No. 730,211. PATENTED JUNE 2, 1903.

G. HONSBERG.

LIGHTNING ARRESTER FOR ELECTRICAL PLANTS.

APPLICATION FILED DEC. 16, 1902.

NO MODEL.

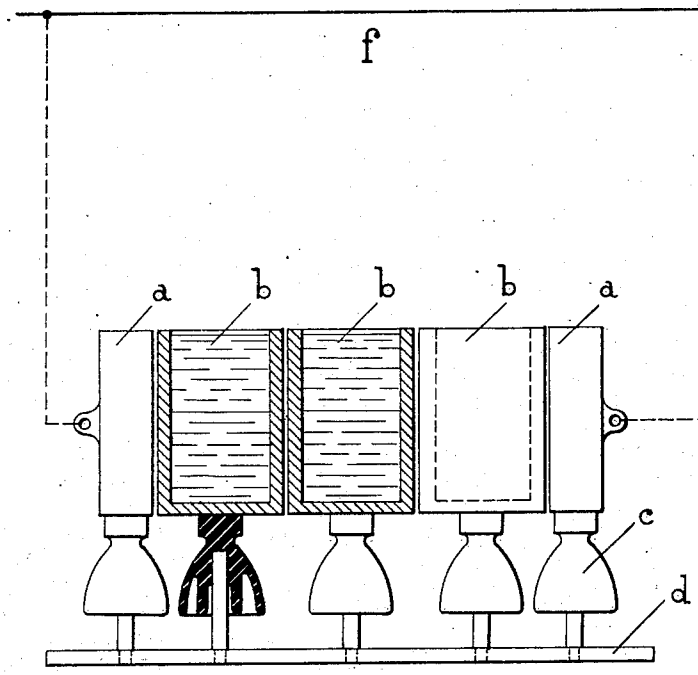


Fig. 1.

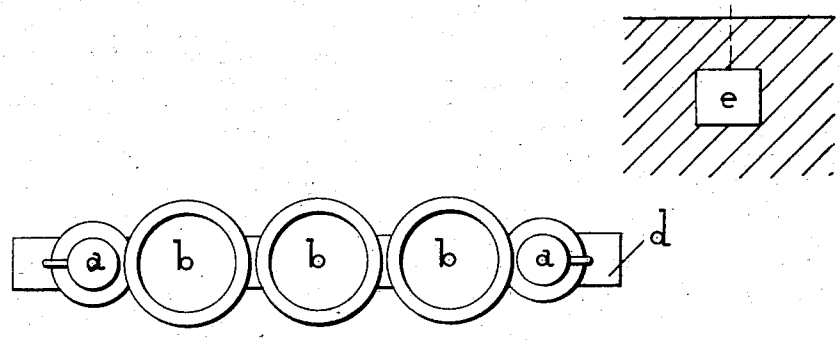


Fig. 2.

Witnesses:
M. J. Keating
A. T. Kennedy

Inventor
Georg Honsberg
By his Attorney
Charles J. Kintner

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 730,211. Patented June 2, 1903.

UNITED STATES PATENT OFFICE.

GEORG HONSBERG, OF NURÈMBERG, GERMANY, ASSIGNOR TO ELEKTRIZITÄTS-AKTIENGESELLSCHAFT, VORMALS SCHUCKERT & CO., OF NUREMBERG, GERMANY.

LIGHTNING-ARRESTER FOR ELECTRICAL PLANTS.

SPECIFICATION forming part of Letters Patent No. 730,211, dated June 2, 1903.

Application filed December 16, 1902. Serial No. 135,460. (No model.)

To all whom it may concern:

Be it known that I, GEORG HONSBERG, electrical engineer, a subject of the King of Prussia, Emperor of Germany, residing at Nuremberg, in the Kingdom of Bavaria, German Empire, have invented a new and useful Improvement in Lightning-Arresters for Electrical Plants, of which the following is a specification.

My present invention relates to improvements in lightning-arresters for electrical plants in which a series of spark-gaps formed by adjacent electrodes is interposed between the line and a grounded conductor, thus furnishing the discharge an easier path to ground than that offered by the electrical machinery of the plant; and the object of my improvement is to provide a lightning-arrester with electrodes of a hygroscopic or liquid-absorbing nature.

Lightning-arresters of the so-called "spark-gap" type as commonly used in electric lighting and power plants essentially consist of a series of milled cylinders of non-arcing metal mounted at suitable intervals on an insulated base-plate. The number or total length of these spark-gaps depends upon the working pressure; but this total length is not increased in direct proportion to the working pressure, but in a much more unfavorable ratio. In other terms, a much longer air-gap is necessary to prevent the dynamo-current from following a static discharge across the spark-gaps than the working pressure alone would require. This is the reason why lightning-arresters of the spark-gap type, especially for high working pressures, are not sensitive.

My invention will be understood by referring to the accompanying drawings, in which—

Figure 1 is a front view of my novel lightning-arrester; Fig. 2, a plan view of the same connected at one end with the line *f* and at the other end with a grounded plate or conductor *e*.

a represents metal bodies, preferably milled cylinders of non-arcing metal, between which one or more tanks *b*, of porous very hygroscopic material, are arranged, having their surfaces presented to each other so as to form small air-gaps between them. The tanks *b*, preferably constructed of some porous material, such as earthenware, and arranged as upright hollow cylindrical vessels, are fixed on the top of insulators *c*, mounted on a base-plate or flat bar *d*. The vessels *b* are filled with a liquid, such as water, which in permeating the porous walls of said vessels covers the convex surfaces thereof with a thin uniform film of liquid moisture. Such a porous hollow cylindrical vessel filled with liquid and the sides of which are permeated and covered by the liquid may be regarded practically as a liquid body. If in such a lightning-arrester the total length of the spark-gaps be made only slightly greater than is necessary to prevent jumping due to the working pressure alone, the dynamo-current tends to follow the static discharges whenever they occur, but is considerably checked, owing to the high resistance of the liquid bodies. Any trifling arc which may occur causes the fluid to evaporate at those points where the arc is formed, whereby the intermediate resistance immediately increases. In consequence of the quick evaporation of the liquid the convex surfaces of the porous vessels become entirely dry, hence the resistance increasing in a measure so as to put out the arc. This done, fresh liquid flows through the porous walls to the outer convex sides of the vessels from their interior, so that in this way the apparatus is always ready for use.

Owing to the fact that the porous vessels are made of non-fusible material there will be no wear and tear upon them due to the arc, and the method of operation just described will always be such that the spark-gaps will remain absolutely constant.

The liquid in the vessels *b* may be supplied thereto in any preferred manner, the novelty of my invention lying generically in the construction of arresting devices for overcoming the effects of high static discharges, such as lightning, in which utilization is made of the absorptive surfaces of porous bodies located between the opposite ends or poles of the ar-

rester, and my claims are generic as to such a structural apparatus.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A lightning-arrester having two conducting-electrodes and one or more intervening porous electrodes having a liquid-conducting medium which permeates the pores thereof, substantially as described.

2. A lightning-arrester having two conducting-electrodes and one or more porous intervening cylinders filled with a conducting liquid, the surfaces of the electrodes and the intervening cylinder or cylinders being out of mechanical contact with each other so as to constitute air-gaps, substantially as described.

3. A lightning-arrester consisting of two or more insulated vessels of hygroscopic material and filled with a liquid, said vessels being arranged closely adjacent to each other so as to constitute air-gaps; in combination with conductors operatively connecting the opposite ends of the arrester to the point to be protected and to earth, substantially as described.

4. In a lightning-arrester the combination of two or more insulated vessels of hygroscopic material each filled with a liquid and separated from each other by definite spaces, so as to constitute air-gaps; together with end electrodes closely adjacent to the outer surfaces of the hygroscopic vessels, said end electrodes being operatively connected by conductors to the point to be protected and to earth, substantially as described.

Signed at Nuremberg, in the Kingdom of Bavaria, German Empire, this 2d day of December, A. D. 1902.

GEORG HONSBERG.

Witnesses:
ALOIS GOBANZ,
OSCAR BOCK.