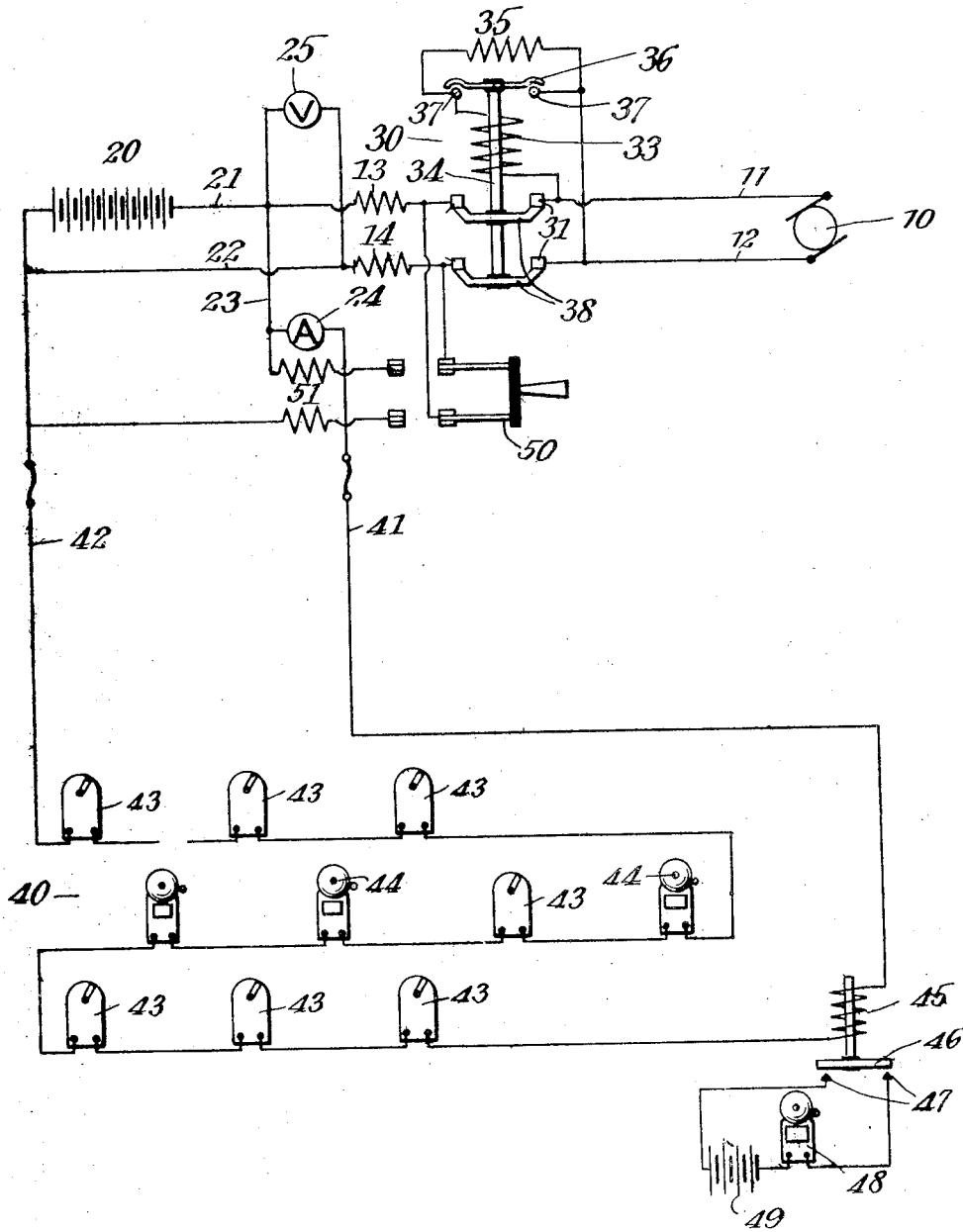


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ELECTRIC FIRE ALARM SYSTEM.
APPLICATION FILED FEB. 4, 1914.

1,184,685.

Patented May 23, 1916.



WITNESSES
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UNITED STATES PATENT OFFICE.

JOHN L. FLAGG, OF HACKENSACK, AND FORD T. TOWERS, OF HAWTHORNE, NEW JERSEY, ASSIGNORS TO WATSON-ELECTRIC COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ELECTRIC FIRE-ALARM SYSTEM.

1,184,685.

Specification of Letters Patent.

Patented May 23, 1916.

Application filed February 4, 1914. Serial No. 816,556.

To all whom it may concern:

Be it known that we, JOHN L. FLAGG, a citizen of the United States of America, and a resident of Hackensack, Bergen county, and State of New Jersey, and FORD T. TOWERS, a citizen of the United States of America, and a resident of Hawthorne, Passaic county, and State of New Jersey, have invented certain new and useful Improvements in Electric Fire-Alarm Systems, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

Our invention relates to electric fire alarm systems such as are adapted to be installed in factories and other buildings, and its object is to provide a simple, reliable and efficient system for this purpose. Another object is to provide a system which is adapted to utilize an ordinary source of electrical supply such as a service line, whenever such supply is available and to provide an alternative source of supply such as that furnished by a storage battery when that of the service line is not available and to provide in such a system a change-over switch for automatically changing the connections from the service line to the storage battery and vice versa.

More specifically this arrangement refers to an improvement in the fire alarm system disclosed in Patent No. 1,075,314, issued to us on the 7th of October, 1913.

We will describe our invention in the following specification and then point out the novel features thereof in appended claims.

The single figure of drawing is a diagram of a system arranged in accordance with and embodying our invention.

In this figure, 10 designates a suitable source of electrical supply such for example as a direct current generator. This is intended to be illustrative of any available source of electrical supply in the building, mill or factory in which the system is installed. The current from this source is conveniently referred to herein as the available mill current. A storage battery 20 forms a part of the same system and is adapted to be charged by the mill current and to supply energy to the system whenever the generator 10 is shut down or its current interrupted for any reason. Connected in circuit between the sources 10 and

20 is an electro-magnetically actuated switch 30 which is adapted to be in the position in which it is shown in the drawings whenever the current supply from generator 10 is active.

The present invention comprises a normally-closed signal and alarm circuit which is designated by the reference numeral 40 and relates particularly to the combination shown whereby such a circuit may be energized continuously by one or the other of the sources of supply, taking its energizing current from the mill supply whenever that is available.

The mains from the available mill current are connected by wires 11, 12 with stationary contacts 31 of the change-over switch. The terminals of the storage battery are connected through resistances 13—14 with stationary contacts 32 of this switch by wires 21, 22. The generator mains are also connected with the coil 33 of an actuating solenoid or magnet, directly when its core 34 is not raised, and through a resistance 35 when the core is raised. This resistance 35 is short circuited by a bridging contact member 36 which is carried by, but insulated from, the core 34 and rests upon a pair of stationary contacts 37 when the solenoid is not energized, which contacts are connected respectively to opposite ends of the resistance 35. When in such position, the current of the available mill supply becomes active, the solenoid 33 will be energized and will raise its core 34 and with it two bridging contacts 38 which are carried by, but insulated from, the core. These will then connect contacts 31 with contacts 32 and so connect the generator 10 with the storage battery 20 and with the rest of the system, as will be described presently. At the same time the contact member 36 will be raised from contacts 37 to introduce resistance 35 into the circuit of the magnet coil 33. This resistance is so proportioned that it and resistances 13, 14 permit only enough current to pass through coil 33 to cause it to maintain its core 34 and the parts which it carries in their raised positions, in which they are shown in the diagram.

One of the terminals of the battery is connected by a wire 23 to a millimeter 24 through which its current passes to and through the wire 41 of the signal and alarm

circuit 40. The other end of this closed circuit is connected with the other terminal of the battery by wire 42. Thus this circuit 40 is always connected with the storage battery.

The signal and alarm system comprises as many signal boxes 43 as may be required in any given installation, and also as many electro-magnetically controlled gongs 44 or other desired alarm mechanisms. These mechanisms are not specifically illustrated or described as they are not parts of our invention except in the novel combination of the system herein disclosed. The signal boxes are adapted when actuated to intermittently interrupt the circuit 40 and the gong controlling mechanisms are adapted to actuate the gongs when the current in circuit 40 is interrupted. The closed circuit 40 also includes the winding 45 of a "trouble bell" relay, which when energized holds a bridging contact 46 off from stationary contacts 47.

48 designates the trouble bell and 49 is a local open-circuit battery. The bell and battery are connected together and with contacts 47 in such a manner that whenever the current fails in circuit 40 and the winding 45 is therefore deenergized, the bridging contact will connect the two stationary contacts 47 and thereby close a local circuit through the bell 48.

50 designates a manually actuated switch which is arranged to close a circuit from the contacts 32 to the battery through resistances 51 for rapidly charging the battery. The resistances 51 are connected in multiple circuit relation to the resistances 13-14 and consequently the charging current is materially increased when the switch 50 is closed. If desired a voltmeter 25 may be connected across the terminals of the battery.

The battery is at all times connected with the signal and alarm circuit 40 so that the latter is always supplied with current. But as soon as the generator 10 becomes active, it will be connected automatically with the circuit 40 and with the battery. The resistances 13, 14 are so proportioned that they supply the desired amount of current to the signal and alarm circuit and at the same time slowly charge the storage battery. But upon failure of the available mill supply, its circuits are at once disconnected from the battery so that none of the battery's current is wasted. The alternate, or permanently connected, source of energy is not necessarily a storage battery and may of course be any other suitable source such as, for example, a public service line.

What we claim is:

1. In an alarm system, the combination of a preferred source of energy, means for automatically connecting said source to the

system, a storage battery constituting an alternate source and connected to the preferred source through said automatic means, and a switch for establishing a relatively low-resistance quick-charging connection between the source and the battery.

2. In an alarm system, the combination of a signal and alarm circuit, a preferred source of energy, a switch energized from said source for automatically connecting said source when active to said circuit, a storage battery constituting an alternate source and connected to the preferred source through said automatic switch, and means for establishing a relatively low-resistance quick-charging connection between the source and the battery.

3. In an alarm system, the combination of a signal and alarm circuit, a preferred source of energy, a switch energized from said source for automatically connecting said source when active to said circuit, a storage battery constituting an alternate source and connected to the preferred source through said automatic switch, and a manually controlled switch for establishing a relatively low-resistance quick-charging connection between the source and the battery.

4. In an alarm system, the combination of a signal and an alarm circuit, a preferred source of energy, and a storage battery connected to the signal and alarm circuit in multiple circuit relation, an automatic switch for interrupting the preferred source when said source is inactive, a relatively low-resistance quick-charging circuit between the source and the battery, and means for controlling the said circuit.

5. In an alarm system, the combination of a signal and an alarm circuit, a preferred source of energy, and a storage battery connected to the signal and alarm circuit in multiple circuit relation, an automatic switch for interrupting the preferred source when said source is inactive, a relatively low-resistance quick-charging circuit between the source and the battery, and a normally open switch for controlling said circuit.

6. In an alarm system, the combination of a signal and an alarm circuit, a preferred source of energy, equalizing resistances interposed between the preferred source and said circuit, a storage battery connected across said circuit, a circuit connected in shunt relation to the equalizing resistances adapted to provide a quick-charging circuit for the battery, and means for controlling said shunt circuit.

7. In an alarm system, the combination with an available source of electrical energy, a storage battery, a normally-closed signal and alarm circuit permanently connected with the storage battery and a plurality of

signal boxes and alarm mechanisms in said circuit, of an automatic switch having an actuating magnet permanently connected with the available source of electric energy and arranged when energized to actuate said switch and connect said available source of electric energy with the signal and alarm circuit and with the storage battery, voltage equalizing resistance between said automatic switch and the storage battery, an emergency charging circuit in multiple relation with said equalizing resistance and a switch for normally interrupting said emergency charging circuit.

8. In an alarm system, the combination with an available supply of electrical energy, a storage battery and a normally-closed signal and alarm circuit permanently connected with the storage battery, of an automatic switch having an actuating magnet permanently connected with the available source of electrical energy and arranged when energized to actuate said

switch and connect said available source of electrical energy with the signal and alarm circuit and with the storage battery, voltage equalizing resistance between said automatic switch and the storage battery, an emergency charging circuit in multiple relation with said equalizing resistance and a switch for normally interrupting said emergency charging circuit, the automatic switch being adapted to open the circuit between the available source of electric energy and the battery irrespective of the position of the emergency charging circuit switch.

In witness whereof, we have hereunto set our hands this 31st day of January, 1914, in the presence of two subscribing witnesses.

JOHN L. FLAGG.
FORD T. TOWERS.

Witnesses:

ERNEST W. MARSHALL,
R. J. DEARBORN.