July 27, 1954 A. R. BERMAN 2,685,072

ELECTRICAL TERMINAL PLUG

Filed May 21, 1951

Fig. 1.

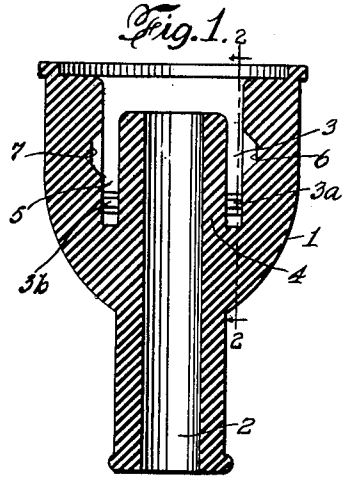


Fig. 2.

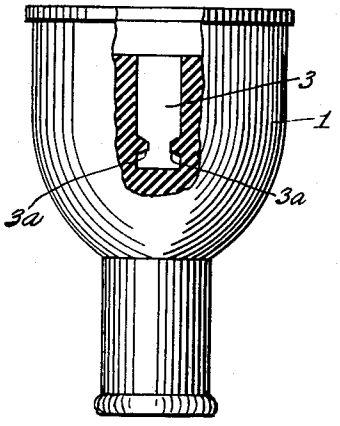


Fig. 3.

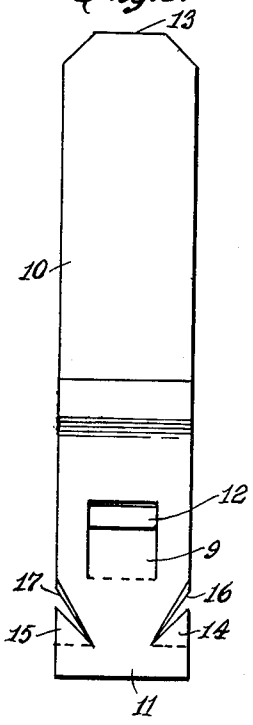


Fig. 4.

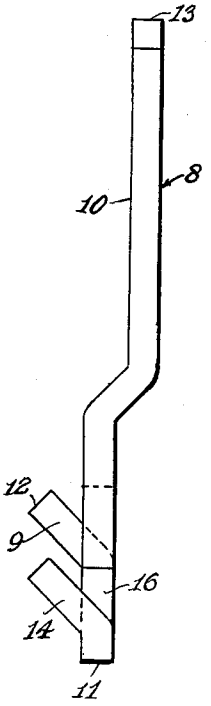
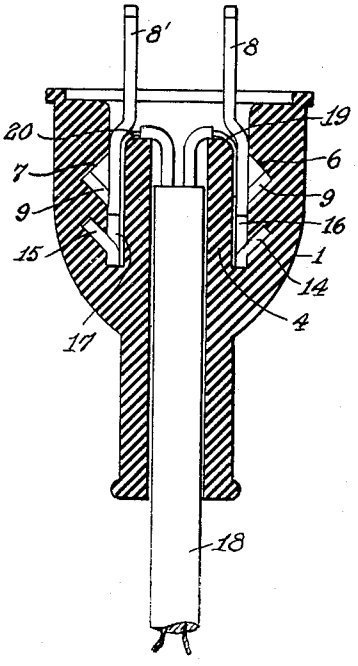


Fig. 5.



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ELECTRICAL TERMINAL PLUG

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3 Claims. (Cl. 339—62)

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The present invention deals with an electrical terminal plug and more particularly to an electical connecting plug for electrically connecting electrical appliances, etc., to a source of electrical energy.

Electrical connectors of the type embodying a resilient housing for electrical conductor terminals and having at least a pair of spaced conductive blade members secured to the housing have been used for making connections with electrical appliances or with a source of electrical energy. The blade members are usually positioned parallel of each other and are each partly inserted into the housing with the inserted portion making contact with the conductors and with free ends extending from the housing for engaging a cooperating receptacle. For securing a blade member to the housing, the housing is provided with a receptive cavity therefor and into which the blade member is inserted, the blade member being thereafter resistant to withdrawal from the cavity by means of barbs or projections on the blade member which grip the walls of the cavity.

In some cases withdrawal resisting projections extend from the broad sides of the blades at substantially right angles, which is disadvantageous in that the inserting of the blades is difficult especially when the housing, although resilient, is composed of a material not deformable sufficiently to allow entry of a projection bearing blade into the cavity without gouging the walls of the cavity, or which prohibits inserting of the blade to the full extent of the cavity.

In other cases the blades are provided with barbs, e. g. saw-tooth barbs, on the narrow longitudinal edges of the blades with the points of the barbs facing the opening of the cavity when inserted therein and which eliminate the difficulty of insertion into the cavity. However, upon repeated withdrawal action, the blades are subject to loosening especially when lateral forces are applied against the blades causing the barbs to dislodge from their original grip and to re-grip the cavity walls. Such re-gripping subjects the walls of the cavity to gouging thereby either weakening the cavity walls or forcing the blades out of alignment with each other. Any subsequent forcing of the blades to realign them only further gouges the cavity walls or further loosens the blades.

It is an object of the present invention to provide an improved electrical terminal plug. It is another object of the present invention to provide an improved electrical terminal plug having blade members secured to a resilient housing

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and being resistant to withdrawal therefrom. It is a further object of the present invention to provide an electrical terminal plug having blade members secured to a resilient housing for electrical conductor terminals and a plurality of blade members secured to said housing and the blade members being capable of maintaining alignment with each other. Other objects of the present invention will become apparent from the description hereinafter following and the drawings forming a part hereof, in which:

Figure 1 illustrates a sectional view of an embodiment of the present invention,

Figure 2 is a right angle fragmentary view of the embodiment of Figure 1,

Figure 3 illustrates a front view of a blade member according to the present invention.

Figure 4 illustrates a side view of the blade member, and

Figure 5 illustrates a sectional view of the assembled terminal plug.

The present invention comprises a resilient body or conductor terminal housing, e. g. a rubber housing, having secured thereto a blade member or a pair of blade members which are resistant to withdrawal from the housing, which maintain alignment with each other, and which are adapted to prevent loosening of the blade members to provide an improved electrical terminal plug.

Figure 1 illustrates a resilient housing **1** having a bore **2** provided therethrough and a cavity **3**, e. g. a rectangular cavity, formed into one end of the housing substantially parallel with said bore and separated or spaced therefrom along a portion of the length thereof by means of a partition **4**. The housing **1** is preferably provided with a pair of such cavities **3** and **5** parallel with each other and independent of said bore and in alignment with each other. A side wall of each cavity is laterally recessed in a direction outwardly of the bore **2** to provide an abutment means or anchor seats **6** and **7** the functions of which are hereinafter more particularly described.

Figure 2 illustrates an enlarged fragmentary portion of the housing **1** at right angles to that of Figure 1 to show the embodiment consisting of a pair of oppositely positioned resilient abutments **3***a* and **3***b* on opposite walls of the cavity **3**, said walls being the edge walls of the cavity. Similar or identical abutments are provided on the edge walls of the cavity **5**.

Figures 3 and 4 illustrate front and side views of an elongated blade member **8** having a tongue

or anchor 9 projecting outwardly and lengthwise of a broad side 10 of the blade member at an acute angle or an angle of less than 90 degrees with said side. The anchor 9 is preferably formed by protruding a portion of the blade, and said anchor being preferably spaced from an end 11 of the blade 8 at a distance less than one-half the length of the blade with an abutting end 12 of the anchor 9 directed substantially toward the other or opposite end 13 of the blade 8. Between the anchor 9 and an end of the blade is a pair of cooperating barbs 14 and 15, e. g. wedge-shaped barbs, which are spaced laterally of each other and which project outwardly of a broad side of the blade substantially parallel with the anchor 9. The barbs and anchor are preferably located on the same side 10 with the barbs between the said anchor and an end 11 which is nearest the anchor. The said barbs are advantageously formed by angularly slitting through the opposite longitudinal edges of the blade with the slits 16 and 17 converging toward each other. The wedge-shaped barbs thus formed are bent outwardly as above described. By so forming the barbs their points are provided advantageously with maximum lateral distance between each other.

Figure 5 illustrates the assembled electrical terminal plug which comprises the combination of the housing 1 of Figure 1 and the blade 8 of Figures 3 and 4.

The terminal plug is preferably provided with a plurality of blades, e. g. blades 8 and 8', which are secured to the housing parallel of each other.

In assembling the terminal plug, an insulated conductor 18 is stripped of its insulation to expose the electrically conductive wires 19 and 20 for a substantial distance from the ends of the wires and the conductor 18 is inserted into the bore 2 with wires 19 and 20 being located in the vicinity of the cavities 3 and 5. The end 11 of the blade 8 is caused to straddle the wire 19 and wire and blade are inserted into the cavity 3. Upon insertion, the resilient walls of the cavity 3 are caused to deform slightly allowing the end 11 of the blade 8 to be inserted to the full extent of the cavity, the anchor 9 to engage the anchor seat 6 on a broad or side wall of the cavity, and the barbs 14 and 15 to contact and pass beyond the abutments 3*a* and 3*b* on the narrow or edge walls of the cavity whereupon the resilient abutments contact the upper portions of the barbs and substantially fill in the space between the barbs and the rest of the blade.

In order to insert the blade so that the barbs 14 and 15 pass beyond the abutments 3*a* and 3*b*, the end 11 of the blade is caused to deform the bottom of the cavity with applied pressure, e. g. by a blade inserting mechanism, and then, depending upon the resiliency of the plug material, the blade member may be pulled back after release of pressure or allowed to settle back due to the inherent resiliency of the plug material to lodge the blade in its locked position whereby the upper portions of the barbs will abut against the abutments 3*a* and 3*b* and the anchor will simultaneously abut the anchor seat.

Upon attempted withdrawal of the blade 8 from the cavity 3, the points of the barbs 14 and 15 grip the side wall of the cavity, the upper portions of the barbs abut against the abutments, 3*a* and 3*b*, and simultaneously the abutting end 12 of the anchor 9 abuts against the wall of the recess or anchor seat 6 not only preventing withdrawal of the blade but also prohibiting the barbs from losing their original grip thereby preventing tearing or gouging of the cavity wall. Since the barbs retain their original grip, the end 11 of the blade 8 is held against the bottom of the cavity thereby securing the wire 19 firmly in the cavity to insure against disengagement of the wire 19 from the blade 8. The barbs 14 and 15 are advantageously laterally spaced of each other on the same side of the blade 8 so that lateral forces moving the edges of the blade will not disengage one barb from its grip while the other barb is forced into the cavity wall as is the common defect with barbs located on the longitudinal narrow edges of the blades. Moreover, lateral forces moving the sides of the blade will not loosen the blades since the broad sides of the blades will prevent gouging and their bluntness or area provides an abuttal sufficient to prevent the barbs from losing their grip.

When a pair of blades 8 and 8' are secured to the respective aligned and parallel cavities, the blades become fixed in parallel alignment with each other and maintain such position because of the combined restraining action of the said anchor against the anchor seat and the said pair of barbs.

Modifications of the invention hereinbefore set forth, e. g. modifications relating to the location of the barbs or anchors on the blades, are possible without departing from the scope of the invention.

What I claim is:

1. A plug comprising in combination a resilient body having a rectangular cavity formed therein and defined by a pair of substantially wide side walls and a pair of substantially narrow edge walls, one of said side walls having a recess formed therein, the recess being positioned outwardly of said cavity, an abutment on each of said edge walls below said recess, said abutments being positioned oppositely of each other, an elongated blade member provided with an anchor projecting outwardly and lengthwise of a side thereof at an acute angle with said side, said anchor being spaced from an end of said blade at a distance less than one-half the length of said blade, a pair of barbs on one side of said blade member spaced laterally of each other the full width of said side and substantially parallel with said anchor, a notch on the end walls of said blade above each barb, said blade member being insertable into said cavity, said anchor and barbs facing the opening of said cavity, said anchor being engageable with a wall of said recess, said barbs being positioned to grip a wall of said cavity between said abutments and the bottom of the cavity and said abutments interlocking with said notches.

2. An electrical terminal plug comprising in combination a resilient body having a bore formed therethrough and a plurality of rectangular cavities spaced from said bore and defined by a pair of substantially wide side walls and a pair of substantially narrow edge walls, each of said cavities having a recessed side wall, an abutment on each of said edge walls below said recess, the recess being positioned outwardly of said cavity, a plurality of elongated blade members each provided with an anchor projecting outwardly and lengthwise of a side thereof at an acute angle with said side, said anchor being spaced from an end of said blade at a distance less than one-half the length of said blade, a pair of barbs on one side of each of said blade members and spaced laterally of each other the full width of

said side and substantially parallel with said anchor, a notch on the end walls of each of said blades above each barb, said blade members being insertable into said cavities, each of said anchors being engageable with a wall of each of said recesses in blade withdrawal resistant relationship, said barbs being positioned to grip the walls of said cavities between said abutments and the bottoms of the cavities, said anchor and barbs facing the openings of said cavities and said abutments interlocking with said notches.

3. An electrical terminal plug according to claim 2, wherein said cavities are parallel with each other and aligned with each other and said blade members inserted therein being parallel and aligned with each other.

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