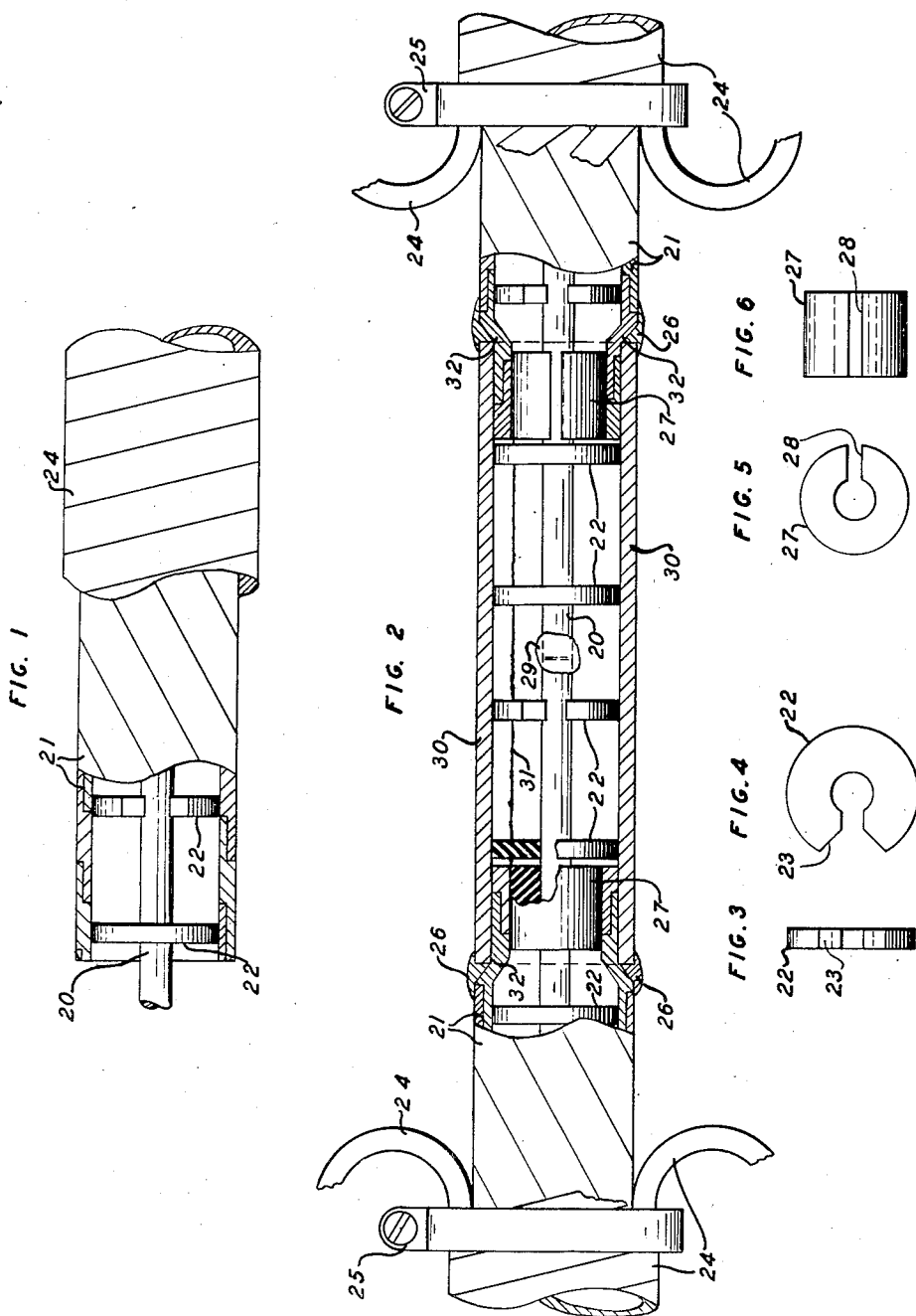


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METHOD OF SPLICING A CABLE

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METHOD OF SPLICING A CABLE

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1 Claim. (Cl. 174—21)

This invention relates to a method of splicing a cable and more particularly to a method of splicing a coaxial conductor cable.

One form of coaxial conductor cable comprises an inner conductor having thereon a series of split, spaced washers of insulating material, an outer cylindrical conductor thereover and a protective cover of spirally applied metallic tape over the outer conductor.

An object of the present invention is to provide a rapid and simple method of producing a satisfactory splice in cables of the kind described.

One form of the method of the invention contemplates clamping the parts to be spliced some distance from their ends, stripping back the armor tapes, cutting back the outer conductors and reducing the diameter of the cut back ends, joining the abutted ends of the inner conductors, applying discs over the joined inner conductor if necessary, joining the reduced and cut back ends of the outer conductors with a sheet of metal formed into a tube thereover and secured thereto, and winding down the armor tapes and securing them in place again.

Other features and objects of the invention will appear from the following detailed description of one embodiment thereof in a method of splicing one type of coaxial conductor cable, taken in connection with the accompanying drawing in which like reference numerals are applied to identical parts in the several figures and in which

Fig. 1 is a broken view partly in section of an end of a coaxial conductor cable previous to splicing;

Fig. 2 is a similar view of a completed splice;

Fig. 3 is a detached edge view of one of the regular washers of the cable;

Fig. 4 is a detached face view thereof;

Fig. 5 is a detached end view of a splicing plug, and

Fig. 6 is a detached side view thereof.

In the embodiment of the invention herein disclosed, a coaxial conductor cable, two ends of which are to be spliced together, comprises a central conductor 20 in the form of a wire, rod or tube of conductive material such as copper, an outer conductor 21 cylindrical in form and coaxial with the inner conductor and here shown as consisting of a plurality of tapes wound together to form the cylindrical shell. The two conductors are spaced apart by means of split washers 22 surrounding the inner conductor and on which the component tapes of the outer conductor are wound and supported. These washers 22 are spaced longitudinally along the cable at

the widest intervals compatible with the mechanical requirements in order that the largest practicable proportion of the dielectric between the conductors may be air. The washers themselves are of any insulating composition or material having suitable mechanical and electrical properties. The slots or splits 23 in the washers serve to permit them to be sprung over the conductor 20 in assembly, and also permit free circulation of fluid along the interior of the cable for drying the same or for filling it with inert gas or oil, or the like purposes. Over the outside of the outer conductor 21 is wound a protective sheath 24 of steel tape for both mechanical and electromagnetic protection.

Fig. 1 shows a square cut end of such a cable and Fig. 2 shows a nearly completed spliced joint of two ends abutted coaxially. To make such a splice, each of the ends is first provided some little distance from its extremity with a clamp or binding 25 over the undisturbed steel armor tapes, which may be merely a few turns of wire wound and twisted tightly around the cable or may be any suitable clamping means. The steel tapes 24 are then unwound and laid back from the extremity to the clamp.

At a convenient point between the extremity and the clamp, a ring of solder 26 is run around the exposed tapes of the outer conductor 21 and allowed to set. These tapes are then cut off squarely around the cable a short distance from the solder ring toward the extremity, exposing a length of the inner conductor 20 with some of the washers 22. These exposed washers are removed, and the extremity of the outer conductor 21 beyond the solder ring is squeezed down to decrease its diameter by about its own thickness as shown in Fig. 2. This may conveniently be done with a pair of pliers having appropriate arcuate notches in its jaws, or with any other suitable tool.

An insulating plug 27 having an axial bore and a radial slot 28 is then slipped over each of the exposed conductors and forced into the necked down portion of the outer conductor to ensure against subsequent short circuiting between the conductors at these points. The slot 28 permits the plug to be installed more easily and also serves to pass air, gas, oil or the like as described above.

The stripped ends of the two inner conductors 20 are then abutted tip to tip and joined by soldering, brazing, welding or in any other suitable manner as indicated at 29. New washers 22 are then forced over the now continuous inner con-

ductor at suitable intervals. This may be done by hand or with any suitable tool.

A piece of sheet metal 30, preferably of the same composition and thickness as the outer conductors 21, is then cut to have a length equal to the distance between the shoulders formed at the necked down portions of the outer conductors, and to have a width equal to the circumference of the outer conductors. This is then formed over the exposed washers 22 and over the necked down portions of the outer conductors, into a cylinder forming a bridge between the outer conductors, and with its longitudinal edges forming a seam 31 along the cable. These edges are then soldered or brazed or otherwise joined together, and the ends of the tube thus formed are soldered, brazed or otherwise joined to the outer conductors where they abut the shoulders thereof at 32.

The steel tapes 24 are then brought down and rewrapped about the conductors, corresponding tapes from the two sides being cut off to meet end to end, and these armor tapes then have their abutted ends soldered or otherwise secured down on the outer conductors. The splice is thus completed and the clamps 25 are removed.

The above illustrates a complete form of the invention as applied to the splicing of finished coaxial conductor cables. During the manufacture of cables of this kind, at one stage, the cable comprises the structure disclosed in Fig. 1 and described above omitting the steel armor tapes 24 which have not then yet been applied.

It may be desired to splice such unarmored cables, in which case the method will obviously be the same, omitting the early step of clamping and unlaying the steel tapes and the ultimate steps of rewinding and securing the steel tapes.

So also in the case of a similar cable having an extruded lead or lead alloy sheath in place of the steel armor tapes 24, the modifications of the invention necessary are obvious, as also if either type be additionally provided with fur-

ther weatherproofing sheaths, e. g. of asphalt impregnated jute, paper or the like either over or under the outer metallic sheath.

An important feature of the preferred form of the invention is the squeezing or necking down of the ends of the outer conductors 21, so that after the auxiliary sheet 30 has been formed into a tube over the necked down ends, the external diameter of the tube so formed is substantially the same as the normal outer diameter of the conductors 21, and hence, when the splice is completed there is substantially no bulge in the outer surface of the spliced cable at the splice. Wherever in the appended claim the phrase "necking down" is used, it is to be understood to mean a reduction in diameter by squeezing as distinguished from any cutting away or paring off of material.

The invention has been described as applied in the case of one minutely described type of coaxial conductor cable, but may obviously be modified and varied for use with related types of cable without departing from the invention. The embodiment disclosed is merely illustrative and may be modified and departed from in many ways without departing from the spirit and scope of the invention as pointed out in and limited solely by the appended claim.

What is claimed is:

A method of splicing two ends of cable having a coaxial conductor pair with washers between the conductor pair and a sheath thereover which comprises the steps of stripping back the sheath on each of the said ends, cutting back the ends of the outer conductors of the pairs to be joined, necking down the cut back ends, stripping the washers from the exposed ends of the inner conductors of the pairs, abutting and joining the ends of the inner conductors of the pairs, replacing the removed washers, forming an auxiliary sheet of metal into a tube enclosing the necked down ends of the two outer conductors, and joining the tube to the two outer conductors.

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