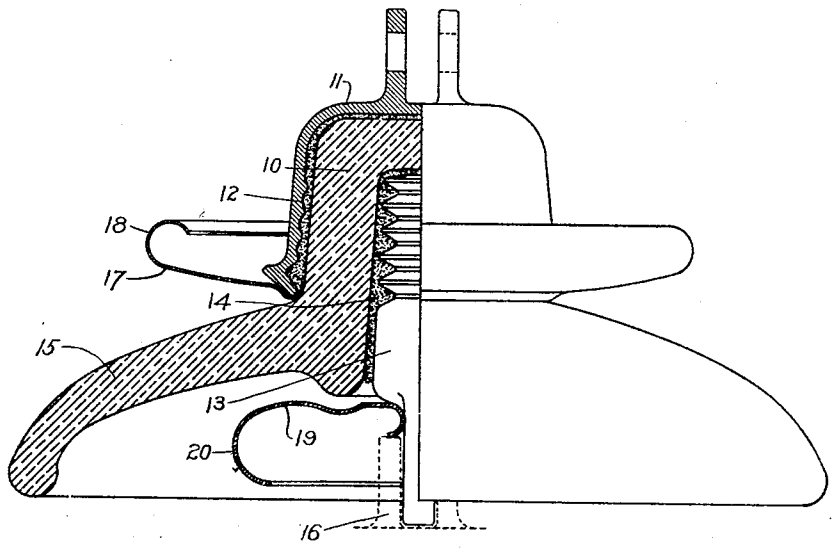
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INSULATOR

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UNITED STATES PATENT OFFICE.

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INSULATOR.

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This invention relates to insulators especially adapted for high tension use and has for its object the improvement of surface gradient, reduction or elimination of surface streamers or overstress and the provision of insulators which shall be of improved construction and operation generally.

The invention is exemplified in the combination and arrangement of parts shown in the accompanying drawing and described in the following specification.

In the drawing the figure is an elevation partly in section of an insulator embodying one form of the present invention.

In the embodiment shown in the drawing a dielectric member is provided with a holding member or cap 11, secured to the dielectric member in any suitable manner as by cement 12. An opening is provided within the dielectric member 10 for receiving a pin 13, secured in place by cement 14. The dielectric member 10 is provided with a flange or petticoat 15, such as commonly provided in insulators of the class shown in the drawing. The insulator may be used as one of a series string, or may be employed for supporting a conductor, or for any other purpose for which insulators are employed. The supported load is represented in broken lines at 16 in the drawing.

Adjacent the lower edge of the cap 11, and extending outwardly therefrom is a thin metal disc or flange 17. This flange as shown in the drawing is in electrical connection with the cap 11, and projects outwardly therefrom in the general direction of the surface of the dielectric flange 15, but is spaced from the surface of the dielectric flange. The outer edge of the flange 17 is turned backwardly to provide a rounded portion 18 at the outermost part of the flange. This prevents the edge of the flange 17 from projecting in a direction which might give rise to streamers or discharging arcs, and provides a smooth curved surface from which the static lines of force emanate. A similar conductor flange 19 is connected with the pin 13 and extends in the general direction of the lower surface of the flange 15. The flange 19 is also bent backwardly to provide a rounded surface 20 to prevent concentration of stress and discharge at the edge. As shown in the drawing, the flanges 17 and 19 are of materially less diameter than the flange 15 to prevent interference with the efficiency of the insulator and to keep the metallic flanges out of the line of drip from the dielectric flange of the same or other insulator in a series.

In insulators having projecting flanges or petticoats the charging and leakage currents over the surface of the insulators will encounter a resistance on the surface of the flange which varies greatly for the portions of the flange at different distances from the center thereof. The surface area adjacent the center of the flange is relatively small, but increases with the distance from the center. For this reason the resistance to charging and leakage currents is largely concentrated in a narrow zone adjacent the inner portion of the flange. This may give rise to streamers or arcs near the inner portion of the flange which are detrimental to the dielectric material and which cause shunting of the surface insulation and are otherwise objectionable.

With the conductor flanges 17 and 19 omitted as in previous constructions, the leakage and the greater part of the charging current will flow outwardly along the surface. At high voltage the current may concentrate in streamers which tend to flow out over the surface. These streamers may be regarded as conducting paths whose resistance drops off very rapidly with an increase in the current flowing in same. This current is usually made up of a combining charging and surface leakage current. If the current in the streamers is reduced or eliminated, their resistance will be increased and their detrimental effect in lowering the insulation of the surface will be minimized.

By providing the conductor flanges 17 and 19, part of the charging current may be supplied through the air. This will cut down the charging current which tends to start from the cap and pin and thereby tend to maintain the effective insulation or flashover voltage of the surface.

The distance between the conductor flanges 17 and 19 and the insulating surface of the flange 15 will vary in accordance with the result desired. The invention improves the surface gradient and voltage which may be carried safely by the insulating member, particularly where conditions are unusually severe. Being separated from the insulated surface, they do not reduce or cut out the surface or reduce the surface

resistance of the insulator for leakage in any way. Either one or both conductor flanges may be used, it generally being advisable to use the flange adjacent to the surface tending to have the highest concentration of stress.

Conductor flanges which are properly formed and separated from the surface will not decrease the flash-over of a given diameter of insulating member as is the usual case where plates are placed in contact to regulate the relative gradient of a series of insulators. The conducting flanges may be made an integral part of the main attachments 11 and 13 or where the insulating elements are used in a series the conducting member 19 may be connected to a connecting member 17 which may be immediately below it. Another object of the members is to provide a smooth surface and lower the concentration of stress so as to increase the flash-over voltage between adjacent sides of the insulating member. This is particularly true of the conducting flange 19 which will protect discharge from rivets or cotters or other sharp points on the attachments.

In the invention it is desirable to so regulate the clearance that the charging current tending to radiate from the main attachments will be reduced to a minimum but the clearance between the conducting flanges and the surface must not be so reduced that arcs will form between the members and the surface of the dielectric.

In general, there is no change in the electrostatic distribution in a series of insulators by the addition of the conductor flanges owing to their electrostatic capacity to ground.

I claim:

1. An insulator comprising a dielectric member having a radially extending flange thereon, terminal members connected with said insulator at opposite sides of said flange, and means connected with each of said terminal members for supplying charging current to said flange at points spaced from said terminal members, said means comprising a conductor disc connected with each of said terminal members and extending radially therefrom in spaced relation with said insulator flange, each of said discs being of materially less diameter than said flange and disposed in close proximity thereto adjacent its terminal member but diverging therefrom outwardly.

2. An insulator comprising a dielectric member having a radially extending flange thereon, terminal members connected with said insulators at opposite sides of said flange, and means for supplying charging current to said flange, comprising a pair of sheet metal plates connected one with each of said terminal members and extending radially therefrom in gradually increasing spaced relation relative to said dielectric flange, said plates being curved to form rounded surfaces at the edges thereof and being of materially less diameter than the dielectric flange.

3. An insulator comprising a dielectric member having a radially extending flange thereon, said flange being curved downwardly to provide a hollow opening at its lower side, terminal members connected with said insulator at opposite sides of said flange, and means for supplying charging current to said flange, said means comprising a pair of sheet metal plates connected one with each of said terminal members and extending radially therefrom in gradually increasing spaced relation relative to said dielectric flange, each plate being less than three-fourths the diameter of said flange and the lower plate having its inner edge disposed within the hollow formed by the downward curvature of said flange to bring said inner edge closely adjacent the lower face of said flange.

In testimony whereof I have signed my name to this specification on this 12th day of October, A. D. 1921.

ARTHUR O. AUSTIN.