May 22, 1934. C. S. ANDERSON 1,959,402

METHOD OF CONNECTING CABLES AND THE LIKE AND ARTICLE PRODUCED THEREBY

Filed April 30, 1930

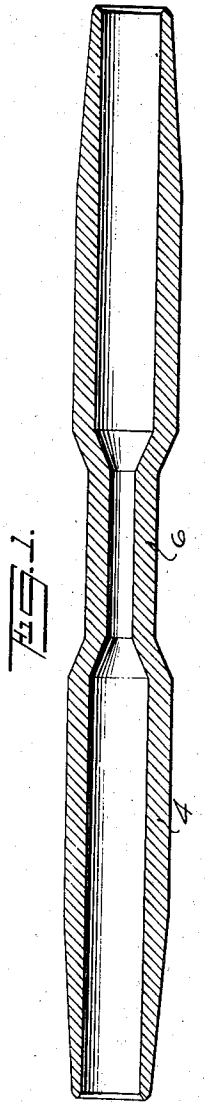


Fig. 1.

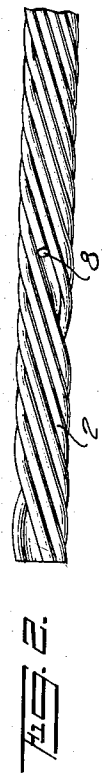


Fig. 2.

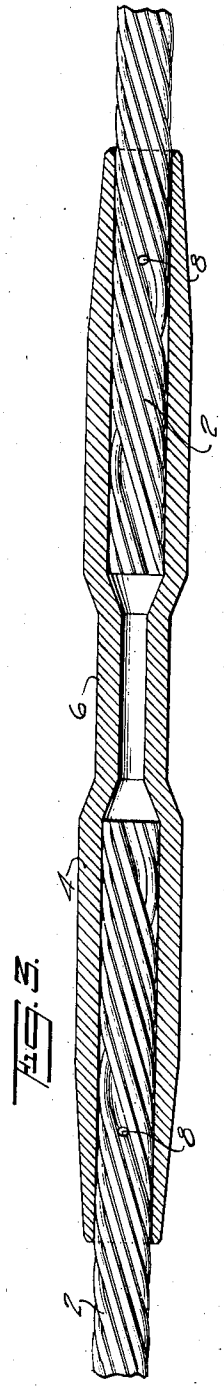


Fig. 3.

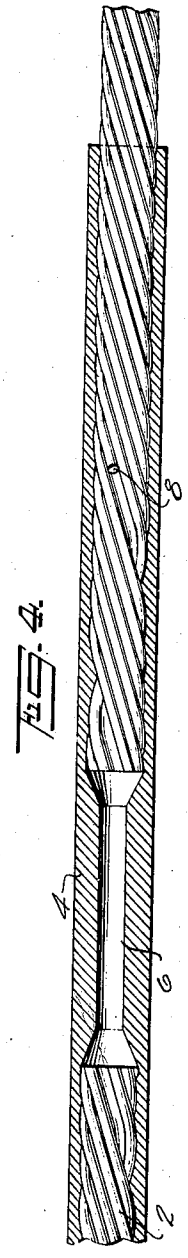


Fig. 4.

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METHOD OF CONNECTING CABLES AND THE LIKE AND ARTICLE PRODUCED THEREBY

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Application April 30, 1930, Serial No. 448,670

5 Claims. (Cl. 29—148)

My invention relates to a method of making connections between rods, tubes, wires, ropes and the like, hereinafter for convenience designated as "bodies such as cables", and further relates to an article of manufacture that may be produced by carrying out the method.

One of the objects of my invention is to provide a novel and improved method of this character.

Another object of my invention is to provide a novel and improved article of manufacture.

The several features of my invention whereby the above-mentioned and other objects may be attained will be readily understood from the following description and accompanying drawing in which—

Figure 1 is a longitudinal sectional view of a connector tube which may be employed in carrying out my improved method;

Fig. 2 is a side elevation of a cable end ready to be inserted in the connector tube in accordance with my improved method;

Fig. 3 is a sectional elevation showing the cable ends inserted in the connector tube; and

Fig. 4 is a similar view of the completed joint.

My improved method may be employed in connecting multi-layer wire cables 2 as shown. In accordance with my improved method as preferably carried out, a tubular connector casing 4 is provided which may be made of copper or other suitable metal. The central portion 6 of this casing is reduced in diameter as shown. The ends of the cables 2 are inserted in the ends of the casing which is then subjected to a drawing action so as to cause intimate inter-engagement of the materials of the casing and the cables. This operation may be performed by a split die initially positioned over the reduced portion 6 of the outer casing and moved in one direction over one end of the casing, and the operation subsequently repeated in the opposite direction, thus reducing the casings on the cable ends. The steps of the method so far described may be and preferably are the same as the corresponding steps of the method described and claimed in U. S. Letters Patent to Alfred Johann Auspitzer, No. 1,599,356, dated September 7, 1926 to which reference may be had for a full and complete description of the same.

In accordance with the present invention the outer surfaces of the end portions of the tubular casing are gradually reduced in diameter toward their outer ends, the remaining inner portions to the ends of the cables being of uniform diameter. As the drawing dies are forced outwardly full compression results during the passage of the dies over the portions of the casing having maximum diameter, but as the dies travel over the tapered portions, this compression gradually becomes less until it finally reaches substantially zero a short distance before the ends of the casing are reached.

The exact degree and length of the taper may vary more or less depending upon the size of the casing and the kind of metal used. Preferably the minimum diameter of the taper at the ends of the casing is slightly less than the diameter of the dies so that there is no substantial compression of the extreme ends of the casing. The length of the taper may, in most instances, be from three and one-half to four times the diameter of the die but may be appreciably less in case of hard drawn copper cables.

One advantage of this method is the avoidance of a substantial change of stress conditions in the cable at or very close to the end of the connector casing, thus reducing the tendency of the cable to break at that point at a value below its full strength. Also, by having the dies pass along the tapered portions at reduced pressures reaching zero just before the dies pass over the ends of the connector casing, a bell mouth effect is produced on the inside of the ends of the connector casing, which overcomes any tendency for the cable to "crystallize" or fail owing to fatigue caused by bending repeatedly at these points while in service.

Heretofore, in the case of multi-layer wire cables, the drawing of the connector casing had a tendency to cause the outer layer to arch in such a manner as to prevent the pressure from being transmitted completely to the core of the cable. To overcome this difficulty, in accordance with my improved method, I preferably cut off at 8 one of the wires from the outside layer of each cable for a distance of about one-half the length of the portion of the cable extending into the drawn connector casing. The cutting off of this wire from each cable end, allows the inner portion of the outer layer of each cable to compress and the drawing pressure to be transmitted completely to the core of the cable. Thus the several layers of wire are firmly and completely held within the connector casing so that there is no danger of the wires working loose or becoming disengaged from the casing.

As will be evident to those skilled in the art, my invention permits various modifications without departing from the spirit thereof or the scope of the appended claims.

What I claim is:

1. The method of securing a connector casing on one end of a multi-layer wire cable which comprises cutting off one of the wires of the outer layer of the cable a distance from the end of the cable, inserting said end of the cable in one end of the connector casing with said cut-off end of said wire spaced a distance inwardly from said end of the casing, and subjecting the casing to a suitable mechanical action so as to cause intimate interengagement of the materials of said casing and said cable.

2. The method of securing the end of a connector casing on one end of a multi-layer wire cable which comprises cutting off one of the wires of the outer layer of the cable a distance from the end of the cable, inserting said end of the cable in one end of the connector casing, subjecting the casing to a suitable mechanical action to cause intimate inter-engagement of the materials of said casing and said cable, said cut-off end of said wire being spaced from said end of the casing a distance corresponding substantially to one-half of the length of the portion of the cable extending into said casing.

3. An article of manufacture comprising a multi-layer wire cable having one of its wires cut off a distance from the end of the cable, and a connector casing surrounding said end of the cable and extending a distance over said cut-off end of said wire, with the materials of said casing and said cable in intimate inter-engagement.

4. The method of connecting the end of a multi-layer wire cable to another article, which comprises cutting off one of the wires of the outer layer of the cable a distance from the end thereof inserting said end in a tubular casing having a substantially uniform inner bore and having an outer diameter gradually reducing from a point spaced a distance from the outer end of the casing toward said outer end, and subjecting the casing to a drawing action so as to cause intimate inter-engagement between the materials of the casing and said body.

5. The method of connecting the ends of multi-layer wire cables which comprises cutting off one of the wires of the outer layer of each cable end a distance from the end thereof, inserting said ends in the ends of a tubular casing having a substantially uniform inner bore and having an outer diameter gradually reducing from points spaced a distance from the outer ends of the casings toward said outer ends, and subjecting the casing to a drawing action by means of dies having a diameter slightly greater than the minimum diameter of the ends of the connector casing so as to cause intimate inter-engagement between the materials of the casing and said bodies.

CEDRIC S. ANDERSON.