

UNITED STATES PATENT OFFICE.

LOUIS STEINBERGER, OF BROOKLYN, NEW YORK.

INSULATED CONNECTER.

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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 improved insulated connectors provided with an oil insulator within the body thereof, and with means for dissipating the heat which may be created within the body of the insulating material when the connector is in use.

One of the objects of the invention is to provide an improved construction for insulated connectors containing within the body of the same a supply of oil to act as an insulator.

Another object of the invention is to provide an insulated connector having a hollow metallic conductor secured to and situated within the central portion of the insulator body, said hollow conductor being surrounded by a body of oil and a stratum of air situated above the body of oil, the said stratum of air being open to the atmosphere through the hollow conductor.

Another object of the invention is to provide an insulated connector having a hollow metallic conductor molded to the insulator and situated within the central portion of the insulator body, said hollow conductor being surrounded by a body of oil throughout the greater portion of its length and extending into an air chamber above the oil, said oil being contained in the central portion of the body of insulating material, the said conductor being provided with vents through the wall thereof by means of which a free circulation of air is afforded to the air chamber above the body of oil.

Another object of the invention is to provide an improved supporting sleeve secured to the central portion of the body of the insulator and surrounding the insulator for effectually distributing at a plurality of points the lines of stress and strain set up within the insulator body, and for also effectually dissipating at a plurality of points the heat generated within the insulator body.

Other objects will appear from the subjoined specification and claims.

In the drawings forming a part of this specification:

Fig. 1 is a vertical section of an insulated connector embodying my invention.

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

Referring to the drawings in which the same reference characters represent like parts, 10 is an elongated body of insulating material provided with circumferential ridge 11 substantially of the form shown, and circumferential grooves 12 between the ridges, also substantially of the shape and form shown.

As clearly illustrated in the drawing, the body 10 of insulating material is elongated, and at the central portion 13 of the body there is provided a sleeve 14 which consists of two flanges each extending in opposite directions from a ring-shaped supporting portion 15. The sleeve 14 is secured to the body of insulating material, as shown, during the molding of the insulating material within the sleeve, so that the metallic sleeve 14 surrounds the central portion 13 of the body 10 of insulating material, and a surface thereof is thus in contact with the surrounding atmosphere. The projecting flange 15 is provided with bolt holes 15' through which bolts 16 pass and by means of which the supporting sleeve and ring is secured to a support S, which may be a roof of a house, a cover of a tank, or the like, as well understood in this art. The sleeve 14 is substantially in the form illustrated in the drawing and is provided respectively at each end with ribs or beads 17 and 17', as clearly shown, these ribs being rounded and of such a form and shape that the insulating material of the body 10 at each end of the sleeve impinges upon the rib at a point about midway of the rib, as clearly shown at 18 and 18'.

An elongated cavity C is formed within the central portion of the insulator body and extends axially thereof at least three quarters of its length.

The body of insulating material is formed by molding it into the shape shown in the drawing, and the cavity C molded therein at the same time. As stated above, the body of insulating material is molded within the ring or sleeve 14 so that the ring or sleeve 14 surrounds the outer surface of the central portion of the body and is exposed on one side thereof to the atmosphere. A metallic tube 20 roughened at its end at 21 is molded within the end portion of the insulating body along its cen-

tral or axial portion and extends outwardly from the ends of the body at 23 and 24. The end 23 of the tube is provided with screw-threads 25 and 26, as shown, and near the upper end of the tube is provided with radially extending apertures 27 and 27'. The set of apertures 27 being in that portion of the tube which extends above the insulator body, and the set of apertures 27' being in that portion of the tube which is situated within the body of insulating material. The lower end 24 of the tube is provided with screw-threads 28 for the reception of lock nuts as shown.

Wire clamps G and G' fit over each end of the tube and are secured in place against washers 35 and 35', which latter are provided to protect each end of the body of insulating material, and the clamps are then secured and held in place by means of lock nuts N, N' at the upper and lower portion of the tube respectively, as clearly shown in the drawing.

At the upper portion of the tubes the nuts N when secured in place are situated below the apertures 27 hereinabove referred to, and a cap 40 of conical or umbrella shape, as shown, having a depending peripheral flange 41, is secured to, and closes the upper end of the tube just free of the apertures 27. The cap is secured in place by means of a screw-threaded cavity 42 in the cap which engages the screw-threads 26 at the extreme upper end of the tube. This cap 40 is provided for the purpose of protecting the tube and connector from the elements of the weather, such as rain, snow, and the like.

The line wires W and W' are secured to the clamps by any approved means, one of which is shown in the drawing which consists of clamping set screws 50 which impinge against the wire, which is inserted in the cavity in the wire clamp, as clearly understood.

As will be seen, the tube forming the metallic conductor is embedded only in the lower body portion of the insulator, and is molded to the insulator only at that point. Around the tube is an annular cavity or air space which is produced when the insulator is made. In this case only the lower portion of the conductor is embedded in the insulating material and a space is thus formed around the tube throughout the remainder of its length. Into this space oil is placed. In the construction shown the oil acts as an insulator and the voltage, therefore, has to break through the oil first and then through the insulating material of which the body is formed, before it will reach the ground. In the construction shown the lines of force which create strains and stresses within the insulator will be distributed and also the gener-

ated heat will be dissipated at a plurality of zones indicated by the letters E and F instead of being concentrated in a single zone, which latter tends to cause a premature destruction of the insulator. When the insulated connector is in use the oil becomes heated and the heat in the oil rises and enters with the generated gases the air space R above the oil. The heated air and gas pass through the vents or apertures 27' upwardly through the tubular conductor 20 and through the vents 27 to the atmosphere. At the same time the cool air of the atmosphere passes through the vents down to the central portion of the insulator body, as well understood, which results in cooling the oil and the interior of the insulator.

As well understood the voltage has a tendency to break through the insulating material in the zones marked E and F and heat will also be generated in these zones. As the flanged sleeve or thimble is placed on the outside of the insulating material it thus contacts with the air, causing the dissipation of the heat at the zones E and F. The advantage of this particular construction is due to the fact that the heat created in the central portion of the insulator body will be separated and dissipated in a plurality of places. By this arrangement, the force due to the electric energy becomes much weaker, and owing to the fact that the metallic material of the supporting flange is directly in contact with the air tends to cause the sleeve or flange to be effectually cooled when heated in use.

As will be seen, the connector as described may be used as an oil or an air-cooled insulator but it may also be used only as an air-cooled insulator. In the present invention the oil is not only used as an insulator but as a means to absorb the heat and as a means to dissipate the heat into the atmosphere. The oil has an insulating effect because the voltage passes along the outside of the metal tube, and must first break through the oil and secondly through the insulating material before reaching ground.

An important feature of the construction is due to the fact that when the insulator is operated at a given voltage, means are provided for dissipating the heat in a plurality of places, and, furthermore, when the flange or supporting sleeve is heated up the heat is quickly dissipated because the metal flange or sleeve is in contact with the air.

The insulator body may be formed of any suitable insulating material, but I prefer to use the insulating material well known in the art as "electrose."

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 and not in a limiting sense.

Having thus described my invention what I claim as new and desire to secure by Letters

5 Patent, is:

1. In a device of the class described, an insulator body, a hollow electric conductor secured within the central portion of said insulator body, a body of oil surrounding
10 said conductor through the greater part of its length, said oil being contained in a cavity formed in said insulator body, said conductor having an opening leading from said
15 cavity into the interior of said conductor above the oil and another opening leading from said conductor to the atmosphere.

2. In a device of the class described, a hol-

low electric conductor having the portion of its lower surface roughened, an insulator body molded in contact with said roughened
20 portion to form an oil tight contact and form an oil cavity around said conductor, said conductor being provided with openings in the upper part thereof communicating with
25 said oil cavity and also provided with openings communicating with the atmosphere, and a protecting cover for the upper end of said conductor.

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

LOUIS STEINBERGER.