H. C. WALFORD.

LIGHTNING ARRESTER.

APPLICATION FILED NOV. 23, 1908.

959,658.

Patented May 31, 1910.

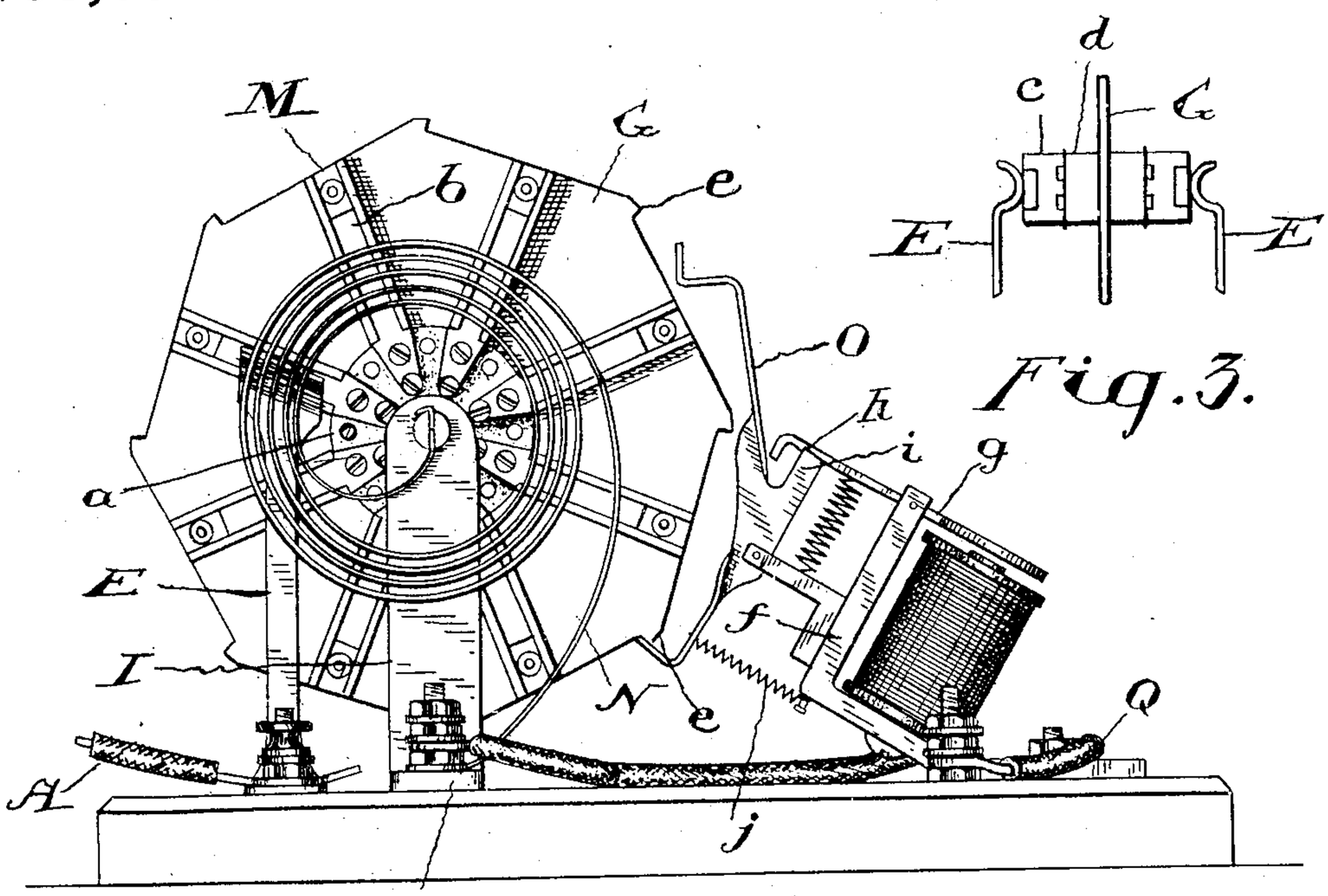

Fig. 1.

Fig. 3.

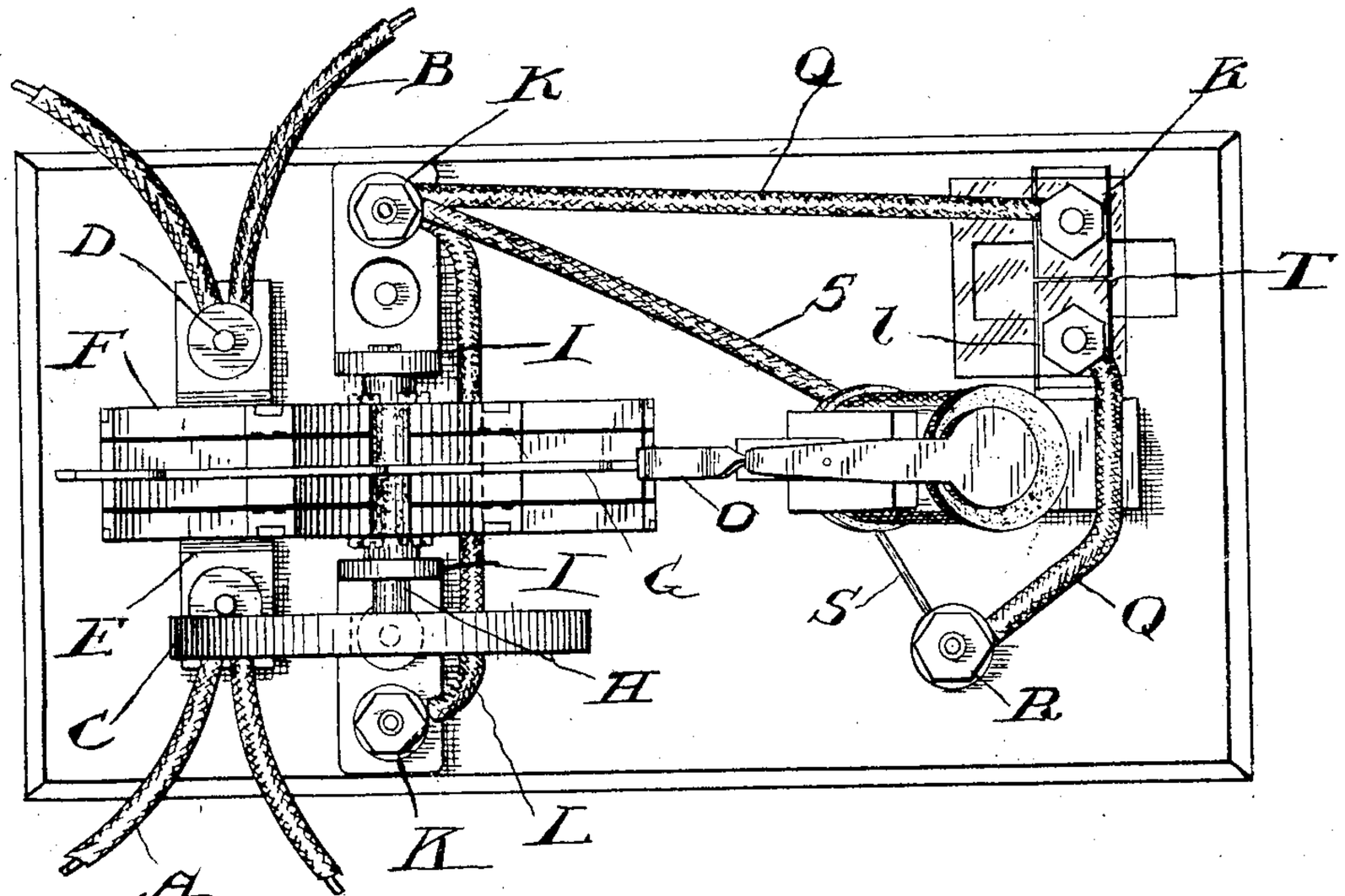

Fig. 2.

WITNESSES:

P. W. McKendrick

Edgar M. Sheffard

INVENTOR.

H. C. Walford.

BY Ridout & Maybee.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

HUGH C. WALFORD, OF BERLIN, ONTARIO, CANADA.

LIGHTNING-ARRESTER.

959,658. Specification of Letters Patent. Patented May 31, 1910.

Application filed November 23, 1908. Serial No. 464,120.

To all whom it may concern:

Be it known that I, HUGH C. WALFORD, of the town of Berlin, in the Province of Ontario, Canada, 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 type in which a metal block connected to earth is separated by small air gaps from blocks to which the line wires are connected. Such arresters, while effective, usually leave the system with which they are employed out of order after the passage of the disruptive discharge due to lightning owing to the fusing together of the blocks and the consequent grounding of the line.

It is my object to overcome this difficulty and I accomplish my purpose by supporting a plurality of independent arresters in such a manner that on the passage of a disruptive discharge the arrester in use at the time of the discharge is moved out automatically and another arrester moved into its place.

Figure 1 is a side elevation of my improved arrester. Fig. 2 is a plan view of the same. Fig. 3 is a sectional detail of an individual pair of arresters with their common ground.

In the drawings like letters of reference indicate corresponding parts in the different figures.

A B are the line wires connected to the binding posts C D respectively. These posts are electrically connected with the spring contact arms E F.

A metal disk G is mounted to rotate between the contact arms E F, being secured to a metal spindle H revolving in the metal standards I. These standards have bases J which are connected to binding posts K which are connected by the wire L. The metal disk G has disks of fiber *a* or other insulating material secured to opposite sides thereof, and to these fiber disks are connected a series of radial spring arms *b* which are adapted to clamp the individual arresters M against the metal disk G. These individual arresters are of a common type comprising two pairs of blocks *c d*, having an air gap formed between them. The inner blocks are in electrical contact with the disk G. The backs of the outer blocks *c* are grooved to receive the spring arms *b*. If either of the binding posts K be connected to earth and a pair of arresters is between the contact arms E F, as shown in the drawings, a disruptive discharge entering either of the binding posts C D will pass through one of the contact arms E F leap the air gap in the individual arrester in contact with the said contact arm, pass through the disk G, through the spindle H, one of the standards I and thence to earth. The passage of the disruptive discharge, however, will fuse together the parts of the arrester through which it has passed, and I therefore provide means conditioned to operate by the passage of the discharge for rotating the disk and bringing a fresh pair of arresters into position between the contact arms E F. For this purpose I provide means tending to rotate the disk, preferably a spiral spring N connected at one end to the spindle H and at the other to some stationary part. By rotating the disk G the spring may be wound. A step-wise movement of the disk is permitted by an escapement O which engages the shoulders *e* formed on the periphery of the disk G. This escapement is suitably pivoted on a stationary part, preferably the frame *f*, supporting an electromagnet P. This magnet is provided with a pivoted armature *g*, which is provided with a shoulder *h* adapted to engage the projection *i* to retain the escapement O in the position shown in the drawings.

A coil spring *j* secured to the escapement and the frame *f* tends to rock the escapement to release one of the shoulders *e*, but this movement is normally prevented by the engagement of the shoulder *h* with the projection *i*. If the electro-magnet be energized the armature will be rocked and the escapement allowed to rock to permit of the escape of one shoulder *e* and the engagement of the next shoulder *e* as the disk G is rotated by the spring N. A coil spring *m* normally holds the armature away from the magnet.

The electromagnet is energized as follows:—One of the binding posts K is connected by a wire Q with the binding post R which when the instrument is in use will be connected to earth. The electromagnet is in a shunt circuit S between the posts K and R, so that the disruptive discharge is divided, part passing direct to earth and part through the electromagnet. To insure the larger part of the disruptive discharge passing directly to earth and thus protecting the electromagnet from being burned out,

I form in the connection an air gap T. This is preferably formed by dividing the wire Q and connecting the divided ends to two metal plates *k l* between which the air gap is formed. This gap may be filled with carbon granules to reduce resistance. From this arrangement it follows that every time a disruptive discharge enters the line wires A or B and passes through either one of a pair of arresters to the ground that the disk G will be caused by the discharge of said current to rotate and bring a fresh pair of individual arresters into position for use.

What I claim as my invention is:—

1. A lightning arrester system comprising a rotatably mounted disk; a series of arresters carried by said disk each including an independent air gap; a common ground for said arresters; and a contact arm for connection electrically with a line wire and adapted to engage the arresters *seriatim* as the disk is rotated.

2. A lightning arrester system comprising a rotatably mounted disk provided with a series of radial pockets; a series of arresters removably carried by said disk in said pockets each including an air gap; a common ground for said arresters; and a contact arm for connection electrically with a line wire and adapted to engage the arresters *seriatim* as the disk is rotated.

3. A lightning arrester system comprising a rotatably mounted disk; a ground plate carried thereby; a series of arresters carried by said disk and adapted to ground through said plate; and a contact arm for connection electrically with a line wire and adapted to engage the arresters *seriatim* as the disk is rotated.

4. A lightning arrester system comprising a rotatably mounted disk; a ground plate carried thereby; a series of arresters carried by said disk at opposite sides of said plate and adapted to ground through said plate; and contact arms for connection electrically with line wires adapted to engage the arresters *seriatim* as the disk is rotated.

5. A lightning arrester system comprising a contact arm adapted for connection to a line wire; a series of arresters, arranged on a common support, movable *seriatim* into engagement with the contact arm and having a common ground; means tending to move said arresters; escapement mechanism adapted to permit of a step wise movement of said arresters one by one; and means whereby the passage of a disruptive discharge through the arm and an arrester conditions the operation of said escapement mechanism.

6. A lightning arrester system comprising a contact arm adapted for connection to a line wire; a series of arresters, arranged on a common support, movable *seriatim* into engagement with the contact arm and having a common ground; means tending to move said arresters; escapement mechanism adapted to permit of a step wise movement of said arresters one by one; and an electromagnet adapted to operate said escapement mechanism the said magnet being located in a shunt circuit of the ground connection of the arresters.

7. A lightning arrester system comprising a contact arm adapted for connection to a line wire; a series of arresters, arranged on a common support, movable *seriatim* into engagement with the contact arm and having a common ground; means tending to move said arresters; escapement mechanism adapted to permit of a step wise movement of said arresters one by one; an electromagnet adapted to operate said escapement mechanism the said magnet being located in a shunt circuit of the ground connection of the arresters; and an air gap placed in said ground connection.

8. A lightning arrester system comprising a contact arm; a series of arresters arranged on a rotatably mounted disk movable to bring said arresters *seriatim* into contact with said arm; a common ground for said arresters; and means whereby the passage of a disruptive discharge through said arm and an arrester causes a partial rotation of said disk to move a new arrester into position.

9. A lightning arrester system comprising a contact arm; a series of arresters arranged on a rotatably mounted disk movable to bring said arresters *seriatim* into contact with said arm; a common ground for said arresters; means tending to move said arrester disk; escapement mechanism adapted to permit of a step wise movement of said disk; and means whereby the passage of a disruptive discharge through the arm and an arrester conditions the operation of said escapement mechanism.

10. A lightning arrester system comprising a contact arm; a series of arresters arranged on a rotatably mounted disk movable to bring said arresters *seriatim* into contact with said arm; a common ground for said arresters; means tending to move said arrester disk; escapement mechanism adapted to permit of a step wise movement of said disk; and an electromagnet adapted to operate said escapement mechanism the said magnet being located in a shunt circuit of the ground connection of the arresters.

11. A lightning arrester system comprising a contact arm; a series of arresters arranged on a rotatably mounted disk movable to bring said arresters *seriatim* into contact with said arm; a common ground for said arresters; means tending to move said arrester disk; escapement mechanism adapted to permit of a step wise movement of said disk; an electromagnet adapted to operate said escapement mechanism the said magnet

being located in a shunt circuit of the ground connection of the arresters; and an air gap placed in said ground connection.

12. A lightning arrester system comprising contact arms; a double series of arresters arranged on a rotatably mounted disk movable between said arms each of said arresters including an independent air gap; a common ground for said arresters; and means whereby the passage of a disruptive discharge through said arms and an arrester causes a partial rotation of said disk to move a new arrester into position.

13. A lightning arrester system comprising contact arms; a double series of arresters arranged on a rotatably mounted disk movable between said arms; a common ground for said arresters; means tending to move said arrester disk; escapement mechanism adapted to permit of a step-wise movement of said disk; and means whereby the passage of a disruptive discharge through the arms and an arrester conditions the operation of said escapement mechanism.

14. A lightning arrester system comprising contact arms; a double series of arresters arranged on a rotatably mounted disk movable between said arms; a common ground for said arresters; means tending to move said arrester disk; escapement mechanism adapted to permit of a step-wise movement of said disk; and an electromagnet adapted to operate said escapement mechanism the said magnet being located in a shunt circuit of the ground connection of the arresters.

15. A lightning arrester system comprising contact arms; a double series of arresters arranged on a rotatably mounted disk movable between said arms; a common ground for said arresters; means tending to move said arrester disk; escapement mechanism adapted to permit of a step-wise movement of said disk; an electromagnet adapted to operate said escapement mechanism the said magnet being located in a shunt circuit of the ground connection of the arresters; and an air gap placed in said ground connection.

Berlin this 28 day of October 1908.

HUGH C. WALFORD.

Signed in the presence of—

ROY KLEINSMITH,

GEORGE DOUGLAS RICHMOND.