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K. A. HAWLEY

METHOD OF MAKING INSULATORS

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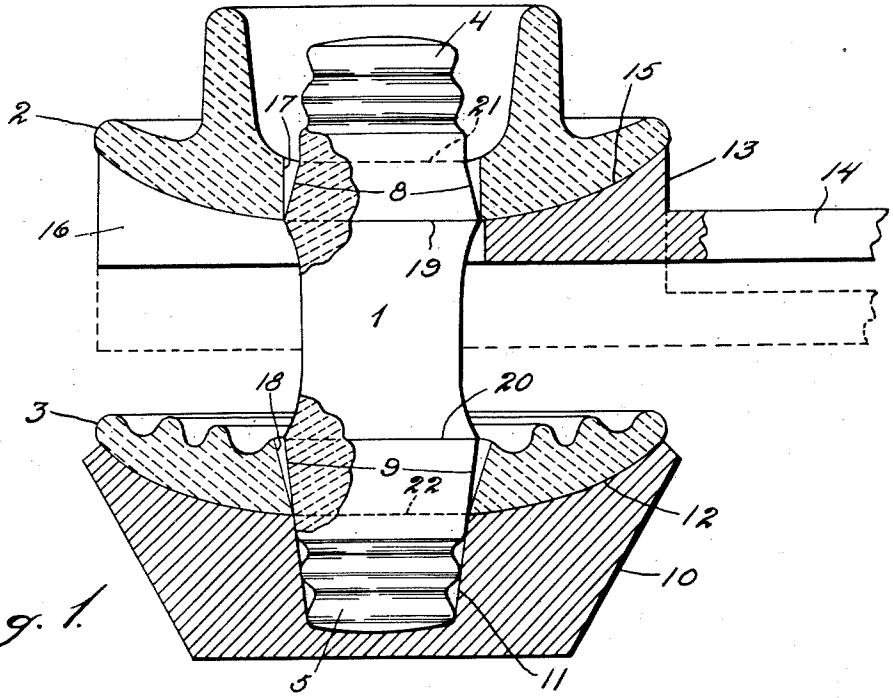


Fig. 1.

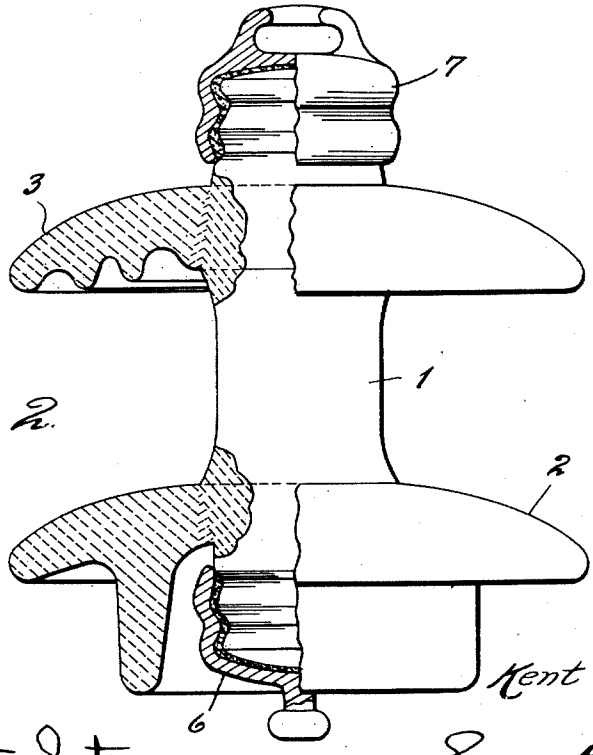


Fig. 2.

Witness
John Milton Jester

Inventor
Kent A. Hawley

By Ernest L. Mechlin
his Attorney

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UNITED STATES PATENT OFFICE.

KENT A. HAWLEY, OF BALTIMORE, MARYLAND, ASSIGNOR TO LOCKE INSULATOR CORPORATION, OF BALTIMORE, MARYLAND, A CORPORATION OF MARYLAND.

METHOD OF MAKING INSULATORS.

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The invention relates to porcelain insulators and has particular reference to a method of assembling.

The object of the invention, generally stated, is to provide a novel means for assembling insulators, particularly those of the type embodying a central body or shank carrying one or more skirts.

It is well known that manufacturing difficulties are encountered in the making of insulators of that type wherein there is provided a central body, stem or shank carrying a plurality of skirts and equipped at its ends with suspension elements. The difficulties experienced are proportionate to the size of the insulator and it is not ordinarily considered feasible to form such an insulator as a single piece owing to the likelihood of warping during drying and firing. For this reason it has been found advisable to form the skirt members separately and then attach them to the body or shank. Various expedients have been resorted to in the endeavor to obtain a proper union. While it is not necessary at this time to set forth what the usual methods ordinarily consist of or what special means has been adopted in some cases, it is pointed out that the joints obtained are not necessarily perfect notwithstanding the fact that the methods of securing are expensive and laborious.

It is with the above facts in view that I have designed the present invention which has for a more specific object the provision of a method of assembling whereby the material of the skirt and the body or shank will be caused to unite to form in effect a homogeneous whole having the same characteristics and advantages of an integral structure without the disadvantages thereof.

Still more specifically, the object of the invention is to provide an assembling method involving the employment of clay slip injected or otherwise applied at the joint between the shank or body and the skirts while the latter are in a somewhat plastic condition, it having been found that the interposed ring-like mass of clay slip will actually unite with the skirt and the shank or body so that if a completed insulator constructed or assembled in this manner were to be cut or broken, no line of demarkation would be visible at the original joint.

An additional object of the invention is to provide an assembling method which will be simple and inexpensive to carry out and which will result in the production of superior insulators at a much lower cost than has been heretofore possible.

To the attainment of the above objects and advantages the invention preferably consists in the detailed steps to be hereinafter more fully described and claimed, and illustrated in the accompanying drawing in which:

Figure 1 is a view partly in vertical longitudinal section, and partly in elevation, showing the body or shank and skirts arranged preliminary to uniting thereof, and

Figure 2 is a similar view showing the completed insulator.

Referring more particularly to the drawing, the numeral 1 designates the elongated body or shank and the numerals 2 and 3 to the skirts to be secured upon the body or shank. In the present instance the body is represented as of considerably elongated form and two skirts are shown. It should, however, be understood that there are no limitations in this respect as the method, broadly considered, is capable of being carried out in connection with insulators of other types having an outstanding skirt. The particular variety disclosed is well adapted for purposes of illustration and is chosen for that reason. In the present instance the body is shown as terminating in preferably tapered and grooved extensions 4 and 5 upon which suspension cap members 6 and 7 are adapted to be secured in the usual or any preferred manner. Inwardly of the tapered ends the body is formed with frusto-conical portions 8 and 9 located at the places where the skirts are to be applied. These seats or tapered portions are represented as inclined in opposite directions inasmuch as it is necessary to place the skirts upon the body from the opposite ends thereof.

In the carrying out of the method some suitable support, such as that disclosed at 10, must be provided for holding the body or shank 1 in upright position and for holding the skirt 3 in its proper relation to the body. For this reason the support 10 may be formed with a socket 11 which receives one end of the body, and has its upper surface 12 concaved to conform to the curvature of the skirt. To hold the skirt 2 in proper position, use may be made of a support 13 carried by an arm 14 or the like, this support having a concaved upper surface 15 conforming to the

curvature of the skirt 2 and having a slot 16 of a diameter not less than that of the body so that the support may be removed from the insulator after assembly thereof.

The skirts 2 and 3 are formed with openings 17 and 18 respectively for the accommodation or passage of the body or shank and these openings are of such size and shape that the walls thereof will incline with respect to the surfaces of the frusto-conical or tapered portions 8 and 9 of the body. In other words the opening in the skirt 2 is such that its smallest diameter is at the top surface, this being the bottom surface in Figure 1 inasmuch as the insulator is inverted, and of substantially the same diameter as the body at the shoulder 19 located at the juncture of the frusto-conical portion 8 with the central portion of the body. It is conceivable that the opening may be a little less in diameter than the body at said shoulder so that when the skirt is slipped onto the frusto-conical portion 8 it may seat firmly thereon, there being no actual space betwen the skirt and the body at the shoulder 19.

The opening 18 in the skirt 3 has its smallest diameter at the top, the bottom in Figure 1 which shows it inverted, so that when the body is inserted within the skirt there will preferably be a close fit. The opening 17 in the skirt 2 may be cylindrical whereas the opening in the skirt 3 is represented as frusto-conical with its largest diameter greater than that of the body at the shoulder 20 located at the juncture of the frusto-conical portion 9 with the central portion. The effect of the above is that there will be a space between the frusto-conical surface 8 and the wall of the opening 17 in the skirt 2 and, similarly, a space between the frusto-conical portion 9 and the wall of the opening 18 in the skirt 3, the space being wedge shaped in cross section and flaring upwardly.

Assuming that the body and skirts have been prepared in a manner well understood so as to possess the above characteristics, and further assuming that the parts have been supported as shown or in some equivalent manner to hold them in the proper relative positions, the next step is the injection or other application of clay slip within the spaces between the frusto-conical portions or surfaces of the body and the walls of the openings in the skirts. All of the above is carried out while the insulator parts are in a somewhat plastic condition and I have found that the union of the slip with the skirts and body is facilitated by initially wetting the walls of the openings and the frusto-conical portions 8 and 9, the wet bands on the latter extending from the shoulders 19 and 20 to the dotted lines 21 and 22. I have found that after the clay slip has been applied and the assembly permitted to stand for a certain length of time a perfect union is effected at the joints without any necessity for agitation or relative movement of the parts to effect setting though, if desired, more or less slight vibration of the assembly might be resorted to to hasten settling of the slip within the spaces. After the insulator has stood for a sufficient time to become bone dry it is glazed, fired and otherwise treated in the usual manner, subsequently to which the caps 5 and 6, or their equivalent, are applied.

From the foregoing description and a study of the drawing it will be apparent that I have thus provided an extremely simple method of assembling insulators, the advantages being of particular note in connection with insulators of the multiple skirt type. There is no necessity for cementing or otherwise similarly securing the elements together after firing, as is the usual practice. Furthermore this method avoids the disadvantages which are always present in case it is attempted to make such insulators in a single piece. In actual practice I have discovered that if an insulator constructed in this manner be broken there will be no line of demarcation showing at the joints between the skirts and the body, the entire mass being of a homogeneous character as if originally made in one piece.

While I have shown and described the preferred embodiment of the invention and the detailed successive steps involved in the method, it should be understood that the disclosure is simply for purposes of illustration as it is conceivable that various details may be changed without in any way departing from the spirit of the invention and the right is reserved to make all such modifications as will not constitute a departure from the scope of the claims hereunto appended.

Having thus described the invention, I claim:

1. The method of assembling a skirt upon the body of a porcelain insulator while in plastic condition, consisting in placing the skirt about the body, and causing union of the material at the joint.

2. The method of assembling a skirt upon the body of a porcelain insulator while in plastic condition, consisting in placing the skirt about the body, and causing union of the material at the joint by filling the space between the skirt and the body with clay slip.

3. The method of assembling a skirt upon the body of a porcelain insulator while in plastic condition, the skirt having an opening for the accommodation of the body, comprising placing the skirt upon the body and applying clay slip between the body and the wall of the opening, the slip uniting with the material of the skirt and body and forming a homogeneous mass as if integral therewith.

4. The method of assembling an insulator having a body and a skirt, comprising form-

ing the skirt with an opening to receive the body, and filling the space between the body and the wall of the opening with fluent material of the same character as that from which the insulator is formed, said assembling being effected while the skirt and body are in plastic condition whereby said fluent material will unite with the material of the body and skirt.

5. The method of assembling the body and skirt of a porcelain insulator while in plastic condition, comprising forming the body with a tapered portion, forming the skirt with an opening for the reception of the tapered portion of the body, the opening being larger at one end than the adjacent portion of the body to provide a space, and filling said space with clay slip which will unite with the body and skirt to form a homogeneous whole.

6. The method of assembling the body and skirt of a porcelain insulator while in plastic condition, comprising forming the body with a tapered portion, forming the skirt with an opening for the reception of the tapered portion of the body, the opening being larger at one end than the adjacent portion of the body to provide a space, wetting the wall of the opening and the tapered portion of the body, and filling said space with clay slip which will unite with the body and skirt to form a homogeneous whole.

7. The method of assembling the skirt of a porcelain insulator upon the body while in plastic condition, comprising forming the body with a tapered seat, forming the skirt with a hole in flaring relation to the tapered seat, placing the skirt upon the body with the wall of the hole located opposite said seat whereby a flaring continuous opening will be defined about the body, and filling said opening with clay slip.

8. The method of assembling the skirt of a porcelain insulator upon the body while in plastic condition, comprising forming the body with a tapered seat, forming the skirt with a hole in flaring relation to the tapered seat, placing the skirt upon the body with the wall of the hole located opposite said seat whereby a flaring continuous opening will be defined about the body, filling said opening with clay slip, and permitting the insulator to set whereby the slip will unite with the material of the skirt and body to form a homogeneous mass with no line of demarcation at the original joint.

9. The method of assembling the skirt of a porcelain insulator upon the body while in plastic condition, comprising forming the body with a tapered seat, forming the skirt with a hole in flaring relation to the tapered seat, placing the skirt upon the body with the wall of the hole located opposite said seat whereby a flaring continuous opening will be defined about the body, filling said opening with clay slip, and permitting the insulator to set whereby the slip will unite with the material of the skirt and body to form a homogeneous mass with no line of demarcation at the original joint, drying the insulator and then firing.

10. The method of assembling a skirt upon the body of a porcelain insulator while in plastic condition, comprising forming the skirt with a hole, placing the skirt about the body with the body passing through said hole, and pouring clay slip between the wall of the hole and the adjacent portion of the body.

11. The method of assembling a skirt upon the body of a porcelain insulator while both are in plastic condition, comprising forming a hole in the skirt to receive the body, shaping the body to reduce its diameter at a portion within the confines of said hole to provide a space between the body and the wall of the hole, and pouring into said space fluent material similar to that from which the body and skirt are formed whereby to unite the body and skirt into a homogeneous structure.

12. The method of assembling a skirt upon the body of a porcelain insulator while both are in plastic condition, comprising forming a hole in the skirt, inserting the body though said hole, defining a space between the body and the wall of the hole, and filling said space with fluent material of the same character as that from which the skirt and body are formed.

In testimony whereof I affix my signature.

KENT A. HAWLEY.