

(No Model.)

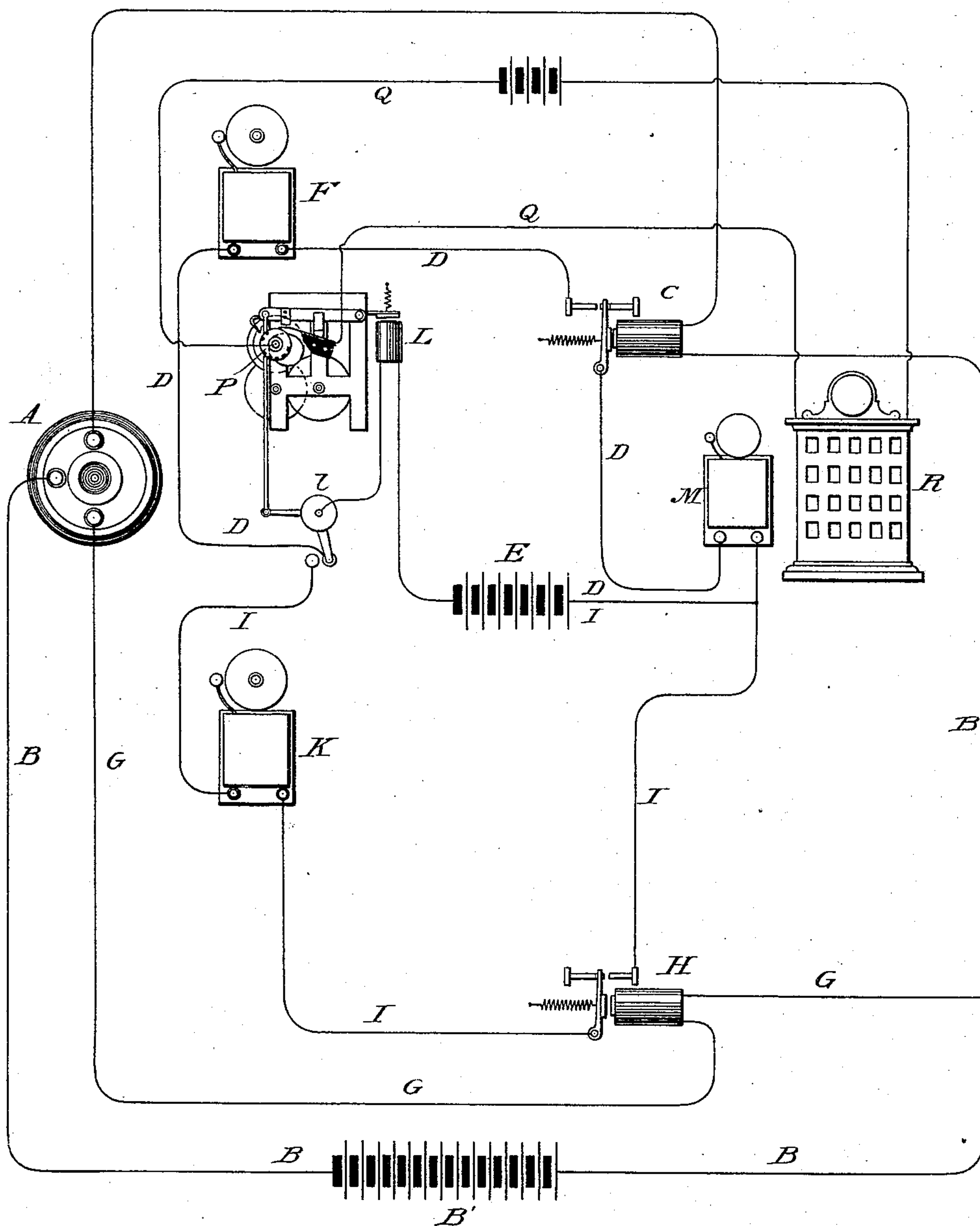
2 Sheets—Sheet 1.

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ELECTRIC FIRE ALARM.

No. 484,140.

Patented Oct. 11, 1892.

Fig. 1.



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UNITED STATES PATENT OFFICE.

HARVEY CORTLAND, OF TORONTO, CANADA.

ELECTRIC FIRE-ALARM.

SPECIFICATION forming part of Letters Patent No. 484,140, dated October 11, 1892.

Application filed April 30, 1892. Serial No. 431,366. (No model.)

To all whom it may concern:

Be it known that I, HARVEY CORTLAND, of Toronto, county of York, and Dominion of Canada, have invented a new and useful Improvement in Electric Fire-Alarms, of which the following is a specification.

My invention has reference to an automatic electric alarm controlled by a thermostat in such manner that when an excessive temperature occurs an alarm will be sounded in the building or at a central station, or both, and that if the increase in temperature continues a second alarm will be sounded.

To this end I combine with a thermostat adapted to first open and then close a circuit as the temperature increases circuits, including alarms, and a clock mechanism for controlling the circuits, as presently to be explained.

In the accompanying drawings, Figure 1 is a diagrammatic illustration of my system. Fig. 2 is a rear face view of one of the thermostats. Fig. 3 is a cross-section of the same. Fig. 4 is an enlarged view of the switch-moving mechanism.

Referring to the drawings, A represents the thermostat, of which there may be any suitable number, consisting mainly of a metal ring or frame a , a concave disk a' , of hard rubber or analogous material seated firmly therein, a conducting-finger a^2 , sustained at the middle by a screw a^3 , resting centrally on the concave side of the disk, and two conducting-fingers a^4 and a^5 , lying on opposite sides of the finger a^2 and connected in like manner with binding-posts. The fingers a^3 and a^4 are insulated from the rim of the thermostat, and the fingers a^2 and a^4 are normally in contact, so that the circuit is closed through them; but as the temperature rises and increases the concavity of the disk the finger a^2 is permitted first to separate from the finger a^4 and open the original circuit, and thereafter as the heat continues to contact with finger a^5 and close the circuit through a new channel, thus forming a double-acting thermostat, which operates first to break the circuit and afterward to re-establish the same through an increase or continuance of temperature. The two circuits thus controlled will be hereinafter referred to as the "primary" and the "secondary" local circuits.

B represents the main normally-closed circuits connecting with the fingers a^2 and a^4 of the thermostat. This circuit includes the main battery B and the relay C. The relay in turn controls a normally-open local circuit D, which includes, first, a local battery E; second, a local magnetic alarm-bell F, of any ordinary construction, intended to give a cautionary alarm; third, a central-office instrument M, which may be an alarm or annunciator, or both; fourth, the controlling-magnet of a spring-actuated mechanical switch and signaling-instrument L and its switch proper t' , hereinafter described in detail.

From the main circuit B there is extended a normally-open branch circuit G, leading to the finger a^5 of the thermostat and containing a relay H, which controls a second normally-open local circuit I. This last-named circuit contains, first, the magnetic alarm-bell K to indicate the existence of a fire; second, the battery E, and, third, the magnet L of the before-mentioned switch mechanism L. This secondary local circuit is open both at the switch l and at the thermostat. The instrument L contains a rotary signal-wheel P, located in a circuit Q, which includes a central-office instrument R, which may be of any construction, adapted to be operated electrically—for example, an ordinary annunciator or alarm-bell. This circuit to the central office may be arranged independently of the other circuits, as shown, or connected with them in any suitable manner, the one requirement being that the operation of the instrument L shall transmit a definite or distinctive signal to the central station. The one central-office instrument may be connected with any desired number of circuits, each serving to transmit its individual or distinctive signal to the office.

The operation of the system is as follows: The main circuit B is closed at the thermostat through the fingers a^2 and a^4 , so that the relay C holds the local circuit D open. When the temperature rises above the predetermined limit, the separation of the fingers a^2 and a^4 opens the main circuit B, whereupon the relay C permits the closing of the local circuit D, which is followed by the sounding of the cautionary alarm F, and by the starting of the switch and signal instrument L through

the action of its magnet L' . The instrument L transmits a signal to the central-office instrument, and at the same time shifts the switch t , so as to open the local circuit D and prevent the wastage of the battery E . The switch continuing its movement closes a second local circuit I , which is, however, held open in the meantime at the relay H . If the temperature continues to rise, as it will do in the event of a fire occurring in its vicinity, the fingers a^2 and a^5 will close the main circuit through its branch G , thereby causing the relay H to close the secondary local circuit I , which is followed by the sounding of the local fire-alarm K , and by the operation of the instrument L , and the transmission of the signal thereby to the central office. The reception of this second signal at the office will at once be recognized as an indication of fire. I now describe in detail the construction of the instrument L . A frame t^2 contains an ordinary clock-train and its actuating-spring t^3 . This train carries a signaling-wheel t^4 , having on its periphery a series of teeth or insulated portions, co-operating with a conducting-finger t^5 , after the manner of ordinary signaling instruments now in use, to transmit the signal to the central station. The shaft which carries the signaling-wheel also carries an eccentric t^6 , which acts on an overlying lever t^7 , from which a rod t^8 is extended downward to one end of the angular switch-finger t^9 . As the eccentric revolves it lifts the lever and shifts the switch to open the primary local circuit and close the secondary local circuit, as before described.

After the sounding of the second or fire-alarm the switch is restored to its normal condition by hand. The starting and stopping of the instrument L is effected by a detent-lever S , such as is commonly used in striking-clocks, this lever being provided with an armature in the field of the electro-magnet L' , before referred to. Whenever the magnet attracts the lever in consequence of the closing of either of the local circuits, the eccentric and

signal-wheel are permitted to make a single revolution.

Having thus described my invention, what I claim is—

1. In combination with the double-acting thermostat, the main and branch circuits controlled thereby, the relays in said circuits, the local circuits controlled by the relays and containing alarm-instruments, and a switch mechanism controlled by one local circuit and acting to open the same and to close the other.

2. In combination with the double-acting thermostat, the main and branch circuits, their relays, the local circuits controlled by the relays and containing alarm-instruments, and the mechanical alarm switch mechanism L , adapted to open one local circuit and close the other, and also adapted and arranged to transmit a signal to a central-office instrument, and a magnet to control the instrument L , located in the local circuit.

3. The improved thermostat, consisting of the frame, the convex expansible disk, the conducting-fingers a^4 and a^5 , and the intermediate conducting-finger a^2 , operated by the disk.

4. In combination with a thermostat and two circuits controlled thereby, the mechanical switch-instrument L , consisting of the spring-actuated clock-train and its eccentric, the lever moved by the eccentric and connected to the switch proper, and the controlling-magnet.

5. The combined switch and signal instrument, consisting of the spring-actuated clock-train, the signal-wheel and finger, the eccentric, the lever actuated thereby, the switch proper connected with the lever, the detent, and the magnet controlling the detent.

In testimony whereof I hereunto set my hand, this 28th day of April, 1892, in the presence of two attesting witnesses.

HARVEY CORTLAND.

Witnesses:

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