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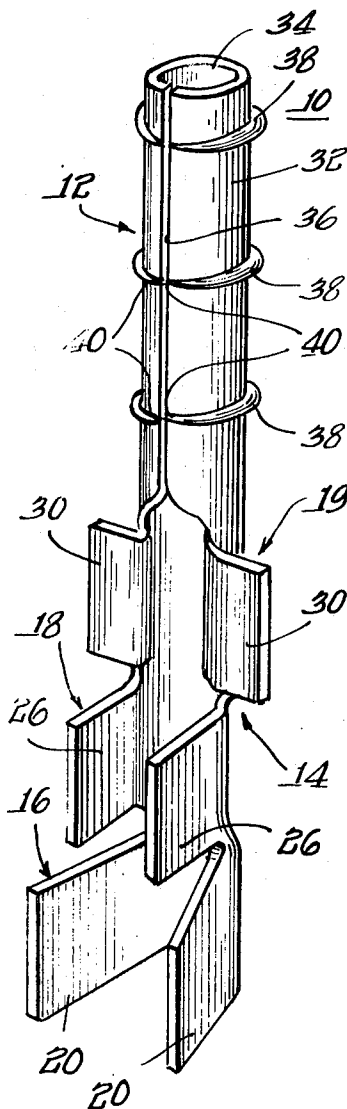
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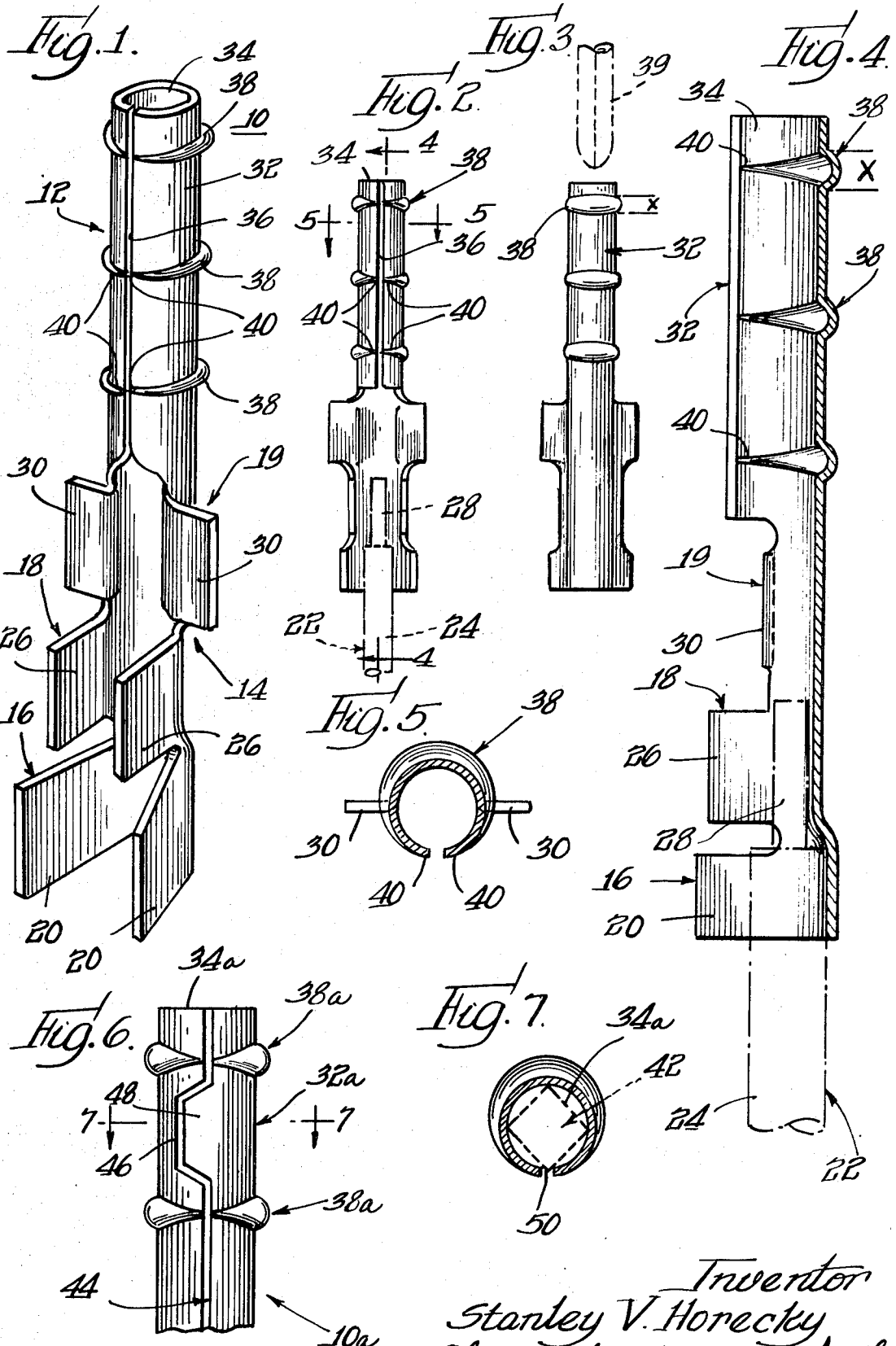
[54] FEMALE ELECTRICAL TERMINAL
5 Claims, 7 Drawing Figs.

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ABSTRACT: A female electrical terminal of spring metal including a cylindrical barrel at one end thereof for receiving a complementary male terminal. The barrel has a longitudinal slit extending the length thereof and a plurality of eccentric reinforcing ribs formed integrally with an in spaced-apart relation thereabout to prevent oversteering of the barrel. Each of the ribs is tapered from a point opposite the longitudinal slit, circumferentially about opposite sides of the barrel toward the slit.





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FEMALE ELECTRICAL TERMINAL

BACKGROUND OF THE INVENTION

This invention relates to electrical terminals and more particularly to a female terminal having an end in the form of a cylindrical barrel for receiving therein a complementary male terminal.

Female electrical terminals of the type having a barrel with a longitudinal slit or seam extending along the side thereof have found many uses in the electrical field. While this type of female terminal is for the most part satisfactory in use, the split barrel thereof often becomes overstressed and opens at the seam after several insertions and extractions of a male terminal, causing a poor electrical connection between the terminals.

To overcome the above, some female terminals of this general type have been constructed with reinforcing beads thereon. This, however, has failed to prove to be an entirely satisfactory solution to the problem.

SUMMARY OF THE INVENTION

Accordingly, it is a primary object of the present invention to provide a new and improved female terminal of the type having a longitudinally split barrel for receiving a complementary male terminal, which overcomes the disadvantages of the prior art.

It is another object of the present invention to provide a female electrical terminal of the above-described type having a plurality of eccentric reinforcing ribs formed about the barrel thereof in spaced apart relation therealong.

DESCRIPTION OF THE DRAWINGS

A better understanding of the present invention and its organization and construction may be had by referring to the description below in conjunction with the accompanying drawings, wherein:

FIG. 1 is an enlarged perspective view of a preferred embodiment of a female terminal according to the invention;

FIG. 2 is a plan view of the female terminal of FIG. 1 as seen from the front thereof;

FIG. 3 is a plan view of the female terminal of FIG. 1 as seen from the rear thereof;

FIG. 4 is an enlarged longitudinal sectional view of the female terminal of FIG. 2 taken along the line 4—4 thereof;

FIG. 5 is an enlarged cross-sectional view of the female terminal of FIG. 2 taken along the line 5—5 thereof;

FIG. 6 is an enlarged fragmentary front view of an alternative embodiment of a female terminal according to the invention; and

FIG. 7 is a cross-sectional view of the female terminal of FIG. 6, taken along the lines 7—7 thereof, shown receiving a mating male terminal having a square cross section.

DETAILED DESCRIPTION

Referring to the drawings now in more detail, a first embodiment of a female terminal, generally designated by the numeral 10, is shown in FIG. 1. The terminal is a unitary structure comprising an integrally formed leading end 12 and trailing end 14, and is constructed of a tin-plated, spring-tempered brass material.

The trailing end 14 of the terminal 10 includes two pairs of crimping arms 16 and 18, respectively, extending outwardly therefrom, and a pair of side-mounting lances 19. The arms are provided for connecting the terminal to an external wire conductor, such as 22, shown in dotted lines in FIGS. 2 and 4.

The pair of arms 16 nearest the extreme trailing end 14 of the terminal, each of which is designated by the numeral 20, is longer than the arm pair 18 adjacent thereto. The arms 20 are long enough to be wrapped about the insulation 24 of a lead wire, such as 22, to prevent the separation of the wire from the terminal. The other, shorter arms, each designated by the numeral 26, of arm pair 18, are provided to be wrapped about

and engage the conductor portion 28 of lead wire 22. In this manner the arms 26 are both mechanically and electrically connected to the wire, thereby electrically to connect the terminal 10 to external circuitry and further to prevent the separation of the wire 22 and the terminal 10. The side lances, each designated by the numeral 30, extend outwardly from the female terminal 10 near the center thereof, and are provided to retain the terminal in an aperture in a receptacle or the like. In the event the terminal is not to be placed in an insulating receptacle, but is to be used as a bare terminal, the lances may be omitted.

The leading end 12 of the terminal includes a cylindrical-shaped barrel 32, with a hollow center or bore 34 extending therethrough. A longitudinal seam or slit 36 extends the entire length of the barrel 32. The slit provides a means for allowing the barrel 32, formed of a resilient or spring metal, to be spread apart when receiving a mating male terminal, such as the cylindrical-shaped terminal 39 shown in dotted lines in FIG. 3. The barrel tightly grips and engages the male terminal, once received in the former, due to the spring properties thereof.

A plurality of spaced-apart reinforcing ribs, each designated by the numeral 38, is integrally formed with the barrel 32, preferably by stamping the former therefrom. The reinforcing ribs encircle the barrel and are eccentric with respect thereto, having their centers set apart from the central axis of the cylindrical barrel, away from the slit 36 and toward the opposite side thereof approximately 180° therefrom. The reinforcing ribs have a maximum dimension axially of the terminal diametrically opposite the slit and taper circumferentially toward the slit about both sides of the barrel. The widest portion of each of the ribs longitudinally of the barrel is indicated by the dimension "X" (FIGS. 3 and 4), and each rib narrows so as to come substantially to a point directly adjacent the slit on opposite sides thereof, as indicated by the numeral 40.

The eccentric ribs 38 provide the barrel of the female terminal with greater spring and reinforce it along the side thereof opposite the longitudinal seam where it is required to insure efficient closing of the barrel at the longitudinally extending slit 36 even after repeated insertions and extractions of a mating or complementary male terminal. This in turn provides a sure, reliable electrical connection between the terminals at all times.

Three reinforcing ribs have been shown formed on the barrel of the female terminal illustrated in the drawings, however, the terminal is not restricted to this number, since more or less reinforcing ribs may be provided as required.

The barrel of a female electrical terminal according to the invention may be modified slightly in the event the terminal is to accommodate a male terminal having a polygonal cross section, such as for example square or rectangular, like the terminal 42 shown in FIG. 7. Such a modified barrel of a female terminal according to the invention is shown in FIGS. 6 and 7 of the drawings wherein like numerals have been utilized, with the addition of the suffix "a" to indicate similar parts.

The barrel 32a of female terminal 10a is similar to that of terminal 10 of FIGS. 1-5, in that it too is cylindrical with a center opening or bore 34a extending therethrough and includes a plurality of spaced-apart eccentric reinforcing ribs, each designated 38a, formed therefrom. The terminal 10a includes a generally longitudinal slit 44 extending the length thereof. The slit includes an offset portion 46 forming a tab 48 against which a corner 50 of the male terminal 42 may be butted to prevent it from protruding through the slit (FIG. 7) upon inserting the male terminal into the barrel 32a. The tab 48 is provided to eliminate a chance that upon insertion of a polygonal cross-sectional male terminal, such as 42 thereinto, a corner 50 thereof would extend into the slit and cause the barrel to open thereat, preventing it from closing adequately about the male terminal. The corner 50 would, in effect, wedge into the slit and hold the barrel in an open position and perhaps provide an unsatisfactory electrical connection. Through the provision of the offset portion of seam 36, there

is insured a good electrical connection between terminals. Thus, the embodiments of a female electrical terminal according to the invention are able to accommodate both circular and polygonal cross-sectional mating male terminals satisfactorily.

The terminal preferably is formed from sheet metal, the blank being stamped out and the ribs stamped therein prior to rolling of the blank into cylindrical form. The eccentric and tapering nature of the ribs affords greater resiliency adjacent the slit than would be possible with concentric or nontapering ribs without undue limitation of the reinforcing effect 180° from the slit.

While preferred embodiments of the invention have been shown and described, it should be understood that the invention is not limited thereto, since many modifications may be made. It is therefore contemplated to cover by the present application any and all such modifications as fall within the true spirit and scope of the appended claims.

What is claimed is:

1. A female connector terminal of spring metal, comprising a hollow barrel portion for receiving therein a complementary male terminal, said barrel portion having a substantially longitudinal slit extending the length thereof and including a plurality of reinforcing ribs formed thereabout in axially spaced-apart relation therealong, each of said ribs being of greater diameter than said barrel portion having a substantially circular cross section with the center thereof being out of alignment with the central axis of said barrel portion and having a predetermined maximum axial dimension at a point on said barrel portion opposite said longitudinal slit and tapering therefrom on opposite sides of said barrel portion circumferentially thereabout toward said slit, said ribs providing

added strength and resiliency to said barrel portion to prevent overstressing thereof.

2. A female connector terminal as claimed in claim 1 wherein said longitudinal slit includes an offset portion to form a tab member.

3. A female electrical connector terminal of a resilient, conductive, metallic material including a hollow cylindrical end portion having a cylindrical inner surface for receiving a complementary male terminal therein in close surface engagement, said end portion having a longitudinally extending slit therein and including a plurality of outwardly projecting reinforcing ribs extending circumferentially about said end portion to lend enhanced resiliency and to prevent overstressing thereof, said reinforcing ribs being placed at predetermined axially spaced intervals along said end portion and each of said ribs being of a predetermined maximum width at a point on said end portion opposite said longitudinal slit and tapering circumferentially about said cylindrical end portion in opposite directions therefrom in narrowing fashion toward said slit and having a minimum width adjacent said slit.

4. A female connector terminal as claimed in claim 3, wherein said longitudinally extending slit includes an offset portion to provide a tab member for engaging said male terminal, thereby to insure a good electrical connection therebetween.

5. A female connector terminal as claimed in claim 3 wherein each of said ribs is of greater outside diameter than said end portion and wherein the geometric center of each of said ribs is out of alignment with the central axis of said cylindrical end portion, thereby to be eccentric with respect thereto.

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