June 6, 1967 H. C. HERVIG 3,324,234

ELECTRICAL CONNECTOR STRAP

Filed Feb. 26, 1965

FIG. 1

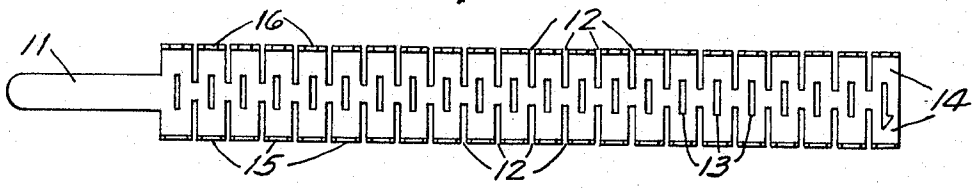


FIG. 2

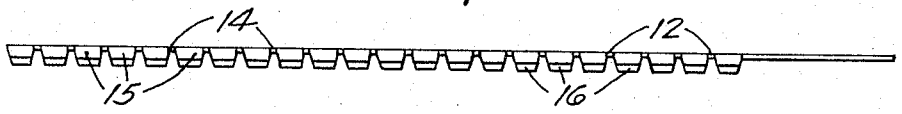


FIG. 3

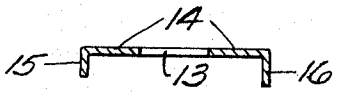


FIG. 4

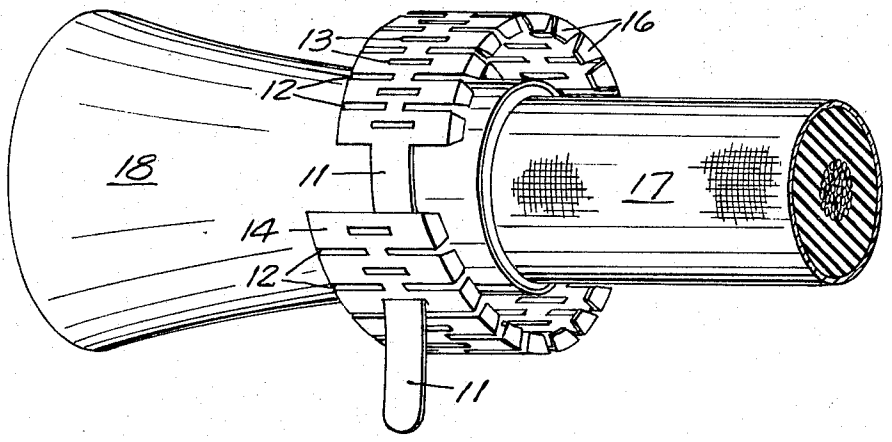
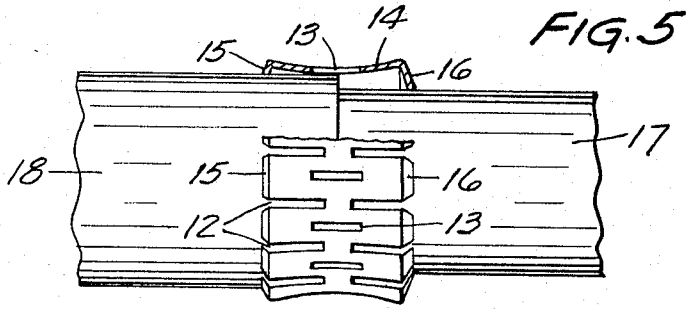


FIG. 5



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ELECTRICAL CONNECTOR STRAP

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This invention pertains to connectors for making electrical and mechanical connections. The connector of the invention will make connection with cables, rods, hex bars, and other conductive structures having a generally circular cross-section. One example of its general application is the connecting of ground straps to hexagonal bars. The connector is especially useful in affixing protective stress cones around and in permanent electrical contact with the terminal areas of metal shielded components of insulated high voltage cables in the making of encapsulated splices or terminations.

Electrical and mechanical connection can be made quickly and effectively by the use of the connector of the invention. The connector is self-contained, requiring no bolts, screws, or other separate or loose components and is of simple construction, being producible in quantity by simple stamping and bending operations. It will connect objects having a wide range of diameters and will make a flush, space saving connection. The connector can be applied by hand without tools to produce a permanent electrical connection between the objects to be connected.

Generally, the connector of the invention consists of a metal band with contact legs spaced along the longitudinal edges. When applied the contact legs on each side of the connector exert a constant force against the objects to be connected. This force is developed by the use of laterally extending resilient segments at the ends of which are disposed the contact legs. The connector is provided with a tab and slot arrangement so it can be quickly fastened around the objects to be connected.

A preferred form of the connector of the invention is illustrated in the drawing, in which

FIGURE 1 is a plan view of the connector as supplied,

FIGURE 2 is a side elevation of the connector of FIGURE 1,

FIGURE 3 is a transverse sectional view of the connector of FIGURE 1,

FIGURE 4 is a view in perspective showing the connector in the process of being applied to a metal shielded cable and an overlapping stress cone, and

FIGURE 5 is a side elevation, partly in section, showing the connector as applied to overlapping cylindrical objects.

As illustrated by FIGURES 1 and 2, the connector consists of a flexible elongate spring metal plate or band, preferably of spring temper brass, provided at one end with an elongate tab **11**. The band is formed with narrow, rectangular transverse notches **12** regularly spaced along the longitudinal edges of the band, thereby providing laterally extending resilient segments **14**. The end portions of the segments are disposed at right angles to the body of the band to form contact legs **15** and **16**. Transverse slots **13** are formed centrally along the length of the band and are adapted to accept the tab **11** to provide a closure when the band is placed around the pieces to be connected so that the tab may be inserted through a slot, pulled taut, and bent back over itself to provide a closure.

The following are the approximate dimensions of one illustrative embodiment of the connector. The connector is stamped from 10 mil spring temper brass. The length of the body of the band is about 5.50 inches. The tab, rounded at the end, extends from one end of the body of

the band about 1.12 inches. Prior to the bending of the end portions of the segments to form contact legs, the width of the band is .94 inch. The rectangular notches, .032 inch wide, are spaced opposite each other at intervals of .250 inch from center to center along the longitudinal edges of the band with .125 inch of band remaining between opposing notches. The width of the resulting resilient segments is .218 inch. The slots **13** are .032 inch wide and .250 inch long, spaced centrally .250 inch apart from center to center along the length of the band. The contact legs are tapered and bent down at right angles to the segments as illustrated. The shorter contact legs **15** are .070 inch and the longer contact legs **16** are .114 inch. These dimensions are particularly effective in providing a connector for affixing thin conductive closely fitting stress cones to shielded electrical cables having a shield diameter of approximately one-half to one and three-fourths inches. Other dimensions may be preferred for other applications.

FIGURE 3 is a cross-sectional view of the band. As illustrated, the contact legs **15** and **16** are formed at right angles to the arms **14**. The contact legs along one side of the band can be formed a length different than on the other side as illustrated by FIGURE 3 where the contact legs **15** are shorter than contact legs **16**. Having the contact legs of different lengths produces a level connection between objects which overlap, as illustrated in FIGURES 4 and 5, and less space in the splice area is taken up. The contact legs are preferably tapered, as shown in FIGURE 2, to facilitate the bending of the band around the cylindrical object and to produce a higher unit area force to be applied to the objects being connected because of the smaller area at the ends of the contact legs.

FIGURE 4 shows the connector in the process of being applied to a metal shielded cable **17** and an overlapping stress cone **18**. The connector is first centered around the joint with the side of the connector having the shorter legs facing the overlapping cylinder; the tab is then inserted into an appropriate slot, pulled taut, and bent back against itself. The tab and slot arrangement permits the connector to be fastened around the objects quickly and effectively. One size connector can be used with objects having a wide variety of diameters, any excess length being easily removed by cutting or folding. The connector is desirably provided with an indicator, such as the notch formed in the end slot of the connector as illustrated by FIGURES 1 and 4, to visually designate which side of the connector has the shorter legs.

FIGURE 5 shows the connector as applied. When the tab is inserted into a slot and pulled taut, the center portion of the connector becomes depressed and the diameter of the connector at the center is then less than at the edges. Due to the resiliency of the spring metal arms the depressing of the connector center produces a force, which is applied by the end of each contact leg to the connected object. The small area at the ends of the contact legs and the high force developed by the resilient segments produces a good electrical connection. The spring tension in each arm, translated through the contact leg to the object to be connected, is simultaneously accomplished in the connector when the tab is pulled taut around the objects.

The spring metal connector of the invention provides a convenient mechanical and a permanent electrical connection, is easily manufactured, and can be quickly applied to objects of a variety of shapes.

Changes in the specific form of the invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of the invention.

I claim:

1. An electrical connector useful in rapidly and effec-

tively securing mechanical and permanent electrical connection between a cable shield and an overlapping stress cones, the connector comprising a spring metal band having an elongate tab (**11**) disposed at one end thereof and adapted to be bent back over itself, said band having a longitudinal central portion along both sides of which uniform rectangular laterally extending resilient segments (**14**) are regularly and oppositely spaced, each of said segments including a contact leg (**15, 16**) disposed at a right angle thereto and at the distal end thereof, said band being of sufficient stiffness, and said segments extending laterally a sufficient distance, to permit constriction of the central portion of the band, when placed around the pieces to be connected and pulled taut by hand application into contact with the outer of said pieces, while still exerting a force through the contact legs sufficient to make permanent electrically conductive spring contact to the pieces to be connected, said band being transversely slotted centrally along the length of the band to provide a series of tab receiving slots (**13**).

2. An electrical connector as described in claim **1** in which said contact legs are tapered and are shorter on one side than on the other, and at least one of said slots has a terminal offset for designating the side of said band having the shorter contact legs.

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