

May 5, 1925.

1,536,749

A. O. AUSTIN

INSULATOR

Original Filed Dec. 3, 1919

Fig. 1.

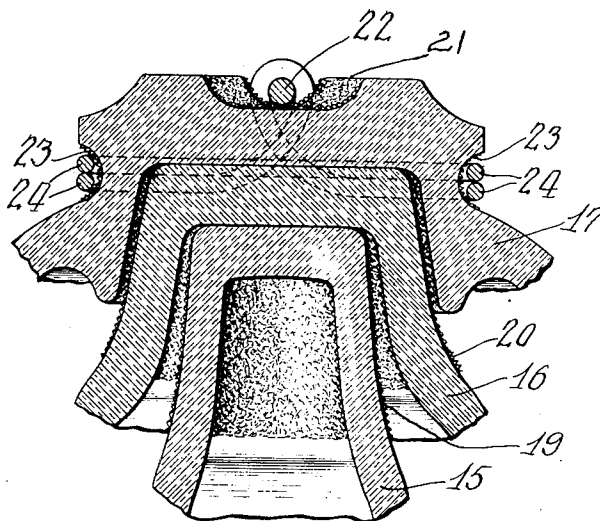
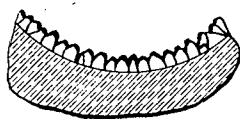


Fig. 2.



Witness:

David S. Magnusson.

Inventor:

Arthur O. Austin

By: Nissen & Grandfettys

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UNITED STATES PATENT OFFICE.

ARTHUR O. AUSTIN, OF BARBERTON, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
THE OHIO BRASS COMPANY, OF MANSFIELD, OHIO, A CORPORATION OF NEW
JERSEY.

INSULATOR.

Original application filed December 3, 1919, Serial No. 342,196. Divided and this application filed
June 6, 1923. Serial No. 643,628.

To all whom it may concern:

Be it known that I, ARTHUR O. AUSTIN, a citizen of the United States, residing at Barberton, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Insulators, of which the following is a specification.

This invention has for its object the provision of a device of the class named which shall be of improved construction and operation, and which shall be provided with means for preventing discharges due to electrostatic stresses.

The invention is exemplified in the combination and arrangement of parts shown in the accompanying drawing and described in the following specification, and it is more particularly pointed out in the appended claims.

In the drawing—

Fig. 1 is a section of a portion of a pin type insulator having one embodiment of the present invention applied thereto; and

Fig. 2 is a diagrammatic fragmentary section showing a feature of the invention on an enlarged scale.

In various types of insulators it is desirable to insulate conductors from one another or from a supporting member and yet permit the transmission of force from one to the other of the conductors or to the supporting member. One form of insulator for performing a function of this nature is shown in my application, Serial No. 342,196, filed December 3, 1919, of which the present application is a division.

Where a charged conductor is supported against an insulated member there is likely to be continual leakage or discharge across the air gap between the conductor and the surface of the insulator. This leakage has been found to be injurious to the conductor, due probably to the chemical effects of the discharge on the air and the material of the conductor or the insulator body. The heat produced by the discharge currents is also liable to cause damage to the insulator at high frequencies. These injurious effects may be remedied by coating the insulator adjacent the conductor with a plating of conducting material. This plating will, of course, be in electrical contact with the conductor so that the lines of force will ema-

nate from the surface of the plating in contact with the insulator and consequently will not cause discharge across the air gap or over the surface, as they do where the surface is not coated.

A metallic coating on a smooth surface will soon wear off under the rubbing of the cables so that simply coating the surface does not provide a lasting remedy. To obviate this defect and to secure other desirable results the surface adjacent the conductor may be covered with fine projections which may be in the form of a sanded coating, such as is described in my prior Patent No. 1,284,975, granted November 19, 1918. The metallic coating is then applied to the surface thus roughened and, of course, will not only cover the points of the projections, but will lie in the interstices between the points where it will be protected from wear of the cable. The coating may be applied in any of the well-known ways, as by a spray or by plating or spreading. Even though the plating does in time wear off the points of the projections, there will still remain a sufficient plating between the points to form a conducting net work to maintain the same potential in the cable and over the surface of the insulator and so prevent electric discharge through the air gap between them. The sanded coating serves the additional purpose of providing a resilient contact between the cable and the insulator and helps distribute the stress. The distribution between the cable and insulator may be largely controlled by proper distribution and strength of the projections and the regulation of this coating as to size of grains and the thickness with which they are applied. Where no provision is made for distributing the load there is almost a line contact between the two members. Where projections are provided on the insulator surface they will crush or yield where the pressure is greatest, causing the projections at other parts to receive a share of the load.

Another advantage of the construction is that the noise produced by the discharge between the conductor and the surface of the insulator is eliminated. This noise in itself may be objectionable and it may also prevent the detection of discharge due to defective insulators. The invention is particu-

larly valuable in wireless work where the air discharge causes loss of power or serious heating.

In Fig. 1 is shown a pin type insulator having a plurality of parts 15, 16 and 17 secured to one another by cement. The surface to which the cement is applied is first sanded, as shown, and the surface may then be given a metallic coating to prevent discharge due to electrostatic stresses. The coating on the outside of the members 15 and 16 should be extended along the surfaces of these members to a point opposite the coating on the inner face of the same members, as shown at 19 and 20. The portion of the insulator 21 adjacent the conductor 22 and the portions 23 adjacent the tie wires 24 are also sanded and coated in the manner described to prevent discharge over the surface of the insulator. The roughened coating greatly facilitates the metallizing of the surface at very small cost.

I claim:—

1. In combination, a dielectric member having a metallized roughened surface, and means for connecting said surface with a coating member.

2. An insulator comprising connected parts having adjacent surfaces provided with projections thereon, a coating of conducting material on said surfaces, and means interposed between said surfaces for securing said members to one another.

3. A built-up insulator having a plurality of component members, adjacent surfaces of different members being roughened and provided with coatings of conducting material, and means interposed between said surfaces for securing said members to one another.

4. In an insulator, a pair of dielectric members having adjacent surfaces, one of said surfaces being roughened and coated with conducting material.

5. An insulator comprising a dielectric member the opposite faces of which are roughened and coated with conducting material, a second dielectric member secured to said first-named member, and a conductor secured to said second dielectric member, there being a seat for said conductor on said second-named member comprising a roughened surface provided with a coating of conducting material.

6. An insulator comprising a dielectric member having opposite faces thereof provided with roughened surfaces which are coated with conducting material, the coatings of said surfaces terminating along lines substantially opposite one another on the opposite surfaces of said member.

7. A built-up insulator comprising a plurality of dielectric members the surfaces of which are roughened and coated with conducting material, means for securing said members to one another, one of said mem-

bers being provided with a seat for a conductor, the surface of said seat for engaging said conductor being roughened and coated with conducting material.

8. An insulator having a dielectric member arranged to contact with a conductor, said dielectric member having the contacting surface thereof sensibly roughened and covered with a coating of conducting material.

9. In combination an insulator, a conductor arranged to engage said insulator, said insulator having the surface thereof adjacent said conductor provided with a plurality of pointed projections and a coating of conducting material on said surface.

10. In an insulator, a dielectric member having a bearing surface provided with sensible projections which will crush and distribute the load, and a contacting member having a smooth bearing surface engaging said projections.

11. In an insulator, a dielectric member, a metallic member connected therewith to transmit force thereto, said dielectric member having the surface thereof adjacent said metallic member provided with sensible projections which will crush and yield to distribute the force transmitted.

12. In an insulator, a dielectric member having a conductor connected therewith, said dielectric member having the surface thereof adjacent said conductor provided with sensible projections engaging the conductor and arranged to yield and distribute the load transmitted from one member to the other.

13. In combination, a ceramic body having sensible sized small projections distributed over a bearing surface which will crush or yield to distribute the load on said surface, and a load member having an approximately smooth surface engaging said projections.

14. In an insulator, a dielectric member having a bearing surface, a supporting member having limited engagement with said bearing surface, and sensibly sized projections distributed over said bearing surface and directly engaged by said supporting member, said projections being of relatively fragile material so that they will crush where subjected to greatest stress by said supporting member.

15. An insulator comprising a dielectric member having a grooved bearing surface, an elongated supporting member arranged to bear upon said grooved surface, and sensibly sized projecting particles secured to said dielectric member and distributed over said grooved surface for contact with said supporting member to distribute the stress transmitted from said supporting member to said dielectric member.

16. In an insulator, a dielectric member

having a sensibly roughened surface, and a coating of conducting material on said surface.

17. In combination, a dielectric member having irregular projections arranged on a surface thereof, and a metallic coating on said surface.

18. In an insulator, a dielectric member having roughened surfaces on opposite sides thereof, said surfaces being provided with a coating of conducting material.

19. An insulator comprising a dielectric member having a surface thereof sensibly roughened and coated with conducting material, a conductor secured to said insulator, and a seat for said conductor comprising a sensibly roughened surface coated with conducting material.

20. An insulator having a bearing surface provided with projections distributed thereover, and a conductor member engaging said bearing surface, said projections being of fragile material and of sufficient size to form supports for portions of the surface of said conductor member spaced away from said bearing surface while the projections engaging the closer portions of the surface of said conductor member will crush beneath the force exerted thereby.

21. In combination, an insulator having a bearing surface for a conductor member, said surface having projections thereon of sufficient length to form struts between said insulator and said conductor member to reach portions of the conductor spaced away from said insulator while the projec-

tions engaged by the closer portion of said conductor are crushed thereby.

22. In combination, an insulator having a bearing surface for a conductor member, said surface having projections thereon of sufficient length to form struts between said insulator and said conductor member to reach portions of the conductor spaced away from said insulator while the projections engaged by the closer portion of said conductor are crushed thereby, and a coating of conducting material applied to said bearing surface to distribute the potential of said conductor member over said surface.

23. In combination, an insulator having a bearing surface, a conductor engaging said surface, and a yielding coating on said surface directly engaged by said conductor and arranged to yield under the force exerted thereby to provide an extended area of contact between said conductor and insulator.

24. In combination, an insulator having a bearing seat, projections distributed over the surface of said seat, a coating of conducting material disposed in the interstices between said projections, and a conductor support on said seat and bearing upon said projections so that the coating material is shielded by said projections from wear by said conductor.

In testimony whereof I have signed my name to this specification on this 31st day of May, A. D. 1923.

ARTHUR O. AUSTIN.