

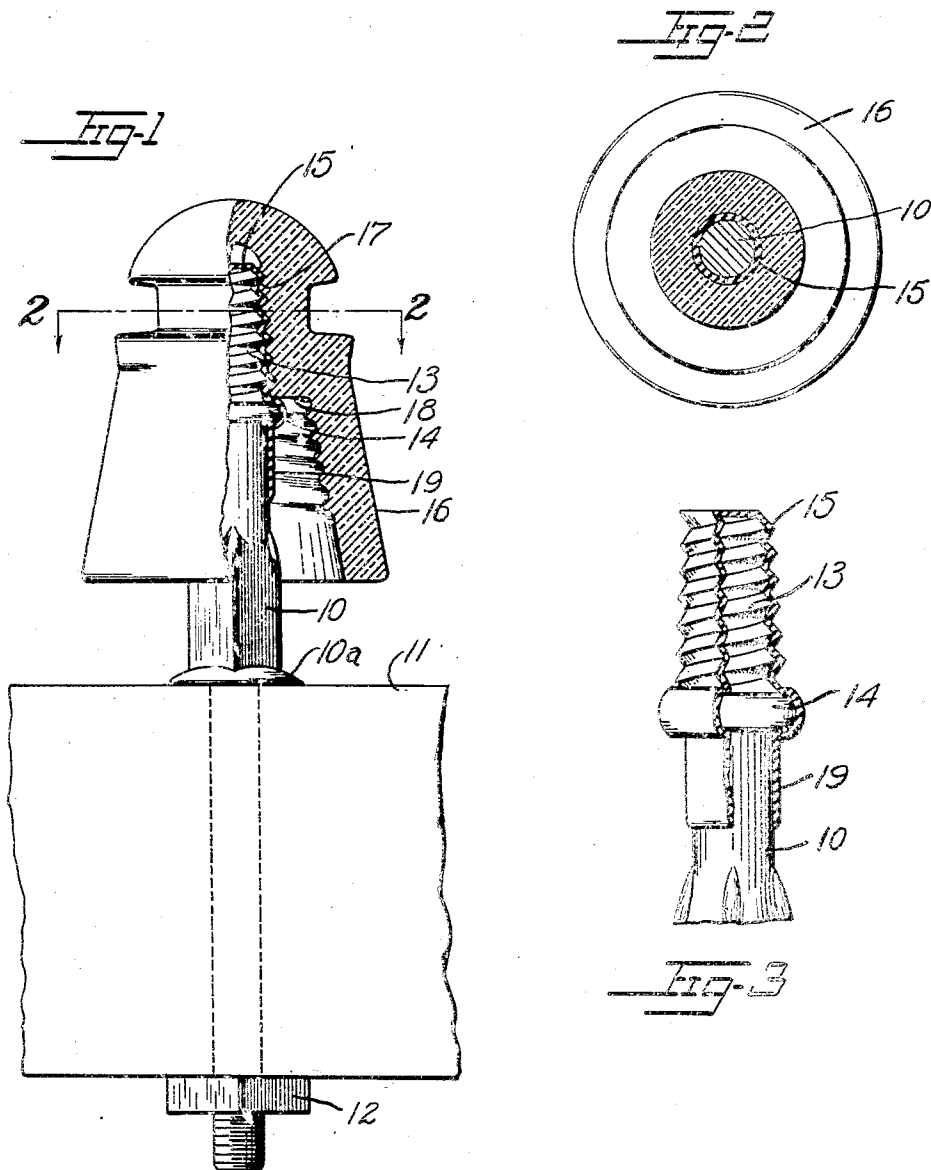
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INSULATOR SUPPORT

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INSULATOR SUPPORT

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8 Claims. (Cl. 174-205)

This invention relates to supports for insulators on which conductors of electric currents are mounted and especially to supports for glass insulator knobs of the type commonly used on cross-country telephone and telegraph lines.

Telephone and telegraph lines ordinarily are strung on insulator knobs of glass or other frangible material which in turn are threaded on steel supporting pins carried by pole cross arms or other supporting members. A great deal of difficulty and much expense has been encountered in the past as a result of frequent breakage of the internal threads of the glass insulator knobs and, in some instances, of the knob body itself. Such breakage is especially prevalent in regions where long stretches of line are exposed to strong winds. Literally thousands of broken knobs have been found immediately after a heavy wind storm. Such breakage apparently results from strains imposed on the glass threads pressing against the metal threads of the pin as the wires are pulled by the wind. Thermal expansion factors also may contribute to some extent. Efforts have been made to reduce such breakage of the knobs and knob threads by interposing layers of various materials between the knob and the supporting pin but such efforts in the past have met with only indifferent success. For example, the threaded recess of the knob has been lined with lead or other soft metal, but this expedient did not solve the problem satisfactorily.

I have discovered that breakage of knobs and knob threads of the character hereinabove described may be greatly reduced if not entirely eliminated by providing a cushioning layer of compressible resilient rubber composition between the steel pin and the insulator knob. As more fully described hereinafter, especially satisfactory results have been obtained when the cushioning layer of rubber comprises unmastered grainless rubber deposited in situ on the pin from an aqueous dispersion of rubber, although other rubber compositions may be used.

The invention will be described in greater detail with reference to the accompanying drawing of which

Fig. 1 is an elevation showing an insulator assembly embodying the present invention mounted on a cross arm, portions of the knob and cushioning layer of rubber being broken away and sectioned for clarity of illustration;

Fig. 2 is a horizontal section taken on line 2-2 of Fig. 1;

Fig. 3 is a fragmentary elevation on an enlarged scale of the portion of the supporting pin

which engages the knob, the cushioning layer of rubber composition being partially broken away for clarity of illustration.

In a preferred embodiment, as illustrated in the drawing, the assembly of the present invention comprises a supporting pin 10 formed of steel or other metal or other suitable rigid non-frangible material. One end of the pin 10 extends through a hole in the pole cross arm 11 or other supporting member, and the pin is clamped in place on the cross arm by means of the projecting flange 10a and the clamping nut 12. The opposite or knob-engaging end of the pin 10 is provided with a coarsely threaded portion 13 terminating at its base in a circumferentially projecting ridge 14 which functions as a stop for the knob as hereinafter described. The knob-engaging end of the pin is provided with an enveloping jacket or covering 15 of compressible resilient rubber composition forming a cushioning layer. The cushioning layer of rubber preferably covers all the coarsely threaded portion 13 of the pin and also extends over the ridge 14 and for some distance below the ridge as indicated at 19. An insulator knob 16 formed of glass, porcelain, or other frangible non-conducting material is mounted on the knob-engaging end of the pin 10. The knob 16 preferably is provided with an internally threaded recess 17 adapted to cooperate with the threaded portion of the pin 10 and the threaded recess 17 preferably terminates in a shoulder 18 adapted to be thrust against the circumferential ridge 14 of the pin and thereby to stop the knob before the end of the pin is jammed against the bottom of the recess.

The cushioning layer 15 preferably should be relatively thin, of the order of 0.015" thick, and should follow closely the contours of the underlying metal so that the exterior configuration of the coated portion of the pin will be substantially the same as that of the metal pin itself. Especially satisfactory results are obtained when the cushioning layer of rubber is applied to the pin by immersing the pin to the desired depth in an aqueous dispersion of rubber and depositing rubber directly from the dispersion onto the pin. The procedure described in U. S. Patent No. 1,908,719 is especially satisfactory for this purpose. It is also desirable to pre-coat the metal pin with any suitable rubber-to-metal adhesive such as a thermoprene cement in order that the cushioning layer of rubber may be bonded tightly to the metal pin. Such procedure is described in U. S. Reissue Patent No. 19,155. The rubber

coating preferably is vulcanized after application to the pin.

Such a coating of rubber deposited in situ directly from an aqueous dispersion of rubber is uniform in thickness, conforms closely to the configuration of the pin, and presents a well defined threaded surface for receiving the threaded knob. Furthermore, such coatings of unmasticated grainless rubber exhibit desirable properties of toughness and surface smoothness and other properties characteristic of rubber deposited in situ from an aqueous dispersion which contribute materially to the success of the invention. It is possible to mold a jacket of ordinary masticated rubber composition about the end of the pin but such procedure is costly because of the mold equipment required and the molded rubber jacket, while materially beneficial, does not exhibit all the desirable characteristics of unmasticated grainless rubber jackets.

It will thus be appreciated from the foregoing description and from an inspection of the accompanying drawing that the coarsely threaded portion of the supporting pin is covered with a thin cushioning layer of rubber which covers the threads without filling them so that when the glass knob is threaded thereover the knob is structurally insulated completely from the pin without, however, interfering with the interthreading of the two parts. Experience indicates that such a thin rubber cushion materially reduces breakage of the glass knob under service conditions of the character hereinabove described and that the present invention for the first time offers a reasonably satisfactory solution to the knob breakage problem.

The term "rubber" has been used in a generic sense to include not only the natural rubber of the Hevea tree but also analogous gums and resins obtained from other natural sources as well as synthetic rubbers and rubber-like materials having the essential compressible and resilient characteristics of natural rubber.

Numerous modifications and variations in details of the structure as hereinabove described may be effected without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. An assembly for supporting a conductor of electric currents comprising, in combination, a supporting pin formed of rigid non-frangible metallic material and having an externally threaded end portion terminating in a circumferential ridge forming a stop, a cushioning layer of compressible resilient rubber composition in a substantially unstretched and untensioned condition covering the end portion of the pin including at least the threaded portion and the circumferential ridge, said rubber layer following the contours of the pin and presenting substantially the same exterior configuration as that of the covered portion of the pin, the cushioning layer comprising unmasticated rubber having the grainless characteristics of rubber deposited in situ from an aqueous dispersion of rubber, and an insulator knob adapted to engage and support the conductor, said insulator knob being formed of frangible non-conducting material and having an internally threaded recess terminating in a shoulder, the knob being threaded on the rubber covered pin with the said shoulder thrust against the circumferential ridge stop on the covered pin, the cushioning layer of rubber structurally insulating the frangible knob from the

non-frangible metallic pin and serving materially to reduce the liability of knob breakage in service.

2. An assembly for supporting a conductor of electric currents comprising, in combination, a supporting pin formed of rigid non-frangible metallic material and having an externally threaded end portion, a cushioning layer of compressible resilient rubber composition in a substantially unstretched and untensioned condition covering the threaded end portion of the pin, said rubber layer following the contours of the pin and presenting a correspondingly threaded exterior surface, the cushioning layer comprising unmasticated rubber having the grainless characteristics of rubber deposited in situ from an aqueous dispersion of rubber, and an insulator knob adapted to engage and support the conductor, said insulator knob being formed of frangible non-conducting material and having an internally threaded recess, the knob being threaded on the rubber covered pin so that, in the assembly, the cushioning layer of rubber structurally insulates the frangible knob from the non-frangible metallic pin and serves materially to reduce the liability of knob breakage in service.

3. An assembly for supporting a conductor of electric currents comprising, in combination, a supporting pin formed of rigid non-frangible metallic material, an insulator knob formed of frangible non-conducting material mounted on the pin with a portion of the knob embracing a portion of the pin, and a cushioning layer of compressible resilient rubber composition in a substantially unstretched and untensioned condition interposed between the pin and the knob and serving structurally to insulate the knob from the pin, the cushioning layer following closely the contours of the pin and comprising unmasticated rubber having the grainless characteristics of rubber deposited in situ from an aqueous dispersion of rubber.

4. An assembly for supporting a conductor of electric currents comprising, in combination, a supporting pin formed of rigid non-frangible metallic material, an insulator knob formed of frangible non-conducting material mounted on the pin with a portion of the knob embracing a portion of the pin, and a cushioning layer of compressible resilient rubber composition in a substantially unstretched and untensioned condition interposed between the pin and the knob and serving structurally to insulate the knob from the metallic pin.

5. A supporting pin for a line insulator knob comprising a metallic member having an exteriorly threaded end portion terminating in a circumferential ridge, and a cushioning layer of compressible resilient rubber composition in a substantially unstretched and untensioned condition covering the end portion of the pin including at least the threaded portion and the ridge, the cushioning layer of rubber following the contours of the pin and presenting substantially the same exterior configuration as that of the covered portion of the pin, the cushioning layer comprising unmasticated rubber having the grainless characteristics of rubber deposited in situ from an aqueous dispersion of rubber.

6. A supporting pin for a line insulator knob comprising a rigid metallic member having a threaded end portion and a cushioning layer of compressible resilient rubber composition in a substantially unstretched and untensioned condition covering the threaded portion of the metallic member, the cushioning layer following the

contours of the rigid metallic member and presenting a correspondingly threaded exterior surface adapted to engage an internally threaded knob, the cushioning layer comprising unmasticated rubber having the grainless characteristics of rubber deposited in situ from an aqueous dispersion of rubber.

7. A supporting pin for a line insulator knob comprising a rigid metallic member adapted to engage the knob and a cushioning layer of compressible resilient rubber composition in a substantially unstretched and untensioned condition completely covering the portion of the rigid metallic member which engages the knob.

8. A supporting pin for a line insulator knob comprising a rigid metallic member having a threaded end portion and a cushioning layer of compressible resilient rubber composition in a substantially unstretched and untensioned condition covering the threaded portion of the rigid metallic member, the cushioning layer following the contours of the rigid metallic member and presenting a correspondingly threaded exterior surface adapted to engage an internally threaded knob, the cushioning layer being bonded tightly to the rigid metallic member by means of an intermediate adhesive layer.

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