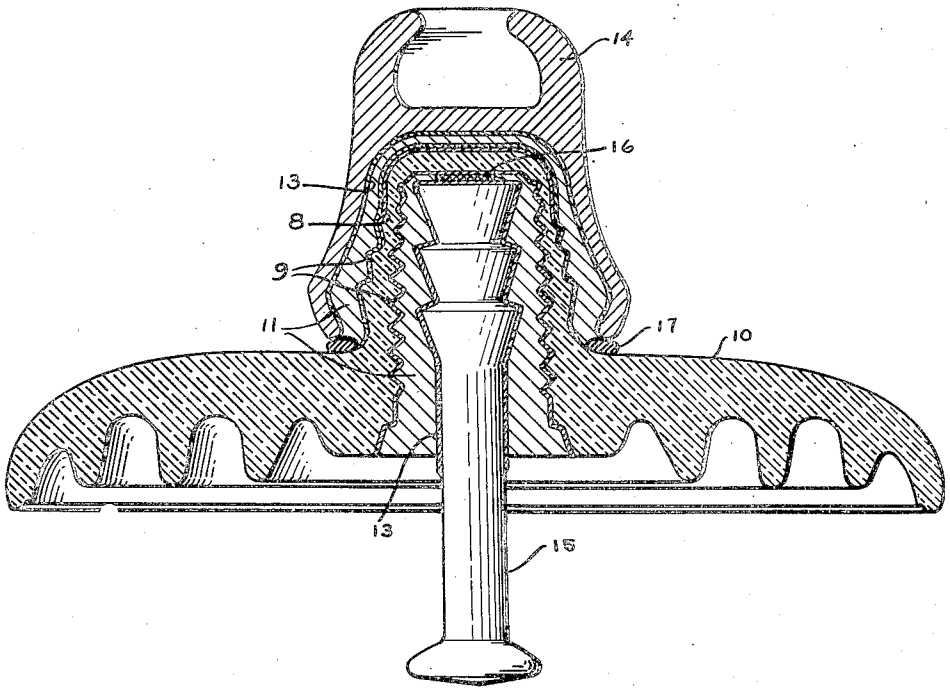
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ELECTRIC INSULATOR

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ELECTRIC INSULATOR

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My invention relates to electric insulators and more particularly to high tension suspension insulators comprising a dielectric member and metallic members connected on opposite sides of the dielectric member, the respective parts being so arranged and bonded to one another as to give the assembly a high mechanical and electrical strength. A typical form of insulator of this general type is one provided with a dielectric member having a head and skirt with a metallic cap fitted over the head and a pin projected into a pinhole in the head.

My invention teaches improved methods of assembling insulators which render them stronger than those of like or similar design assembled by previous methods. My invention also teaches the use of combinations of bonding media which are believed to be novel and which have advantages over bonding media used in the past. Furthermore, my invention teaches a method of treatment of the dielectric members, when made of glass or similar material, which enables them to be more readily inspected than could those of the past.

The principal object of my invention, generally considered, is a suspension insulator of improved mechanical and electrical strength.

Another object is an improved method of assembling an insulator.

Another object is a suspension insulator, which has been assembled in such a fashion and so treated as to have improved mechanical and electrical strength.

Further objects of the invention are improved insulator bonding media.

A still further object is an insulator which may be readily inspected for defects of the dielectric part.

Other objects and features of my invention will become apparent on a further perusal of the specification and accompanying drawing.

The drawing is a sectional elevation of a conventional form of insulator the mechanical and electrical strength of which is materially greater when assembled according to methods herein defined than by any former method known to me.

Prior to the assembling operation and in order to facilitate inspection later, I prefer, when employing a dielectric member 10 having light transmitting qualities, to apply to the upper head surface area of the dielectric member a coating 8 of good light reflecting material having adhesive qualities which prevent entry of moisture between the coating and dielectric and for reasons which will hereinafter become evident having the further quality of resisting destruction by solvents of an asphalt or similar composition. A good grade of commercial white enamel has been found to satisfactorily meet these requirements. After the enamel is dry I apply a thin coat or cushion 9 of resilient asphalt or similar compound to those surfaces of the dielectric member 10 adjacent a bonding medium 11, and apply a coat 13 of corrosion resistant material to those surfaces of metallic members 14 and 15 adjacent such bonding medium. I prefer to employ as the bonding medium 11 a hydraulic mixture of neat Portland cement comprising approximately two parts generally known as "standard grind;" i. e., ground fine enough that 50% will pass through a 200 mesh screen, and approximately one part ground fine enough that 50% will pass through a 500 mesh screen.

An important part of the assembling operation has to do with the method of mixing of the hydraulic mixture and of packing it between the metallic and dielectric parts irrespective of the proportions of the mixture employed. By conventional methods of preparing a neat cement mixture for use, it has been deemed necessary to employ water to the amount of 28% to 30% of the weight of the cement in order to produce a mixture having the necessary fluidity to properly fill the space between the metallic and dielectric parts. I have found that if a certain percentage of the cement used is of coarser than of standard grind, the mixture vibrated while it is being prepared for use and the insulator parts vibrated with the cement mixture therein as assembling of the parts takes place, I can reduce the quantity of water required to the neighborhood of 20% of the cement weight and still thoroughly pack the mixture between the component parts.

After the hereinbefore referred to coatings on the respective insulator parts are dry, I insert an asphalt impregnated paper pad 16 in the bottom of the pinhole which completes the preparation of the dielectric member for the receipt of the bonding medium 11 and the hardware, in the instant disclosure comprising the pin 15 and cap 14. I first place cap 14 in inverted position in a suitable fixture supported by a vibrator mechanism, place the necessary quantity of the cement mixture in the cap and then insert the head of member 10 into the cap. The introduction of cement into the pinhole may take place either before placement of the head of the dielectric member 10 in its cap 14 or immediately thereafter. In any case, as soon as the dielectric member 10

has been placed on the vibrator and cement introduced into the pinhole, I place the pin 15 therein, hold it in proper axial position with respect to the pinhole and exert downward pressure thereon to force the pin down into the cement mixture as the whole insulator assembly continues to vibrate. In order to enable the pin 15 to become properly positioned in the pinhole by the time proper positioning of the dielectric member 10 in cap 14 has been effected, I prefer to employ a very slightly wetter cement mixture in the pinhole than used in the cap, because excessive vibration of the parts tends to weaken the cement by the separation of the fine and coarse grains thereof from one another.

After the assembling operations above described, I thoroughly cleanse the insulator assembly, give the hardware a thin coat of a corrosion protecting material, then steam cure the cement in the well known manner.

An alternative assembling method which I have also found quite satisfactory is to introduce the necessary quantity of cement-water mixture in the cap while in the vibrator, as in the previously described method, and temporarily sealing the space between the open edge or rim of the cap 15 and the dielectric member 10 with a spacer washer 17 preferably made of rubber or paper. After the parts have been vibrated for a sufficient time to bring them into properly spaced relation, I revert the dielectric and cap members 10 and 15 to their normal position in use and resume the vibrating treatment for a time sufficient to obtain maximum density and/or packing of the cement mixture in the neighborhood of the rim of the cap where the holding action of the cement or bonding medium is most effective. Subsequently, preferably after the cement between the cap and dielectric member has become slightly set, I invert the assembly, hold it fixed, introduce a suitable quantity of the cement-water mixture into the pinhole of the dielectric member, insert the metallic pin member therein and vibrate the pin 15, or alternatively the cap 14 and the dielectric member 10, for a sufficient time to produce greatest density and/or packing of the mixture in the bottom of the pinhole cavity and about the portion of the pin where maximum bonding action is wanted. I then prefer to set the cement by the steam cure method. The reflective coating of enamel 8 makes it possible, with the aid of a good light, to visually inspect the glass lying between the insulator pin and cap wall by looking at the insulator from its bottom side in a direction parallel to the pin. This is true because the reflecting coating enables one to see any defects in the glass which fall between such coating and the bottom surface of the insulator. The glass which can thus be inspected for defects is that which is under greatest stress and therefore is that needing closest inspection for possible defects.

Many attempts have been made to provide bonding mixtures which can be satisfactorily employed without need of resorting to the use of a resilient coating on the dielectric member because it is known that such a coating, especially if of material thickness, permits excessive slippage between the cement and the dielectric and tends materially to reduce the mechanical strength of the assembly. I have found that it is practicable to obviate the necessity of providing the dielectric with a resilient coating, or to reduce the thickness of such a coating to such extent that it will not materially reduce the mechanical strength of the assembly, by adding a small amount of diatomaceous earth to the cement mixture. An amount equaling two to five per cent of the weight of the cement has been found ample for this purpose. However, when diatomaceous earth is used as described, it becomes necessary to increase the water content of the mixture to from 25% to 28%.

Although I have herein illustrated the preferred treatment of insulator dielectric and metallic members of a design and the cement mixtures which I prefer to employ, it will be apparent that one of the prime requisites to best results is the method followed in mixing the cement and in the assembly of the respective parts, and, obviously, this method can be applied well within the spirit and scope of my invention to insulator assemblies of different designs than that illustrated and with different kinds and proportions of bonding media than herein disclosed.

What is claimed is:

1. In an insulator assembly a transparent dielectric part having a head with a pinhole therein with a metal cap covering the head and a metal pin occupying the pinhole, a cement mixture in the space between the metal parts and the dielectric, a film of plastic material preventing direct contact of the cement mixture with the insulator parts, and a film of light reflecting enamel covering the head portion of the dielectric to facilitate visual inspection of that portion of the dielectric arranged between the pin and cap.

2. As an article of manufacture, an insulator including a transparent dielectric member having a head with a metal cap fixed thereover and having a pin hole with a metal pin fixed therein, and reflecting means arranged intermediate the cap and head enabling visual inspection of the glass lying between the pin and the cap.

3. As an article of manufacture, an insulator including a transparent dielectric body having a portion lying between two non-transparent members, and reflecting means arranged intermediate said body and one of said members enabling visual inspection of the covered part of the dielectric member.

JULIUS J. TOROK.