Nov. 29, 1938. R. C. DEHMEL 2,138,571

INSULATOR

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FIG. 1

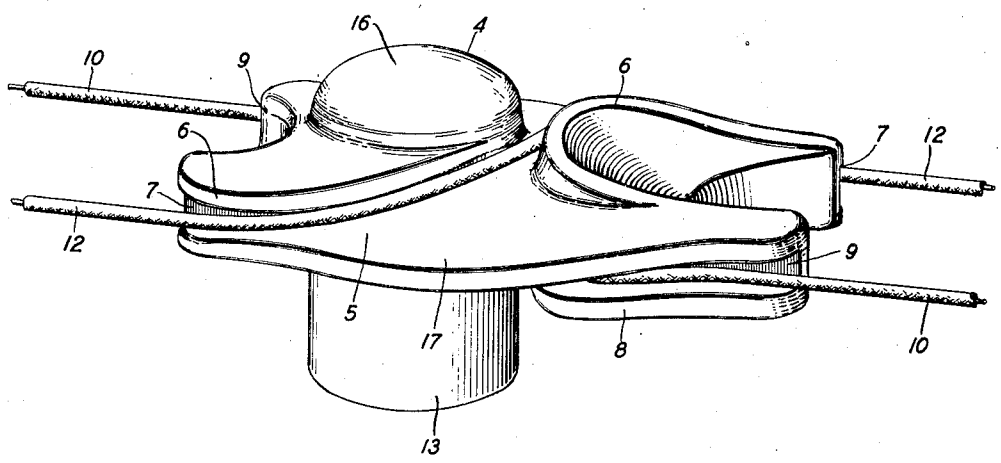

FIG. 2

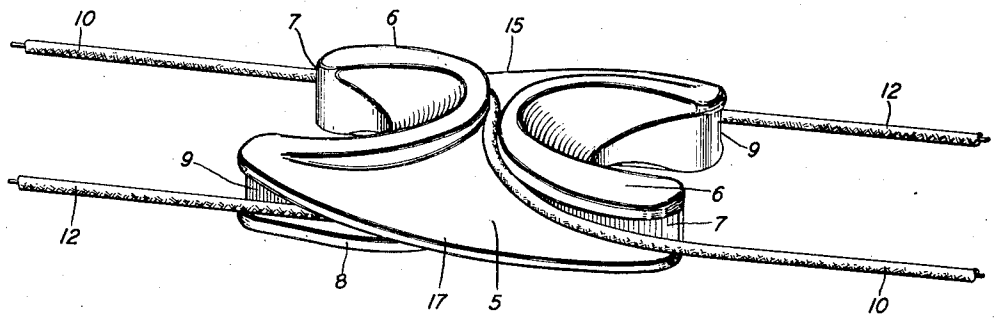

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FIG. 4

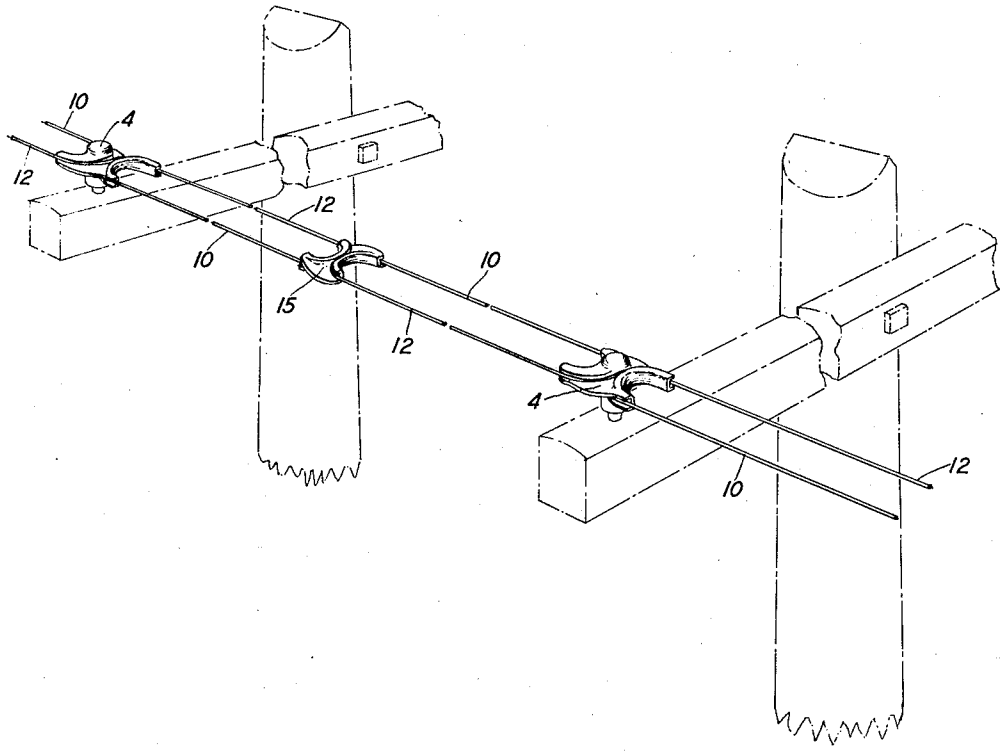
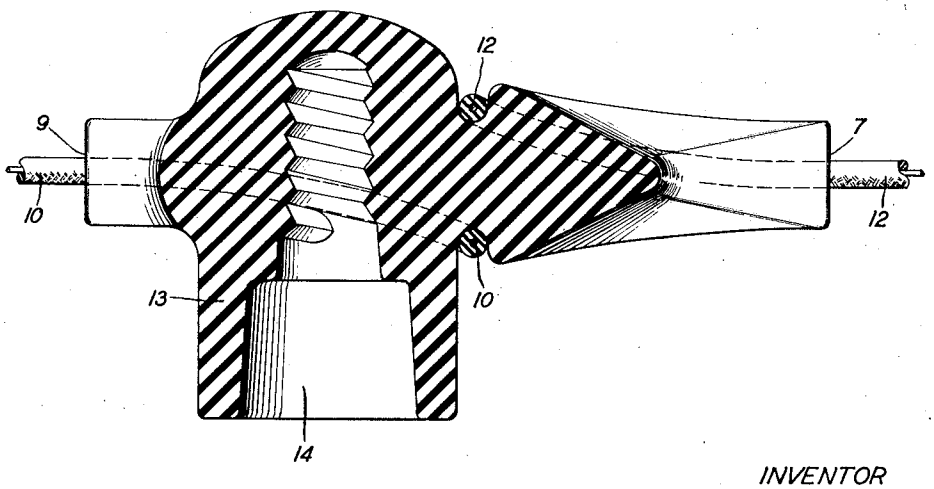


FIG. 3



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UNITED STATES PATENT OFFICE

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INSULATOR

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Application November 20, 1936, Serial No. 111,805

7 Claims. (Cl. 173—28)

This invention relates to insulators and more particularly to transposition insulators of the type used on open wire transmission lines.

In accordance with well-known practice the wires of a transmission line and particularly the wires of open-wire telephone lines are transposed at suitable intervals for the purpose of equalizing the induction effects between the conductors. It is general practice to support the wires of an open-wire transmission line by means of insulators mounted on pins which fit into holes bored at definite intervals in cross-arms mounted on a pole. Each wire of the transmission line is secured to an insulator by means of a tie wire or other suitable means. In order to provide for the transposition of the wires it has been customary to employ transposition brackets of the type disclosed in U. S. Patents 1,840,362 and 1,912,456, issued to Hunter et al. and Klein respectively, which facilitate the mounting of four or more insulators, at a point of transposition, to which the transmission wires are secured and between which the transposition is effected. Such devices are relatively costly and for the transposition of the wires of a pair require four insulators, four pins for mounting the insulators, four tie wires for securing the conductors to the insulators and the bracket itself.

It is the object of this invention to simplify and improve the design of insulators used in transposing the conductors of an open-wire transmission line.

This object is attained in accordance with a feature of the invention by the provision of a unitary insulating device of such a design as to provide pairs of transposition grooves which accommodate the wires of a transmission line and effect the wire changeover without recourse to the use of brackets or tie wires and which materially reduces the number of insulators and pins heretofore required at a transposition point.

Another feature of the invention resides in stream-lining the insulators to minimize changes in air velocity to which the structure is subjected and thereby minimize precipitation of dust particles.

A further feature of the invention is embodied in a design of insulator which is suitable not only for wire transposition at the poles supporting the transmission line, but also for transposition at some point between poles.

These and other features of the invention will be readily understood from the following detailed description, made with reference to the accompanying drawings in which,

Fig. 1 is a perspective view of a point type transposition insulator which is suitable for use in transposing the wires at a point at which the transmission line is supported on a pole.

Fig. 2 is a perspective view of a point type transposition insulator which is suitable for use in transposing the wires of a transmission line at a point between poles.

Fig. 3 is a sectional view of the insulator shown in Fig. 1; and

Fig. 4 is a schematic representation of a section of a two-conductor transmission line with which are employed the transposition insulators of this invention.

The insulators shown in the drawings may be made of glass, porcelain or other suitable material by molding.

The point type insulator 4 shown in Figs. 1 and 3 comprises a portion 5, which, for descriptive purposes is herein referred to as the main body portion and which, when in service occupies, substantially, the same horizontal plane as the transmission line with which it is associated. On its upper surface, the main body portion 5 of the insulator is provided with diagonally disposed raised portions 6 which are curved in such a manner as to effect, together, a substantially S-shaped guide. The raised portions 6 are extended so as to form substantially U-shaped raised portions at each end of the insulator with the sides opposite the raised portions 6 gradually tapering off to meet the surface of the main body portion 5. The U-shaped raised portions may be described as having their apices in close proximity to each other at substantially the transverse center line of the main body portion 5. The undersurface of the insulator is formed in a similar manner except that the raised portions 8 on the underside are diagonally disposed with respect to the raised portions 6 on the upper surface on the same end of the insulator. The raised portions 6 on the upper surface of the insulator cooperate in forming a continuous substantially S-shaped transposition groove or guide, the termini of which are indicated by the numeral 7 whereas the termini of the continuous substantially S-shaped transposition groove or guide, effected on the undersurface of the insulator by the raised portions 8, are indicated by the numeral 9. Each of the grooves or guides, so formed, accommodates one of the wires 10, 12 of a transmission line.

The portion of the insulator which serves to transpose the conductors of the transmission line is provided with an integral stem portion 13 hav-

ing a centrally located bore, the upper portion of which is threaded for the purpose of permitting the insulator to be screwed onto a pin which supports the insulator on the cross-arm of a pole, as illustrated in Fig. 4.

The span insulator 15, illustrated in Fig. 2, distinguishes from the insulator 4 of Fig. 1 primarily in the omission of the stem portion 13 and its incidental dome portion 16. Like numerals in Figs. 1 and 2 have been used to identify similar portions of the insulators 4 and 15.

As shown in Fig. 4, the insulator 15 is employed for the purpose of transposing the wires of a transmission line at a point between poles and requires no support other than the wires themselves.

The wires, in both types of insulators, are held in the insulator grooves or guides by the inward pressure component resulting from their tension. No tie wires are required. Slippage is avoided by the snubbing action developed at the deflecting curves. The insulators are streamlined to minimize changes in air velocity and the consequent precipitation of dust.

It will be noted that the principal insulating surfaces of both insulators disclosed are essentially horizontal. This shaping is desirable for the reason that horizontal surfaces generally remain cleaner than vertical surfaces due to the flow and sweepage of winds and the impingement of rain. Also, these surfaces are widened as shown at 17 to increase the length of the leakage path between conductors thereby improving the electrical resistance of the insulators.

What is claimed is:

1. A unitary insulating device for use in spacing the wires of a transmission line having a substantially S-shaped guide for the wires of the line on each of its upper and lower surfaces, each of said guides being formed by diagonally disposed raised curved portions on each surface of the device.

2. A unitary insulating device for use in spacing the wires of a transmission line having a substantially S-shaped guide for the wires of the line on each of its upper and lower surfaces, each of said guides being formed by diagonally disposed raised curved portions on each surface of the device and the raised portions on one surface being diagonally disposed with respect to the raised portions on the other surface.

3. A unitary insulating structure for use in spacing the wires of a transmission line, having raised curved portions on its upper and lower surfaces, the raised portions on each surface being diagonally disposed with respect to each other and with respect to the raised portions on the other surface and the raised portions on each surface cooperating to form a transpositional guide for a wire of the transmission line.

4. In combination, a unitary insulating structure for use in spacing the wires of a transmission line comprising a main body portion located substantially in the horizontal plane of the wires of the transmission line, raised curved portions located at each end of the main body portion on each side thereof and having their peripheries in close proximity to each other at substantially the transverse center line of the main body portion and a pair of wires threaded between the peripheries of said raised portions and abutting diagonally disposed sides of each of said raised portions.

5. In combination, a unitary insulating structure for use in spacing the wires of a transmission line comprising a main body portion located substantially in the horizontal plane of the wires of the transmission line, a pair of raised curved portions on each of the upper and lower sides of the main body portion with the peripheries of each pair of raised portions in close proximity to each other at substantially the transverse center lines of the main body portion and a pair of wires threaded between the peripheries of said pair of raised portions and abutting diagonally disposed sides of the raised portions of each pair thereof.

6. In combination, a unitary insulating structure for use in spacing the wires of a transmission line comprising a main body portion located substantially in the horizontal plane of the wires of the transmission line, a pair of raised curved portions on each of the upper and lower sides of the main body portion with the peripheries of each pair of raised portions in close proximity to each other at substantially the transverse center lines of the main body portion and a wire threaded between each of the peripheries of each of said pair of raised portions and abutting diagonally disposed sides of the raised portions of each pair thereof whereby said structure serves to space and transpose the wires of the transmission line and is held in position on the wires by virtue of the snubbing action of the deflecting curves effected by the diagonally disposed sides of said raised portions.

7. In combination, a unitary insulating structure for use in spacing the wires of a transmission line comprising a main body portion located substantially in the horizontal plane of the wires of the transmission line, a raised curved portion located at each end of the main body portion with the peripheries thereof in close proximity to each other at substantially the transverse center line of the main body portion, a pair of wires threaded between the peripheries of said raised portions and abutting diagonally disposed sides of each of said raised portions and a tapped hollow projection integral with said main body portion for accommodating a threaded insulator pin.

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