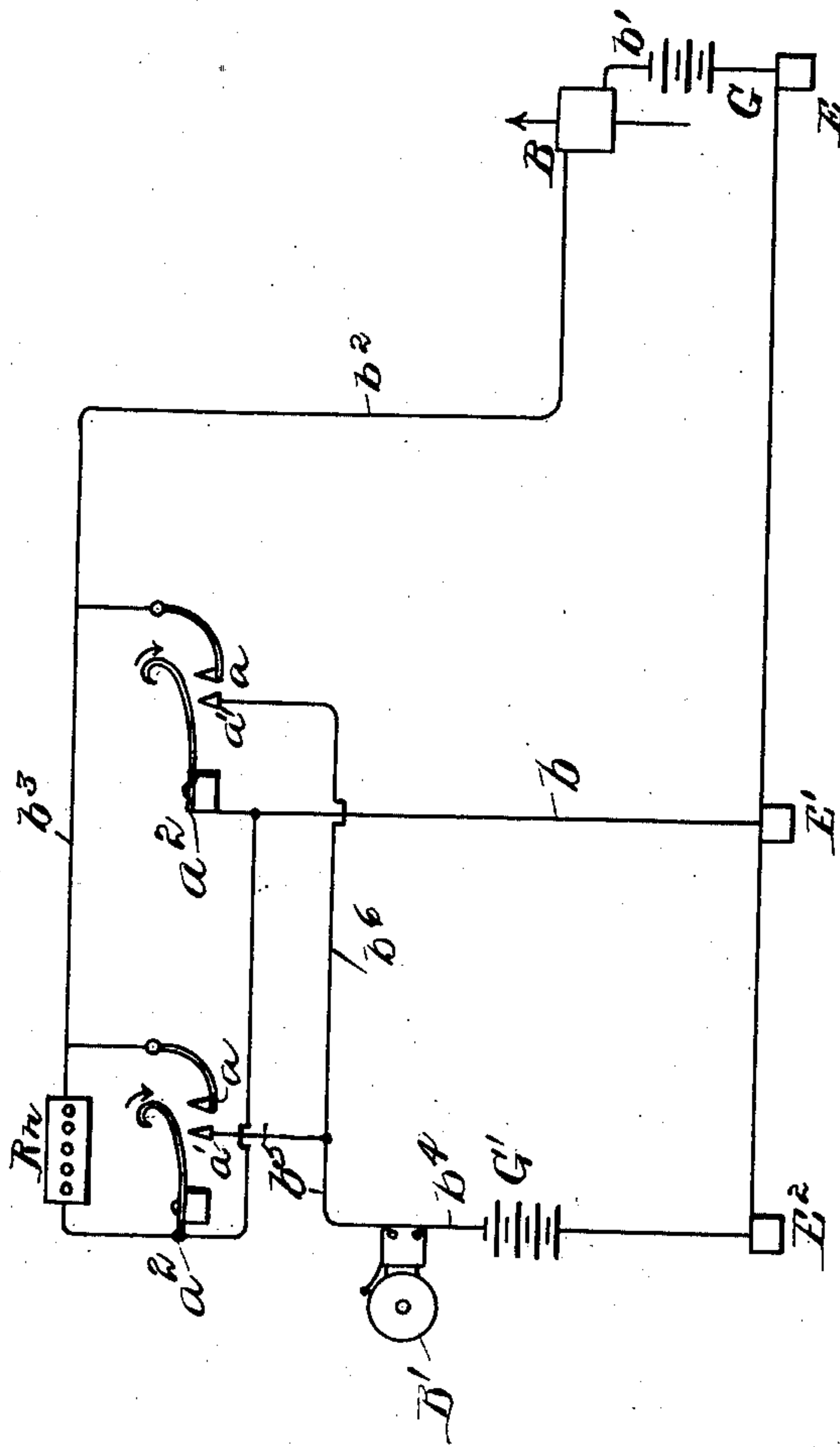


(No Model.)

**J. W. WHITE.**  
**FIRE ALARM SYSTEM.**

No. 524,973.

Patented Aug. 21, 1894.



Witnesses;  
Fourth Cell,  
John R. Snow.

Inventor:  
J. W. White  
by J. H. Maynard  
his Atty.

# UNITED STATES PATENT OFFICE.

JOEL WALES WHITE, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF ONE-HALF TO ASHBEL T. WALL AND GEORGE A. WALL.

## FIRE-ALARM SYSTEM.

SPECIFICATION forming part of Letters Patent No. 524,973, dated August 21, 1894.

Application filed May 28, 1894. Serial No. 512,753. (No model.)

*To all whom it may concern:*

Be it known that I, JOEL WALES WHITE, of Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Fire-Alarm System, of which the following is a specification, reference being made to the accompanying drawing, which is a diagram illustrating the invention.

The use of thermostats in systems for guarding property against fire by giving an alarm automatically as soon as any thermostat is exposed to a predetermined temperature has long been known; but owing to the fact that the apparatus is likely to remain unused for long periods of time and to the further fact that it is likely to get out of order before the occasion arises for its operation, its use has been much restricted.

The object of the present invention is to provide a system of this kind which will give notice automatically when it is out of order, whether from accident or design and generally to make the use of thermostats as automatic fire alarms so certain and efficient that full confidence can be reposed in such a system in spite of the fact that no occasion for its operation as a fire alarm may arise for years after it is constructed.

The invention consists in the combination of a thermostat having three electrodes, with two circuits one of which is closed and the other open, the closed circuit and the open circuit having one electrode of the thermostat in common; and both circuits being provided with suitable translating devices, but the closed circuit being through a loop about all the thermostats, with such a resistance in that loop that the normal current in the closed circuit is small and serves simply to move the needle or pointer of its translating device to an intermediate position indicating that the apparatus is in order; all as will now be more fully explained by reference to the diagram.

The thermostats A will be arranged as usual, and may be of any usual construction, except that each must have three electrodes  $a$   $a'$   $a^2$ , instead of but two as in thermostats heretofore used. As an example these thermostats will be arranged on the floors of a building and all the thermostats on the several floors may constitute one series so far as

concerns the closed circuit, its translating device B and its rheostat R; but those on one floor only will constitute a series so far as concerns the open circuit and its annunciator, or other translating device B'. This is in order that those in charge of the system may have a number of indicators such as B constantly under the care of an attendant, while the annunciators B' may be arranged in a proper place in the building which is to be protected; each indicator thus representing at the central office a given building but each annunciator in any building representing one of the floors of that building.

The spring  $a^3$  or other moving part of each thermostat A is in electrical connection with the electrode  $a^2$  which is grounded, as by the wire  $b$ , or otherwise; and the electrodes  $a$  and  $a'$  are insulated from the spring  $a^3$  until the temperature about the thermostat rises to the danger point, when the spring  $a^3$  is released by the melting of the solder by which the spring  $a^3$  is held under stress; whereupon the spring  $a^3$  makes contact with the electrodes  $a$  and  $a'$  and thereby completes an electrical connection between all three electrodes,  $a$   $a'$   $a^2$ . Of course two thermostats, each with but two electrodes, as now commonly made, will answer in place of a single thermostat with three electrodes, if one electrode of each of the two thermostats with but two electrodes be connected with the wire  $b$ , or otherwise grounded; but for certainty of operation a single thermostat with three electrodes is preferable to two thermostats each with two electrodes but made the equivalent of a single thermostat with three electrodes by connecting two of the electrodes together.

The closed circuit in the diagram is from generator G grounded at E through wire  $b'$ , galvanometer B, wire  $b^2$ , through loop  $b^3$  and rheostat R to electrode  $a^2$  of the thermostats, and from electrodes  $a^2$  by wire  $b$  to ground E'; and the open circuit from generator G' grounded at E<sup>2</sup> through wire  $b^4$  annunciator B', wire  $b^5$ , to the electrode  $a'$  of thermostats connected by wire  $b^6$ ; and when the open circuit is closed by electrical connection of wires  $b^5$  or  $b^6$  with wire  $b$ , through electrodes  $a'$  and  $a^2$  (or otherwise when testing the apparatus) the open circuit is completed through wire  $b$  to



ground  $E'$ , thus operating  $B'$ . Of course metallic circuits may be used, that is  $a^2$  may be connected by a wire to the proper pole of  $G$ , and to the proper pole of  $G'$ .

5 Normally the current through the closed circuit will be small but sufficient to keep the index of the galvanometer  $B$  at a point between two other points, one of which on the left in the diagram indicates that the apparatus is out of order, as by the rupture, or rusting out, of wire  $b^2$ , or failure of generator  $G$ , or the like, preventing sufficient current in the closed circuit to keep the index of  $B$  at its proper point to indicate good order; and the other of which on the right in the diagram, 15 indicates that the thermostats have operated or that there is an excess of current above the normal; for when wire  $b^2$  is connected to wire  $b$  by the operation of any thermostat causing electric connection between  $a$  and  $a^2$  the current instantly increases through  $B$ ; and so if wire  $b^4$  be accidentally grounded or if, for any reason, an excess of current passes through  $B$ . In case the temperature at any thermostat 25 becomes excessive the electrodes  $a$   $a'$  and  $a^2$

are electrically connected and an excess current is established through  $B$  and a current is also established through  $B'$ , thus giving a double alarm.

While no broad claim is made to any part 30 of the apparatus the combination of the elements necessary to produce a double automatic fire alarm system which automatically gives notice of any derangement unfitting it for its intended operation, and which is otherwise practically efficient is new. 35

What is claimed as the invention is—

A fire alarm system comprising a closed circuit containing a resistance and translating device, an open circuit containing a translating device, a thermostat having three electrodes, a shunt around the resistance closed by two of the thermostatic electrodes, and the open circuit arranged for closure by the third thermostatic electrodes. 40

JOEL WALES WHITE.

Witnesses:

H. W. TIMBALL,  
GEO. B. SMITH.