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J. H. HOPKINS ETAL

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TERMINAL MEANS

Original Filed Aug. 13, 1959

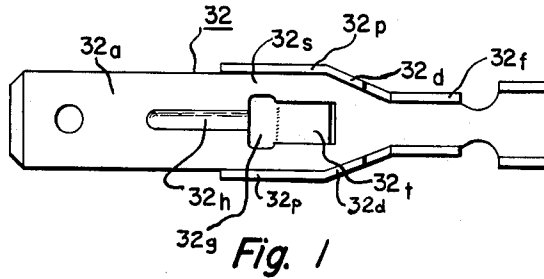


Fig. 1

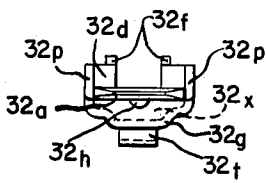


Fig. 3

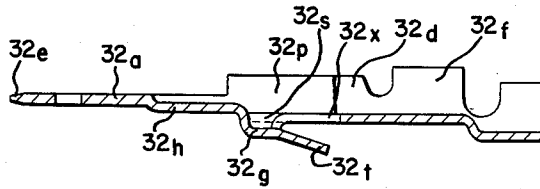


Fig. 2

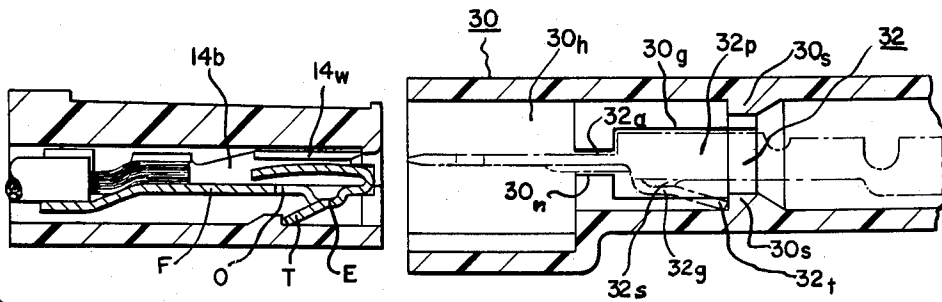


Fig. 4

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TERMINAL MEANS

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Divided and this application Apr. 4, 1960, Ser. No.  
41,712

2 Claims. (Cl. 339-217)

This invention relates to electrical connectors, and particularly to terminals adapted to facilitate connection therewith relative to multiple mating terminal means.

This is a divisional application of a co-pending application, S.N. 833,449, filed August 13, 1959, now Patent 2,989,723, granted June 20, 1961.

An object of this invention is to provide new and improved terminal means having structural features to facilitate connection therewith relative to multiple mating terminal means.

Another object of this invention is to provide male terminal means having increased stability relative to an insulating housing and adapted to facilitate connection involving multiple terminal mating means.

Another object of this invention is to provide a terminal means having laterally-located rail portions adapted to provide a stop against movement in one direction in an insulating body and to provide stabilization of the terminal in the body to avoid tilting of the terminal which is also strengthened and stiffened by a re-enforcing rib portion extending longitudinally in alignment with a centrally-located tang of the terminal.

Still another object of this invention is to provide a male-blade terminal means having laterally-located rail portions adapted to extend longitudinally as well as partly inwardly and always integrally with a floor portion of the terminal means also having a tang in longitudinal alignment with first and second embossed rib portions, one of the dual rib portions having less depth than the other and extending longitudinally into a male-blade portion.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein preferred embodiments of the present invention are clearly shown.

In the drawings:

FIGS. 1, 2 and 3 are plan, side, and end views, respectively, of a male-blade terminal means in accordance with the present invention and mountable in an insulating body as shown in FIG. 4 that includes an illustration of a female terminal means positioned for connection to the insulating body and male-blade terminal means.

It is to be noted that the female terminal means such as 14b shown in FIG. 4 can be also mounted in insulating housings, complementary to recess or hollow interior 30h of the insulating body 30. The female terminal means 14b is provided with an embossed portion E swaged or deformed laterally to one side of a floor F thereof. A tang T is integral at one end with the embossed portion E and the tang is cut from the floor F such that an opening O is left therein. The embossed portion E can be slightly wider than the tang and is therefore at least partially in longitudinal alignment with the tang T and opening O. The opening O remains in the floor F and the tang T can be deformed or deflected relative to the floor without hindrance by engagement of outer free edges of the tang relative to edges of the opening O because the embossed portion E maintains a predetermined spacing of the tang T relative to the floor. Thus the tang T can be deformed or deflected temporarily for insertion

and/or removal relative to an insulating body as shown in the Patent 2,682,038, Johnson mentioned earlier. The embossed portion E and tang T represent structure which is an improvement over that shown by Patent 2,682,038.

In FIG. 1 there is shown a male terminal means generally indicated by numeral 32 having a body portion 32a and ferrule portion 32f. The body portion has a tapered edge 32e and includes a central stabilizing portion 32s located intermediate the body portion 32a and ferrule portion 32f. The stabilizing portion 32s is located in a plane parallel to a plane that passes through the blade portion 32a. A tang 32t is cut out of the stabilizing portion 32s leaving an open space 32x having rough edges relative to which the tang 32t would bind and be hindered whenever the tang 32t is deformed and temporarily bent back relative to the stabilizing portion 32s. To avoid such hindrance of the tang, there is provided a first embossed portion 32g which is swaged or deformed downwardly from the stabilizing portion 32s and which is longitudinally in alignment with the tang 32t having one end integral with the first embossed portion 32g. The terminal means 32 is further provided with a second embossed portion 32h having less depth than the first embossed portion 32g. The depth of the first embossed portion 32g is at least equal to and preferably greater than the thickness of the tang 32t. The resilience of the tang 32t is enhanced due to the presence of the embossed first portion 32g and longitudinal rigidity of the body portion 32a of the male-blade terminal means is increased relative to the stabilizing portion 32s due to the second embossed portion 32h. The second embossed portion 32h extends from the body portion 32a into the one end of the stabilizing portion 32s adjacent to and in longitudinal alignment with the first embossed portion 32g. The second embossed portion 32h is in a plane parallel to and intermediate to the planes of the body portion 32a and stabilizing portion 32s as can be best seen in FIGURE 2.

The stabilizing portion 32s is further provided with a laterally outwardly and upwardly extending wing structure including first parallel parts 32p and laterally inwardly extending and diverging second parts 32d. The relationship of the parallel parts 32p and diverging parts 32d with respect to the male-blade body portion 32a, the second embossed portion 32h and first embossed portion 32g as well as tang 32t can be best seen in FIG. 3 which is an end view also illustrating the ferrule portion 32f in an uncrimped condition. The male terminal means 32 is outlined in FIG. 4 to show fitting thereof relative to an insulating housing generally indicated by numeral 30 and having a hollow interior 30h. The exploded view of FIG. 4 illustrates a partially sectioned elevational view of a female terminal means 14b noted previously and having the embossed portion E and tang T as described earlier. The hollow interior 30h of the insulating housing 30 is formed by side walls, a pair of which are provided with longitudinally extending grooves complementary to the first parallel parts 32p of the terminal means 32. The body portion 32a of the terminal means fits into a neck portion 30n formed as an extension of the grooves 30g. The neck portion 30n of the housing 30 is adapted to be located laterally on opposite sides of the second embossed portion 32h of the terminal means 32. The tang 32t of the terminal means engages a shoulder 30s formed along a bottom surface of one of the wall portions of the housing 30. A similar shoulder 30s is formed along an upper wall portion so that the terminal means 32 can be assembled into one end of the body or housing 30 in either of two opposite directions and yet properly provide for the connection to the mating female connector. The two positions are obtained by

a 180° rotation around the longitudinal axis of the terminal means 32. The first and second parts 32p and 32d can be described as side rails that provide a forward stop for the terminal means 32 relative to the housing 30 while a backward stop is obtained by the use of the tang 32t having a central location relative to the stabilizing portion 32s. These rails enhance stabilization relative to the housing 30 and also strengthen and stiffen terminal means 32.

While the embodiments of the present invention as herein disclosed constitute preferred forms, it is to be understood that other forms might be adopted.

What is claimed is as follows:

1. A male-blade electric terminal means for attachment to conductors, comprising, a ferrule portion adapted to be crimped into engagement with an end of a conductor, a blade portion as well as a stabilizing portion joined to said ferrule portion, said stabilizing portion having a location in between said blade portion and said ferrule portion so as to have said stabilizing portion include both a first pair of members extending integrally outwardly and upwardly from said stabilizing portion as well as a second pair of members extending integrally upwardly at an angle relative to both said first members and said stabilizing portion for increase in rigidity of said male-blade terminal means at a location intermediate said ferrule portion and said blade portion, a tang

bent downwardly away from said stabilizing portion and having a free end located in a direction toward said second pair of members, and embossed means including a first portion to enhance resilience of said tang and a second portion of less depth than the first portion and joined thereto at one end, said first and second embossed portions having axial alignment with each other as well as with said tang and blade portion, said second embossed portion providing increased longitudinal strength at a location where said blade portion and stabilizing portion are joined to each other, said tang being joined directly to one end of said first embossed portion in a location remote from said second embossed portion of said embossed means and centrally in longitudinal alignment with said conductor engaging portion as well as said blade portion.

2. The terminal means of claim 1 wherein said first and second portions of said embossed means collectively have a T-shaped though offset by difference in depth thereof respectively relative to each other.

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