ABSTRACT: The terminal is stamped from a thin sheet of metal and rolled into a cylindrical sleeve which is bent at the center to have the adjacent sections disposed at an angle of approximately 110° to each other after the wires of a conductor have been inserted in the end with the two sections retained in angular relation by locking fingers. The terminal is encased in an elastomeric tube before it is bent and the memory therein aids in retaining the terminal sections in locked angular relation.
SPARK PLUG TERMINAL

SUMMARY OF THE INVENTION

The invention pertains to a spark plug terminal which is stamped from a sheet of 0.018 stainless steel (Armco 400) and rolled into a hollow cylinder. The central part of the cylinder is so stamped as to permit it to bend to have the adjacent section move into approximately 110° angular relationship. Interlocking fingers on the conductor-supporting section passes into apertures in the spark plug engaging section and retains the two sections in angular relationship. The outer end of the conductor-supporting section is retained in U-shape having two extending wing portions and provided with ribs having inwardly extending ribs of spherical section which extend into the elastomeric covering for the conducting core of the conductor when the wing portions are moved into cylindrical form. The conducting core is bent back over the elastomeric covering and forced against the terminal when the wings are clamped about the conductor. The assembly is inserted into an elastomeric tube and bent into angular shape and locked therein by the interlocking fingers.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view in elevation of a spark plug terminal having the conductor disposed therein embodying features of the present invention;

FIG. 2 is a bottom view of the structure illustrated in FIG. 1;

FIG. 3 is a sectional view of the structure illustrated in Figure 1, taken on the line 3-3 thereof;

FIG. 4 is a view of the conductor-receiving end of the structure illustrated in FIGS. 1 and 2 before the conductor is inserted therein;

FIG. 5 is an enlarged view of a stamped sheet from which the terminal of the present invention is constructed;

FIG. 6 is an enlarged broken sectional view of the structure illustrated in Figure 5, taken on the line 6-6 thereof;

FIG. 7 is a view of the terminal after being inserted within an insulating tube;

FIG. 8 is a view of the structure illustrated in Figure 7 after moving the sections into angular relationship, and;

FIG. 9 is a view of the structure illustrated in FIG. 8 with parts in section and with a rod for bending the locking fingers extending therefrom.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A spark plug terminal is stamped from a sheet 11 of stainless steel, the one herein illustrated having a thickness of approximately 0.018 inch, as illustrated in FIG. 5. Centrally of the sheet, cutout portions 12 provide edges 13 which move into engagement with each other after the stamped sheet is rolled into cylindrical form and bent along a central web 14. A conductor-receiving end 15 has cutout portions 16 forming a locking end 17 for the conductor. Strengthening ribs 10 are formed in the sheet at the bottom of the cutout portions 16. The end is bent into U-shape having wings 18, as illustrated in FIG. 4, to permit the conductor to be placed therein. The locking end 17 has inwardly extending ribs 20 containing a row of ribs 19 which provide sharp edges for biting into the elastomeric cover 35 for a conducting core 34 of a conductor 33 after the U-shaped end has been squeezed into cylindrical form with the conducting core of the conductor in contact therewith.

A spark plug receiving end 21 contains recesses 22 aligned with extending fingers 23 having coined outer edges 24 which extend outwardly and recesses 22 when the sheet 11 is rolled into cylindrical form. A pair of apertures 25 are provided through the sheet aligned with the edge of the fingers 23 for receiving inwardly extending ribs 38 of a collar 30 which limits the expansion of the spark plug end 21. Cutout portions 26 are provided in the sheet 11 which permits the spark plug receiving end to slightly expand when inserted over the end of the spark plug.

The conductor-receiving end 15 has barbed locking fingers 27 extending toward the spark plug receiving end 21 aligned with apertures 28 in the adjacent portion thereof. Central extending sections 29 orient the sheet 11 within the die and the edge 31 at the spark plug receiving end is coined to beveled shape so that it will readily slide over the spark plug end. Thereafter, the sheet is rolled into a cylindrical form except for the U-shaped locking end which has a semicylindrical web and extending wings 18. The extending ends 32 containing the apertures 28 are deflected inwardly at an angle of approximately 15° to form a cam surface adjacent to the apertures 28 which direct the locking fingers 27 thereinto when the sections 15 and 21 are moved into approximately 110° relationship, as illustrated in FIG. 1.

Before the bending operation, the conductor 33 has the conducting core 34 bent backward along the cover 35, and placed in the end 15 between the wings 18. The ends of the wings 18 are then bent about the elastomeric cover 35 into cylindrical form forcing the core 34 into contact with the metal thereof and the ribs 19 into the elastomeric material of the cover. The assembly is then inserted within a slightly tapered tube 36 inwardly between the ends thereof and is bent at the center to have the conductor-receiving end 15 disposed at an angle to the spark plug receiving end 21, as illustrated in FIGS. 1 and 8. In this position the locking fingers 27 have entered the apertures 28 in position to retain the two ends 15 and 21 in angular relation.

As illustrated in FIG. 9, a rod 37 is placed within the spark plug receiving end against the locking fingers 27 for applying a force thereagainst for bending the fingers and forcing them into the smaller bottom edge of the apertures 28 to positively prevent the release of the fingers 27 therefrom. The memory in the material of the tube 36 attempting to move the ends 15 and 21 into aligned relations urges the fingers 27 toward the bottom of the slots 28. The spark plug receiving end of the tube is enlarged to receive the projecting end of the spark plug which is protected thereby.

We claim:

1. In a spark plug terminal, a cylindrical sleeve having cutout portions in the edges to provide a central bendable web joining a spark plug receiving section and a conductor-receiving section, and locking means at the adjacent ends of the sections which engage when the two sections are moved into angle relationship to lock the sections thereto.

2. In a spark plug terminal as recited in claim 1, wherein said locking means are extending fingers on one section aligned with apertures at the adjacent end of the other section.

3. In a spark plug terminal as recited in claim 2, wherein the portion of the section having the apertures therein is deflected inwardly to provide a cam surface for guiding the fingers into the apertures.

4. In a spark plug terminal as recited in claim 2, wherein the cylindrical sleeve is rolled from a flat stamped sheet to have mating edges along the side opposite to that containing said bendable web.

5. In a spark plug terminal as recited in claim 4, wherein the outer end of the conductor-receiving section has inwardly extending locking ribs in the U-shaped web and extending sides thereof for receiving a conductor and forcing the ribs into the elastomeric sleeve of the conductor by bending said sides there around while the sections are in aligned relation to each other.

6. In a spark plug terminal as recited in claim 5, wherein the ribs are provided in rows on inwardly extending transverse ribs in the U-shaped web and extending sides.

7. In a spark plug terminal as recited in claim 4, wherein the spark plug receiving section has recesses extending into the abutting edges in offset relation to each other and aligned with projecting fingers on the offset edges which extend into said recesses to span the abutting edges.
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8. In a spark plug terminal as recited in claim 7, wherein the inner portion of the recesses are of greater width and wherein the ends of the fingers projecting from the edges are wider to provide an interlocking relation therebetween.

9. In a spark plug terminal as recited in claim 7, wherein sleeve means at the end portion of the spark plug receiving end extends over said aligned fingers and recesses.

10. In a spark plug terminal as recited in claim 5, wherein said terminal is encased within an elastomeric tube before said tube and terminal are bent as unit to have the end sections disposed in angular relation.