outer points of the fillets. As noted in legend on

Figure 5, the angle between the center lines of the square grooves may be 60° with the included angle between surfaces 28 being 140° . This structure of the fillets and grooves permits the forcing of the shank into an aperture as illustrated in Figure 1 or the threading of a nut 12 onto the shank. In the case of a threaded connection, it has been found that the fillets will form about the threads rather than the threads cutting into the nylon material. A very strong attachment of the terminal structure to a base may be secured in either manner. The aperture may be sufficiently smaller than the shank of the attaching post that considerable force must be used to force the shank into the opening. A relatively great force will also be needed to remove it. Once attached, the terminal remains in place against all vibration forces.

The body 16 of the terminal may be formed as desired and preferably includes wrench flats 29, which may be used to hold the terminal when the attaching member is being threaded into a tapped hole or to hold it against turning while a nut, such as illustrated at 12, is threaded upon the shank. The portion 30 above the wrench flats may be made round or of other configuration. Since nylon, of which the attaching member is made, may absorb moisture, it is preferred that the melamine plastic body space the metallic terminal post from the attaching member.

As an example, a terminal structure as illustrated in Figure 1 may have a total height of about .72 inch and the attaching post shank corresponding to the height of the terminal is about .14 inch, whereas the terminal post may have a diameter of about .047 inch. The body has a long dimension of about .28 inch and may vary in diameter from .23 to .25 inch.

The foregoing detailed description is given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, for some modifications will be obvious to those skilled in the art.

I claim:

1. A member for attachment to an apertured base, comprising: a resilient body having an integral post portion and an enlargement at one end of the post portion, said post portion being of elongated generally cylindrical configuration formed with outer longitudinally extending grooves of different sectional configuration to form spaced fillets of generally triangular section with one side

more exposed than the other, said fillets providing frictional securing of the member to said base when forced into an aperture in said base.

2. A member for attachment to an apertured base, comprising: a resilient body having a post portion and an integral enlargement at one end, said post portion being generally cylindrical and having a fluted outer surface, said outer surface including longitudinally extending fillets of generally triangular section including an obtuse angle and the fillets being arranged with one short side of the triangular section extending toward the center of the post portion, said fillets being deformable upon forcing the post portion into an aperture to frictionally bind the member to the base.

3. A member for attachment to an apertured base, comprising: a molded nylon plastic body having a generally cylindrical shank with an enlargement at one end of the shank, a portion of the shank being exposed and longitudinally fluted for frictionally gripping the base when forcibly inserted in an aperture in the base, said fluted shank having deformable generally fish-tail sectionally shaped fillets alternately arranged with generally square grooves for self-locking fastening in such an aperture against loosening by vibration.

4. A securing post member for an electrical terminal, comprising: a body of resilient material having an exposed elongated post portion formed with a fluted outer surface, said flutes extending longitudinally of the post portion and being of generally fish-tail section alternately arranged with generally square section grooves, each fish-tail section flute having spaced sides formed by the sides of adjacent square grooves and the other sides being arranged at an obtuse angle to each other providing flutes deformable upon being forced into an aperture for resiliently holding the body therein.

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