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SEPARABLE CRIMPED CONNECTOR

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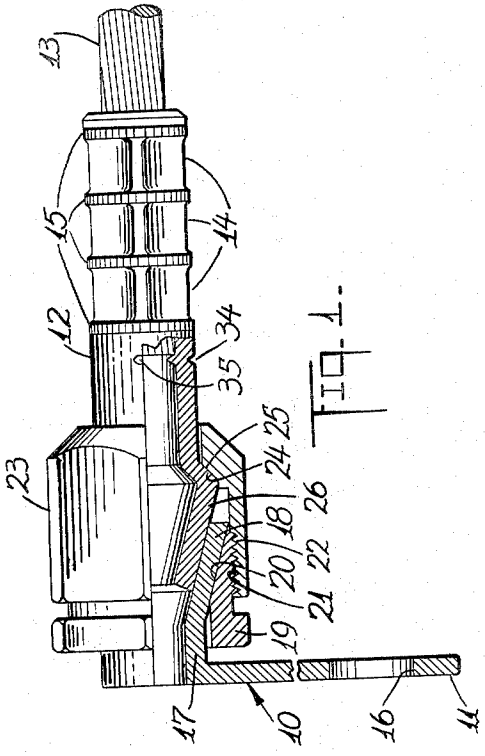


FIG. 1.

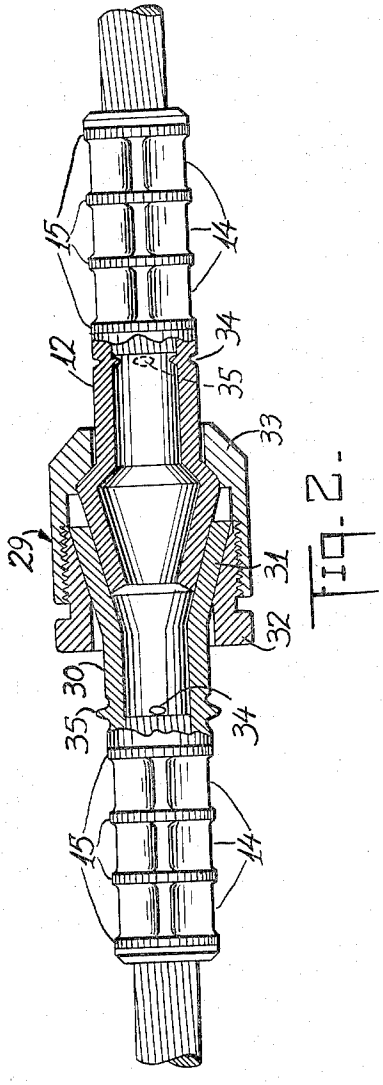


FIG. 2.

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SEPARABLE CRIMPED CONNECTOR

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3 Claims. (Cl. 339—268)

My invention relates to crimped type electrical connectors and more particularly to connectors which can be electrically and mechanically disconnected without destroying the crimped connection thereto.

The many advantages of crimped type connectors have resulted in their widespread use in fields hitherto limited to the soldered and cone-compression types. A crimped connector is easier and quicker to install and is initially less expensive. The crimped or indented connector has been shown to be completely reliable and it has been widely adopted in view of its many advantages and obvious savings.

Even where crimped connectors have to be replaced the number of replacements are usually relatively few so that despite the additional costs involved in replacements in a big installation, they retain much of the original overall savings.

I have found that it is possible to reduce the cost of such replacements where crimped connectors are involved by the strategic use of a crimped connector made readily disconnectable and reusable through the adoption of a separable feature.

Accordingly the principal object of my invention is to provide a crimped connector that may be readily disconnected without destroying the crimped element.

Normally a readily disconnectable means usually requires a threaded element, and since the indentable sleeves are made of soft malleable copper it is difficult to thread. Therefore a further feature of my invention is to provide an element in my connection that may be easily threaded. Such an element is usually made of metal less malleable and which usually results in a lower conductivity. As a consequence it is important that the portion of my separable crimped connector carrying the current shall be made only of highly conductive material to avoid loss in the electrical joint efficiency of my connection.

A still further object of my invention is to provide a means to retain the threaded element in the connector to facilitate shipment and loss of parts while the connector is being installed on a job; and to provide a connection that can be disassembled and assembled in a minimum of time.

I accomplish these and other objects and obtain my new results as will be apparent from the device described in the following specification, particularly pointed out in the claims, and illustrated in the accompanying drawing, in which—

Fig. 1 is a longitudinal side elevation view, partially in cross-section, of my device for use in a terminal type of connection, and

Fig. 2 is a longitudinal side elevational view, partially in cross section, of my device for use in a splicing type of connection.

With particular reference to Fig. 1 of the drawing, the reference character **10** designates a connector terminal comprising a lug **11** made of highly conductive metal, usually pure copper, and extending tubular sleeve **12**,

similarly made of pure copper which is readily malleable. The sleeve extends a sufficient length to permit insertion therein of a conductor **13**, which may be crimped or indented thereto by applying a suitable tool to the sleeve, causing the indentation **14** to appear thereon securing the conductor to the sleeve. The indentations are suitably spaced to prevent the overlapping of indentations and to provide the minimum length sleeve for the required number of indentations.

This may be accomplished by forming knurled rings **15** encircling the sleeve to indicate the spacing between indentations. The knurled rings may be formed on the sleeve at the factory during manufacture by rolling the sleeve against the knurling tool, a relatively inexpensive procedure. When the connector is installed on the job, the knurled rings may be used as a guide for the positioning of the indenting tool, thus insuring the proper spacing of the indentations.

One end of the lug **11** is perforated as at **16** to enable the lug to be mounted to a supporting structure, not shown. The other end of the lug is illustrated as having a transversely extending tube **17** or engaging member made of the same material as the lug and terminating in a flared or female portion **18**, which constitutes a contacting surface.

Between the lug and the flared portion, a hollow bolt **19** is positioned having a tapered cam surface **20** for engaging the outer surface of the flared portion, and an external threaded section **21** for engaging the internally threaded section **22** of a hollowed compression nut **23**, which encircles the sleeve **12**. An inner seat **24** is formed in the nut **23** to engage the shoulder **25** of the sleeve **12**. The bolt and nut **19** and **23** respectively constituting compression means for the connection.

Completing the sleeve **12**, the inner or male end **26** constituting a contacting surface thereof is tapered to snugly fit inside the flared end **18** of the lug tube **17**. In normal operation nut **23** is slipped over the end of the sleeve until it abuts shoulder **25** thereof, the bolt **19** having been positioned between the terminal lug and flared end **18** of the lug tube. The threads of the bolt and nut are then engaged and tightened, forcing tapered or male end **26** of the sleeve inside the flared or female portion **18** of the tube, establishing a good electrical contact between the tube and sleeve. Thereafter the conductor **13** is inserted in the sleeve **12** and indented to secure the conductor thereto. The terminal is thereafter mounted to its supporting structure.

In the event it becomes necessary to separate the terminal from its secured conductor for any reason, such as changing the terminal connector or replacing the terminal connector, with a different style connector, such as that shown in Fig. 2, this can be readily done by unscrewing the nut and bolt, and removing the terminal stud with its extending tube and retained bolt, and reestablishing the connection as desired.

The connector may be of the so-called splicing type **29** illustrated in Fig. 2, wherein the extending tube with its flared end is formed in another sleeve. Thus an indenting type of sleeve **30**, one end of which is flared as at **31** is provided to permit connection to the sleeve **12**, similarly as is the flared tube **17** of Fig. 1.

A hollow bolt **32**, identical with bolt **19** of Fig. 1 is similarly employed, engaging with the nut **33**, identical with nut **23**.

As a matter of convenience to the workman making the installation, cable stop **34** may be formed by indenting the inner end of the malleable sleeves of Figs. 1 and 2 to limit the forward movement of the conductor **13** as it is inserted into the sleeve thus insuring the proper location of the indentation with respect to the conductor. Likewise stops **35** may be formed projecting from the outer

surface of the sleeves to prevent the nuts 23 or 33 from becoming dissociated from the sleeve and lost, yet permitting the nut to be loosened for separating the connector.

Thus my invention makes possible connectors having extending sleeve sections made of malleable metal suitable for indentation to electrical conductors, and capable of transmitting current efficiently through the connector. A connection may be quickly made to the conductor obtaining the many advantages of indented connections. At the same time, and without loss of electrical efficiency, the connection may be broken by my separating feature for changing the type of connector, or for replacing a portion thereof, or for changing the connection itself.

I have thus described my invention, but I desire it understood that it is not confined to the particular forms or uses shown and described, the same being merely illustrative, and that the invention may be carried out in other ways without departing from the spirit of my invention, and, therefore, I claim broadly the right to employ all equivalent instrumentalities coming within the scope of the appended claims, and by means of which, objects of my invention are attained and new results accomplished, as it is obvious that the particular embodiments herein shown and described are only some of the many that can be employed to attain these objects and accomplish these results.

I claim:

1. A permanently indented electrical connection to a wire comprising a pair of soft malleable highly conductive metal sleeves short in length having conforming tapered contacting surfaces at one end, and pressure-

engaging surfaces; separate threaded means for compressing the pressure-engaging surfaces forcing the two contacting surfaces against each other and establishing a good electrical contact between the sleeves, at least one of said sleeves having an electric wire inside said sleeve permanently indented to said wire at the other end of the sleeve.

2. The permanently indented electrical connection of claim 1, wherein both sleeves are permanently indented to electric wires.

3. The permanently indented electrical connection of claim 1, wherein one of the sleeves is provided with an extending stud for attachment to a terminal post.

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