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Willem

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[54] **PIN-TYPE INSULATOR**

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[58] **Field of Search**.....174/150, 165, 168, 169, 176, 174/177, 178, 180, 194, 195, 196, 209, 210

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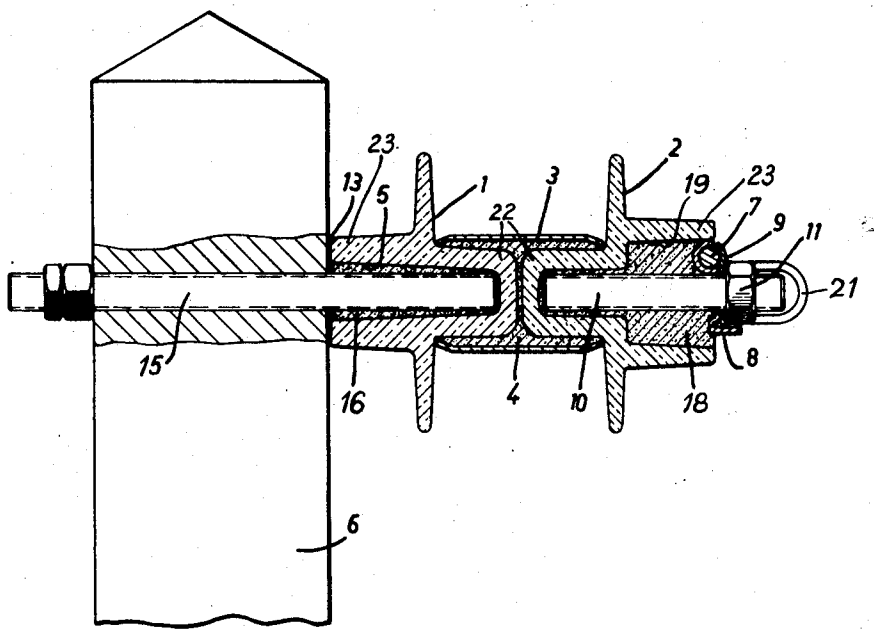
[57] **ABSTRACT**

In a pin-type insulator, one of two channel-shaped conductor-gripping elements is sealed to the outermost dielectric element to transmit to that dielectric element, either directly or via a cementitious mass filling a cavity in that dielectric element, at least part of the stress imposed on the gripping elements by the conductor which is supported by the insulator.

4 Claims, 4 Drawing Figures



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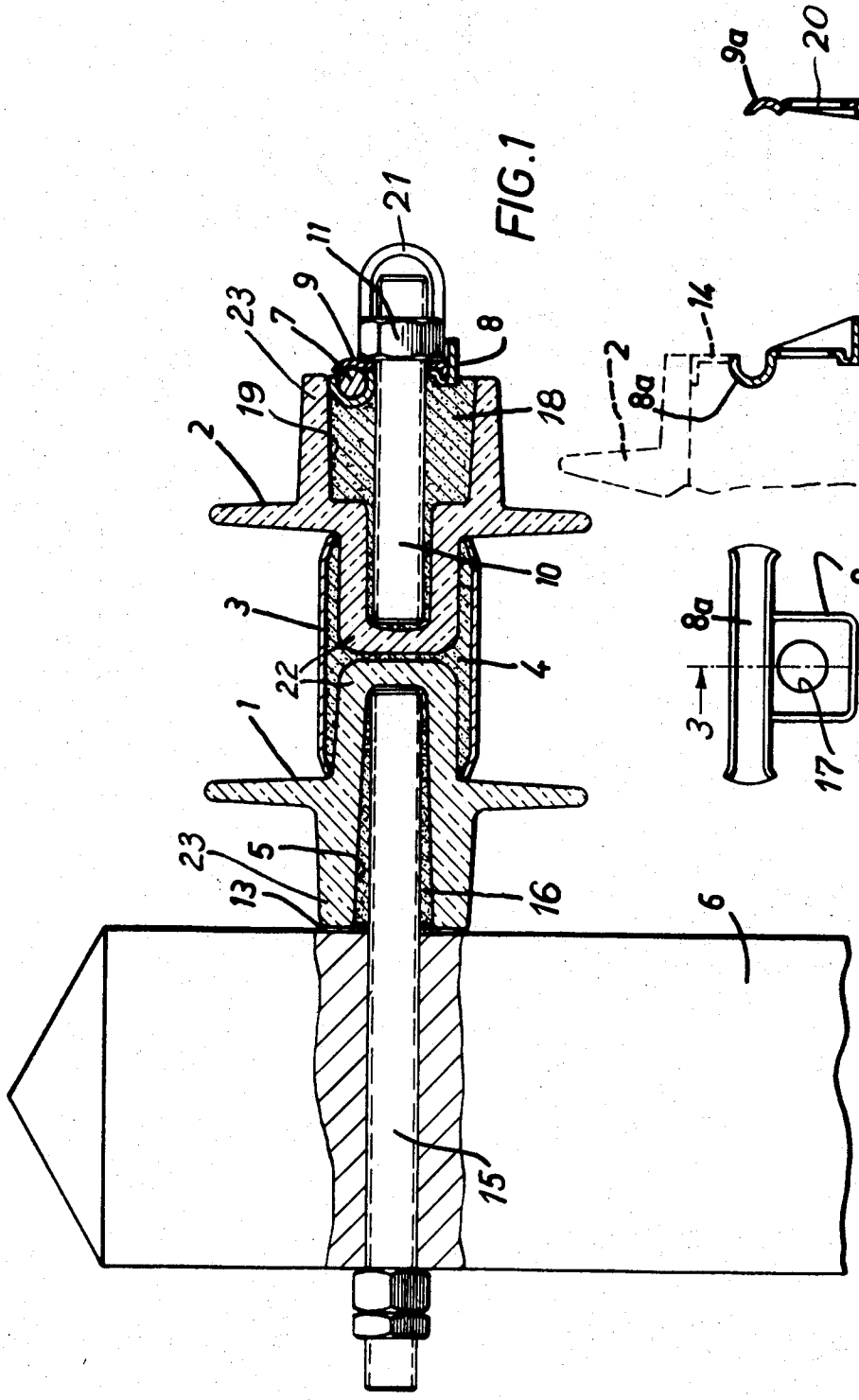

FIG.1

FIG.4

FIG.3

FIG.2

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PIN-TYPE INSULATOR

The present invention pertains to pin-type electric insulators including gripping means to hold the electric conductors intended to be supported by those insulators.

Pin-type insulators have been heretofore proposed including a plurality of dielectric elements made of glass or porcelain rigidly coupled together in coaxial relation, for example by means of a cement, with one of the elements affixed to a pin by means of which the insulator is mounted horizontally or vertically on a pole or tower. These insulators support an electric conductor by means of one or more metallic elements which in turn are usually fixed to a metallic stem sealed or cemented to the uppermost or outermost dielectric element, farthest from the supporting pin.

A shortcoming of this manner of holding the conductor is that the entire weight thereof is borne by the metallic element which contacts it, so that it is necessary to use a supporting stem having high mechanical strength. This requires a large cross-section for the stem and a consequent increased size for the insulator.

The invention proposes to surmount this shortcoming by providing an insulator of the type hereinabove described in which the weight of the conductor is not carried in its entirety by the stem engaged by the conductor, but is rather transmitted at least in part to the cement by which that stem is sealed into the outermost dielectric element. The invention also provides means for fastening the conductor to the insulator which are simple, easy to assemble and disassemble, and which facilitate replacement of the insulator in the event of its accidental breakage.

In accordance with the invention, the outermost dielectric element sustains the conductor by means of gripping elements which comprise two concave channel-shaped pieces surrounding the conductor, one of these being fixed to the outermost dielectric element, whereas the other one is movable and can be tightened into a position to hold the conductor with the aid of fastening means provided on that outermost dielectric element.

The means for tightening the two channel-shaped pieces against the conductor may comprise for example a nut threaded onto a threaded stem which is cemented to the outermost dielectric element, this stem passing through openings in the channel-shaped pieces in such fashion that tightening of the nut on its stem moves the movable one of those pieces so as to stress it against the stationary one.

The nut may advantageously include a ring or bridle so as to be susceptible of manipulation at a distance. The insulator of the invention has the advantage that the fixed channel-shaped gripping element transmits to the cement which holds the stem a substantial part of the stress imposed on the insulator by the conductor. This permits use of a smaller stem, and the gripping elements themselves can be smaller as well, while effecting nevertheless a secure support for the conductor and permitting easy assembly and disassembly of the conductor to the insulator.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be further described in terms of a presently preferred exemplary embodiment thereof and with reference to the accompanying drawings in which:

FIG. 1 is an axial sectional view of one form of insulator according to the invention;

FIG. 2 is a view in elevation of that one of the conductor gripping elements in the insulator of FIG. 1 which is fixed with respect to the dielectric elements of the insulator;

FIG. 3 is a sectional view taken on the line 3—3 of FIG. 2, shown however at an enlarged scale, and with a showing in phantom of the outermost dielectric element of the insulator and showing in addition, in phantom, lugs or feet which may be included on the gripping element of FIG. 2 to center it in the cavity of the outermost dielectric element of the insulator; and

FIG. 4 is a view in side elevation of the movable conductor gripping element in the insulator of FIG. 1.

The insulator of FIG. 1 is of the horizontal type. It comprises two dielectric elements 1 and 2, typically of glass or porcelain, joined together by a metallic sleeve 3 which is sealed to those elements by means of a cement 4. Each of the elements 1 and 2 includes a crown 22 and a skirt 23, the skirt of element 1 surrounding a cavity 5 therein and the skirt of element 2 surrounding a cavity 19 therein. The element 1 includes a cavity 5 at which it is sealed to a pin 15, again by means of cement as indicated at 16, for support of the insulator on a post 6.

In accordance with the invention the conductor 7, supported by the outer dielectric element 2, is gripped between two gripping elements 8 and 9 which include channel-shaped portions 8*a* and 9*a* (FIGS. 3 and 4) for engagement with the conductor. The gripping elements 8 and 9 are each apertured, as indicated at 17 in FIG. 2 for the element 8 and at 20 in FIG. 4 for the element 9, to pass over a threaded rod or stem 10, sealed by means of cement 18 into a cavity 19 of the outer dielectric element 2. The gripping element 9 is movable on the stem 10, whereas the gripping element 8 is fixed with respect thereto and with respect to the outer dielectric element 2 by means of the cement 18. The gripping element 8 may be provided with roughening on the convex surface thereof, to assist its adhesion to the cement 18. A nut 11, threaded onto the rod 10 makes it possible to clamp the conductor between the gripping elements 8 and 9. The nut may include a clevis-like bridle or loop 21 to facilitate remote manipulation of the nut. Notches not visible in the sectional view of FIG. 1 are provided in the dielectric element 2 to accommodate the conductor 7.

As hereinabove indicated, a large part of the stress carried by the elements 8 and 9 is transmitted to the body of cement 18 contained in the cavity 19 of the dielectric element 2. More particularly, a part at least of the stress imposed by the conductor 7 onto the element 8 is transmitted directly by the latter to the body of cement 18 and thence to the dielectric element 2, and is not borne by the stem 10. The stem 10 can consequently be of small cross-section and the elements 8 and 9 may themselves be of light construction, being made for example simply of galvanized sheet iron. The cement employed at 4, 16 and 18 is desirably a fibrous cement.

To center the fixed gripping element 8 with respect to the stem 10 and dielectric element 2, and additionally to assist independently of the stem 10 transfer to the dielectric element 2 of the stress imposed on the insulator by the conductor 7, the fixed gripping ele-

ment **8** may be provided with extensions or lugs as indicated in phantom at **14** in FIG. **3**, bearing against the inside walls of the cavity **19**.

It will be observed that the dielectric element **1** does not rest directly against the post **6**. Rather, a collar **13** of plastic material or the like avoids direct contact between the post and the element **1**. This arrangement limits the bending stress to which the pin **15** is subjected by the conductor. Lugs may be provided on the collar **13** to fit within the cavity **5** and thereby to center the collar with respect to the dielectric element **1**, and to facilitate sealing of the collar to that dielectric element.

The stem **10** may be offset from the axis of the element **2** so as to dispose the conductor **7** on the axial plane of the insulator.

It will thus be seen that the invention provides a pin-type insulator comprising a plurality of dielectric elements as indicated at **1** and **2** of the drawings, for example, and means such as the cement **4** supporting those elements in a linear array and in fixed relative position. The array need not however be straight. The insulator further comprises at least two channel-shaped conductor gripping elements, such as the elements **8** and **9**, and means such as the cement **18** sealing one of those gripping elements to the dielectric element at one end of the array. The insulator further comprises two-part interengaging means such as the stem **10** and the nut **11** to stress the two gripping elements together. The insulator may further comprise a pin as indicated at **15** at the end of the array opposite that of the conductor gripping means, and a collar or washer as indicated at **13** engaged on that pin.

While the application has been described hereinabove in terms of a presently preferred exemplary embodiment, the invention itself is not limited thereto but rather comprehends all modifications of and departures from that embodiment falling within the scope of the appended claims.

I claim:

1. A horizontal pin-type insulator comprising a metallic sleeve, two cup-shaped dielectric elements having each a crown and having each a skirt surrounding a cavity, said elements being coaxially disposed with their crowns adjacent each other inside said sleeve, a first mass of cementitious material filling said sleeve and holding said elements and sleeve in fixed coaxial relation, a stem cemented into the cavity of one of said elements for affixation of the insulator to a support, a second mass of cementitious material in the cavity of the other of said elements, at least two complementary conductor gripping elements shaped to embrace opposite sides of a filamentary conductor, one of said gripping elements being sealed in said second mass of cementitious material, and two-part interengaging means carried by said other dielectric element to stress the other of said gripping elements against said one gripping element.

2. A pin-type insulator according to claim **1** wherein said one gripping element comprises a channel embedded in said second mass of cementitious material.

3. A pin-type insulator according to claim **2** wherein said one gripping element further comprises extensions bearing against the inside walls of the cavity in said other dielectric element.

4. A pin-type insulator according to claim **1** wherein said interengaging means comprise a threaded stem embedded in said second mass of cementitious material and a nut engaged on said last-named stem.

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