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N. J. A. WAHLBERG
TRANSMISSION LINE DEVICE

Filed July 30, 1927

Fig. 1.

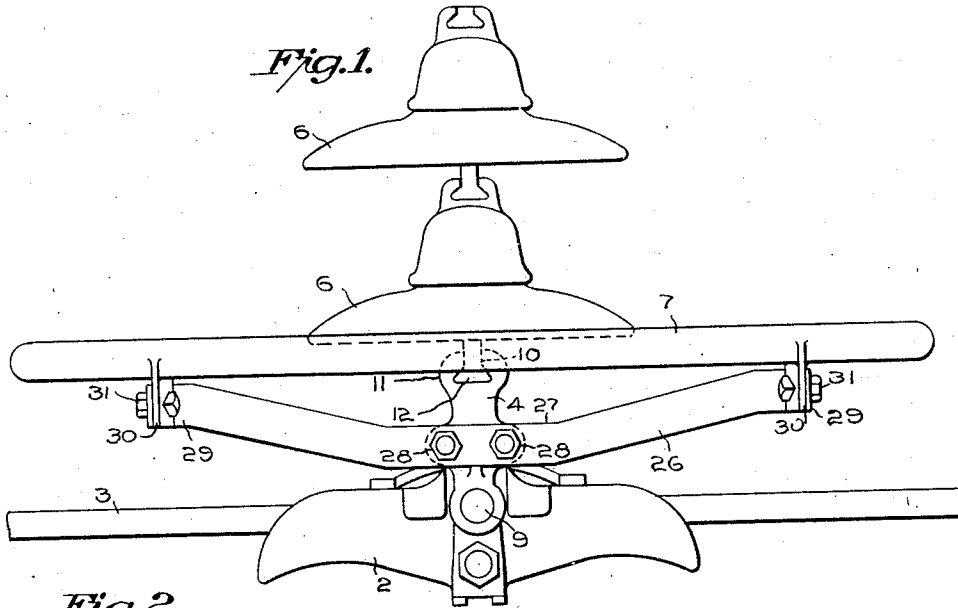


Fig. 2.

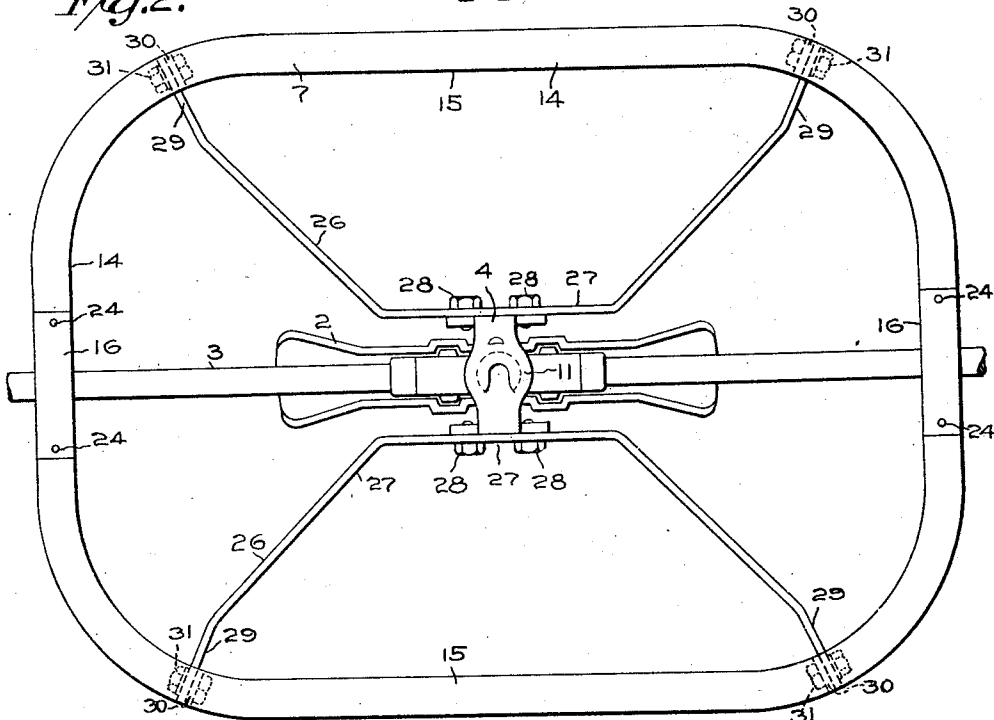


Fig. 3.

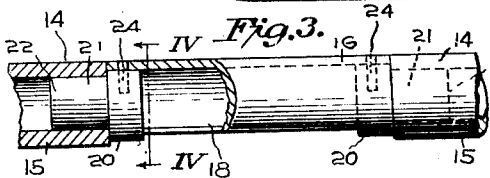
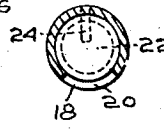


Fig. 4.



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TRANSMISSION-LINE DEVICE.

Application filed July 30, 1927. Serial No. 209,439.

My invention relates to transmission-line devices and particularly to electrostatic field-controlling means, such as arcing rings, for cooperation with suspension insulators and clamps.

One object of my invention is to provide a device of the above-indicated character that shall prevent damage to parts thereof by disturbances on the line.

Another object of my invention is to provide an electrostatic field-controlling device that shall have a portion that is automatically movable in response to predetermined conditions.

Another object of my invention is to provide an arcing ring or a similar structure that shall embody removable sections for positioning over a conductor and removable from the remainder of the device by engagement with the conductor.

Another object of my invention is to provide a transmission-line device that shall be simple and durable in construction, economical to manufacture and effective in its operation.

In transmission-line practice, it is usual to support a conductor by a clamp at the lower end of a series string of suspension-insulator units and to provide an electrostatic field-controlling device, such as an arcing ring, at one or both ends of the insulator.

Such field-controlling devices, and particularly arcing rings of relatively great diameter, are subject to vibrations caused by oscillation of the line conductor and are sometimes distorted and rendered useless by particularly violent movements of the structure.

It has also been suggested to employ a suspension clamp that normally holds the conductor securely but that, in response to abnormal line conditions, such as the breaking of the conductor between towers, releases the conductor to permit it to slip through the clamp.

This action is obtained by relatively movable conductor-receiving and suspension members and clamping means therebetween that are automatically released, in response to relative movement of the receiving and

suspension members, when the insulator string moves through a relatively great angle from its normal substantially vertical position suspended from a tower.

In the latter structure, a field-controlling device is likely to be damaged by engagement with the conductor or other parts, by reason of the angle through which the insulator swings.

It is my aim to prevent the damage which sometimes occurs to arcing rings and similar devices, whether the damage is caused by ordinary violent vibrations of the line or displacement of the parts caused by line breakage.

Accordingly, in practicing my invention, I provide a transmission-line device in which an electrostatic field-controlling portion is movable or automatically removable from its normal operative position to prevent the damage above mentioned.

Figure 1 of the accompanying drawing is a side elevational view of a structure embodying my invention.

Fig. 2 is a top plan view of a portion of the device shown in Fig. 1.

Fig. 3 is an enlarged detail view, partially in section and partially in elevation, of a portion of the device shown in Figs. 1 and 2, and,

Fig. 4 is a view taken along the line IV—IV of Fig. 3.

The device comprises, in general, a conductor-receiving or channel member 2 for a conductor 3, a suspension element or yoke 4 for the member 2, insulator units 6 and an electrostatic field-controlling device 7.

The channel member 2 may be of any usual construction and relation to the insulator 6 but is preferably connected thereto, through the yoke 4, by means of trunnions 9, about which the members 2 and 4 are pivotally movable. The yoke 4 is connected to a pin 10 of the lower insulator unit 6 by a socket portion 11 that receives a ball portion 12 on the pin 10, in a usual manner. Eye and clevis or other suitable parts may be substituted for the ball-and-socket members 12 and 11, respectively.

The trunnions 9, of the clamp structure

illustrated, are preferably directed substantially through the longitudinal conductor axis, and the clamp also, preferably, embodies the above-mentioned slipping features, but these features constitute no part of the present invention and need no further description herein, except that relatively great angular movement is permitted between the channel member 2 and the yoke member 4 about the axes of the trunnions 9.

The field-controlling device 7 comprises an annular arc-assuming element 14, preferably of tubular construction, having permanently-related sections 15, at opposite sides of the conductor 3, and removable sections 16 disposed opposite or over the conductor 3.

As shown more in detail in Figs. 3 and 4, the removable sections 16 are preferably provided with longitudinal slots 18 at the lower sides thereof and constructed of thinner material than the side sections 15, whereby they may be sprung into position over heads 20 of bushing members 21 having portions 22 secured in the ends of the side sections 15. Pins 24 may also be provided for preventing lateral separation of the side sections 15. The pins 24 are preferably disposed at the upper sides of the removable sections 16 and extend substantially normal to the conductor 3.

The element 14 is mounted on the yoke 4 by supporting members 26 of substantially U-shape embodying apertured central portions 27 secured to the yoke 4, as by bolts 28, and free end portions 29 connected to depending lugs 30 on the side sections 15, by bolts 31.

In operation, when the conductor breaks at one side of the structure, or if, through other cause, the member 2 pivots, relative to the yoke member 4, about the trunnions 9 through a sufficient angle to violently engage the conductor 3 against one of the removable sections 16, the latter, by reason of the slot 18 therein, and the disposition of the pins 24 extending in a direction away from the conductor 3, is removed from position between the adjacent ends of the permanently-related side sections 15 of the element 14, the curved wall adjacent slots 18 yielding to spring over heads 20. The removed section or sections 16 may subsequently be replaced between the side sections 15 to restore the device to its normal operating condition.

The particular construction shown in Figs. 3 and 4 is, of course, only illustrative of one means for accomplishing the purposes of my invention, it being understood that the section 16 may be permanently pivotally mounted at one end and various other modifications may be provided that are substantial equivalents of the illustrated structure.

Therefore, while I have shown and described a particular form of my invention, changes may be effected therein without de-

parting from the scope and spirit thereof as set forth in the appended claims.

I claim as my invention:

1. A transmission-line device comprising an annular electrostatic-field-controlling element having sections for permanent positions relative to each other at opposite sides of the line conductor, mounting means for the device cooperating with said sections and sections between said sections opposite the conductor for displacement by engagement with the conductor.

2. A transmission-line device comprising an electrostatic-field-controlling element including portions co-operating with the line conductor for movement relative to each other in response to movement of the conductor.

3. A transmission-line device comprising an electrostatic-field-controlling element including portions, one of which moves relative to the other when engaged by the line conductor.

4. A transmission-line device comprising an electrostatic field-control structure including a supporting member and an electrostatic-field-controlling element mounted thereon and responsive to movement of the line conductor for movement relative to said supporting member.

5. A transmission-line device comprising an electrostatic-field-control element including spaced sections and a section between said sections movable laterally relative thereto in response to movement of the line conductor.

6. A transmission-line device comprising an electrostatic-field-control element including spaced sections, a section between said sections and means for normally positioning said intermediate section and permitting movement thereof relative to said spaced sections in response to movement of the line conductor.

7. A transmission-line device comprising an electrostatic-field control element including spaced sections, a section between said sections being movable laterally relative thereto in response to movement of the line conductor and means for temporarily positioning said sections relative to each other to have a continuous field-controlling surface.

8. A transmission-line device comprising a supporting member and an electrostatic-field-controlling element supported thereby and extending transversely to the conductor and cooperating with the conductor for movement relative to said supporting member in response to movement of the conductor.

9. A transmission-line device comprising an electrostatic-field-controlling ring-like element including a section opposite the conductor for movement out of the plane of the ring in response to movement of the conductor.

10. A transmission-line device comprising

an electrostatic-field-controlling element including a section opposite the conductor for movement out of the plane of the element in response to movement of the conductor, and
5 means for detachably securing said section relative to the remainder of the element.

including spaced sections between which a portion of the line conductor passes in response to predetermined relative movement between the conductor and the device. 10

In testimony whereof, I have hereunto subscribed my name this 23rd day of July, 1927.

11. A transmission-line device comprising an electrostatic-field-controlling element in-

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