Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.
IMPROVEMENTS IN OR RELATING TO TERMINAL FITTINGS FOR THE ENDS OF WIRES OR THE LIKE


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5 Claims. (Cl. 339—100)

This invention relates to wire-end terminals and connectors and has for an object to provide an improved solderless wire-end connection.

When the end of a stranded or other insulated wire is to be permanently provided with a terminal or connector, it is generally necessary for an end portion of the wire to be stripped of its insulation, and a sleeve-like portion of the terminal or connector is then secured on the stripped end portion by soldering or crimping. While the sleeve-like portion renders the greater part of the stripped portion rigid, a mechanically weak point occurs in this case between the end of the remaining insulation and the adjacent end of the said sleeve. It is an object of the present invention to avoid wholly or substantially the creation of this weak point. According to the present invention, a terminal is applied to an insulated conductor wire by placing a metal sleeve over the insulation of the wire and, after placing an extension of the terminal into contact with the conductor wire inside the metal sleeve, crimping the sleeve to secure the connector to the wire and compress the insulation inside the sleeve.

The spike is separate from the sleeve, which is provided as a separate ferrule of malleable metal and, after the spike has been forced into the end of the unstripped wire adjacent the conductor or, in the case of a stranded conductor, between the strands of the conductor, the spike is crimped around the insulation where the same encloses the spike thereby ensuring permanent high-pressure contact between the strands and the spike and at the same time a good friction hold of the spike, which prevents its withdrawal by the forces normally encountered at a terminal connection. In this case the collar, which no longer forms part of the conductively active element, can be made of a material having desired mechanical and/or chemical qualities irrespective of its conductive characteristics, for example in connection with a wire having P.T.F.E. (poly-tetrafluoro-ethylene) or nylon insulation, a ferrule of oxidation-resisting material, for example of stainless steel, may be employed to provide a terminal connection which is resistant to elevated temperatures.

The fact that in all forms of the invention the insulation is retained inside the crimped sleeve or ferrule contributes greatly to the reliability of the connection, since the elastic compressibility of the insulation, for example in the case of polythene-insulated wire or wire insulated with nylon or P.T.F.E., allows a considerable amount of deformation of the ferrule and corresponding compression of the insulation to be effected by the crimping, whereas after any minor elastic spring-back of the metal of the ferrule is taken up by elastic reexpansion of the insulating material without undue reduction in contact pressure, due to the relatively small elastic modulus of the insulation.

The metal spike is preferably formed with a re-entrant portion, for example by being formed with an arrow-head shaped loading portion, to increase the resistance against accidental withdrawal.

While one aspect of the invention consists in a method in which an insulated wire is provided with a terminal, other aspects consist in forms of connector which are specially adapted to this method and in an unstripped insulated wire end with a connector applied thereto by one of the methods of the present invention.

Various embodiments of the invention are illustrated in the accompanying drawing.

Figure 1 is an exploded view illustrating the application of a two-part crimped connector according to the invention to a stranded wire.

Figure 2 is a sectional elevation of the wire end with the connector applied thereto, and

Figure 3 shows a modified form of terminal member which may be substituted for that of Figure 2.

Figure 4 of the accompanying drawing is an elevation of yet another form of terminal member, which can be substituted for that of Figures 2 or 3 to obtain a plug-in terminal.

In Figure 1, i is an end of insulated stranded wire and a suitable connector comprises a malleable metal ferrule j and a connector lug k formed with a spike l. To apply the connector, the ferrule is slipped well over the wire and as indicated in chain-dotted lines at 3l. Then the spike l is forced home axially between the strands 11 of the wire, the ferrule is moved forward to be flush with the wire end, and then the ferrule is crimped into, for example, hexagon cross-section, whereupon the spike l is held firmly in contact with, and retained in the wire by, the deformed strands 11 (see Figure 2).

Figure 3 shows a modified form of terminal member, which is deformed into a stepped form so that the lug k2 is displaced from the plane of spike l2, for example tangentially of the crimped ferrule j, when the terminal is applied to an insulated wire.

Figure 4 shows another terminal which can be substituted for that illustrated in Figure 1. The terminal proper is formed as a plug pin m having a recessed groove n, and a lead-in taper o. The spike portion p is formed with an arrow head q, undercut at qa, and is tapered towards this arrow head from a flange r which, when the connector is assembled with an insulated wire, abuts the insulation of the wire and limits the penetration of the spike p. The shaft p of the spike is further provided with a pair of lateral flats s to prevent rotation of the terminal relative to the wire when the sleeve j (Figure 1) is crimped round the insulation.

What I claim is:

1. An insulating wire having a conductive core and an insulating covering and provided with a terminal element including a terminal and an extension to the terminal, said extension projecting axially into an unstripped end of the wire in contact with the conductive core, and a metal sleeve separate from the terminal and closely surrounding the said end of the wire and its insulating covering and being cramped thereto so as to hold the extension in intimate clamping contact with the core thus counteracting withdrawal, while the sleeve itself is electrically insulated from the wire core and terminal element by the insulating covering of the wire.

2. An insulating wire having a stranded conductive core and an insulating covering and provided with a terminal element having a terminal and a spiked extension to said terminal, said extension projecting endwise into the conductive core of an unstripped end of the wire between the strands of the core, and a metal sleeve separate from the terminal element, said sleeve being cramped on to said unstripped end of the wire so as to hold the extension in intimate clamping contact with the strands of the core, thus counteracting withdrawal, while the sleeve itself is electric-
cally insulated from the core by the insulating covering of the wire.

3. An insulating wire having a stranded conductive core and an insulating covering, the wire being provided with a terminal having a barbed extension which penetrates axially into an unstripped end of the conductive core between the strands thereof, and a metal sleeve separate from the terminal, surrounding and crimped about said unstripped end of the wire so as to hold said extension in intimate clamping contact with the strands of the core thus countering withdrawal, while the sleeve itself is electrically insulated from the wire core by the insulating covering of the wire.

4. An insulated wire as claimed in claim 2, wherein the sleeve is made of oxidation-resisting metal.

5. An insulated wire as claimed in claim 2, wherein the sleeve is made of stainless steel.

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