

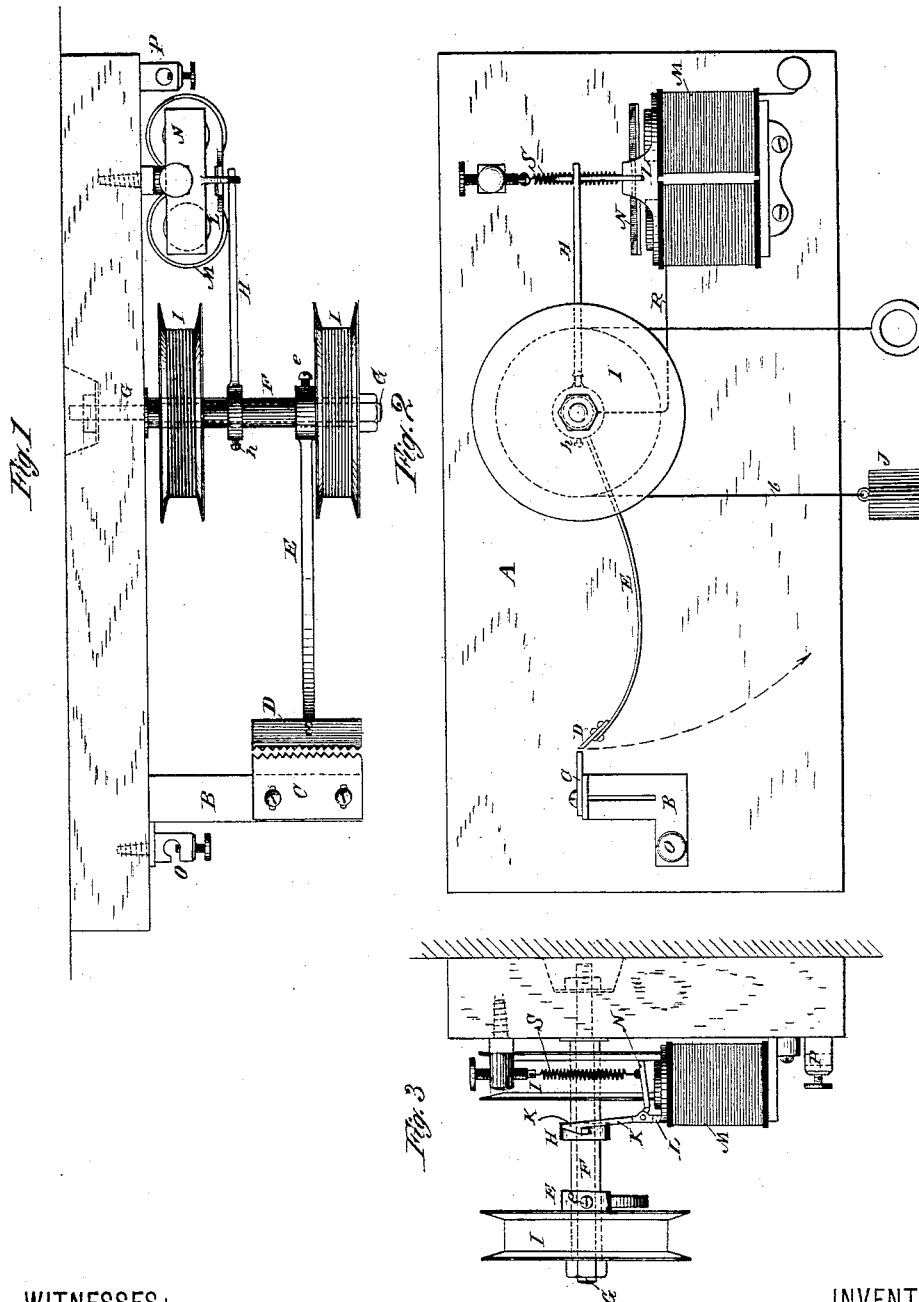
(No Model.)

F. A. CHENEY.

LIGHTNING ARRESTER FOR ELECTRIC CIRCUITS.

No. 387,051.

Patented July 31, 1888.



WITNESSES:

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LIGHTNING-ARRESTER FOR ELECTRIC CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 387,051, dated July 31, 1888.

Application filed May 12, 1888. Serial No. 273,755. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK A. CHENEY, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Lightning-Arresters for Electric Circuits, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

This invention is a safety appliance for electric systems, more especially electric-lighting or power circuits supplied by currents from one or more dynamo electric machines, its purpose being to protect the machines from injury or derangement by atmospheric electrical discharges. In such systems the currents developed by the generators are generally of such character that the passage of a high tension spark across the space between the saw-teeth of the lightning-arrester plates, with which the circuits are nearly always equipped, is liable to establish an arc which produces very injurious results. To avoid this it has been usual to employ some form of mechanism which will be actuated by the current that produces the spark or discharge to effect a greater or less separation of the saw-teeth or serrated plates, and thereby prevent the formation or continuance of an arc between them. Special mechanism has also been proposed which, when properly set or adjusted, will act first to separate the two plates and then restore them to their original position; but such apparatus, at best, is capable of restoring the plates to position but once, and requires to be reset after every discharge—a feature which, in the event of a severe electric disturbance of the atmosphere, renders its use of doubtful practicability.

My object in the present invention is to provide a mechanism which shall be capable, when tripped or set in operation by a high-tension discharge of dangerous character, of separating the serrated or other plates of the lightning-arrester to a safe distance and immediately restore them to their operative position an indefinite number of times, so that the apparatus will require attention or adjustment at long intervals only. This I accomplish by making one of the serrated plates part of

a rotating system, using a stop normally in the path of movement of some portion of the rotary mechanism which arrests the said plate in close proximity to the stationary plate, and combining with the said stop or catch an electro-magnetic tripping mechanism in the circuit made through the plates to ground. By such arrangement a discharge across the plates of a degree of sensitiveness determined by the character and adjustment of the electro-magnetic tripping mechanism energizes the tripping-magnet and releases the rotary devices. The movable plate is thus carried rapidly away from the other, and, making a complete revolution, is restored to its operative position by the re-engagement of the rotating part with the stop, which immediately upon the demagnetization of the tripping-magnet resumes its normal position in its path of movement.

The tendency of the mechanism to rotate is imparted to it by a clock mechanism, a weight, or by any other convenient form of motor.

The details of this mechanism are illustrated in the accompanying drawings, in which—

Figure 1 is a top view of the apparatus complete. Fig. 2 is a side view, and Fig. 3 an end view of the same.

The operative devices are mounted on an insulating base or plate, A, which is secured to a side wall or any other vertical support.

B is a support, to which is secured one of the serrated plates C of an ordinary lightning-arrester. D is the opposite plate carried by an arm, E, which, by means of a set-screw, e, is secured to a sleeve, F, on a rod or stud, G, set in the base A.

The sleeve F, which may be an ordinary shaft mounted in suitable bearings, carries also an arm, H, secured to it by a set-screw, h, and two spools, I I. A cord, b, wound around one of these spools carries a weight, J, which imparts to the sleeve a tendency to rotate. A cord is also wound in the opposite direction around the other spool, by means of which the weight is wound up when run down.

In the path of the arm H, or any other equivalent attachment to the sleeve F, is a catch or stop, K, which is adapted to be withdrawn from its path by an electro-magnet. The special disposition of these parts which I employ is shown to consist of an electro-magnet, M,

secured to the base A and provided with a non-magnetic yoke, L, secured to the poles. The lever K', which is formed with the catch, is welded to or forms part of an armature-plate, N. The lever K' extends from this plate at right angles and is pivoted in a slot in the yoke L, so that when the catch extends over into the path of arm H the armature-plate is tilted or at an angle to the poles of the magnet. An adjustable retractible spring, S, is connected to the armature-plate and maintains the catch normally in engagement with or in the path of movement of the arm H.

A binding post, O, affords the means by which a branch connection is made with the line or circuit to be protected. The path of a high-tension discharge is from this post to the plate C, thence across the gap to plate D, and thence through arm E, sleeve F, conductor R, the coils of the electro-magnet to the opposite binding-post, P, which is connected to earth.

If the discharge is sufficiently heavy, the magnet will be energized, the armature drawn down toward its poles, and the arm H released. The arm E will therefore be instantly carried in the direction of the arrow, separating plates C and D, and interrupting any arc that may be formed between them. By interrupting in this way any current that may have existed, the armature N is retracted and the catch K shifted over, so that after a complete revolution of the sleeve F it will intercept the arm H and retain the parts in their original

relative relations. This operation may be repeated a great number of times without any attention to the apparatus being required.

What I claim as my invention is—

1. The combination, with the plates of a lightning-arrester, of a rotary device carrying one of said plates, a catch or detent normally in the path of the rotary device, so as to restrain it against movement, and an electro-magnet in the circuit including the plates and adapted when energized to maintain the catch or detent out of the path of the rotary device, whereby the rotary device after being released by the action of the magnet will again encounter the said detent at the end of a complete revolution, as set forth.

2. In a lightning-arrester, the combination, with a stationary plate, of a movable plate, a sleeve or shaft capable of complete rotation, a motor for rotating the same, an arm extending from said sleeve and carrying the movable plate, a detent or catch normally in the path of movement of an arm secured to the rotary sleeve, and an electro-magnet in the circuit including the plates and adapted when energized to withdraw the detent or catch and set the sleeve in rotation, whereby the movable plate will be carried away from the stationary plate, as set forth.

FREDERICK A. CHENEY.

Witnesses:

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FRANK E. HARTLEY.