

F. CASTLE.
ELECTRICAL ALARM SYSTEM.
APPLICATION FILED JUNE 8, 1910.

973,627.

Patented Oct. 25, 1910.

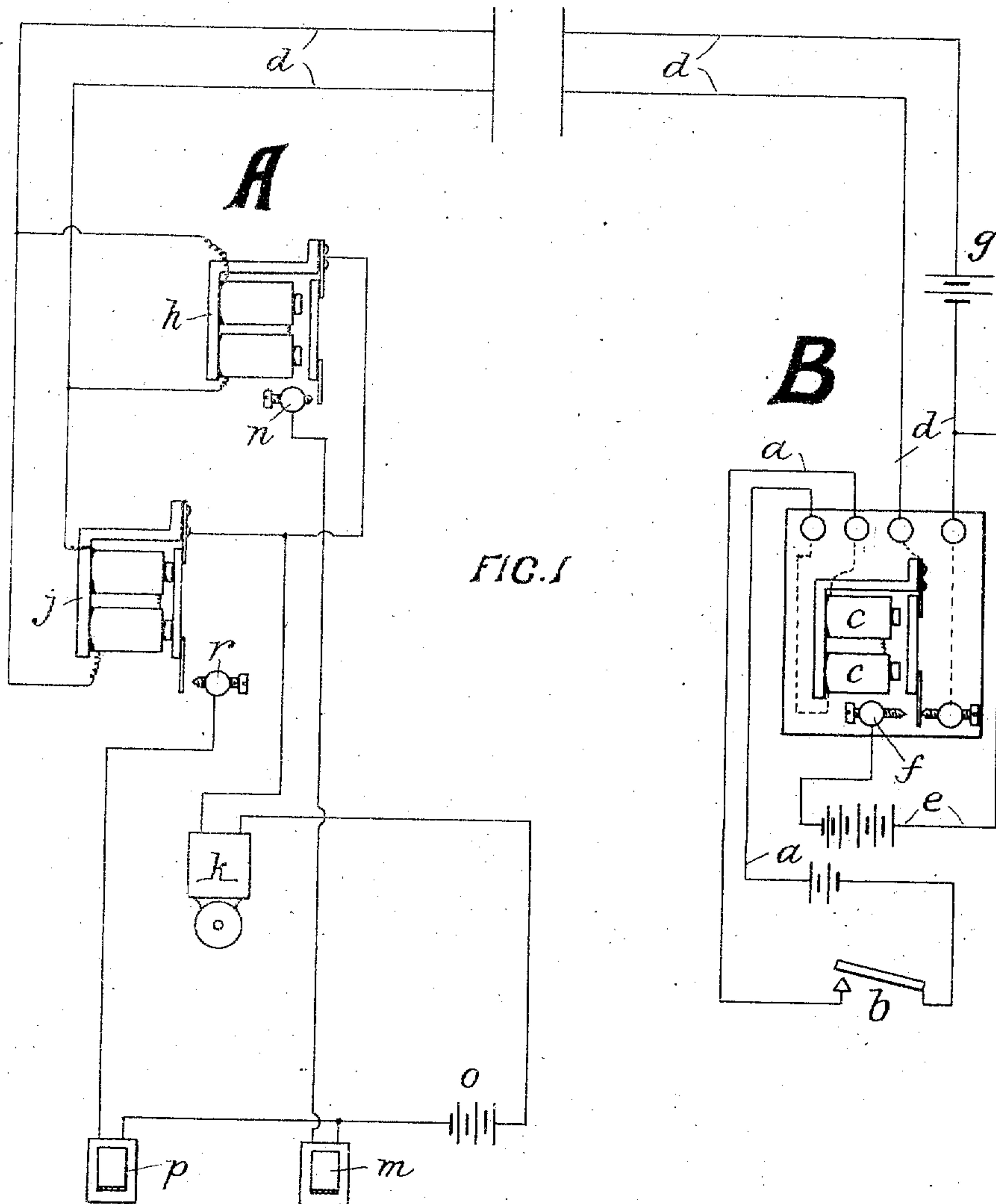


FIG. 1

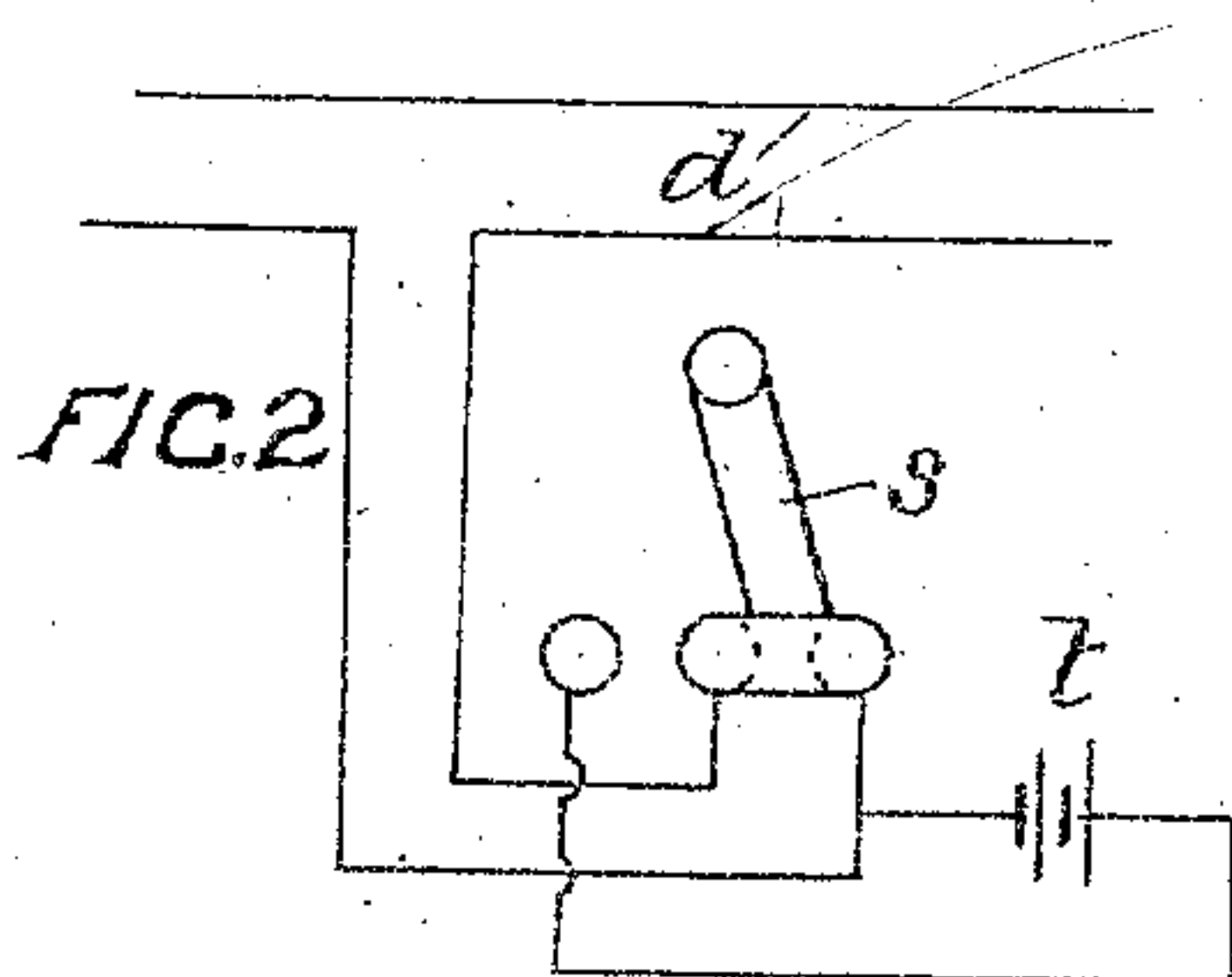


FIG. 2

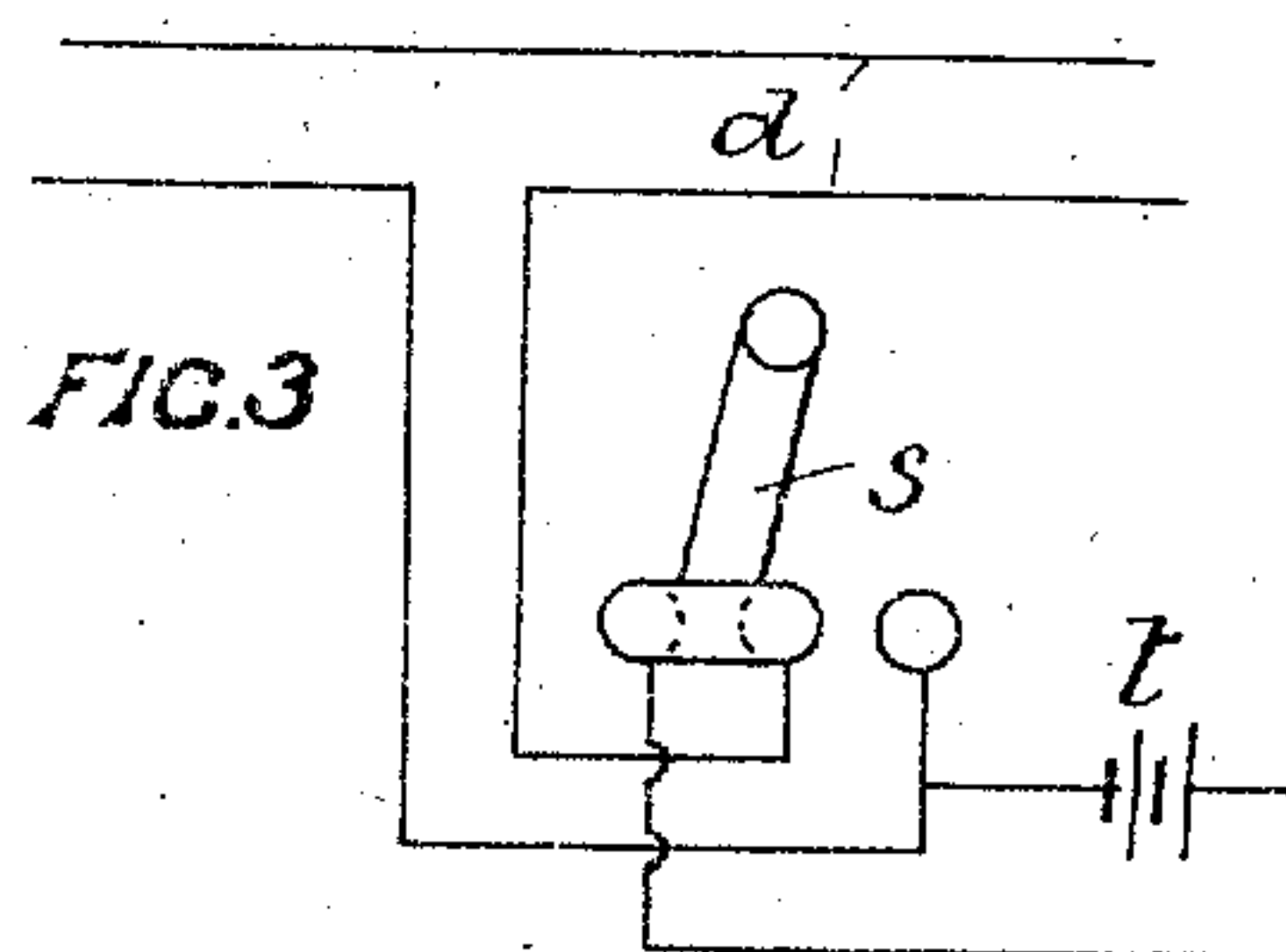


FIG. 3

WITNESSES

W. P. BURKE
John A. Percival.

INVENTOR

Frank Castle
BY E. M. Miller

UNITED STATES PATENT OFFICE.

FRANK CASTLE, OF AUCKLAND, NEW ZEALAND, ASSIGNOR OF TWO-FIFTHS TO EDWARD JOSHUA RIDDIFORD, OF WELLINGTON, NEW ZEALAND, TWO-FIFTHS TO WILLIAM EDWARD BIDWILL, OF FEATHERSTON, NEW ZEALAND, AND ONE-TENTH TO LESLIE LOUIS McDERMOTT, OF AUCKLAND, NEW ZEALAND.

ELECTRICAL ALARM SYSTEM.

973,627.

Specification of Letters Patent.

Patented Oct. 25, 1910.

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To all whom it may concern:

Be it known that I, FRANK CASTLE, subject of the King of Great Britain, residing at Auckland, in the Dominion of New Zealand, have invented new and useful Improvements in Electric Alarm Systems; and I do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to alarm systems, and especially fire alarm systems, in which an alarm is electrically communicated from a building, in which a local circuit is installed, to a central station at any distance therefrom, through a closed line wire circuit.

The invention has been designed in order to improve means for giving the alarm at the central station upon the local circuit being actuated and also to provide means whereby a break or cross wire fault in the line wire may be signaled.

The invention consists in the employment of two relays at the central station and each arranged in circuit with the closed circuit. One of these relays is made of greater resistance than the other so that the current of the closed circuit is prevented from flowing through it. The armature of this relay is arranged to close a local indicator alarm circuit when the relay is energized, while the armature of the weaker relay is arranged to close a separate local indicator alarm circuit when it is deenergized.

A relay circuit is arranged in the building in which the installation is placed, such circuit being adapted to be closed or opened by the action of thermostats or other appliances. A local battery circuit is also arranged in such building and this circuit is adapted to be closed by the movement of the relay armature. This circuit is placed in series connection with the closed circuit communication leading to the central station so that upon the local battery circuit being completed, a current will be sent through the lines wires sufficiently strong to overcome the resistance of the stronger relay and cause its armature to be attracted and close the alarm circuit at the station. Means are also provided for indicating the nature of a fault in the wiring of the line wires.

The invention is illustrated in diagram-

matic form in the accompanying drawings, in which:—

Figure 1 is a diagram of the whole of the circuits in their normal conditions. Figs. 2 and 3 are details views of the means for indicating the nature of a fault in the line wire.

In Fig. 1 A represents the central station and B represents the building from which the alarm is to be given.

Within the building is arranged the thermostat or like circuit *a* which may be either an open or closed circuit, but which in the drawings is represented as an open circuit adapted to be closed by the action of a thermostat *b*. A relay *c* is arranged in this circuit and the armature of this relay when in its normal position, serves to keep closed the line wire circuit *d* leading to the central station A. A local battery circuit *e* is also placed in the building and arranged in open circuit with the line wire *d* and a terminal *f* placed adjacent to the armature of the relay *c*. When this armature is acted upon by the closing of the relay thermostat circuit *a*, it will engage with the terminal *f* and thereby serve to bring such local circuit battery into series with the battery *g* of the line wire circuit and thus strengthen the current in this latter circuit.

Two relays *h* and *j* are arranged at the station A in circuit with the line wire circuit *d* and one of these *h* is made of higher resistance than the other so that the current from the battery *g* cannot flow through it. It is therefore normally quiet. The other relay *j* is kept normally energized by the current from the battery *g*. The current from the battery circuit *e*, when brought into series with the line wire circuit, is of sufficient strength to overcome the resistance of the relay *h*, and such relay will consequently be energized in the event of the thermostat circuit *a* being completed.

An alarm *k*, and shutter indicator *m*, are arranged in circuit with a battery *o*, the armature of the relay *h*, and a terminal *n* adapted to be engaged by such armature, when the relay is energized in the manner before mentioned. Consequently, when the thermostat circuit in the building B is brought into action, say by the heat from a

fire, this alarm indicator circuit will be completed and thus the alarm given. The alarm *z* and battery *o* are also arranged in circuit with a separate shutter indicator *p* and the armature of the relay *j* and with a terminal *r* adapted to be engaged by such armature when the relay is deenergized and thereby complete such circuit. Thus should a break occur in the closed line wire circuit *d*, an alarm will be sounded and a shutter dropped indicating such fact. Also should any cross wiring or short circuiting of the wires take place, the alarm will be sounded.

The shutter indicators *m* and *p* will be marked respectively "fire" and "fault" so that when an alarm is sounded, the attendant may ascertain the cause thereof.

In order to ascertain whether the "fault" alarm is caused by a break or by cross wires, the means shown in Figs. 2 and 3 may be employed. These means consist of a switch *s* that is interposed in the line wire *d* at the central station, and normally keeps such wire closed as shown in Fig. 2. The switch is however adapted to bring the current from a battery *t* into circuit with such wire by moving it to one side, as shown in Fig. 3.

When a "fault" alarm is given, the switch is moved over to the position shown in Fig. 3. This will bring the battery *t* into the wire so that if the alarm is caused by a cross wire the relay *j* will be reenergized by such battery and the alarm circuit broken. Should a break have occurred, the alarm will continue to sound.

What I do claim as my invention, and desire to secure by Letters Patent is:—

1. In electric alarm systems, the combination with a closed line wire circuit, of a battery circuit adapted to be switched into such wire circuit by the operation of a thermostat or other local circuit, two relays of respectively differential resistances arranged in the line wire circuit, and an alarm indicator circuit adapted to be operated by the

movement of the armature of each relay, substantially as herein specified.

2. In electric alarm systems, the combination with a closed line wire circuit, of a relays of respectively differential resistances arranged in such circuit, an alarm indicator circuit adapted to be operated by the movement of each relay armature, and means whereby the differential resistances of the relays may be overbalanced upon the operation of a thermostat or other local circuit, substantially as herein specified.

3. In electric alarm systems, the combination with a closed line wire circuit, of a thermostat or other local relay circuit arranged with its relay armature in the line circuit, a battery circuit adapted to be brought into the line circuit by the movement of the relay armature, a pair of relays of respectively differential resistances arranged in the line circuit and an alarm indicator circuit adapted to be operated by the movement of each relay armature, substantially as specified.

4. In electric alarm systems, the combination with a closed line wire circuit, of two relays of respectively differential resistances arranged in such circuit, an alarm indicator adapted to be operated by the movement of each relay armature, means whereby the differential resistances of the relays may be overbalanced upon the operation of a thermostat or other local circuit, a switch interposed in the line wire circuit and a battery adapted to be switched into such circuit by the operation of the switch, substantially as specified.

Dated this 19th day of April 1910.

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

FRANK CASTLE.

Witnesses:

LESLIE McDERMOTT.

M. E. DE LANGE.