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AUTOMATIC FIRE ALARM

Filed Dec. 31, 1928

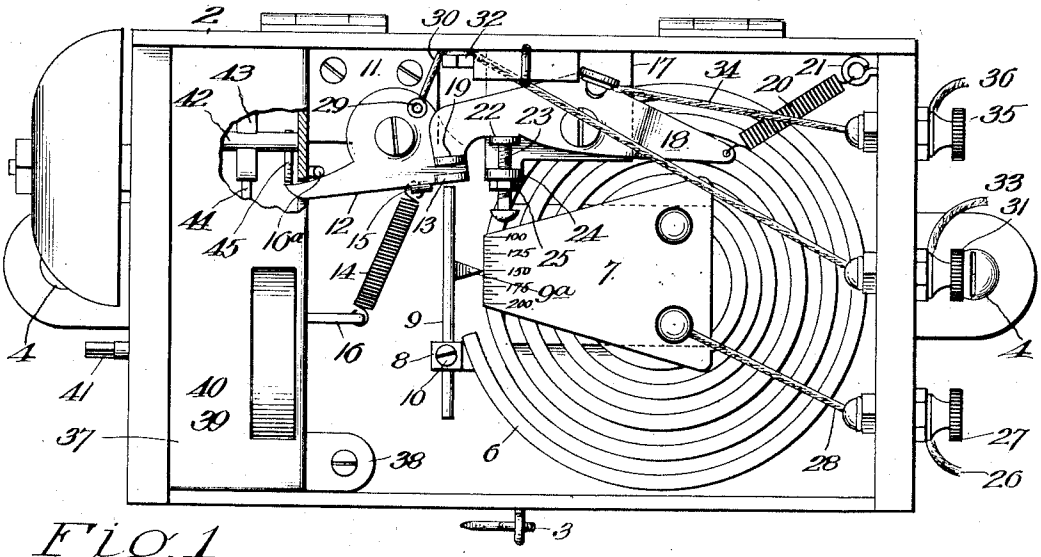


FIG. 1.

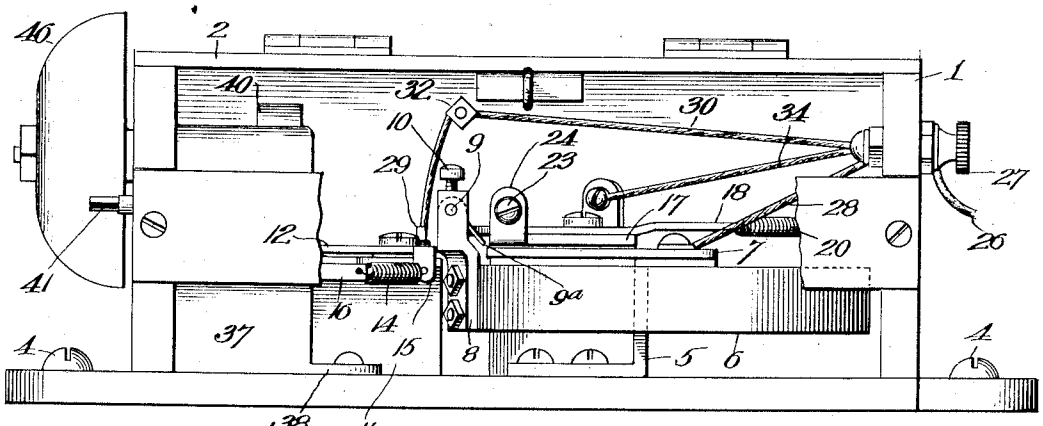


FIG. 2.

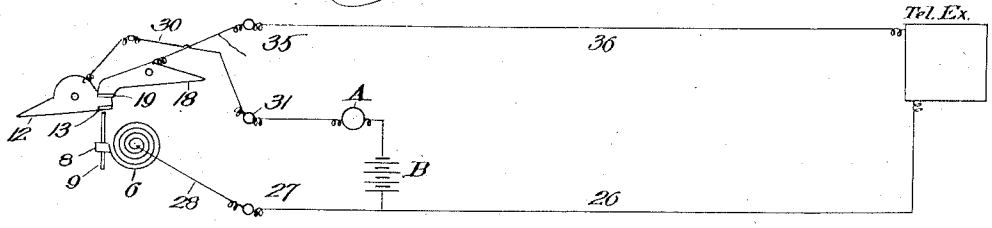


FIG. 3.

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AUTOMATIC FIRE ALARM

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This invention relates to fire alarms of that class in which thermostats are caused by abnormal temperatures, to effect the operation of a signal of the audible or visual type, or both, to call attention to the fact that a fire is imminent or in progress in a particular building, and our object is to produce an inexpensive appliance of the character indicated which will call attention of people within the building whence the abnormal temperature originates, or people at a telephone or fire headquarters or the like, of the existence of such a condition and of the location of the building, and the room thereof if desired. A further object is to provide an alarm which can be set to operate but little above normal temperature, to give opportunity for the suppression of a fire before it has attained a dangerous start. A still further object is to provide thermostat controlled mechanism for effecting the operation mechanically of a clockwork mechanism for local alarm purposes, in the immediate vicinity of the origin of the abnormal temperature; to effect the operation electrically, through a local circuit, of an annunciator of any suitable type, either visual or audible, or both, at a point within the building whence the abnormal heat originates, such as the office of such building, where it is most likely to attract attention; and to make provision for electrically operating an alarm or signal at a telephone or fire alarm headquarters regardless of the distance from the point of origin of the abnormal temperature.

With these objects in view, the invention consists in certain novel and useful features of construction and combinations of parts as hereinafter described and claimed; and in order that it may be fully understood, reference is to be had to the accompanying drawings, in which:

Figure 1 is a top plan view of a fire alarm mechanism embodying the invention, the lid of the container of the mechanism being indicated in vertical or open position.

Figure 2 is a side view of the same with the container broken away and the lid in closed position.

Figure 3 is a diagrammatic view of electrical connections.

In the said drawings, 1 indicates a housing in the form of a skeleton box preferably of insulating material, 2 is a hinged lid therefor, and 3 means for fastening the lid in closed position to discourage any attempt to tamper with the device by children.

The housing is preferably secured as at 4 to a suitable support, not shown, and secured to and projecting from the bottom or other suitable part of the housing, is a bracket 5 forming a support for the thermostat 6, shown in the form of a helix or coil, the bracket also forming the support of a plate 7 having a graduated scale at the end adjacent the outer end of the thermostat, and secured to the last-named end of the thermostat, is a post 8 in which is mounted a push pin 9. A clamping screw 10 mounted in the post, holds the pin against accidental movement, and the pin has an index finger 9^a for adjustment with reference to the scale on plate 7, for a purpose which hereinafter appears.

Secured within the housing is a bracket 11 and pivotally mounted on and insulated from said bracket in any suitable manner, is a lever 12 provided with an upstanding ear 13 in alinement with and adjacent to push pin 9, there being no contact normally between the push pin and said ear. A retractile spring 14 attached to a depending ear 15 of said lever and to a fixed anchorage 16, yieldingly holds the lever with its ear 13 in close proximity to the push pin, and a stop 16^a is suitably disposed to limit the movement of the lever under the power of said spring and thereby prevent contact between the push pin and said ear except when the former is adjusted by expansion of the thermostat under the influence of a rise in the temperature of the latter, as hereinafter more particularly referred to.

Secured within the housing is a bracket 17, on which is pivotally mounted a lever 18 at one end overlapping but out of contact with lever 12, and provided at such end with an upstanding ear 19, adapted under certain conditions hereinafter mentioned, to be engaged

by ear 13 of lever 12. The other end of the lever 18 is connected to a retractile spring 20, anchored as at 21 to a fixed point within the housing, the tendency of said spring being to hold the ear 19 of said lever yieldingly in the path of movement of ear 13, and to normally prevent contact between said ears 13 and 19, lever 18 is provided with an upstanding ear 22 engaged by an adjusting screw 23 mounted in an upstanding ear 24 of bracket 17, a lock nut 25 guarding against accidental adjustment of said adjusting screw.

A supply wire 26 for incoming electrical current, is connected to a binding post 27 mounted on the housing, and connecting said post with the plate 7 and hence with the bracket 5 and inner end of the thermostat is an electrical conductor 28. Connected at 29 to lever 12 is an electric conductor 30 leading to a second binding post 31 mounted on the housing, said conductor at an intermediate point being preferably anchored, as indicated at 32, to the housing and leading from binding post 31 is a conductor 33, which passes through one or more signal devices such as an annunciator A and through a local battery B to the lead-in wire 26. It will thus be seen that in the event the thermostat is expanded because of a rising temperature affecting it, the push pin, when the expansion of the thermostat becomes sufficient, will contact with lug 13 and thus complete a local circuit from the battery B through 26, 27 and 28 to the thermostat and thence through 8 and 9 to lever 12, and then through 30, 31 to the battery, and incidentally through the signal or annunciator A, which signal or annunciator is preferably located in a part of the building where its operation will almost instantly come under the notice of someone so that steps may be immediately taken for investigation as to the cause of the expansion of the thermostat and for the extinguishment of the blaze if a fire is starting.

The provision of a local circuit and signal device or devices will be desirable chiefly in isolated houses or small towns having no special facilities for fighting fires. Ordinarily this local battery service will however be supplemented by telephonic connection with a nearby town containing a telephone exchange system. In such cases the conductors 26 and 36 will lead respectively from and to the telephone exchange or a telephone exchange in a fire headquarters, so that in the event the expansion of the thermostat is sufficient, it will, after the push pin makes contact with ear 13 and completes the local circuit (if such is employed), press the ear 13 against ear 19 of lever 18 and thus complete a circuit from the telephone exchange through conductors 26 and 36, ears 13 and 19 and the intermediate elements. It will be noted that the local circuit will be completed first. This is desirable because if the fire causing the expansion of the thermostat is minute, it may be readily suppressed locally. If this conclusion is reached, the completion of the circuit between ears 13 and 19 can be prevented and thus avoid the operation of an alarm or signal at telephone or fire headquarters.

For notifying the occupant or occupants of a room equipped with the protecting device, a clockwork bell-operating mechanism is provided. Such a clockwork mechanism, not detailed because of conventional type, is indicated as mounted in a casing 37 within the housing 1, the casing having a lug 38 through which it is secured at one end. At the other end it may conveniently be integrally formed with the bracket 11 hereinbefore mentioned as a support for lever 12. The casing has an opening 39 for the accommodation of the power spring 40 of the clockwork, and there is a shaft 41 for engagement by a key when it is desired to wind up the spring 40. There is also shown the usual oscillatory shaft 42 provided with the escapement 43 for engagement with the customary escapement wheel 44, and an arm 45 projects from the shaft 42 and is normally held inoperative by the lever 12, which projects into the casing. The clockwork mechanism also includes a bell or gong 46 and a clapper, not shown, but connected to the oscillatory escapement shaft 42. The arrangement is such that when the push pin 9, through expansion of the thermostat under the influence of heat, applies pressure on the ear 13, the lever 12 is rocked slightly and thus releases the pressure on the escapement shaft arm 45. As this occurs, the clockwork mechanism operates under the power of the spring 40 and the bell rings, this operation continuing until the push pin is withdrawn by retraction of the thermostat to permit spring 14 to cause the lever 12 to engage and arrest the vibratory arm 45, or until the spring 40 becomes completely unwound, it being understood of course that a clockwork mechanism to be applied to work of the character suggested, would operate the alarm for a long period of time before the power of its spring became exhausted.

It will be apparent that by proper adjustment of the push pin relative to the scale of plate 7, a very slight rise of temperature above normal will result in tripping the lever 12 from engagement with arm 45 to permit the clockwork to operate, the local circuit, if employed, functioning at the same time, it being understood that because of capacity for such adjustment, the device will be available for use anywhere regardless of normal temperature conditions. The markings on the dial plate 7 are merely to indicate normal temperatures in different sections where the device may be employed. For example in a certain section or place where the nor-

mal temperature is about 80° F., the push pin index finger would be set at dial marking 100; for another section or place where the normal temperature is say twenty-five degrees higher than normal in the first section, the index finger would be set at marking 125, as otherwise the device, lacking such adjustment, would operate under the influence of the normal temperature of the last-named place or section.

From the foregoing, it will be seen that the thermostat is instrumental in tripping the lever 12 to effect the operation of a mechanical alarm; in closing the break in a local circuit to operate an alarm therein, and, if not restrained, in completing a circuit including a telephone exchange or fire headquarters, it being also noted that the appliance is of simple and inexpensive construction and therefore available to anyone who desires protection against fire. In its mechanical form alone, and especially if such is used in conjunction with a local circuit, it would provide very efficient protection in apartment houses where the fire hazard is much greater than in private homes.

It will be understood that the appliance will be wired to special signal station alarm apparatus in a telephone and/or fire station, so that the operation of such apparatus will be notification in itself, that a fire is in progress in the building respectively wired to such apparatus.

It will be apparent that the device is susceptible of modification in the details of construction and arrangement of parts without departure from the principle of construction and mode of operation involved or from the spirit and scope of the appended claim.

We claim:

In an automatic fire alarm, a casing, a bracket therein, a spirally wound thermostat carried by the bracket and adapted to expand or contract under variations of heat, a push rod carried by the thermostat for endwise movement in one direction or the other as the thermostat expands or contracts, a contact lever having an upstanding lug held yieldingly adjacent one end of said rod, a second lever suitably mounted and in superposed but spaced relation with the first-named lever and provided with a lug, a spring holding the second lever with its lug adjacent the lug of the first-named lever, and means to limit movement of the second lever toward the lug of the first-named lever.

In testimony whereof we affix our signatures.

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