Nov. 16, 1937. G. B. BENANDER 2,099,555

ELECTRICAL CONNECTER

Filed Oct. 12, 1929

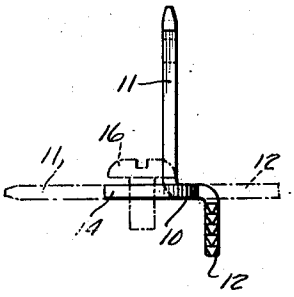


FIG. 2.

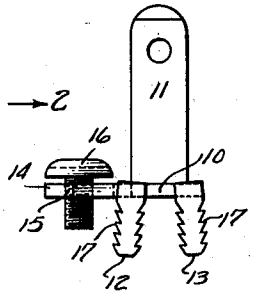


FIG. 1.

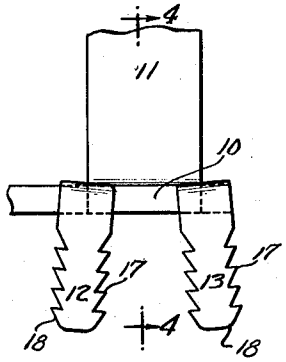


FIG. 3.

FIG. 4.

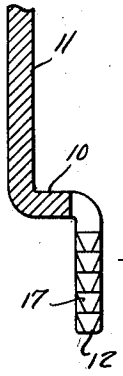


FIG. 5.

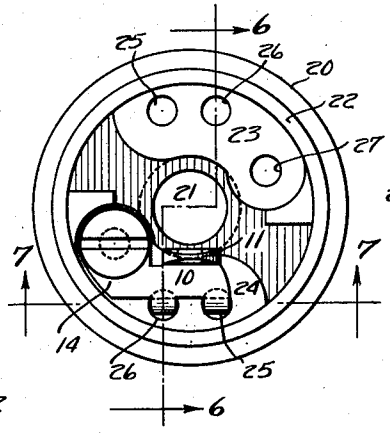


FIG. 6.

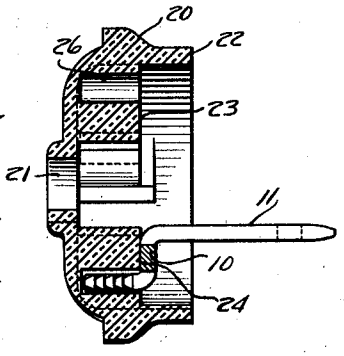


FIG. 7.

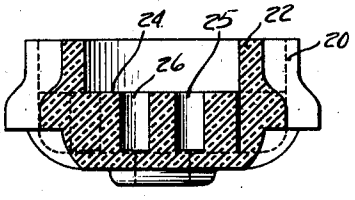
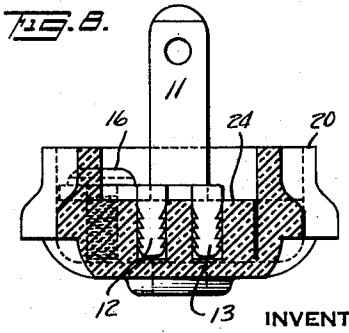


FIG. 8.



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ELECTRICAL CONNECTER

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Application October 12, 1929, Serial No. 399,126

10 Claims. (Cl. 173—361)

The present invention relates to electrical connecters, and is more particularly directed toward the provision of electrical connecters wherein a metal part is permanently anchored to a part of non-yielding, non-frangible insulating material without employment of inserts, rivets or other similar securing means.

It has heretofore been customary in the manufacture of electrical connecters out of molded insulating material to provide metal inserts in the molded material and to utilize these inserts as the supporting means for the metal parts. The inserts are either threaded to receive a clamping screw or are of such form that they may be spun over or upset onto the metal part to secure it in place. These operations have added to the expense of making this class of merchandise, not only on account of the cost of the inserts, but on account of the time consumed in placing the inserts in the molds. The mold cost also was increased on account of making provisions for these inserts.

The present invention contemplates an improved construction in this type of merchandise according to which the molded insulating part of non-frangible and non-yieldable material may be provided with easily molded holes or openings, adapted to receive prongs or the like provided on the metal parts. These prongs are so made that they may be forced into the holes or openings in the insulating material and are barbed so as to yield slightly during assembly in the holes and thereafter to resist removal.

For convenience in illustration, the present invention is shown as more particularly applied to attachment plug caps, although it is to be understood that this is merely illustrative of the broader features of the invention which are capable of general application to a wide variety of electrical fittings.

The accompanying drawing shows, for purposes of illustrating the present invention, one embodiment of the invention, it being understood that the drawing is illustrative of the invention rather than limiting the same.

In the drawing:

Figure 1 is an elevational view of a combined blade and terminal member for an attachment plug cap;

Figure 2 is a side view taken in the direction of the arrow 2 of Figure 1;

Figure 3 is an enlarged view of the lower end of the member;

Figure 4 is a sectional view taken on the line 4—4 of Figure 3;

Figure 5 is an elevational view of an attachment plug cap showing one of the terminals in place;

Figure 6 is a sectional view taken on the line 6—6 of Figure 5;

Figure 7 is a sectional view taken on the line 7—7 of Figure 5, showing the insulating body without the terminal member; and

Figure 8 is a view similar to Figure 7, but showing the terminal member in place.

The combined blade and terminal member, shown in Figures 1 to 4 inclusive, is made up of comparatively heavy sheet metal, but preferably of such a gauge as will provide a stiff substantial blade for the attachment plug cap. The sheet metal blank is formed to have a middle or body portion 10, a blade forming portion 11, and a pair of prongs 12 and 13. The prongs 12 and 13 and blade 11 are in the positions indicated in dotted lines in Figure 2 and are then bent to full line positions.

The body portion of the stamping is provided with a laterally extending lug 14, threaded, as indicated at 15, to receive a binding screw 16. The prongs 12 and 13 are barbed or serrated as indicated at 17 in the drawing. These barbs or serrations are preferably placed on both side edges of the prongs 12 and 13 and face away from the ends of the prongs. The prongs 12 and 13 are preferably made divergent, as indicated in the drawing. They may be made parallel with each prong slightly tapering, or they may be made convergent instead of divergent. These prongs are bent away from the body of the sheet metal blank, and the serrations or barbs may be placed in the prongs before or after the bending operation. Where the prongs are divergent, as indicated in the drawing, the outer corners 18 are preferably beveled inwardly.

The insulating body for an attachment plug cap is shown at 20 in Figures 5, 6 and 7. This body is of more or less conventional shape and has a central wire receiving opening 21 and peripheral skirt 22. The inner face of the insulating body is provided with two flat transverse platforms 23 and 24. These platforms form flat faces, transverse of the axis of the insulating body. Each of these faces of the insulating body is provided with two parallel spaced holes or openings 25 and 26, these holes being spaced according to the spacing of the prongs 12 and 13 of the metal parts. The platforms 23 and 24 are also provided with holes 27, adapted to receive the screw 16.

This molded insulating body may readily be formed in the usual molds employed in making

devices of this character. For the molding material one may employ any of the well known non-frangible and substantially unyielding molding materials, such, for example, as the phenol-formaldehyde resins. The molds employed in the molding operation are provided with suitable pins to produce the holes **25**, **26** and **27**, and the entire insulating body of the attachment plug cap may be made in molds capable of high speed operation. No time is consumed on account of placing metal inserts or the like in the molds, and multiple cavity dies and molds may be employed so as to facilitate the production of large quantities of these insulating bodies at low cost.

The assembly of the metal parts shown in Figures 1 to 4 inclusive in the molding part is very readily accomplished. The insulating body may be held in a press, and the metal members forced into place by applying strong pressure. The beveled portions **18** of the prongs **12** and **13** assist in wedging the prongs toward one another, and the strong pressure employed forces the prongs into the openings. The barbs or serrations **17** engage the side walls of the insulating body and effectively resist removal. The body portion **10** of the metal member rests against the platform or face of the insulating body, and the screw **16** passes into the opening **27** provided for it. When the parts are assembled as has been described, the metal terminal is permanently and fixedly secured in place. The method of securement provides an exceedingly strong and rugged construction. The metal prongs yield slightly as they are forced into the holes and spring outwardly and the barbs bite into the insulating material, making it practically impossible to pull out the metal member.

While the form of construction illustrated in the drawing employs two prongs, and they are both in the same plane, it will be obvious that any number of prongs may be employed and they may be in the same or different planes. This method of securing the metal and insulating parts together may be utilized in forms of construction in which it is merely desired to secure a terminal to the insulating body. In these cases, parts such as the blade contact will, of course, be omitted.

The employment of barbs makes for a very secure assembly of parts. In some cases the barbs may, however, be omitted and one may rely on friction between the insulation and the metal prongs.

It is obvious that the invention may be embodied in many forms and constructions within the scope of the claims, and I wish it to be understood that the particular form shown is but one of the many forms. Various modifications and changes being possible, I do not otherwise limit myself in any way with respect thereto.

I claim:

1. An electrical fitting comprising a body of non-yielding non-frangible insulating material having parallel prong receiving openings and a metallic member having non-parallel barbed prongs incapable of easy insertion into the openings but capable of being forced into the same, the barbed prongs being effective to resist removal.

2. An electrical fitting comprising a body of non-yielding non-frangible insulating material having parallel prong receiving openings and a sheet metal member having barbed prongs of a thickness equal to the thickness of the sheet and of a width slightly greater than the diameter of the openings, the prongs being incapable of easy insertion into the openings but capable of being forced into the same, the barbed prongs being effective to resist removal.

3. An electrical fitting comprising a body of non-yielding non-frangible insulating material having a face and two spaced holes extending inwardly from the face, and a metallic member having prongs forced into the holes, the sides of the prongs having laterally extending projections which engage the walls of the holes and resist removal.

4. An implement of the kind described comprising a metallic bar having a tang portion thereon adapted for insertion into a handle or the like of non-yielding material having recess means therein of substantially the same shape in cross section as the tang portion, said tang portion being provided with an opening forming a portion slightly wider than the recess means, the side walls of said portion being adapted to yield inwardly under pressure, and teeth on the outer edges of the yielding portions of said portion adapted to engage the inner walls of the recess under pressure when said tang portion is driven into the recess.

5. An electrical fitting comprising a contact member of sheet metal having two spaced barbed prongs and a body of non-yielding, non-frangible insulating material having recess means therein to receive the prongs, the end walls of said recess means being spaced apart a distance slightly less than the overall width of the spaced barbed prongs, the prongs being incapable of easy insertion into the recess means but capable of being forced into the same, the barbed prongs being effective to resist removal.

6. In an implement of the kind described, the combination with a body of non-yielding, non-frangible insulating material having recess means therein, of a tang for insertion in said recess consisting of a strip of sheet metal having an elongated aperture near one end thereof and forming a portion having two spaced members, and teeth on the outside of said members cooperating with the walls of said recess to resist removal.

7. An electrical fitting comprising a contact member of sheet metal having two spaced prongs and a body of non-yielding, non-frangible insulating material having recess means therein to receive the prongs, the end walls of said recess means being spaced apart a distance slightly less than the overall width of the spaced prongs, the prongs being incapable of easy insertion into the recess means but capable of yielding slightly upon being forced into the same, whereby after having been forced therein, they are effectively held against removal.

8. An electrical fitting comprising a contact member of sheet metal having two spaced divergent prongs, a body of non-yielding, non-frangible insulating material having recess means therein to receive the prongs, the end walls of said recess means being spaced apart a distance slightly less than the overall width of the spaced prongs, the prongs being incapable of easy insertion into the recess means but capable of yielding slightly upon being forced into the same, whereby after having been forced therein, they are effectively held against removal.

9. An attachment plug cap comprising a body of molded non-yielding insulating material having an opening for the passage of an electric cord, walls forming flat surfaces adjacent said opening, and recess means in said walls, and

terminal contacts supported in said recess means, each such contact comprising a blade portion and a pair of yieldable spaced members of a width slightly greater than that of the recess means, said yieldable spaced members being incapable of easy insertion into the recess means but capable of being forced into the same, whereby after having been forced therein, said contacts are effectively held against removal.

10. In an attachment plug cap, terminal contacts each comprising a blade, a pair of spaced prongs projecting therefrom and provided with serrations thereon, and means for attaching a conductor wire thereto, and a plug body formed from non-yielding insulating material having an opening for the passage of an electric cord and recess means adjacent to the opening in which the prongs of said terminal contacts are located, said prongs being incapable of easy insertion into the recess means but capable of being forced into the same and held therein by the engagement of the prongs with walls of the recess means.

GEORGE B. BENANDER.