Aug. 5, 1941. C. H. KLEIN 2,251,709

METHOD OF CONNECTING WIRES TO SLEEVES

Filed Jan. 4, 1940

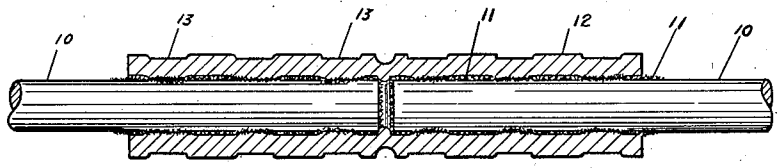


FIG. 1

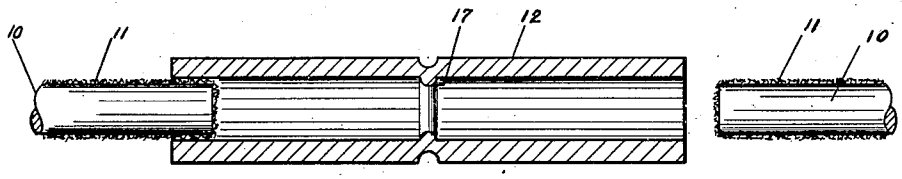


FIG. 2

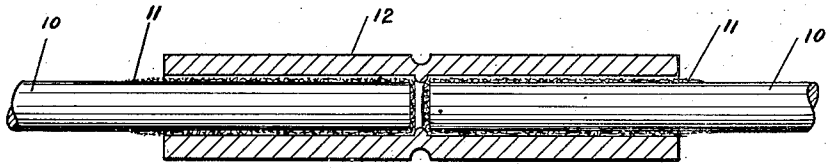


FIG. 3

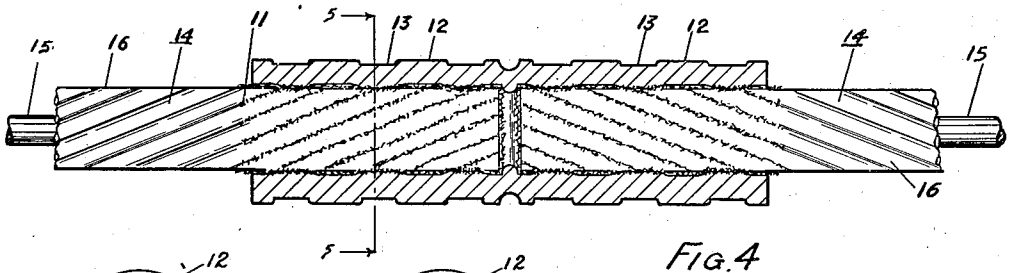


FIG. 4

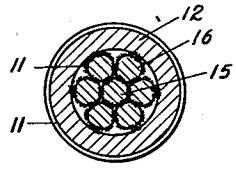


FIG. 5

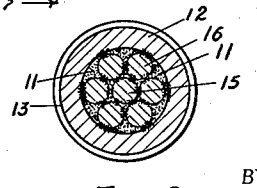


FIG. 6

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METHOD OF CONNECTING WIRES TO SLEEVES

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3 Claims. (Cl. 29—148)

My invention pertains to a joint between a wire and a metallic sleeve and the method for making same.

Successful compression type splicing sleeves usually have an abrasive to help hold the conductor without "necking" the wire. See Moore Patent 1,827,297 and Brenizer Patents 1,936,185 and 2,038,535. My proposal is to apply a mixture of a waterproof lead compound or a binder like shellac or lacquer and a finely divided abrasive to the wire. The conductor when ready for splicing, is coated with the mixture and then inserted in the sleeve and the sleeve is compressed by any one of the known arts such as drawing, rolling or squeezing with a hinge type tool.

An object of my invention is to coat the end of a wire to be anchored in a sleeve with an abrasive to prevent the wire from pulling out of the sleeve upon a pulling force being put on the wire with respect to the sleeve.

Another object of my invention is to cover the end of a wire with a binder such, for example, as shellac or lacquer which contains an abrasive.

Another object of my invention is to waterproof a joint between a wire and a sleeve by applying a waterproof lead compound binder containing an abrasive to the wire and by inserting the coated wire into the sleeve and compressing same to make the waterproof joint.

Still another object of my invention is to provide for covering the ends of wires adapted for insertion into a connecting sleeve by applying a waterproof lead compound binder which contains an abrasive material and which, when the wire is inserted and clamped into the connecting sleeve, establishes a waterproof coating to protect the wires being joined.

A further object of my invention is to provide a lead compound binder for application to a stranded wire which penetrates the spaces between the strands of the wire to form a waterproof coating and which contains an abrasive to prevent slippage of the strands with respect to each other and to the compressed sleeve.

Still another object of my invention is to provide a binder containing an abrasive which is thin enough to flow between the strands of a wire cable and carry the abrasive with it.

Another object of my invention is to prevent the slipping of an individual wire with respect to the other wires in a stranded cable by applying an abrasive between the individual wires and to prevent the slipping of the stranded cable with respect to a clamping sleeve by applying an abrasive between the cable and the sleeve.

Other objects and a fuller understanding of my invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawing, in which:

Figure 1 is a longitudinal cross-sectional view of my invention showing a clamping sleeve about my improved wire.

Figure 2 is a longitudinal cross-sectional view showing the abrasively coated wires being inserted into a compression sleeve.

Figure 3 is a cross-sectional view taken longitudinally of the abrasively coated wires and the compression sleeve showing the wires in position inside the compression sleeve and before a compression pressure has been applied to the sleeve.

Figure 4 is a longitudinal cross-sectional view showing an abrasively coated stranded cable in a compression sleeve after the sleeve has been compressed about the cable.

Figure 5 is a transverse cross-sectional view taken along the line 5—5 of Figure 4 showing a stranded cable which has been coated with shellac and an abrasive and squeezed inside the compression sleeve; and

Figure 6 is a view similar to Figure 5 showing a stranded cable which has been coated with a waterproof lead compound carrying an abrasive.

In Figure 1 of the drawing, I have illustrated one embodiment of my invention. It consists of wires 10 having their ends covered with a binder such as shellac or a lead compound and an abrasive 11 which are inserted into a sleeve 12 which is intimately compressed upon the wires 10 and the binder and abrasive 11.

In order to more fully illustrate the function of the abrasive 11 on the wire 10 I have shown the abrasive in cross-section and the wire 10 in full side view. By so doing I best illustrate the abrasive sticking to the surface of the wire 10 as in Figures 2 and 3 and imbedded in the wire 10 and the sleeve 12 upon a squeezing pressure being exerted on the sleeve as is shown in Figures 1 and 4. Although it is not shown it is to be understood that the abrasive 11 substantially completely encircles the ends of the wire 10.

I preferably coat the wires 10 with the abrasive 11 as this method permits the person such as a linesman who is connecting the wires 10 in the sleeve 12 to make a final inspection of the abrasive 11 before inserting the wires 10 into the sleeve 12. The coating of the inside of the sleeve 12 with an abrasive during manufacture renders a final inspection by the linesman in the field rather difficult. A linesman may cut the wire 10 at the desired point and dip the end of the wires

to be joined in a container of binding material such as shellac or lacquer into which is mixed an abrasive, or in a container of binding material such as a waterproofing lead compound into which is mixed an abrasive. The wires are then inserted, see Figures 2 and 3, into the open ends of the sleeve 12, until they abut the internal stop 17, after which the sleeve is compressed upon the wires 10 and the abrasive 11. As illustrated, the compression may be done by means of a constant movement clamping tool which makes depressions 13 in the surface of the sleeve 12 and causes the abrasive 11 to dig into both the inside surface of the sleeve 12 and the outside surface of the wires 10 to provide a firm non-slipping joint between the sleeve and the wires. The non-slipping joint is effected without "necking" the wire 10. That is, it does not reduce the cross-sectional area of the wire 10, and as a result the joint is as strong as the wire itself.

A feature of my invention is the use of a binder which carries the abrasive 11. A shellac or lacquer may be used which will air dry quickly into a semi-fluid or gummy substance which will hold the abrasive particles as the wires 10 are being inserted into the sleeve 12 and which will establish a waterproof coating about the wire to prevent the seepage of moisture into the joint, or a lead base compound may be used to protect the wire and the joint from water damage.

A further feature of my invention is that the linesman may determine the quantity of abrasive and waterproofing material needed for each joint. This is of importance as the presence of abrasive 11 and the binder tends to reduce the electrical conductivity between the wires 10 and the sleeve 12. A good current conducting joint is highly desirable as well as a good grip between the sleeve 12 and the wires 10. Therefore, by my invention, the linesman can apply binder and abrasive over a sufficient length of the inserted ends of the wire to assure a strong joint and leave a length of the wire free from binder and abrasive to establish a joint which will have a high electrical conductivity. The application of the abrasive and binder can be varied to accommodate field conditions and each joint will have the maximum strength and conductivity possible.

The binder and abrasive may be applied to the wires 10 by means of a brush or the wires may be dipped into a container of the mixture.

My invention has great utility when used with a stranded cable 14 such as is shown in Figures 4 and 5. The cable 14 comprises an inner core zone 15 which may be a single wire or a plurality of wires and an outer concentric zone 16 which may be a plurality of wires twisted around the core wire. In the practice of my invention the binder and the abrasive is provided between the core wire and the outer wires as well as between the outer wires and the inside of the sleeve, and slippage between the core wire and the outer wires is avoided.

Thus, by applying my mixture of binding material and abrasive to a stranded cable the abrasive will be carried between the individual wires as well as around the entire cable. When a sleeve 12 in Figure 4 is compressed around the stranded cable 14 which has been treated with an abrasive carrying binder, the abrasive under the compressed portions 13 will dig into the core wire 15 and into the outer wires 15 thereby preventing slippage of the core wire 15 with respect to the outside wires. The abrasive will also dig into each of the wires constituting the outer zone thereby preventing the slippage of any one wire in the outside zone with respect to the others. The abrasive also prevents slippage of the outside wires 16 with respect to the sleeve 12. My invention therefore prevents the slipping of the core wire 15 with respect to the sleeve 12. My binder also waterproofs the joint to reduce damage by moisture and other damaging elements. My joint is impervious to moisture and will not corrode.

Figure 5 illustrates a stranded cable 14 which has been coated with an abrasive 11 mixed in a thin shellac or lacquer and shows how the abrasive 11 is embedded into the wires of the cable and into the sleeve 12.

Figure 6 illustrates a cable 14 which has been coated with the abrasive 11 mixed in a lead compound binder. Effective waterproofing is provided by the lead compound as substantially all of the spaces between the wires of the cable 14 are filled with the compound and the spaces between the cable 14 and the sleeve 12 are substantially filled with the compound.

Although I have described my invention with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous changes in the details of construction may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

I claim as my invention:

1. The method of making a wire and sleeve joint which comprises the steps of coating the end of the wire with an abrasive mixed with an air drying binder, inserting the wire in the open end of a sleeve, and compressing the sleeve upon the abrasive coated wire to embed said abrasive into said sleeve and into said wire.

2. The method of making a joint between a sleeve and a stranded wire comprising, coating and waterproofing the stranded wire with an abrasive mixed in a thin air drying binder which penetrates the spaces between the strands of the wire, inserting the wire in the open end of a sleeve, and compressing the sleeve into intimate contact with the abrasive coated wires to embed the abrasive between the wires themselves and between the wires and the inside of the sleeve.

3. The method of making a joint between a sleeve and a stranded wire comprising, coating and waterproofing the stranded wire with an abrasive mixed in a waterproofing compound which penetrates and substantially fills the spaces between the strands of the wire, inserting the wire in the open end of a sleeve, and compressing the sleeve into intimate contact with the abrasive coated wires to embed the abrasive between the wires themselves and between the wires and the inside of the sleeve.

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