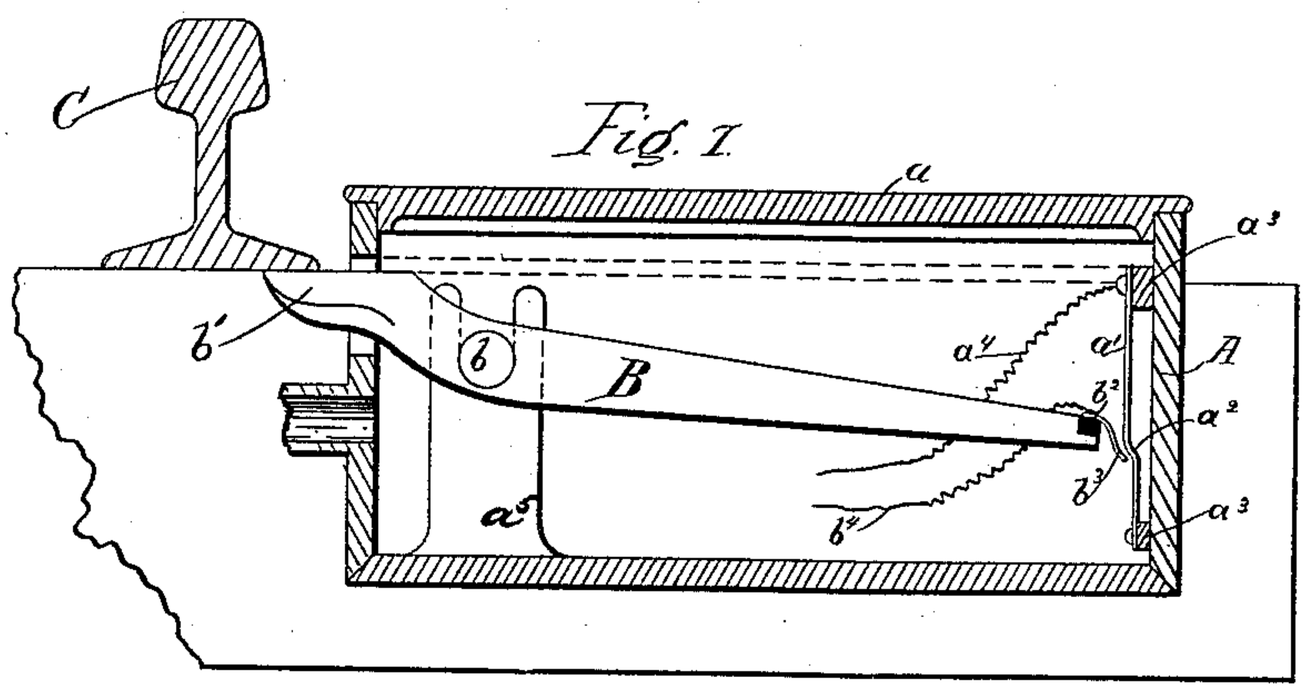
(No Model.) 2 Sheets—Sheet 1.

J. C. O'NEIL.

RAILWAY SIGNALING DEVICE.

No. 452,281. Patented May 12, 1891.

Fig. 1.



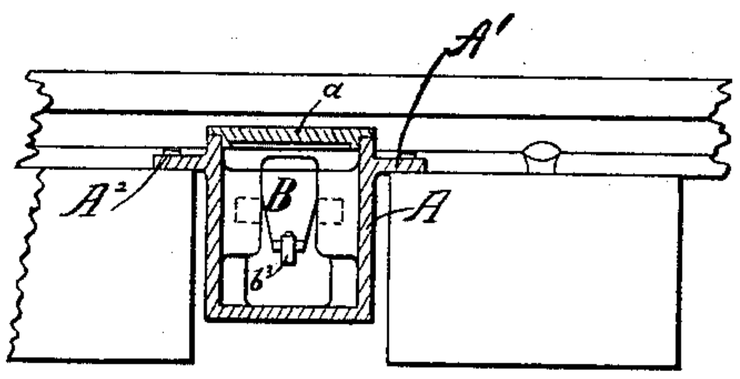


Fig. 2.

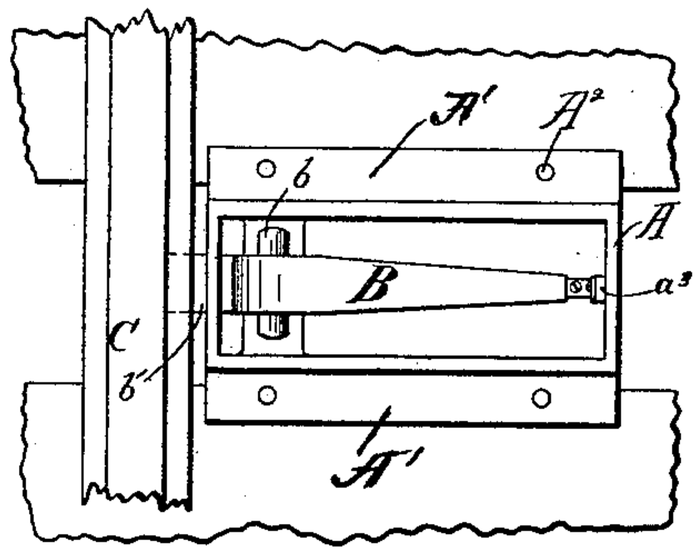


Fig. 4.

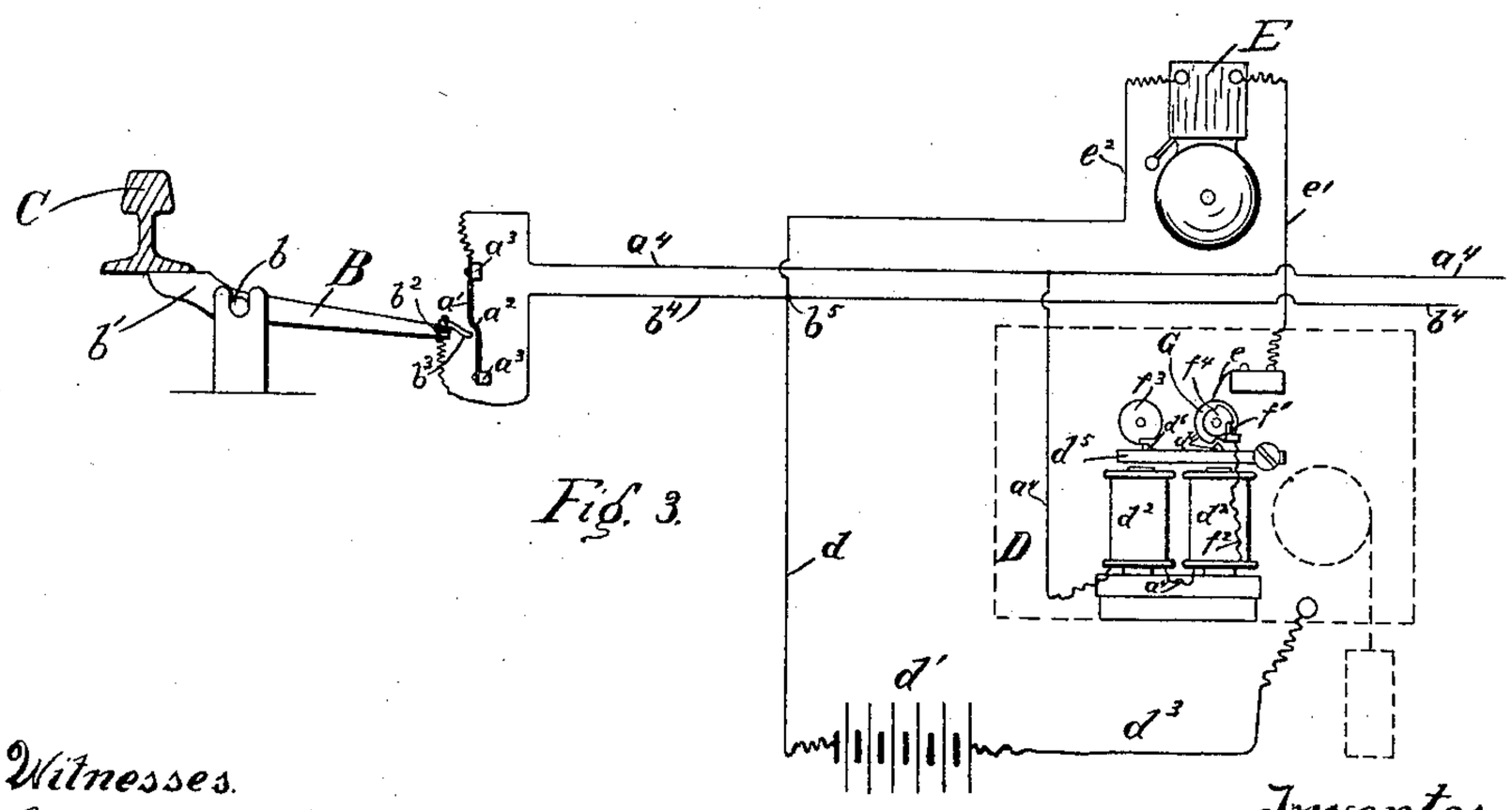


Fig. 3.

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(No Model.) 2 Sheets—Sheet 2.

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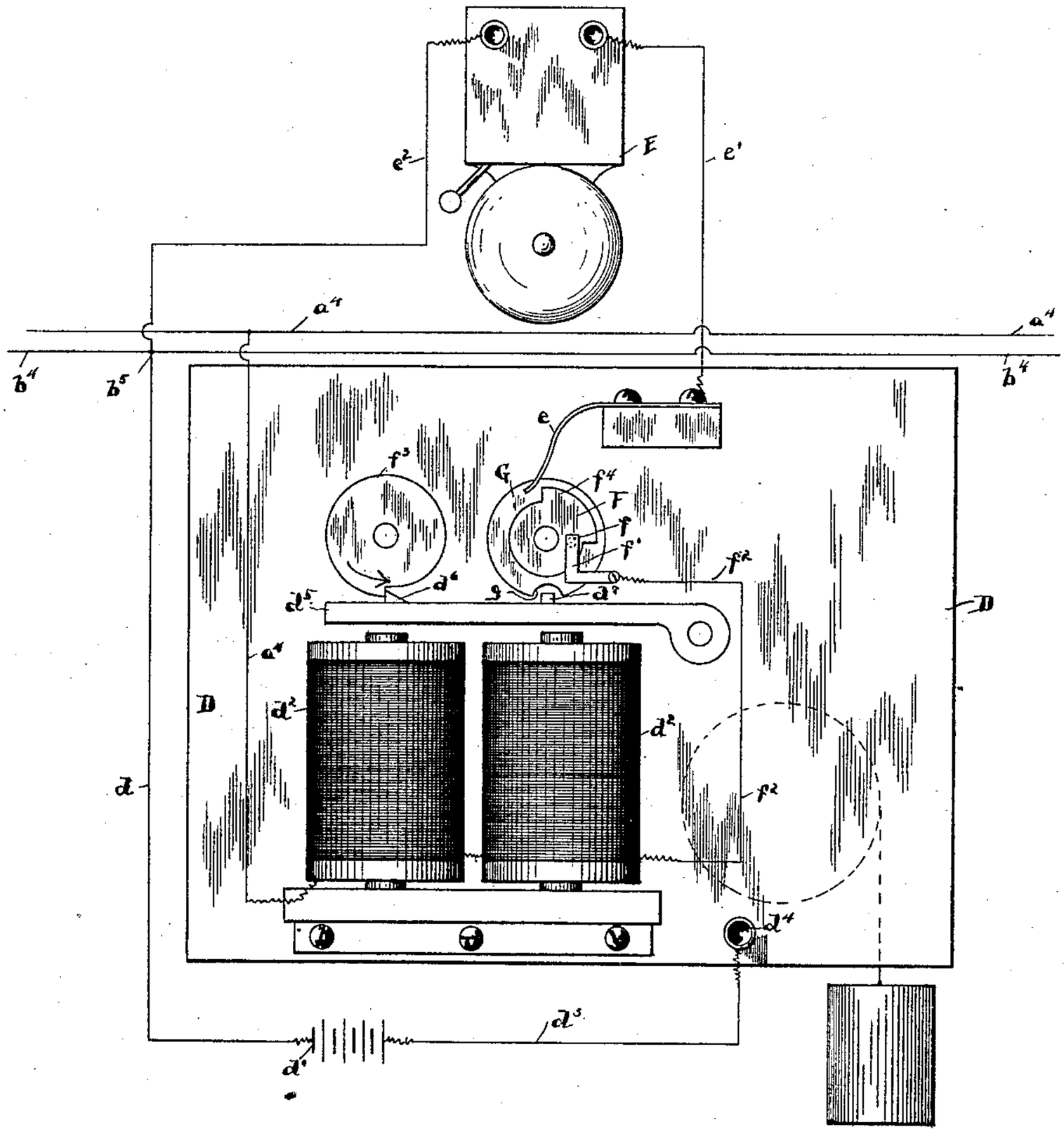
Fig 5



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UNITED STATES PATENT OFFICE.

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RAILWAY SIGNALING DEVICE.

SPECIFICATION forming part of Letters Patent No. 452,281, dated May 12, 1891.

Application filed June 30, 1890. Serial No. 357,189. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. O'NEIL, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Railway Signaling Devices; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in railway signaling devices designed for roadway-crossings and all similar service; and it consists more especially of the elements pointed out in the claims.

The object is to provide a circuit-controller which shall effect an alarm at all times when so directed, so that confidence may be placed in its efficiency. To this end I have invented the circuit-controller herein described, and shown in the drawings, of which—

Figure 1 illustrates a side elevation in section of the device. Fig. 2 shows an end view of the same, partly in section. Fig. 3 illustrates in a diagrammatic view the several electrical connections between the alarm cut-out and the signaling mechanism. Fig. 4 is a plan view of the circuit-controller with the cover removed to disclose the arrangement of parts. Fig. 5 is an enlarged diagrammatic view more clearly disclosing the arrangement of circuits in the signaling device as shown at the right-hand side at Fig. 3.

A represents a box, preferably of cast-iron, with a suitable cover a, which is closely held upon the box by screws or otherwise. At the one end of this inclosure is mounted a metallic spring a', having a ledge or bent portion near its one end a^2. Said spring is held in the position substantially as shown in Fig. 1 by insulating-blocks a^3. A wire a^4, leading to the cut-out magnets d^2, is secured to the upper end of this spring, thus completing one side of the circuit from the track circuit-closer to the cut-out magnets. Near the other end of the box is provided a suitable bearing a^5, in which a lever B is supported by trunnions b. The short arm of lever B terminates in a toe b', which is in contact with the under side of the rail C. The long arm of the lever has on its extreme end a block of insulation b^2, upon which is mounted the projecting spring b^3. When the short arm is depressed by reason of an engine passing over the rail, the long arm is raised, thus bringing springs b^3 a' into contact, and thus closing the circuit through the track circuit-closer. A wire b^4 leads from spring b^3 to point b^5, and thence by wire d to one terminal of the battery d'. The other terminal of the battery leads by wire d^3 to the metal work of the cut-out mechanism at binding-post d^4, from thence through the metal work to pin f on mutilated disk F. A spring-contact f' engages this pin, being mounted upon insulation upon the frame-work. A wire f^2 leads to the magnets d^2. Thus a circuit is completed through wires d b^4, springs b^3 a', wires a^4, through the magnets d^2 by return-wire f^2, having contact f' and pin f, and disk F, frame D, binding-post d^4, and wire d^3 to battery, thus energizing the magnets and attracting the armature d^5. This armature carries a ratchet projection d^6, which seats itself in a recess of the disk f^3, and when so engaged keeps the clock-work inactive; but the moment it is released the clock-movement starts in the direction as shown by the arrow-points. Disk F also moves taking pin f away from under contact-spring f', thus opening the circuit through the track circuit-closer, or, in other words, "cutting it out." Then a spring upon the pivoted point of the armature retracts it, bringing into contact pin d^7 with the periphery of disk G. This disk revolves much slower than disk f^3; hence this point d^7 is necessary to keep the armature-point d^6 from stopping the clock-work until disk F has made a complete revolution.

A recess g in disk G is provided for pin d^7, which, when in its bottom position conjointly with the recess of disk f^3, allows the armature to be drawn back to its full extent, thus stopping the clock-work.

When the clock-work stops, it always leaves pin f under spring f'. Disk F for one-fourth, more or less, according to the length of ring described, of its circumference is of larger radius than the remaining portion thereof. A little after the disk has begun to move contact is made with spring e through this distended portion f^4 of the disk. The current can now flow from the battery through wire

wire d^2, binding-post d^4, the frame-work D, disk F, spring e, wire c', to the alarm-bell E. The return being through wires c^2 and d to the battery, the signal continues to ring as long as spring e is in contact with f^4, thus operating the alarm upon a local circuit.

The track circuit-closer is positive in its action. A slight movement of the short arm of lever B, caused by the springing of the rail, will cause a corresponding large movement of the long arm, thus effecting a closing of circuit whenever a sufficient weight moves over the rail to depress it, say one-sixteenth of an inch, more or less. The arm, by gravity, drops away from the spring-contacts when the load is removed from the rail. However, the short arm always remains in contact with the rail.

The box A has flanges A', which rest upon adjacent ties, and thus support the box. It is easy of erection and its cost of maintenance is small, practically needing no attention whatever, since these boxes are placed a few thousand feet from road-crossings. This is important. Not alone is this of importance, but the positiveness of action is a feature which insures confidence in the mechanism as it is applied in daily practice.

The invention comprises two circuits, a circuit for the signal-controlling mechanism and a circuit for the signal. When the first circuit becomes operative, then the signal-circuit is automatically made alive, and near the same time or a little subsequent the circuit for the signal-controlling mechanism is "cut out," leaving only the signal-circuit operative. When, however, this has been in action a predetermined length of time, the circuits are all cut out and the device restored to its initial position.

Particular stress is placed on the contacts a' and b^3. These contacts are both springs, and their normal tendency is toward each other, so that a perfect contact will be maintained as long as the rail is depressed.

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

1. The combination of the vertically-disposed spring a', secured at both ends, the lever fulcrumed near one end and having its shorter arm bearing against the bottom of the rail, and a spring secured on the end of the longer arm of the lever at right angles to the spring a' and adapted to travel over the same.

2. The combination of the track-circuit closer, the magnet, the bell, the armature d^5, having projection d^6, and pin d^7, the clock-work having the disks f^3, F, and G, the contact-strips e and f', and pin f.

Witness my hand to the foregoing specification this 3d day of June, 1890.

JAMES C. O'NEIL.

Witnesses:
SILAS IZANT,
ALFRED CLUM.