No. 743,540. PATENTED NOV. 10, 1903.

L. W. MILLER.

ELECTRIC CUT-OUT.

APPLICATION FILED FEB. 26, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

FIG. 1.

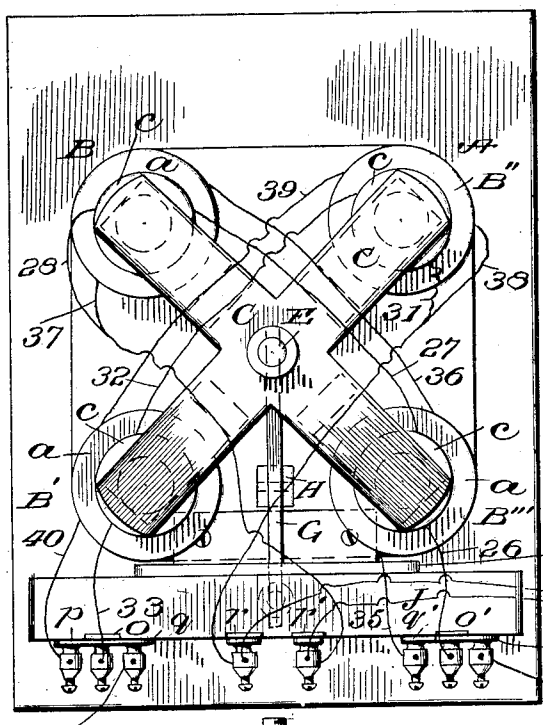
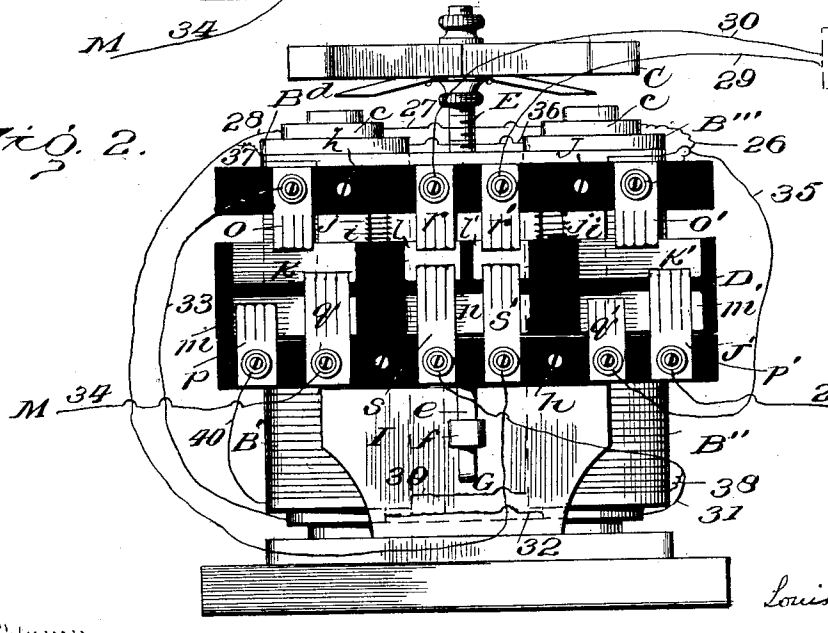


FIG. 2.



Inventor

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Witnesses

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Attorney

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

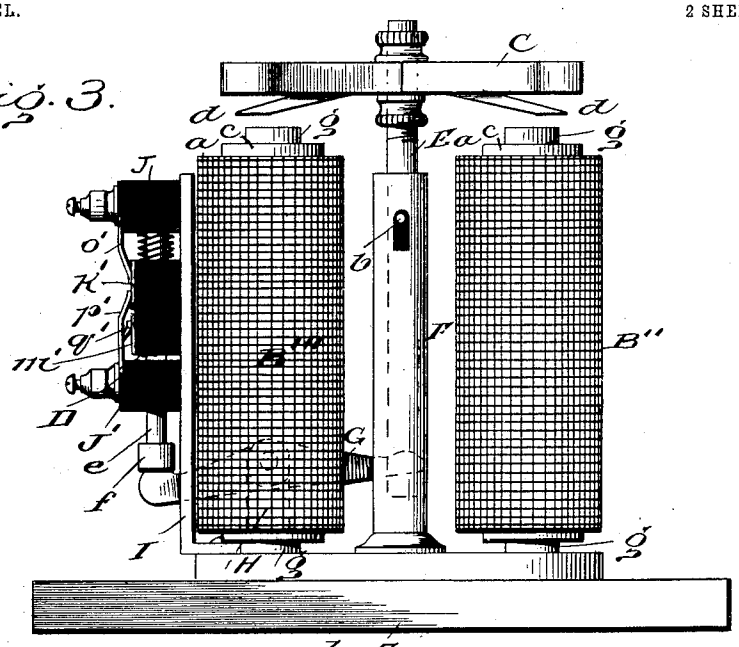


Fig. 4.

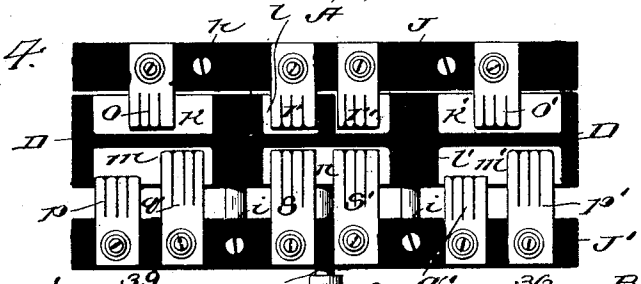
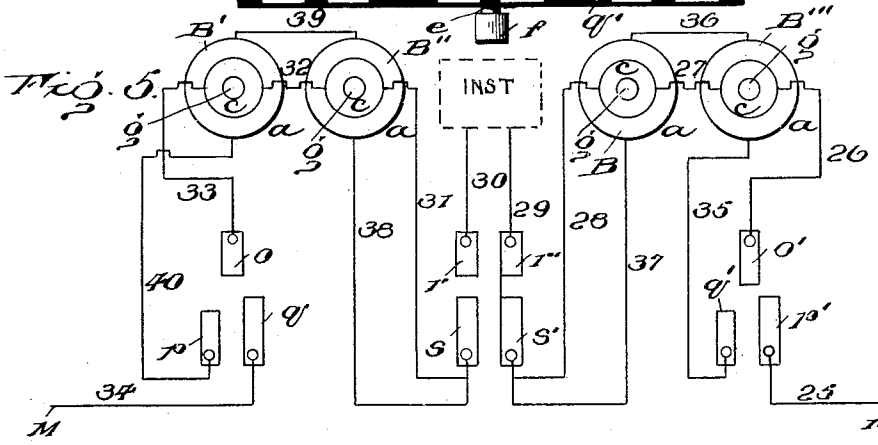


Fig. 5.



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No. 743,540. Patented November 10, 1903.

UNITED STATES PATENT OFFICE.

LOUIS W. MILLER, OF ROCHESTER, NEW YORK, ASSIGNOR TO ALERT MANUFACTURING COMPANY, OF ROCHESTER, NEW YORK.

ELECTRIC CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 743,540, dated November 10, 1903.

Application filed February 26, 1903. Serial No. 145,187. (No model.)

To all whom it may concern:

Be it known that I, LOUIS W. MILLER, a resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Electric Cut-Outs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

The invention relates to an improved electrical cut-out designed to prevent injury to telephones, signal-boxes, and other electrical apparatus from excessive currents.

In the accompanying drawings, Figure 1 is a plan view. Fig. 2 is a front elevation. Fig. 3 is a side elevation. Fig. 4 represents the contacts in the position they occupy when the instrument to be protected is cut out, and Fig. 5 is a diagram representing the electrical connection.

The improved cut-out consists, essentially, of the base A, the coils B B′ B″ B‴, the armature C, the movable block D, and the contact devices.

M represents a main or line wire, and the arrangement is such that when an excessive current occurs on the line-wire the armature C is attracted by the coils, and this, through a suitable lever connection, moves the block D into position represented in Fig. 4, opens the line-wire, and cuts out the instrument, the dangerous current continuing to flow through the coils, which are made double and of different sizes of wire. The outer wire is a coarser wire than the inner one, *c*, and adapted to carry the heavy current without becoming unduly heated. By the operation of the magnets the unusual current is shifted from the inner to the outer coils.

In the construction shown the armature is made in the shape of a cross, and one of the magnets is placed under the end of each of the arms. The armature is supported by a sliding rod E, arranged to move in a central post F, an opening or slot *b* and pin, Fig. 3, or other suitable device being provided to limit the movement. Elastic strips of non-magnetic metal *d* are attached to the armature to prevent adhesion.

G is a lever pivoted to a standard H on the base, which transmits the movement of the armature to the rod *e*, inserted in the block D. At its lower end the rod *e* is provided with a collar *f*, against which the rounded outer end of the lever bears. When the armature is attracted by the magnets, the block D is shifted upward—that is, moved from the position represented in Fig. 2 to that shown in Fig. 4. The coils or magnets are provided with suitable cores *g*. An upright plate or standard I supports the bars J J′, which are of suitable insulating material, attached to the plate by the screws *h*. The block D, which is also made of suitable insulating material, is arranged to slide on suitable ways between the bars J J′—such, for instance, as the rods *i i*, provided with springs *j j*, which normally hold it in the depressed position represented in Fig. 2. The upper ends of the spring enter suitable recesses in the bar J. Each of the contact-plates *k k′*, *l l′*, *m m′*, and *n* is attached to block D. The bars J J′ are provided with the contact-springs *o o′*, *p p′*, *q q′*, *r r′*, *s s′*, each provided with a binding-post and arranged to make or break contact with the plates on the block D when the latter is shifted in position, as indicated in Figs. 2 and 4.

The electrical connections are herein shown as arranged on the exterior of the cut-out for clearness of illustration; but it will be understood that many of them may be concealed or arranged within the base in the practical apparatus. The current when the cut-out is in normal position arrives by the main line-wire 25, Figs. 1 and 2, and after traversing the inner coils *c c* of the magnets B B‴ is conducted through the telephone, signal-box, or other instrument to be protected by the wires 29 and 30 and being then led through the inner coils *c c* of the magnets B′ B″ is thence returned to the main line-wire 34. The main wire 25 is connected to the binding-post of the contact-spring *p′*, and the current thence passes through the metallic plate *k′* on the insulating-block D to the contact-spring *o′* and from its binding-post by the wire 26 to the inner coils of the magnet B‴, which is connected with the inner coils of the magnet B by wire 27. Thence the current passes through the wire 28 to the binding-post on one of the central contact-springs *s′*, which

bears on plate l', connected to the instrument by spring r' and wire 29. From the instrument the current returns to the cut-out by the wire 30 and passes by the spring r, plate l, spring s, and wire 31 to the inner coil of the magnet B″. The inner coils of the magnets B′ B″ are connected by the wire 32, and from the inner coils c of the magnet B′ the circuit passes through wire 33 to the contact-spring o, the plate k, the spring q, and so to the main 34.

When the block D is shifted by the action of the magnets, the plates l l' are moved out of contact with the springs s s', as indicated in Fig. 4, and consequently the current cannot reach the instrument to be protected. At the same time the plates k and k' are shifted out of contact with the springs q p', so that the current is cut off from the inner coils c of the magnets; but it is permitted to traverse the outer coarser coils through the plates m m', the springs p q', and the wires 35, 36, 37, 38, 39, and 40. Connection between the springs s s' is established through the plate n on the insulating-block D. The arrangement of the connecting-wires will be readily understood from the diagram Fig. 5.

It will be understood that the parts of the apparatus may be arranged in different ways from that herein shown, and the improved cut-out may be applied to any purpose when it is required to protect any sort of electrical instrument from a current which would injure it.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with an electrical instrument to be protected, and a line-circuit therefor, of a cut-out having two magnets, each magnet having a fine inner coil and a coarse outer coil, an armature for said magnets normally retracted but adapted to be moved by an abnormal current in said fine coils, an insulating-block, means between the armature and block for moving the latter, electrical contacts on said insulating-block, and circuit connections normally closing the circuit of the fine coils of one magnet to one side of the instrument to be protected, and closing the fine coils of the other magnet to the other side of said instrument, said contacts opening the circuit through the fine coils when moved, contacts normally holding the circuit of the coarse coils open but adapted to close the same when said insulating-block is moved.

2. The combination with an electrical instrument to be protected of a line-circuit therefor, of a cut-out having two magnets, each magnet having a fine inner coil and a coarse outer coil, an armature for said magnets normally retracted but adapted to be moved by an abnormal current in said fine coils, an insulating-block, electrical contacts thereon, and circuit connections normally closing the circuit of the fine coils of one magnet to one side of the instrument to be protected, and closing the fine coils of the other magnet to the other side of said instrument, said contacts opening the circuit through the fine coils when moved, contacts normally holding the circuit of the coarse coils open but adapted to close the same when said insulating-block is moved, and a lever and suitable connections whereby the armature and lever move said insulating-block.

3. The combination with an electrical instrument located in a line-circuit, of the magnets B B′ B″ B‴ arranged in pairs on each side of the instrument and having fine inner and coarse outer coils, the cross-shaped armature, the central rod supporting the armature, the lever, the movable insulating-block carrying suitable contact-plates, the contact-springs and suitable electrical connections, substantially as described.

4. The combination with an electrical instrument located in a line circuit, of a double electrical cut-out, comprising the base A, the magnets B B′ B″ B‴ connected in pairs to each side of the instrument, the cross-shaped armature C, its supporting-rod E, the lever G and the movable insulated contact-plates, suitable contact-springs and electrical connections, whereby the excess of current breaks the circuit on each side of the instrument and shunts it from the inner to the outer coarser coils, substantially as described.

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

LOUIS W. MILLER.

Witnesses:
GEO. B. SELDEN,
H. R. SELDEN.