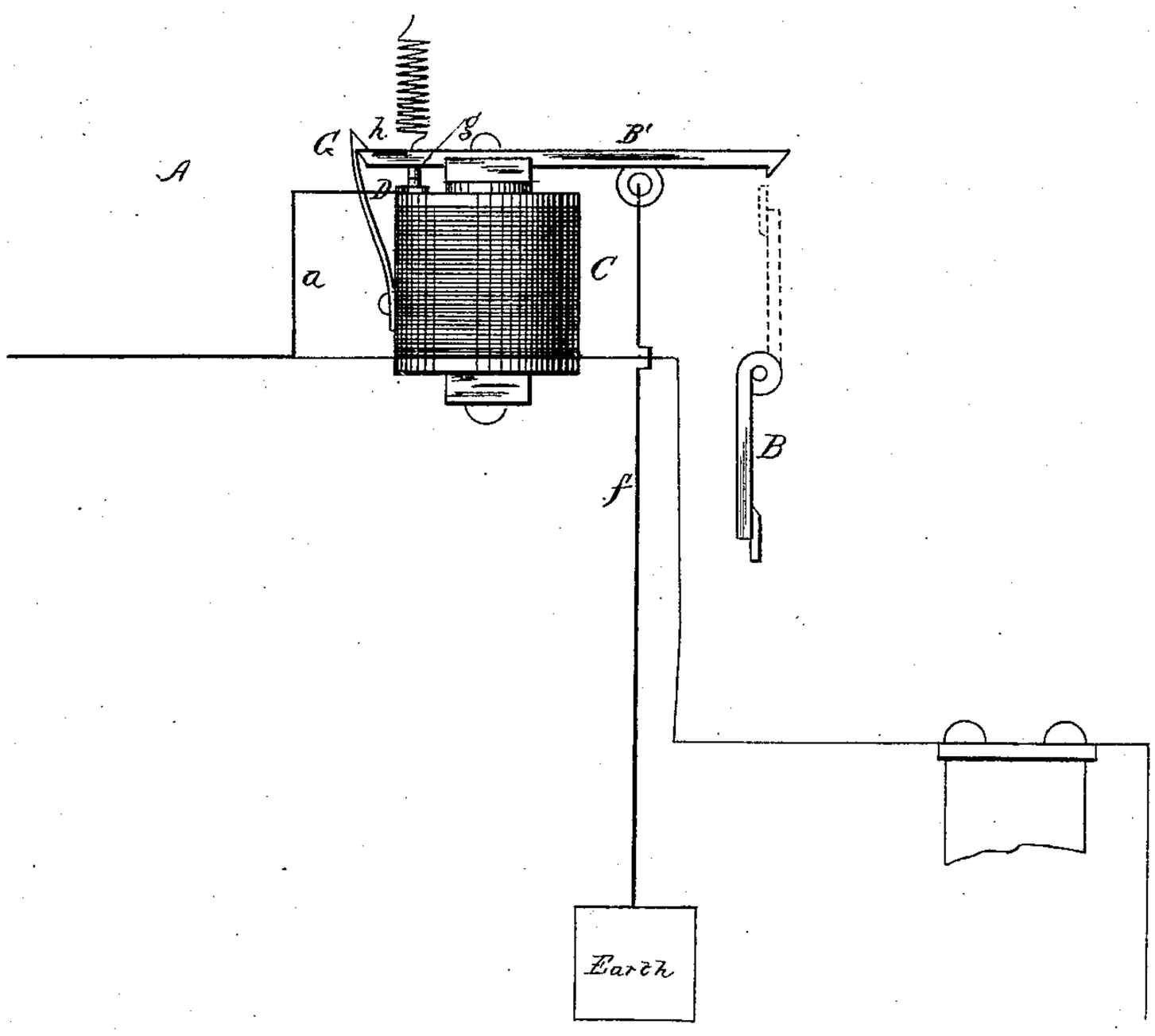
(No Model.)

M. D. & T. A. CONNOLLY.

PROTECTOR FOR ELECTRICAL INSTRUMENTS.

No. 279,713. Patented June 19, 1883.



WITNESSES

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UNITED STATES PATENT OFFICE.

M. DANIEL CONNOLLY, OF PHILADELPHIA, PENNSYLVANIA, AND THOMAS A. CONNOLLY, OF WASHINGTON, DISTRICT OF COLUMBIA.

PROTECTOR FOR ELECTRICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 279,713, dated June 19, 1883.

Application filed February 16, 1883. (No model.)

To all whom it may concern:

Be it known that we, M. DANIEL CONNOLLY, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, and THOMAS A. CONNOLLY, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Protectors for Electrical Instruments; and we do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawing, which forms part of this specification, in which is shown a side elevation of a telephonic exchange annunciator-magnet with protecting devices.

Our invention has relation to that class of devices known as "protectors for telegraphic, telephonic, and other electrical instruments," and which operate, when abnormally-powerful currents fall on the line, to divert the same to ground or return by change of circuit through the movement of an armature.

Our improvements have for their object to provide a construction of such protector which will avoid needless duplication of parts at telephonic exchanges and other places where entering electric wires lead to an annunciator.

Our improvements consist in so constructing such annunciators that while they will perform their usual services when actuated by ordinary working-currents they will also operate as protectors against the injurious effects of abnormally-powerful currents accidental circuiting through the lines.

Our improvements consist accordingly, in the first place, in constructing an annunciator so that it will operate as a protector; and, secondly, in the specific construction and combination of parts hereinafter described.

Referring to the accompanying drawing, A indicates a portion of the annunciator of a telephone-exchange or like office.

B designates the shutter or drop, which is arranged in the ordinary way to be held up by a catch on the armature-lever B′, and allowed to fall when the armature is attracted toward the annunciator-magnet C. The line enters the magnet C and continues thence to the telephone or other device located in its path to earth or return, as may be convenient or usual, for signaling or calling purposes. The ordinary working-circuit is in the direction described. From the line outside the magnet a branch, *a*, leads to a stop or conducting-point, D, attached to the magnet-head or to any other suitable insulated support. Another branch line, *f*, leads from the armature-lever to ground. The armature-lever is provided with a stop, *g*, or has its under side suitably adapted to make contact with the stop D when the armature is brought in contact with the pole or poles of the magnet. Such contact of armature or pole can only take place when the magnet is strongly energized by a powerful abnormal current, its movement under ordinary circumstances being limited by a spring-catch, G, against which presses the elongated point *h* of the armature-lever. Sufficient play is, however, allowed to effect a release of the annunciator-drop. A powerful current attracts the armature with sufficient force to overcome the obstruction of the spring-catch and bring the stops D *g* in contact. At the same time an engagement is effected between said catch and the armature-lever, and the latter is held down. As soon as the stops D *g* come together a new path is formed for the current, being then through the branch *a*, armature-lever B′, and earth branch *f*, which path the current takes by preference, as it is of practically no resistance, being outside and independent of the magnet. The magnet is therefore protected, as are also the telephone, bell, and other instruments, from burning or other injury, as the initial stroke or passage of the current is but momentary, the annunciator-magnet responding instantly to the powerful current, and immediately diverting the same to earth.

Each of the annunciator-magnets should be provided with the parts and circuits suggested, whereby the provision of special protecting-magnets and appurtenances is avoided, each annunciator-magnet being practically a self-acting protector for itself and for the other instrument on the line to which it pertains.

What we claim as our invention is—

1. The combination, with a magnet and its armature-lever, constructed and adapted for annunciator purposes, of the spring-catch G, contacts D *g*, and connections *a f*, whereby

change of circuit is effected and maintained when said magnet is powerfully or abnormally energized, substantially as described.

2. The combination, with an annunciator-magnet, its armature, armature-lever, and drop or shutter, said armature-lever being constructed and adapted to retain said drop and to release it when the magnet is energized by normal currents, of suitable contacts, shunts, and a catch, whereby abnormal currents will be short-circuited to earth, and the short circuit maintained by the closing of said contacts, the establishment of the shunt-circuit, and the engagement of the catch with the lever, substantially as described.

In testimony that we claim the foregoing we have hereunto set our hands this 14th day of February, 1883.

M. DANL. CONNOLLY.
THOMAS A. CONNOLLY.

Witnesses:
A. A. CONNOLLY,
D. MOFFETT.