Nov. 13, 1928.

1,691,330

A. O. AUSTIN

INSULATOR

Original Filed April 6, 1921

Fig. 1.

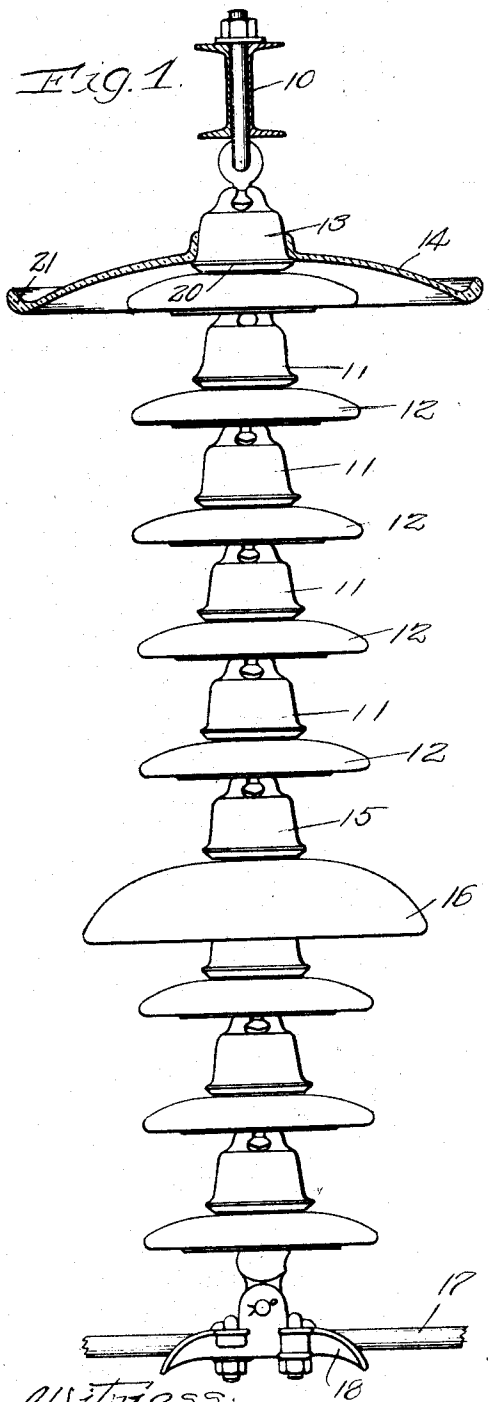
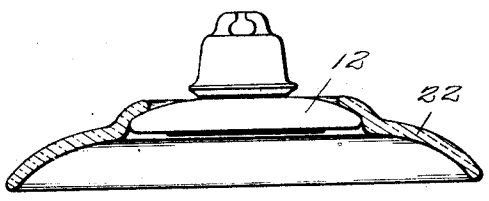


Fig. 2.



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UNITED STATES PATENT OFFICE.

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

INSULATOR.

Substitute for application Serial No. 459,063, filed April 6, 1921. This application filed June 10, 1927. Serial No. 197,976.

This application is a substitute for my abandoned application, Serial Number 459,063, filed April 6, 1921.

This invention relates to electric insulators, and especially to suspension insulators in series, and has for one of its objects the protection of such insulators from foreign matter which occasionally causes injurious and destructive arcing.

A further object is to provide mechanism of the class named which shall be of improved construction and operation.

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 an elevation of a series of insulators showing one embodiment of the present invention; and

Fig. 2 is a vertical sectional view of a modification.

In insulator practice it sometimes happens that falling matter, such as droppings from birds, will strike a string of insulators and running from the edge of the uppermost insulator of the string will form a path from one insulator to another in the string causing an undesirable and injurious arc. Foreign matters accumulating on the uppermost insulator will sometimes wash off in a rain and form a stream connecting the edges of the insulators where the edges are in substantial alinement, as is the usual arrangement. By placing insulator members having large diameters at different points in the string a stream of conducting material which will permit an arc to form, may be broken up and the arc prevented. The insulators of smaller diameter will be largely protected and kept clean so that there will be less danger of arc-over, either from falling material or from accumulations of conducting material. By thus maintaining the normal insulation of the small members, there is less danger of arc-over under severe fog or storm conditions. The large members in the string may be so designed that they will not carry undue stress by properly regulating their electrostatic capacity, surface resistance, and section length.

The same result for protection from falling material may be obtained by placing a large metal hood at the top of a string or by attaching hoods or flanges at different points in the string, or to the insulating flanges. This, however, may be more expensive, or if the metal shields are cheaply made they will deteriorate in a few years and cause trouble by coming loose. The presence of a metal or conducting hood tends to take the electrical stress off the members at the upper part of the string. Since the members at the upper part of the string ordinarily have a lower stress than is desirable under most operating conditions it will be seen that conducting shields are likely to have disadvantages which will prevent their use as a protection for the string from falling material. On the other hand a hood of insulating material has little or no effect on the stress distribution under dry conditions which are the conditions of poorest electrical gradient. Under wet conditions the protecting covering for the upper part of the string will tend to keep that part dry and maintain the resistance of the upper members normal and keep their electrostatic capacity small compared to the lower members. This will cause the upper members to carry more of the stress due to leakage and charging currents, improving the efficiency of the string for wet or storm conditions. By employing insulating material for the large hood a large shield may be used at the top of the string without disturbing the electrical gradient as would be the case with a metal shield. Where it is desired to obtain the advantage of the large protecting hood and where its insulating properties as an integral member of the regular insulating flange is not desirable, the protecting flange may be in the form of a separate ring and attached to the insulator coupling or to the insulating flange by suitable means. The protecting ring may have a trough or depression to prevent a stream of conducting material falling rapidly with a possible resulting arc. The same trough or retarding or directing means may be used where the large hood or flange is an integral part of the insulating member.

By placing a small insulating member on the tower side of the large protecting hood more clearance may be gained and an improved electrical gradient for some operating conditions is secured. Where the large

flanges are integral with the string they tend to keep the arc away from the smaller members in case of a flashover.

In the drawing, the numeral 10 designates a supporting member, such as an I-beam of a high tension line tower. Suspended from the member 10 is a string of insulators 11 having flanges or petticoats 12 of usual form. The uppermost insulator 13 of the string is provided with a flange 14 of larger diameter than the flanges 12 of the other insulators so that the periphery of the flange 14 overhangs the peripheries of the other insulator flanges so that material falling from the outer edges of the flange 14 will clear the flanges 12 of the lower insulators. A second insulator 15 having an enlarged flange 16 similar to the flange 14 may be inserted at a lower point in the string so as to insure protection for the lowermost insulators. The additional insulator 15 may be omitted, however, in cases where a single enlarged flange at the top of the string affords sufficient protection for the entire string. The string in this instance is shown as carrying a high tension line 17 supported by a saddle member 18 suspended from the lowermost insulator.

The insulator 13 is provided with a separate flange member 14 made to fit over a restricted portion of the insulator, such as the cap, and rest on a rib 20 commonly provided at the lower edge of the cap. The flange member 14 is turned up at its edges to provide a gutter 21 for retaining any material deposited on the flange and preventing such material from falling in a stream from the edge of the flange at one time.

In Fig. 2 a flange member 22 is provided which is shaped to rest upon the insulator petticoat 12 instead of the supporting cap. Where the flanges are made detachable or separate they may be readily attached to lines already installed without the necessity of replacing one of the insulator units. As shown in the drawing, the separate flange members 14 and 22 have offset reinforcing ribs extending about their central openings.

I claim:—

1. The combination with a series string of detachably connected insulators, each having an upper approximately cylindrical restricted portion and a radially projecting flange, of supplemental flanges of dielectric material, each having a diameter greater than the maximum diameter of said insulators, said supplemental flanges each having an opening therethrough of a size to receive the upper restricted portion of one of said insulators to permit the supplemental flange to rest on the flange of the insulator and support said supplemental flange on said insulator, said supplemental flanges each having a retaining groove in the upper face thereof adjacent to the outer edge of said supplemental flange and having a reinforcement extending about the periphery of the opening through the supplemental flange, one of said supplemental flanges being carried on the uppermost insulator of the string and another of said supplemental flanges being carried on an insulator between the ends of the string, the intervening insulators of the string being without supplemental flanges.

2. The combination with a series string of detachably connected insulators, each having an upper approximately cylindrical restricted portion and a radially projecting flange of supplemental flanges of dielectric material, each having a diameter greater than the maximum diameter of said insulators, one of said supplemental flanges having an opening therethrough of a size to receive the upper restricted portion of one of said insulators, to permit the supplemental flange to rest on the flange of the insulator and support said supplemental flange on said insulator, said supplemental flange being carried on the uppermost insulator of the string and having a reinforcement extending about the periphery of the opening therethrough, another of said supplemental flanges being carried on an insulator between the ends of the string, the intervening insulators of the string being without supplemental flanges.

In testimony whereof I have signed my name to this specification on this 6th day of June, A. D. 1927.

ARTHUR O. AUSTIN.