

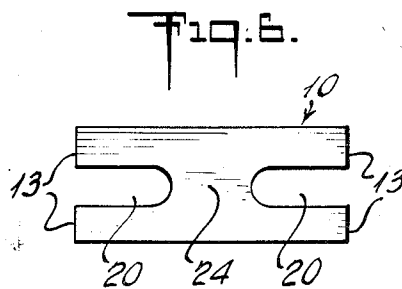
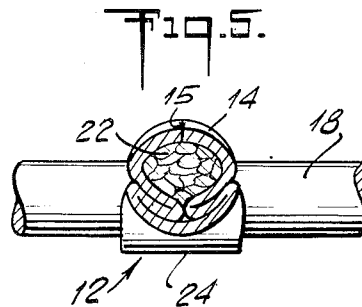
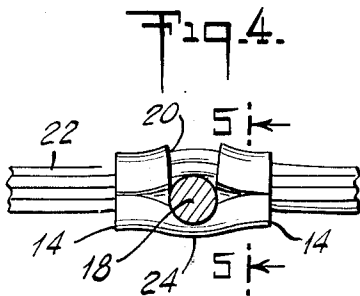
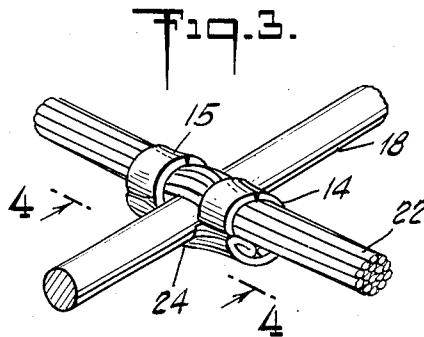
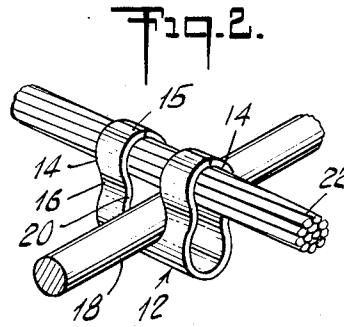
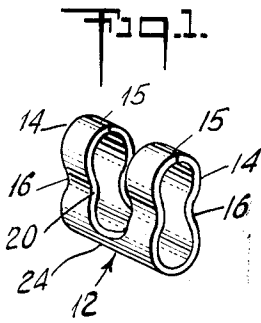
Aug. 28, 1956

W. R. EVANS

2,760,798

TAP CONNECTOR

Filed July 16, 1952



INVENTOR.
WILLIAM R. EVANS.

BY
Curtis Morris & Safford
ATTORNEYS

1

2,760,798

TAP CONNECTOR

William R. Evans, Oberlin, Pa., assignor to Aircraft-Marine Products, Inc., Harrisburg, Pa.

Application July 16, 1952, Serial No. 299,201

2 Claims. (Cl. 287—49)

This invention relates to electrical connectors and more particularly to a connector for pressure-formed X- and T-tap connections.

The present invention in certain of its aspects is ideally suited for joining a tap or lead-in conductor to a long transmission line and the invention will be described in connection therewith. It should be understood, however, that, in its broader aspects, the invention is applicable to the joining of any two wires or cables which intersect at a substantial angle.

Generally in the electrical connector art it has been the practice to join a pair of conductors by placing them in a generally parallel relationship, either end to end or side by side and then surrounding them with a connector having a ferrule in which the two conductors are crimped or soldered. With this type of connector, it was impossible to tap off from a mid-point of a long wire by a conventional connector having a closed or cylindrical ferrule portion.

According to the present invention there is provided a closed cylindrical type connector capable of joining a tap connector to a long conductor at a distance from its ends, by pressure-forming, whereby a stronger, superior connection is obtained.

It is accordingly a primary object of the present invention to provide an improved connector of the closed ferrule type and of a very simple construction, for joining a conductor to another conductor at a substantial distance from its ends. It is another object of the present invention to provide a tap connector for joining a tap wire to a long conductor. It is a further object of the present invention to provide a connector of the closed ferrule type for joining a tap conductor to a relatively long main conductor that may be easily and readily assembled and will remain assembled before crimping. It is a still further object of the present invention to provide a connector for joining two conductors which intersect at a broad angle, that may be readily placed over one conductor at any point and, by receiving the end of the other conductor, to be keyed in its assembly on both conductors. These and other and further objects will be in part apparent and in part pointed out as the specification proceeds.

In the drawings:

Figure 1 is a perspective view of the connector according to the present invention.

Figure 2 is a perspective view of the connector according to the present invention, assembled on the conductors to be joined.

Figure 3 is a view similar to Figure 2 after the pressure-forming of the connector.

Figure 4 is a side elevation partially in the section taken on line 4—4 of Figure 3.

Figure 5 is an enlarged cross-sectional view taken on line 5—5 of Figure 4.

Figure 6 is a top plan view of a blank from which the connector of Figure 1 is formed.

In Figure 6 there is shown a blank 10 slotted from each

2

end to give it an H shape. The connector 12 of Figure 1 is formed from this blank e. g., by stamping and brazing. This blank may be stamped from a sheet of copper, brass, soft steel or the like, depending upon the particular application for which it is intended. In the preferred form, the blank is stamped from a sheet of electrical grade pure copper, advantageously annealed after forming. The blank is rolled up into a U-shape, and the legs 13 of the H are formed in at 15 and 16 so that their ends abut and the ferrule has a form between an ellipse and a dumb-bell, or figure 8 as shown in Figure 1.

This tubular ferrule has the slot 20 in the middle thereof. The abutting edges of the end portions 14 are brazed at 15 to securely join them together. In describing the present invention the following terms will be used whenever possible as here defined. The term "top" will be used to denote those portions of the connector adjacent the seam 15. The term "height" is to be understood to mean the distance from the seams 15 to the bottom portion of the ferrules adjacent the web 24. The terms "width" or "breadth" will be used to denote the maximum dimension of the ferrule measured perpendicular to the height. The diameter of a lobe of the figure 8 is defined as the line from the center of curvature of one end perpendicular to the long axis through both centers of curvature of the figure 8 lobes.

In the connector 12 the slot 20 is wide enough to fit over the line conductor to which the tapping conductor is to be joined and the inside diameter of the upper lobe of the figure 8 portion of the connector 12 is slightly larger than the diameter of the tapping wire that will be joined to the main conductor. In the preferred embodiment shown, these diameters are approximately equal. The total height of the figure 8 is a little more than the sum of the diameters of the conductors to be joined, and the slot extends slightly less than the height, leaving enough metal at the bottom to provide a good electrical and mechanical connection.

To form the connection, the connector 12 is placed astride the main conductor or transmission line 18 so that the conductor 18 rests in the bottom of the slot 20. The tapping or take-off conductor 22 is then inserted through the top lobe of the figure 8 tube of the connector 12 so that it extends through both end portions 14 above the main conductor 18. This locks the tap connector about the main conductor 18 so that it will not fall off and it is now ready for pressure forming onto the junction of the conductors.

The assembled connector and conductors are then placed between semi-cylindrical concave dies adapted to fit respectively the upper and lower semi-cylindrical portions of the connector both at its end portions 14 and in the web 24. When the upper die is brought to bear upon the end portions 14, they buckle inward under pressure, as may be seen in Figure 5 and eventually fold at the indentations 16 under the tapping cable 22; and advantageously the whole is then compressed to form a substantially solid cross-section, as shown in Figure 5.

As shown in Figures 3 and 4 this draws the connector and stranded tapping conductor tightly about the main conductor 18 to the extent that the main conductor 18 is somewhat deformed and forged to the connector and cable, thus forming a substantially solid connection having excellent electrical and mechanical properties. Since the tapping conductor 22 is stranded, it is pulled down around the main conductor, giving a large area of contact and a strong connection.

There is thus provided a simple, readily applied and economical, yet extremely effective, connector for joining a tap conductor to a main unbroken conductor. The connection thus formed is of a very high quality both electrically and mechanically.

3

While I have shown above a certain specific example of this invention and its application in practical use, it should be understood that this is not intended to be exhaustive or to be limiting of the invention. On the contrary, this illustration and the explanation herein is given in order to acquaint others skilled in the art with this invention and the principles thereof and a suitable manner of its application in practical use, so that others skilled in the art may be enabled to modify the invention and to adapt it and apply it in numerous forms, each as may be best suited to the requirement of a particular use.

I claim:

1. A sheet metal tap connector adapted to be pressure-formed in a compact cold-forged electrical connection about a lead-in conductor and a main line conductor comprising a generally tubular member of malleable sheet metal and having a longitudinal seam therein, said seam being brazed to form a closed substantially homogeneous shell opposed longitudinal portions of said shell being reentrant to define upper and lower channels, the upper channel adapted to receive the lead-in conductor, a slot transverse to the longitudinal axis of said member, said slot extending through said upper channel and into the lower channel and having a width approximately equal to the diameter of the main conductor and a depth approximately equal to the width of said slot plus the diameter of said upper channel, said reentrant portions adapted to cause the metal of the shell to buckle inwardly around the lead-in conductor upon application of crimping pressure to the channel bottoms.

2. A tap connection joining a tapping conductor and a

4

main line conductor in a compact substantially solid body comprising a tubular ferrule, opposed longitudinal portions defining the top and bottom of the ferrule, a transverse slot extending through the top of said ferrule, the main conductor being disposed transversely of the ferrule in the bottom of said slot, the tapping conductor being inserted longitudinally of said ferrule between said main conductor and said ferrule top and fitting over one side of said main conductor, opposed longitudinal portions of said ferrule intermediate said top and bottom being folded inwardly and around the tapping conductor on each side of the main conductor tightly to embrace with said ferrule top the tapping conductor, and the bottom of said ferrule conforming tightly with and against said intermediate portions and the side opposite said one side of the main conductor.

References Cited in the file of this patent

UNITED STATES PATENTS

368,459	Clow	Aug. 16, 1887
579,238	Littlefield	Mar. 23, 1897
806,721	Wood	Dec. 5, 1905
819,968	Anderson	May 8, 1906
1,051,126	Lachman	Jan. 21, 1913
1,054,803	Stiver	Mar. 4, 1913
1,986,528	Ranger	Jan. 1, 1935
1,998,518	Mray	Apr. 23, 1935

FOREIGN PATENTS

30	668,347	Germany	of 1938
----	---------	---------	---------