Feb. 19, 1935. H. ROST 1,991,700

HIGH TENSION INSULATOR

Filed April 18, 1932

Fig. 2.

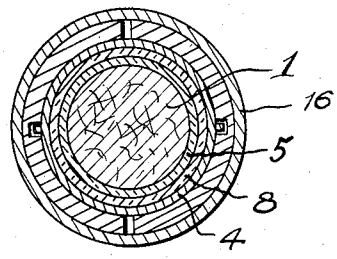
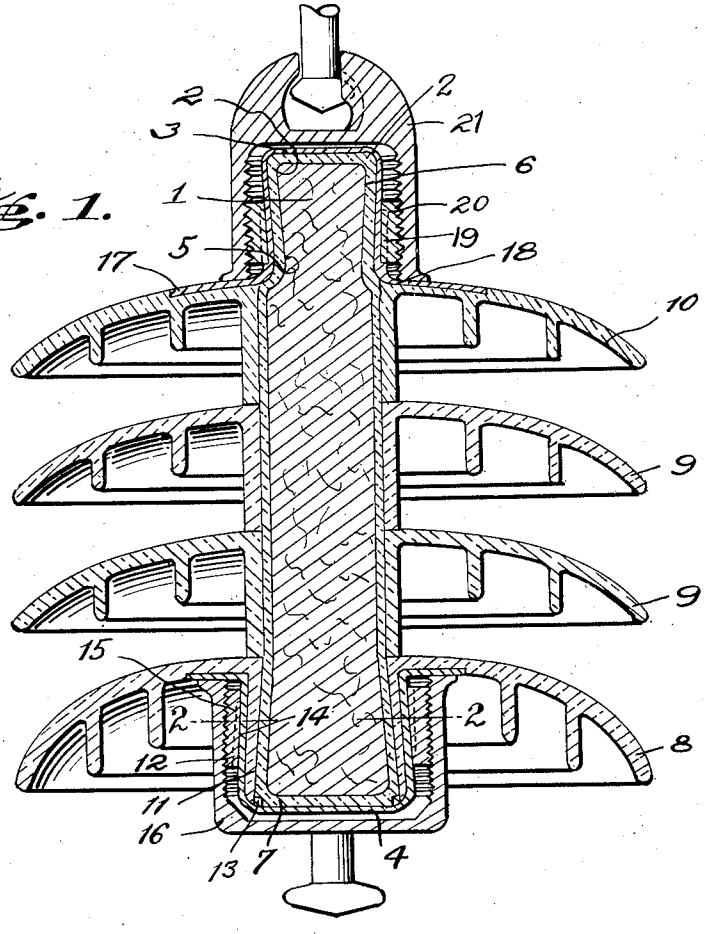


Fig. 1.



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HIGH TENSION INSULATOR

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7 Claims. (Cl. 173—318)

This invention refers to high tension insulators.

According to this invention a composite electric line insulator for high tension is composed of shells of a synthetic thermo-plastic compound, arranged around a solid central mechanically strong and electrically insulating support, the shells being made from a thermo-plastic compound of the carbon-hydrogen series, which do not absorb water, as for instance commercial trolitul.

Above plastics generally are polymerization products, which do not contain hydroxyl groups, of organic compounds such as acetylene, acrylic acid, styrol, vinyl esters, vinyl alcohol, vegetable oils, cyclic, ketones, methylene ketones etc.

Any of the above specified compounds can be provided with added suitable plasticizing agents in order to give to the final product the necessary hardness and elasticity.

The invention is further characterized by a plurality of moulded parts of any of above mentioned thermo-plastic compounds in the form of shells, each open in the centre and there provided with a petticoat in the form of a collar, which together with the shell is slipped over a central support, each collar being secured to the central support and to each successive shell and collar respectively by a suitable solvent of the plastic compound used.

The central part is provided with a cylindrical solid member of fibrous material, as for instance fibre or wood, and of a special shape to take up the mechanical stress. Said central member is preferably made of hard wood which is tough and of high tensile strength and which has been dried in vacuum and impregnated with an organic plastic compound of the carbon-hydrogen series in solution, so that it does not absorb water, as for instance trolitul which is a vinyl compound consisting of polymerized styrol.

Trolitul is dissolved in, for instance, benzol or some other solvent and as soon as the member is impregnated it will be impervious to moisture, absorption and putrefaction in the same degree as would the organic compound itself.

The central member may be provided with an outside layer of solid compound of the same consistency as that of the material used for impregnation, in order to increase the dielectric strength.

The central member has at the bottom an increased surface of conical shape, and at the top features make a definite stop for the lowest disc it has a decreased surface of conical shape. These and allow all upper discs to be passed over the cylindrical part of the central member at the top without hindrance.

The conical surfaces at the top and bottom allow of a positive clamping to be made in order to take up the mechanical stresses.

The central member, at top and bottom, is provided with a metallic insert of aluminum or other suitable metal, and the top and bottom discs are also provided with a similar kind of metallic insert on the superior and inferior surface respectively.

When all the discs are in place, then the metal inserts at the top will make metallic contact, and at the bottom the metallic insert of the disc will make metallic contact with the insert at the lower part of the central member.

These metallic inserts will cause the same potential at all places at top and bottom and will prevent corona discharges at eventual air spaces between the metal parts and the insulating materials.

The insulating discs shall be made of plastic, flexible homogeneous compound, and each disc is glued to the insulating central member and to each preceding and following-disc, with the result that a completely built-up insulator unit is formed with enough discs to correspond to the required voltage.

The mechanical stress is completely taken up by the impregnated central member and the stress is transmitted to the top and bottom metal fixtures by means of a conical metal ring in two halves with threads on the outside, and which are guided by one or various flanges protruding from the metal inserts above described, one being fixed to the top part of the central member, and the other to the lower part of the lowest disc.

The top and bottom fixtures have inside threads which engages the threaded conical rings mentioned; when said fixtures are screwed on sufficiently they engage the metallic inserts of respective discs, and when screwed on further, the conical rings will begin to move upwards from the discs gradually increasing the pressure between the top and bottom fixtures and the conical parts of the central member.

The tension is thus transmitted from the fixtures to the central member by compression of same. Between the top and bottom fixtures and the corresponding surfaces of the central member there is an air space provided to allow for longitudinal expansion. Owing to the fact that

the insulating structure is made of the same material and the central member of fibrous material is impregnated with the same, the expansion and contraction laterally between top and bottom fixtures will be free, while the expansion longitudinally will be met by compression between the fixtures. In such a way no dangerous stresses will occur.

The metallic insert in the top and bottom discs serve to make a tight joint between the metal and the insulating material and at the same time, by increasing the surface, to distribute the electrical tension.

In the accompanying drawing Fig. 1 is a vertical longitudinal sectional view of the improvement and Fig. 2 is a cross section taken on line 2—2 of Fig. 1.

Referring more particularly to the accompanying drawing:

1 is the impregnated central member; 2 is a coating compound of the same substance as that with which the central member is impregnated.

3 is a metallic insert at the top of the coated central member; 4 is a metallic insert in the coating at the bottom of the central member; 5 is the narrowest part of the dowel at the top; 6 is the conical surface of the top part of the central member.

7 is the conical surface of the lower part of the central member; 8 is the lower disc with a metallic insert; 9 are intermediate discs; 10 is the top disc with metallic insert; 11 is the conically formed interior surface of the lower disc and 12 is the metallic insert in the interior of the lower disc.

13 is solder to eventually make metallic contact with metallic insert 4; 14 is a metallic rib on the insert.

15 is a metallic conical ring, outwardly threaded and split in two parts; 16 is the bottom fixture preferably of galvanized malleable steel; 17 is the metallic insert in the top disc.

18 is the solder to eventually make metallic contact to the metal insert on the top of the central member; 19 is a metallic rib on the insert on the top of the central member to guide the ring and prevent same from rotating; 20 is the conical top ring in two sections and 21 is the top fixture made preferably of galvanized malleable steel.

Having thus described my invention, what I claim is:

1. A built up electrical line insulator characterized by a solid central member having conical surfaces at the ends thereof, said member being formed of fibrous material having a smooth outer surface larger at its bottom than at its top and impregnated and coated with a plastic and homogeneous organic compound, said insulator being provided with flared discs composed of said organic compound, said discs having on the under surface a central spacer member having a central hole therethrough, whereby each disc may be passed over the upper end portion of the central member and thence downwardly to fit tightly around the same to facilitate gluing of the disc and spacer to the central member, each disc being spaced on the central member by said spacer member to provide air spaces between the flared portions of the discs.

2. An insulator as claimed in claim 1, in which the central member is provided with a metallic insert at its bottom end and on the small portion at the top end.

3. An insulator as claimed in claim 1, in which each spacer is integral with the flared portion of the disc.

4. An insulator as claimed in claim 1, in which the bottom disc is provided with a metallic insert on part of the lower flared portion of the disc and extending over the outside conical portion of the central member.

5. An insulator as claimed in claim 1, in which the top disc is provided with a metallic insert on part of the upper surface and extending over the top of the central member.

6. An insulator as claimed in claim 1, in which the top and bottom portions are provided with conical rings having outside threads and hollow cylinders with inside threads which engage the threads of the conical rings.

7. An insulator as claimed in claim 1, characterized by the fact that the central member of fibrous material besides being impregnated is provided with a coating of flexible, plastic and homogeneous compound of the same consistency as the impregnating compound.

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