

(No Model.)

E. THOMSON.
LIGHTNING ARRESTER.

No. 468,497.

Patented Feb. 9, 1892.

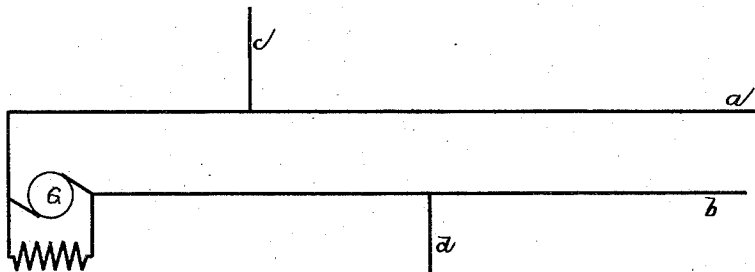


Fig. 1.

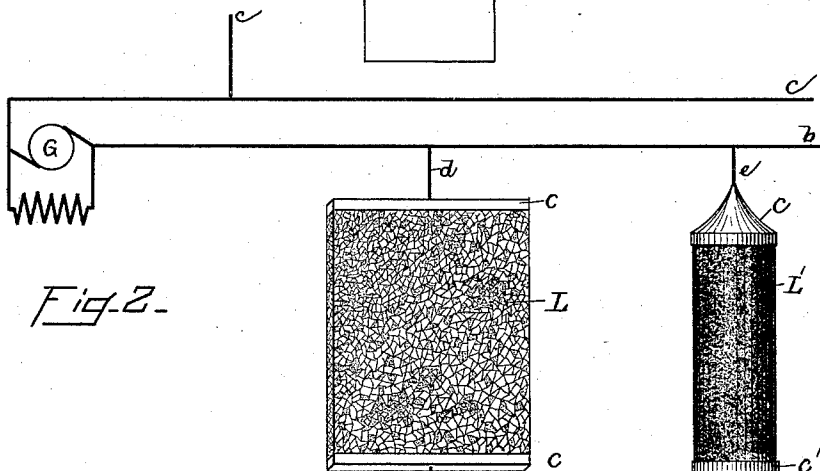


Fig. 2.

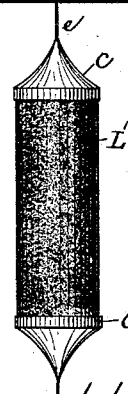


Fig. 3.

WITNESSES.
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ELIHU THOMSON, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE THOMSON-HOUSTON ELECTRIC COMPANY, OF CONNECTICUT.

LIGHTNING-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 468,497, dated February 9, 1892.

Application filed May 5, 1890. Serial No. 350,659. (No model.)

To all whom it may concern:

Be it known that I, ELIHU THOMSON, a citizen of the United States, residing at Lynn, in the county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Lightning-Arresters, of which the following is a specification.

My present invention relating to lightning-arresters has for its object the production of a cheap and reliable lightning-arrester for the protection of apparatus used in connection with electric-light and electric-power systems of distribution or other lines.

It is the object of my invention also to secure a lightning-arrester which will protect the apparatus employed upon electric circuits from successive atmospheric discharges or induced-current discharges without necessitating the manual manipulating of the arrester after any discharge or a number of discharges, or, in other words, to obtain a lightning-arrester which is entirely automatic in its action and one having no moving parts.

My invention consists in interposing a mass or sheet of conducting particles between the line to be protected and the ground, these conducting particles being arranged contiguous to each other, but not in actual contact, so as to form a continuous conductor for any distance and so that a discharge in passing to earth must leap over very many insulating-spaces, the conducting particles being supported or held in some suitable insulating material.

Figure 1 illustrates one form of my present invention. Figs. 2 and 3 show modifications.

In Fig. 1, G is an electric generator or motor connected to the mains *a b*. *d* is a connection from one of the mains, as *a*, to the lightning-arrester and to earth at E. I prefer, whether the system of distribution be a multiple-arc system or a series system or a combination of the two, to place two lightning-arresters upon the mains *a b*, one connected to the line *d* and another to the line *c*, both connected to earth. The plate or form L of the arrester is made as follows: The plate may be molded of any good insulating material—such as plaster-of-paris—and while it is in a soft and yielding state particles of conducting material—such as copper, iron, &c.—may be

sprinkled over its surface and forced into the plate by pressure, the particles being left with exposed portions projecting from the surface of the plate. Each side of the plate may be, if desired, similarly treated. Over the ends of the plate thus formed I place caps C C' of copper or other metal, to one of which caps is attached the line *d*, leading to the main *b*, and to the other the line leading to earth at E. A static charge existing upon the main *b*, tending to reach earth at E, finds an easy path through the arrester, as this charge has a potential sufficient to make a spark over the entire length of the plate L between the conducting particles; but the normal working current upon the mains *a b* has not a potential sufficient to maintain an arc, and cannot consequently reach earth through the arrester. The lightning-arrester is therefore selective, permitting only the passage of currents of much higher potential than those generated for the mains *a b*.

An extended surface covered with conducting particles arranged in the manner described is not replaceable by a single disruptive space of equivalent resistance as measured by a galvanometer, because I find in practice that a static discharge which will leap and divide over quite a number of small disrupting spaces arranged in series is not able to overcome a single space equal to the total of the smaller spaces if added together. The discharge can leap the small spaces successively with ease.

In Fig. 2 the plate L is shown as made up of irregularly-shaped pieces of sheet metal, which pieces may be held in a suitable insulating material—such as described above—by their bent edges and arranged over the surface of the plate so as not to form a continuous metallic conductor across the plate between the line *d* and earth E, but so that there exist numerous small disruptive spaces, across which a lightning-discharge or a similar high-potential discharge can force its way, but which is altogether impassable for any current produced by the generator G.

In Fig. 3 I have shown the preferred form of a lightning-arrester constructed according to my present invention. It is simply a cylinder with caps C C' at each end, to which the

line *c* and earth E are connected, the surface being prepared in the same manner as are the plates L of Figs. 1 and 2.

Other modifications will readily suggest themselves to any one familiar with the subject, and I do not deem it necessary to describe anything more than the typical apparatus illustrated in the figures herein referred to, which sufficiently explain the action.

10 What I claim, and desire to secure by Letters Patent, is—

1. A lightning-arrester consisting of a series of conducting particles supported in a form of plastic insulating material and arranged so as to form a succession of small
15 disruptive spaces in the discharge-path.

2. A lightning-arrester consisting of a form of plastic insulating material having conducting ends and having conducting-pieces molded in the surface thereof to form a path for the
20 discharge.

3. A lightning-arrester consisting of a form or support of plastic insulating material having conducting particles molded in its surface and arranged contiguous to one another, but
25 not in actual contact, so as to form a succession of small disruptive spaces in the discharge-path, as described.

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Witnesses:

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