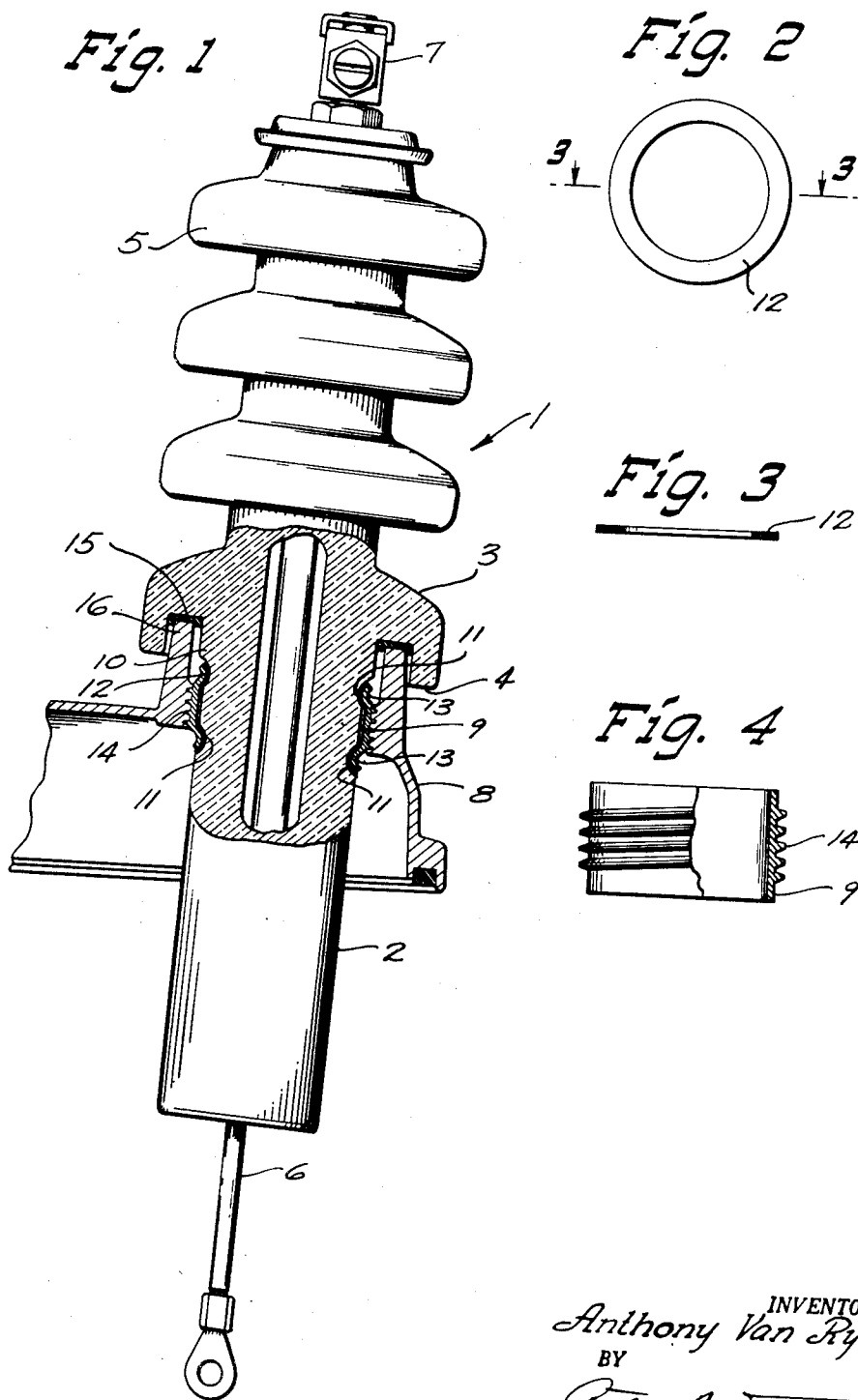


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INSULATOR BUSHING ASSEMBLY

2,564,181

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INSULATOR BUSHING ASSEMBLY

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1 Claim. (Cl. 174—152)

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This invention relates to an insulator bushing assembly.

Insulating bushings, such as porcelain or the like, are relatively brittle and have a different coefficient of expansion from the metal support to which they have to be secured. For instance, in transformer and circuit breaker tanks and similar devices, it is the usual practice to form the tanks of metal and provide them with metal covers or tops, and to provide insulating bushings which extend through some portion of the metal tanks such, for example, as the tops or covers of the tanks. It has been found difficult to secure the insulator bushings in place and secure both a firm and reliable mechanical connection therebetween while at the same time securing an oil tight joint.

This invention is designed to overcome the above noted defects and objects of this invention are to provide a novel arrangement whereby the insulator bushing is firmly mechanically secured to the metal support and at the same time is secured thereto in an oil tight manner, and in which the attaching means occupies the minimum of space.

A further specific object is to provide an attaching ferrule or sleeve which is secured to the insulator bushing and which attaches the insulator bushing to the metal support in such a manner that the sleeve is called upon merely to hold the flange of the insulator bushing tightly in place with a sealing gasket between the flange of the insulator bushing and the metal support, the construction being such that the sleeve does not resist lateral stresses imposed on the projecting portion of the insulator bushing but in which these lateral stresses are resisted by the direct coaction of the insulator bushing and the metal support.

Further objects are to provide a construction as defined hereinabove in which no fluid-tight or oil-tight joint is needed between either the sleeve and the insulator bushing or between the sleeve and the metal support, but in which the oil-tight joint is directly between the insulator bushing and the metal support, the construction being such that only a single oil-tight joint is required for each insulator bushing.

Further objects are to provide a novel arrangement of securing an insulator bushing to a metal support which does not become unduly stressed or become leaky when subjected to wide temperature changes, and to provide a construction which is cheap and simple and easy to use.

An embodiment of the invention is shown in the accompanying drawings, in which:

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Figure 1 is a vertical elevation partly in section showing the insulating bushing in assembled position.

Figure 2 is a plan view of one of the resilient gaskets.

Figure 3 is a sectional view on the line 3—3 of Figure 2.

Figure 4 is a side elevation of the threaded sleeve or ring, such view being partly broken away and partly in section.

Referring to the drawings, it will be seen that the insulating bushing is indicated generally by the reference character 1. It is provided with a downwardly projecting cylindrical portion 2 and with a laterally extending, annular flanged portion 3 provided with a downwardly turned, annular, lower lip 4. Suitable petticoats 5 are provided in the usual manner. A conductor 6 extends through the hollow bushing 1 and is provided with an upper terminal 7. The conductor 6 is sealed to the bushing 1 at its upper and lower portions in any suitable and well known manner, not shown. The bushing is adapted to be secured to any suitable metal support, such as the top or cover 8 of a transformer, circuit breaker, or other device. The cover 8 is adapted to be clamped or otherwise secured in a manner, not shown, to the body portion of the tank, such tank being omitted.

The insulating bushing 1 may be formed of porcelain, glass or other suitable refractory material. Means in the form of a threaded ring 9 is employed to connect the porcelain or other insulating bushing 1 to the supporting metal member 8. This threaded ring 9 may be a die-cast metal member formed of suitable material and is arranged to be freely slipped over the cylindrical portion 2 until the upper end of the ring abuts the enlarged or shouldered portion 10 of the insulating bushing 1. The porcelain bushing 1 is provided with annular grooves 11 within which are positioned yielding gaskets 12. These yielding gaskets 12 may be initially in the shape shown in Figures 2 and 3 and are drawn upwardly over the cylindrical portion 2 and when released immediately conform to the annular grooves 11. The ends of the threaded ring 9 are spun or swaged inwardly into the grooves 11 as indicated at 13 to cause the ring 9 to interlock with and grip the cylindrical portion of the insulating bushing. It is apparent that there is a certain amount of spring-back in the material of the ring after spinning but the yielding gaskets 12 compensate for this and insure a tight fit between the ring 9 and the insulating bushing 1.

The metal support or cap 8 has an aperture

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which is internally threaded as indicated and the threads 14 of the ring 9 are adapted to be screwed into the threaded aperture of the metal support 8 and to draw the insulating bushing 1 downwardly. A yielding gasket 15 is interposed between the lower portion of the flange 3 of the insulating bushing 1 and the upstanding, annular portion or bearing portion 16 of the metal support 8. The threaded ring 9 is not called upon to bear any stresses due to lateral forces impressed on the projecting portion of the insulating bushing 1. The threaded ring 9 merely serves to draw the insulating bushing downwardly so that its flanged portion is securely supported from the upstanding or bearing annular member or supporting portion 16 of the metal support 8. This annular flange in conjunction with the portion 16 resists any lateral stresses that may be imposed on the projecting portion of the insulating bushing 1. Also the gasket 15 serves as a liquid-tight or oil-tight seal. There is not, therefore, an oil-tight or liquid-tight seal at the gaskets 12. It is to be understood that although gaskets 12 are employed between the inwardly spun or swaged portions of the metal ring 9 and the grooved portions of the insulating bushing 1, that nevertheless this threaded metal sleeve or ring interlocks with and firmly grips the insulating bushing. Similarly, it is to be understood that although the flange 3 is spaced from the supporting portion 16, that nevertheless the flange 3 is supported directly from the supporting portion 16 of the metal support 8 and expressions of this general nature, wherever they appear in the application, are intended to cover a construction whether gaskets are employed or not.

It will be seen that the metal ring 9 is not called upon to resist any lateral stresses whatsoever but serves the sole function of drawing the insulating bushing downwardly so that its flanged portion binds against or is supported from the metal support.

It will be seen that the construction is very simple and is economical to produce and apply. Also it is a very simple matter to secure the bushing in place as all that is required is to screw the bushing down into its final position.

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Although this invention has been described in considerable detail, it is to be understood that such description is intended as illustrative rather than limiting, as the invention may be variously embodied and is to be interpreted as claimed.

I claim:

An insulating bushing assembly comprising a support provided with an internally threaded aperture and having an annular supporting portion surrounding said aperture, an insulating bushing having a cylindrical portion projecting through said aperture and having an annular flange overhanging said annular supporting portion, a yielding gasket interposed between said flange and said supporting portion, the cylindrical portion of said bushing having spaced annular grooves, a threaded ring surrounding said cylindrical portion and having its ends pressed inwardly into interlocking relation to said grooves, yielding gaskets located within said grooves and beneath the inwardly pressed portions of said threaded ring, said ring being screwed into said internally threaded aperture and holding said flange in binding supporting relation to said annular supporting portion with said first mentioned gasket under compression, and a conductor within said bushing.

ANTHONY VAN RYAN.

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Certificate of Correction

Patent No. 2,564,181

August 14, 1951

ANTHONY VAN RYAN

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 4, line 17, for "a threaded" read *a continuous threaded*;

and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 29th day of April, A. D. 1952.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.