No. 847,372. PATENTED MAR. 19, 1907.

C. A. ROLFE.

LIGHTNING ARRESTER.

APPLICATION FILED FEB. 13, 1903.

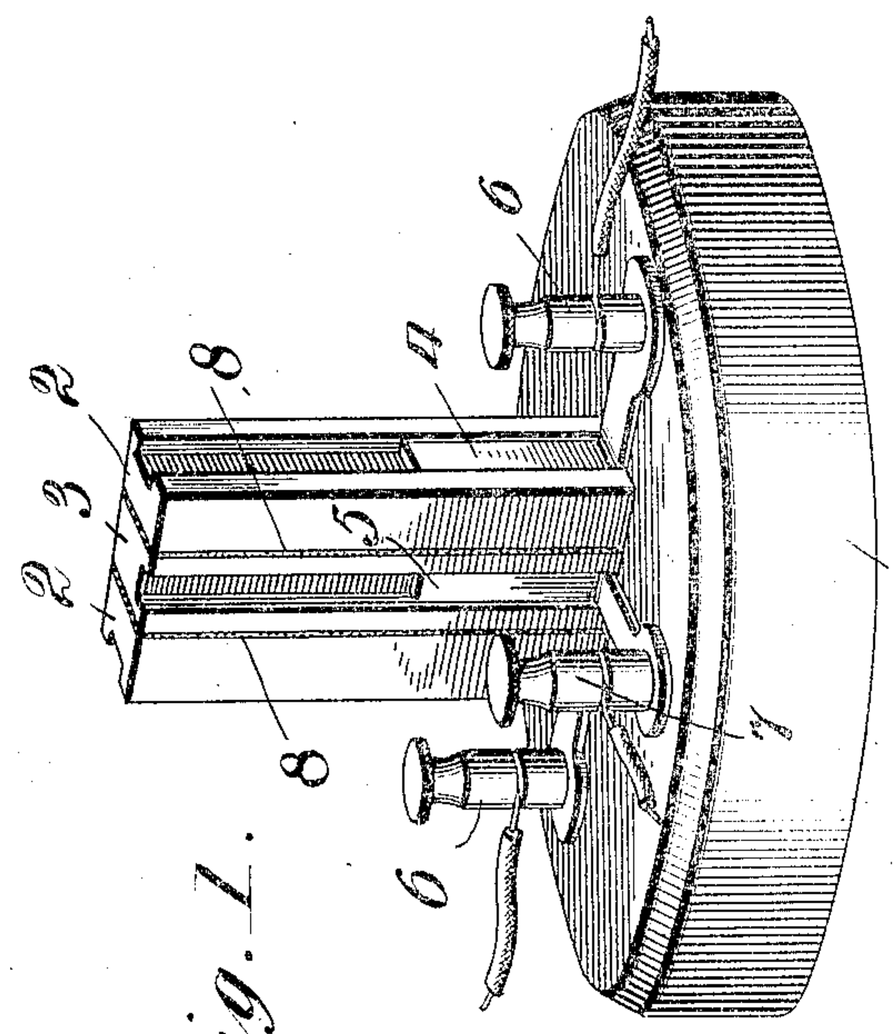

Fig. 1.

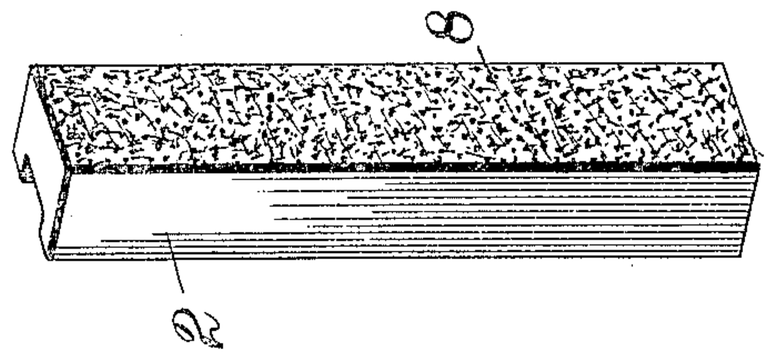

Fig. 3.

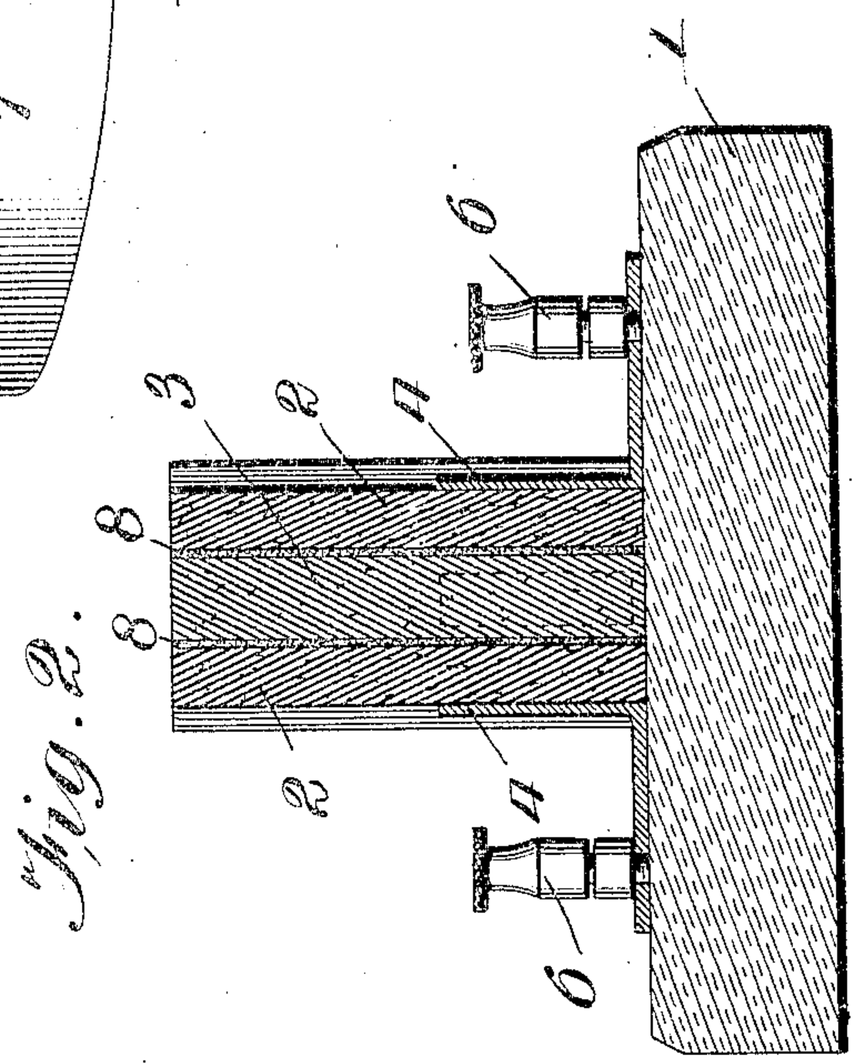

Fig. 2.

Witnesses:
F. C. Barry
A. C. Lee.

Inventor:
Charles A. Rolfe.
by A. Miller Depuis
Attorney:

UNITED STATES PATENT OFFICE.

CHARLES A. ROLFE, OF ADRIAN, MICHIGAN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO ROLFE ELECTRIC CO., OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

LIGHTNING-ARRESTER.

No. 847,372. Specification of Letters Patent. Patented March 19, 1907.

Application filed February 13, 1903. Serial No. 143,227.

To all whom it may concern:

Be it known that I, CHARLES A. ROLFE, a citizen of the United States, residing at Adrian, in the county of Lenawee and State of Michigan, have invented a certain new and useful Improvement in Lightning-Arresters, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to lightning-arresters for high-potential discharges, such as lightning and the like.

The object of the invention is to provide a simple, practical, and effective form of lightning-arrester.

The lightning-arrester which I herein show for carrying out my invention has suitable electrodes arranged close to one another, and a small quantity or layer of material or substance which is a non-conductor while cold, but a conductor when warm or heated, is interposed between the adjacent or opposing faces of these electrodes. By this arrangement the material or substance under ordinary circumstances forms a gap in the circuit; but when lightning or other high potential intrudes it jumps across this gap, thereby heating the material or substance and turning it into a conductor, so that it thereupon closes the circuit preferably to ground, allowing the lightning or other high potential to escape in that way. After the trouble has passed the material or substance cools and again assumes its non-conducting character, thereby again forming an opening or gap in the circuit. As the substance interposed between the electrodes any suitable or desired material or substance having the characteristic above mentioned can be employed. A material of this general character can be made from earths—such as lime, magnesia, zirconia, and thoria—preferably mixed with small quantities of certain oxids, such as those of chromium, manganese, uranium, titanium, and niobium. I find a very satisfactory material to be a material composed of zirconia ninety parts, magnesia five parts, lime four parts, and sesquioxid of manganese one part. This is desirably made in the form of a paste and applied to the electrodes as a paint.

In the accompanying drawing, Figure 1 is a perspective view of a simple form of lightning-arrester embodying my present invention. Fig. 2 is a vertical section of the same; and Fig. 3 is a perspective view of one of the electrodes, showing its coated surface.

The form of lightning-arrester shown in the drawing is a simple form, illustrated merely to show the manner of carrying out the invention. No originality is claimed for the particular mechanical construction or form of the device. It comprises a base 1, made of insulating material, such as porcelain, and three electrodes 2 2 and 3, mounted upon the base 1, the electrodes 2 2 being line-electrodes and the electrode 3 being a ground-electrode interposed between the two line-electrodes. These electrodes could be of any desired material or form, but are desirably made of carbon in the form of long rectangular blocks. These electrodes are held in position by contact-strips 4 4 and 5, the two former being for the line-electrodes 2 2 and fitted into grooves therein, and the latter being for the ground-electrode 3 and fitted in a groove in the same. The base 1 is provided with suitable binding-posts 6 6 and 7, the two former for the line-electrodes 2 2 and the latter for the ground-electrode 3. It is understood that the binding-posts 6 6 are connected in the usual manner with the line and binding-post 7 with ground.

Small quantities or layers 8 8 of a substance or material having the property of being a non-conductor when cold and a conductor when warm or heated are interposed between the adjacent faces of the electrodes. A desirable substance for this purpose is zirconium ninety parts, magnesia five parts, lime four parts, and sesquioxid of manganese one part. This is desirably made in the form of a paste or syrup and the faces of the electrodes properly coated with it with a brush. In such case the layers 8 8 form non-conductors under ordinary circumstances and prevent connection between the line and ground electrode. When lightning or other high potential intrudes upon the line, however, it jumps across these layers 8 8, thereby heating them and changing them to conductors, by which action the circuit is grounded, thereby permitting the lightning or other

high potential to escape in this way. After operation the layers 8 8 become cool and return to their non-conductive state, again electrically disconnecting the line and ground electrodes and removing the ground from the line.

It will be readily seen that the invention can be applied to any form of lightning-arrester other than that herein shown, which is merely submitted as a simple type of device. It will also be understood that any substance or material or composition other than that herein specified can be employed instead of that mentioned.

What I claim is—

1. In a lightning-arrester, the combination with suitable electrodes, of a suitable body or mass of material having the property of being a non-conductor when cold and a conductor when warmed or heated, said material being interposed between the electrodes, whereby when an arc passes between the electrodes, said material becomes a conductor, and when such arc desists the same becomes a non-conductor, substantially as described.

2. In a lightning-arrester, the combination with the electrodes thereof, of means for establishing a low-resistance electrical connection on the passage of an arc between said electrodes, and for disestablishing said connection on the cessation of the arc.

In witness whereof I hereunto subscribe my name this 22d day of January, A. D. 1903.

CHARLES A. ROLFE.

Witnesses:
A. MILLER BELFIELD,
I. C. LEE.