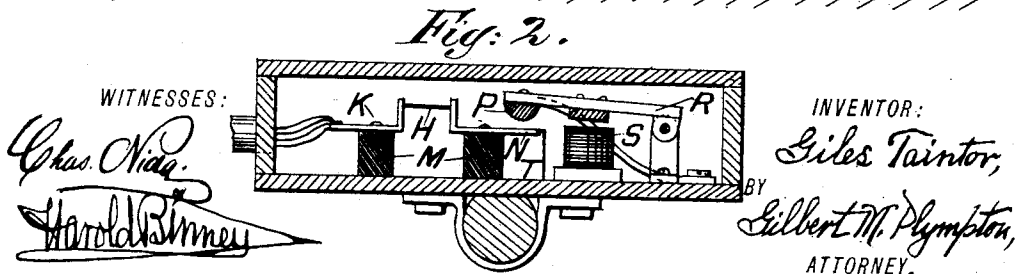
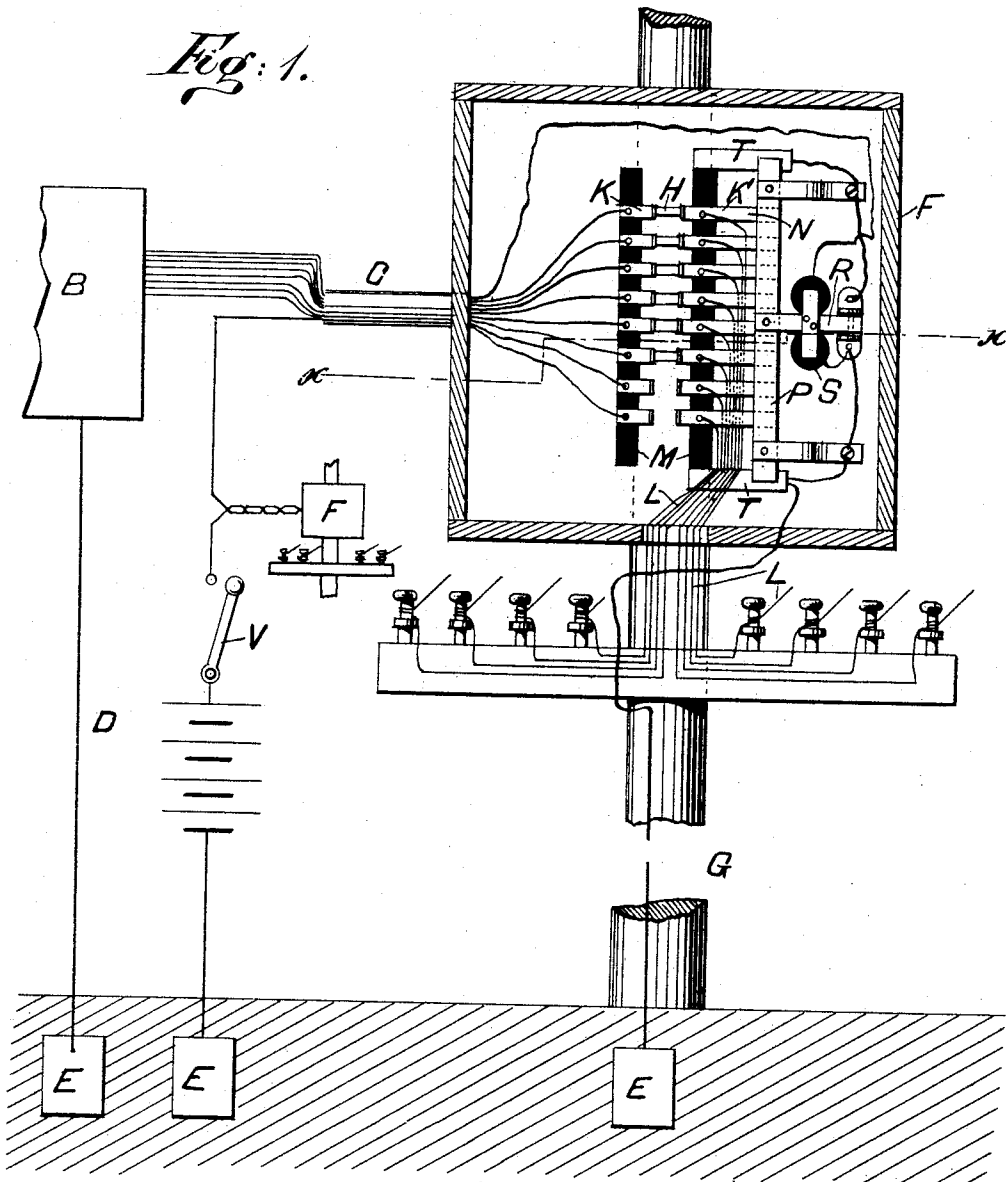


(No Model.)

G. TAINTOR.  
ELECTRO MAGNETIC CUT-OUT.

No. 447,529.

Patented Mar. 3, 1891.



# UNITED STATES PATENT OFFICE.

GILES TAINTOR, OF WORCESTER, MASSACHUSETTS.

## ELECTRO-MAGNETIC CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 447,529, dated March 3, 1891.

Application filed August 16, 1890. Serial No. 362,250. (No model.)

*To all whom it may concern:*

Be it known that I, GILES TAINTOR, a citizen of the United States, residing at Worcester, county of Worcester, and State of Massachusetts, have invented a new and useful Method of and Apparatus for Protecting Electrical Instruments and Conductors from Heavy Currents and for Grounding the Several Lines at Various Points, of which the following is a specification.

In extended electric systems heavy currents are often generated by atmospheric charges and the consequent differences of potential at the surface of the earth. These phenomena occur especially during thunder-storms, and frequently, besides burning out fuse wires and plugs, do serious injury to the instruments in circuit. In consequence it is necessary to test the lines to locate the damages and to repair the same. If this only amount to replacing fuse wires and plugs, delay is caused and consequent loss. By my device, however, I am enabled to ground the line at various points during dangerous disturbances, and thus shunt the heavy currents away from the fuses and instruments and insure their safety. By the same device I greatly facilitate the testing of the lines, the location of any breaks or faults, and the ready determination of whether trouble exists in the cable or in the local wires.

One embodiment of my invention as applied to telephone-lines is illustrated in the accompanying drawings, wherein—

Figure 1 is a diagrammatic illustration of circuits and apparatus, showing grounding device in elevation. Fig. 2 is a horizontal sectional view of the same on lines X X of Fig. 1.

Like reference-letters indicate like parts.

C is the usual cable running to the switch-board B.

D is the ground-connection from switch-board to earth E.

The switch-board B is merely indicated. Its details are immaterial to my invention.

F are the cable-boxes located on the telegraph-poles G or at other convenient places, only one of which is shown in detail.

H are heavy-current protectors or fusible connections of any desired type, preferably retained between pairs of spring-supports K

K'. To these protectors H the wires of the cable severally lead, and from them on the other side are lead the respective local line-wires L. The springs K K' may be mounted on insulating-bases M, as indicated. To the spring-strips K', which are on the local wire side of the heavy-current protectors, I connect contacts N. These, as shown, are preferably integral extensions of strips K', and have some resilience to insure the contact of them all with their common opposite contact P on the grounding-switch. This movable contact P is attached to the armature-lever R, suitably pivoted and bearing the armature of an electro-magnet S. Any convenient retracting device may be employed, though I have shown springs that are adapted to afford additional support to the pivot of lever R by exerting equal pressure on and guiding the movements of the two ends of contact-block P. When the lever is drawn down and connection is made with contacts N, the ends of movable contact P rest on the metallic blocks T. These blocks, the retracting-springs, and the armature-lever are all connected to earth, thus affording ample means for the grounding of all currents coming over the line-wires.

From the exciting-coil of electro-magnet S one terminal is led to earth and the other out through the cable to the office, thence through a switch V and battery back to earth. I am thus enabled by simply closing switch V to put the junctions of the outside lines with the cable to earth. It will also be seen that the one switch V may control any number of such grounding devices, and thus enable me to put the same or different lines simultaneously to earth at various places. This is conventionally expressed in the drawings by a second cable-box F, (shown in series connection,) though other connection would be equally effective.

I have shown and described my ground-connection as running to the outside wire side of the fusible connection. This is matter of choice, as it is only necessary to run connections from any points in the lines to the contacts N in the manner described to effect grounding at said points.

It will now be clear from the foregoing that during dangerous electrical disturbances—

such as thunder-storms and the like—I can cut off my switch-board from outside currents, while opening switch V, releasing armature R, and breaking contacts with block P restores the lines to their normal condition.

Beside the protection of the cable and switch-board I afford protection to the fusible connections which are principally of use against currents derived from accidental contacts with high-tension wires and which during thunder-storms are burned out to such extent that much loss of time and great expense ensue. I also afford a simple and convenient means of testing the lines both for burned-out safety connections or breaks and for general trouble by enabling the tester to put a common ground on the line between line wire and cable.

Having now fully set forth my invention in its application to one electric system I limit myself neither to this application nor to the details of parts and operation, but claim—

1. In combination with the other operating parts of an electric system of telegraph, tele-

phone, or similar conductors, contacts connected with the several conductors, a contact-block common to several of said contacts and connected to earth, and electrically-operated means for making and breaking connection between said contacts and said contact-block, substantially as set forth.

2. In combination with a telephone, telegraph, or like system of electrical conductors, contacts connected to line and cable wires at their junction, a contact-block connected to earth and adapted to contact with the line-contacts, an electro-magnet, armature, lever, and retracting device for making and breaking such contact, and a switch and connections for making and breaking current in the said electro-magnet, substantially as set forth.

In testimony whereof I have hereunto set my hand, this 12th day of August, A. D. 1890, in the presence of two subscribing witnesses.

GILES TAINTOR.

Witnesses:

JNO. B. HUNT,

L. J. SHAY.