J. A. KOONTZ, JR.

ELECTRIC CONDUCTOR INSULATING SUPPORT.

APPLICATION FILED JULY 26, 1916.

1,215,549. Patented Feb. 13, 1917.

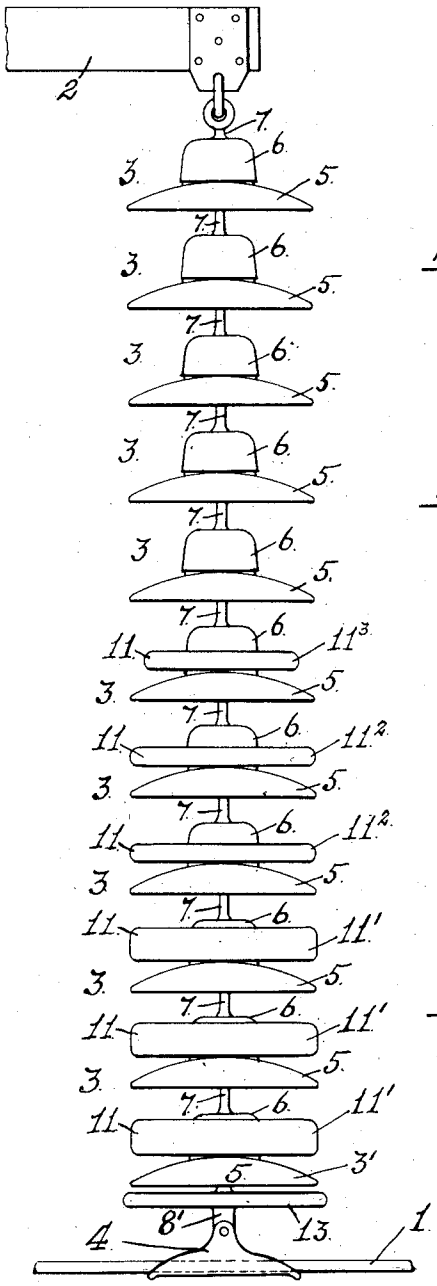


Fig. 1.

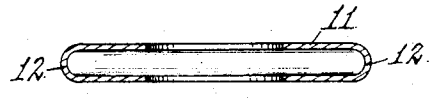


Fig. 5.



Fig. 4.

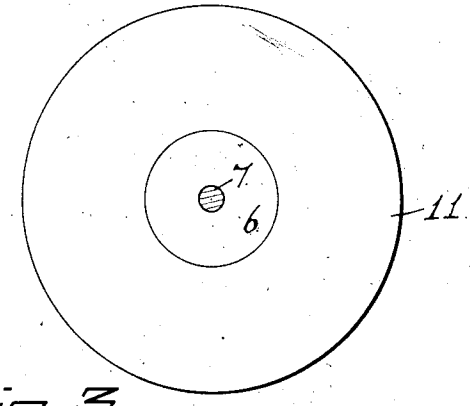


Fig. 3.

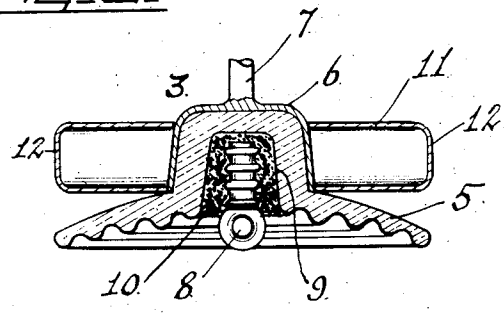


Fig. 2.

WITNESS

Wm. F. Drew

INVENTOR.

John A. Koontz, Jr.

BY

Wm. F. Booth

ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN A. KOONTZ, JR., OF PALO ALTO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO EDWARD W. BEARDSLEY, OF SAN FRANCISCO, CALIFORNIA, AND ONE-FOURTH TO RICHARD W. SHOEMAKER, OF ALAMEDA, CALIFORNIA.

ELECTRIC-CONDUCTOR-INSULATING SUPPORT.

1,215,549. Specification of Letters Patent. Patented Feb. 13, 1917.

Application filed July 26, 1916. Serial No. 111,398.

To all whom it may concern:

Be it known that I, JOHN A. KOONTZ, Jr., a citizen of the United States, residing at Palo Alto, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Electric-Conductor-Insulating Supports, of which the following is a specification.

My invention relates to the class of electric-conductor insulating-supports, and more particularly to that type consisting of a series of interconnected units.

The uneven distribution of voltage along a string of insulators is well known. With a small number of units this uneven distribution is not serious, and scarcely justifies the complication and expense required to overcome it. But with an increasing number of units, the distribution becomes continually poorer. A limit is soon reached where additional units make no appreciable decrease in the potential duty of those units next the conductor.

In general, the unit next to the conductor has the largest proportion of the total voltage across it, the succeeding units taking a smaller and smaller amount. This is unsatisfactory for two reasons; the units nearer the conductor have to stand an excessive strain, and the units nearer the grounded end have a lower voltage across them than is desirable for economical service.

The object of my invention, therefore, is to provide means for grading the voltage duty of the several insulator units in such manner that each will take an approximate equal proportion of the total voltage. This is accomplished broadly by grading the electro-static capacity of the individual units. The capacities of the units nearer the conductor are increased relatively to the capacities of the units nearer the ground, and by so doing the voltage duty of all the units of the series is rendered practically uniform.

The result of my invention is to enable higher voltage than has heretofore been employed to be carried in a conductor without danger of corona discharge from the metal parts of the insulator units nearest the conductor. A further advantage of my invention lies in the fact that it may be employed upon standard insulators as now constructed, thus eliminating the need for specially constructed and expensive insulator units.

To this end, my invention consists in the novel device illustrated in the accompanying drawings, wherein—

Figure 1 is an elevation of a suspension insulator of standard construction showing my invention applied thereto.

Fig. 2 is a transverse section, enlarged, through one of the insulator units, having my capacity increasing disk applied thereto.

Fig. 3 is a plan view of the same.

Figs. 4 and 5 are transverse sections through capacity increasing disks of different forms.

In the drawings, the reference numeral 1 represents an electric conductor, and 2 the supporting arm therefor. An insulator-support comprising a series of inter-connected insulating units 3 (here shown as of the suspension type) supports the conductor 1 from the arm 2 in the usual well known manner, by means of a clamp 4. Each of the insulator units 3, as shown particularly in Fig. 2 of the drawings, comprises a bell 5 of porcelain or other electrically non-conducting material, surmounted by a metallic cap 6 carrying the upper suspension member 7. The lower suspension member 8 is retained within the cavity 9 of the bell in any well known manner, as, for example, by cement 10.

Surrounding the cap 6, I place a disk 11 of electrically conducting material, and preferably hollow, as shown in the drawings. This disk 11 may be of the form shown in Figs. 2 and 3, or as illustrated in Figs. 4 and 5, the edges 12 thereof being curved and formed with a radius great enough to prevent corona discharge. The disk should be in electrical contact with the cap 6, but ordinarily need not be permanently secured thereto.

Below the lowermost insulating unit 3′, I place a metallic disk 13 having electrical connection with the lower suspension member 8′ of said lowermost insulating unit.

The conducting disks 11 increase the electro-static capacity of the individual insulator units, and by varying the thickness of said disks to bring their adjacent surfaces nearer together, and also by varying the diameter of said disks, the electro-static

capacity of the units can be varied. Therefore, the insulator units nearer the conductor 1 are equipped with conducting disks 11′ of relatively great thickness and as large in diameter as the diameter of the insulating units will permit. As the distance from the conductor 1 increases, the conducting disks then become thinner, as at 11^2, and finally smaller in diameter, as at 11^3. The upper insulating units have no disks whatever.

Thus it will be seen that the electro-static capacity of the lowermost insulating units is increased by the addition thereto of the metallic disks 11′, and the capacities of the succeeding units are graded by means of the disks 11^2 and 11^3 of less thickness and diameter, so that the voltage duty of the several insulator units of the series is rendered approximately uniform.

I claim:—

1. An electric-conductor insulating-support, comprising a plurality of interconnected insulating units, and a hollow metallic disk interposed between two adjacent insulating units for increasing the electrostatic capacity thereof.

2. An electric-conductor insulating-support, comprising a plurality of interconnected insulator units, and conducting members interposed between said insulating units, said conducting members varying in thickness.

3. An electric-conductor insulating-support, comprising a plurality of interconnected insulating units, and removable conducting members interposed between said insulating units, said conducting members varying in diameter.

4. An electric-conductor insulating-support, comprising a plurality of interconnected insulating units adapted to support a conductor, and conducting members interposed between said insulating units, said conducting members being of greater thickness and diameter nearer said conductor.

5. An electric-conductor insulating-support, comprising a plurality of interconnected insulating units, and conducting members interposed between said units, said conducting members varying in thickness and diameter.

6. An electric-conductor insulating-support comprising a series of inter-connected insulating units, a metallic disk positioned between the conductor and the insulating unit adjacent thereto, and metallic disks interposed between said insulating units, said disks varying in thickness and diameter, the disks of greatest thickness and diameter being nearest the conductor.

7. An electric-conductor insulating-support comprising a series of alternating insulating and conducting units spaced apart by varying distances, the least distance being nearest the conductor.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN A. KOONTZ, Jr.

Witnesses:
Wm. F. Booth,
D. B. Richards.