Dec. 26, 1950 H. P. DUPRE 2,536,003

COAXIAL CABLE CONNECTION

Filed July 8, 1946

Fig. 1.

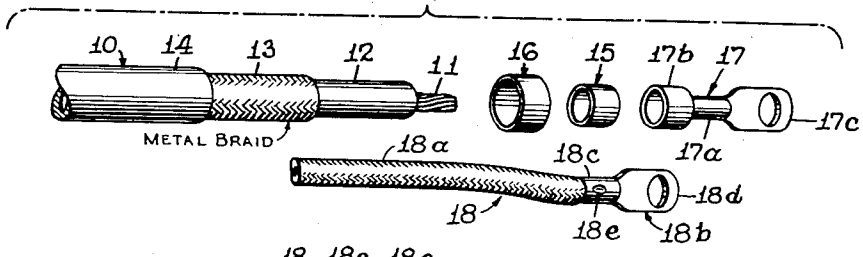


Fig. 2.

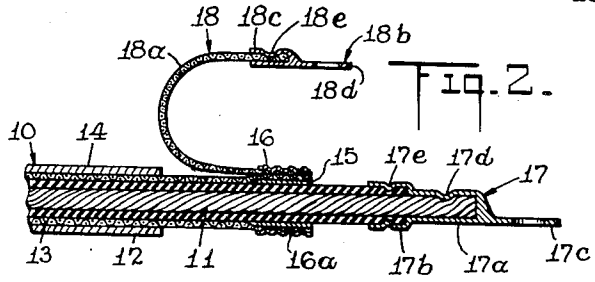


Fig. 3.

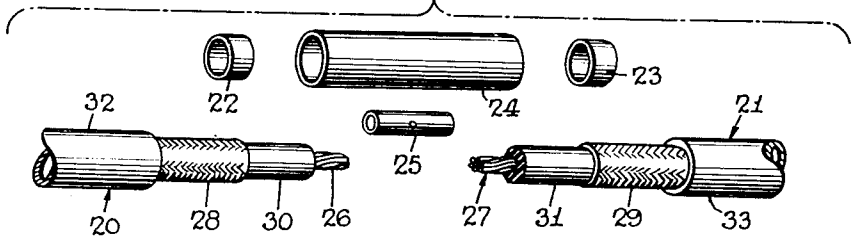
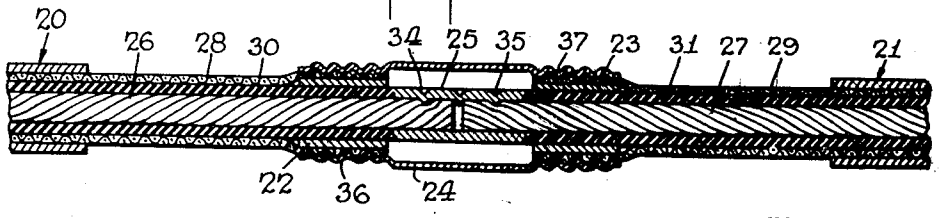


Fig. 4.



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2,536,003

COAXIAL CABLE CONNECTION

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3 Claims. (Cl. 174—88)

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My invention relates to coaxial cable connections and more particularly to means for establishing permanent connections for coaxial cables.

Hitherto such cable connections have been the separable type involving threaded parts, many of which required soldering to the conductors of the cables. Such connections are bulky, expensive and difficult to install. The use of solder may cause injury to the inner insulation and may necessitate the deposition of large amounts of metal on the outer conductor, thereby changing the electrical characteristics of the cable.

The principal object of my invention is to provide an indentable type of connection for coaxial cables which will not appreciably change the electrical characteristics of the cable.

Other objects are to provide a connection which will not require heat; which will not add appreciably to the diameter of the cable; which is inexpensive to install; requires little bulk or weight; and which can be manufactured at low cost.

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 an exploded perspective view of my device for terminal connections;

Fig. 2 is a longitudinally sectioned assembly view for coaxial cables showing the final connection;

Fig. 3 is an exploded perspective view of the elements of my device for making a splicing connection for coaxial cables;

Fig. 4 is a longitudinal sectioned assembly view showing the final splice connection.

In the drawing, reference numeral **10** designates a portion of coaxial cable having a central conductor **11**, an intermediate insulator **12**, the tubular conductor **13**, and the outer insulation **14**.

In order to provide my novel terminal connection, I provide an inner ferrule **15**, and outer ferrule **16**, a central conductor terminal **17** and an outer conductor connection **18**.

The central conductor terminal **17** comprises a tubular body section **17***a*, an insulation shroud **17***b* and a terminal lug **17***c*, all of which may be made from a single piece of metal tubing formed into the desired shape.

The outer connection **18** comprises a piece of flexible conductor **18***a* which has been inserted into a tubular connector **18***b* having a conductor carrying body portion **18***c* for inserting the conductor **18***a* therein, which connector **18***b* terminates in a terminal lug **18***d*. The connector **18***b* may also be made of a single piece of metal tubing formed into the desired shape, with the body portion **18***c* indented as at **18***e* to secure the conductor **18***a* thereto.

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The various elements are assembled in the following manner: The cable is stripped to expose a sufficient length of the central conductor suitable for insertion into the tubular body of the terminal **17**. The tubular conductor **13** is then bared and cut back for a short distance as shown in Fig. 1.

The outer ferrule **16** is then inserted over the tubular conductor **13** until it is adjacent the outer insulation and over the ends of conductor **18***a* which is compressed thereunder. The inner ferrule **15** is then inserted under the marginal edge of the tubular conductor until hidden from view. Thereafter the outer ferrule **16** with the end of conductor **18***a* thereunder is slid until directly over the inner ferrule **15**. A circumferential crimp **16***a* locks the conductors **13** and **18***a* to the ferrules **15** and **16**.

The terminal connector **17** is then inserted over the end of the central conductor **11**, with the shroud **17***b* covering a portion of the insulation **12**. The tubular body section **17***a* and the shroud **17***b* are suitably indented as at **17***d* and crimped as at **17***e*, respectively, to secure the terminal thereto.

The completed assembly of the connection is shown in section in Fig. 2.

In providing a splice connection, I employ the construction shown in Figs. 3 and 4. The elements include the coaxial cables **20** and **21**, the pair of inner ferrules **22** and **23**, an outer connection ferrule **24** and an inner connecting ferrule **25**.

Cables **20** and **21** each contain central conductors **26** and **27**, tubular conductors **28** and **29**, intermediate insulation **30** and **31**, and outer insulation **32** and **33**, respectively.

The cable ends **20** and **21** are prepared similarly as indicated for terminal connections.

The inner ferrules **22** and **23** are slipped under the tubular conductors **28** and **29**, as previously described. Thereafter the outer ferrule **24** is placed over one cable end and pushed to one side to expose the inner conductor. The inner ferrule **25** is then connected to the inner cable ends **26** and **27** and indented thereto as at **34** and **35**. The outer ferrule is pulled back into position so that the two ends thereof are positioned over

the inner ferrules with the tubular conductors inbetween.

Circumferential crimps 36 and 37 are applied to the ends thereof to secure the outer ferrule 24 into electrical and mechanical engagement with the tubular cable conductors. The assembled view is shown in Fig. 4.

The outer conductors 13 and 28 are preferably of the braided type which may be stripped from the insulation without damage to either, in order that the inner ferrules may be inserted thereunder. The inner ferrules support the crimping pressures and prevent the insulation from being crushed and insure a good electrical contact with the braided conductor and the outer ferrule.

Tools for performing the indenting and crimping operation are illustrated in pending applications Serial No. 510,426, now abandoned, and Serial No. 563,029, now Patent No. 2,457,538, issued December 28, 1948, respectively.

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.

What is claimed is:

1. A connection for transmitting current, comprising a coaxial cable having inner and outer conductors spaced apart by a layer of insulating material, the outer conductor made of hollow readily expansible stranded and braided metal separated at one end thereof from the layer of insulating material, an inner conductor sleeve having a tubular end made of metal attached to the end of the inner conductor, to permit transmitting current therefrom, said inner conductor sleeve having means at the remaining end for electrical attachment to another conductor, a rigid inner tubular ferrule made of non-collapsible metal positioned within the separated portion of the outer conductor and encircling the inner conductor, an outer ferrule made of crimpable metal encircling the outer conductor and positioned directly above the inner tubular ferrule, said outer ferrule being crimped to the inner tubular ferrule with the outer conductor being positioned therebetween, and extending means for electrically connecting the outer ferrule to another conductor.

2. A connection for transmitting current, comprising a coaxial cable having inner and outer conductors spaced apart by a layer of insulating material, the outer conductor made of hollow readily expansible stranded and braided metal separated at one end thereof from the layer of insulating material, an inner conductor sleeve having a tubular end made of metal attached to the end of the inner conductor, to permit transmitting current therefrom, said inner conductor sleeve terminating in a connecting lug section, a rigid inner tubular ferrule made of non-collapsible metal positioned within the separated portion of the outer conductor and encircling the inner conductor, an outer ferrule made of crimpable metal encircling the outer conductor and positioned directly above the inner tubular ferrule, said outer ferrule being crimped to the inner tubular ferrule with the outer conductor positioned therebetween, and a terminal conductor positioned between the outer conductor and the outer ferrule.

3. A connection for splicing electrical coaxial cables, said coaxial cables having inner and outer conductors spaced apart by a layer of insulating material, the outer conductors made of hollow readily expansible stranded and braided metal separated at one end thereof from the layer of insulating material, an inner hollow metal conductor sleeve receiving the adjacent ends of the inner conductor and indented thereto, a rigid inner tubular ferrule made of non-collapsible metal positioned within the separated portion of each of the outer conductors and encircling the inner conductors, an outer ferrule made of crimpable metal extending between and encircling the outer conductors and positioned directly above the inner tubular ferrules, said outer ferrule being crimped to the inner tubular ferrules with the outer conductors being positioned therebetween.

HENRY PETER DUPRE.

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