Jan. 25, 1938. L. THIRY 2,106,667

MOUNTING OF ELECTRIC INSULATORS

Filed Nov. 8, 1934

Fig. 1

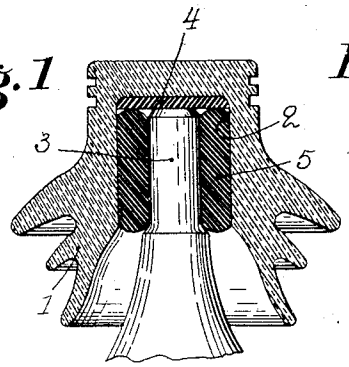


Fig. 2

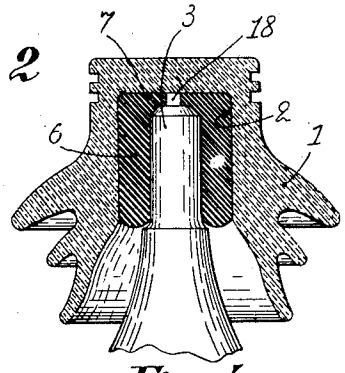


Fig. 3

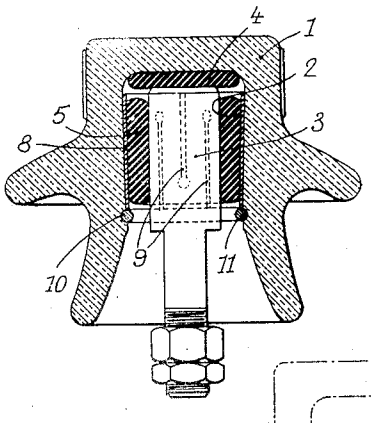


Fig. 4

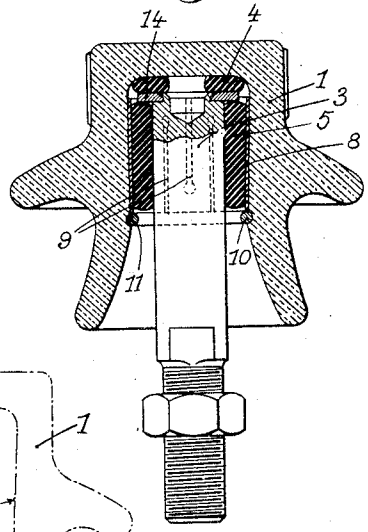


Fig. 5

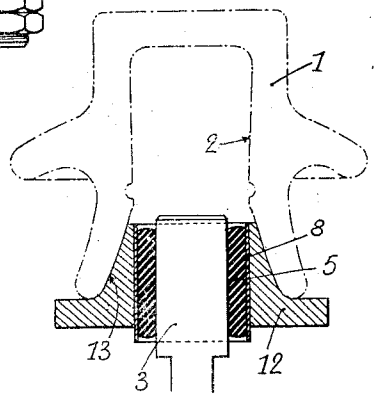


Fig. 8

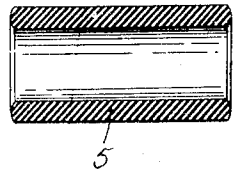


Fig. 6

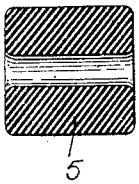
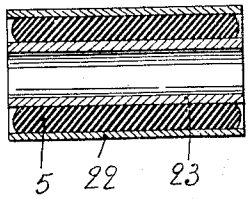


Fig. 7



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MOUNTING OF ELECTRIC INSULATORS

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2 Claims. (Cl. 173—321)

The present invention relates to the mounting of electric insulators upon their supports, and has chiefly for its object a device for the mounting of electric insulators which comprises a thick ring of elastic material adapted to be interposed between the insulator and the head of the supporting bracket, and assuring their connection.

Owing to this device, the vibrations and mechanical stresses which may be accidentally exerted upon the insulator or the bracket, will have no prejudicial effect upon their connection, and will not weaken the same. On the other hand, the vibrations received by one of these two members are absorbed by the mass of elastic material and are not transmitted to the other, thus increasing the duration of the insulator, which usually consists of a fragile substance.

The invention has further for its object a method for the mounting of insulators upon their supports by means of the aforesaid device, which is chiefly characterized by the fact that it consists in mounting the elastic ring, in the first place, between the supporting bracket and an external auxiliary member whose inner diameter is equal to or somewhat less than the smallest diameter of the recess provided in the insulator, and then inserting the device consisting of the ring and bracket, and the auxiliary member, into the body of the insulator.

Further characteristics of the invention will be set forth in the following description:

In the accompanying drawing, which is given solely by way of example:

Fig. 1 is a longitudinal section showing the mounting of an insulator upon its bracket, according to the invention.

Figs. 2 to 4 are views, analogous to Fig. 1, of various modifications.

Fig. 5 shows, in longitudinal section, a method of mounting of the insulator, according to the invention.

Fig. 6 is a longitudinal section of a ring of elastic material, in the free state, of the type employed for the mounting of insulators, according to the invention.

Fig. 7 is a longitudinal section of the same ring, maintained in a state of deformation between two sleeves.

Fig. 8 is a view, analogous to Fig. 6, of the same ring, congealed when in the state of deformation to which it has been brought.

According to the example of execution represented in Fig. 1, the insulator 1, made of porcelain, glass, or other suitable insulating material, has a recess 2 adapted to receive a supporting bracket 3. At the upper end of said recess 2 is mounted a washer 4 of elastic material, which prevents all contact between the bracket 3 and the insulator 1.

A ring 5 of elastic material, of indiarubber for example, is mounted in the recess 2 and surrounds the bracket 3.

The connection between the ring 5 of elastic material and the bracket 3, and the insulator 1, may be obtained by one of the following operations, or by a combination of several of these operations: by cementing, by vulcanizing, by deformation of the elastic material between the bracket and the insulator (either by axial elongation, by compression and circular expansion, or by both of these, and in general, by any deformation in one or more specified directions), or by a spiral winding, with or without elongation.

Owing to the presence of the ring 5 and of the washer of elastic material between the bracket 3 and the insulator 1, the vibrations received by one of these two members cannot be imparted to the other member, as they are absorbed by the deformations of the elastic material. On the other hand, this elastic material (usually of indiarubber) is a good electric insulator, and thus the insulation of the insulator 1 with reference to the bracket 3 is improved.

Fig. 2 represents another method of realization of the invention, in which the washer 4 is eliminated, and the ring 6 of elastic material comprises a closed end 7 separating the end of the bracket 3 from the end of the recess 2 of the insulator. This ring may be subject to deformation, and preferably by axial elongation and radial contraction, which also causes a deformation of the end 7 of the said ring.

In the examples of execution represented in Figs. 3 and 4, the ring 5 of elastic material is not in direct contact with the insulator 1. A sleeve 8, preferably of a soft metal such as brass, is interposed between the ring 5 and the insulator. The recess 2 of the insulator, in Figs. 3 and 4, has a conical shape, and the large base of the cone is next the upper end of the recess, whilst the bracket 3 is cylindrical, and the cylindrical sleeve 8 has longitudinal slots 9 providing for its expansion under the effect of tensions of the ring 5 of elastic material. Thus the sleeve 8 is well applied against the inner wall of the insulator, and owing to the conical shape of this wall, the ring cannot leave the insulator. One may also provide an elastic ring 10 located in a groove 11 formed in the narrow part of the recess and adapted to stop the sleeve 8.

The assembling of the insulator represented in Figs. 3 and 4 is preferably effected in the following manner. The sleeve 8 is placed in a ring 12 whose inner diameter is equal to or somewhat less than the smallest diameter of the conical recess 2 of the insulator (Fig. 5). The ring 5 of elastic material is then placed in the sleeve 8, and this ring receives the shank 3 of the bracket. A suitable choice is made of the dimensions of

the ring 5 when in the free state, and of those of the rod 3 and the sleeve 8, so that the elastic material of the ring shall be subjected to a great deformation between the sleeve and the shank.

The device thus formed is applied against the insulator 1, in such way that the ring 12 shall fit against the lower part 13 of the insulator (the outline of the external surface of this ring being in fact arranged for this purpose), and the whole device, sleeve 8, ring 5 and shank 3, is fitted from the ring 13 into the insulator 1. Under the action of the molecular tensions of the ring 5 consisting of elastic material subjected to deformation, the slotted sleeve 8 will expand, and principally towards the upper end of the recess 2 at which the diameter is greater, and it will fit strongly against the wall of this recess.

Although it is possible to obtain a good adherence between the elastic ring 5 and the internal shank 3, either by the deformation of the said ring, or by cementing or vulcanizing, there is also provided a stop, in order to prevent the shank 3 from moving lengthwise on the ring 5 (Fig. 4). This stop may consist of a metallic washer 14 fitted into a groove in the end of the shank 3 of the bracket and adapted to make contact with the inner end of the elastic ring 5.

One proceeds with the mounting of the stop washer 14 on the bracket 3, after securing this bracket in the elastic ring 5 and before inserting the assemblage of the sleeve 8, the ring 5 and the bracket 3 into the recess 2 of the insulator.

The washer 14 will come against the mass of elastic material 4 interposed between the end of the recess 2 and the bracket 3. This mass 4 of elastic material may be perforated, as shown in Fig. 4.

It will be noted that the mounting of the elastic ring 5 between the insulator 1 and the head 3 of the bracket will require certain special precautions on account of the fragility of the material constituting the insulator, and in particular in the case in which the said ring is to be placed in position in a state of deformation. This mounting may be readily effected by operating in the following manner. The ring 5, in the free state (Fig. 6), is inserted, by known means, between two sleeves 22 and 23 (Fig. 7) whose dimensions are chosen with respect to the dimensions of the ring 5, in order to produce, in this latter, the desired state of deformation.

In the example represented in Fig. 7, this ring is elongated axially, but it is quite evident that it may be given any other deformation; for example, a circular elongation may be given to said ring.

One then proceeds with the congelation of the ring of elastic material which is thus maintained between the two sleeves.

The congealed ring thus obtained preserves the form and the dimensions which it had when it was maintained between the sleeves 22 and 23 (Fig. 8), as under the action of the low temperature, it has lost its elastic properties. The said ring may thus be inserted, readily and without effort, between the body 1 of the insulator and the head 3 of the bracket, the space provided between these members being somewhat larger than the thickness of the congealed ring. When the temperature of the ring 5 rises, this ring, will gradually resume its elastic properties, and when its temperature reaches the surrounding temperature, the internal elastic stresses of the said ring will cause it to adhere strongly to the walls of the members between which it is situated.

The method of mounting the elastic ring, as above described, has the advantage of permitting the insertion of the said ring alone and without any auxiliary sleeves. On the other hand, the elastic ring of congealed material may be machined and worked in the same way as wood.

It may be subjected to the operations of drilling, cutting up, or boring, and it is thus possible to bring it to the desired dimensions and to give to it, in the congealed state, any desired form in order to assure a determined distribution of the elastic tensions when this elastic material has resumed the surrounding temperature and to produce complementary molecular tensions which are added, at given points or regions, to the tensions prevailing at the time of the congelation. Thus in the example represented in Fig. 2, there is formed in the end of the elastic ring 5, in the congealed state, an aperture 18 which has the effect of modifying the distribution of the elastic tensions when the said ring has returned to the surrounding temperature. In fact, the tensions produced by eliminating the connections between the fibres of the end part 7 have a tendency to increase the diameter of the orifice 18, which thus effects an increase of the pressure exercised by the elastic material 5 upon the end of the rod 3 and the walls of the recess of the body 1, at the upper part of this recess. A particular advantage of this disposition consists in the damping of shocks and vibrations transmitted in the axial direction from the shank 3 to the body 1 of the insulator.

Obviously, the invention is not limited to the methods of execution represented and described, which have been chosen solely by way of example.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:

1. In combination, an electric insulator comprising a cap of insulating material provided with an inner frusto-conical recess having smooth walls, the large base of said recess being directed towards the closed end of the cap, a bracket having one end with a smooth surface of circular cross section extending in said recess and leaving a clearance between said bracket and said walls of said inner recess, a resilient metallic sleeve provided with longitudinal slots arranged against said walls of said recess, and a ring of elastic material inserted in said recess between said bracket and said sleeve and considerably elongated in the axial direction in compensation for a considerable compression in a radial direction.

2. In combination, an electric insulator comprising a cap of insulating material provided with an inner recess having smooth walls of circular cross section, a metallic resilient sleeve provided with longitudinal slots arranged against said walls of said recess, a bracket having one end with a smooth surface of circular cross section extending in said recess and leaving a clearance between said bracket and said resilient sleeve, a ring of elastic material inserted in said recess between said bracket and said resilient sleeve and considerably elongated in the axial direction in compensation for a considerable compression in the radial direction, and stop means on said insulator adapted to maintain said metallic sleeve in said recess.

LEON THIRY.