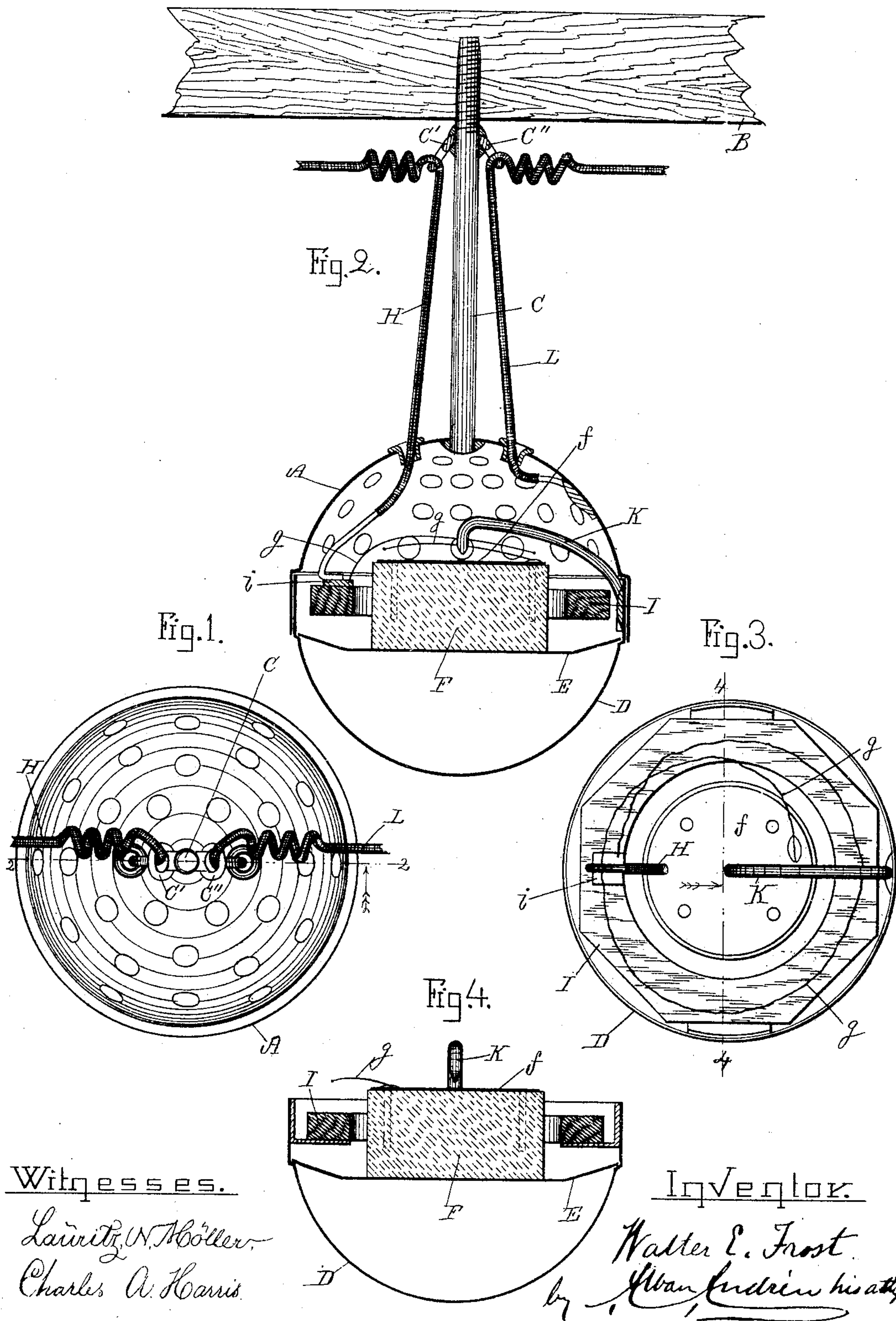


(No Model.)

W. E. FROST.
AUTOMATIC ELECTRIC FIRE ALARM.

No. 603,270.

Patented May 3, 1898.



Witnesses.

Lauritz W. Möller.
Charles A. Harris.

Inventor.

Walter E. Frost.
by *Wm. Andrew* his atty.

UNITED STATES PATENT OFFICE.

WALTER E. FROST, OF LEWISTON, MAINE, ASSIGNOR TO ORLAND S. HAM,
OF SAME PLACE.

AUTOMATIC ELECTRIC FIRE-ALARM.

SPECIFICATION forming part of Letters Patent No. 603,270, dated May 3, 1898.

Application filed June 30, 1897. Serial No. 642,903. (No model.)

To all whom it may concern:

Be it known that I, WALTER E. FROST, a citizen of the United States, and a resident of Lewiston, in the county of Androscoggin and State of Maine, have invented new and useful Improvements in Automatic Electric Fire-Alarms, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in automatic electric fire-alarms adapted for use in rooms or buildings for giving an alarm in case of fires occurring in such places, and it is carried out as follows, reference being had to the accompanying drawings, wherein—

Figure 1 represents a top plan view of the invention. Fig. 2 represents a central longitudinal section on the line 2 2, shown in Fig. 1. Fig. 3 represents a top plan view of the device, showing the cap or cover removed; and Fig. 4 represents a cross-section on the line 4 4, shown in Fig. 3.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

In Figs. 1 and 2, A represents a perforated metal cap or cover, secured to the wall or ceiling B by means of a screw spindle or rod C or other suitable fastening device. To the lower end of the cap A is preferably detachably secured the drum D, which is closed airtight at its upper end by means of an expansive sheet-metal drum-head or diaphragm E, which is made concave or disk-shaped on its upper side and convex on its under side, as shown in Figs. 2 and 4. By making the said diaphragm of such sunken form it is made more readily expansive and yielding by the expansion of the air in the drum or closed air-chambers D, as will hereinafter be more fully described. Upon the top of the diaphragm E is loosely supported the float F, which is preferably made of cork or other suitable buoyant material, and to the upper side of said float is attached a metal plate *f*, that is electrically connected, by means of a very light flexible or hair wire *g*, to the circuit-wire H, as shown. Above the diaphragm E is secured within the upper end of the drum D an annular ring I, preferably made of fiber or other suitable non-conducting material,

which ring serves as a guide for the float F during its vertical adjustment caused by the expansion of the diaphragm E or by water that may enter the upper portion of the drum D through the perforated cap A, as shown.

In practice I prefer to attach to the ring I a metal plate *i*, to which one end of the hair wire *g* and the inner end of the circuit-wire H are metallically connected, as shown.

To the interior of the upper portion of the metal drum D is attached a metal electrode K, the inner end of which projects about centrally above the float F, the terminal point of said electrode being normally out of contact with the metal plate or cover *f* on said float, as shown in Figs. 2 and 4.

L is a circuit-wire electrically connected to the interior of the metal cap A, as shown in Fig. 2.

h and *l* are eyelets, made of insulated material and secured to the perforated metal cap A, and through said eyelets are conducted, respectively, the circuit-wires H and L, and in practice I prefer to attach to the upper end of the spindle C a pair of guide-eyes C' C'' for supporting and guiding the respective circuit-wires H and L, as shown in Figs. 1 and 2.

The wires H L in practice are connected to a battery or electric-current generator and an alarm in the circuit, as is common in automatic fire-alarm wiring.

The operation is as follows: In case of a fire occurring in the room where the device is located the air within the drum D is expanded, causing the flexible diaphragm E to expand, by which the float F is raised sufficiently to cause its metal plate *f* to come in contact with the electrode K, by which the circuit is closed through the battery and the alarm automatically sounded. In case water from a sprinkler in the vicinity of the device should enter the perforated cap A and accumulate on the diaphragm E the float F will rise until its metal plate comes in contact with the electrode K, causing the circuit to be closed through the battery and causing the alarm in the circuit to be automatically sounded. It will thus be seen that the circuit is automatically closed for sounding an alarm, either by the expansion of the heated air within the

drum D or by accumulation of water within the upper portion of said drum, thus making the device duplex acting and particularly well adapted for the purpose set forth.

5 What I wish to secure by Letters Patent and claim is—

1. In an automatic electric fire-alarm in combination a shell or case having an air-chamber and a concave or sunken drum-head
10 or diaphragm, a movable float circuit-closer arranged centrally within said case or shell and loosely supported on said diaphragm a stationary electrode metallically connected
15 nected respectively to said electrode and float circuit-closer substantially as and for the purpose set forth.

2. In an automatic electric fire-alarm, in combination an inclosing shell or case having
20 an air-chamber and a concave or sunken diaphragm, a circuit-closing float supported loosely on said diaphragm, a guide-ring of fiber or suitable material secured within said case or shell, a stationary electrode and cir-

cuit-wires connected respectively to said float 25 circuit-closer and stationary electrode substantially as and for the purpose set forth.

3. In an automatic electric fire-alarm in combination an inclosing shell or case having
an air-chamber and a concave or sunken dia- 30 phragm, a movable circuit-closing float resting on said diaphragm, a guide-ring secured within said shell, a stationary electrode secured within said shell, a flexible hair wire connecting the said float, and one of the cir- 35 cuit-wires and an electrical connection from the other circuit-wire to the stationary electrode substantially as and for the purpose set forth.

In testimony whereof I have signed my 40 name to this specification, in the presence of two subscribing witnesses, on this 26th day of June, A. D. 1897.

WALTER E. FROST.

Witnesses:

NINA W. KEYES,
WILLIAM H. BOOTHBY.