E. MOSS.

THERMOSTAT.

APPLICATION FILED JUNE 24, 1909.

1,039,174. Patented Sept. 24, 1912.

FIG. 1

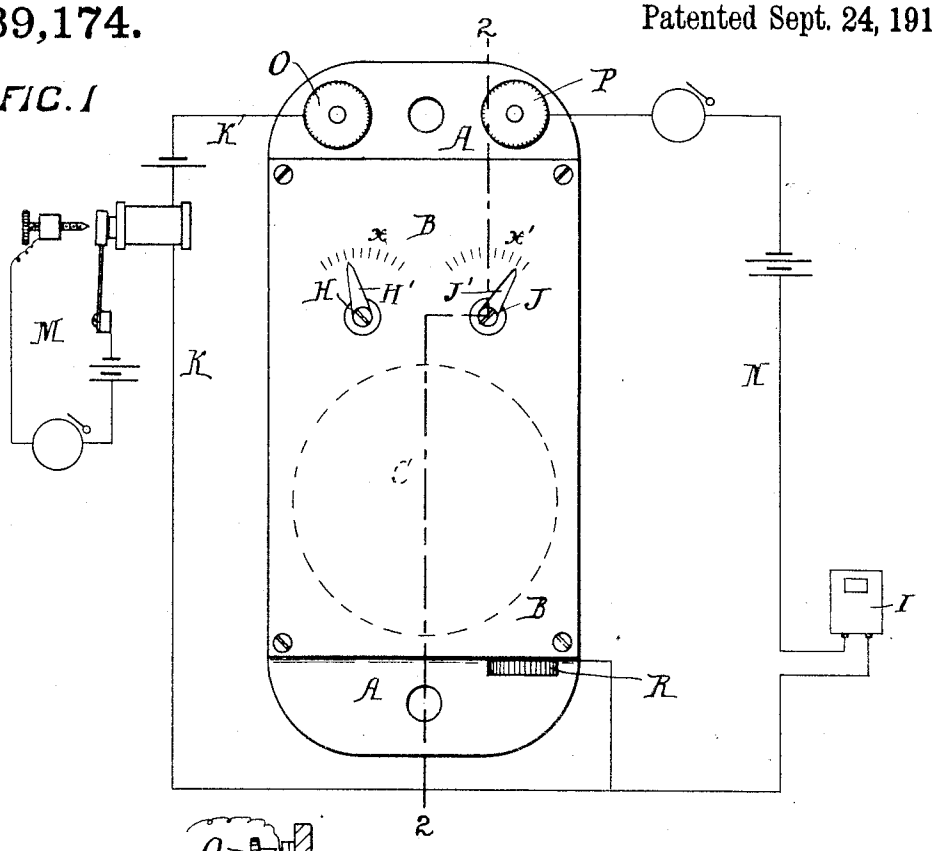


FIG. 2

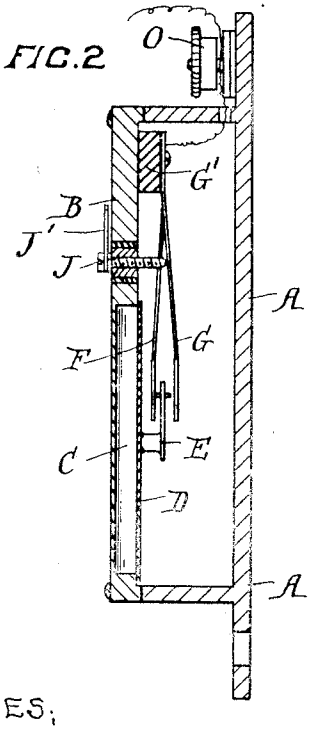
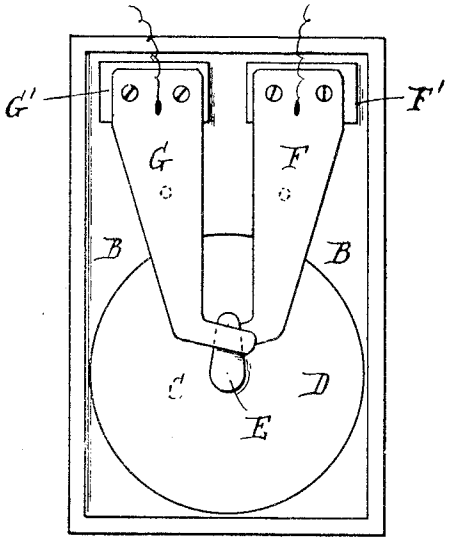


FIG. 3



WITNESSES;

W. A. Berrigan

A. Stetson.

INVENTOR,

ERNEST MOSS,

by Howson & Howson

Attorney.

UNITED STATES PATENT OFFICE.

ERNEST MOSS, OF DALLINGTON, CHRISTCHURCH, NEW ZEALAND.

THERMOSTAT.

1,039,174. Specification of Letters Patent. Patented Sept. 24, 1912.

Application filed June 24, 1909. Serial No. 504,187.

To all whom it may concern:

Be it known that I, ERNEST MOSS, a subject of the King of Great Britain, residing at Dallington, Christchurch, in the Dominion of New Zealand, have invented a new and useful Thermostat; and I do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to an improved construction of apparatus for the purpose of recording heat, or for giving an alarm upon an outbreak of fire in its vicinity.

The invention relates particularly to that class of appliances in which a fluid, expansible under the action of heat, is placed within a receptacle having flexible sides and connected with electric alarm circuit making or breaking apparatus, in order to sound an alarm when the sides of the receptacle expand under the action of the expanding fluid.

The invention consists in an improved construction of such apparatus, by means of which provision is made for the sounding of a local alarm, as the temperature begins to rise, and for the sounding of a second alarm, say situated at a fire station, when the temperature reaches a dangerous degree.

The invention also consists in other details of construction and arrangement of parts whereby a compact reliable apparatus is provided.

In fully describing the invention, reference will be made to the accompanying sheet of drawings, in which,—

Figure 1 is a front elevation of the appliance, the electric circuits connected therewith being indicated by the diagrammatic lines. Fig. 2 is a sectional side elevation thereof, taken on the line 2—2 of Fig. 1. Fig. 3 is a back view of the cover of the appliance showing the operative parts attached thereto.

The appliance devised consists of a metallic case or box A that is adapted to be fastened to a wall, ceiling, or other fixture, and is provided with a metallic cover B adapted to be firmly secured upon it, so as to make a good electric connection. Within the cover is arranged the receptacle C for containing the expansible fluid, such as alcohol, ether, bisulfid of carbon, or other similar fluid, and the inner wall D of this receptacle is formed of a suitable flexible material, while the outer wall is preferably formed as one with the cover B. Any expansion or contraction of the fluid will thereby cause the inner wall D to bulge inward into the casing or outward therefrom. Fixed to the center of the flexible wall D is a stud or pin E formed with an overhanging inner end.

Secured to the inside of the cover are the metal arms F and G which are made of springy nature, and are insulated from the cover and box, by being attached to the insulating blocks F′ and G′ respectively. These arms are arranged to extend downward so that their bottom ends will lie within the range of movement of the stud E, and one arm F is placed so as to lie in front of such stud, and to be kept in close contact therewith, while the other arm G is arranged to lie behind the stud away from contact therewith as clearly shown in Fig. 2. The relative positions of these two arms in relation to the stud are regulated by means of the screws H and J respectively. These screws pass in through the box cover B (being suitably insulated therefrom) and by manipulating them, the distance of the arms from the stud may be arranged at will, and the amount of expansion and contraction movement of the wall D necessary to make and break contact between the arms and the stud consequently regulated.

The arm F is preferably arranged to operate the local alarm and it is arranged to complete a closed circuit K with the box A and adapted, when broken, to operate an alarm relay M. The arm G is arranged to actuate the main alarm, and it is placed in open circuit N with such alarm and the box, through earth, as shown in Fig. 1, or through a metallic circuit. This arrangement of the arms F and G I prefer, because I consider it best to hold the local circuit closed, since the first alarm is to be given here, and unless the contacts were maintained carefully an alarm would call attention to the fact that there was trouble. The least expansion of the plate D would cause the contact E to leave the arm F and give the alarm. If an open contact were relied upon to give the first alarm, rusty or imperfect contact might allow the fire to get under way, without giving an alarm. Moreover, if the battery were out of order, the open circuit would not work, whereas, with the closed circuit, a run down battery would be at once indicated. There is a further advantage in the fact that the move-

ment of the plate D in the same direction operates both alarms. If the fire is only a moderate one the second alarm need not be allowed to operate, but there will be no failure of the alarm, because some one forgets to turn it in. The increase in the heat takes care of the second alarm, while the attendants are giving their attention to extinguishing the blaze.

It will be seen that when the appliance is subjected to a rising temperature, the fluid within the receptacle C will expand, and as it expands, will force the wall D and stud E inward into the box. The stud E will then leave the arm F, breaking its circuit and closing the alarm relay M, and thereby causing such alarm to sound. As the heat increases and the inward movement of the stud E continues, such stud will engage with the arm G thereby closing the main alarm circuit N and causing such alarm to sound, and to continue sounding so long as the heat remains at the same or a higher temperature. Should the temperature then fall again, the different parts will resume their normal positions again.

It will be readily understood that by means of the screws H and J, the positions of the arms F and G may be arranged so that the different alarms may be caused to sound at any desired temperature. These screws for this purpose may be provided with any approved form of indicating mechanism by which their positions are thus regulated, say for instance, pointer arms H′, J′ attached to their outer ends, and passing over scales x, x' upon dials fixed to the cover. It will also be apparent that the alarm circuits operated by the movements of the stud E may be both closed or open circuits without departing from the spirit of the invention, and merely requiring variations in the arrangement of the arms F and G and the formation of the stud.

O and P are the terminals by means of which the respective circuits K and N are connected to the arms F and G respectively. These terminals are suitably insulated from the box A.

R is the earth terminal by means of which the box is arranged as part of the respective circuits K and N.

Any number of these appliances may be connected to the same alarm circuits, suitable indicator boards I being arranged in the well known manner to differentiate between alarms actuated by the distinct appliances. Thus, the locality of a fire or of a rise in temperature may be indicated at the same time as an alarm is given.

What I do claim as my invention, and desire to secure by Letters Patent, is,

In a thermostat, the combination of a metallic casing; a front cover fitting thereon and having a recess in the lower part of its inner face; a flexible inner wall secured over said recess and forming therewith a receptacle; an expensive fluid in said receptacle; a stud secured to said flexible wall and having an angular end portion spaced from said wall; separate insulating blocks secured at the upper corners respectively of the inner face of said cover; spaced approximately parallel pending arms secured to said blocks respectively and each having an inclined lower end disposed respectively to the front and the rear of said angular end of the stud; regulating screws passing through said cover and engaging said arms respectively; pointer arms on said screws respectively; and a scale under each pointer and on the front of the cover.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

ERNEST MOSS.

Witnesses:
C. H. STONYER,
CHAS. C. MASSEY.