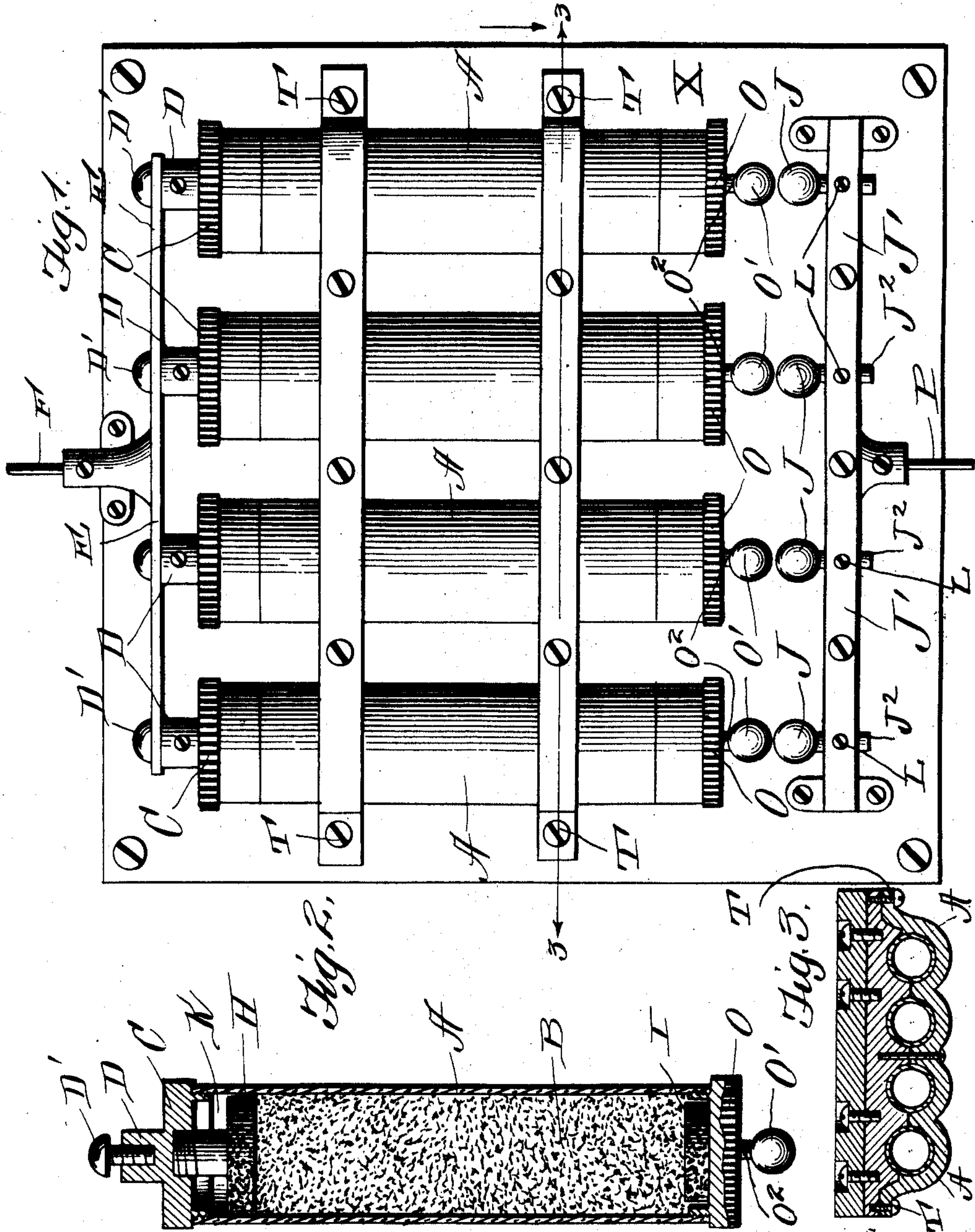


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PATENTED FEB. 6, 1906.

W. GIFFORD.
LIGHTNING ARRESTER.
APPLICATION FILED MAY 25, 1905.



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LIGHTNING-ARRESTER.

No. 812,126.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM GIFFORD, a citizen of the United States, residing at Thompsonville, in the county of Benzie and State of Michigan, have invented certain new and useful Improvements in Lightning-Arresters, and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in lightning-arresters; and the object in view is to produce means whereby connected machines and electrical apparatus may be protected from the effects of atmospheric electricity.

More specifically the present invention comprises an arrester consisting of a series of tubes of glass or other insulating material which is adapted to be filled with graphite, acidulated or saline water, or any other non-inductive resistance adapted to the purpose and having metallic caps fitted to the ends thereof and in the provision of means for conducting the electric current to the ground through an air-gap which may be adjusted to suit the requirements.

My invention is illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this application, and in which drawings—

Figure 1 is a front elevation of my improved lightning-arrester, and Fig. 2 is a vertical sectional view through one of the tubes. Fig. 3 is a sectional end view of the arrester, showing the construction of the fiber-racks.

Reference now being had to the details of the drawings by letter, A A designate a series of glass tubes, or, if preferred, A may be made of hard rubber, porcelain, or other suitable insulating material and adapted to be filled with graphite, acidulated or saline water, or any other non-inductive resistance suitable. Said tubes each has a cap C, of brass or other suitable metal, at its upper end and a binding-screw D'. E designates a metal bar, which is held by said screw to the binding-posts on said caps and provides means for electrically connecting the several tubes in parallel relation at the top end. The line-

wire F to the circuit is connected to the said bar at the binding-post, which is a part of said bar, as shown clearly in Fig. 1 of the drawings. To the inside of each of said caps is fastened by threaded connection or otherwise a carbon disk H, which projects down into the tube a short distance, as shown clearly in Fig. 2 of the drawings, an air-space K being left to allow for expansion. Carbon I is fitted in each metallic cap O at the bottom of each of said tubes and below the upper marginal edges of the flanges of said caps O. Each of said bottom caps is provided with a lug O², which is a part of said cap, which projects a slight distance below the tubes and is threaded to receive a metal ball O', which forms means for conducting the discharge from the tubes across the space intermediate said ball O' and ball J, a lug J² of ball J being inserted in the bar J' in the holes, as shown in detail of bar J', and are held in place by the set-screws L, as shown in the drawings. Said plugs J can be raised or lowered, so that the air-gap between the balls J and O' may be adjusted to suit requirements. A ground-wire P is connected to J' by means of the binding-post thereon, as clearly shown in the drawings. Said tubes are mounted on an insulating-base X, as shown in Fig. 1, are preferably in fiber-racks R in Fig. 3, which are firmly fastened to the base by screws entered from the back of base, as shown in Fig. 3, each tube being held in place by means of set-screws T, as shown clearly in drawings. Said tubes are not limited to any number of tubes and can be mounted directly on the face or back of switchboard, if desired, or on any suitable base where wires enter the building.

By the provision of an arrester made in accordance with my invention each tube may be so finely adjusted that it will just balance the line voltage, and the opening of the circuit will occur when the line voltage has reached a point about ten per cent. above normal or line voltage, thereby forming a direct path for the lightning discharge to the earth. I do not wish to convey the idea that the voltage on a line-wire from the lightning discharge (stroke) does not reach a higher point than ten per cent. above line voltage, but that the arrester opens a pathway for the lightning discharge at that point and chokes back the arc formed when the voltage becomes normal again. This construction will not allow

current to flow across the air-gap at line voltage, and consequently will not maintain an arc at line-pressure, and at the same time the several tubes will take care of any lightning discharge. The present arrester permits of a much finer adjustment and will discharge at a less rise in voltage than other arresters commonly in use, and it is only necessary to use but one air-gap for each tube, and that an extremely small one. The discharge passes straight through the arrester, there being no crooks or turns to retard the discharge, and all moving wires or parts liable to get out of order are dispensed with, and its operation is absolutely sure at all times.

While I have shown a particular form of apparatus illustrating my invention, it will be understood that I may vary the details, if desired, without in any way departing from the spirit of the invention.

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

A lightning-arrester comprising a series of insulating-tubes adapted to hold a non-in-

ductive material, metallic caps fitted to the ends of said tubes, a bar connected to corresponding caps, a binding-post projecting from said bar and a line-wire connected to said post, means for holding said bar to the caps, a series of plugs having shank portions fitted to the caps at the lower ends of the tubes, a bar having set-screws therein, balls having shank portions passing through apertures in the bar carrying said set-screws and held in adjusted positions by the latter, a ground-wire connected to said set-screw-carrying bar, a carbon resting upon each bottom of the tubes, and a carbon disk having a threaded shank portion, fitting within a threaded opening in each cap at the tops of the tubes, said shank portion of the carbon disk being surrounded by an air-space, as shown and described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

WILLIAM GIFFORD.

Witnesses:

E. M. DIXON,
A. W. BEEDON.