Nov. 21, 1933. J. R. McFARLIN 1,935,810

LIGHTNING ARRESTER

Filed Aug. 10, 1928

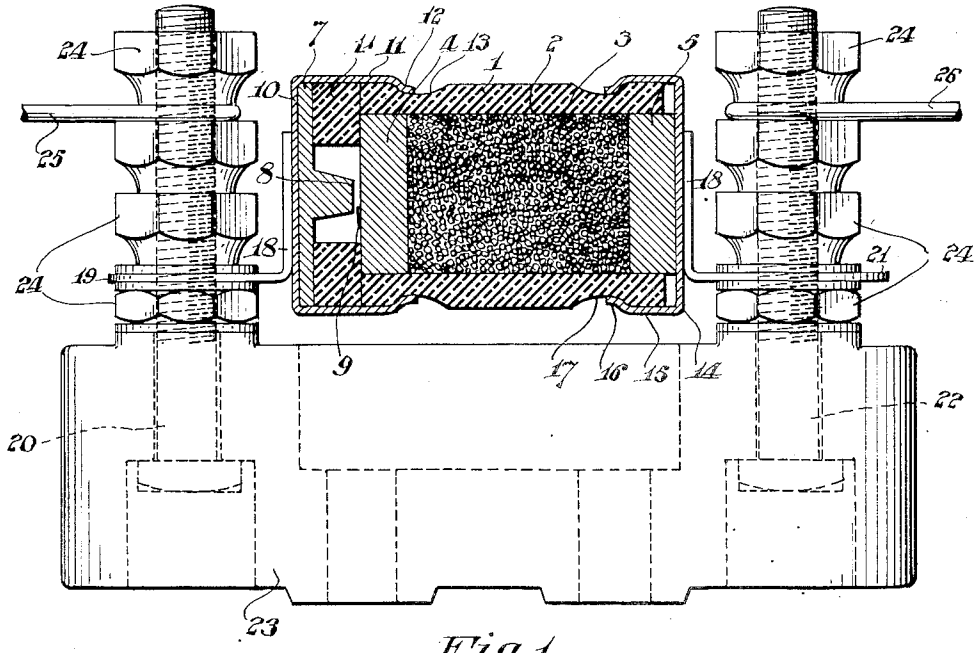


Fig. 1.

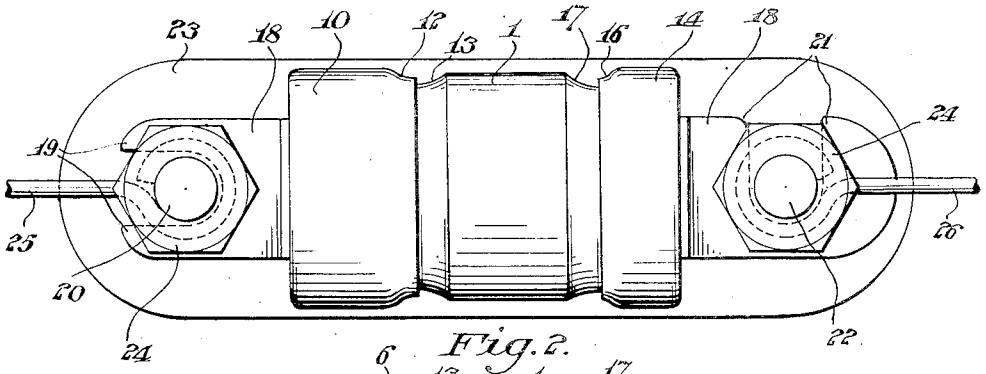


Fig. 2.

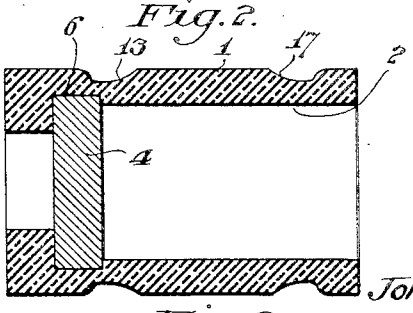


Fig. 3.

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1,935,810

LIGHTNING ARRESTER

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Application August 10, 1928. Serial No. 298,839

1 Claim. (Cl. 175—30)

My invention is an improved lightning arrester which combines simplicity and economy of construction with efficiency in operation, and is particularly adapted for use on low voltage circuits.

It comprises a casing of insulating material provided with end electrodes and an intermediate electrode and containing between the intermediate electrode and one of the end electrodes a filler, such as silicon carbide, having normally low conductance. The intermediate electrode is preferably securely positioned, and spaced from the other end electrode, by a radially projecting section of the insulating casing, and the gap between the intermediate electrode and such end electrode is preferably decreased by providing one of such members with a boss or lug approaching the other and surrounded by an air chamber.

The electrodes forming closures for the silicon carbide chamber may be seated in the ends thereof by pressure after the formation of the casing, or the casing may be moulded around one of such electrodes during manufacture and the other electrode closure seated after the chamber has been filled with the silicon carbide.

The end electrodes are preferably further secured to the casing by members having flanges crimped into recesses in the exterior wall of the casing. The end electrodes may be connected to suitable conducting and supporting posts or bolts by notched clips secured to the posts by suitable clamping screws.

When the casing is made of isolantite or other material requiring the use of high temperatures, it is preferably made in sections to avoid the deleterious effect of heat on the intermediate electrode and to facilitate the subsequent insertion thereof; but when the casing is made of material such as bakelite it may be moulded as an integral shell with the intermediate electrode embedded therein.

The characteristic features and advantages of my improvements will more fully appear from the following description and the accompanying drawing in illustration of a preferred embodiment thereof.

In the drawing, Fig. 1 is a part sectional elevation of a lightning arrester embodying my improvements; Fig. 2 is a top plan view thereof; and Fig. 3 is a longitudinal section of a shell having an intermediate electrode embedded therein.

In the form of the invention shown in the drawing, the insulating cylindrical casing 1 forms a chamber 2 for the reception of a filler 3, the ends of the chamber being sealed by the metallic disk closures or plugs 4 and 5. As shown in Fig. 1, the casing may be made in two sections, preferably of different internal diameters, and the end section 1', which resembles a washer, is fixed on the body section 1 after the electrode 4 has been seated in the latter. As illustrated in Fig. 3, the end and body sections of the casing may be moulded in an integral homogeneous structure around the electrode 4 which is firmly secured in place by the projecting edges of the channel 6 in which it rests.

The end section of the casing is preferably of smaller internal bore than the body section, whether made integrally therewith or separately therefrom, and spaces the electrode 4 from an end electrode 7 which may be provided with a boss or lug 8 projecting toward the electrode 4 to form an air gap 9 of desired width.

A fastener or cap 10 overlies the electrode 7 and is provided with a flange 11 having its edge 12 crimped into the channel or recess 13 of the body section 1 so as to secure the washer or section 1' and the electrode 7 firmly to the body 1. A similar cap 14, for securing in place the plug electrode 5, has a flange 15 with its edge 16 crimped in the channel or recess 17 of the body. If desired, the caps 10 and 14 may be made integral with the respective electrodes 7 and 5.

Each of the caps 10 and 14 has fixed thereto a conductor 18, preferaby consisting of a notched bent strap. One of the straps 18 is notched longitudinaly of the arrester so as to form a yoke 19 which can be slipped on a bolt 20 by longitudinal movement of the arrester, and the other strap 18 is notched transversely to the length of the arrester so as to form a yoke 21 which can be slipped on the bolt 22 by turning the arrester about the bolt 20 as an axis after the yoke 19 has been slipped thereon. The bolts 20 and 22 are mounted in an insulating base 23 and the yokes are clamped relatively to the bolts by nuts 24. The line conductor 25 and ground conductor 26 may be secured to the bolts by similar nuts.

The gap 9 between the electrodes 4 and 8 is made of such width as to prevent the normal line current jumping thereover and the filler 3 consists of a discrete mass of particles in contact with the electrodes 4 and 5 and composed of granules of silicon carbide or other infusible refractory material of limited conductivity freed of dirt and broken crystals. The size of the particles is preferably proportioned to the length of the discharge path formed by the mass so as to suppress an arc maintained across the gap by a prede-

termined potential, and the cross sectional area of the mass is preferably so proportioned to the size of the crystals and length of the path as to interpose a substantially minimum impedance to high voltage discharges.

Upon the occurrence of a lightning discharge or other cause of high potential upon the line, the gap 9 is immediately arced over to permit discharge of such high potential to ground with little impedance from the filler 3, which, upon the cessation of the flow of high potential current, immediately interposes sufficient resistance to the flow of normal line current to quench the arc.

Having described my invention, I claim:

A lightning arrester comprising a non-conducting housing consisting of a hollow tube and an apertured ring overlying an end of said tube and forming a tight joint therewith, said ring projecting inwardly from the inner surface of said tube toward the center thereof, a disc electrode within said housing and making a tight joint with the inner radial face of said ring, a disc electrode bearing against the outer radial face of said ring, one of said electrodes having a boss disposed within the aperture of said ring and forming a spark gap with the other of said electrodes, a mass of discrete arc suppressing particles within said tube in contact with said first named electrode, a third disc electrode at the end of said tube opposite said first named electrode and holding said discrete particles within said tube, and means for securing said second and third named disc electrodes relatively to said tube.

JOHN ROBERT McFARLIN.