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1,967,616

INSULATOR

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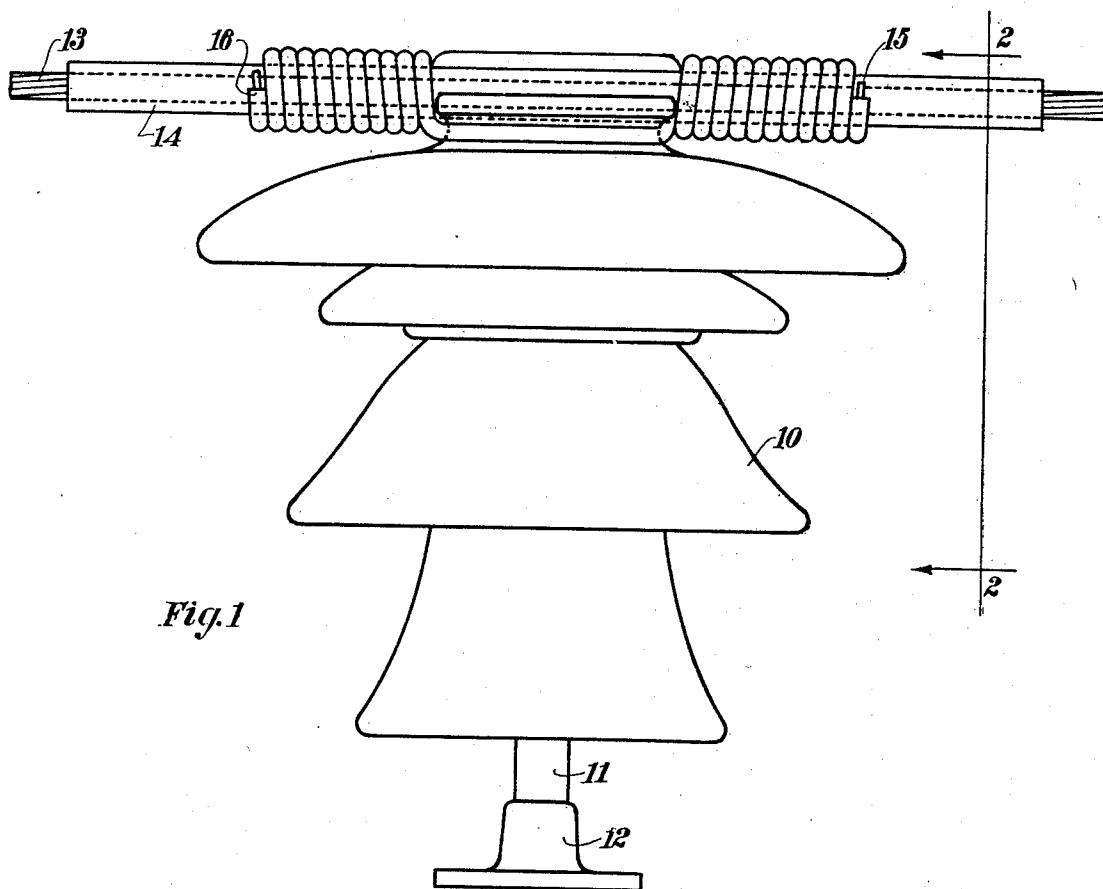


Fig. 1

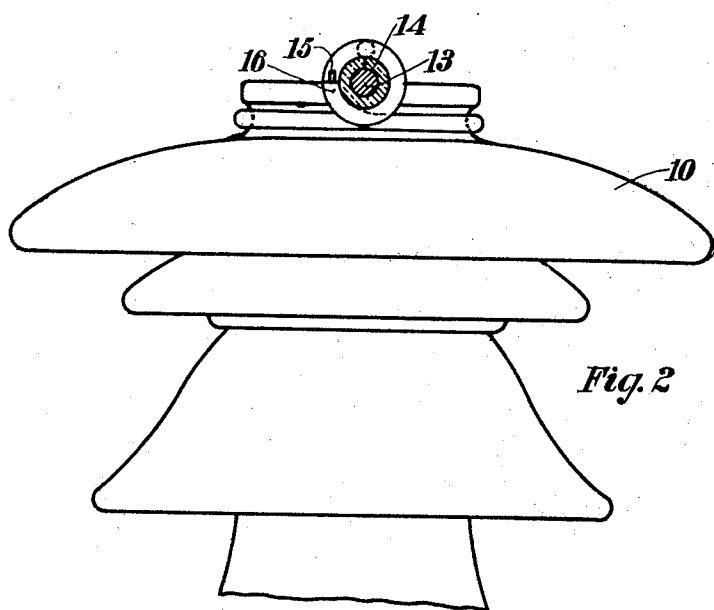


Fig. 2

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INSULATOR

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Application June 20, 1932, Serial No. 618,135

3 Claims. (Cl. 173-318)

This invention relates to insulators and particularly to pin type insulators for high voltages, and has for one of its objects the provision of means for connecting a conductor to an insulator in such a manner that air breakdown and electrical discharge adjacent the contact between the conductor and the surface of the insulator will be prevented.

A further object of the invention is to reduce or eliminate radio disturbances in the vicinity of high potential transmission lines, resulting from electrical discharges from the line at its points of support.

Other objects and advantages will appear from the following description.

The invention is exemplified by the combination and arrangement of parts shown in the accompanying drawing and described in the following specification, and it is more particularly pointed out in the appended claims.

In the drawing:

Fig. 1 is an elevation of an insulator and its supported conductor showing one form of the present invention applied thereto.

Fig. 2 is an elevation on line 2-2 of Fig. 1.

One of the most troublesome problems in connection with high voltage electrical transmission lines arises from the fact that insulators, and particularly insulators of the pin type when carrying transmission lines of 44 k. v. or higher, are very often the cause of serious disturbances to radio receiving sets located in the vicinity of the insulators.

Pin type insulator construction usually consists of wood cross arms, steel pins having insulators mounted on the pins, a stranded copper or aluminum conductor, and a solid aluminum or copper tie wire. The insulator constitutes the dielectric member of a condenser of which the pin and conductor are the metallic members. The conductor and tie wire make only a line contact with the surface of the insulator and, as a result, the dielectric flux density where the flux passes from the conductor and tie wire into the dielectric member is very high. Air breakdown occurs along this line of contact in the form of small disruptive discharges and the radio waves from these discharges excite near-by receiving sets, causing objectionable noises.

The present invention prevents these disturbances by increasing the area of contact between the conductor or tie wire and the insulator and, consequently, eliminating the so-called "fringe" effect and air breakdown and

thus preventing radio interference. This result is accomplished by using a high resistance conducting covering over both the conductor where it rests upon the insulator and also the tie wire. This covering may be formed from cotton fabric impregnated or filled with high resistance conducting material such as asbestos fibre, powdered carbon, powdered carborundum or other material which preferably is insoluble in water and which can be retained by the fabric. The fabric combined with the high resistance conducting material forms a soft covering which will crush under the pressure of the wires and present a large contact area with no sharp edges for the concentration of flux. The use of a high resistance filler tends to prevent the concentration of current at any one point.

The disruptive discharge which accompanies an air breakdown causes a sudden increase in the charging current. Where this current flows through a high resistance conducting material, as in the present invention, it will set up an IR drop which will momentarily tend to reduce the voltage and correspondingly reduce the tendency for the discharge to occur. However, the effectiveness of the present invention is probably due primarily to the fact that the high resistance conducting material prevents the charging current from concentrating at points along the conductor or tie wire and provides electrical connection between a large surface area of the conductor and the surface of the condenser.

The material used as a conducting filler should preferably be one which will not oxidize and change its conductivity with time. However, copper or iron in fine particles may be used for impregnating the wire covering and, in some cases, will have certain advantages in that although these particles may oxidize and reduce the conductivity of the covering, this coating of oxide will break down and offer a conducting path when subjected to abnormally high voltages.

In the embodiment of the invention shown in the drawing, the numeral 10 designates the dielectric portion of an insulator supported by a pin 11 having a base 12 which may be secured to a cross arm in the usual manner. A conductor 13 rests in the usual groove in the top of the insulator 10, but instead of bearing directly upon the insulator is provided with a sleeve or covering 14 of high resistance conducting material, such as asbestos fabric or cotton fabric impregnated with powdered graphite, asbestos fibre, powdered carborundum or other

material preferably insoluble in water and which is held by the fabric. The conductor 13 is secured in place by a tie wire 15 which is also provided with a covering 16 similar to the covering for the conductor 13.

I claim:

1. The combination with an insulator, of a conductor carried by said insulator, and a tie wire for securing said conductor to said insulator, said conductor and tie wire both being covered with high resistance, permanently conducting material adjacent the connection between said conductor and insulator said material having extended engagement with said tie wire, conductor and insulator.

2. The combination with a high voltage con-

ductor, of an insulator for supporting said conductor and a tie wire for securing said conductor to said insulator, said tie wire being covered with high resistance permanently conducting material having extended electrical contact with said tie wire and insulator.

3. The combination with a conductor, of a pin type insulator for supporting said conductor, a tie wire for securing said conductor to said insulator, fabric covering for said conductor at its point of support and fabric covering for said tie wire, said fabric covering being impregnated with non-evaporating conducting material and having extended, electrical contact with said conductor, tie wire and insulator.

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20	95
25	100
30	105
35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150