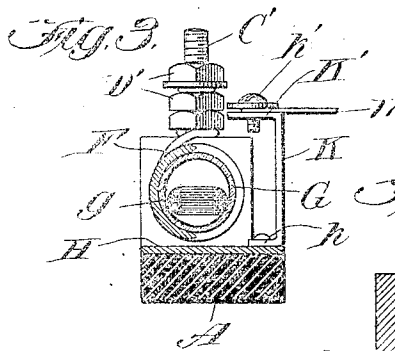
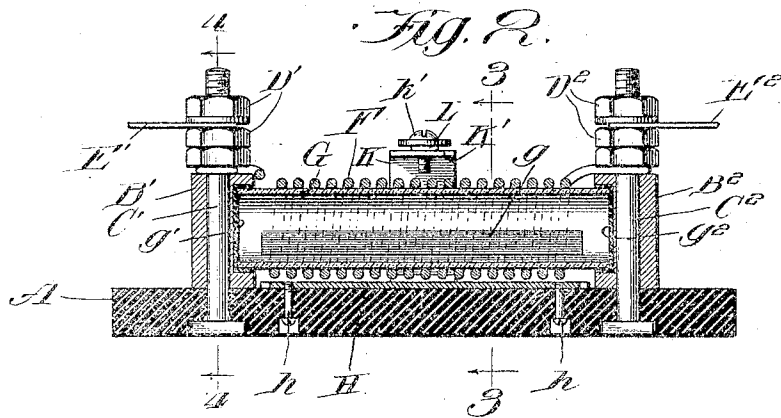
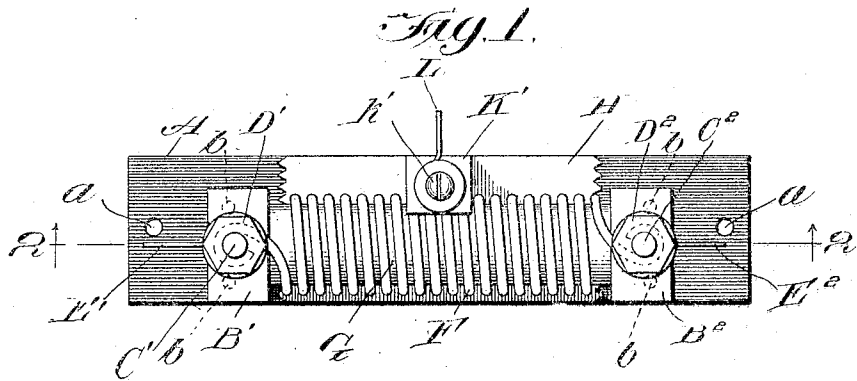


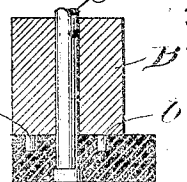
E. W. VOGEL.  
 LIGHTNING ARRESTER.  
 APPLICATION FILED MAY 5, 1906.

940,220.

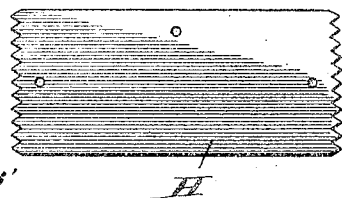
Patented Nov. 16, 1909



*Fig. 4.*



*Fig. 5.*



Witnesses:

*H. L. Carter*

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Inventor:

*Eugene W. Vogel*

*by Chamberlain & Wilkinson  
 his Attorneys*

# UNITED STATES PATENT OFFICE.

EUGENE W. VOGEL, OF CHICAGO, ILLINOIS.

LIGHTNING-ARRESTER.

940,220.

Specification of Letters Patent.

Patented Nov. 16, 1909.

Application filed May 5, 1906. Serial No. 315,280.

To all whom it may concern:

Be it known that I, EUGENE W. VOGEL, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Lightning-Arresters, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to lightning arresters for protecting electrical translating instruments.

It is customary to provide electrical conductors for telephones, telegraphs, signals, etc. with devices for preventing the passage of lightning to the translating instruments which would be destroyed thereby, such devices serving to divert the lightning from the conductor to the ground before it reaches the instruments.

The primary object of my invention is to provide a lightning arrester which will be simple in construction, inexpensive in manufacture, and efficient in use.

The embodiment of my invention herein disclosed may be generally described as comprising a supporting base of insulating material, posts spaced apart and supported upon the base, a coil of wire interposed between and electrically connected to the posts, an insulating tube supported between the posts and around which the coil is supported, a coil of wire within the insulating tube the convolutions of which intersect the planes of the convolutions of the conducting coil, and a grounding conducting plate located adjacent the conducting coil.

My invention will be more fully described with reference to the accompanying drawing in which,—

Figure 1 is a plan view; Fig. 2 a sectional view on line 2—2 Fig. 1; Fig. 3 a transverse section on line 3—3 Fig. 2; Fig. 4 a sectional view on line 4—4 Fig. 2; Fig. 5 a plan view of the grounding plate.

The same reference characters are used to designate the same parts in the several figures of the drawing.

Reference letter A designates a supporting base formed of any insulating material such for instance as slate. B' B<sup>2</sup> designate posts made of conducting material mounted upon the base A. The posts may be secured to the

base in any suitable manner as for instance by bolts C' C<sup>2</sup> extending through the base and upwardly through the posts. The heads of the bolts are preferably located in recesses in the under surface of the base.

In order to prevent the posts from rotating relatively to the base, dowel pins such as indicated at b may, if desired, be formed on the lower ends of the posts and received in sockets in the plate.

The ends of the bolts which extend above the posts are provided with suitable means uniting to them the ends of the leads constituting the electrical circuit. E' E<sup>2</sup> indicate the leads which are electrically connected by means of nuts D' D<sup>2</sup> to the respective bolts C' C<sup>2</sup>.

F designates a coil of wire, the ends of which are electrically united to the posts B' B<sup>2</sup> in any suitable manner as by being bent around the bolts C' C<sup>2</sup> and clamped between the bottom nut on each bolt and the top of the corresponding post.

G designates a coil of wire, the ends of which are electrically united, loosely located within the conducting coil F, the convolutions of the coil g intersecting the planes of the convolutions of the coil F. A tube G made of any suitable insulating material, as for instance glass, surrounds the coil g and is located with the coil F. The ends of the tube G are supported in sockets formed in the posts B' B<sup>2</sup>. Lining caps g' g<sup>2</sup> are interposed between the ends of the tube G and the sockets in the posts, such linings are made of resilient material and serve to prevent the tube from being broken through contact with the posts.

H indicates a plate made of conducting material and supported upon the base immediately below the coil F. Any suitable means may be provided for securing the plate to the base, as for instance screws h extending through the base into screw-threaded holes in the plate. The ends of the plate terminate adjacent the posts B' B<sup>2</sup> and are preferably provided with teeth or serrations. The plate H is connected with the ground in any suitable manner, as by means of a lead l to the upper end K' of a bracket K, the lower end k of the latter being mounted upon and electrically connected to the plate H.

k' indicates a binding screw for clamping the end of the lead l to the bracket K.

The operation of my invention is as fol-

lows: The device is located at any desired point and may be supported by screws extending through holes *a* in the base plate. The base plate is preferably loosely connected with its support as the arrester is less liable to be destroyed by lightning when it is loosely mounted than when it is rigidly connected with its support. The circuit, instruments in which are to be protected, is united to the arrester by the leads *E'* *E*<sup>2</sup> so that the coil *F* forms a part of the circuit. When lightning, or any current of such high voltage as would destroy the instruments, passes from the circuit through the coil *F* it will be choked or retarded so that it will pass from the convolutions of the coil *F* to the plate *H* and thence to the ground. The current may also be grounded by passing directly from the posts *B'* *B*<sup>2</sup> to the plate *H* without passing through the coil *F* in which event the teeth on the ends of the plate *H* facilitate the passage of the lightning from the posts to the plate.

The strain to which the arrester is subjected by the passage of lightning there-through would result in the breaking of the insulating tube *G* were it not for the cushioning effect of the end caps *g'* *g*<sup>2</sup> interposed between its ends and the posts.

From the foregoing description it will be observed that I have invented an improved

lightning arrester which though simple and inexpensive in manufacture is durable and efficient in use.

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

1. In a lightning arrester, the combination with a base of insulating material, a pair of posts of conducting material supported on said base, a conducting coil of wire interposed between and secured at its ends to said posts, and a ground conductor supported on said base in proximity to said coil and having its ends projecting into proximity to said posts.

2. In a lightning arrester, a base of insulating material, a pair of posts of conducting material on said base, a conducting coil of wire interposed between said posts, a pair of bolts passing through said base and securing the ends of the coil to the posts and the posts to the base, and a ground conductor supported on said base in proximity to said coil and having its ends projecting into proximity to said post.

In testimony whereof, I sign this specification in the presence of two witnesses.

EUGENE W. VOGEL.

Witnesses:

GEO. L. WILKINSON,  
C. A. MULLEN.