Oct. 10, 1939. J. M. WHITE 2,175,583

TERMINAL FOR ELECTRICAL CONDUCTORS

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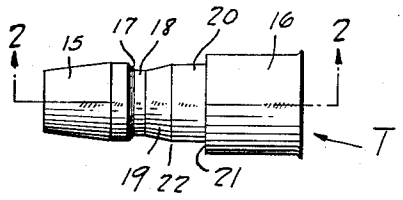


FIG. 1

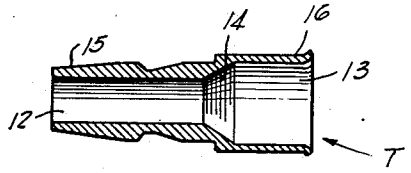


FIG. 2

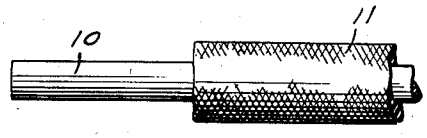


FIG. 3

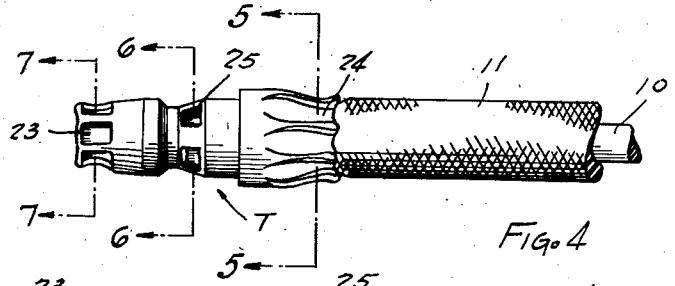


FIG. 4

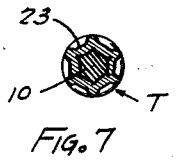


FIG. 7

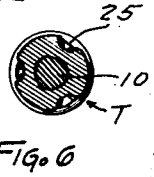


FIG. 6

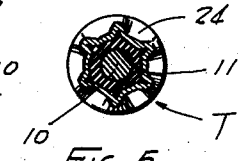


FIG. 5

INVENTOR.
JESSE M. WHITE.

BY Joshua R. H. Potts
ATTORNEY.

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TERMINAL FOR ELECTRICAL CONDUCTORS

Jesse M. White, Philadelphia, Pa.

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4 Claims. (Cl. 173—269)

This invention has to do with terminals such as are applied at the extremities of insulated electrical conductors for the purpose of adapting the extremity for insertion into a socket to establish an electrical connection.

At the present time it is common practice, particularly in the field of wiring motor vehicles, to employ a detachable connection which includes as one element a socket, and as the other element a terminal which is mounted on the extremity of an insulated electrical conductor. This terminal is usually formed with a groove extending thereabout which cooperates with a ball or protuberance in the socket to establish the detachable connection.

The present invention has in view, as its foremost objective, the provision of an electric terminal of the character above noted which is characterized as including a groove of a novel and highly improved construction.

In accordance with this invention the groove which receives the ball or protuberance in the socket is so designed as to present a sharp wall or inclined surface over which the ball or protuberance must ride to remove the terminal from the socket. In providing this sharp wall or inclined surface the invention has particularly in mind the provision of a groove which includes such a sharp wall or incline that is disposed more closely adjacent to the nose of the terminal, while positioned more remotely from the nose is the wall in which the angle of inclination is more gradual.

At the present time it is common practice in this art to crimp the metal at the nose of the terminal to the metal of the electrical conductor, and also to crimp the skirt of the terminal to the insulation about the conductor. As set forth in my co-pending application, Serial No. 60,917, filed January 27, 1936, it has also been proposed to provide an additional zone of crimpings of the terminal to the metallic conductor, and which zone is spaced from the crimpings at the nose. A groove of the formation above set forth particularly lends itself to this arrangement of providing a second crimping of the terminal to the metallic conductor, as these crimpings are readily formed in the gradually inclined surface.

Various other more detailed objects and advantages of the invention will in part become apparent, and in part be hereinafter stated, as the description of the invention proceeds.

The invention, therefore, comprises a terminal for insulated electrical conductors which is formed with a groove extending thereabout, and which groove presents a sharply inclined wall over which a ball or protuberance must ride in order to withdraw the terminal from a socket. This sharply inclined wall is disposed adjacent the nose of the terminal, and cooperating therewith to define a groove is a short bottom wall, and another inclined wall in which the angle of inclination is more gradual.

For a full and more complete understanding of the invention reference may be had to the following description and accompanying drawing, wherein

Figure 1 is an elevational view of a terminal made in accordance with the precepts of this invention prior to being applied to an insulated electrical conductor,

Figure 2 is a section taken about on the plane represented by the line 2—2 of Figure 1,

Figure 3 is an elevational showing of one end of an insulated electrical conductor prior to having the terminal mounted thereon,

Figure 4 is a side elevational showing developing the terminal after it is applied to the insulated electrical conductor,

Figure 5 is a transverse section taken about on the plane represented by the line 5—5 of Figure 4,

Figure 6 is another transverse section taken about on the plane represented by the line 6—6 of Figure 4, and

Figure 7 is still another transverse section taken about on the plane represented by the line 7—7 of Figure 4.

Referring now to the drawing, wherein like reference characters denote corresponding parts, and first to Figure 3, an electrical conductor is shown at 10 as provided with insulation 11 which is cut away to leave the conductor 10 bare at the extremity thereof. An electrical terminal which is designed to be mounted on the conductor 10 and insulation 11 is shown in Figure 2 as having a smaller bore 12 for receiving the conductor 10, and a larger bore 13 that is connected thereto by a conical wall 14. This larger bore 13 is designed to receive the insulation 11.

The terminal, which is referred to in its entirety by the reference character T, includes a nose portion at 15 that is formed about the bore 12, and is of a slightly conical formation. A skirt portion designated 16 surrounds the enlarged bore 13, and intermediate the nose 15 and skirt 16 is the improved grooved construction of this invention.

This groove comprises a front wall 17 which preferably has an inclination of substantially 45° with respect to the axis of the bore 12. Extending towards the skirt portion 16 from the bot-

tom of the wall 17 is a bottom wall 18 which may be substantially flat and is fairly narrow. An inclined wall 19 completes the formation of the groove, and this inclined wall 19 is of much greater extent than either of the walls 17 or 18, and has a relatively small angle of inclination with respect to the axis of the bore 12 as compared with the angle of inclination of the wall 17. This wall 19 terminates at the place where it joins in with a cylindrical wall 20 that extends rearwardly to a shoulder 21 that defines the skirt portion 16, the line of joinder between the conical wall 19 and cylindrical wall 20 being shown at 22.

With the terminal T positioned on the extremity of an insulated electrical conductor, the conductor 10 is received in the bore 12, and the insulation 11 in the enlarged bore 13 of the skirt 16. The metal of the nose 15 is then crimped to the metal of the conductor 10, as represented at 23 in Figure 4. Also, the skirt 16 is crimped to the insulation 11, as depicted at 24 in Figure 4.

In accordance with this invention crimpings are also formed in the conical wall 19, as shown at 25, and these crimpings crimp the central portion of the terminal T to the conductor 10. As clearly brought out in Figures 4, 6 and 7, fewer crimpings may be formed in the conical wall 19 than are formed in the nose 23, although this feature may vary as circumstances require.

It is evident that the conical wall 17 presents a sharply inclined surface over which a ball or protuberance in the socket must ride in order to withdraw one of the terminals from the socket. Thus a more positive assurance is given that the terminal will remain positioned in a socket. At the same time the construction of the retaining groove in no way interferes with the formation of the intermediate crimps 25.

While a preferred specific embodiment of the invention is hereinbefore set forth it is to be clearly understood that I am not to be limited to the exact construction illustrated and described, because various modifications of these details may be provided in putting the invention into practice within the purview of the appended claims.

I claim:

1. In combination, an insulated electrical conductor, a terminal having a nose portion formed with a bore receiving the conductor, and a skirt portion having an enlarged bore receiving the insulation, said nose portion being crimped to the conductor, said skirt portion being crimped to the insulation, said terminal having a portion intermediate said nose and skirt portion which is formed with a groove presenting a conical surface, there being a cylindrical contact surface between said groove and said skirt, and crimpings formed in said conical surface for crimping said intermediate portion to the conductor.

2. In combination, an insulated electrical conductor, a terminal having a nose portion formed with a bore receiving the conductor, and a skirt portion having an enlarged bore receiving the insulation, said nose portion being crimped to the conductor, said skirt portion being crimped to the insulation, said terminal having a portion intermediate said nose and skirt portion which is formed with a groove presenting a conical surface sharply inclined with respect to the axis of said bores adjacent to said nose, and a more extensive conical surface having a smaller angle of inclination with respect to the axis of said bores, there being a cylindrical contact surface between said groove and said skirt and crimpings in said last mentioned conical surface which crimp the said intermediate portion to the said conductor.

3. In combination, an electrical conductor, a terminal having a nose portion formed with a bore receiving the conductor, said terminal having a portion spaced from the nose and formed with a groove presenting a conical surface adjacent to said nose and sharply inclined with respect to the axis of said bore and a more extensive conical surface having a smaller angle of inclination with respect to the axis of said bore, and crimpings in said last-mentioned conical surface which swage the metal of the terminal and conductor into a solid cross-section.

4. In combination, an electrical conductor, a terminal having a nose portion formed with a bore receiving the conductor, crimpings in said nose portion swaging said terminal and conductor into a solid cross-section, said terminal having a portion spaced from said nose formed with a groove presenting a conical surface adjacent to said nose and sharply inclined with respect to the axis of said bore and a more extensive conical surface having a smaller angle of inclination with respect to the axis of said bore, and crimpings in said last-mentioned conical surface swaging the terminal and conductor into a solid cross-section.

JESSE M. WHITE.