No. 708,329. Patented Sept. 2, 1902.

C. E. EGAN.

LIGHTNING ARRESTER.

(Application filed Mar. 11, 1901. Renewed Apr. 22, 1902.)

(No Model.)

Fig. 1.

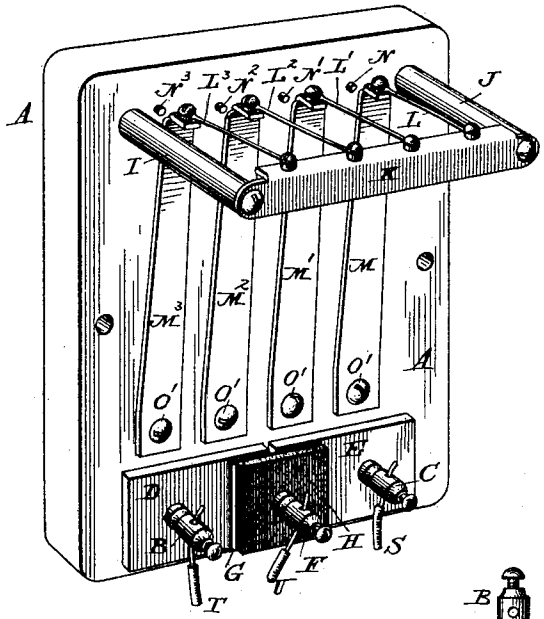


Fig. 3.

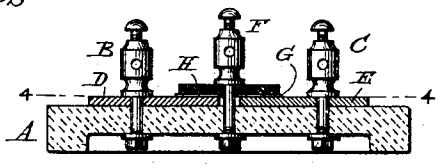


Fig. 2.

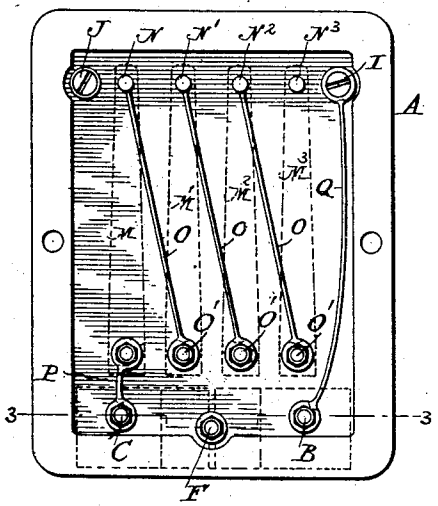


Fig. 4.

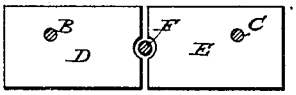
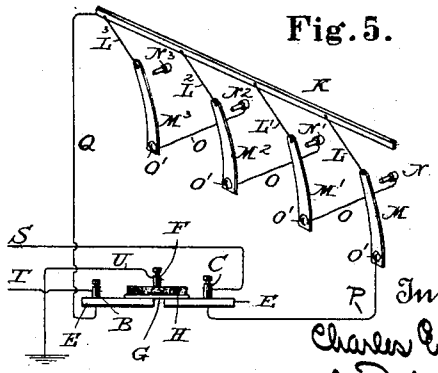


Fig. 5.



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UNITED STATES PATENT OFFICE.

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LIGHTNING-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 708,329, dated September 2, 1902.

Application filed March 11, 1901. Renewed April 22, 1902. Serial No. 104,222. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. EGAN, a citizen of the United States, residing at Durham, in the county of Durham and State of North Carolina, have invented certain new and useful Improvements in Lightning-Arresters, of which the following is a specification.

My present invention relates to improvements in lightning-arresters, the construction and advantages of which will be hereinafter pointed out, reference being had to the accompanying drawings, wherein—

Figure 1 is a perspective view of the device as a whole; Fig. 2, a bottom plan view of the same; Fig. 3, a transverse sectional view on the line 3 3 of Fig. 2; Fig. 4, a horizontal sectional view on the line 4 4 of Fig. 3, and Fig. 5 a diagrammatic view illustrating the connections between the various parts.

The object of my invention is to provide a lightning-arrester wherein after a fuse has been blown the circuit will be automatically completed or reëstablished and will include a fuse.

In suburban telephone systems it frequently happens that lightning, coming in over the line, blows the fuse, the line being thereby rendered useless. The circuit remains broken until a lineman is sent to repair the same by inserting a new fuse. With my apparatus this is not necessary, as the action thereof is automatic—that is to say, after a fuse is blown the line will be instantly reestablished by the release of a member held out of contact by the fuse which is blown by the excess current or lightning coming in over the line.

Referring to the drawings, A indicates a base plate or member, preferably formed of some insulating substance. At one end of said plate I provide two binding-posts B C, the stems of the posts extending through the base-plate A, as indicated in Figs. 2 and 3. Interposed between said posts and the upper face of the base-plate are conducting-plates D E, which, as indicated in Figs. 3 and 4, stop short of each other, or, in other words, are out of contact. A third post F is secured to the base intermediate said plates D and E, the stem of the post extending through the base and up between the adjacent ends of the members D and E, but out of contact therewith.

Extending across from the plates D and E below the body of post F is a sheet of insulating material G, preferably mica, and a carbon block H. In this manner the post F is normally insulated from the plates D and E, and consequently out of line.

At the opposite end of the base-plate and extending upwardly therefrom are two posts or pillars I J, connected at their upper ends by a cross bar or member K. Attached to said member K is a series of fuse-links L L' L^2 L^3, which extend toward the base-plate A and in turn are connected to a series of spring plates or members M M' M^2 M^3. The links are of such length as to normally hold the free ends of the spring arms or members in an elevated position, as indicated in Fig. 1. Immediately below the free ends of the spring arms or members are contact points or posts N N' N^2 N^3, the posts N' N^2 N^3 being connected, as shown in Fig. 2, upon the under side of the base with the opposite ends of the spring arms or members M' M^2 M^3, respectively, by means of wires O, which in turn are connected to screws or bolts O', passing through the ends of the spring-arms. The fixed end of the spring arm or member M is connected, by a member or link P, with the binding-post C, while the upright post I or the frame formed of the members I, J, and K is connected with the binding-post B through a member Q, Fig. 2. The posts B and C are connected to the line, which is indicated in Fig. 5 by the letters S T, while the binding-post F is grounded through connection U.

From the foregoing description it will be seen that the current coming in over line S will pass through binding-post C, connection P, arm M, fuse L, member K, pillar I, connection Q, and post B back to line T. Thus is secured a complete circuit for the line, including a fuse. Should lightning come in over the line or should there be an excess of current from any cause whatsoever over the line S, it will pass through post C through the connections above given to the fuse L, which will immediately be blown, and at the same instant the current will jump from plate

E to the carbon block and post F and through line U to the ground. Of course this action is instantaneous. As soon as fuse L is blown spring-arm M, being released, will move down into contact with the post or contact member N, thus again completing the circuit. The current instead of passing as before will pass through arm M, contact N, connection O, arm M′, and fuse L′ to the conductor-bar K or the frame composed of the members I, J, and K and thence back to the line. Should the current come in over line T instead of line S, it will pass through post B, connection Q, the fuse-supporting frame, along said frame to fuse L, which will be blown, and at the same instant the current will jump, as before stated, to post F and pass to ground through connection U. The circuit will again be completed, as above described. The same action will follow if the second fuse or link L′ is blown, the arms by reason of their spring action being successively thrown into contact with the contact posts or members N N′ N², thus completing the circuit through said members and the various connecting-wires O and the next succeeding spring-arm, which has a fuse attached to it.

It is manifest that various arrangements of the circuits will suggest themselves and it is not desired to limit the present invention to the exact details shown. So, too, the general construction may be varied without departing from the spirit of my invention.

Having thus described my invention, what I claim is—

1. In a lightning-arrester, the combination of a base; main line-terminals carried thereby; a ground normally insulated from said terminals; a conductor connected with one of said terminals; a series of fuses connected to said conductor; a closed circuit intermediate one of said fuses and the other line-terminal; and means for cutting in each of the fuses in succession as the preceding fuse is blown.

2. In a lightning-arrester, the combination of a base; main line-terminals mounted thereon; a ground insulated from the terminals against the passage of normal current; a frame supported by the base and electrically connected to one of the main line-terminals; a series of fuses connected to the frame; a series of spring members connected to said fuses; a connection intermediate one of said members and the second of the main line-terminals; contacts arranged to act in conjunction with the members when released by the fusing of the links; and connections between said contacts and the fixed ends of the spring members.

3. In a lightning-arrester, the combination of a base; main line-terminals carried thereby; a ground insulated from said terminals against the passage of current of normal strength; a conductor connected with one of said main line-terminals; a series of fuses connected to said conductor; a closed circuit intermediate one of said fuses and the other line-terminal, said circuit including a spring member held under stress by the fuse; and means for cutting in each of the fuses in succession as the preceding fuse is blown.

4. In a lightning-arrester, the combination of a base; main line-terminals carried thereby; a ground normally insulated from said terminals; a conductor connected with one of said terminals; a series of fuses connected to said conductor; a closed circuit intermediate one of said fuses and the other line-terminal; and a series of spring members connected to each of the succeeding fuses, adapted and arranged to close the circuit as its fuse is blown.

5. In a lightning-arrester, the combination of a base; main line-terminals carried thereby; a ground insulated from said terminals against the passage of normal current; a conductor connected with one of said terminals; a series of fuses connected to said conductor; a closed circuit intermediate the first of said fuses and the other line-terminal, said circuit including a spring member held under stress by the fuse; a series of spring members carried by the base and connected to the fuses; a series of contacts arranged in line with the ends of said spring members; cross connections between said contacts and the fixed ends of the adjacent spring members; and a connection between the other line-terminal and the first of said contacts.

6. In a lightning-arrester, the combination of a suitable base; conducting-plates D, E, mounted thereon; main line-terminals connected respectively to said plates; a ground connection carried by said base adjacent to the plates but normally insulated therefrom; a conducting-frame carried by the base; connections intermediate one of said terminals and said frame; a series of fuse-links connected to said frame; a series of spring-arms carried by the base and having their free ends attached to the links; a series of contacts mounted in the base beneath the free ends of said spring-arms; connections between said contacts and the fixed ends of the adjacent spring-arms; and a connection between the other line-terminal and the last of the series of spring-arms.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES E. EGAN.

Witnesses:
G. R. BLACKWELL,
THOS. U. GORMAN.