(No Model.)

2 Sheets—Sheet 1.

G. B. LEHY.

ELECTRIC BURGLAR ALARM.

No. 364,764. Patented June 14, 1887.

Fig: 1.

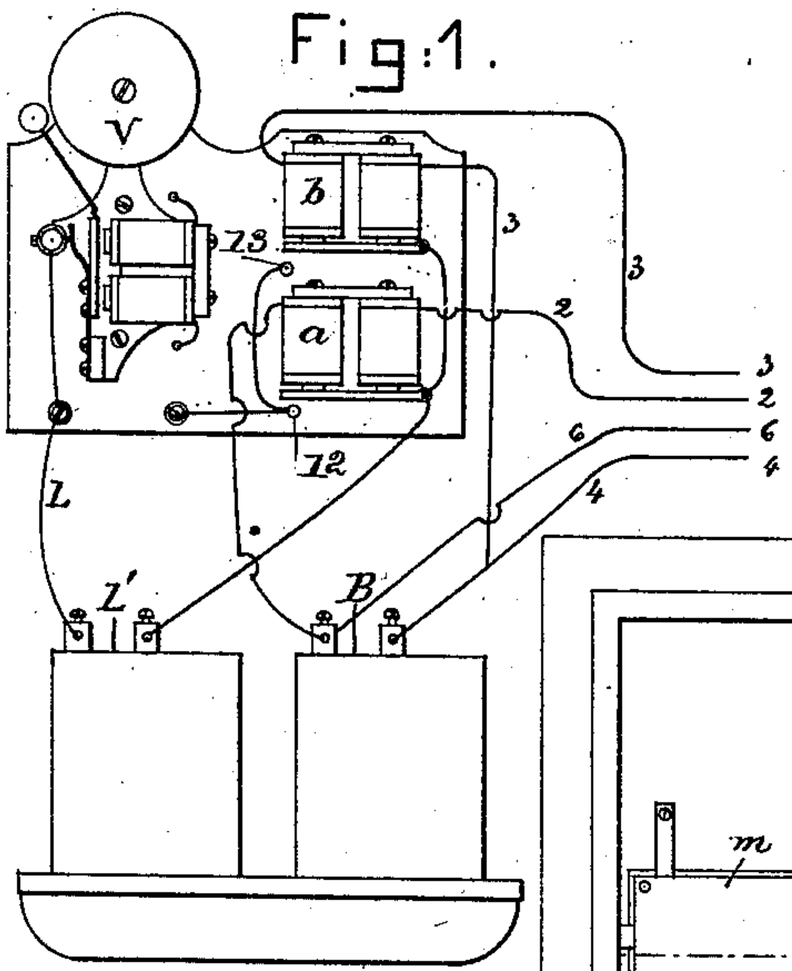


Fig: 2.

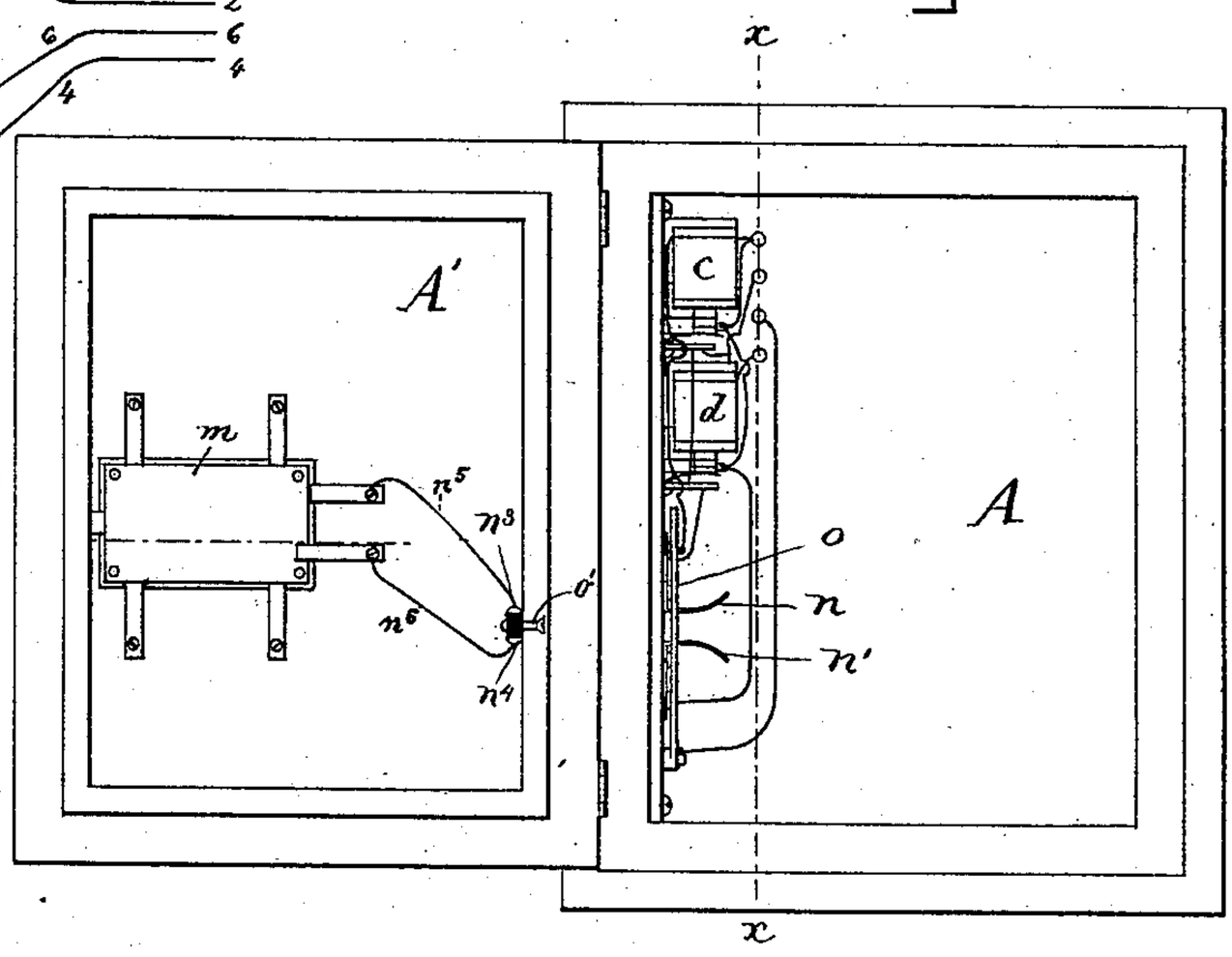


Fig: 4.

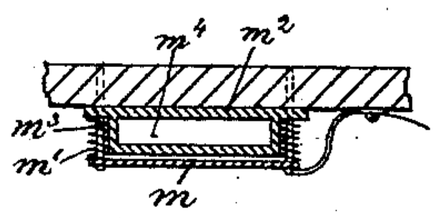
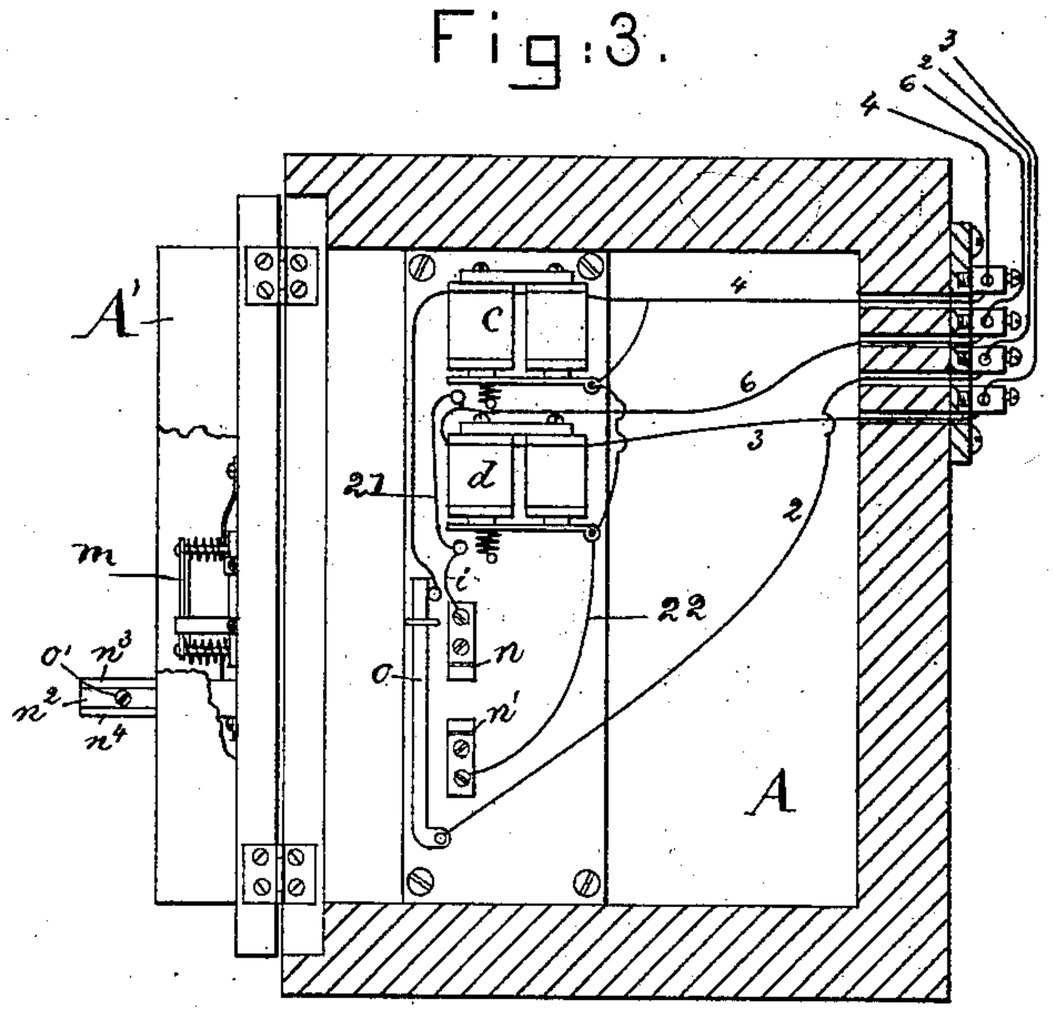


Fig: 3.



Witnesses.

Fred L. Emery

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(No Model.) 2 Sheets—Sheet 2.

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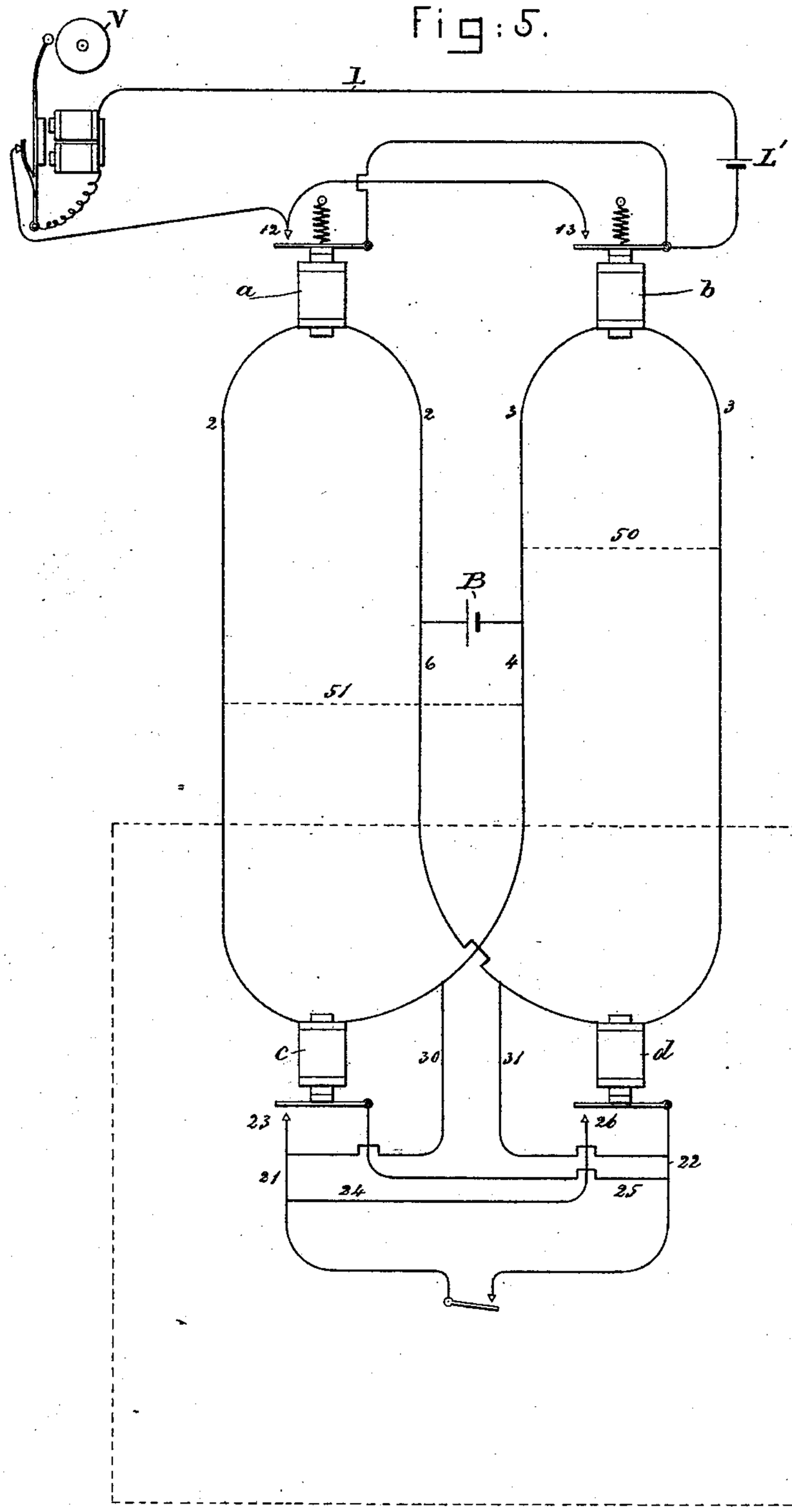
ELECTRIC BURGLAR ALARM.

No. 364,764. Patented June 14, 1887.

Fig: 5.



Witnesses.
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Jas. H. Churchill

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UNITED STATES PATENT OFFICE.

GEOFFREY B. LEHY, OF BOSTON, MASSACHUSETTS.

ELECTRIC BURGLAR-ALARM.

SPECIFICATION forming part of Letters Patent No. 364,764, dated June 14, 1887.

Application filed July 20, 1886. Serial No. 208,531. (No model.)

To all whom it may concern:

Be it known that I, GEOFFREY B. LEHY, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Burglar-Alarms for Safes, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to provide a safe with electrical burglar-alarm apparatus containing suitable instruments and arrangement of circuits, whereby very efficient service can be rendered.

In accordance with this invention two primary circuits of substantially equal resistance lead from a main battery, each circuit containing two magnets, one located outside and the other inside of the safe or other apartment to be protected.

The armatures of the two magnets located outside the safe operate when released to close a local circuit containing a suitable audible alarm, and the armatures of the magnets within the safe operate when released to close suitable branch circuits, which by short-circuiting the several magnets and releasing their armatures causes the alarm to respond.

A circuit-closing device of considerable dimensions is located at the rear side of the door of the safe or compartment in proximity to or concealing the lock, so that should the door be drilled at any point necessary to break or disturb the main bolt the circuit-closing device will be positively actuated to close suitable branch wires connected with the two primary circuits to thus short-circuit the magnets, causing the release of their armatures to produce an alarm.

Figure 1 shows in front elevation a portion of a burglar-alarm apparatus embodying this invention and located outside the safe or compartment; Fig. 2, a front elevation of the safe with the door open; Fig. 3, a section of Fig. 2, taken on the dotted line *x x;* Fig. 4, a section of the circuit-closing device, to be referred to; and Fig. 5, a diagram of the circuits.

The safe A, or other compartment to be protected, is of any usual or suitable construction, having a door, A′.

Two primary circuits, 3 6 and 2 4, lead from a main battery, B, preferably located outside the safe, the wires 2 3 of the said circuits containing each an electro-magnet, *a b*, located outside the safe, and then, passing into the safe, respectively, through electro-magnets *c d*, located therein, return to the battery B by the wires 4 6.

The two primary circuits 3 6 and 2 4 are normally closed and are of substantially equal resistance, in order that the armatures of the several magnets *a b c d* may remain attracted.

The armatures of the magnets *a b*, located outside the safe, co-operate, respectively, with contact-points 12 13 when released, thereby closing a local circuit, L, containing the local battery L′ and an audible alarm, herein shown as an ordinary vibrating bell, V.

The two primary circuits being normally closed as described and of substantially equal resistance, in order that each may remain closed, it will be understood that no irregularity—such, for instance, as a break, cross-wire, or ground—should occur, as any such irregularity would cut out the electro-magnets and cause the audible alarm to at once respond.

Within the safe or compartment are two branch wires, 21 22, one of which, as 21, leads from a contact-point, 23, against which the armature of the magnet *c* strikes, and the other, as 22, leads from the armature of the magnet *d*, each of said branch wires 21 22 also having a branch, 24 or 25, the branch 24 leading from the branch wire 21 and terminating at the contact-point 26, against which the armature of the magnet *d* strikes, and the branch 25 leading from the branch wire 22 and terminating at the armature of the magnet *c*, so that one of the branch wires, as 21, includes both contact-points and the other branch wire both armatures. Two branch wires, 30 31, lead, respectively, from the two primary circuits 3 6 and 2 4, the said branch wires connecting, respectively, with the branch wires 21 22.

In order that the apparatus within the safe may remain inoperative when the door of the safe is opened by being turned upon its hinges, the two branch wires 21 22 are connected with two springs or yielding arms, *n n′*, separated from each other to keep the said branch wires open, and a lug, n^2, secured to the rear edge of the door, has two conducting strips or wires, n^3 n^4, located upon each side of the lug, which,

as the door is closed, make contact with the two spring-arms *n n'*.

A circuit-closing device, consisting of a plate, *m*, is located at the rear side of the door, in proximity to or covering the main bolt or lock, the said plate being connected rigidly with the rear side of the said door by posts *m'*. Another plate, m^2, is placed between the said plate *m* and the door, sliding upon or guided by the posts *m'*, and normally held in contact with the rear side of the door by springs m^3. To the plate m^2 is secured a suitable box-like frame, m^4, interposed between the two plates *m* m^2, and of sufficient dimensions to touch the plate *m* when the plate m^2 is moved away from the door for a short distance—as, for instance, by an instrument puncturing the door and striking the rear side of the plate m^2.

The main bolt or lock mechanism of the door A' passes through the box or frame m^4, or is contained therein, so that before an instrument can be inserted to break or disturb it in any way the plate m^2 will be moved. The branch wires 21 22 are extended when the door is closed through the spring-arms *n n'*, the contact-strips n^3 n^4, and by wires n^5 n^6, respectively, to the two plates m^2 *m*, so that when the said plates make contact with each other the branch wires 21 22 will be closed, thereby short-circuiting the several magnets, as previously described, and the armatures of the magnets *a b* co-operating with the contact-points, the alarm will be sounded.

A short lever, *o*, is pivoted within the safe, normally lying in a vertical position and forming a part of the primary circuit 2 4, and a suitable hook or stud, *o'*, (see Figs. 2 and 3,) having a beveled head, is secured to the rear side of the door close to the edge, so that as the door is swung upon its hinges the head of the stud passes over the lever *o;* but should the hinges of the door be broken and the door taken or blown from the safe, the head of the stud will in passing out strike the rear side of the pivoted lever *o* and turn it, thus breaking the primary circuit 2 4, whereupon the armature of the magnet *a* will fall.

Should two of the wires be joined—as, for instance, as shown by dotted line 50—outside the safe, the magnet *a* will be cut out; if joined as at 51, magnet *c* will be cut out, and so on. Consequently, should any change or irregularity occur to disturb the balance of the two primary circuits, the alarm will at once respond.

I claim—

1. In an alarm apparatus, two primary circuits leading from a main battery, an electro-magnet in each primary circuit, and an audible alarm controlled by said electro-magnets, another electro-magnet in each primary circuit, and branch wires leading from the primary circuits, said branch circuits being controlled by the armatures of the last-named electro-magnets for short-circuiting the several electro-magnets, substantially as described.

2. In an alarm apparatus, two primary circuits leading from a main battery, an electro-magnet in each primary circuit, and an audible alarm controlled by said electro-magnets, branch wires leading from said primary circuits, and a circuit-closing device for closing said branch wires, substantially as described.

3. In a burglar-alarm apparatus, a main battery and two primary circuits leading therefrom, an electro-magnet in each of said primary circuits located outside of the safe, and an audible alarm controlled by said electro-magnets, an electro-magnet in each of said primary circuits located within the safe, and branch wires connected with the primary circuits controlled by the last-named electro-magnets, and other branch wires connected with the primary circuits, and a circuit-closing device located upon the rear side of the door for closing the last-named branch wires, all substantially as and for the purpose described.

4. In a burglar-alarm apparatus, a main battery and two primary circuits leading therefrom, electro-magnets in said primary circuits and an audible alarm controlled by said electro-magnets, and branch wires connected with the primary circuits, and a circuit-closing device, substantially as described, for closing said branch wires, as and for the purpose set forth.

5. In a burglar-alarm for safes, a main battery and primary circuit leading therefrom, an electro-magnet in said primary circuit, and an audible alarm controlled by said electro-magnet, and a circuit-breaking lever located within the safe and forming a part of or included in said primary circuit, and the headed stud or projection attached to the door to actuate said circuit-breaking lever only when the door is removed bodily from the safe, all substantially as and for the purpose set forth.

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

GEOFFREY B. LEHY.

Witnesses:
F. D. EMERY,
F. CUTTER.