N. E. NORSTROM.

LIGHTNING ARRESTER.

APPLICATION FILED OCT. 14, 1905. RENEWED AUG. 28, 1909.

980,884. Patented Jan. 3, 1911.

Fig. 1.

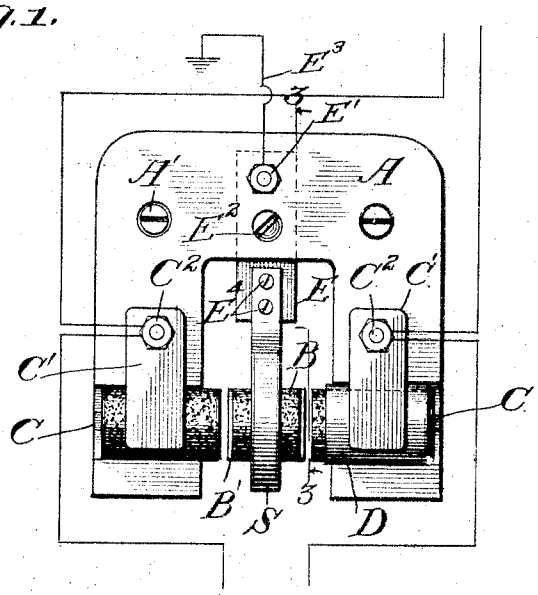


Fig. 2.

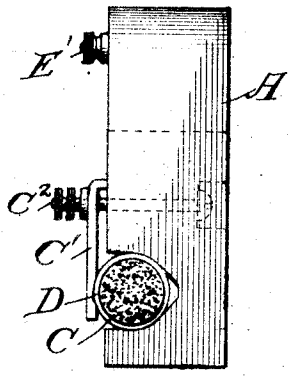
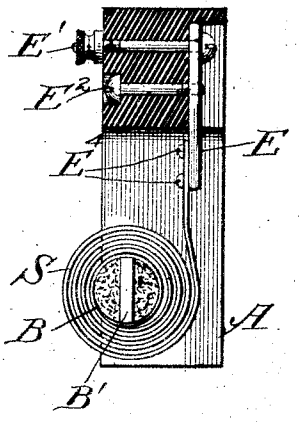


Fig. 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

NILS EMEL NORSTROM, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE ANDERSON ELECTRIC & MANUFACTURING CO., OF WICHITA, KANSAS.

LIGHTNING-ARRESTER.

930,884. Specification of Letters Patent. Patented Jan. 3, 1911.

Application filed October 14, 1905, Serial No. 282,730. Renewed August 26, 1909. Serial No. 515,100.

To all whom it may concern:

Be it known that I, NILS EMEL NORSTROM, a citizen of the United States of America, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Lightning-Arresters, of which the following is a specification.

My invention relates to lightning arresters of the kind used on telephone and telegraph lines and has for its object improvement in such devices.

In the accompanying drawings, which are substantially full size, Figure 1 is a plan; Fig. 2 is a side elevation; and Fig. 3 is a section on line 3—3 of Fig. 1.

The frame of the device consists of a horse-shoe shaped piece A of porcelain or other insulating material. Near the ends of the legs of this piece are transverse V-shaped or curved grooves in which are held carbon blocks C. These carbon blocks are held in position by brass clamp bars C^1, and bolts C^2 which extend through the piece A as shown in Fig. 2. The bolts C^2 are also used as binding posts for connecting the two branches of the telephone or telegraph line to the two branches which extend to the telephone or telegraph instrument used. One of the carbon blocks C is secured inside of an iron sleeve D which is somewhat shorter than the block held by it. The other carbon block, however, is without any body of magnetic material secured thereto.

The rear face of the piece A has a recess formed in its central portion as shown in Fig. 3, and in this recess is a metal bar E secured to the piece A by bolt E^1 and screw E^2. The bolt E^1 also serves as a binding post from which there is a conductor E^3 extending to a ground connection.

Secured to the metal bar E by the screws E^4 is a clock spring S, in the center of the coils of which is held a carbon block B of the same diameter as the blocks C. The spring S is adjusted so that when the piece A is secured to a wall or other support, the axis of the carbon block B is normally in line with the axes of the blocks C. The faces of the block B have secured to them thin strips of mica B^1 which intervene between the block B and the adjacent blocks C. These strips of mica are simply spacing pieces which cover only a small part of the face of block B but which serve to prevent actual contact between B and C.

In setting up the arrester it is secured to any convenient wall, post, or other support by screws through the holes A^1. The block B, supported upon the spring S, is permitted to seek its own center in its axial direction. The blocks C are then adjusted so that their faces are very close to the faces of the block B, and are secured in this position by tightening the nuts on the clamps C^1. In this adjustment the open space between the block B and the blocks C is about one sixty-fourth of an inch or a trifle less. It is highly desirable, if not quite absolutely essential, that the block B which is freely supported on the spring S, does not touch the other blocks when the spring is in a quiescent state, or in a state which approaches very nearly to the quiescent. One of the line wires and one of the wires leading to the telephone are then connected to one of the binding posts C^2, and the other two wires are similarly connected to the other post C^2. Another wire is then connected to the post E^3 and to ground. When the device is set up in this way the spring S is never, or almost never, absolutely quiescent. Any jar in the building, even when it is no more than a person walking on an adjacent floor, or the wind blowing outside, causes the spring S to vibrate so as to move the block B with respect to the blocks C. This continual vibration of the block B with respect to the blocks C serves to prevent dust from settling on the faces of the blocks B and C and thus grounding the line. As thus set up, the mica-faced vibrating block B does not short circuit a telephone or a telegraph circuit passing through the binding posts C^2, but when lightning strikes one of the line wires, the high potential of the charge causes it to arc across from block C to block B, and it then flows through the spring S, the bar E, post E^1, and wire E^3 to ground. The passage of this heavy current through the coils of the spring S sets up lines of force between this spring and the magnetic body of the sleeve D, the result of which is to draw the block B sharply against the block C which has the magnetic sleeve D. The jar communicated to the device by this action is more severe than the ordinary jar and serves

to shake out dust and chips of carbon due to the arc from C to B. The device is therefore self-cleaning, not only under normal conditions, but under the conditions arising from acting as an arrester.

What I claim is:—

1. The combination with a supporting frame, and the conductors of a circuit, of a carbon block connected to each conductor and adjustably supported on the frame, a spring having one end secured to the frame, a third carbon block secured to the other end of the spring and supported adjacent to the first mentioned block, and a ground connection for the third block.

2. The combination with the conductors of a circuit, of a carbon block connected to each conductor, a spring having one end connected to a fixed support, a third carbon block connected to the other end of said spring and supported closely adjacent to the first mentioned blocks and a ground connection for said third block.

3. The combination with the conductors of a circuit, of a carbon terminal connected to each conductor, a spiral spring secured to a fixed support, a third terminal supported on the free end of said spring and located closely adjacent to the first mentioned terminals, and an electrical connection extending from said spring to ground.

4. The combination with the conductors of a circuit, and a terminal connected to each conductor, of a conducting block supported adjacent to said terminal, a ground connection, a metallic coil interposed between said block and said ground connection, and a magnetic body associated with one of said terminals.

5. The combination with the conductors of a circuit, of a horse-shoe shaped frame of insulating material provided with binding posts to which said conductors are connected, carbon blocks located in recesses formed in the legs of said frame, electrical connections from the binding posts to said carbon blocks, and a ground connection provided with a movable terminal supported between said blocks.

Signed at Chicago, Ill., this 10th day of Oct. 1905.

NILS EMEL NORSTROM.

Witnesses:
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