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INSULATOR.

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1,015,229.

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Fig. 1.

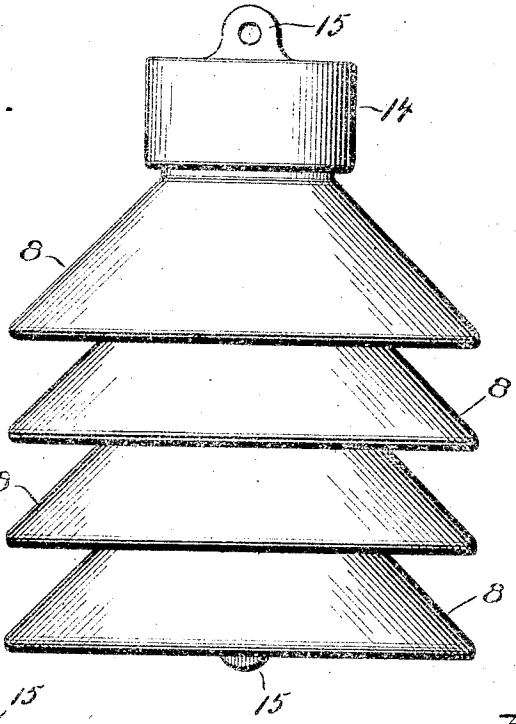


Fig. 2.

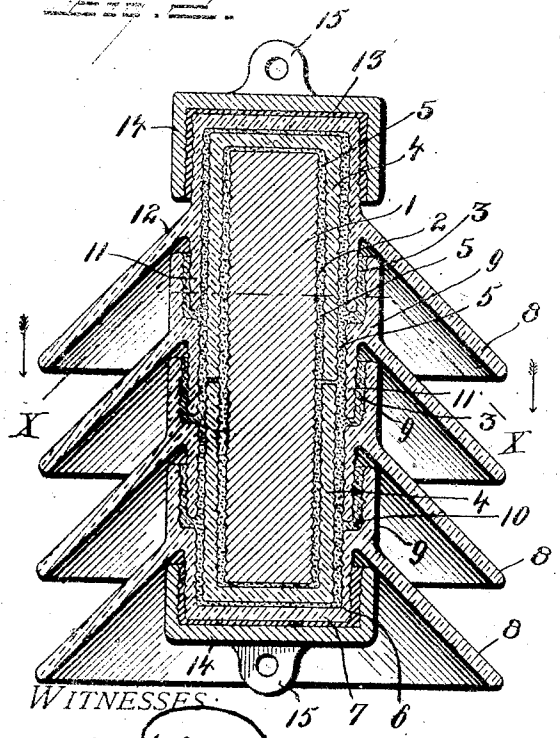
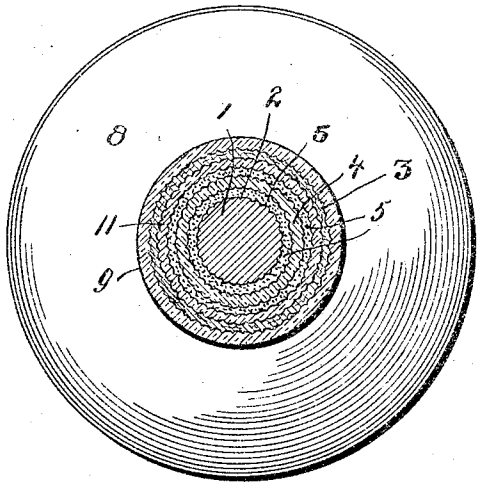


Fig. 3.



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UNITED STATES PATENT OFFICE.

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INSULATOR.

1,015,229. Specification of Letters Patent. Patented Jan. 16, 1912.

Application filed January 29, 1906. Serial No. 298,533.

To all whom it may concern:

Be it known that we, JOHN D. HILLIARD, Jr., and CHARLES E. PARSONS, citizens of the United States, residing at Glens Falls, in the county of Warren and State of New York, have invented a certain new and useful Improvement in Insulators, of which the following is a specification, reference being had therein to the accompanying drawing.

Our invention relates to insulators and more especially to that type of insulators employed for high potential circuits, long distance transmission lines, and the like.

The object of the invention is to provide an insulator for high voltage transmission lines which will have the mechanical stresses applied longitudinally instead of laterally as with the pin supported insulator, which will be cheap to manufacture, and which will be able to carry practically an unlimited potential without danger.

Heretofore, the typical insulator for high voltage transmission lines has been constructed of a series of petticoated shells mounted over an iron or wooden pin held upon a cross-arm. As the metal pin is in every case in contact with the cross-arm, the condenser capacity of such an insulator is considerable and if high electrostatic stress be applied to a thin section of the porcelain, a puncture is inevitable. In the case of a wooden pin, it is bound to take moisture from the cross-arm with which it is in contact and from the surrounding air, and under high voltage the destruction of the pin is probable, due to burning by static leakage. Inasmuch as voltage must continually increase with the increase of distance transmitted, a new type of insulator has been found necessary, in order to stand the mechanical and electrical stresses.

Further objects of the invention will be apparent to those versed in the art when the specification is read in connection with the accompanying sheet of drawing which forms a part of this application and in which:

Figure 1 is a side elevation. Fig. 2 a longitudinal section thereon, and Fig. 3 a transverse section on the line x x of Fig. 2 looking in the direction indicated by the arrows.

Referring more especially to the drawing, 1 represents a wooden core which has preferably been impregnated with resin or a similar compound so as to render it moisture and air proof and which is corrugated throughout its entire length as indicated at 2 so as to furnish a good holding surface for a cement 5 preferably composed of sulfur and powdered glass which not only forms a strong and tough cement but is also possessed of high insulating qualities. Surrounding the wooden core 1 and held by the cement 3 are porcelain or tile cylindrical insulators 4 which preferably have their ends closed so as to fully insulate the ends of the core. These cylindrical porcelain insulators 4 may be surrounded by other similar insulators which, if necessity required, could be increased in number so as to provide a device that would withstand any line potential whatever. These insulators are corrugated along their interior and exterior surfaces so that the bodies of cement may have good holding surfaces.

The porcelain or tile member 6 is slipped over the bottom insulating member 4 and secured thereto by the cement 5. This member 6 is provided with a head 7 which lies adjacent to the head of the bottom insulator 4 and is also provided with a petticoat 8 of the usual construction. Extending at an obtuse angle to the line of the petticoat 8 and lying parallel with the insulator 4, is an up-standing flange 9 slightly offset from the main body of the member 6, which offset forms a shoulder 10. Each outer insulator with its petticoat 8 and flange 9 has also a flange 11 which as it is slipped over the cylindrical insulators 4 is surrounded by the flange 9 of the next insulator and approaches the shoulder 10 of the insulator below. After a sufficient number of these petticoated insulators, bearing the same relation to one another, have been placed around the cylindrical insulators 4, a cap insulator 12 is placed over the whole. This cap insulator is provided with a head 13, lying adjacent to the cylindrical head of insulator 4, and sides which extend down from the head and merge into the petticoat 8. This insulator is also provided with a depending flange 11 forming a continuation of the sides and surrounded by the flange 9 of the insulator next below. These petticoated insulators are all corrugated upon their interior surface and the flanges 11 are also corrugated upon their exterior surfaces so as to approximately mate with the corrugations on

the interior of the flanges 9. The cement 5, consisting of sulfur and powdered glass, placed between the petticoated and plain cylindrical insulators, rests upon the shoulders 10 and forms a seat for the flange 11 of each insulator. Instead of placing a similar cement between the flanges 9 and 11, we prefer a cement 3 consisting essentially of ozocerite, stearic acid, and resin which is soft or resilient enough to prevent breakage of the insulators and has also a high puncturing point. This cement is likewise waterproof.

Secured upon the opposite end members 6 and 12 are iron caps 14 each provided with an eye 15, the upper one being intended for engagement by a hook or ring suspended from a cross arm, and the lower one for attachment to the conducting wire or cable by means of any suitable band, hook or hanger.

By suspending this insulator from its support, on a hook, wire or equivalent device, and then swinging the cable below the insulator, the latter has free lateral motion in all directions, therefore the stress of the cable upon it is always direct, and as the individual insulator shells of which it is built up are mechanically separate from each other, and only connected through the cement by which they are secured upon the wooden core, this core or plug will receive the strain.

Having thus described our invention, what we claim and desire to secure by Letters-Patent is:

1. An insulator comprising a core, tubular insulating members surrounding said core and cemented thereto, a plurality of nested insulators cemented to said tubular members, each of said nested insulators provided with an annular flange adapted to overlap a complementary flange on the next succeeding insulator, and cap insulators for the ends.

2. An insulator comprising a core, tubular insulating members surrounding said core and cemented thereto, a plurality of nested insulators cemented to said tubular members, each of said nested insulators provided with an annular flange adapted to overlap a complementary flange on the next succeeding insulator, cap insulators for the ends, and means connected to the cap insulators for suspending the entire structure and thereby flexibly supporting a conductor.

3. An insulator formed of a plurality of separate elements or shells, with the space between them filled with material comprising in part a solid cement to give strength and in part a viscous insulating material as ozocerite, stearic acid and resin to give insulation, the latter being held in place by the said cement.

4. A built-up insulator for high voltage transmission lines comprising a treated wood core, cup-shaped insulating shells surrounding said core and inclosing the opposite ends thereof, a plurality of petticoated rings or shells surrounding said cup-shaped shells and having upper and lower nested flanges between each pair, cement filling between the core and cup-shaped shells and a yielding cement filling between said nested flanges, and caps or securing means cemented upon opposite ends of the structure.

5. A built-up strain insulator for high tension transmission lines comprising a core, a plurality of nested insulating shells cemented upon said core intermediate of its ends, and attaching means secured upon opposite ends thereof.

6. A built-up strain insulator for high tension transmission lines comprising a treated wood core from which all moisture has been extracted, a pair of cup-shaped insulating shells inclosing said core, a plurality of annular petticoated insulating shells surrounding and inclosing said cup-shaped shells, cement containing sulfur and a vitreous material between the core and the cup-shaped shells, and also between the latter and the petticoated shells, a cement composed of soft, resilient or viscous material such as ozocerite, stearic acid and resin between the individual shells, and a pair of metal caps carrying attaching means cemented over the end shells.

7. A suspension insulator comprising a core adapted to resist tensional strains, insulating shells completely inclosing and cemented over and upon said core, a plurality of petticoats formed upon said shells and carried intermediate of the ends of the core, and attaching means secured upon said ends.

In testimony whereof we have affixed our signatures in presence of two witnesses.

JOHN D. HILLIARD, JR.
CHARLES E. PARSONS.

Witnesses:
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WM. B. SMITH, JR.