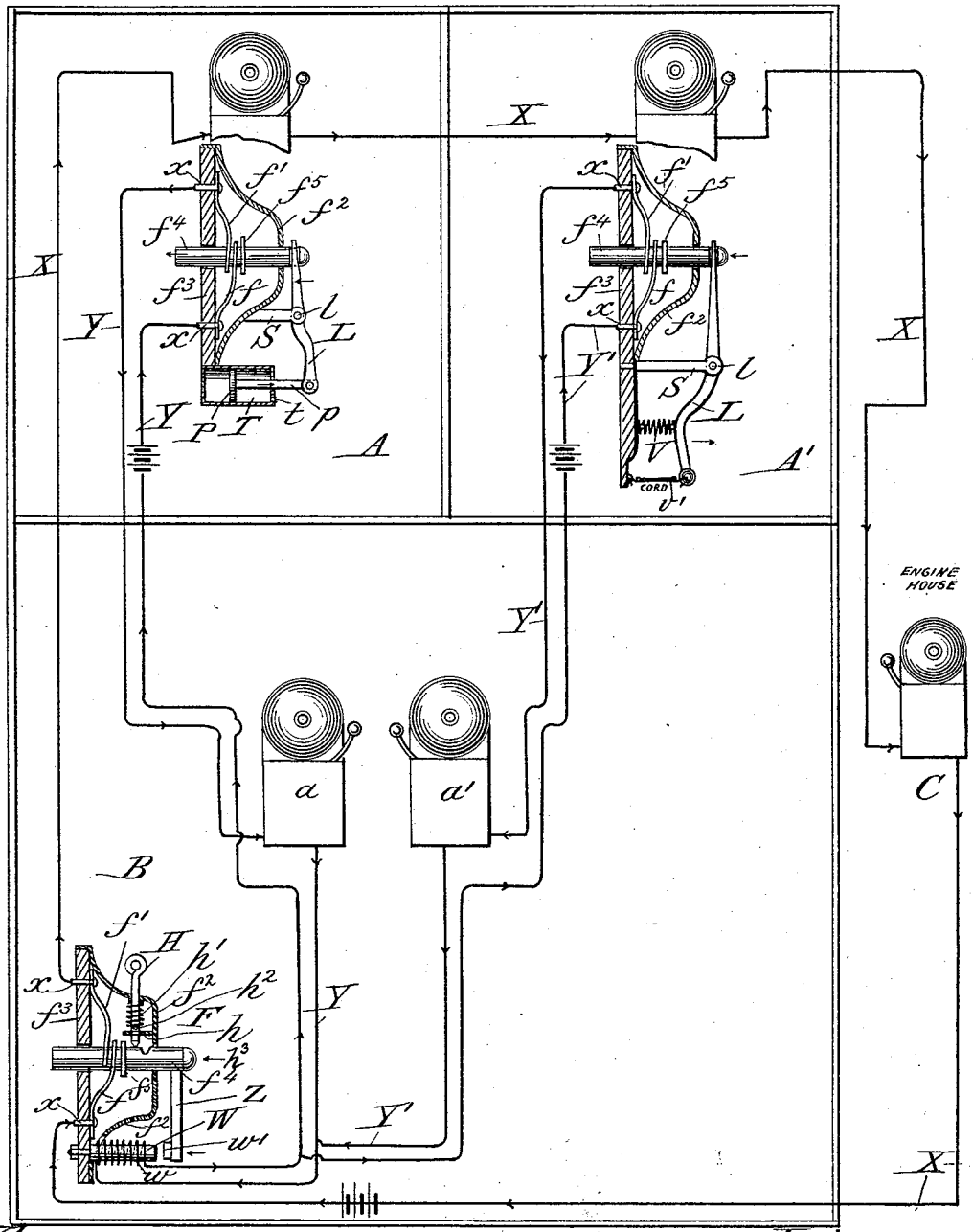
(No Model.)

# B. W. LEONARD.

## ELECTRICAL FIRE ALARM.

No. 454,746. Patented June 23, 1891.

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# UNITED STATES PATENT OFFICE.

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## ELECTRICAL FIRE-ALARM.

SPECIFICATION forming part of Letters Patent No. 454,746, dated June 23, 1891.

Application filed March 24, 1891. Serial No. 386,189. (No model.)

*To all whom it may concern:*

Be it known that I, BRUNSWICK W. LEONARD, a citizen of the United States, residing at Saybrook, in the county of Middlesex and the State of Connecticut, have invented certain new and useful Improvements in Electrical Fire-Alarms, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing and the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in electrical fire-alarms, and has for its object the provision of means whereby the existence of an abnormal temperature in an unoccupied room of a hotel or similar establishment is immediately indicated at a central point, as an office, from which a general alarm is simultaneously sent over the whole building and to a fire department, thereby making the danger generally known before the fire causing the rise in temperature has time to spread, and allow the occupants time to escape.

The invention consists in establishing a general circuit through all the rooms of a building and the office of a fire department, adapted to ring a gong or other alarm suitably placed in each of the said places, and at a central point providing it with a circuit-closer which will be operated by thermal circuit-closers situated at different places. This I accomplish by providing local circuits, each of which connects a thermal circuit-closer, the indicator of its respective room, and a common solenoid located in the office. This solenoid is provided with an armature which is attached to an arm of the plunger of the circuit-closer of the general circuit, so that if one of the local circuits should be closed the general circuit would be established and the alarms sounded in consequence. The closing of the local circuit would also designate by the indicator in the office the place of the fire. The general circuit-closer is provided with a catch which will register with a recess in the side of the plunger when the latter is depressed and hold it in its depressed position, and thereby cause a continuous ringing of the alarms until the plunger is released.

The invention further relates to the novel combination and arrangement of parts, as will be hereinafter more fully described, pointed out in the appended claim, and illustrated in the accompanying drawing.

In the accompanying drawing, in which similar letters of reference designate corresponding parts, the figure shows the device as applied to a building, illustrating the system of circuits and the arrangement of the circuit-closers, the latter being shown in section.

Referring to the drawing, A and A′ designate the rooms, and B the office, of a hotel, and C an engine-house. In each of these places is affixed in a suitable position an electrically-operated bell D, connected with a common circuit X. The terminals of this circuit are the spring-contacts $f$ and $f'$ of the circuit-closer F. By closing this general circuit all of the bells D D will be rung and the alarm given to the inmates of the building and to the fire department, where the fire can be located by suitable indicators.

The circuit-closer F consists of a casing $f^2$, secured to a base $f^3$, and has projecting from its crown the outer end of a plunger $f^4$, which is guided at its inner end by a recess in the base $f^3$, with which it registers. Midway of the plunger is secured a collar $f^5$, the purpose of which will be explained further on. The casing, base, and plunger are formed of such non-conducting material as is suitable in the premises.

Secured near the outer edges of the base $f^3$ are the outer ends of the spring-contacts $f$ and $f'$, which are connected with the ends of the wire forming the circuit X through the screws $x$ $x$. The inner ends of the spring-contacts are bifurcated and each of them partly surrounds the plunger $f^4$, the lower one $f$ being outside of the upper and normally out of contact with it. By pressing upon the projecting end of the plunger the collar $f^5$ will engage with the spring-contact $f$ and press it inwardly to contact with the spring-contact $f'$ and thereby close the circuit X. To retain the plunger in its depressed

position and thereby cause a continuous ringing of the alarms D D, a spring-catch is provided. This catch consists of a bolt H, supported at its inner end in an opening in the lug $h$, projecting inwardly from the crown of the casing and at its outer end by an opening in the side of the casing, through which it projects. The bolt is pressed inwardly by a coiled spring $h'$, surrounding the same and compressed between the casing and the pin $h^2$. The plunger is recessed at $h^3$, so that when it is pressed inwardly the bolt will register with the recess and retain the former in its depressed position. The outer end of the bolt projects a considerable distance, so that the plunger can be released and the circuit broken when desired.

In each room of the hotel is secured a thermal circuit-closer adapted to close a local circuit Y, leading from the same to the office or other central place to an indicator for its respective room. Each local circuit has connected with it the wires of a solenoid adapted to close the general circuit on the completion of the former. The thermal circuit-closers are also adapted to be operated by hand. A placard setting forth the purposes and manner of operating these devices should be placed in a conspicuous place near each of them, so that the occupant of the room in which it is placed could comprehend its nature and not take it for a call-button.

In the present instance two thermal circuit-closers are shown, each of which is actuated by means somewhat different, though substantially the same. The general arrangement of the several parts of these circuit-closers proper is similar to that hereinbefore described, with the exception of the spring-catch for retaining the plunger when depressed. The additional features will now be described. S is a standard projecting from the casing or base in a line perpendicular to the base. L is a lever pivoted at $l$ to the outer end of the standard and has one of its ends bifurcated and registering with the recessed projecting end of the plunger, so that if the free end of the lever be elevated the inner end will press the plunger inwardly of the casing, and thereby complete the local circuit.

Several means may be adopted to operate the lever, two of which are shown. That shown in connection with the local circuit of the room A consists of a hollow cylinder T, attached at its base in any suitable manner to the casing $f^2$ or base $f^3$, and which projects from the same, so that its axial line is parallel with the plunger. The top of the cylinder is perforated at $t$, for a purpose which will be explained farther on. Within the cylinder is a piston P, connected with the free end of the lever L by the piston-rod $p$. Beneath the piston is placed a small quantity of any material which will be rapidly expanded or exploded if the temperature of the room should become abnormal. The object of the vent $t$ is to allow the escape of the air in front of the piston when it is put in motion.

The means for operating the lever, as illustrated in room A′, consists of a coiled spring V, compressed between the casing or base and the free end of the lever, and which would if unrestrained elevate the said end and force the plunger inwardly. Normally, however, the action of the spring is restrained by tying down the free end of the lever by a cord $v'$ or a wire of metal easily fusible. Should the temperature of the room become abnormal, the string would be charred or the metal melted and the lever released and the local circuit established.

Y and Y′ are circuits leading from the rooms A and A′, respectively, to the indicators $a$ and $a'$, located in the office or other central point of the building. With each of these circuits is connected the wiring $w$ of the solenoid W.

Z is an arm projecting from the plunger $f^4$ of the circuit-closer located in the office, and has attached to its free end an armature $w'$ in such a position as will adapt it to be attracted by the solenoid W.

The operation of the device is as follows: Should a fire be accidentally started in an unoccupied room in which a thermal circuit-closer is located, the heat from the same would cause the circuit-closer to act and establish the local circuit leading to the indicator and the solenoid in the office. The solenoid would, through its armature and other connections, complete the general circuit and sound the alarms throughout the entire building and the indicator at the fire department.

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

In a device of the class specified, the combination of the general-alarm circuit, the circuit-closer placed in the said circuit, consisting of the base, the casing attached to the base, the spring-contacts, the plunger, the catch carried by the said casing, the arm attached to the outer end of the plunger, the armature attached to the free end of the said arm, and the means for operating the said plunger, consisting of the thermal circuit-closers, the solenoid, and the local circuits connecting the thermal circuit-closers with the solenoid, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

BRUNSWICK W. LEONARD.

Witnesses:
THOS. C. ACTON, Jr.,
C. M. DU VERNET.