

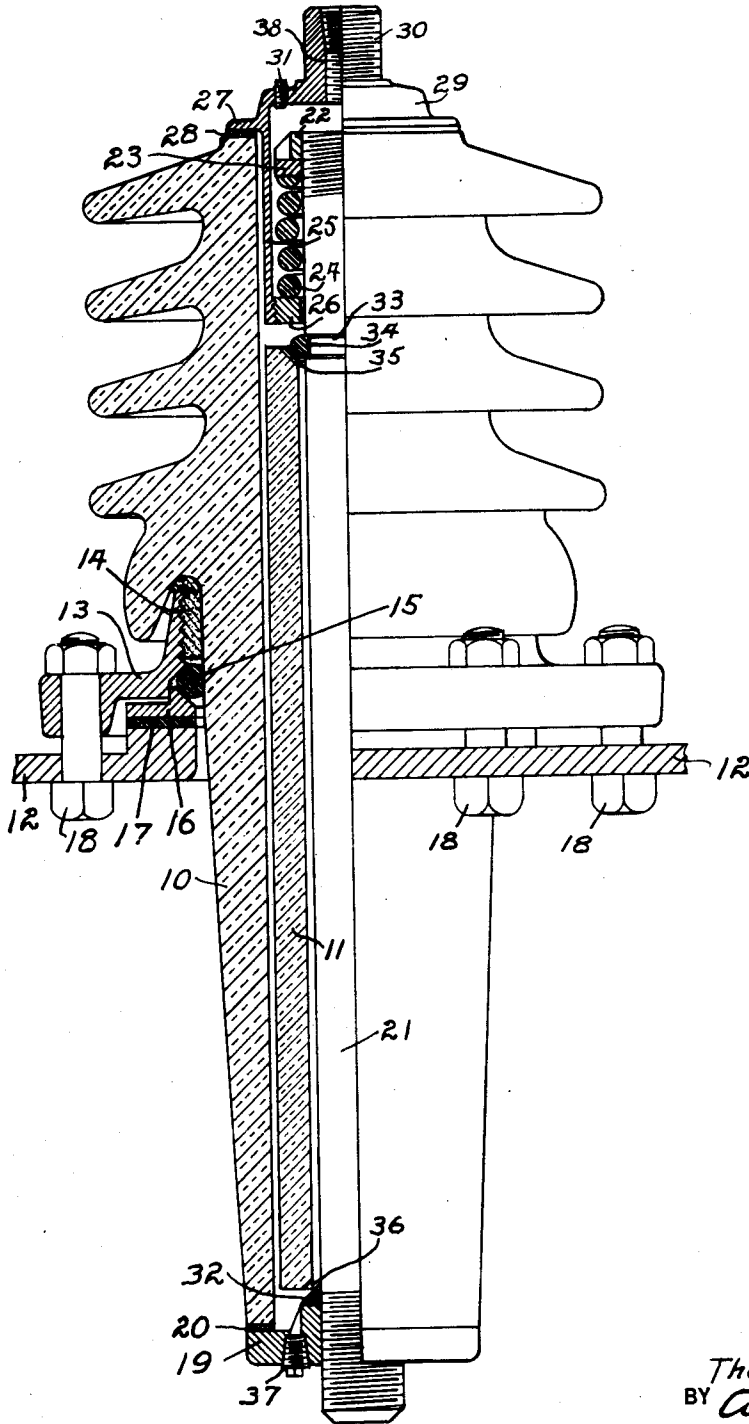
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BUSHING INSULATOR

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BUSHING INSULATOR

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4 Claims. (Cl. 174-167)

This invention relates to bushing insulators and has for one of its objects the provision of a sealing means for insulators of the compression type which shall be easy to assemble with the insulator without the use of soldered joints.

A further object of the invention is to provide an improved packed joint between the insulator and the supporting structure which will prevent leakage of oil or other insulating liquid past the insulator flange.

A further object of the invention is to provide improved means for centering the internal baffle of the insulator.

A further object of the invention is to provide a device of the class named which shall be of improved construction and operation.

Other objects and advantages will appear from the following description.

The invention is exemplified by the combination and arrangement of parts shown in the accompanying drawing and described in the following specification and it is more particularly pointed out in the appended claims.

In the drawing:

The figure is a part elevation and part section of a bushing insulator showing one embodiment of the invention.

In the embodiment shown, the insulator comprises an outer shell or dielectric tube 10 and an inner dielectric baffle 11. These dielectric members may be made of porcelain or other suitable dielectric material. The insulator extends through an opening in a supporting member 12 which may be the cover of a housing for electrical apparatus or any other suitable member through which it is desirable to extend an electrical conductor. A flange 13 is secured to the shell member 10 by cement 14, the flange having an inner beveled surface for engaging a packing ring 15. The ring 15 is preferably made of some suitable packing material that will withstand the action of oil or other insulating liquids with which the housing 12 may be filled. A synthetic rubber is suitable for this purpose. A metal ring 16 is also provided with a beveled face for engaging the lower portion of the packing ring 15, the two beveled faces cooperating to compress the packing tightly against the outer surface of the shell 10 to form a liquid-tight joint between the flange and bushing. The metal ring 16 rests upon a gasket 17 which is supported on the housing cover 12. The flange 13 is secured to the cover 12 by bolts 18 which compress the gasket 17 and the packing ring 15.

The lower end of the bushing 10 is closed by

a terminal plate 19 which bears upon a gasket 20 engaging the lower end of the member 10. The plate 19 is threaded on the lower end of the conductor rod 21 which extends upwardly through the bushing, the upper end being secured by a nut 22 which rests upon a washer 23 supported by a helical spring 24. The spring 24 is surrounded by a pocket member 25 having a ring 26 threaded into its lower end for supporting the spring 24. The upper end of the pocket member 25 is provided with a radial flange 27 which rests upon a gasket 28 supported by the upper end of the member 10. An integral cover 29 closes the upper end of the pocket member 25 and carries a threaded stud 30 for receiving the connected conductor. The cover 29 may be perforated for filling the bushing, a pipe plug 31 being used to close the perforation when the bushing is filled. The major portion of the space within the shell member 10 below the pocket member 25 is occupied by the supplemental dielectric tube 11 which rests upon a centering ring 32 supported on the closure plate 19. The ring 32 may be made of resilient material, such as synthetic rubber, and its outer face is beveled so as to center the lower end of the ring relative to the conductor 21. The conductor 21 is provided with a peripheral groove 33 at the upper end of the supplemental tube 11 and a resilient ring of synthetic rubber 34 surrounds the conductor at this point and is held in place by the groove 33. The upper end of the tube 11 is provided with an inner beveled surface which engages the ring 34 to center the upper end of the tube. Grooves 35 and 36 may be provided to permit circulation of the filling liquid past the ends of the tube 11. A drain plug 37 may be provided in the terminal plate 19 for draining the bushing when necessary.

In assembling the bushing the nut 22 is threaded on the upper end of the conductor 21 and the washer 23 and spring 24 are moved over the conductor into the position shown in the drawing. The pocket member 25, with the ring 26 removed, is then moved downwardly over the spring and the ring 26 moved upwardly over the conductor and threaded into the lower end of the pocket member to hold the spring in place. The packing ring 34 is then moved into place from the lower end of the conductor and has sufficient resiliency to be drawn tightly into the groove 33. The conductor with the pocket member 25 in place is then moved into the shell member 10 through the upper end and the supplemental tube 11 is moved over the conductor through the lower end of the shell member 10. The centering ring

32 is then moved into position in contact with the lower end of the tube 11 and the terminal plate 19 screwed onto the lower end of the conductor. The terminal member 30 has a central threaded opening 38 through which a tool is threaded into contact with the upper end of the conductor 21 and sufficient pressure is exerted by the tool on the conductor to compress the spring 24. The cover plate 19 is screwed up against the gasket 20 and after the tool has been removed the spring 25 expands and draws the terminal plate 19 and the flange 27 tightly against their respective gaskets so as to provide a completely sealed bushing. A pipe plug is then tightly threaded into the tapered upper end of the opening in the terminal 30 to seal the opening.

It will be noted that the space for filling liquid within the bushing is exceedingly small so that there will be but very little expansion or contraction of the filling liquid. The bushing may be filled through the upper end and sufficient liquid is placed within the bushing to bring the surface level slightly above the lower end of the pocket member 25. This will leave sufficient air space in the upper end of the bushing to form a cushion to accommodate the expansion and contraction of the filling liquid. This, as explained, will be relatively small since there is only a small quantity of liquid within the bushing.

I claim:

1. The combination with a bushing insulator, of an integral closure member for one end of said insulator, said closure member having a supporting pocket extending into said insulator to receive and support a spring, the lower end of the pocket having an opening through which the said spring may be passed and the inner surface of the pocket wall surrounding the opening being threaded, a tension member extending through said insulator and having one end positioned in said pocket, a spring surrounding said tension member within said pocket and having bearing connection with said tension member, a removal abutment threaded into the lower end of said pocket to support said spring and transmit tension from said spring to said closure member, a threaded projection on said closure member to receive a cable connector and a threaded opening through said projection into said closure

member and opposite the end of said tension member to receive a threaded tool to engage the end of the tension member and compress said spring, the thread of said opening cooperating with the thread on the tool to hold the tool rigid and to advance the tool in the direction of the tension member.

2. The combination with a bushing insulator having a conductor extending therethrough, of a compression spring cooperating with said conductor and a terminal member for said insulator held in place by said spring and conductor, said terminal member having a threaded opening therethrough for receiving and guiding a threaded tool and effecting the longitudinal movement of the tool when rotated, into the terminal member to compress said spring.

3. The combination with a bushing insulator of a compression spring, a terminal member for said insulator, a conductor extending through said insulator and terminating within said terminal member, and means on the conductor cooperating with the spring to hold the terminal member in place, said terminal member having a threaded opening therethrough for receiving a threaded tool and cooperating therewith whereby the tool is held in a predetermined relation to the terminal member and spring and adjusted into contact with the conductor when the tool is rotated in order to compress the spring.

4. A closure member for a bushing insulator comprising an integral member having an external radial flange to rest upon the end of the insulator, a tubular portion to extend into the insulator to receive a compression spring, a removable abutment at the lower end of the tubular portion and having a threaded engagement therewith, an opening through the abutment to receive a conductor terminating within the integral member, an outwardly extending projection on the end of the integral member opposite the abutment to receive a cable connector, and a threaded opening through the projection into the integral member to receive and cooperate with a tool to guide the tool and effect its longitudinal movement into the integral member when rotated whereby the spring member within the integral member may be compressed.

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