

(No Model.)

A. DE KHOTINSKY.
LIGHTNING ARRESTER.

No. 571,669.

Patented Nov. 17, 1896.

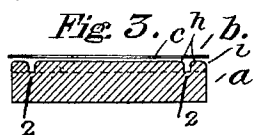
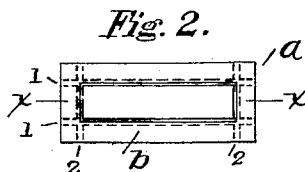
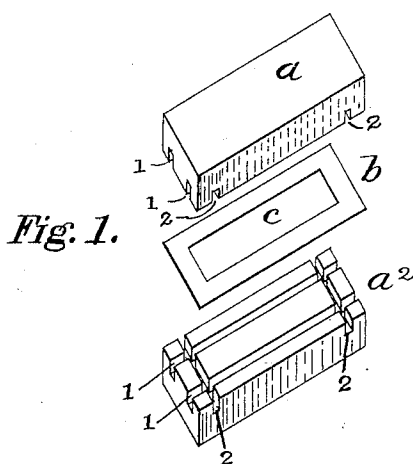


Fig. 4.

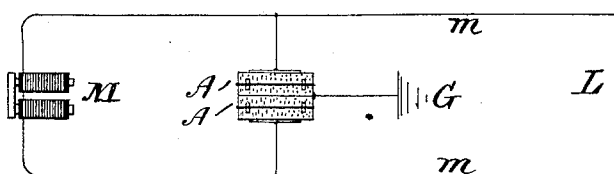
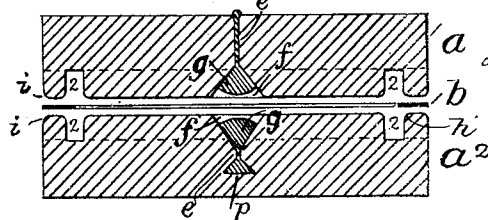


Fig. 3a.



Inventor.

Achilles de Khotinsky

Attest,

Geo. Frank.

Samuel Purce

UNITED STATES PATENT OFFICE.

ACHILLES DE KHOTINSKY, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE
AMERICAN BELL TELEPHONE COMPANY, OF SAME PLACE.

LIGHTNING-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 571,669, dated November 17, 1896.

Application filed September 24, 1896. Serial No. 606,877. (No model.)

To all whom it may concern:

Be it known that I, ACHILLES DE KHOTINSKY, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Protective Appliances for Electrical Circuits, of which the following is a specification.

The present invention relates to an improved form of carbon-plate protective appliances for electrical circuits.

The ordinary form of instrument-protector, consisting of two carbon plates separated by an air or spark gap, is not entirely satisfactory by reason of the occasional short-circuiting of the plates, which seems to be chiefly if not wholly caused by slight discharges through the air-gap, resulting from static charges on the line, or secondary lightning discharges. These discharges apparently disengage small particles of the carbon surface, which are blown against and become attached to the surface of the interposed mica septum, forming conducting-bridges between the plates along the inner edges of the septum. Such conducting-bridges, in addition to their ill effects in grounding and short-circuiting the line, are disadvantageous because they favor discharges along the edges of the mica septum, which in time becomes perforated and disintegrated.

The invention aims to avoid the formation of conducting or short-circuiting bridges between the separated carbon plates, and this is effectuated by the formation of comparatively deep grooves in the opposing or proximate surfaces of the plates, extending longitudinally and transversely thereof along and within their edges, and in forming the size of the central opening in the mica-separator so that its edges will be in the central or axial line of the intersecting grooves. By this arrangement the inner edges of the mica-separator do not come in contact with the surfaces of the plates, and when a discharge takes place the momentary expansion of the air within the grooves, due to the heat occasioned by the discharge, causes a rush of air, and any disintegrated carbon particles are carried outward through the grooves. The septum is made of the same length and breadth as the carbon plates, and when it is placed between

them and pressed by the fingers on all sides it assume the proper adjustment without further attention being necessary. The edges of the grooves and external edges of the plates are preferably rounded, so that the edges of the mica-separator will be at such a distance therefrom that sparks will not readily pass around the separator.

Referring to the drawings, Figure 1 represents in perspective the invention showing the carbon plates and mica septum separated from each other to show their relation to one another. Fig. 2 is a top view of the mica septum with a carbon plate underneath. Fig. 3 is a section on line xx of Fig. 2. Fig. 3^a is an enlarged sectional view of two carbon plates and mica septum slightly separated from each other, and Fig. 4 illustrates the utilization of the protective appliances with an electric circuit.

a and a^2 are two carbon plates made precisely alike, and b is the mica septum placed between them. In practice these plates are held in a suitable support and may be connected to the circuit-conductors, as shown in Fig. 4, which represents two protector devices A in a common support connected by branches to each conductor m of the circuit L and with a common connection to ground G , M representing the apparatus to be protected.

In the protection of a grounded circuit it is obvious that one protector only would be required under conditions otherwise identical. Comparatively deep intersecting grooves 1 1 and 2 2 are formed in one surface of the carbon plates a a^2 near to its edges. These may be of any desired cross-section, the rectangular section shown in the drawings being preferable, and the edges h of the grooves and the external edges i of the plates are chamfered or rounded, as shown.

The opening in the mica septum or separator is so proportioned that when the said separator is placed between the carbon plates the edges thereof will coincide with or be directly over the central or axial line of the intersecting grooves in the plates.

I propose to employ a drop of easily-fusible metal with one or both of the carbon plates, as shown in the Patent No. 438,788, granted to

A. C. White, secured, however, to the said plates in a novel manner.

I form in each plate a funnel-shaped orifice *f*, as shown in plate *a* of Fig. 3^a, with a small passage *e* from the bottom thereof to the opposite side. When the fusible drop *g* is run in, it fills the orifice and passage, and a knob of the metal is formed at the end of the passage. Instead of the passage *e* extending to the opposite side of the plate it may end in an enlargement *p* in the central part thereof, as shown in plate *a*², and when the metal is run in it fills the space *p* and serves to lock the metal into the plate. By this construction the fusible drop is held in place so that it cannot fall out, and when fused, owing to the angular sides of the orifice, the melted metal flows quickly to the surface of the opposite carbon and cools, forming a bridge for the current from plate to plate.

Having now fully described the invention, I claim—

1. A spark or air gap protective appliance, consisting of two carbon plates having their proximate surfaces grooved or channeled; and a centrally-slotted non-conducting septum between them, the edges of the slot coinciding with the axial or central lines of the said channels.

2. In a spark or gap protective appliance, the combination of carbon line and earth plates in close proximity to each other, and

provided with longitudinal and transverse grooves or channels in their proximate surfaces, with an interposed septum of mica or like non-conductor having a slot in its central part whose edges coincide with the axial lines of the channels in the said plates, as set forth.

3. A spark or air gap protective appliance consisting of two carbon plates having their proximate surfaces grooved or channeled and their edges chamfered or rounded; and a centrally-slotted non-conducting septum between the said surfaces of the same size thereof, the edges of the slot coinciding with the axial lines of the said channels, substantially as described.

4. A spark or air gap protective appliance consisting of two carbon plates one of which has an angular-shaped mass of easily-fusible conducting material embedded in its approximate surface having a hooking or locking extension; and a centrally-slotted non-conducting septum between the said plates, the edges of the slot coinciding with the axial lines of the said channels, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 21st day of September, 1896.

ACHILLES DE KHOTINSKY.

Witnesses:

GEO. WILLIS PIERCE,
JOSEPH A. GATELY.