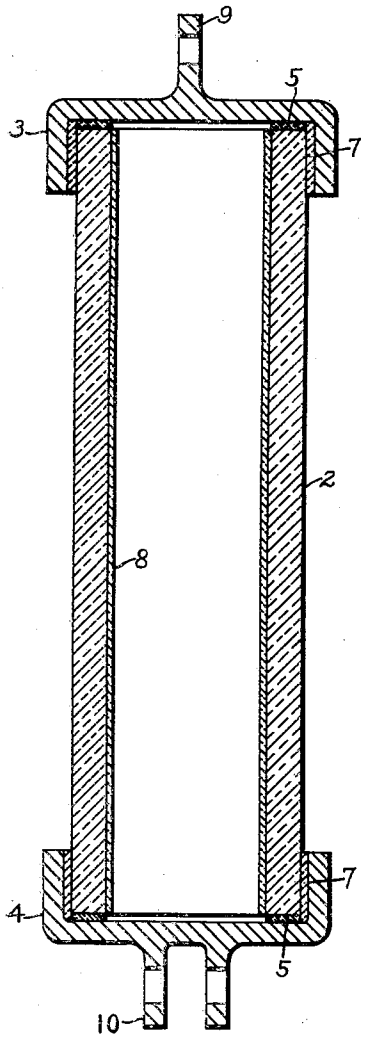
Sept. 17, 1929. W. ESTORFF 1,728,531

HIGH VOLTAGE INSULATOR

Filed June 4, 1927



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UNITED STATES PATENT OFFICE

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HIGH-VOLTAGE INSULATOR

Application filed June 4, 1927, Serial No. 196,494, and in Germany July 28, 1926.

My invention relates to high-voltage insulators and particularly to high-voltage insulators embodying hollow tubular main insulating or dielectric elements.

One object of my invention is to provide an insulator of the above-indicated character that shall permit the use of a hollow dielectric member without requiring a usual filler material therefor, such as non-conducting resin.

Another object of my invention is to provide means associated with a high-voltage insulator that shall so chemically co-operate with the electrostatic field of the insulator as to prevent, or to nullify, the formation of a conducting medium.

Another object of my invention is to provide a coating medium for the inner surface of a high-voltage tubular insulating member that shall counteract the normal tendency of the electrostatic field in the insulator to form an electrolyte on said inner surface.

A further object of my invention is to provide a high-voltage insulator that shall be light in weight, simple and durable in construction, economical to manufacture and effective in its operation.

In high-voltage insulators having interior spaces in which an electrostatic field exists, as in insulators embodying tubular dielectric members and metal terminal members or end caps, interior breakdown, which usually results in the destruction of the insulators, occurs. These breakdowns are frequently traceable to the fact that the electrostatic field adjacent to the cap or terminal member, at the conductor end of the dielectric member, causes a glowing of the air in the insulator which results in the formation of impurities from the generation of ozone and oxidation products of nitrogen.

Such insulators have been filled with a solid material which will withstand the electrostatic stress but such practice is not desirable because of the tendency of the insulator to crack under varying temperature conditions and because of other objections, such as added cost, increased weight and the requirement for effective sealing means.

It is my aim to prevent breakdown of hollow insulators from the above-mentioned causes and to provide a structure that shall be of reduced cost and weight and an improvement in other respects over similar insulators heretofore employed.

Accordingly, in practicing my invention, I provide an insulator having an interior surface that is so coated with a medium that co-operates with the electrostatic field and that so precludes the requirement of a filler material as to prevent the formation of a deleterious or conducting medium which causes such breakdown and to render the structure lighter in weight and more economical.

The single figure of the accompanying drawing is a longitudinal sectional view of an insulator embodying my invention.

The device comprises, in general, a tubular dielectric member 2, metal end caps or terminal members 3 and 4, end gaskets 5 between the member 2 and the caps 3 and 4, bodies 7 of cement or other suitable bonding medium for securing the caps 3 and 4 to the member 2 and a coating 8 on the inner surface of the member 2.

The dielectric member 2 is preferably constructed of refractory material, such as porcelain or glass, and may be suitably roughened on its outer surfaces, adjacent to its ends, for co-operation with the cement bodies 7.

The end caps 3 and 4 are of usual construction having cylindrical portions secured to the cement bodies 7 around the ends of the member 2 and end walls for closing the ends of the member 2 and provided with eye and clevis elements 9 and 10, respectively, for mounting the insulator between a conductor and a main support or ground element.

In the above-described structure, if the coating 8 and a filler material are both

omitted, action of the electrostatic field so affects the air or other medium in the member 2 as to cause the formation of compounds, such as ozone, oxidation products of nitrogen and other compounds from the constituents of the medium employed.

When even the slightest amount of moisture is present, as usually is the case under operating conditions, the inner surfaces of the member 2 become covered with a coating of a conducting acid fluid or electrolyte which causes or assists in causing breakdown of the insulator from one end to the other.

To prevent the above-mentioned effect, the coating 8 is provided with a material that will combine with or affect the products resulting from the action of the electrostatic field on the gas so as to form other products which are non-conducting or poor conductors or prevent the formation of conducting media. This coating may consist of linseed varnish for the purpose of combining with the ozone.

If not only the ozone but also the oxides of nitrogen are to be combined, slaked or unslaked lime may be employed for the coating 8.

Other materials which may be employed to advantage for the coating 8 are calcium and lead resinate.

In any case, a structure is provided that, by preventing breakdown from the causes set forth and by precluding the requirement of a filler material, is less subject to damage or destruction, more effective, lighter in weight and less expensive than insulators heretofore employed.

While I have shown and described a particular form of my invention, changes may be effected therein without departing from the spirit and scope thereof as set forth in the appended claims.

I claim as my invention:

1. An insulator comprising a hollow dielectric member and a coating on the inner surface thereof of material for preventing the formation of a conducting medium normally caused by an action of the electrostatic field with a gas in the member.

2. An insulator comprising a hollow dielectric member and a coating entirely covering the inner surface thereof of material that is chemically reactive with a medium caused by the electrostatic field to prevent the formation of a conducting medium that would be formed if said first medium were not present.

3. An insulator comprising a dielectric member and a coating medium on a surface thereof capable of interaction with the electrostatic field to prevent the formation of a conducting medium on said surface.

4. An insulator comprising a hollow dielectric member and a coating medium on the inner surface thereof for nullifying an effect of the electrostatic field normally tending to render said inner surface conducting.

5. An insulator comprising a tubular dielectric member, metal terminal members therefor and a coating medium on the inner surface of said tubular member for preventing the formation of an electrolyte on said surface normally caused by electrostatically charging a fluid medium in the dielectric member.

In testimony whereof, I have hereunto subscribed my name this 14th day of May, 1927.

WALTHER ESTORFF.