

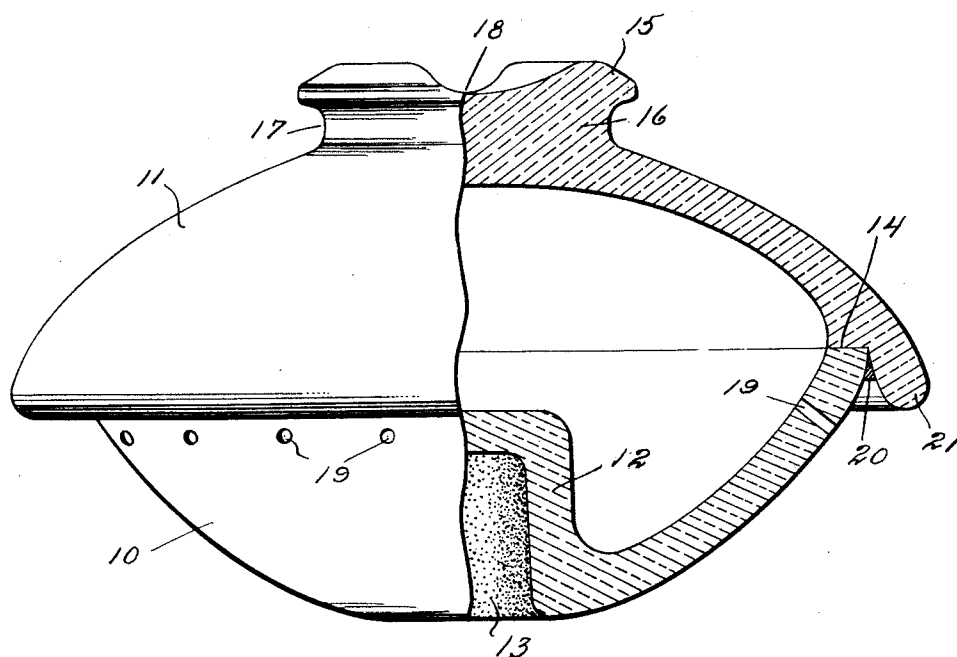
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INSULATOR

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UNITED STATES PATENT OFFICE

1,955,609

INSULATOR

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11 Claims. (Cl. 173—318)

The invention relates to insulators and has for its general object the provision of a radio-proof insulator in which there will be the effect of three or more condensers in series, one of which is of such low capacitance as to be capable of carrying most of the voltage under normal line conditions.

A more specific object of the invention is to provide an insulator in which the construction is such that there will be the effect of three or more condensers in series, the inside one, preferably an air space, being of sufficiently low capacitance to carry most of the voltage so as to relieve the electro-static stress on the tie wire connecting the conductor to the insulator, and the supporting pin for the insulator.

It is well known that the usual or common type of insulator comprises one or more masses of dielectric material such as porcelain or the like. It is a common practice to provide an insulator of solid construction mounted upon a metal pin and having a groove receiving and supporting a conductor which is held to the insulator by a tie wire engaging about a neck or within a groove on the insulator. It is with this usual arrangement in view that I have devised my improvement which, more specifically, comprises an insulator of porcelain or other similar material formed as a hollow body with its lower end mounted upon a supporting pin and its upper end carrying the conductor and tie wire, there being, consequently, two layers of porcelain and a layer of air between the conductor and the support so that in accordance with accepted theories there will be the effect of a plurality of condensers in series between the conductor and the grounded support.

Another important object of the invention is to provide an insulator of this type which may be formed in sections which may be cast or plunged and which are subsequently united so as to form, in effect, a homogeneous whole as the parts are subsequently indivisible or inseparable.

Another object of the invention is the provision of an insulator having the above mentioned characteristics and which, in addition, is so shaped as to offer the minimum resistance to air currents, thereby making it free from accumulations of dirt and other undesirable foreign matter upon it which might influence its resistance to leakage currents, the shape being moreover such that rain water impinging upon the insulator will wash the surfaces clean even under the most adverse conditions as for example if the insulator be used near cement works and other places where there is a large amount of foreign matter floating in the air.

An additional object is to provide an insulator having these advantages and which will at the same time be simple and inexpensive to make, just as easy to install as any other, 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 which will appear as the description progresses, my invention preferably consists in the details of construction and shapes of surfaces to be hereinafter more fully described and claimed, and illustrated in the accompanying drawing in which:

The figure is a view of an insulator constructed in accordance with my invention, one half being in elevation and the other half in section.

Referring more particularly to the drawing I have shown the insulator as comprising a hollow porcelain body including a lower section 10 and an upper section 11, both concavo-convex in cross section and arranged with their open sides toward each other. As all the external and internal surfaces are surfaces of revolution it is quite apparent that these sections may be readily formed by plunging in the usual and well known manner though it is of course conceivable that they may be cast if such is preferred for any reason. The lower section 10 is arranged with its convex side down and this convex surface may be either a portion of a sphere or of compound curved shape, as preferred. The lower section is also formed at its center with an upstanding projection 12 formed with a recess or socket 13 which may be sanded or otherwise roughened in accordance with common practice and which is intended to receive a suitable pin, not shown, which is cemented into the recess and which is for the purpose of supporting the insulator upon a cross arm or other equivalent support.

The upper section 11 has its convex side disposed upwardly and it is of greater diameter than the lower section so as to extend beyond the periphery thereof for the purpose of shedding rain or in fact any accumulation of moisture. Spaced inwardly from its edge the upper section is formed with a ledge or shoulder 14 closely abutting upon the corresponding upper edge of the lower section 10. At its center the upper section is formed with a head 15 joined thereto by a constricted neck 16 which provides or defines a groove 17 for the reception of the conventional or any preferred tie wire, clamp or the like for holding the conductor, not shown, in the conductor receiving slot 18 at the top of the head 15.

In the manufacture and assembly of an insulator of this type it should be understood that after the sections 10 and 11 have been performed either by plunging or casting, or any other method, the sections are arranged in superposed relation as shown with the ledge 14 engaging snugly upon the edge of the lower section. It is intended that slip or glaze be provided on these contacting surfaces. If the sections are to be assembled while in a "green" or slightly plastic condition then it is probable that clay slip would be used at the areas of contact between the two sections but if assembly is contemplated while the sections are in a bone dry condition, which may conceivably be preferable, then glaze would be the medium applied to the contacting surfaces for the purpose of uniting them. In any event, after the sections are assembled they are fired in a kiln in the usual manner and owing to the fact that the assembled sections are hollow it is necessary to permit the escape of air from the interior during firing. This is readily taken care of by providing the lower section with a series of small holes 19 which incline downwardly and outwardly as clearly indicated in the drawing so that water cannot enter the interior even though gusty rains may beat upon the insulator. Of course it is also obvious that all the exterior surfaces of the sections are glazed in the usual manner before firing.

After assembling and firing, it may be well to pour in a filler 20 of melted asphaltum or the like in the groove between the outer edge of the lower section and the inner surface of the overhanging outer portion 21 of the upper section, the purpose of this being to seal and additionally secure the sections especially in case there might be any slight lack of cohesion between the contacting surfaces. Moreover this filling will preclude any accumulation of moisture or dirt at the joint.

In use, the insulator is mounted upon a pin which is cemented within the recess 13, the conductor is laid in the groove 18 and whatever tie wire is used is engaged with the conductor and disposed within the groove 17.

Attention is directed to the fact that in this insulator there will be the effect of a series of condensers between the conductor and the supporting hardware as each thickness of porcelain with its outer and inner surfaces acts as one condenser and as the interposed air together with the inner surfaces of the sections will act as another. A very important feature is the air space which is directly interposed between the conductor and the pin and which greatly increases the insulating value or puncture strength. The fact that the dielectric constant or permittivity of air is only one-sixth that of porcelain causes the capacitance of the condenser formed by the air space to be very much lower than that formed by the two porcelain parts since the capacitance is indirectly proportional to the permittivity. As the air is not entirely confined, owing to the provision of the holes 19, there will be no great ionization, at least not sufficient to impair the electrical efficiency. An insulator constructed in this way is particularly advantageous for use as it may be said to be radio-proof, that is to say it will cause no great disturbances such as occur with the ordinary types embodying one or more sections of solid porcelain without any interposed air gap. Another feature of importance is the stream-line shape of the insulator which will insure the surfaces being wetted when rains occur so that there will be no unequal

electrical stresses set up and so that the surfaces will be adequately washed off so as to prevent the accumulation of dirt and foreign matter which, in some localities in particular, is highly conductive and leads to excessive leakage over the surface.

From the foregoing description and a study of the drawing it is thought 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 embodiment 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. An insulator comprising a dielectric body including upper and lower sections concavo-convex in cross section arranged with their concave sides toward each other to define an interposed air space, one section being formed for mounting upon a support and the other for attachment to a conductor, the upper section extending outwardly beyond the lower section.

2. An insulator comprising a dielectric body including upper and lower sections concavo-convex in cross section arranged with their concave sides toward each other to define an interposed air space, one section being formed for mounting upon a support and the other for attachment to a conductor, the upper section projecting outwardly and downwardly beyond the upper edge of the lower section, and sealing means about the upper edge of the lower section.

3. An insulator comprising a dielectric body including upper and lower sections concavo-convex in cross section arranged with their concave sides toward each other to define an interposed air space, one section being formed for mounting upon a support and the other for attachment to a conductor, the upper section having a downwardly and outwardly extending skirt portion projecting beyond the upper edge of the lower section, the inner surface of said skirt portion defining, with the upper edge of the lower section, a groove, and sealing material within said groove.

4. An insulator comprising a pair of sections concavo-convex in cross section arranged with their concave sides toward each other to define an interposed air space, the upper section being formed inwardly of its periphery with a ledge seating conformingly upon the upper edge of the lower section, and being formed for engagement with a conductor and the other having a reflexly curved portion defining a socket for mounting upon a support.

5. An insulator comprising a pair of sections concavo-convex in cross section arranged with their concave sides toward each other to define an interposed air space, the upper section being formed inwardly of its periphery with a ledge seating conformingly upon the upper edge of the lower section and united thereto whereby both sections will constitute a homogeneous whole.

6. An insulator comprising a pair of sections concavo-convex in cross section arranged with their concave sides toward each other to define an interposed air space, the upper section being formed inwardly of its periphery with a ledge

seating conformingly upon the upper edge of the lower section and united thereto whereby both sections will constitute a homogeneous whole, one section having means permitting communication between the interior and the atmosphere.

7. An insulator comprising a pair of sections concavo-convex in cross section and arranged with their concave sides toward each other with the periphery of one section extending outwardly beyond that of the other to form a water drip, said sections being secured together at the edge of one.

8. An insulator comprising a pair of sections concavo-convex in cross section and arranged with their concave sides toward each other with the periphery of one section extending outwardly beyond that of the other to form a water drip, said sections being secured together at the edge of one, one section having an inwardly extending projection with a recess therein for engagement upon a supporting pin and the other having a transversely grooved conductor supporting head joined thereto by a constricted neck.

9. An insulator comprising upper and lower sections concavo-convex in cross section arranged with their concave sides toward each other to define an included air space, the upper section being of greater diameter than the lower to project outwardly beyond the same and being formed with a ledge united to the edge of the lower section, the lower section having means for engage-

ment upon a support and the upper section having means for supporting a conductor.

10. An insulator comprising upper and lower sections concavo-convex in cross section arranged with their concave sides toward each other to define an included air space, the upper section being of greater diameter than the lower to project outwardly beyond the same and being formed with a ledge united to the edge of the lower section, the lower section having means for engagement upon a support and the upper section having means for supporting a conductor, the lower section further having a circumferential series of holes therein establishing communication between the air space and the atmosphere.

11. An insulator comprising upper and lower sections concavo-convex in cross section arranged with their concave sides toward each other to define an included air space, the upper section being of greater diameter than the lower to project outwardly beyond the same and being formed with a ledge united to the edge of the lower section, the lower section having means for engagement upon a support and the upper section having means for supporting a conductor, the lower section further having a circumferential series of holes therein establishing communication between the air space and the atmosphere, said holes being inclined upwardly toward the axis of the insulator to prevent entrance of water.

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