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CORONA SHIELD

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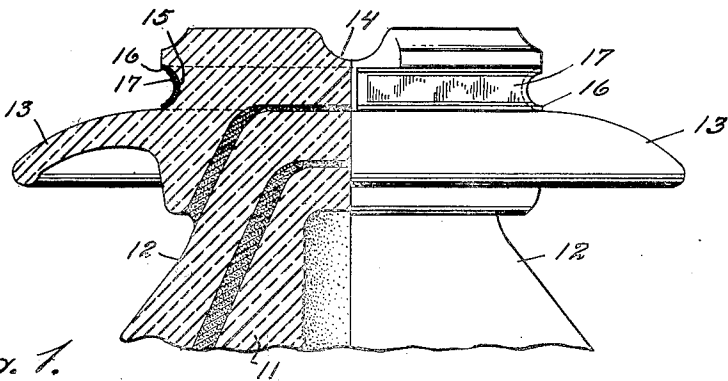


Fig. 1.

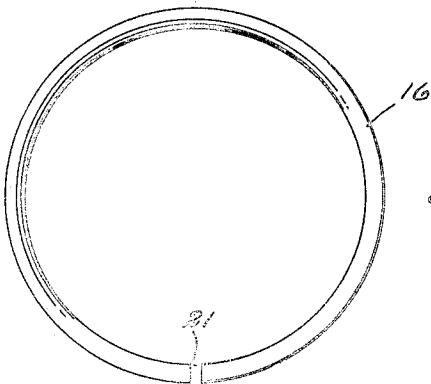


Fig. 2.

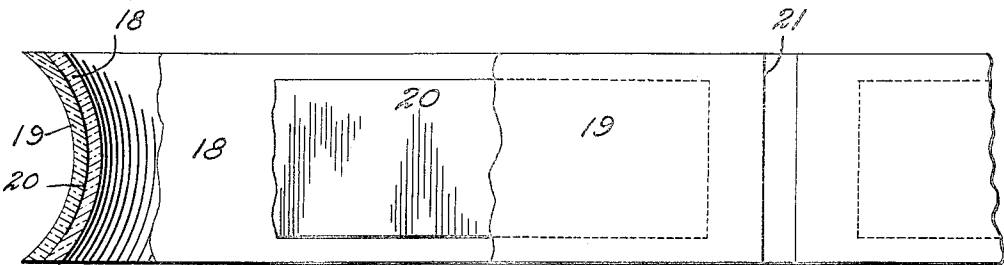


Fig. 3.

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CORONA SHIELD

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The invention relates to insulators for electrical transmission lines and has for its general object the provision of a novel shield device adapted to be attached to already existing insulators for the purpose of grading the electrical field immediately about the insulator so as to avoid corona and the resultant radio interference.

It is known that where a current conductor is carried by an insulator ordinarily mounted upon a metallic pin on a suitable support the relation of the conductor to the insulator and pin thereof is such that there is a tendency for corona to form owing to peculiarities in the electrical field immediately about the insulator. It has been discovered that by providing a metallic area on the insulator, either in the conductor receiving groove or in the tie wire groove, or both, the field may be graded and the potential sufficiently equalized that there will be no corona effect. In new equipment it is readily feasible to apply a conductive coating to the insulator or to provide it with an appropriate adjunctive means for carrying out the purpose but such expedients are not available for application to already existing installations.

It is with the above facts in view, and particularly the last mentioned circumstance in mind, that I have devised the present invention which contemplates the provision of a shield which may be quickly and easily attached to insulators in existing installations without requiring any actual change therein or any material dismantling and restoration.

An important object of the invention is to provide a shield which may be engaged upon an insulator and which will remain thereon without any necessity for securing means.

A further object is to provide a shield engageable within the tie wire receiving groove of an insulator and which will cooperate with the tie wire and conductor to constitute a condenser of such character as to equalize the potential in the electrical field about the insulator and thereby eliminate corona.

A more specific object of the invention is to provide a corona shield embodying a metallic area or surface protected against actual contact with the air so as not to be subject to deterioration under different climatic conditions.

An additional object is to provide a shield of this type which will be very simple and inexpensive to make, easy to apply, positive in action, efficient and durable in service, and a general improvement in the art.

To the attainment of the foregoing and other

objects and advantages, the invention preferably consists in the details of construction and the arrangement and combination of parts to be hereinafter more fully described and claimed, and illustrated in the accompanying drawing in which:

Figure 1 is a fragmentary view partly in elevation and partly in section of a pin type insulator equipped with one form of my invention,

Figure 2 is a plan view of the shield alone, and

Figure 3 is a view partly in side elevation and partly in section showing a modified and preferred form of the invention.

Referring more particularly to the drawing it will be noted that I have shown an insulator, indicated as a whole by the numeral 10, of the multi-part or nested section type though it should be understood that it might be of the one piece, this detail being immaterial. However, notwithstanding various possibilities in this respect, the particular insulator illustrated includes inner, intermediate and outer sections 11, 12 and 13 respectively, the latter being formed with the customary transverse conductor receiving groove 14 and a peripheral groove 15 which receives the tie wire employed for securing the conductor in place. The conductor and tie wire are not shown as such is unnecessary to a proper understanding of the invention, though for purposes of explanation it might be just as well to state that the practice is to wrap about the insulator and within the groove 15 a wire of suitable material and gauge which is twisted about the conductor so that the latter will be positively and firmly anchored in place. In installations of this type a discharge, commonly known as corona, often takes place about the conductor and/or the tie wire and it is to avoid this that I resort to the means to be described.

My invention comprises, broadly, the provision of a metallic area or surface in juxtaposition to the tie wire. While the invention is susceptible of various actual or specific embodiments I have found that it is a simple plan to mount within the groove 15 a band 16 of some suitable inorganic dielectric material, for instance molded mica or the like, which band is provided with a metallic surface 17 applied in any convenient or appropriate manner and consisting of any suitable material such as will not corrode. In view of the fact that the whole advantage is obtained from the superficial area it is clear that the thickness of the metal may be practically negligible especially as it does not need to be self-sustaining.

In the form of the invention shown in Figure 1 the band is represented as simply having a metallic coating on its exterior, the metal of course being in contact with the tie wire which instead of engaging the porcelain, of which insulators of this character are generally constructed, will engage about the coated band. In view of the fact that it is preferable to have the attachment fit snugly upon the insulator, the band is shown as of concavo-convex shape in cross section so as to conform to the curvature of the tie wire receiving groove.

The above constitutes what may be considered as substantially the simplest form of the invention but as it may be preferable to protect the metallic surface against the ravages of the weather, I prefer the embodiment shown in Figure 3 wherein the attachment is represented as laminated or formed of inner and outer layers 18 and 19, respectively, of suitable dielectric material having interposed between them a metallic member 20 which may be a thin sheet of copper foil or its equivalent. The metal sheet is preferably of less size than the dielectric layers so that even its edges will not be exposed. Suitable cement or any other means may be provided for securing the layers together and/or to the foil or it is conceivable that the parts may be united by pressure, possibly while the dielectric layers are in a plastic condition. The whole assembly is shaped to conform to the configuration of the groove, as is the case in the first instance.

Regardless of whether the band be of single or multiple layer formation it is intended to be of a flexible nature and is split as at 21 so that it may be snapped over the head of the insulator so as to engage within the groove.

Regardless of which form of the device is used it is clear that the metallic layer cooperating with the tie wire will constitute, in effect, a condenser which will perform the well recognized function of maintaining a substantially equipotential in the field about the insulator. The advantage of the second form over the first is that moisture and corrosive gases cannot gain access to the metal. Furthermore the metal being covered at all times can never escape from its proper position and is not subject to mutilation when the tie wire is applied. It is thought from the foregoing that the construction, operation and advantages will be readily apparent to one skilled in the art without further explanation.

While I have shown and described the preferred embodiments of the invention, it should be understood that the disclosure is merely an exemplification of the principles involved as the right is reserved to make all such changes in the details of construction as will widen the field of utility and increase the adaptability of the device provided such changes constitute no departure from the spirit of the invention or the scope of the claims hereunto appended.

Having thus described the invention, I claim:

1. In combination with an insulator supporting a current conductor, means comprising substantially coextensive dielectric and conducting means carried by the insulator and arranged in juxtaposition to the conductor for maintaining a substantially equi-potential condition in the electrical field about the insulator for avoiding corona.

2. In combination with an insulator of the type having a conductor receiving groove in its top and a peripheral tie wire receiving groove,

means located within the second named groove in insulated relation to the insulator cooperating with the tie wire to constitute a capacitive corona prevention means.

3. In combination with an insulator of the type having a conductor receiving groove and a peripheral tie wire receiving groove, an attachment engageable within the second named groove beneath the tie wire and embodying a metallic element physically supported by the insulator and electrically insulated therefrom cooperating with the tie wire and conductor to constitute a corona eliminating condenser.

4. Corona prevention means for an insulator of the type having a conductor receiving groove and a tie wire receiving groove, comprising a dielectric member fitting within the second named groove and carrying a metallic element.

5. Corona prevention means for an insulator of the type having a conductor receiving groove and a tie wire receiving groove, comprising a dielectric member fitting within the second named groove and carrying a metallic element out of mechanical contact with the insulator.

6. Corona prevention means for an insulator of the type having a conductor receiving groove and a tie wire receiving groove, comprising a dielectric member fitting within the second named groove and carrying a metallic element, the dielectric member being formed as a contractile band.

7. Corona prevention means for an insulator of the type having a conductor receiving groove and a tie wire receiving groove, comprising a dielectric member fitting within the second named groove and carrying a metallic element, the dielectric member being formed as a contractile band having a cross sectional configuration conforming substantially to that of the tie wire receiving groove.

8. A corona eliminating attachment for an insulator of the type having a conductor receiving groove and a tie wire receiving groove, comprising a flexible split band of dielectric material fitting within the tie wire receiving groove in snug engagement therewith and carrying a metallic surface.

9. A corona eliminating attachment for an insulator of the type having a conductor receiving groove and a tie wire receiving groove, comprising a flexible split band of dielectric material fitting within the tie wire receiving groove in snug engagement therewith and carrying a metallic surface, the band being laminated with the metallic surface interposed between the laminations.

10. A corona eliminating attachment for an all-porcelain insulator having a groove carrying conducting means, comprising a metallic element carried by the insulator cooperating with the conducting means and constituting a corona eliminating condenser, and means within the groove for maintaining said metallic element out of physical and electrical contact with the insulator.

11. A corona eliminating attachment for an all-porcelain insulator having a groove for normally directly receiving a conductor, said attachment comprising a metallic element within the groove and insulated from the wall thereof and located beneath and in juxtaposition to the conductor for cooperation therewith.

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