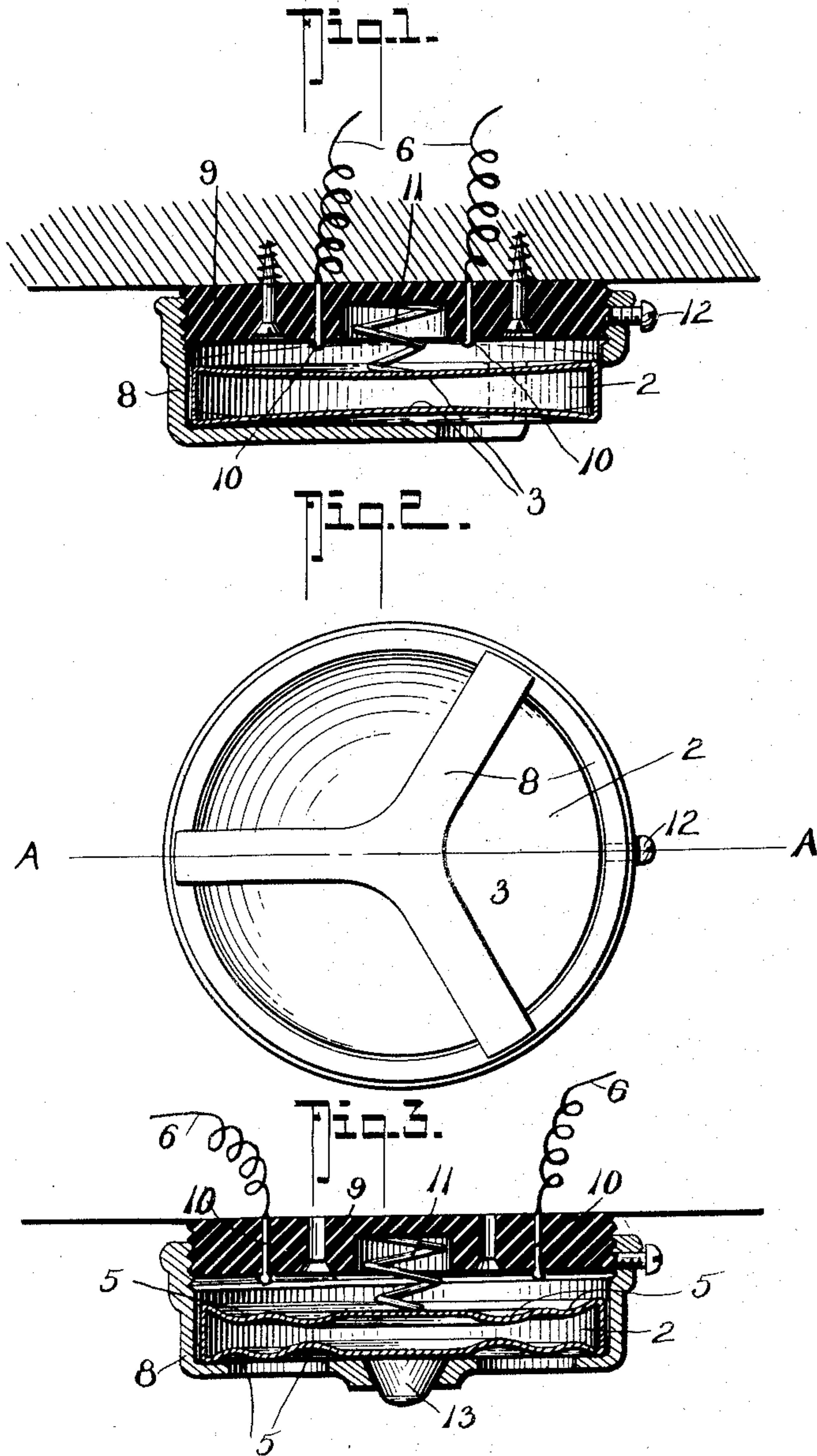


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A. TAYLOR.
AUTOMATIC FIRE ALARM.
APPLICATION FILED MAY 13, 1905.



WITNESSES:

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AUTOMATIC FIRE-ALARM.

No. 812,776.

Specification of Letters Patent.

Patented Feb. 13, 1906.

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To all whom it may concern:

Be it known that I, ALFRED TAYLOR, a citizen of the Dominion of Canada, residing at the city of Victoria, in the Province of British Columbia, Canada, have invented a new and useful Improvement in Automatic Fire-Alarms, of which the following is a specification.

This invention relates to an automatic fire-alarm of that class wherein the expansion under heat of a volatile material is used to establish contact in an electric-bell circuit, whereby an alarm may be given; and the invention consists, primarily, in the particular design of the chamber in which the volatile material is retained, whereby the expansion of it under heat produces an axial extension of the chamber in a series of intermittent movements as the internal pressure increases. By this intermittent feature the adjustment of the device to effect an alarm may be better regulated to any desired temperature, and when such temperature is reached the contact by which the circuit is opened to ring the alarm is immediate and complete and the alarm consequently more effectual. In other fire-alarms operated by expansion by heat the contact being gradually attained the ring is at first feeble and the ear of a sleeper becomes accustomed to the sound before it attains its full strength, and the value of the alarm is consequently less than if a ring of full strength were given at once.

A further and important advantage of the design lies in the fact that it is susceptible of being introduced into the structure of an ordinary electric-bell push, so that an automatic fire-alarm system may be grafted onto a bell-signaling system and the expense of separate installation avoided. The value of this feature will be readily appreciated in buildings—such as factories, warehouses, hotels, &c.—requiring a call system.

The invention is fully described in the following specification and illustrated in the drawings which accompany it.

Figure 1 is a cross-section on the line A A in Fig. 2 of my device in a form which may be appropriately secured to the ceiling or upper part of the wall of a room; Fig. 2, a plan of the same from the under side, and Fig. 3 a cross-section showing the device as applied to an ordinary electric-bell push.

In the drawings, 2 represents a shallow cy-

lindrical metallic vessel within which is hermetically sealed a volatile material which at the desired limit of temperature will afford the necessary expansion to effect the purpose. The ends 3 of this chamber 2 are edge-bound to a sufficient extent to impart a slight convexity to them, (the amount of which is exaggerated in the drawings,) and this convexity under normal conditions is directed inward, as shown by the full lines in the drawings; but when a pressure sufficient to overcome the edge tension of the ends is generated within the chamber by the volatilization of the material therein the convexity of the ends will be bulged or forced outward and the axial length of the chamber increased, as indicated by dot-and-dash lines in Fig. 1. Attention is here drawn to the fact that if both ends 3 of the chamber are edge-bound as the pressure within the chamber increases one end will first be outwardly bulged and the relief thus afforded to the internal pressure will require a sensible further increase of pressure before the other end is forced out, and this pause or rest in extension affords the opportunity for effective adjustment to which attention will be drawn later. To further increase this opportunity for adjustment, one or both ends 3 may be corrugated or provided with a series of annular grooves 5, as illustrated in Fig. 3, so that each end may be provided with a series of edge-bound areas, which will successively be acted upon as the pressure within gradually increases. In the application of this principle to the purpose of an alarm the chamber 2 is inclosed in a casing 8, adjustably secured to a base 9, through which the terminals 10 of the electric-bell circuit 6 are carried in suitable insulation and project within the casing. A spring 11 holds the chamber 2 off the terminals 10 until the bulging of one or the other, or both, of the ends reacting against the end of the casing 8 overcomes the resistance of the spring 11 and presses the adjacent end 3 of the chamber 2 against the terminals 10, thus bridging the space between the terminals by the metallic end of the chamber and opening the circuit in which is the electric bell.

The base 9 will preferably be made of insulating material to which the casing can appropriately be attached by a screw-thread, which means of attachment will afford the desired

facility for adjustment, a small screw 12 being provided to enable the casing to be secured at any desired position of such adjustment.

5 The casing 8 will preferably be made open to afford access of the external air to the material of the chamber and insure a prompt volatilization and alarm in the case of fire.

The application of the device to an electric-
10 bell push is illustrated in Fig. 3, the construction being similar to that revealed in Fig. 1, with the addition of the push-button 13 in the outer end of the casing 8, so that when required as a call-bell the chamber 2 merely
15 acts as a contact-bridge to be pushed in by the button 13 and establish connection between the terminals 10 of the bell-circuit, while if a fire breaks out in the room the ends of the chamber 2 will be outwardly-extended
20 and connect the terminals.

Having now particularly described and ascertained the nature of my said invention and the manner of its operation, I hereby declare that what I claim as new, and desire to
25 be protected in by Letters Patent, is—

1. In an automatic fire-alarm; the combination with the terminals of an electric-bell circuit, of means for establishing a connection between the terminals and closing a circuit
30 such means comprising, a shallow hermetically-sealed chamber having ends which are edge-bound and normally inwardly convex but susceptible of being outwardly bulged by pressure within the chamber, means for supporting such chamber adjacent to the terminals so that when one or other or both of the ends are outwardly bulged the adjacent end will electrically connect the terminals, and
35 means for positively and normally holding such connecting means off both of the terminals.

2. In an automatic fire-alarm; the combination with the terminals of an electric-bell circuit, of a non-conducting base through
45 which the terminals outwardly and fixedly project, of an open casing adjustably secured to the base, of a shallow hermetically-sealed chamber between the base and the end of

the casing, the ends of which chamber are edge-bound and normally inwardly convex, 50 but outwardly extensible under internal pressure to contact with and bridge between the terminals and close the bell-circuit, and means for normally holding such bridging means off the terminals. 55

3. In an automatic fire-alarm; the combination with the terminals of an electric-bell circuit, of a base of non-conducting material through which the terminals are carried, such base having a screw-thread receiving a casing 60 designed to retain between the end of the casing and the terminals a shallow hermetically-sealed chamber the ends of which are edge-bound and normally inwardly convex, but susceptible of being outwardly bulged to 65 contact with the exposed terminals of the circuit, of means for normally holding the adjacent end of the chamber off the terminals and means for securing the casing in any desired position of adjustment from the non-con- 70 ducting base.

4. In an automatic fire-alarm, the combination with an insulating-base having screw-receiving apertures to secure the same to a support and having a central countersunk 75 portion, of an open frame connected with said base and supported thereby, an expandible sealed vessel held within said open frame below the base, a coil-spring seated in said countersunk portion of the base for engaging 80 the sealed vessel, a pair of electric terminals carried by said base, said spring serving to normally hold said sealed vessel out of contact with said terminals and a push-button carried by the open frame and in engagement 85 with said vessel by means of which the vessel can be pushed up into engagement with the electric terminals, substantially as shown and described.

In testimony whereof I have signed my 90 name to this specification in the presence of two subscribing witnesses.

ALFRED TAYLOR.

Witnesses:

H. A. FREDERICK,
THOMAS H. HORNE.