

Jan. 31, 1961

I. S. BLONDER
ELECTRIC CABLE CONNECTOR

2,970,184

Filed March 5, 1958

2 Sheets-Sheet 1

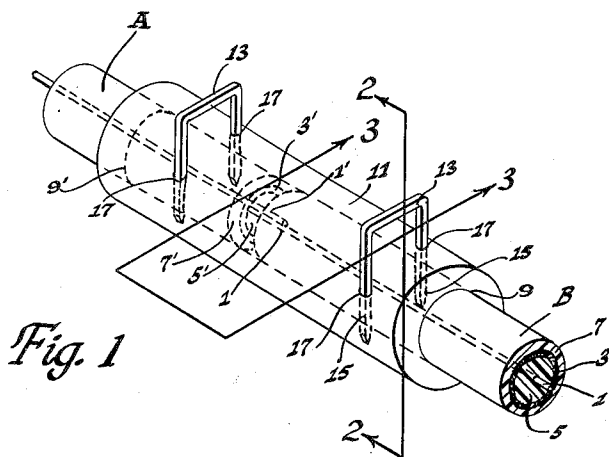


Fig. 1

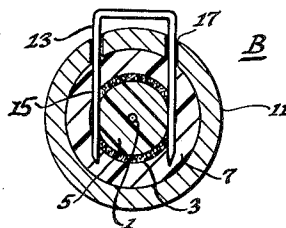


Fig. 2

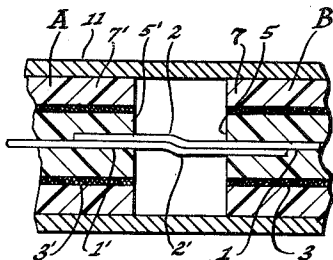


Fig. 3

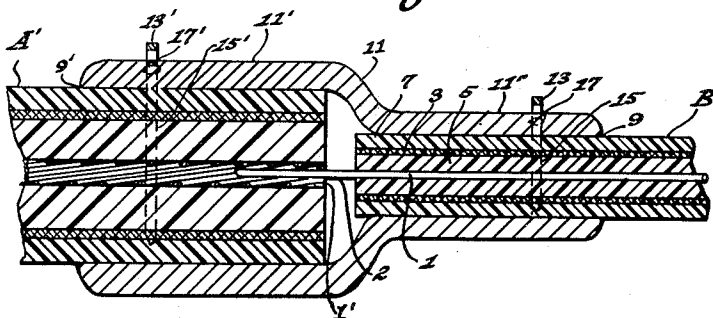


Fig. 4

INVENTOR.
Isaac S. Blonder
BY Rines and Rines
ATTORNEYS

Jan. 31, 1961

I. S. BLONDER
ELECTRIC CABLE CONNECTOR

2,970,184

Filed March 5, 1958

2 Sheets-Sheet 2

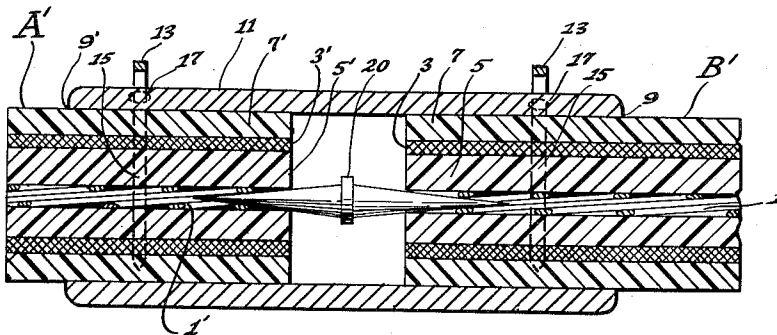


Fig. 5

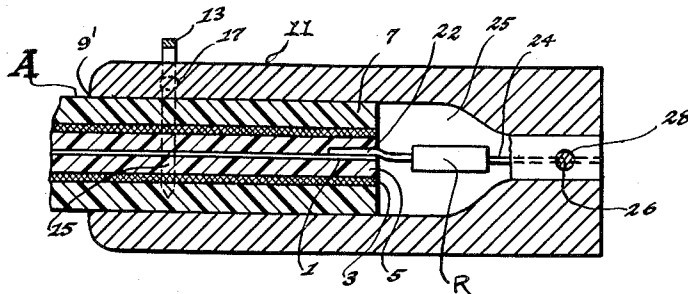


Fig. 6

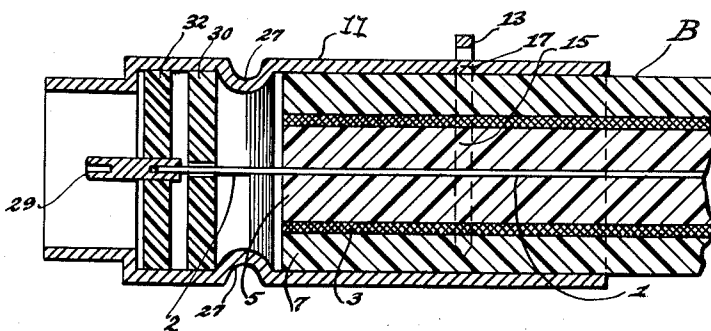


Fig. 7

INVENTOR.
Isaac S. Blonder
BY *Rines and Rines*
ATTORNEYS

1

2,970,184

ELECTRIC CABLE CONNECTOR

Isaac S. Blonder, West Orange, N.J., assignor to Blonder-Tongue Electronics, a corporation of New Jersey

Filed Mar. 5, 1958, Ser. No. 719,325

8 Claims. (Cl. 174-88)

The present invention relates to electrical cable connectors, and more specifically, to connectors that are particularly adapted for use with coaxial-line cables and the like.

As described in my copending application, Serial No. 574,906, filed March 29, 1956, for Transmission-Line Connector, it is frequently important to provide a transmission-line connector that can be quickly and reliably applied to or removed from the line, preferably without the necessity for solder joints or other time-consuming connecting structures. While the said copending application discloses apparatus particularly suited for such purposes as providing male and female coaxial connectors, it is important to provide, also, for other types of connection, such as splice-connections between two sections of coaxial cable.

It is with this last problem that the present invention is primarily concerned, though an object of the invention is to provide a novel connector of more general utility, as well.

A further object is to provide a new and improved solderless connector wherein, in summary, the use of a single appropriate conductive body for receiving and aligning the transmission-line cable and one or more staples may effect rapid, reliable and inexpensive solderless connection.

Other and further objects will be explained hereinafter and will be more particularly pointed out in the appended claims:

The invention will now be described in connection with the accompanying drawing, Fig. 1 of which is a perspective view of a preferred splice-connector constructed in accordance with the present invention;

Figs. 2 and 3 are fragmentary transverse and longitudinal sections, respectively, taken along the lines 2-2 and 3-3 of Fig. 1, looking in the direction of the arrows; and

Figs. 4 through 7 are views similar to Fig. 3 of modifications.

A pair of coaxial transmission-line cable sections A and B are shown in Fig. 1 each having inner conductors 1, 1'; outer coaxial sheath, braid or other conductors 3, 3' separated therefrom by cylindrical polyethylene or other insulation spacers 5, 5'; and an outer vinyl or other insulation covering 7, 7'. The cable sections A and B are shown received within openings 9, 9' at opposite ends of a generally cylindrical conductive body 11, which openings are preferably only sufficiently large to receive the cables A and B snugly, in order to align the same without appreciable play. It has been found that in such cables as, for example, type RG59U and the like, an extension of the inner cable conductors 1 or 1', respectively, may be inserted between the inner surface of the insulation 5 or 5' and the inner conductor 1 or 1' of the other cable section, alongside and in contact with the inner conductor 1 or 1', as more particularly shown at 2 and 2' in Fig. 3. This solderless connection or engagement of the inner conductors 1 and 1' may be effected with the

2

body 11 pushed back along one only of the cable sections A or B, after which the body 11 may be slid over the connection, as illustrated in Fig. 1.

Electrical connection between the outer and usually grounded conductors 5 and 5' of the cable sections A and B is effected, in accordance with the present invention, with the aid of staples or hasps 13 preferably U-shaped and of square cross-section, though other configurations may also be employed, as later explained. The arms 15 of the staples 13 are preferably pointed at their free ends and are separated or transversely spaced apart a distance greater than the diameter of the inner cable conductor 1 or 1' and less than the outer diameter of the coaxially disposed outer conductor 3 or 3' for a reason also later evident. The arms 15 of the staples 13 are received within correspondingly spaced pairs of apertures 17 on the surface of the body 11, on opposite sides of the spliced cables A and B. Since the cable sections are held aligned within the body 11, the arms 15 of the staples 13 will symmetrically penetrate the outer conductors 3 and 3', as more particularly illustrated in Fig. 2, preferably embedding in the outer covering 7 at the bottom thereof. If the arms 15 have at least portions of cross-dimension slightly larger than that of the openings 17, as when the openings 17 are substantially circular and the staple arms 15 are of appropriately dimensioned square cross-section, the arms 15 will "bite" into the material of the body 11 bounding the apertures 17 and lock therein as the staples 13 are inserted. Not only will excellent electrical connection be thus simply and rapidly established between the outer conductors 3 and 3' of the cable sections A and B, but a balanced and strong mechanical junction will also be established.

For splicing cables of different diameter, such as A' and B in Fig. 4, the conductive body may be formed in correspondingly shaped portions 11' and 11''. The connector of Fig. 4 may be useful, for example, when splicing types RG11U and RG59U cable sections A' and B, respectively. Where an inner conductor extension 2 is not sufficiently rigid or otherwise appropriately adapted, moreover, a separate inner-conductor tapered connector plug may be provided, as at 20, Fig. 5, for insertion into the inner conductors 1, 1' of the cable sections A', B'. This is of particular utility with type RG11U cables having multi-stranded inner conductors 1, 1'.

The same connection construction may also be applied to other types of connections such as, for example, the terminating of a cable with an appropriate impedance R. The body 11 again receives the stapled cable A within the opening 9', Fig. 6, and the terminating-impedance R is received within a recess 25. The impedance R may be connected by inserting the terminal lead 22 thereof adjacent the cable inner conductor 1, as before described, and wedging the other terminal lead 24 by a conductive pin 26 inserted within a transverse aperture 28 in the body 11 that communicates with the interior recess 25.

In Fig. 7, furthermore, a female connector may be provided, by inserting the extension 2 of the inner conductor 1 of the cable B through apertured transverse insulating spacers 30, 32, as of Bakelite or the like. The spacers 30 and 32 may be held within the body 11 by dimples 27 therein, and the spacer 32 may support a contact cylinder 29 to which the inner conductor extension 2 may be connected in any desired manner. Again, as in the case of the other embodiments of the invention, the staple 13 secures the cable section B that is inserted within the body 11.

Further modifications will occur to those skilled in the art and all such are considered to fall within the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. A connector splicing two sections of a coaxial cable

3

each having inner and outer conductors insulated from one another and an outer insulation covering, the connector comprising a conductive cylindrical body having openings at opposite ends receiving and aligning the two sections of cable and two longitudinally spaced pairs of apertures, the apertures of each pair being transversely spaced apart on the surface of the connector a distance greater than the diameter of the inner conductor and less than the outer diameter of the outer conductor of the corresponding section of cable, and a pair of U-shaped staples, one inserted within each pair of apertures, and each staple having at least a portion of the arms thereof of cross-dimension slightly larger than that of the apertures inserted within the apertures into the said outer insulation and outer conductor of the corresponding section of cable, the inner conductors of the cable sections engaging one another within the said body.

2. A connector splicing two sections of a coaxial cable each having inner and outer conductors insulated from one another and an outer insulation covering, the connector comprising a conductive cylindrical body having openings at opposite ends receiving and aligning the two sections of cable and two longitudinally spaced pairs of apertures, the apertures of each pair being transversely spaced apart on the surface of the connector a distance greater than the diameter of the inner conductor and less than the outer diameter of the outer conductor of the corresponding section of cable, and a pair of U-shaped staples, one inserted within each pair of apertures, and each staple having at least a portion of the arms thereof of cross-dimension slightly larger than that of the apertures inserted within the apertures into the said outer insulation and outer conductor of the corresponding section of cable, the inner conductor of at least one of the cable sections being inserted alongside the inner conductor of the other cable section within the said body.

3. A connector splicing two sections of a coaxial cable each having inner and outer conductors insulated from one another and an outer insulation covering, the connector comprising a conductive cylindrical body having openings at opposite ends receiving and aligning the two sections of cable and two longitudinally spaced pairs of apertures, the apertures of each pair being transversely spaced apart on the surface of the connector a distance greater than the diameter of the inner conductor and less than the outer diameter of the outer conductor of the corresponding section of cable and a pair of U-shaped staples, one inserted within each pair of apertures, and each staple having at least a portion of the arms thereof of cross-dimension slightly larger than that of the apertures inserted within the apertures into the said outer insulation and outer conductor of the corresponding section of cable, and means for connecting the inner conductors of the cable sections together within the said body.

4. A connector in combination with a coaxial cable having inner and outer conductors insulated from one another and an outer insulation covering, the connector comprising a conductive cylindrical body having an opening at one end receiving and aligning the cable and a pair of apertures transversely spaced apart on the surface of the connector a distance greater than the diameter of the inner conductor and less than the outer diameter of the outer conductor, and a staple having at least a portion of the arms thereof of cross-dimension slightly larger than that of the apertures locked within the same with the arms of the staple inserted within the apertures into

4

the said outer insulation and outer conductor of the cable, the body having a recess for receiving a line-terminating impedance with one terminal of the impedance engaging the inner conductor of the cable within the body and means for connecting the other terminal of the impedance to the said body.

5. A connector as claimed in claim 4 and in which the last-named connecting means comprises a conductive pin wedged within a further aperture in the said body into contact with the said other terminal of the impedance.

6. A connector in combination with a coaxial cable having inner and outer conductors insulated from one another and an outer insulation covering, the connector comprising a conductive cylindrical body having an opening at one end receiving and aligning the cable and a pair of apertures transversely spaced apart on the surface of the connector a distance greater than the diameter of the inner conductor and less than the outer diameter of the outer conductor, and a staple having arms inserted within the apertures into the said outer insulation and outer conductor of the cable, the body having a recess for receiving a line-terminating impedance with one terminal of the impedance engaging the inner conductor of the cable within the body and means for connecting the other terminal of the impedance to the said body.

7. A connector in combination with a coaxial cable having inner and outer conductors insulated from one another and an outer insulation covering, the connector comprising a conductive cylindrical body having an opening at one end receiving and aligning the cable and a pair of apertures transversely spaced apart on the surface of the connector a distance greater than the diameter of the inner conductor and less than the outer diameter of the outer conductor, and a staple having at least a portion of the arms thereof of cross-dimension slightly larger than that of the apertures locked within the same with the arms of the staple inserted within the apertures into the said outer insulation and outer conductor of the cable, the body having an apertured transverse insulating spacer means supporting an inner-conductor contact member exposed at the other end of the body, and means for securing the inner conductor of the cable to the contact member.

8. A connector in combination with a coaxial cable having inner and outer conductors insulated from one another and an outer insulation covering, the connector comprising a conductive cylindrical body having an opening at one end receiving and aligning the cable and a pair of apertures transversely spaced apart on the surface of the connector a distance greater than the diameter of the inner conductor and less than the outer diameter of the outer conductor, and a staple having arms inserted within the apertures into the said outer insulation and outer conductor of the cable, the body having an apertured transverse insulating spacer means supporting an inner-conductor contact member exposed at the other end of the body, and means for securing the inner conductor of the cable to the contact member.

References Cited in the file of this patent

UNITED STATES PATENTS

1,949,883	Sharp	Mar. 6, 1934
2,389,255	Graham	Nov. 20, 1945
2,694,183	Elden et al.	Nov. 9, 1954
2,755,330	Ludwig et al.	July 17, 1956
2,839,730	Rosenberg	June 17, 1958