April 28, 1959 C. D. FIERO ET AL 2,884,479

ELECTRICAL INSULATORS

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Fig. 1

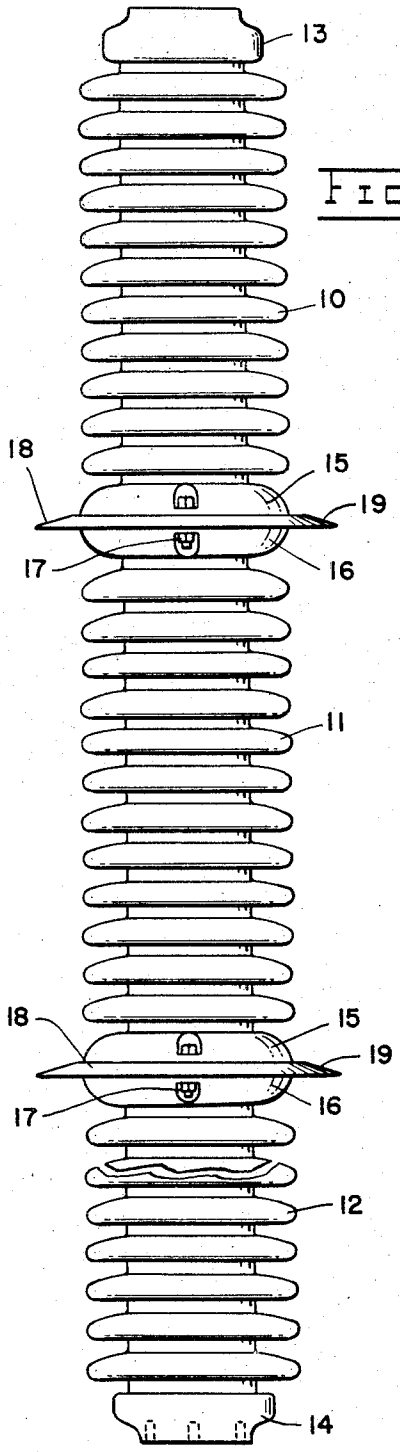
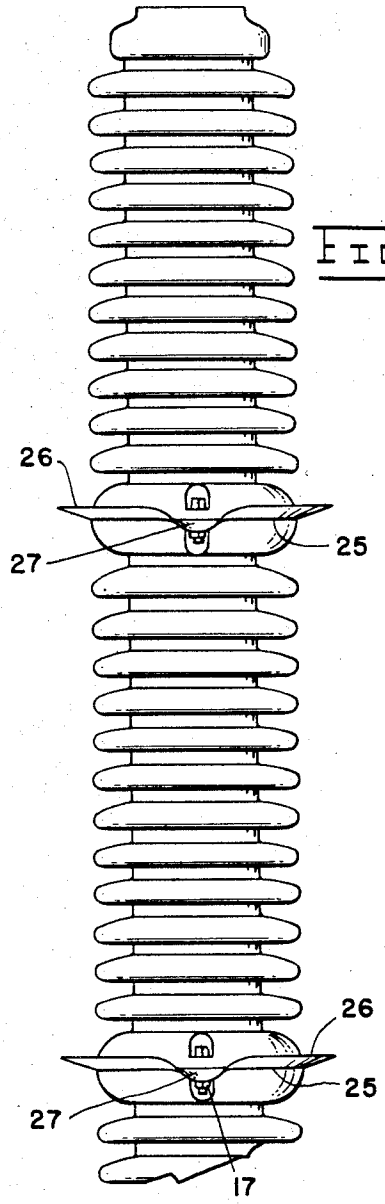


Fig. 3



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Fig. 2

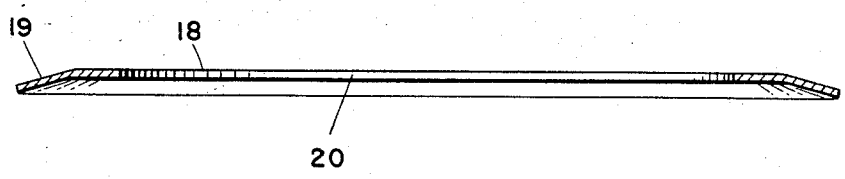
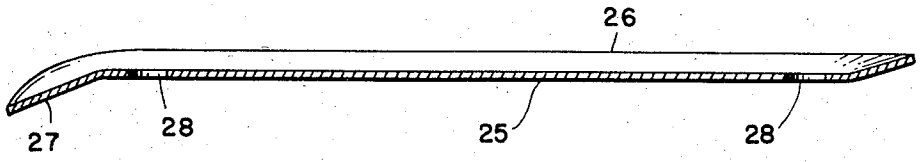


Fig. 4



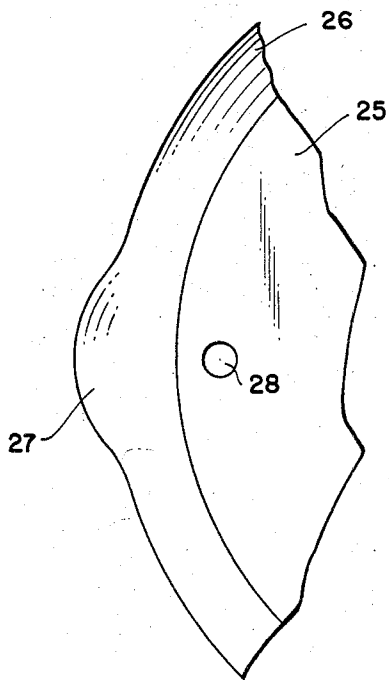


Fig. 5

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ELECTRICAL INSULATORS

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Application February 7, 1956, Serial No. 563,867

3 Claims. (Cl. 174—211)

This invention relates to electrical insulators for outdoor use, such, for example, as station post insulators, one object of the invention being to provide an improved insulator of this type with more advantageous operating characteristics in exposure to weather.

Another object is to provide an improved insulator of this character comprising superposed sections with means for deflecting the drainage of rain water from an upper section to clear a lower section, while preserving the cleaning action of rain on the lower section.

A further object is the provision of an insulator having the above advantages in a type of construction capable of being readily and economically manufactured and installed in use with equipment of standard design.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a side elevation of a station post insulator embodying the present invention;

Fig. 2 is a sectional elevation of a deflector plate shown in Fig. 1;

Fig. 3 is a view similar to Fig. 1 but showing a modified construction;

Fig. 4 is a sectional elevation of the deflector plate shown in Fig. 3;

Fig. 5 is a fragmentary plan view of parts shown in Fig. 4

Station post insulators, when subjected to rain combined with wind, have a tendency to become completely wet from the top or cap of the insulator to its base, both on the upper surfaces of the petticoats and, as the rain falls, on the under surfaces thereof as well, due to the splashing of the raindrops from the petticoats below. This has the desirable effect of periodically washing the porcelain surfaces and keeping them relatively clean.

The water striking the petticoats runs down off the edge of each, so that the petticoats toward the bottom of the insulator have an increasingly large drainage of water flowing over them. Heretofore, station post insulators have commonly been limited to the height required for insulation up to 161 kv., or a height of about 60 inches. As the height is increased for voltages higher than 161 kv., the lower part of the insulator becomes flooded with water so as to effect disadvantageously the flash-over voltage limit.

One problem has been to eliminate this large flow of water over the lower section or sections of the insulator, and another has been to accomplish this result without eliminating the advantageous washing of the insulator by falling rain.

We have solved these problems by devising an improved construction, a preferred embodiment of which is shown in Figs. 1 and 2 This embodiment is a station post insulator comprising three cylindrical porcelain sections **10, 11, 12** superposed on one another as shown.

The top of the upper section **10** is provided with the usual cap **13**, adapted for the mounting thereon of the known bus clamp. The bottom of the lower section **12** is provided with the known base support **14** for mounting the insulator on a suitable support. Each porcelain section is formed with the usual petticoats as shown, and adjacent sections are secured together in superposed relation by conductive metal spacer parts as **15** and **16**, clamped together by bolts **17**.

Clamped between spacer parts **15** and **16** as a water deflector plate preferably in the form of a relatively flat thin disc of metal **18**, Figs. 1 and 2, having a downwardly turned peripheral portion **19**. This disc or plate may have its central portion **20** removed, so as to form a circular ring, which embraces and is maintained in position by the clamping bolts **17** of the spacer parts. Deflector plate **18** is preferably formed of a corrosion resisting metal such as stainless steel, or is covered with a corrosion resisting or vitreous coating, as desired. A deflector plate such as described is located between each porcelain section and the porcelain section below it.

Deflector plate **18**, as shown, is of slightly greater diameter than the diameter of the porcelain section below it, with the result that it collects the water draining down from the section above and discharges it at its downturned outer edge so as to fall clear of the porcelain section below. However, the diameter of the deflecting plate is less than that of the area of exposure of the next lower section to raindrops blown by any wind, in other words less than that required to protect the next lower section from wetting by rain so that the lower section is left exposed to beneficial washing and cleaning, without being subjected to the excessive drainage of water from the section above.

Figs. 3, 4 and 5 show a somewhat modified construction of deflector plate combined with a similar assembly of porcelain sections. In this modification the deflector plate **25** is formed with an upwardly turned peripheral edge **26**, providing a collecting trough, but with one or more downwardly inclined spouts **27** by which the drainage of water from the porcelain section above is discharged clear of the section below. This modification is in the form of a continuous plate provided with openings **28** to receive the bolts **17** of the parts for clamping the sections together, as previously described, so that this plate also is positively maintained in proper location.

We have found that there is a beneficial electrostatic repulsion effect at the peripheral edges of the deflector plates which causes the water to flare outwardly as it leaves the peripheral edges. This is believed to be due to the fact that the water, in contact with the deflector, takes on an electrical charge of the same sign as the plate, so that it is repelled by such charges of like sign, as well understood in the art.

The combination of our deflector plates with insulator sections as described has been found to produce a definite and substantial increase in the flashover voltage. On a typical test of a standard 220 kv. station post insulator, for example, the wet flashover voltage was 530 kv., while this same post when made to include the present invention had a wet flashover of 685 kv. A station post insulator 92 inches high, when improved by our invention, has been found to acquire a 20% increase in wet flashover voltage.

While the deflector plates described above are separately manufactured and assembled between the spacer parts of the insulator sections, it is contemplated that such plates may be otherwise fixed to one of the spacer parts. It is contemplated also that the deflector plates may be made of other materials such as porcelain and while these deflectors have been hereinabove described as adapted for use with station post insulators, it is

evident from the above description that they are adapted for use also with outdoor insulators of other types.

It is evident from the above description that when such an insulator is exposed to rain, the drainage of water from each porcelain section is discharged at its base clear of the section below, thereby avoiding an excessive accumulation of water on any section. At the same time, the deflector plates are constructed of such size as to leave each section exposed to falling rain so as to effect the cleaning of its surface. It is evident also that the deflector plates are adapted to be readily and economically manufactured and assembled with standard insulator parts for use in standard equipment.

It will thus be seen that the invention accomplishes its objects and while it has been herein disclosed by reference to the details of preferred embodiments, it is to be understood that such disclosure is intended in an illustrative, rather than a limiting sense, as it is contemplated that various modifications in the construction and arrangement of the parts will readily occur to those skilled in the art, within the spirit of the invention and the scope of the appended claims.

We claim:

1. An elongated electrical insulator adapted for outdoor use in a vertical position, comprising: a plurality of cylindrical porcelain sections superposed one on the other, each of said sections having a plurality of annular skirt portions of substantially equal diameter; conductive spacer parts on adjacent sections for securing them together; a deflector disc disposed transversely of said insulator secured to at least one of said parts at each place that two of said sections are joined, said disc having its peripheral edge disposed substantially above the juncture of the next lower section with said spacer parts, said disc having its center falling substantially along the axis of said insulator and said disc having a diameter sufficiently large to cause rain water draining from the one of said sections immediately above said disc to be discharged away from said insulator but sufficiently small to permit normal wind-blown rain to freely contact and clean the one of said sections immediately below said dsic.

2. The insulator of claim 1 in which said disc has a downwardly turned peripheral portion.

3. The insulator of claim 1 in which said disc has an upwardly turned peripheral portion provided with a discharge spout.

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