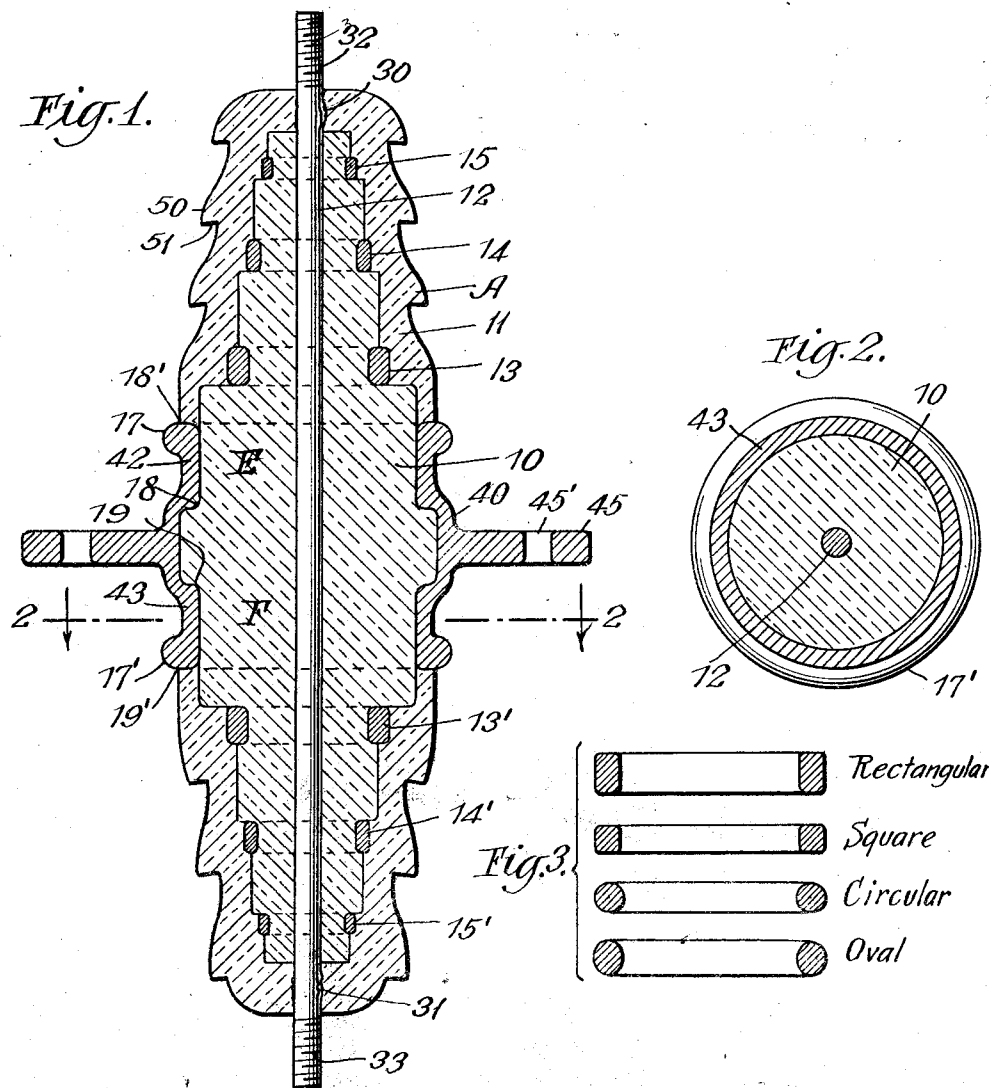


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L. STEINBERGER
INSULATED CONNECTER
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INSULATED CONNECTER.

Application filed May 5, 1919. Serial No. 294,698.

To all whom it may concern:

Be it known that I, LOUIS STEINBERGER, a citizen of the United States, and a resident of the borough of Brooklyn, city and State of New York, have invented certain new and useful Improvements in Insulated Connecters, of which the following is a specification.

This invention relates to improvements in insulated connecters of the condenser type and has particular reference to structures by means of which the electrical stresses and strains will be redistributed within the body portion of the insulator, and the method of its manufacture.

One of the objects of the invention, therefore, is to provide means in the insulator body which will cause redistribution of the electrical stresses and strains within the body portion of the insulator.

Another object is to provide an insulated connector having a conductor molded therein axially thereof and provided with a series of condenser rings surrounding each end of the conductor, the said rings being wholly embedded within the body of the insulator.

Another object of the invention is to provide a series of graded rings embedded within the insulator body, the rings being arranged in groups at each end of the body and graded with respect to their diameters.

Another object is to provide a series of graded rings embedded within the insulator body, the rings being graded with respect to the areas of their cross sections.

Another object is to provide a series of graded rings embedded within the insulator body, the rings being graded with respect to their diameters and to the two dimensions of their cross sections, the ring of larger diameter and larger cross section being nearest the center, the ring of lesser diameter and lesser cross section being at the end, the intermediate rings of the groups being graded accordingly.

Another object is to provide a support near the central portion of the body, said support also acting to redistribute the stresses and strains in a plurality of zones within the body of insulating material.

Another object of the invention is to provide means for distributing the heated areas

in a plurality of zones within the insulation and effect a rapid cooling.

Other objects will appear from the herein-after description and the subjoined claims.

Referring to the drawing in which the same reference character indicates the same part in the several views:

Fig. 1 is a vertical cross section of an insulated connector embodying my invention, the conductor being shown in elevation.

Fig. 2 is a cross section on line 2—2 of Fig. 1.

Fig. 3 is a detail showing modified forms of rings which may be used.

In the drawings, the body of insulating material is represented as having a central core 10 and an outer layer 11 integrally molded thereto during the process of manufacture to be hereinafter described. 12 is the conductor which consists of a solid rod of metal. 13, 14, 15 and 13', 14' and 15' are the condenser rings which are embedded within the body of insulating material at each end thereof and which surround the conductor 12.

The group composed of the rings 13, 14 and 15 is arranged within the body of insulating material and encircles the conductor at one end of the insulated connector, and the rings 13', 14' and 15' are similarly arranged at the other end of the insulated connector. Each ring of each group is positioned substantially the same distance from its adjacent ring and the rings comprising each group are similarly graded, that is to say, the ring of each group which is nearest the center of the insulated connector has the largest diameter, both externally and internally, of any ring of its respective group; the ring next thereto being the central ring of each group is less in diameter both externally and internally, than the previous ring, and the ring at the end of each group nearest the end of the body of insulating material is less in diameter both externally and internally of any ring of its group.

These rings are also graded in two other respects, namely, the ring of largest diameter has the greatest cross sectional area, the ring of least diameter has the smallest cross sectional area, and the cross sectional areas of the rings of intermediate diameters are correspondingly graded. So also are the rings graded in cross section with respect to their two dimensions; that is, both the height or length, the width or thickness of the cross section of the ring nearest the

center are greater than the height and width respectively of the ring next thereto of that group, and in like manner the height and width of the cross section of the last mentioned ring is greater than the height and width respectively of the cross sections of the rings at the end of the group.

The position of the rings and the graded arrangement and form thereof are clearly illustrated in the drawings and further details are therefore regarded as unnecessary in this written description in order that one skilled in the art may clearly understand how to construct and use the invention.

It is preferred to make the ring of metal in ribbon form, as shown in Fig. 1, the corners, however, being slightly rounded although, of course, it is within the scope of my invention to form the rings either entirely of flat sides which are either rectangular or square in cross section, or to make them either oval or round, in cross section, as illustrated in Fig. 3, the rings, however, being graded in accordance with the instructions above set forth. In the event that the rings are either round in cross section or square in cross section, the rings are also graded with respect to their diameters and their cross sectional areas.

As clearly illustrated in the drawings, there is provided at the central portion of the elongated body of insulating material A, a sleeve 40 which consists of two flanges which extend in opposite directions from the ring shaped supporting portion 45. The sleeve 40 is secured to the body of insulating material during the molding of the insulating material within the sleeve so that the metallic sleeve 40 surrounds the central portion of the body of insulating material and a surface thereof is thus in contact with the surrounding atmosphere so as to afford an efficient means for heat dissipation.

The projecting flange 45 is provided with bolt holes 45' through which bolts may pass by means of which the supporting sleeve and ring and consequently the insulated connector is secured to the support (not shown) which may be the roof of a house, the cover of a tank, or the like as well understood in the art.

The sleeve 40 is substantially in the form illustrated in the drawing and each flange is offset as at 42 and 43 from the central inner surface, being curved inwardly as at 18 and 19 and is formed at their edges with ribs or beads 17 and 17', these ribs being rounded and of such a form and shape that the insulating material of the body of the connector at each edge of the sleeve impinges upon the rib at a point about midway thereof, as clearly shown at 18' and 19' so as to afford an effective hold between the flange and the insulator body.

From this construction it is seen that the

upper and lower portions of the supporting ring are nearer the conductor rod than is the center of the inner surface of the supporting ring. As well understood the voltage has a tendency to break through the insulating material and by means of my improved construction just described, as the electric stress or lines of force tend to leave the collars 42 and 43 where they are nearest the conductor rod 12 they will extend through or from the zones E and F from which they may be more readily distributed throughout the insulator rather than concentrating toward the central zone of the supporting ring. As the flanged sleeve or thimble is placed on the outside of the body of insulating material it thus contacts with the air, causing a dissipation of the heat created in the zones E and F. The advantage of this particular construction is due to the fact that the lines of stress and strains will be distributed and consequently the heated zones will be enlarged and the heat readily dissipated in a plurality of places.

The conductor rod is roughened near its ends at 30 and 31 so as to afford an efficient holding surface for the insulating material when it is molded therearound. The extreme ends of the conductor rod are screw-threaded at 32 and 33 to afford means for connecting the leads thereto, as well understood.

The manufacture of the improved insulated connector as above described is accomplished as follows:

The conductor rod is fixed in an upright position and the groups of rings positioned in graded relation to each other as hereinabove described, each group surrounding the respective ends of the conductor. The supporting sleeve and ring 40 and 45 are also positioned centrally of each group of rings. The insulating material is then molded around the conductor and around the condenser rings and within the supporting ring 40 to form the core body 10, as clearly shown. After forming the body 10 with the metal connections, as shown, the insulator body is then completed by molding therearound the portion 11 which is molded into the shape shown, having alternate circular ribs 50 and grooves 51 on its surface, as clearly shown.

The insulating material used may be any suitable moldable material, but I prefer to use the insulating material well known in the art as electrose.

The portions 10 and 11 of the insulator body may be formed of the same grade of electrose, or the two portions 10 and 11 may be formed of electrose of different grades.

From the above construction it is seen that the electrical stresses and strains will be distributed and the heating effects which may be created within the body part of the

insulator by the changes in the electric stress, will be distributed and dissipated to the air almost instantly, there being a large metal surface exposed to the air for that purpose.

5 The rings, 12, 13, 14, 12', 13' and 14' serve to uniformly distribute the lines of the flux and static field formed on the surface of the insulator and prevent concentration of the electrostatic field in paths between the ex-
10 posed portion of the conductor 12 and the supporting ring 40. The effect of the rings is somewhat similar in this respect to the external static or flux control shields used for this purpose. Therefore a redistribution of
15 the electrical stresses and strains is accomplished by the groups of metal rings of varying sizes and varying heights and widths which are embedded at each end of the insulator body, as above set forth. It is to
20 understood that the relative positions of the rings to each other may be varied somewhat from the equidistant position illustrated, the proper adjustments being made in the proportions of the rings.

25 As changes of construction could be made within the scope of my invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative
30 and not in a limiting sense.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

35 1. In a device of the kind described, a body of insulating material, a conductor molded therein and extending therethrough, two groups of metallic rings, the several rings of each group having different surface areas, a group surrounding the con-

ductor at each end, the rings of each group 40 being progressively graded with respect to the areas of their cross sections.

2. In a device of the kind described, a body of insulating material, a conductor molded therein and extending therethrough, 45 two groups of metallic rings, the several rings of each group having different surface areas, a group surrounding the conductor at each end, the rings of each group being progressively graded with respect to 50 the heights of their cross sections.

3. In a device of the kind described, a body of insulating material, a conductor molded therein and extending therethrough, 55 two groups of metallic rings, the several rings of each group having different surface areas, a group surrounding the conductor at each end, the rings of each group being progressively graded with respect to the 60 widths of their cross sections.

4. In a device of the kind described, a body of insulating material, a conductor secured thereto and extending axially there- 65 through, a metallic supporting ring surrounding said body of insulating material and spaced metallic rings of varying capacities embedded in said body of insulating material concentrically to the axis thereof to 70 uniformly control and distribute the static charge.

In witness whereof, I have hereunto set my hand at the borough of Manhattan, city and State of New York, this second day of May, 1919.

LOUIS STEINBERGER.

In presence of—
ZITA M. GRAHAM.