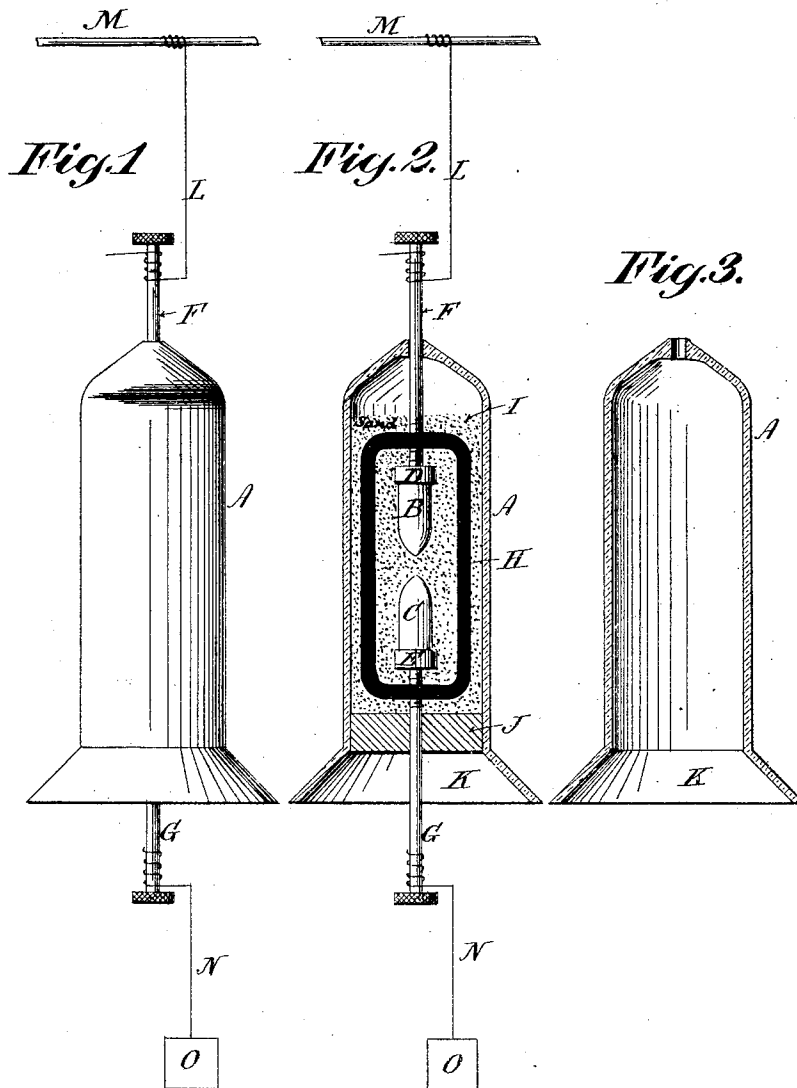


(No Model.)

J. E. BROWNE.
LIGHTNING ARRESTER.

No. 501,241.

Patented July 11, 1893.



Witnesses:

D. W. Gardier

Wm. A. Courtland

Inventor:

James E. Browne

UNITED STATES PATENT OFFICE.

JAMES E. BROWNE, OF ELIZABETH, NEW JERSEY.

LIGHTNING-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 501,241, dated July 11, 1893.

Application filed September 12, 1892. Serial No. 445,606. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. BROWNE, a citizen of the United States, residing at Elizabeth, county of Union, and State of New Jersey, have invented certain new and useful Improvements in Lightning-Arresters for Electric-Light or other Electric Circuits; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in lightning arresters, in which an insulating material is interposed between the line and ground connections, whereby the high potential current may escape by disruptive discharge and an arc be prevented or extinguished by the closing in of said insulating substance. Heretofore lightning arresters of this class have been liable to ground the line circuits by imperfect closing in of a too solid insulating substance, thereby allowing an arc to form and ground or short-circuit the line, or when insulating liquids have been employed for this purpose they were liable to evaporate, burn or escape thus rendering the arrester of no service.

The object of my invention is to provide a cheap, simple and safe lightning arrester which will prevent or extinguish an arc after a lightning discharge without the intervention of substances liable to permanent rupture or the employment of liquids liable to evaporate, burn or escape. I attain this object by the mechanism illustrated in the accompanying drawings.

Figure 1, is a view of a lightning arrester represented as attached to an electric light wire in order to show the manner of operating more clearly. Fig. 2. is a sectional view of the arrester showing the working parts within. Fig. 3. is a sectional view of the envelope of the arrester with the other parts removed to show its construction.

Similar letters of reference refer to like parts throughout the different views.

A. represents a case or envelope of waterproof insulating material having a hole or opening in its upper end. (See Fig. 3.) The upper end of A. is preferably pointed while the lower part of said envelope may be flared or bell shaped as shown.

B and C. are the upper and lower separated discharge points of my lightning arrester. They are of carbon and are fitted into the upper and lower metal carbon holders D. and E, which in turn are fastened to or may form a portion of the upper and lower metallic discharging rods F. and G.

H. represents a frame or device constructed wholly or in part of insulating or suitable material. Through the opposite portions of said frame or device H are passed or fastened the discharge rods F. and G. The parts of said rods which pass through the frame or device H. are threaded as shown or otherwise arranged to firmly maintain the carbon holders D. and E. in position and the carbon discharge points B and C at the necessary distance apart. The upper part of rod F. should pass upward and project through the hole in the upper end of envelope A. where it is firmly held in place and sealed in a waterproof manner by shellac or other suitable cement. The lower part of rod G should project below the flared or bell shaped termination of said envelope A. The space within envelope A not occupied by the carbon points and other internal working parts of the arrester is filled to the point indicated by the line I. with dry sand or any powdered or finely divided insulating and refractory material the particles of which move freely over or upon each other. The space above line I. is left vacant. It will be observed that the carbon discharge points C. and D. are thus surrounded and deeply immersed within said sand or finely divided material and that said material is interposed between said carbon discharge points without said material being tightly packed in envelope A.

The lower interior portion of envelope A. above the flared or bell shaped terminal of said envelope A is closed by means of the plug J. as shown, the rod G. passing through a suitable hole in said plug J. The plug J, rod G and envelope A. are hermetically sealed against the admission of moisture within or the escape of the sand or powdered material from envelope A by melted shellac or other strong waterproof cement.

During wet weather while the upper and outer part of the arrester may be covered with moisture the cavity K under the plug J.

being protected by the flared terminus of envelope A. will remain comparatively dry thus maintaining the insulation between rods F and G and the carbon discharge points B and C within said envelope A.

L is a wire preferably covered with waterproof material connected electrically at its upper end to the main line M; its lower end is also connected in a similar manner to the projecting end of discharge rod F. It thus serves as a line connection and also to suspend the lightning arrester in position.

N is a wire with its upper end electrically connected to the protruding part of rod G. The lower end of wire N is electrically connected to the buried ground plate O or any other means of obtaining what is technically called a ground. I shall hereinafter designate wire N as the ground connection.

It will be obvious that lightning in passing from the main line M to ground through the wire L, rod F, holder D, carbon discharge points B. and C. and holder E, rod G. and ground connection N must leap across the space between said discharge points B. and C. and in its passage will disrupt or scatter the powdered insulating material or sand between said points B. and C. and that an arc from the line circuit M will be prevented or extinguished by the closing in of the sand or powdered insulating material upon its rapid return to its original position between said discharge points B. and C. It will also be seen that by only filling the envelope A with the sand or insulating material as far as line I as shown in the drawings the free movement is secured to the particles of insulating material thus preventing liability of bursting the envelope A. during the disruptive lightning discharge.

Various modifications of my arrester can be made without altering the spirit of my invention; for instance the separated discharge points might be made of other material than carbon or placed in parallel to each other and held in position by one or more insulating frames or devices. Neither do I confine myself to any particular method of connecting the arrester; but

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a lightning arrester of a case or envelope of insulating material, one or more rods or conductors inserted therein, said case or envelope being closed

by a seal or plug said seal or plug being protected from moisture by a cavity formed below it by an attachment to or the extension of said envelope, substantially as described.

2. The combination with a lightning arrester of a waterproof insulating case or envelope containing sand or other suitable dry and finely divided material; a plug or device for closing the envelope; two or more rods or conductors inserted within said envelope and held firmly in place by means of a frame or device therein to which they are attached; said envelope being protected against the entrance of moisture substantially as described.

3. The combination with a lightning arrester of rods or conductors attached to separated points, said rods and separated points being held in position by means of an insulating frame or device, through portions of which they are passed or to which they are firmly attached said rods or conductors being partly and said separated points and insulating frame or device being wholly within an insulating envelope or case containing sand or other suitable powdered insulating material, substantially as specified.

4. The combination with a lightning arrester of two rods or conductors firmly attached to separated points, said rods and separated points being held in position by means of an insulated frame or device through portions of which they are passed or are firmly attached, said rods being partly and said separated points and insulated frame or device being wholly within an insulating envelope or case containing sand or other suitable powdered material said case or envelope being protected from the entrance of moisture by a sealed plug having a cavity below it said cavity being also protected from moisture by the flared or lower termination of the said envelope substantially as described.

5. The combination with a lightning arrester of two or more separated points a frame or device for holding said points in place within an insulating envelope, and two or more rods attached to said points, said rods protruding from said case or envelope, substantially as described.

Signed at New York, in the county of New York, this 1st day of September, A. D. 1892.

JAMES E. BROWNE.

Witnesses:

MARY T. BROWNE,
JAMES EDWARDS.