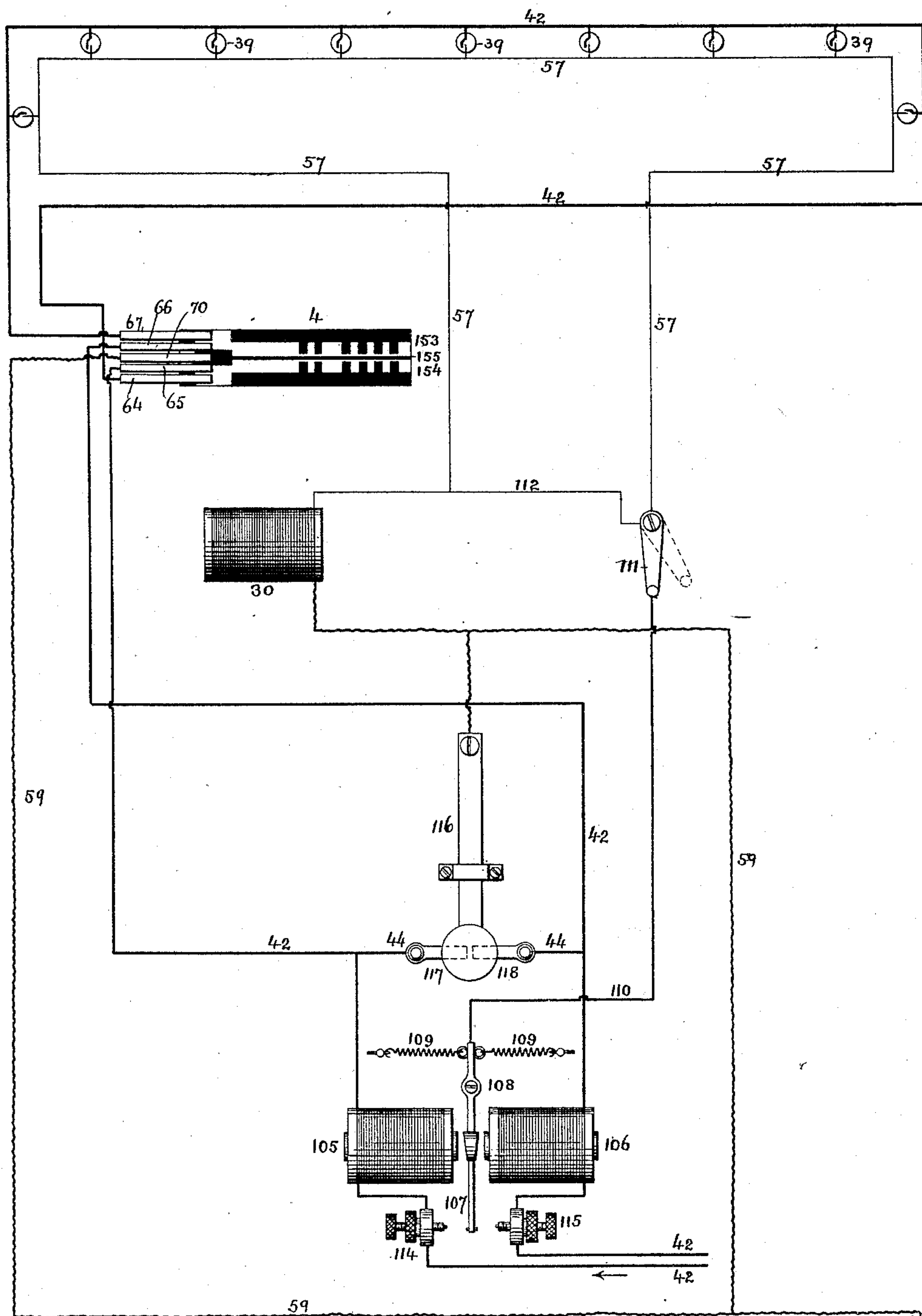


(No Model.)

L. G. ROWAND.
FIRE ALARM SYSTEM.

No. 477,070.

Patented June 14, 1892.



Witnesses:
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UNITED STATES PATENT OFFICE.

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FIRE-ALARM SYSTEM.

SPECIFICATION forming part of Letters Patent No. 477,070, dated June 14, 1892.

Application filed December 14, 1891. Serial No. 415,055. (No model.)

To all whom it may concern:

Be it known that I, LEWIS G. ROWAND, a citizen of the United States, residing at Camden, New Jersey, have invented certain Improvements in Fire-Alarm Systems, of which the following is a specification.

My invention relates to that class of fire-alarm systems in which an alarm is sounded at a central receiving-station or other suitable point by the closing of a switch or thermostat in a circuit in a building protected; and it consists in providing for the signaling of an alarm at the receiving-station in the event of the grounding of the main line within the building, or in case of a fire when a circuit is established between one of the local lines and the main line in the building. Provision is also made for telegraphing to the central station, the instruments operated being located at a box or local station, preferably on the exterior of the building, for the convenience of the line-men, firemen, and inspectors. The circuits are also arranged in such a manner as to work equally well in case the current through the main line is reversed, which will occur in the event of the breaking of one of the main-line wires, the operator at central station reversing the current and throwing in a new battery and new set of receiving-instruments, using the earth for the return-circuit.

The accompanying drawing represents a diagram of a system forming the subject of my invention, 42 representing the main line which has in circuit the helix of an electro-magnet 105, and from thence the circuit passes through a brush 65, the conducting-surface of a drum 4, (shown in diagram,) a brush 64, and up through the building, thence back to a brush 67 in contact with the conducting-surface of the contact-drum 4, and through a brush 66 to the outgoing wire, as indicated by arrows. This wire is connected to the helix of an electro-magnet 106, of precisely the same power as the electro-magnet 105 on the ingoing wire, the two electro-magnets being on the same line and having between them an armature-lever 107, pivoted at 108, thus constituting a polarized relay with the two helices in the ingoing and outgoing circuits. The electro-magnets being of equal power always act with precisely the same

force on the armature-lever 107 and keep it normally in a central position, the action of the magnets being aided by springs 109 on the opposite sides of the armature-lever, as shown.

The light lines 57 represent local circuits extending from the electro-magnet 30 up through the building, and extending between this local circuit and the main line are a series of normally-open thermostats or switches 39.

The ground-wire 59 is represented by heavy waved lines, and is provided with a brush 70, normally in contact with the insulated portion of the drum 4, and is also connected to one end of a strap-key 116.

44 represents branch wires of the main line extending to contact-points 117 118, immediately beneath the free end of the telegraph-key 116, these contact-points being separated from each other and normally out of contact with the key, so that the current will pass through the building and out again through the magnet 106 unless diverted to the ground-wire 59 by the operation of the thermostats or switches 39 in case of a fire or by the grounding of the circuit.

The contact-drum 4 is cylindrical in form and is provided with conducting portions (represented in white) and insulating portions, (represented in black,) the view in the diagram representing the periphery of the drum flattened out or extended. It is formed of two main portions 153 154, insulated from each other by a narrow ring of insulating material 155, slightly less in width than the width of the ground-wire brush 70, this brush normally resting, however, on a wider portion of the insulating-surface, so that it is normally not in contact with either of the conducting portions of the drum. The main bodies 153 154 are provided with alternate insulating and conducting portions to represent the number of the box, (42 in the present instance,) and as the ground-wire brush, after the drum begins its rotation, is in electrical contact with the conducting-surface of both of the portions 153 154 the circuit is alternately made and broken between the brushes 65 66 and the brush 70, thus sending an alarm of the central station through the ground-wire 59, the instruments at the central station having one terminal in contact with the ground-wire and being energized and operated as soon as the

circuit between the main line and the ground-line at the building is closed. This contact-drum is rotated by any suitable mechanism—such, for instance, as that shown in my application for Letters Patent for fire-alarm systems, filed of even date herewith, Serial Nos. 415,053 and 415,054, and in which is described a contact-drum carried by a train of power-driven gears normally locked in position, but having the locking mechanism under the control of an electro-magnet (marked “30” in this diagram) so that when the magnet is energized by the passage of an electric current the train of gears is released and the drum rotated.

110 is a branch line extending from the pivot-point of the armature-lever 107 to a switch-lever 111, and from the opposite end of the switch-lever extends a wire 112, connected to the electro-magnet 30. In the event of the grounding of the main line the current through, the return-wire will of course be cut off. The electro-magnet 106 will no longer attract the armature-lever 107, but the latter will be attracted by the electro-magnet 105, causing its outer end to come into contact with a contact-point 114 on the main line. The current then passes from the main line through the contact-point 114, armature-lever 107, wire 110, switch 111, wire 112, and magnet 30 to ground-wire 59, causing the energizing of the magnet and the consequent release of the mechanism which rotates the drum 4. On the rotation of said drum the brush 70 comes into contact with the conducting portion of said drum, and as the drum continues to rotate the circuit is alternately made and broken between the brush 65 and the brush 70, signaling to the main station by operating the printing-register there. The ground in the building is meanwhile cut off by the passage of the brush 64 from the conducting-surface to the insulating-surface of said drum, so that there is no danger of the circuit being completed through the building-ground in place of the ground-wire 59. The establishment of a circuit by the closing of a thermostat or switch 39 and the consequent energizing of the local circuit will also cause the energizing of the magnet 30, the release of the mechanism, and the rotation of the drum 4. In telegraphing to the central station the switch 111 is opened and communication made to the central station by depressing the key 116, which causes the current to pass from the ingoing wire of the main circuit directly to the ground-wire 59.

In systems of this kind, when the main ingoing wire to the building is broken between the building and the central station, the operator receives notice of the fact by the opening of his relay-circuit and the continuous operation of the printing-register. In such cases another set of receiving-instruments operating in open circuit is thrown in and a battery is placed on the circuit, which causes the current to travel in the opposite direction and go

into the building on what has previously been described the “outgoing wire.” The circuit being an open one, however, the magnet 106 is not energized until it is grounded by accident or by the closing of one of the thermostats or switches and the establishment of a circuit through the local wire and electro-magnet 30 to the ground.

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

1. In an electric fire-alarm system, the combination of the main line, the relay-magnets 105 106 on the ingoing and outgoing wires, respectively, of said main line, a contact-drum, alternate insulated and conducting portions thereon, brushes on the main line in contact with said drum, mechanism for rotating said drum, an electro-magnet controlling said mechanism, an armature-lever normally in a central position between the magnets of the relay and adapted to be brought into contact with contact-points on the main line, and a normally-open circuit extending from the armature-lever through the said controlling electro-magnet to the ground, substantially as specified.

2. The combination, in an electric fire-alarm system, of the main line, opposite relay-magnets on the ingoing and outgoing wires, respectively, of said line, a contact-drum, alternate insulated and conducting portions thereon, brushes on the main line in contact with said contact-drum, mechanism for rotating said drum, an electro-magnet controlling said mechanism, a local circuit, and thermostats or switches between said local circuit and the main line, said local circuit extending from the thermostats or switches through the said controlling electro-magnet to the ground, substantially as specified.

3. In an electric fire-alarm system, the combination of the main line, the opposite relay-magnets on the ingoing and outgoing wires, respectively, of said line, the local line, thermostats or switches between such main line and local line, the contact-drum having alternate insulated and conducting portions, brushes on the main line in contact with said drum, mechanism for rotating said contact-drum, an electro-magnet controlling such mechanism, a pivoted armature-lever between the magnets of the relay, and a normally-open circuit extending from said armature-lever through the said controlling electro-magnet to the ground, branch wires from the main line extending to contact-points 117 118, a key adapted to be brought into contact with such contact-points, and a ground-wire extending from the key, substantially as specified.

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

LEWIS G. ROWAND.

Witnesses:

JNO. E. PARKER,
HARRY SMITH.