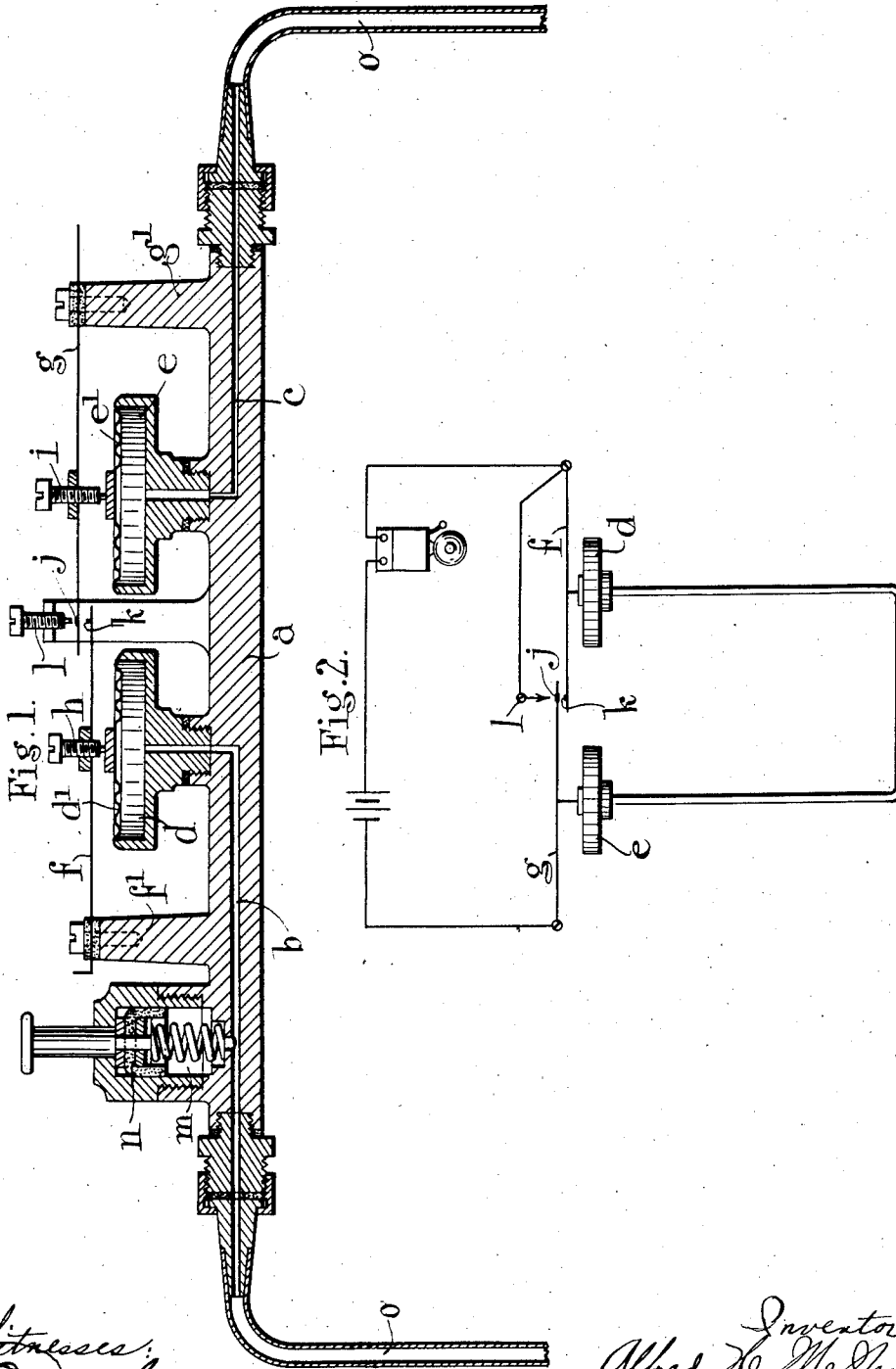


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 AUTOMATIC FIRE ALARM SYSTEM.
 APPLICATION FILED DEC. 1, 1911.

1,047,264.

Patented Dec. 17, 1912.



Witnesses:
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UNITED STATES PATENT OFFICE.

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AUTOMATIC FIRE-ALARM SYSTEM.

1,047,264.

Specification of Letters Patent.

Patented Dec. 17, 1912.

Application filed December 1, 1911. Serial No. 663,328.

To all whom it may concern:

Be it known that I, ALFRED HENRY McNEIL, a subject of the King of Great Britain and Ireland, residing at 43 Beech Hall road, Chingford, Essex, England, have invented certain new and useful Improvements in Automatic Fire-Alarm Systems, of which the following is a specification.

This invention for improvements in automatic fire alarm systems relates to an air or volatile fluid apparatus in which a small tube extends to the places to be protected, and is connected to an apparatus for indicating an increase of pressure.

Hitherto compensation for the ordinary or normal variations in temperature has been effected by means of a small leak into the open or into a closed reservoir.

Now according to my invention I connect the tube containing an expansible fluid, to two boxes, each having a flexible diaphragm and the connection to one diaphragm is made very small, and two spring contacts are arranged above the diaphragms and the differential movement of the two contacts is used to operate the alarm circuit.

In one way of carrying out this invention, the small tube containing the volatile liquid is connected at its end to two boxes closed by flexible diaphragms, one of the said connections being through a restricted orifice or other device that allows only of leakage past it. Above each diaphragm a movable contact is supported, that over the reservoir having the restricted passage being at any desired distance in front of the other. When one contact overtakes the other, a fire signal is given. A bridge piece passes over both contacts and carries a screw either as a mechanical stop or as a contact so that an alarm may also be actuated at any desired degree of temperature.

In the accompanying sheet of illustrative drawings, Figure 1 is a sectional elevation of the differential contact apparatus constructed according to this invention, and Fig. 2 is a diagram of the connection of the fire alarm circuit.

The apparatus consists of a metal base *a* with one free passage *b* and one restricted passage *c* leading to two hollow reservoirs *d* and *e* which are provided with thin flexible metal diaphragms *d'* and *e'*. Above the diaphragms *d'* and *e'* two spring contact strips *f* and *g* are mounted on supports *f'*

and *g'*. The contact strips are insulated from the supports by ebonite washers and from the diaphragms by ebonite points on the adjusting screws *h* and *i*, and their ends which overlap are provided with platinum contact points *j*, *k*. Situated above the contact points *k* and *j* is a bridge carrying an adjustable stop screw and contact *l* intended to limit the motion of the contact strips *f* and *g*. To the passage *b* a small cylinder *m* is connected, which with its plunger *n* is intended to apply an increased pressure when desired for the purpose of testing the apparatus. The ends of the passages *b* and *c* are connected to the extremities of the metal tube *o* which passes throughout the area to be protected.

The action of the apparatus is as follows: In the event of a fire, the rapid increase of temperature produces a corresponding increase in pressure in the tube *o* which causes the liquid contained therein to flow to the reservoirs *d* and *e*. Now owing to the restriction in the passage *c* leading to the reservoir *e*, the effect produced on the diaphragm will be greater in the case of diaphragm *d'* and so the spring *f* will overtake spring *g* and effect a contact between the two. With ordinary rises in temperature the increase in pressure will be so gradual that the liquid will flow equally into both reservoirs and the contact points will both move, but not approach one another. Thus no alarm is given for ordinary temperature rises until a certain limit is reached, this point being determined by the position of the stop *l*.

The method of connecting the apparatus with the battery and bell is diagrammatically shown in Fig. 2. The two contact strips *f* *g* are connected in series with the battery and bell and the limiting stop point *l* is also connected to the strip *f*. By this arrangement it will be seen that an alarm is given if the contact strips touch one another, or if the upper contact strip touches the limit stop *l*.

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

1. A temperature alarm apparatus comprising pressure responsive devices, one of said devices having a restricted passage leading thereto, and the other an unrestricted or free passage, a detector piping communicating with the free and the re-

stricted passages, a circuit including an alarm device, a source of current, and a contact for actuation by each of said responsive devices for closing circuit by differential movement of said contacts, substantially as described.

2. A temperature alarm apparatus comprising pressure responsive devices, one of said devices having a restricted passage leading thereto and the other an unrestricted or free passage, detector piping communicating with the free and the restricted passages, a circuit including an alarm

device, a source of current and a contact for actuation by each of said devices for closing circuit by differential movement of said contacts, and an auxiliary contact in said circuit arranged in the path of one of the first named contacts, substantially as described. 15

In testimony whereof I have affixed my signature, in presence of two witnesses. 20

ALFRED HENRY McNEIL.

Witnesses:

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