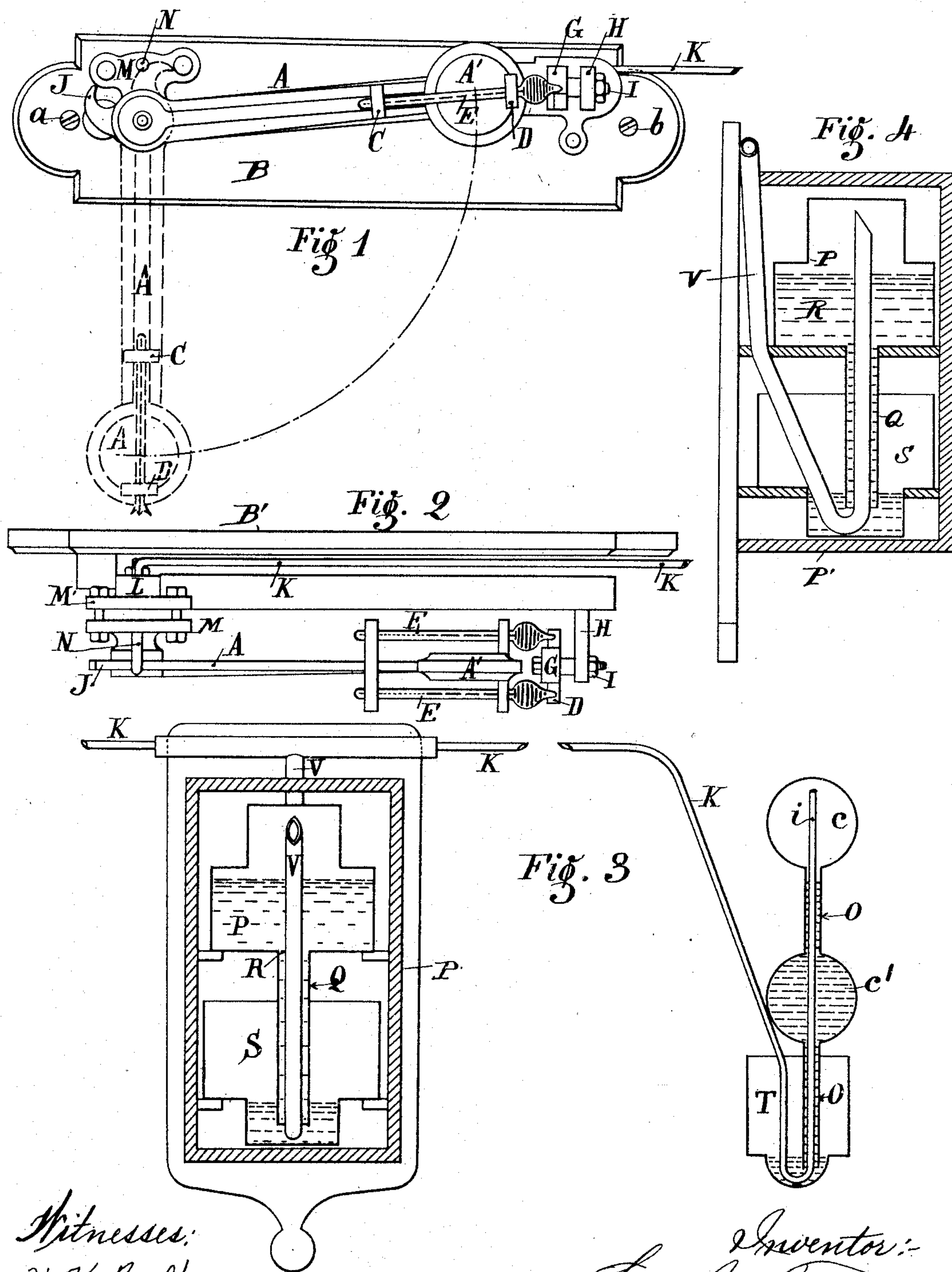


(No Model.)

L. J. TIRARD.
FIRE SIGNALING OR ALARM MECHANISM.

No. 504,002.

Patented Aug. 29, 1893.



Witnesses:
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Inventor:-
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by his attorney H. K. Boulter.

UNITED STATES PATENT OFFICE.

LOUIS JOSEPH TIRARD, OF CAEN, FRANCE.

FIRE SIGNALING OR ALARM MECHANISM.

SPECIFICATION forming part of Letters Patent No. 504,002, dated August 29, 1893.

Application filed June 24, 1893. Serial No. 478,764. (No model.) Patented in France November 22, 1892, No. 225,739.

To all whom it may concern:

Be it known that I, LOUIS JOSEPH TIRARD, a citizen of the French Republic, residing at Caen, France, have invented certain new and
5 useful Improvements in Fire Signaling or Alarm Mechanism, (for which I have obtained Letters Patent in France, dated November 22, 1892, No. 225,739,) of which the following is a description.

10 My invention has relation to automatic fire signaling devices, and among the objects in view is to provide devices for automatically giving a signal when the temperature in a room exceeds the normal as when caused by
15 a fire occurring in said room or immediate proximity.

A further object is to provide an alarm or signal device which is extremely simple and inexpensive in construction, and efficient in its
20 operation, and with the above objects in view, the invention consists in the novel construction, arrangement and combination of parts as hereinafter fully described, illustrated in the accompanying drawings and pointed out
25 in the appended claims.

In the drawings:—Figure 1 is a side elevation of a portion of my signaling or alarm device. Fig. 2 is a plan view thereof. Fig. 3
30 is a vertical sectional elevation of the remaining parts of my device. Fig. 4 is a vertical sectional elevation of the compensator, taken at right angles to Fig. 3.

A indicates an arm or lever which is pivoted at one end upon a pivot stud or short
35 shaft B and provided at its opposite end with a weight A'. Said arm or lever is also provided with cross arms C and D, the latter being provided with aligned openings in which are mounted the tubular portions of thermometers E and F, the bulbs of which rest
40 upon a suitable support G which is secured by a nut I to an arm H projecting from the base board B' which may be secured to a wall of a room by screws *a* and *b*. Thus, by the
45 described arrangement of parts, the arm A is held in its normal or elevated position indicated in Fig. 1, in full lines, by reason of the bulbs of the thermometers having a bearing upon the support G.

50 In constructing the thermometers E and F for use with my device I make the bulbs

thereof much thinner than the tubular portions, for a purpose presently apparent.

N indicates a glass or other frangible tube which is arranged above the shaft B and is
55 secured to arms M M' which may be suitably secured to the base B'.

Integral with and forming part of the arm A in rear of the pivot shaft B is a hook J which when the arm swings downwardly into
60 a vertical position will strike against and break the tube N.

K indicates a tube which leads at one end into the box or chamber L carried by the shaft B, and said tube K leads off to a room
65 which may be located at a greater or less distance from the room in which the parts above described are located. The opposite end of the tube K is bent into siphon-like form as seen in Fig. 3, and terminates within a tube O
70 having enlarged portions or bulbs *c c'*, the lower end of which tube O lies adjacent to the bottom of a vessel or receiver T which latter should in practice be carried by a counter-weighted arm or lever (not shown) so pivoted
75 and arranged as to operate or set in motion a suitable alarm mechanism or device. The vertical portion *i*, of tube K passes through the vessel T and tube O as shown and in said tube is placed a quantity of a non-freezing
80 liquid such as glycerine.

When constructing the thermometers the same may be made to indicate any desired temperature before being sealed; I prefer to
85 so construct said thermometers that the same will be adapted to indicate only up to a temperature say 40° centigrade (a temperature which is seldom exceeded except in the case of an abnormal heating of the air as by a fire
90 for instance), the said thermometers being then sealed after said temperature has been reached.

In operation, should the temperature of the air in the room containing my device exceed
95 40° centigrade an expansion of the liquid in the thermometer tubes occurs until a temperature of say 45° centigrade is reached when the bulbs of said thermometers will break by reason of their thin walls and the arm A will drop to the position indicated in dotted lines,
100 and the hook J will strike against the tube N and break it, thus permitting heated air to

enter the tube K which will thus be admitted through the opposite end of the tube into the chamber c, and by its pressure cause the liquid in tube O to be forced into the vessel T and when the weight of the liquid entering said vessel exceeds the counterweight on the lever carrying it the said lever and vessel will tilt and cause said lever to actuate any suitable alarm mechanism or device, whereby an indication will be given of the existence of the fire in the room containing the arm A and connected parts of my device.

In order to avoid a false alarm being given I employ in conjunction with the remaining parts of my device what I term a compensator, the same comprising vessels P and S communicating by means of the tube Q, the whole being arranged in a suitable casing P'. A siphon-like pipe V communicates with the interior of the vessel P and passes through the tube Q and up through vessel S, and the opposite end communicating with the pipe K. Within the vessel P and tube Q is placed a quantity of liquid R such as glycerine.

Where a great length of tubing K is employed and the temperature of the outer air should vary, say from 10° centigrade to 40° centigrade the expansion of the air contained in tubing K would result in the liquid being caused to escape from pipe O into vessel T and thus give a false alarm. But by reason of the provision of the vessel P communicating with the tubing K an expansion of air in the latter would cause at least a portion of such air to be admitted into vessel P and allow only a small proportion of such air to act upon the liquid in tube O and therefore only a slight escape of such liquid would result not sufficient to effect the tilting of the vessel T and the sounding of the alarm, the nearly complete emptying of tube O being necessary for the operation of the alarm.

What I claim, and desire to secure by Letters Patent, is—

1. In an alarm mechanism of the class described, the combination with a vessel adapted to receive a liquid, a tube communicating therewith and adapted to contain a liquid to be discharged into said vessel, a second tube communicating at one end with the first-mentioned tube and having its opposite end closed, of a pivoted arm or lever arranged in proximity to the closed end of the tube and adapted to be normally supported in an elevated position and to be automatically released from its support when the temperature exceeds a predetermined degree said arm or lever being adapted when so released to place the closed end of the described second tube in communication with the outer air, for the purpose specified.

2. In an alarm mechanism of the class described, the combination with a vessel adapted to receive a liquid, a tube communicating therewith and adapted to contain a liquid to be discharged into said vessel, a second tube

communicating at one end with the first-mentioned tube and having its opposite end closed, of a pivoted arm or lever, a thermometer carried thereby, a support upon which one end of the thermometer rests whereby to support the arm normally in an elevated position, said thermometer being adapted to be broken when the temperature of the air exceeds a predetermined degree, and allow the arm to fall, and means for placing the closed end of the said second tube in communication with the outer air when the arm or lever falls, for the purpose specified.

3. In an alarm mechanism of the class described the combination with a vessel adapted to receive a liquid, a tube communicating therewith and adapted to contain a liquid to be discharged into said vessel, and a second tube communicating at one end with the first-mentioned tube, and a frangible tube communicating with the opposite end of said second tube, of a pivoted arm or lever adapted to be normally supported in an elevated position and to be automatically released from its support when the temperature exceeds a predetermined degree, and a hook carried by the arm and adapted to strike against and break the said frangible tube when the arm or lever falls, for the purpose specified.

4. In an alarm mechanism of the class described, the combination with a vessel adapted to receive a liquid, a tube communicating therewith and adapted to contain a liquid to be discharged into said vessel, a second tube communicating at one end with the first-mentioned tube a frangible tube communicating with the opposite end of said second tube, of a pivoted arm or lever, a thermometer carried thereby, a support upon which one end of the thermometer rests whereby to support the arm normally in an elevated position, said thermometer being adapted to be broken when the temperature of the air exceeds a predetermined degree, and allow the arm to fall, and a hook carried by the arm and adapted to strike against and break the said frangible tube when the arm or lever falls, for the purpose specified.

5. In an alarm mechanism of the class described, the combination with a vessel adapted to receive a liquid, a tube communicating therewith and adapted to contain a liquid to be discharged into said vessel, a second tube communicating at one end with the first-mentioned tube and having its opposite end closed, of a pivoted arm or lever arranged in proximity to the closed end of the tube and adapted to be normally supported in an elevated position and to be automatically released from its support when the temperature exceeds a predetermined degree, said arm or lever being adapted when so released to place the closed end of the described second tube in communication with the outer air, and a compensator comprising superposed vessels communicating with each other, and a pipe communicat-

ing with the upper vessel at one end and with the said second tube at its opposite end, for the purpose specified.

5 6. In an alarm mechanism of the class described, the combination of a base adapted to be secured to a wall, an arm or lever pivoted at one end to said base, a thermometer carried by said lever at its opposite end, a support upon which one end of said thermometer rests,
10 said end of the thermometer being more frangible than the remaining portion thereof, a frangible tube arranged adjacent to the arm or lever, a main air tube communicating with said frangible tube, a vessel adapted to
15 receive a liquid, a tube adapted to contain a

liquid to be discharged into said vessel, said main air tube communicating with the upper end of the tube containing the liquid, and a compensator comprising superposed vessels communicating with each other and adapted 20 to contain a liquid, and a tube communicating with the upper vessel and with the main air tube, for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of 25 May, 1893.

LOUIS JOSEPH TIRARD.

Witnesses:

VICTOR MATRAY,

JOSEPH SALING.