Feb. 1, 1944. W. A. BRUNO 2,340,732

COUPLING MEANS FOR TUBULAR ELECTRICAL CONDUCTORS

Filed June 27, 1942

Fig. 1.

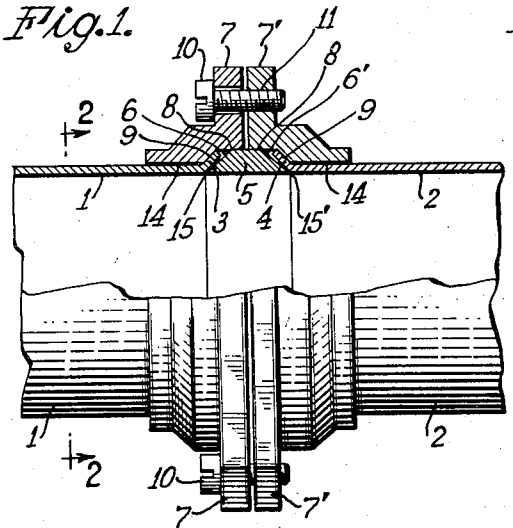


Fig. 2.

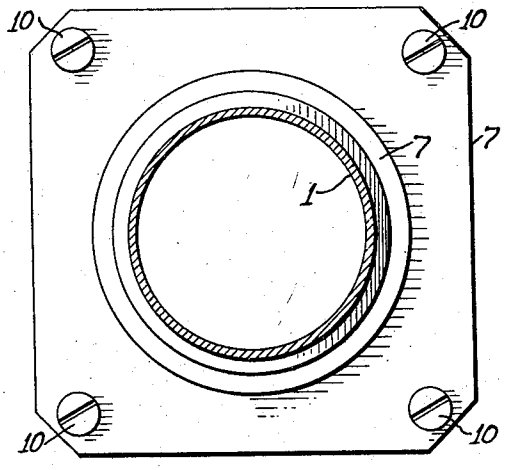


Fig. 3.

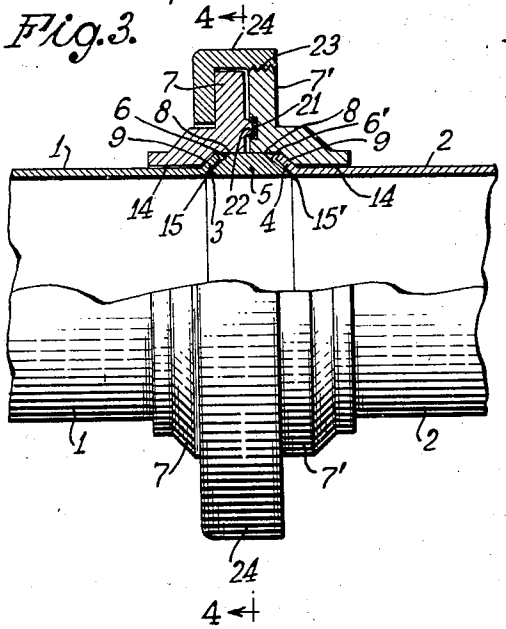
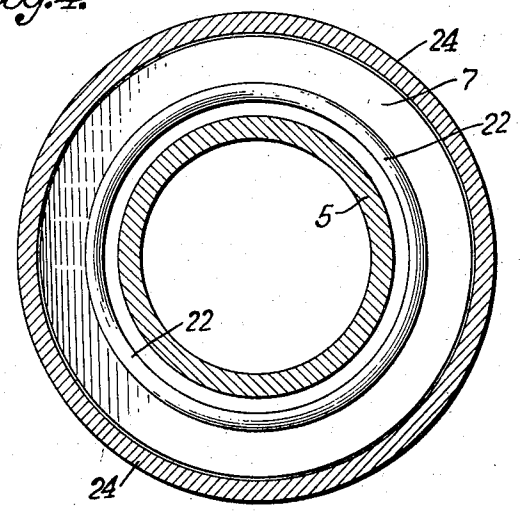


Fig. 4.



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COUPLING MEANS FOR TUBULAR ELECTRICAL CONDUCTORS

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1 Claim. (Cl. 285—86)

This invention relates to coupling means for tubular electrical conductors, and has particular relation to coupling means which are adapted to form a joint between the tubular high-frequency electrical conductor sections to be connected.

It is the main object of the present invention to provide a coupling means or connector which provides for safe electrical connection when assembled with the conductor sections to be connected without soldering elements of the coupling means to the conductor sections.

It is a further object of this invention to provide a connector which is adapted to form a gas-tight connection between the conductor sections to be joined.

Another object of this invention is to provide a connector which can be easily and quickly applied to and removed from the parts to be connected.

Other objects and the advantages of the invention will appear from the following specification and the appended claim when taken in connection with the drawing which forms a part of this specification, and in which

Fig. 1 shows a coupling means according to this invention partly in section, and partly in elevation;

Fig. 2 is an end view of the coupling means shown in Fig. 1;

Fig. 3 illustrates a modified form of a connector embodying my invention;

Fig. 4 shows a section on line 4—4 of Fig. 3.

Referring now to Figures 1 and 2, cylindrical conductor sections 1 and 2 adapted to be used in wave guides, for example, are provided with outwardly tapering conical end portions 3 and 4 preferably of substantially equal design and dimensions, said conical surfaces being produced as described further below, and forming an acute angle of, for example, 45° with the cylindrical inner surface of the conductor sections. A ring member 5, having bevelled portions 6 and 6', on its both ends, is adapted to be inserted between end portions 3 and 4 of conductor sections 1 and 2, respectively, the conical surfaces being preferably of substantially equal design on both ends of ring member 5, and forming with the cylindrical inner surface of this ring an acute angle somewhat smaller than the above mentioned acute angle formed by conical end portions 3 and 4. For example, an angle of 38° may be formed by said bevelled surfaces and the inner cylindrical surface of ring member 5.

In order to bring sections 1 and 2 and ring member 5 into tight engagement, removable flanged members 7 and 7' are applied to the ends of conductor sections 1 and 2. Each of these flanged members has an inner cylindrical surface 8, and an adjoining conical surface 9, forming substantially the same angle with cylindrical surface 14 as that formed by conical end portions 3 and 4 and the inner cylindrical surfaces of sections 1 and 2. By screwing screws 10 into holes 11, conductor sections 1 and 2, and ring member 5 may be brought into tight engagement. Once these parts are assembled, a contact between conductor sections 1 and 2 and ring member 5 is formed at 15 and 15', i. e. at the tips of conical end portions 6 and 6' and at the ends of the cylindrical portion of conductor sections 1 and 2, respectively.

In producing a connector illustrated in Figs. 1 and 2, flanged members 7 and 7' are first placed on the cylindrical conductor sections 1 and 2, and conical end portions 3 and 4 are then produced by means of a suitable tool.

In the embodiment shown in Figs. 3 and 4, flanged member 7' is provided with an exterior thread 23, and a recess 21, adapted to receive a resilient gasket of rubber or neoprene, for example, while the other flanged member 7 has a registering annular projection 22. Upon bringing members 7 and 7' into engagement by means of threaded coupling nut 24, a safe electrical connection and gas-tight seal is obtained.

The connector according to this invention may be used with advantage in outer conductors of co-axial cables, in wave guides, or in other tubular high-frequency electrical conductors of any type, and the conductor sections to be connected may be of circular, elliptical or other suitable cross-section.

It is to be understood that my invention is not limited to the specific embodiments presented herein for illustration, and is susceptible of numerous modifications within the scope and spirit of the invention as defined in the appended claim.

I claim:

In an electric connector, in combination tubular electrical conductor sections, each of which is provided with an outwardly tapering end portion, the tapering surface of which forms a first acute angle with the axis of the tubular conductor, a cylindrical intermediate member having inwardly tapering end portions, the surface of which forms a second acute angle with the axis of the intermediate member, said end portions being adapted to be received by the corresponding outwardly tapering end portions of the conductor sections, said second acute angle being

slightly smaller than said first acute angle, and means for bringing said intermediate member and the ends of the tubular conductor sections into engagement, said means including flanged members adapted to be applied to the end portions of the conductor sections, said flanged members being provided with an annular recess adapted to receive and fit to the tapering end portions of the tubular conductor sections and a portion of the cylindrical surface of the intermediate member, one of said flanged members being provided with a further recess adapted to receive a resilient gasket, while the other of said flanged members is provided with a projection registering with said further recess; a contact between said conductor sections and the conical end portions of said intermediate member being formed in assembled condition at the tips of said conical end portions and at the adjacent ends of the cylindrical portion of said conductor sections.

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