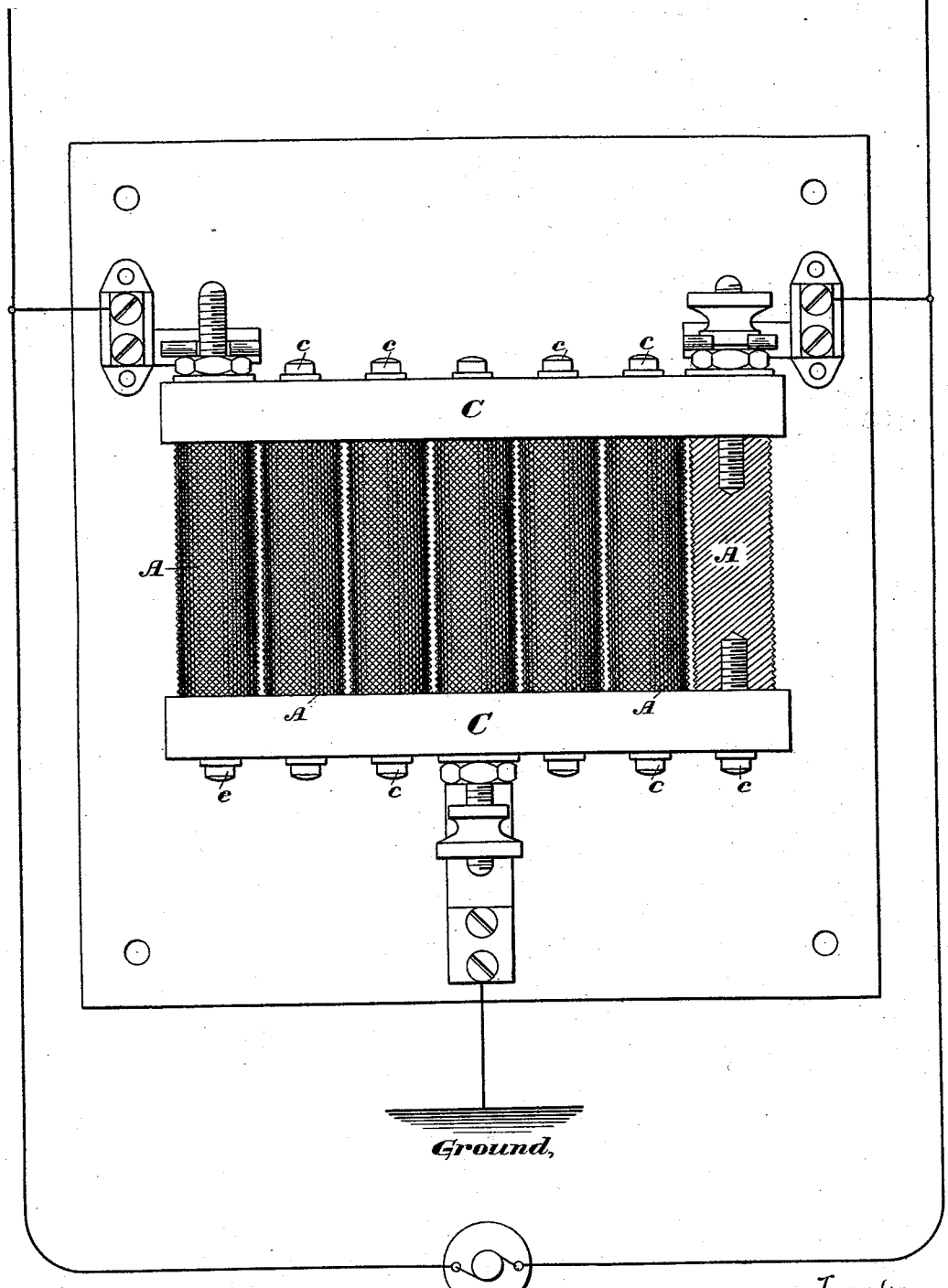
(No Model.)

A. WURTS.

LIGHTNING ARRESTER.

No. 492,548. Patented Feb. 28, 1893.



Witnesses
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UNITED STATES PATENT OFFICE.

ALEXANDER WURTS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, OF SAME PLACE.

LIGHTNING-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 492,548, dated February 28, 1893.

Application filed March 12, 1892. Serial No. 424,656. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER WURTS, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Lightning-Arresters, (Case No. 489,) of which the following is a specification.

The invention relates to certain improvements in the construction of lightning-arresters.

The object of the invention is to provide a lightning arrester which will afford a path for lightning discharges to earth, and which will automatically operate to prevent the currents generated by dynamo electric machines connected with the circuit, from continuing to flow across the arc established by the lightning discharge.

In certain other applications for patents filed by me, Serial Nos. 413,749 and 413,082, I have described certain lightning arresters in which the electrodes are composed of special materials which I have found to have the characteristics of preventing the continuance of an electric arc. Such metals I have for convenience termed non-arcing metals. The principal metals which I have found to possess these characteristics are zinc, antimony, cadmium, mercury and bismuth, and also compounds of these metals with other metals, such, for instance, as a compound of zinc and copper, making a zinc brass, or a compound of mercury with copper forming an amalgam, and likewise compounds of certain of these metals with each other, as for instance, zinc and antimony. I have discovered that electrodes made of these metals or compounds when placed in close proximity to each other, afford a ready path for lightning discharges; but possess certain properties which prevent a dynamo current from continuing to flow across the intervening space. In the applications referred to I have described the use and operation of these metals and shown certain forms of electrodes.

In practice I find that it is desirable to place the electrodes in quite close proximity to each other, and it is also desirable that the resistance offered to the passage of lightning discharges should be as small as possible consistent with the prevention of the flow of the dynamo current. I have found that cylindrical electrodes of the materials above referred to operate very satisfactorily. I have also found that by corrugating or roughening the surfaces of the cylindrical electrodes which are presented to each other, the resistance offered to an electric charge, that is to say, what might be called the striking electromotive force, is considerably reduced.

My present invention, therefore, relates particularly to the construction of electrodes of zinc, antimony, cadmium, mercury or bismuth or compounds thereof, or equivalent metals, the electrodes having confronting surfaces, presenting to each other numerous points or projections. While these electrodes are advantageously made cylindrical, so that they may be turned upon their axes and thus new or fresh surfaces presented to each other from time to time, yet they may be of other shape than cylindrical without departing from the spirit of the invention.

In the accompanying drawing, the figure is a plan of a lightning arrester embodying the features of the invention.

Referring to the figure, A A represent cylinders of non-arcing metals, such as hereinbefore referred to. They are mounted upon a suitable base B in any suitable manner. In the drawing they are shown as being cylindrical in form, sides of the cylinders being presented to each other. The distance which they are separated from each other may be varied somewhat; but in practice I have found that they may be very close together, and still serve to interrupt the flow of current of very high electromotive force. If the cylinders are smooth they will offer a given resistance to an electric discharge, but by corrugating or roughening or knurling them, as indicated in the drawing, numerous projections or points are presented by each cylinder to its adjacent cylinder or electrode, and this reduces the striking electromotive force very materially. The cylinders are mounted by means of screws *c* passing through suitable end plates C, which permit each cylinder to be rotated upon its axis, when it is desired to

expose a fresh surface to the adjacent electrode.

In employing the lightning arrester one of the electrodes, for instance, the central one shown in the drawing, may be connected with the earth, and the outer ones with the respective sides of the circuit, a lightning discharge will then escape from either side of the circuit to the earth across the intervening air gap, but the dynamo current will be prevented from continuing to flow across this gap by reason of the effects produced by the non-arcing metal.

In practice I prefer to construct the electrodes with numerous small points, as indicated, and to effect this the cylinders need be cut only to a very slight depth, and in this manner the points may be brought into very close proximity to each other and therefore a large number of discharge points are assembled.

I claim as my invention—

1. A lightning arrester consisting of adjacent electrodes of non-arcing metal having their surfaces milled, corrugated or knurled and presenting numerous points to each other, substantially as described.

2. In a lightning arrester, the combination of cylindrical electrodes having rough, corrugated or knurled surfaces presented to each other, said electrodes being composed of non-arcing metal, such as zinc or antimony or their equivalent.

3. In a lightning arrester, electrodes cylindrical in form having their sides adjacent to each other and having their surfaces studded with numerous points and means for turning one or more of said cylindrical electrodes upon their axes for presenting fresh surfaces, substantially as described.

4. In a lightning arrester, confronting electrodes presenting to each other curved surfaces studded with numerous closely assembled points.

5. In a lightning arrester confronting cylindrical electrodes provided with numerous closely assembled points and presenting their convex surfaces to each other.

In testimony whereof I have hereunto subscribed my name this 11th day of March, A. D. 1892.

ALEXANDER WURTS.

Witnesses:
JAMES W. SMITH,
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