

H. PLOWMAN.
AUTOMATIC FIRE ALARM APPARATUS.

APPLICATION FILED JULY 3, 1901.

NO MODEL.

2 SHEETS—SHEET 1.

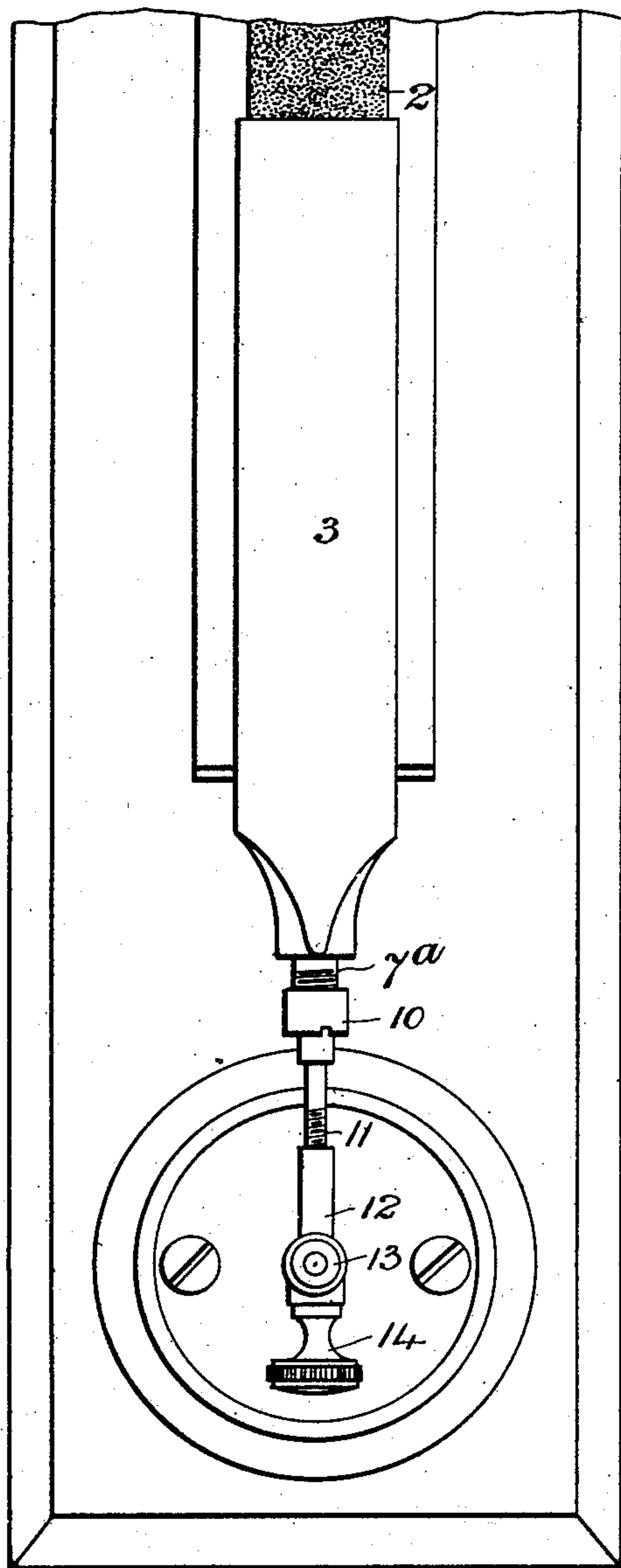


Fig. 2.

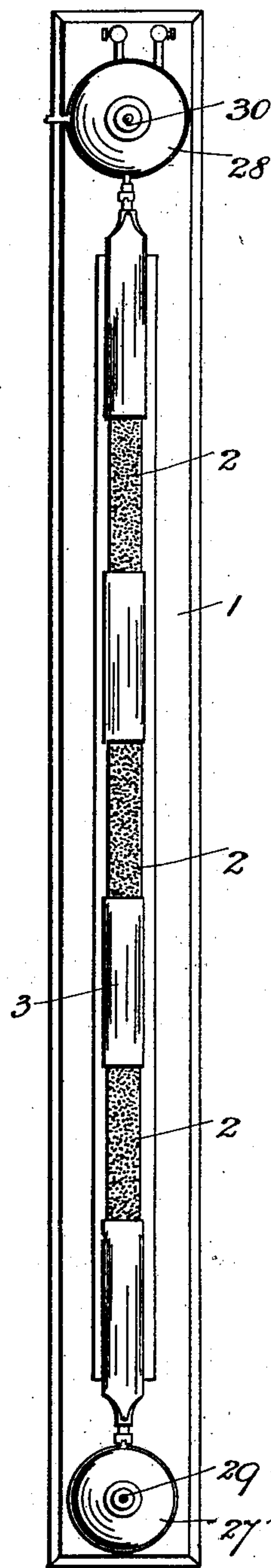


Fig. 1.

Witnesses
Thomas Kirkpatrick
H. van Heerenbriek

Inventor
Harry Plowman
by Alexander & Co
Attorneys

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2 SHEETS—SHEET 2.

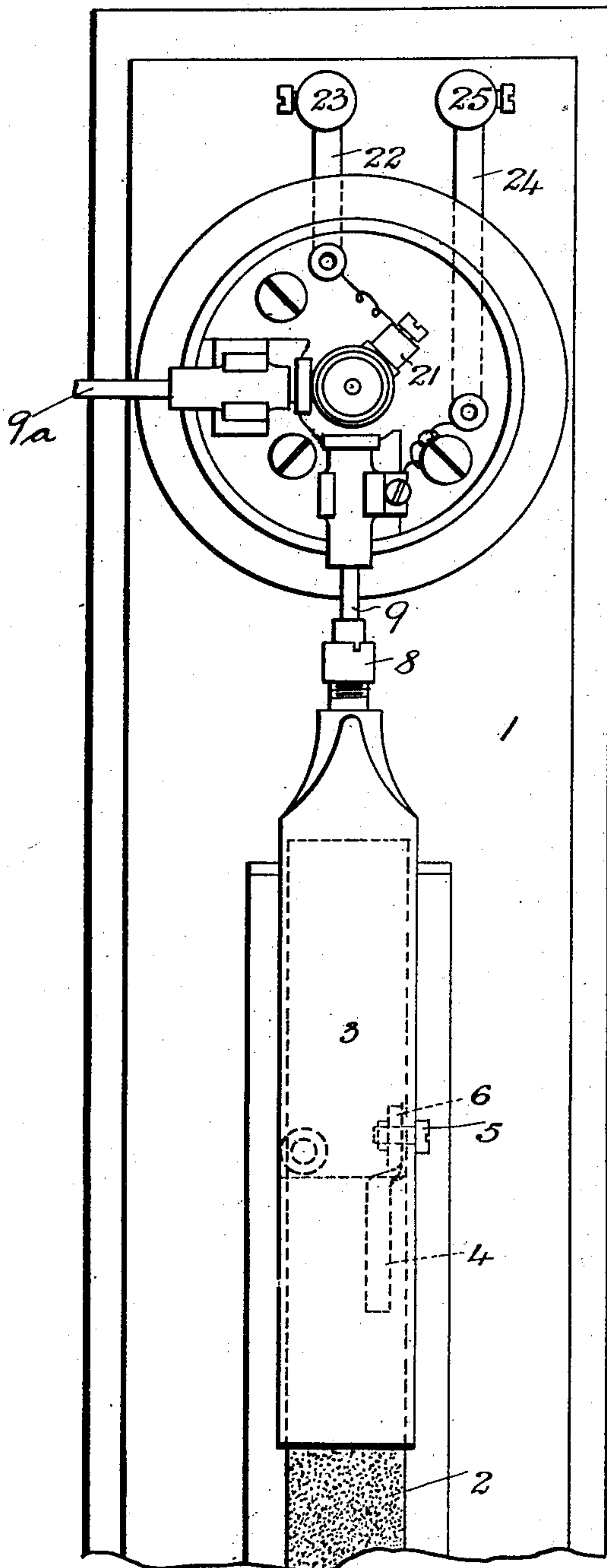


Fig. 3.

Witnesses
 Thomas Kupatrust
 H. Van Heerenbrink

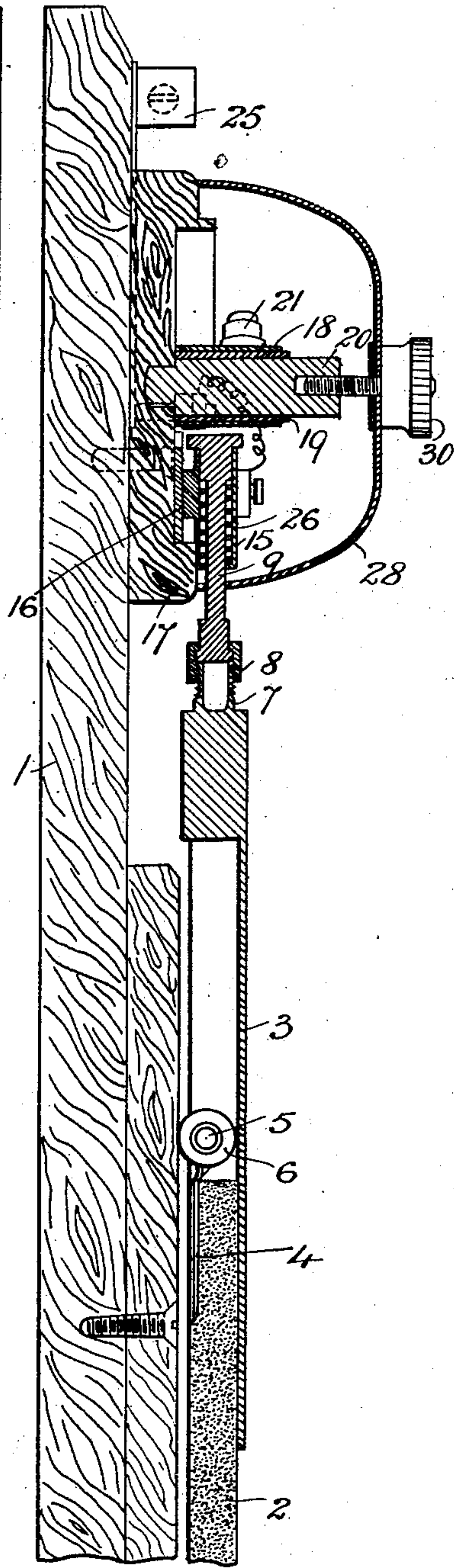


Fig. 4.

Inventor
 Harry Plowman
 by Alexander, Co
 Attorneys

UNITED STATES PATENT OFFICE.

HARRY PLOWMAN, OF LONDON, ENGLAND.

AUTOMATIC FIRE-ALARM APPARATUS.

SPECIFICATION forming part of Letters Patent No. 719,504, dated February 3, 1903.

Application filed July 3, 1901. Serial No. 66,944. (No model.)

To all whom it may concern:

Be it known that I, HARRY PLOWMAN, gentleman, a subject of the King of Great Britain and Ireland, and a resident of 7 Denmark street, Charing Cross road, London, W. C., England, have invented certain new and useful Improvements in Automatic Fire-Alarm Apparatus, (for which I have made application for Letters Patent in Great Britain, No. 22,012, bearing date December 4, 1900,) of which the following is a specification.

My invention relates to fire-alarms in which an electric contact is made, effecting an alarm either at a fire-station or at other desirable points.

My invention consists in a fire-alarm thermostat in which the contacts of a switch or similar device in an electric circuit are normally maintained apart against spring tension or gravity by a composition of fusible alloy, which becomes plastic and yields when subjected to a sufficient rise in temperature, so as to allow the contacts to come together and close the alarm-circuit, thereby effecting the required alarm.

In the accompanying drawings, which illustrate devices constructed in accordance with my invention, Figure 1 is a plan of one form of my improved thermostat device suitable for fitting along the cornice or other similar part of a room and having the thermostat composition in bar or rod form. Figs. 2 and 3 are plans, on an enlarged scale, of the two end portions of the device. Fig. 4 is a central longitudinal vertical section of Fig. 3.

Referring to Figs. 1 to 4, I provide a base-board 1, of any suitable length, on which I arrange the thermostat-bar, which consists of a number of short lengths 2 of suitable wax composition, held between metal sheaths 3 of channel-section. The wax is attached to the sheaths by casting it onto lugs 4, Figs. 3 and 4, which are secured to the sheaths by screws 5 or in any suitable manner. The ends of the screws 5 are fitted with rollers or wheels 6 to enable the bar to slide freely along the base-board 1. The sheaths at the two extremities of the bar are formed with screwed extensions 7 7^a, and the extension 7 is coupled by a union-nut 8 to one end of a spring-pressed plunger 9, which forms one of the contacts of the switch in the alarm-circuit, while the ex-

tension 7^a, Fig. 2, is coupled by a nut 10 to a tension-screw 11, which works in a screwed socket or sleeve 12, passing through a pillar 13, projecting from the base-board 1. This socket is formed on a milled adjusting-head 14, which is shouldered against the pillar 13. The switch plunger-contact 9 is guided in a sleeve 15, projecting from a metal plate 16, attached to the base 17 of the switch. Within this sleeve is situated a spring 26, which tensions the wax-composition bars 2. The other switch-contact consists of a metal sleeve 18, placed over an insulating-tube 19, which surrounds a central metal pillar 20. The sleeve 18 is provided with a binding-post 21, which is metallically connected by a strip 22 to the terminal 23 of the apparatus, and a similar strip 24 connects the other terminal 25 with the switch contact-plunger 9. The apparatus is arranged in the fire-alarm circuit by connecting the wires of the circuit to the terminals 23 and 25. The switch and tension-adjusting device are provided with removable covers 27 and 28, which are secured to the pillars 13 and 20 by screws 29 30, Figs. 1 and 4. When the tensioning-screw 11 is tightened up by turning the adjusting-head 14, the spring 26 is compressed and the plunger 9 is drawn out of contact with the metal sleeve 18, thereby breaking the alarm-circuit. The adjustment of the head 14 should be such that the distance between the end of the plunger 9 and the sleeve 18 is small and well within the range of the spring 26. The wax composition of which the thermostat-bar is made should be hard enough so that no substantial extension of the bar can take place at ordinary temperatures under the tension of the spring 26, but at the same time such that when a temperature of, say, 120° or 130° Fahrenheit is reached the wax becomes plastic or melts, and the spring 26 pulls it out, thereby causing the contact-plunger 9 to close the alarm-circuit and sound the bell or other alarm device employed. The temperature at which the apparatus comes into action may be controlled between limits of, say, 80° and 200° Fahrenheit by varying the composition of the wax of the thermostat-bar and the strength of the tensioning-spring. The wax composition may be prepared by taking ordinary hard wax

and thoroughly mixing it with a proper proportion of fine sand. The proportions I have found suitable are eighty-five parts of wax composition and fifteen parts of sand or ground bath-brick. The wax composition is preferably a mixture of soft and hard waxes.

I may provide special bells, one in each room of a building which is fitted with thermostats, which bells are adapted to be automatically actuated from the station-alarm, so that in the case of a fire taking place in any one room of a building the occupants of the whole of the rooms will be alarmed by the ringing of all the bells.

The thermostat-bar (illustrated in Figs. 1 to 4) can be made of any suitable length, the metal sheathings 3 affording sufficient support for the wax composition, and the apparatus is therefore suitable for fitting along the whole length of a room-cornice. The side projecting switch-plunger 9^a enables a second thermostat-bar on a suitable base to be readily coupled up at right angles to it—for example, on the wall at the corner of the room—the same switch-circuit serving for both thermostat-bars. The thermostat-rod may be made of any ornamental form so that it does not disfigure the cornice, and the cornices of the whole four walls of a room may be fitted with thermostat-bars and switches, in which case the protection from fire given by the thermostats will be more perfect.

Thermostats constructed in accordance with my invention, it will be seen, possess great advantages over existing thermostats, for should the wax composition become accidentally broken the tensioning-spring will be immediately released and the alarm sounded, so that any defect in the thermostat at once shows itself and calls for repair. This repair can be very easily effected, as the wax melts readily and joins again at a low temperature,

when all that is necessary is to retension the wax by the screw-adjusting device at the end of the bar.

By means of the adjustable tensioning device the stress upon the fusible composition may be maintained constant for any given temperature at or about which the switch is desired to operate to close the alarm-circuit by the yielding of the composition employed.

Instead of the wax composition I may use pitch or other similar substance or any fusible alloy which melts or becomes plastic at a sufficiently low temperature for the purpose of the thermostat.

It will be seen that the thermostats above described may be arranged on the bell-circuits of a house or building, thereby enabling the batteries already used for bell purposes to be used for the fire-alarms.

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

In a fire-alarm system, a thermostat apparatus comprising a supporting-base, a multiple-contact switch attached to said base consisting of a central fixed contact-pillar, and a plurality of movable contact-plungers arranged around it, guide-sleeves for said contact-plungers and springs within said sleeves for resisting the movement of the plungers, thermostatic bars attached to and free to move axially with the plungers, said bars consisting of sheaths or plates and wax composition attached between them, and adjustable tensioning devices attached to said bars, substantially as set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

HARRY PLOWMAN.

Witnesses:

ALBERT E. PARKER,
BERTRAM H. MATTHEWS.