

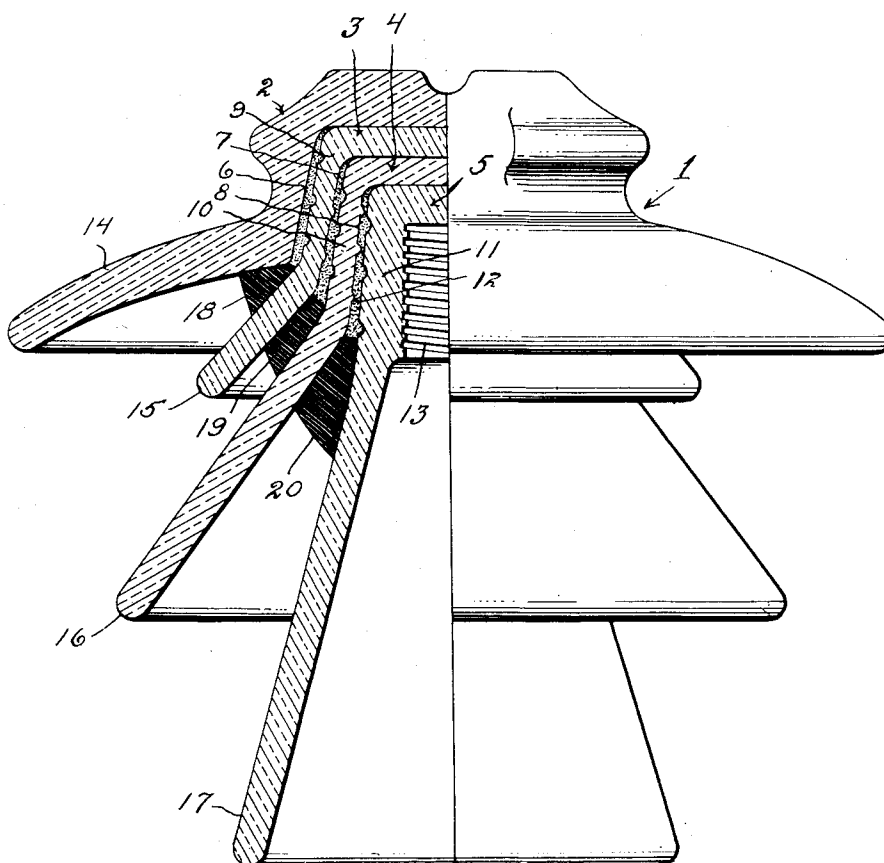
June 4, 1929.

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1,716,123

INSULATOR

Filed July 18, 1925



Witness

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INSULATOR.

Application filed July 18, 1925. Serial No. 44,484.

This invention relates to electrical insulating bodies or structures, particularly to such as are used in connection with high potential lines.

5 The object of the invention, generally stated, is to provide a high potential insulator embodying a plurality of nested shells so constructed, arranged and connected as to utilize the full insulating value of the dielectric medium in which the conductors or lines are located.

10 It is well known that when a difference of potential exists between adjacent conducting bodies, the interposed insulating medium is subjected to stresses by reason of the electro-static field produced, the field depending upon the shapes and sizes of the conducting bodies, the potential thereof and the character of the insulating medium. When
15 a medium other than air is introduced between conductors a marked influence on the electro-static field may result. In ordinary practice and design more attention has been directed to the obviation of surface discharges, this being generally accomplished
20 by providing a large area formed by employing corrugations, skirts and the like which insure a long leakage path. It has been discovered that the breaking down of insulators, particularly those of the nested shell type is due not so much to the results of the concentration of stresses along the surfaces but rather to the stresses produced in the electro-static field, the general cause of these
25 stresses being an incorrect shape of the insulating material, other than air, between successive units or elements of a complete insulator of the nested or similar type. It has been proposed to construct an insulator
30 of the nested shell type of shell elements or units having integral portions, flanges or shoulders of such shape that their contour will conform to the electro-static field as defined or represented by lines normal to the surfaces of the spaced outstanding portions of the shell elements. From a practical viewpoint, considered in the light of manufacturing difficulties and durability in service, insulators constructed in this way are unsatisfactory for the reason that they are thermally deficient. Another point of objection is that during the firing process involved in the preparation of the elements the flange portions may become warped to a certain
35 extent, rendering it more or less difficult to

obtain the proper fit and union between successive elements. Furthermore, when such elements are secured together, as by cementing in the customary manner, the joints are exposed to the atmosphere and hydration of the cement may occur, resulting in breaking down and disintegration of the cement with obvious resultant disadvantages.

It is with the above facts in view that I have designed the present invention which has for a more specific object the provision of an insulator including a series or plurality of shell elements arranged and secured in nested relation and having interposed between the outstanding portions thereof a subsequently applied dielectric material shaped to conform to the lines of the electro-static field so as to avoid the concentration of stresses and suppress corona.

Another object of the invention is to provide an insulator of this general character in which the dielectric material applied subsequently to the nesting and securing together of the shell elements will act as an effectual seal for enclosing and protecting the cemented joints against the influence exerted by the weather so that hydration of the cementitious material employed will be avoided and the length of life of the assembly greatly prolonged.

Still another object of the invention is to provide a method of relieving or avoiding the concentration of stresses by the application of an auxiliary dielectric material between successive elements of a series of outstanding portions or skirts.

To the attainment of the foregoing objects and advantages the invention may consist in the arrangement and construction of parts to be hereinafter more fully described, pointed out in the claims hereunto appended, and illustrated in the accompanying drawings in which: •

The figure is a view half in elevation and half in section, of an insulator embodying the invention.

Referring more particularly to the drawing, I have disclosed a built-up insulator 1 including or comprising a plurality or series of superposed nested members 2, 3, 4 and 5, the number being more or less immaterial and depending upon variations such as the size of the members and the potential of the line in connection with which the insulator is used. These members 2, 3 and 4 are shown

as provided with recesses 6, 7 and 8 which receive upstanding neck portions 9, 10 and 11 on the members 3, 4 and 5 respectively, securing being effected by means of suitable cement 5 12 filling the joints. As is a common practice, it is preferable that the confronting surfaces be ribbed or grooved as indicated, to insure proper holding action, though it is obvious that any other equivalent means for 10 the same purpose may be resorted to as being within the spirit of the invention. The upstanding neck portion 11 of the innermost or lowermost element 5 is shown as recessed at 13 so as to be capable of mounting upon a 15 pin or other support for the entire assembly.

Subsequent to the assembling of the shell members, which are shown as having outstanding skirt portions 14, 15, 16 and 17, some suitable bituminous material, such as asphaltum or the like, is applied to the joints between the successive members and filled into 20 the spaces between the successive outstanding portions or skirts 14, 15, 16 and 17 to provide masses 18, 19 and 20 of appreciable size. In 25 actual practice this material would probably be poured or otherwise placed in position while in a molten, fluent or plastic condition. The exposed surfaces of these successive insulating masses may be smoothed down with 30 a hot soldering iron or equivalent tool or device, or by any other means desired, and the outer surfaces are preferably shaped or contoured, as indicated, so as to conform, preferably, to the lines of the electro-static field. 35 The result is that the air is excluded and the concentration of stresses avoided so that corona is suppressed entirely.

An insulator constructed in accordance with the present invention will be highly efficient inasmuch as simple, cheaply made and 40 thermally perfect shell members or elements may be employed, the method of filling in a portion of the spaces between the successive outstanding portions or skirts resulting in 45 the elimination or suppression of corona without the disadvantages inherent to the provision of shoulders or other contacting portions formed integrally on the nested elements themselves.

While I have shown and described a preferred embodiment of the invention, it should be understood that the right is reserved to make all such changes in the details of construction and arrangement as will not depart from the spirit of the invention or the 55 scope of the appended claims.

Having now described my invention, what I claim is:

1. In an insulator including superposed

nested shell members having outstanding portions, means for suppressing corona consisting of successive masses of dielectric material partially filling the spaces between the successive outstanding portions, the outer surfaces of said successive masses being continuations of one another and conforming to the lines of the electro-static field. 60 65

2. In an insulator including superposed nested shell members having outstanding portions, means for suppressing corona consisting of masses of dielectric material partially filling the spaces between the successive outstanding portions, the outer surfaces of said masses lying along a single curve coincident with lines of the electro-static field. 70 75

3. The method of suppressing corona in insulators of the type including a plurality of nested sections each having an outstanding portion, consisting in applying between the successive sections a plastic filling of dielectric material of a nature other than that from which the insulator parts are formed, shaping the filling between the successive sections whereby the outer surfaces thereof will all be in continuation and substantially coincide with lines of the electro-static field, and permitting the material to harden. 80 85

4. In an insulator, a plurality of superposed nested shell members having outstanding portions, and a filling of dielectric material between the successive outstanding portions, the filling being of a material other than that from which the shell members are formed, and the outer surfaces of the fillings between the shell members lying in a substantially spherical curve conforming to lines of force of the electro-static field. 90 95

5. In an insulator, a plurality of superposed nested shell members having outstanding portions, and a filling of dielectric material between the successive outstanding portions, the filling being of a bituminous material, the outer surfaces of all the fillings lying in the same curve. 100

6. In an insulator, a plurality of superposed nested sections having outstanding skirt portions and a filling of bituminous material applied to the joints between and partially filling the spaces between the successive outstanding skirt portions whereby to exclude air, the outer surfaces of the fillings between the successive outstanding portions lying in continuation of the same curve and conforming to lines of the electro-static field whereby to avoid the concentration of electrical stresses and to suppress corona. 105 110 115

In testimony whereof I affix my signature.
WALTER T. GODDARD.