April 30, 1935. H. M. HALL 1,999,502

CONDUCTOR FOR TRANSMISSION LINES

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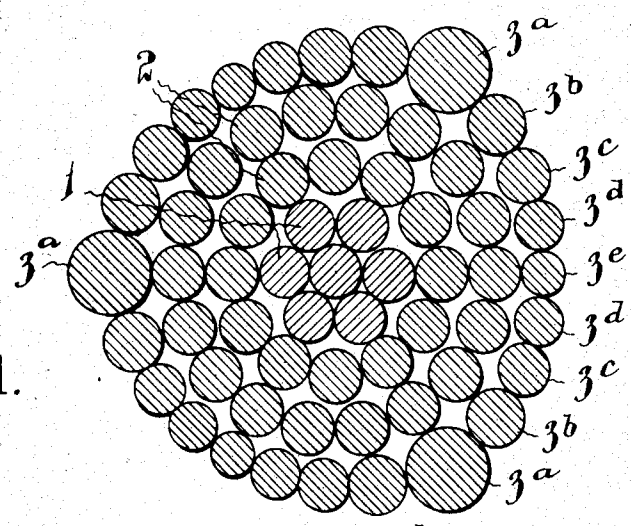


Fig. 1.

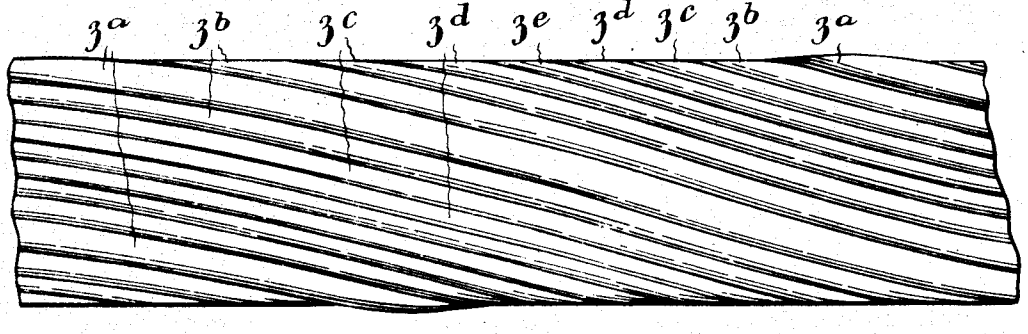


Fig. 2.

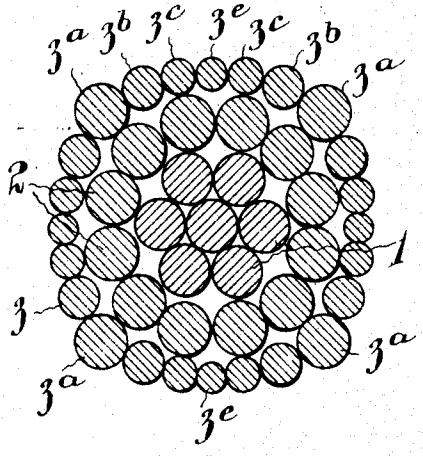


Fig. 3.

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CONDUCTOR FOR TRANSMISSION LINES

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4 Claims. (Cl. 173—13)

This invention relates to conductors of a power transmission line. It is well known that such conductors vibrate between their points of suspension and that the vibrations result in the conductors breaking prematurely at said points. The object of this invention is to so construct a conductor as to reduce this objectionable vibration which results in the creation of breaking stresses, without materially affecting the cost of production of the conductor.

I attain my object by producing a stranded conductor having a cross section at any point shaped as a regular polygon and having its peripheral contour varied at different points in the length of the conductor. The varied contour is provided by helically laying a plurality of large wires in the conductor strand in spaced relationship to one another circumferentially of the conductor, and a plurality of relatively smaller wires between the large wires. The said smaller wires vary in diameter and are graded in size to produce a contour substantially flush with the large wires.

The constructions are hereinafter more specifically described and illustrated in the accompanying drawing in which

Fig. 1 is a cross-section of my conductor;

Fig. 2 a side elevation thereof; and

Fig. 3 a cross section of a modified form of the conductor.

In the drawing like numerals of reference indicate the corresponding parts in the different figures.

Heretofore it has been the general practice to use stranded conductors of circular cross-section in transmission lines which are suitably suspended from towers. These conductors vibrate as a result of wind blowing across them. The wind creates an eddy first at one side of the conductor and then at the other side which produces an alternating force on the conductor in a plane at right angles to the flow of wind. To overcome this vibration, which results in the conductor breaking at its points of connection with the towers, I construct the conductor so that the eddy currents will not be uniform throughout the length of the span between towers and therefore these eddy currents will counterbalance and thus dampen one another.

1 is a core which may be formed of one or more wires or rods but preferably of a plurality of stranded steel wires having a high tensile strength. On the core are stranded one or more layers of conducting wires 2 in the usual manner to form a conductor which to this point may be circular in cross-section and in accordance with standard practice. On the stranded wires 2 is stranded a layer of conducting wires 3 including a plurality of large wires 3^a which are equally spaced apart circumferentially of the conductor. The wires 3 also include a plurality of wires 3^b, 3^c, 3^d and 3^e of different diameters but all smaller in diameter than that of the wires 3^a. These smaller wires are laid between adjacent large wires 3^a and are graded in size so that the smallest wire or wires 3^e are positioned substantially midway between adjacent large wires 3^a, and the largest wires 3^b of the smaller wires are positioned next to the large wires 3^a.

From this description it is obvious that the cross-sectional contour at any point throughout the length of the conductor has been changed from a circle (through the conducting wires 2) to a regular polygonal shape (through the conducting wires 3). As the wires 3 are helically laid, the cross-section of the conductor will remain constant throughout the length thereof but the peripheral contour will vary. This variation in the peripheral contour not only presents different faces and angles of the polygon to a wind from any direction towards the conductor but also changes the faces and angles on the side of the polygon away from the wind whereby eddy formation cannot be uniform throughout the length of the conductor.

With the cross-sectional triangular shaped contour having slightly convexed sides or faces as shown in Fig. 1, a stream-line effect its produced so that, at intervals determined by the lead, pitch or lay of the helically laid wires 3, a wind from any direction will flow around both sides of the conductor and join behind the rear wire 3^a without the formation of these eddies.

Of course, it is obvious that the layer of conducting wires 3 need not be the outer layer of the conductor and that the contour formed by this layer of wires would be maintained in a successive layer or layers of wires of equal diameters provided the successive layer or layers follow the direction of rotation of the wires 3.

What I claim as my invention is:

1. A stranded conductor having a symmetrical, convex polygonal cross-sectional contour, comprising a circular core; a plurality of large wires helically laid in spaced relationship to one another circumferentially on the core; and a plurality of relatively smaller wires of various diameters laid side by side between the large wires, the small wires being graded according to size so that the smallest wires are substantially midway

between the large wires and being progressively varied in distance from a circumscribed circle touching the large wires.

2. A stranded conductor comprising a plurality of wires helically stranded and graded according to size relative to one another so that the cross-sectional contour of the conductor at any point throughout its length will be a symmetrical convex polygon, the wires touching an inscribed circle and the largest of the graded wires touching a circumscribing circle concentric to the inscribed circle, the other graded wires being spaced from the circumscribing circle and being arranged so that the smallest wires lie substantially midway between the largest wires.

3. A stranded conductor comprising a bundle of round wires, the peripheries of the outer wires touching a circumscribed circle; three large wires helically stranded on the bundle, the said large wires being substantially equi-distant from one another circumferentially of the conductor; and a plurality of relatively smaller wires of various diameters laid side by side between the large wires, the small wires being graded according to size relative to one another and to the large wires so that the smallest wires are substantially midway between the large wires and the said small wires being progressively varied in distance from a circumscribing circle touching the large wires.

4. A stranded conductor including a layer of helically stranded wires of various diameters progressively and symmetrically graded according to size from large to small and from small to large so that the conductor will have three high points substantially equi-distantly spaced apart around its circumference at any point throughout its length, the said high points being defined by the largest of the wires and being located substantially midway between the smallest of the wires.

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