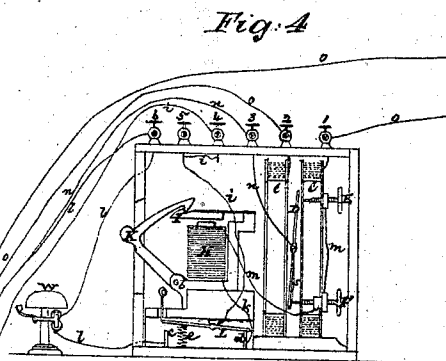
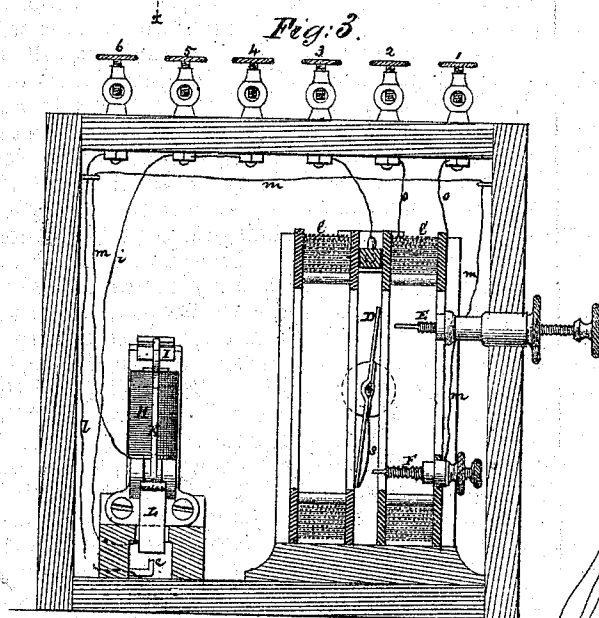
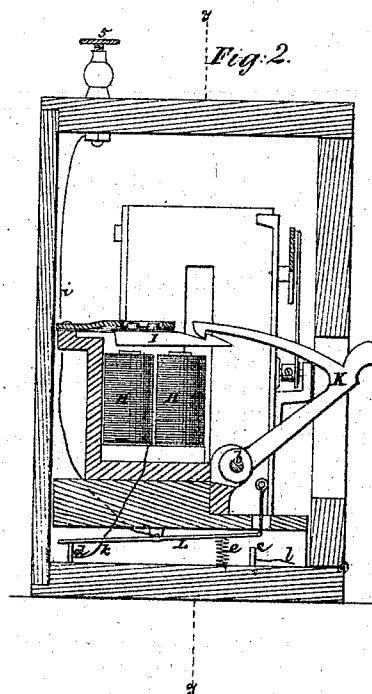
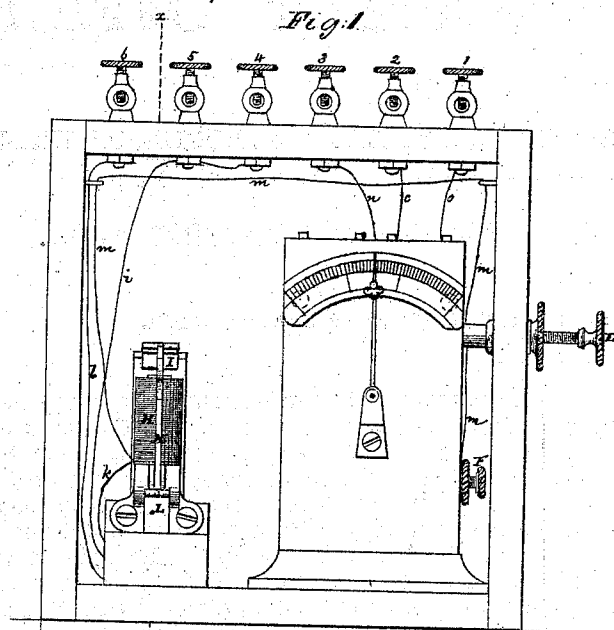
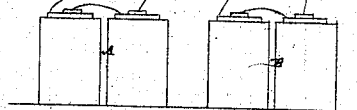


EDWIN HOLMES & HENRY C. ROOME.
 Improvement in Circuit Closers for Electrical Burglar Alarms and Signals.
 No. 120,744.
 Patented Nov. 7, 1871.



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UNITED STATES PATENT OFFICE.

EDWIN HOLMES, OF BROOKLYN, NEW YORK, AND HENRY C. ROOME, OF JERSEY CITY, NEW JERSEY.

IMPROVEMENT IN CIRCUIT-CLOSERS FOR ELECTRICAL BURGLAR-ALARMS AND SIGNALS.

Specification forming part of Letters Patent No. 120,744, dated November 7, 1871.

To all whom it may concern:

Be it known that we, EDWIN HOLMES, of Brooklyn, in the county of Kings and State of New York, and HENRY C. ROOME, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Circuit-Closers for Electrical Burglar-Alarms and Signals, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing forming part of this specification.

Our invention relates to circuit-closers for that class of burglar-alarms and signals which are operated by a difference in the flow of the current of a closed circuit; and the invention consists in a permanent magnet surrounded by one or more magnetic coils, thereby forming an improved circuit-closer. The invention likewise comprises a certain combination of an armature with a circuit-closer, whereby the synchronous opening of one circuit and closing of another is effected by the action of said armature; and the invention furthermore includes a combination, with the permanent magnet, of a foil spring, whereby a more complete or perfect contact is obtained between said magnet and the point it makes and breaks circuit with.

Figure 1 represents an interior front view of an apparatus having our invention applied to it; Fig. 2, a vertical section through the line *x x* in Fig. 1; Fig. 3, a vertical section through the line *y y* in Fig. 2; and Fig. 4, a diagram, showing the connection of the apparatus with certain batteries and an alarm-bell.

Similar letters of reference indicate corresponding parts throughout the several figures.

D in the accompanying drawing is the permanent magnet surrounded or inclosed by one or more magnetic coils, C. F is an adjusting-screw, arranged so that when the coils C are not charged it will always be in metallic connection with the magnet D by the impinging or embedding of it, as produced by the deflection of the magnet against or within a fine foil springs, one end of which is soldered to the magnet. Said spring is used to insure electrical contact with the screw F, and, by making said spring of thin foil, this is more effectually and certainly accomplished than when mere contact of the spring and end of the screw is relied upon, as dust or dirt getting upon the end of the screw would arrest or interfere with

the passage of the current, whereas a spring made of thin foil allows of the point of the screw embedding itself therein; consequently the fouling of the end of the screw would be of but little or no importance. E is a similar screw, but so arranged and adjusted that when the usual current is passing through the coils C the magnet D will almost, but not quite, touch it. H represents a pair of electro-magnets, provided with an armature, I, which is notched at its one end so as to engage with a hook upon the arm of a drop, K, pivoted, as at *b*, and so arranged and constructed that when released by the armature I it will fall upon and move downward an upright arm of a circuit-breaker, L, and cause the latter to rest upon a pin, *c*. Said circuit-breaker L is pivoted intermediately of its length, so that when its one end is in contact with the pin *c* its other end will be thrown up and made to break contact with a pin or stop, *d*. The circuit-breaker L has its contact with the pin or stop *c* broken and its contact with the pin *d* established by a spring, *e*, when relieved from the weight of the drop K. The pivot of L is connected, by a wire, *i*, with screw-cups 4 and 5, and connection continued from thence, by the wire *i*, to one pole at the battery B; and the pin or stop *d* is connected, by a wire, *k*, to the wire of the electro-magnets H, and connection continued from thence, by a wire, *m*, to the adjusting-screws E and F. The pin *c* is connected, by a wire, *l*, to a signal or alarm-bell, W, and from thence, by said wire, *l*, through a screw-cup, *b*, to the other pole of the battery B. A is a battery, having one of its poles connected, by a wire, *o*, to the place or structure to be guarded or signal to be made, from whence said wire returns to a screw-cup, 1, and, passing through the magnetic coils C, emerges at a screw-cup, 2, and from thence to the other pole of the battery A. The permanent magnet D is in connection, by a wire, *n*, through a screw-cup, 3, with the battery B.

The operation of the invention as applied to a burglar-alarm, which is the purpose here selected for illustration, is as follows: When the points or places to be guarded are closed and secured, a current will flow from the battery A through the wire or circuit *o* and magnetic coils C. This will cause the magnet D to approach closely to, but not quite touch, the adjusting-screw E, at the same time breaking contact between the magnet D and screw F. The drop K is set to engage with the

armature I. This being the condition, the circuit-closer is then in proper position for protecting the exposed points or places, and the magnet D, as in Fig. 3, touches neither of the adjusting-screws E and F. If any attempt be made to enter the point or place guarded by means which cause the flow of the current through the coils C to be increased, then the magnet D will instantaneously deflect to a contact with the adjusting-screw E. This will close the circuit *i* of the battery B, and the current, passing through magnet H and attracting the armature I, will release the drop K, which, in falling upon the upright arm of the circuit-breaker L, will break contact between the latter and the pin *d* and establish contact between said circuit-breaker and the pin or stop *e*, thereby completing the circuit *l* through the alarm W and the battery B and sounding a continuous alarm. If any attempt be made to enter the point or place guarded by means which cause the flow of the current through the circuit *o* to be broken or diminished, the magnet D would fall and establish contact with the adjusting screw F, and thus close the circuit *i m* of the battery B and sound the alarm, as before.

While we prefer to use two batteries, A and B, as described, one battery might be made to answer without changing the character or principle of the invention. Neither do we confine ourselves to making the magnet D of itself close the

circuit of the battery B, as it is obvious that said magnet might be made to carry or actuate an independent circuit-closer with substantially the same effect; nor do we restrict ourselves to the use of the adjusting-screws E and F, as a like contact with the magnet D can be made in various ways or by other means without changing the invention.

Instead of the alarm-bell, too, any other audible or visible signal might be used.

What we here claim, and desired to secure by Letters Patent, is—

1. The circuit-closer, consisting of the permanent magnet D, surrounded or inclosed by the magnetic coil or coils C C, charged by a primary circuit, and operating substantially as described, for the purpose set forth.

2. The combination of the armature I with the circuit-closer L, whereby the synchronous opening of one circuit and the closing of another by the action of said armature is effected, substantially as specified.

3. The combination of the foil spring *s* with the magnet D, essentially as described.

EDWIN HOLMES.

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Witnesses:

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