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F. HENDEY ET AL

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ELECTRIC CONDUCTOR

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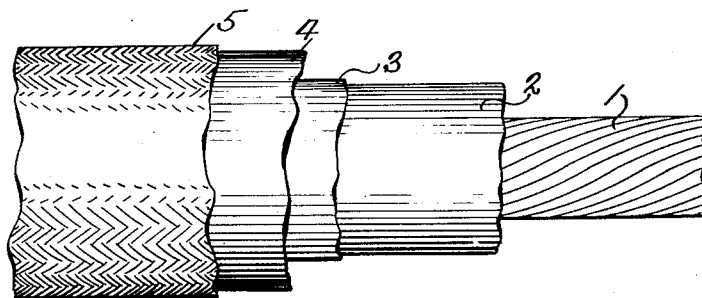


Fig. 1.

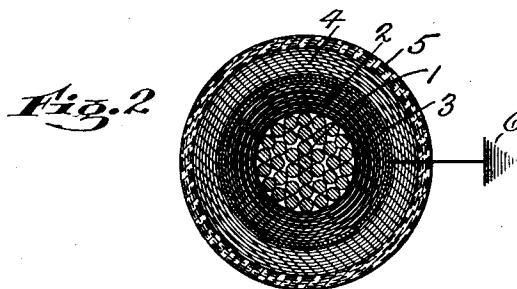


Fig. 2.

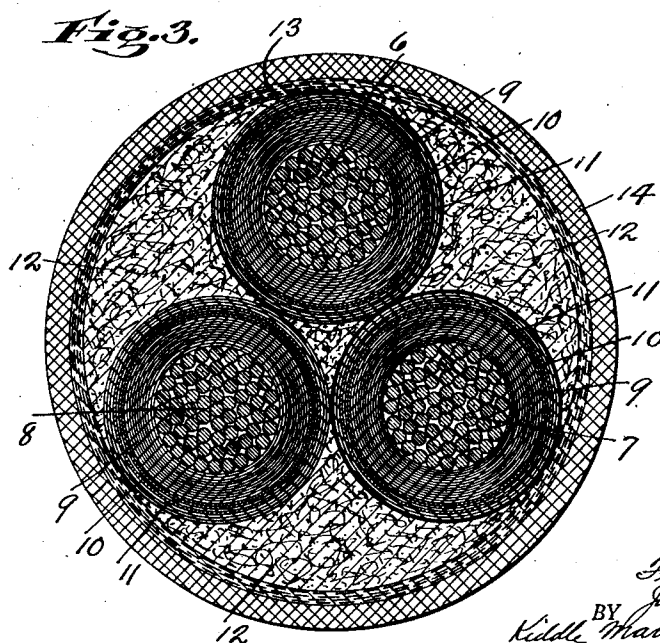


Fig. 3.

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ELECTRIC CONDUCTOR

Application filed January 31, 1930. Serial No. 424,762.

This invention relates to an improvement in electric cables, and is directed to improving the construction of high voltage cables, for example, cables carrying two thousand volts or over.

One of the objects of our invention is the provision of a cable of the character described which is so constructed that corona cutting of the insulation of the conductor or conductors will be reduced to a minimum.

More specifically, our invention is directed to a cable construction in which the rubber insulation is protected against corona action by the use of an imperforate conductor coating applied to the surface of the rubber insulation, the imperforate conductor coating being grounded so as to prevent the air at the outer surface of the conductor from being stressed to the point where it becomes ionized to produce ozone which has a deteriorating action on the rubber insulation of the conductor.

Our invention may take several forms, depending upon the character or construction of the cable to which the invention is applied, and in the accompanying drawings we have shown several embodiments of our invention by way of illustration.

More specifically, however, our invention provides an imperforate flexible conducting or conductor coating on the outer surface of the rubber insulation of the conductor, this conducting coating being in the form of metal deposited on the insulation so as to be in intimate direct contact therewith throughout the entire area of the surface of the insulation, thus affording an adherent imperforate conducting surface which can be grounded readily, and a construction in which the volume of air entrapped in the cable is reduced to a minimum; and a construction in which ionization of air at the exterior surface of the insulation and the formation of ozone with its consequent deleterious effects on the rubber insulation are reduced to a minimum.

In the drawings accompanying this application:

Fig. 1 shows one embodiment of our invention in sectional elevation;

Fig. 2 is a cross section of the cable of Fig. 1; and

Fig. 3 is a view similar to Fig. 2 of another embodiment of our invention.

Referring first of all to Figs. 1 and 2, 1 designates the conductor of a single conductor cable, the conductor being either of the solid or stranded copper type. Immediately surrounding the conductor 1 is a rubber compound insulation 2. Upon the exterior of the rubber compound insulation 2 is an adherent imperforate flexible conducting surface of metal designated 3, such as lead, zinc, aluminum, tin, etc., or any other metal that commercially is used as an electric conductor. This conducting surface is in direct intimate contact with the surface of the insulation throughout. To obtain this direct and intimate contact of the conducting surface or layer 3 with the surface of the rubber insulation 2 the metal is applied in a heated atomized condition to the surface of the insulation, as, for example, by the processes of the Schoop Patent No. 1,256,599 of February 19, 1918 or the McCoy Patent No. 1,268,030 of May 28, 1918. By employing those or similar processes not only is the metal conducting surface in direct and intimate contact with the compound constituting the insulation, but the metal even becomes embedded in the insulation. This eliminates all danger of entrapping air between the insulation and the conducting layer and hence by grounding this conducting layer, as shown at G, practically all corona cutting is eliminated.

Over the outside of this metallic conducting surface we apply a tape designated 4 which may be the usual rubber treated tape employed in cable manufacture and over this tape we apply, for example, a braid covering 5.

In some instances we elect to apply a conductive metal coating to one face of the tape 4, which when the tape is applied will be wound directly over the conducting surface 3.

In this connection we wish it to be noted that if the tape 4 is to be metal coated or to have a metallic conducting coating applied thereto, this surface is preferably applied by the same method employed in applying the

coating 3 to the insulation 2, that is to say, in a heated finely atomized condition. The tape may be coated on either side or on both sides. If desired the tape before the metal coating is applied may be rubber filled on either side or on both sides. By employing a conducting surface on the tape 4 and winding it in contact with coating 3 on the insulation electrical conductivity is further increased with a further reduction in corona cutting.

While the embodiment of our invention shown in Fig. 1 is directed to the construction of a single conductor cable, either of the stranded or solid conductor type, it is to be understood, as pointed out above, that our invention is applicable to multiple conductor cables as well, and in Fig. 3 we have illustrated a three conductor cable.

In this embodiment of our invention, the conductors are designated 6, 7 and 8, respectively. Each conductor is covered with an insulating rubber compound designated 9 on which is sprayed a continuous unbroken imperforate flexible metallic conducting layer 10. About this conducting surface or layer we apply a tape 11 which is preferably, though not necessarily, of the metal sprayed type above referred to. The voids between the three structures thus formed are filled with jute designated 12 or other suitable material to build up a circular cross section, and then about the entire mass is applied rubber filled cotton tape designated 13. On the exterior of this tape we apply a lead sheath 14, or this sheath may be rubber, braid, or a sheath known commercially as submarine armor.

In all cases it will be understood that when the cable is in use the imperforate flexible conducting surface or conducting layer immediately over and in intimate direct contact with the insulation is grounded.

It will be understood also that we have, for the purposes of illustration, exaggerated the thickness of the conductive layer.

It is to be understood also, as mentioned at the outset of this description, that this invention is concerned with cables carrying relatively high voltages, two thousand volts or over, for instance, inasmuch as below such a voltage the stresses set up in the cable are not sufficiently high to cause corona cutting to a detrimental extent.

What we claim is:—

A high tension electric cable comprising in combination an electric conductor, insulation about the same, a continuous adherent imperforate conductor coating, to be grounded, on the exterior surface of the insulation, a rubber filled tape about the conductor coating, a conductor coating on one face of said tape, the tape being applied so that said conductor coating is in contact with said first

mentioned conductor coating, and a protective coating over said tape.

This specification signed this 28th day of January, 1930.

FRED HENDEY. 70

This specification signed this 28th day of January, 1930.

JAMES P. MILLWOOD. 75

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