Dec. 27, 1960 J. T. GALE 2,966,541

DEAD-END CONNECTOR

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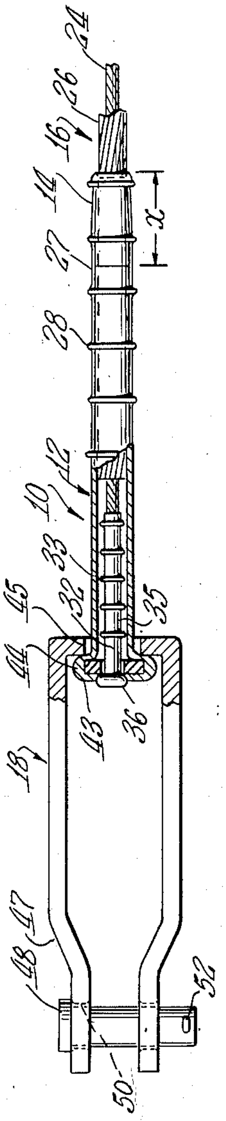

FIG. 2.

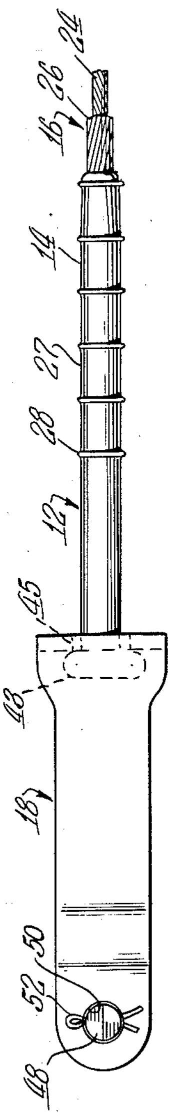

FIG. 1.

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DEAD-END CONNECTOR

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This invention relates to cable connectors, and more particularly to connectors for anchoring the ends of composite transmission line cables to a supportnig structure.

It is common in high power transmission lines to use an outer stranded cable conductor made of soft metal having high electrical conductivity such as aluminum over a reinforcing core of harder metal, such as steel. An example is the aluminum cable with steel reinforcement (A.C.S.R.).

In the past, anchorage for this type of transmission line has been provided by connectors having two concentric sleeves of different lengths, the outer sleeve attached to the sheath conductor and the inner sleeve attached to the core. In the dead-end type of connector, each sleeve terminates at the free end of the cable in a clevis, one within the other. Oppositely positioned holes in each clevis are aligned to take an anchor pin which attaches each cable member through its respective clevis to a supporting structure.

This type of connector has many disadvantages. For example, it is important in the use of composite cables for transmission lines that the stress on each member of the cable occur simultaneously to prevent an unbalanced strain. Each cable member being provided with its attached clevis, must be aligned with one another, and therefore a balanced stress is difficult to achieve. A simplified solution to this problem is an object of my invention.

Further, if a clevis is provided for both inner and outer cable members, there are four holes through which the anchor pin must be inserted. As the usual installation occurs on a transmission pole high above the ground and in an inconvenient position, it is awkward and time consuming to jockey the inner and outer clevises so that each pair of holes will be aligned to receive the anchor pin which is simultaneously secured to the eye on the usual strain insulator. A similar difficulty is encountered in removing the anchor pin where the uneven stress on the pin by the clevises causes it to stick until the holes are exactly aligned. Accordingly, another object of my invention is the eliminiation of the double devices in my simplified construction.

Individual steel and aluminum clevises were used to independently hold the steel and aluminum portions of the cable. Where this was eliminated, a steel reinforcement was cast into the aluminum clevis to help support the load carried by the steel cable core. A further object is the elimination of the need for casting aluminum parts.

A further object seeks to minimize the corrosion and loss of conductivity that usually occurs in the prior art connectors by moisture seeping in between the core and the conductor through the space between the clevises.

Still other objects of my invention are to provide a connector which can be manufactured at a reduced cost by eliminating machining operations; which is labor saving during installation; in which indentable connections are provided for attaching the cable members; and which

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is lighter in weight, less bulky and less expensive than previous types.

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 a side elevational view of my dead-end connector attached to a transmission cable.

Fig. 2 is a plan view of the same, partly in longitudinal section.

In the drawing, **10** designates a dead-end type of connector incorporating my invention, and comprises a body member **12**, made of electrically conducting metal, preferably aluminum tubing terminating at one end in a hollow tubular portion **14** adapted to receive the composite cable **16**, and at the other end in an attached clevis **18** adapted to secure the connector to a supporting structure, such as a strain insulator, not shown.

The cable **16** may be the conventional high strength transmission type of A.C.S.R. cable, consisting of a steel core member **24** and an aluminum sheath conductor member **26**. Other types of reinforced cables may be used.

The tubular portion **14** of the body member receives the sheath conductor member **26** and is attached thereto, preferably by indentation **27**, the guide lines **28** being provided to assist the workman in positioning the indenting tool and prevent overlapping of the indentations.

The tapered end of the body member has a two-fold advantage. Firstly, the strain on the connector is redistributed so that the greatest strain is furthermost from the free end or mouth of the tubular portion, which is the weakest point as it is the point where the connector first takes the load. Secondly, the effect of cable vibration is reduced by gradually relieving the "notched effect." The tensile strength of the sheath conductor member is gradually transferred to the tubular portion.

The hollow tubular body **12** of the connector houses a steel tube or hollow member **32** for attachment to the steel core **24**, preferably by indentations **35**.

The steel tube may similarly be provided with guide lines **33** for proper positioning on the indenting tool.

A headed or enlarged portion **36** at one end of the steel tube **32** bears against the headed or enlarged portion **43**, at one end of the encircling aluminum tube **12** to support the tensioned steel core of the cable. A steel washer or ring **44** preferably of standard size, is contained within the enlarged portion **43** to reinforce same. Two standard washers may be used to provide a thicker headed portion. The end of the aluminum tube, after heading or enlargement, is peened over the washer to form a confining chamber.

The clevis **18** is provided with an opening **45** to receive the aluminum tube **12**, the opening being sufficiently small to engage the headed portion **43** and support the cable. The clevis legs may taper inwardly as at **47** to receive the anchorage pin **48** fitted through the aperture **50** in each leg of the clevis. A cotter pin **52** may be inserted into the apertured stem of the anchorage pin to secure the same against accidential withdrawal.

The cable connection is made by inserting the dead-end connector over the cable allowing the end of the cable to extend beyond the opening **45**. The end of the sheath conductor **26** is stripped along its length sufficiently to permit the end of the core **24** to fit within the hollow steel tube **32**, and is secured therein. The connector is then pulled back over the cable until the head **36** of the tube abuts the reinforced headed portion **43**, and the end portion **14** of the tube is indented to the sheath conductor **26**. The space between the tubes may be filled with a protective compound.

In the foregoing construction, the various objects of my invention have been achieved. A single clevis is used with consequent saving in cost of manufacture and time in installation. My construction, using a strong reinforcing ring or washer captured within the end of the hollow tube of soft metal, provides a less bulky dead-end or splice connector and with less weight than previously devised types.

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.

I claim:

1. An electrical connector for attachment to a soft metal cable having a relatively hard core comprising a first tubular member having one end for attachment to the soft metal of the cable and at the other end having a portion of enlarged outer diameter with an internal peripheral recess, a relatively hard metal ring captured withing said peripheral recess; a second tubular member of relatively hard metal positioned within and coaxially to said first member and extending through said metal ring having one end for attachment to the core of said cable

and having at its other end a portion of enlarged outer diameter and means surrounding the enlarged diameter of said first member for supporting said electrical connector.

2. An electrical connector for attachment to a soft metal cable having a steel core comprising a soft metal hollow tubular body member for attachment at one end to the soft metal of the cable, a portion of enlarged diameter at the other end, a relatively hard metal ring positioned within said enlarged portion of said body at the other end and secured thereto, a hollow relatively hard metal member positioned within and coaxially to said body member and extending through said metal ring for attachment at one end to said core of the cable and including at the other end a portion of enlarged diameter for coaction with the end of said body member containing the metal ring and means having an opening therein through which said body member extends for supporting the end of said connector.

3. The connector of claim 2, wherein the hard metal member is a steel tube, the end of which is headed to form an enlarged portion.

4. The connector of claim 2, wherein the body member is a tube which is enlarged at its end to provide a chamber for enclosing the hard metal ring.

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