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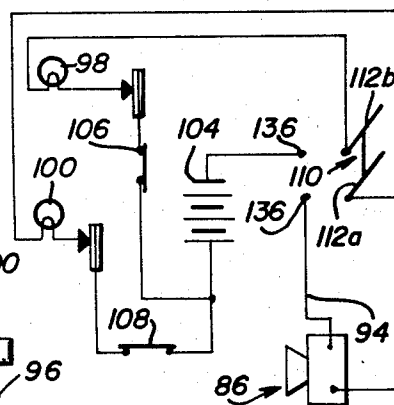
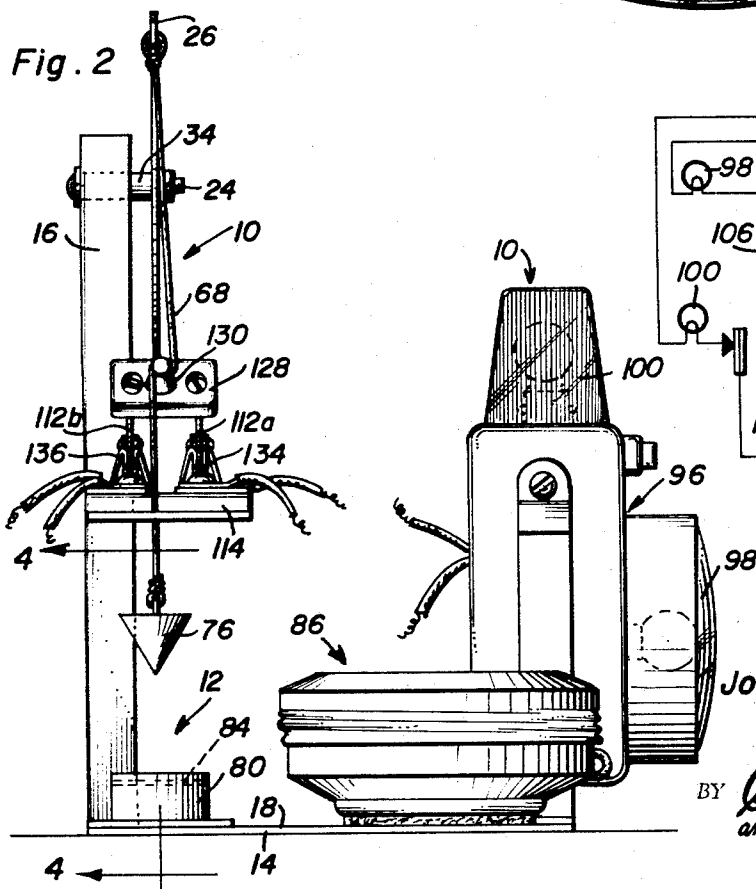
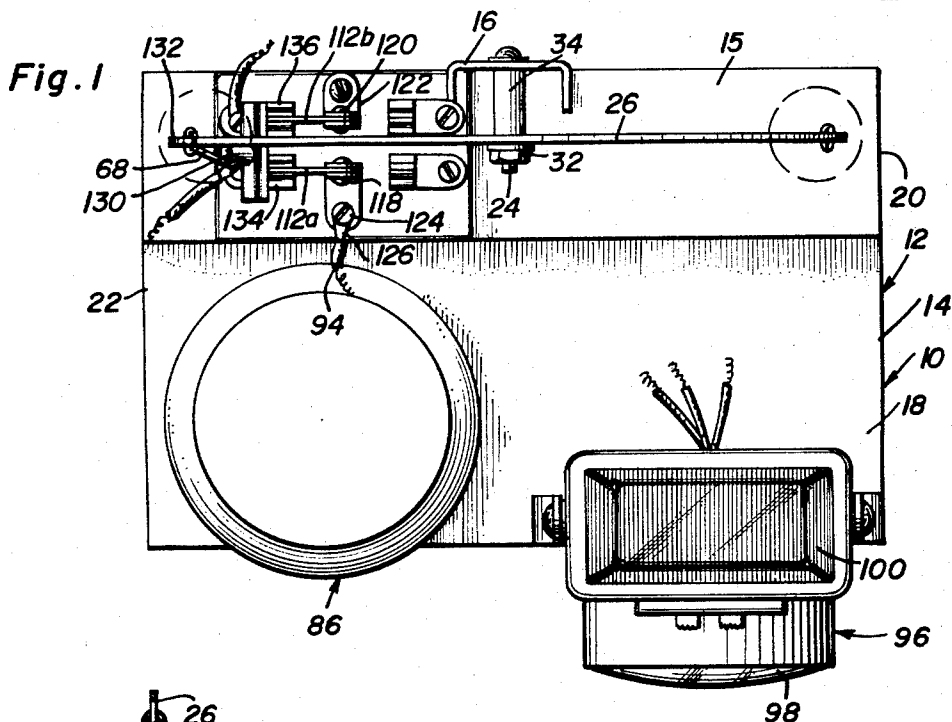
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3,430,219

FIRE ALARM

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Sheet 1 of 2



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3,430,219

FIRE ALARM

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9 Claims

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This invention generally appertains to improvements in fire alarms and more, particularly relates to novel improvements in portable fire alarms, which are adapted to be disposed in a preset arrangement of potential operation at any desired place within a dwelling or the like enclosure.

An important object of the present invention is to provide an extremely compact, sturdy and efficient portable alarm which, when the temperature conditions of the surrounding atmosphere reach a certain, preselected value, will be effectively operative to indicate the presence of such temperature, occasioned by an accidental, hazardous, and undesired factor, such as the presence of a fire, by an alarm means that will be physiologically discernible and recognizable by multiple senses of an individual.

Another important object of the present invention is to provide a sturdy and very efficient fire alarm, which, when activated by a rise in temperature conditions, will give off an alarm that will be audible, an alarm that will be visible and an alarm that will be noticeable by the olfactory senses, so that the alarm means is of a multisensual nature, namely, audible, visual and smellable.

Another important object of the present invention is to provide means for creating the alarms, either in simultaneous or selected delayed fashion, such means being held in a restrained position of potential operation for effecting the operation or actuation of the alarms with the restraining means being in the form of a fusible element that is melted when the surrounding air reaches a preselected temperature.

In line with the foregoing, another important object of the present invention is to provide an alarm which is composed of a minimum of operating parts, so as to be less subject to malfunctioning, and which includes a control member that is held in a position of potential action by a fusible plug and which is gravity driven or moved, upon melting of the fusible plug, so as to actuate the multiple alarm means, which have appeal to the many senses of a person, who is either close to or in spaced proximity from the alarm.

A still further important object of the present invention is to provide a self-contained alarm unit, which is extremely compact and portable and which can be placed for effective operation in any desired area, as, for example, in a hotel or motel room by a traveler.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a top plan view of a fire alarm constructed in accordance with the principles of the present invention;

FIGURE 2 is an end elevational view thereof;

FIGURE 3 is a front elevational view thereof;

FIGURE 4 is a fragmentary, longitudinal vertical sectional view, taken substantially on the line 4—4 of FIGURE 2;

FIGURE 5 is a fragmentary, vertical sectional view, taken substantially on the line 5—5 of FIGURE 4; and

FIGURE 6 is a schematic illustration of the wiring arrangement for the audible and visual signalling means.

Referring now more particularly to the accompanying drawings, the fire alarm 10 includes a supporting means 12 which is composed of a bottom plate 14. A vertical supporting arm 16, which is in the nature of a channel member, upstands from the plate 14 and is preferably disposed along the longitudinal side portion 15 of the upper face 18 of the plate and positioned substantially centrally between the ends 20 and 22 of the plate. A bolt 24 is projected through a suitable opening in the web portion of the vertical supporting arm 16 and serves as a pivot or fulcrum for a lever arm 26, the arm 26 being formed with an opening, centrally disposed intermediate its end portions 28 and 30, to receive the shank of the bolt, with the arm 26 being held in place for swinging movement on the bolt shank by a nut 32 secured on the threaded end of the bolt and spaced from the arm by a washer. A spacer 34 is circumposed on the shank and spaces the arm 26 from the vertical support 16, so that the arm 26 is free for curvilinear swinging movement about the central fulcrum or pivot point 24, intermediate the end portions 28 and 30 of the arm.

The end portion 28 of the lever arm 26 is formed with a transverse aperture 36, by virtue of which a rather sturdy flexible element 38, preferably in the nature of a heavy duty wire, is attached to the end portion 28. The flexible element 38 is tied to the aperture 36 and has a lower end portion 40, which is inserted through an eyelet 42 and wrapped around itself, as at 44, so as to secure the lower end to the eyelet 40. The eyelet 40 is connected to an eyelet 46 by an interconnecting flexible element or wire 48, as shown in FIGURE 4. The eyelets may be in the nature of loop ends on the flexible element.

The eyelet 46 is formed as an integral end of the connecting wire 48 and is attached to a centrally upstanding eyelet 50 on an annular weight 52, the weight 52 having upper and lower flat faces and being substantially round or annular, though such configuration is merely exemplary.

The weight 52 is held in a cup-like seat 54, which has a bottom wall 56 and an annular side wall 58, by means of a heat fusible seal 60, which may be wax or the like material that, when in a solid state, would cause a firm adhesive seating of the weight in the cup-like seat or socket 54. The seat or socket 54 is supported in a horizontal position by an upstanding support 62, which is substantially arcuate and has its lower end secured to a mounting foot 64 that is fixedly superimposed on the upper face 18 of the plate, along the side edge portion 15 and adjacent the end edge 20. It is to be noted that the socket-like seat is spaced above the plate so that the majority of the undersurface and side wall of the socket-like seat is exposed to the surrounding atmosphere.

The weight 52 when secured by the meltable adhering adhesive substance 60 in the socket or seat 54 holds the lever arm 26 in an inoperative position, as shown in FIGURE 3.

The opposing end portion 30 of the centrally pivoted lever arm or control member 26 is provided with a transverse aperture 66 to receive one end of a heavy wire 68, which constitutes an elongated flexible single element that has its upper end 70 inserted in the aperture 66 and wrapped around the adjoining portion of the wire so as to anchor the upper end of the wire to the lever arm. The lower end 72 of the flexible element or wire 68 is attached to an eyelet 74 on the upper flat surface of a conical weight 76 by having its lower end 78 inserted through the eyelet and wrapped around itself.

The weight 76 is heavier than the weight 52 so that, when the weight 52 is released from its adhered position in the socket, consequent upon melting of the adhering substance by a rise in temperature, the weight 76 will cause the lever arm 26 to move about its central fulcrum

or pivot point 24, the weight 76 moving, under gravitational force, downwardly and swinging the arm 26 about its fulcrum 24.

Means is provided, responsive to the downward gravitational movement of the weight 76, for producing an indication means of the fact that there has been a rise in temperature, such as caused by a fire, so as to give an alarm, which would be noticeable by one who is deaf and blind, through the use of the olfactory sense of the person.

Such means comprises the provision of a receptacle 80, which is mounted on the top wall 18 of the supporting plate along the side edge portion 15 and adjacent the end 22, the receptacle being disposed immediately below the free gravitational path of movement of the weight 76.

The receptacle 80 is adapted to contain a liquid substance 82, which would be extremely effective to the olfactory senses of individuals, so that the same would be smelled, even above and distinguishable over odors that would emanate from smoldering or burning fires. The receptacle 80 is closed off by a frangible top closure or wall 84, which seals the substance 82 within the receptacle so that, until the pointed end of the conical weight 76 pierces and breaks the frangible closure 84, the odor from the substance 82 is not released.

Accordingly, one of the multiple signal means of the present invention includes a means which gives off an odor so that it can be recognized by the olfactory sense of an individual, the means comprising the direct gravitational movement of the pointed weight 76 so as to break the enclosure for the substance 82 and release the odor thereof to the surrounding air.

Audible signal means 86 is provided and is positioned on the upper surface 18 of the support plate and includes a siren or horn 88, which has its housing 90 mounted by a fastener 92 on the upper surface 18 of the support plate, so that the same is disposed in a horizontal position raised above the upper surface of the support plate. The siren is powered by electrical energy, supplied through self-contained batteries (not shown), operation of which is controlled by switch means through conductors 94.

Visual signal means 96 is provided and includes a pair of lamps 98 and 100, which are mounted in a casing 102, the lamp 100 being vertically disposed and upstanding from the casing and the lamp 98 being horizontally disposed and projecting outwardly from the casing. The lamps are controlled by batteries 104 and are each provided with an on and off switch 106 and 108, as shown in FIGURE 6. The lamp 100 is of the flashing type, while the lamp 98 is similar, both having blinking bulbs.

Means is provided and is responsive to the released downward swinging movement of the lever arm 26, caused by the weight 76, for simultaneously actuating the visual means 96 and the audible means 86. The actuating means 110 includes a blade contact arm 112, which is pivoted on a contact carrier 114 that is mounted on a horizontal supporting plate 116, carried by the upstanding supporting arm 16. The contact arm 112 consists of two knife blade contacts 112a and 112b which have their inner ends pivoted, as at 118 and 120, to the upstanding end of angle brackets 122, which are fixed on the contact carrier 114 and support contact screws 124 for reception of contacts 126 for the conductors for the visual and audible signal means.

The outer ends of the blades 112a and 112b are joined together by a non-conductive outer end portion or enlargement 128, which terminates in a projecting knob 130. The knob 130 is formed with a transverse opening 132, through which the wire 68 is passed, as shown in FIGURE 2. In this fashion, the end 130 of the movable contact members or blades 112a and 112b is anchored to the line 68, so that the line cannot move relative thereto and the movable contact arm 112 will be carried downwardly about the pivots 118 and 120, by the weight 76, as the lever arm 26 moves about the fulcrum 24. When such occurs, the blades 112a and 112b will engage fixed

contacts 134 and 136 for the electrical conductors of the batteries for the audible and visual indicating means.

It can thus be seen that the alarm 10 can be set in a potential operational condition by providing a film of wax or similar substance 62 in the seat 54 for the weight 52 and holding the weight 52 in place until it is securely sealed in its seated position in the seat or socket 54. Such sealed arrangement will cock the lever arm 26 into a tilted position with the gravitational weight 76 raised above the receptacle 80 and the movable actuating means 110 having the arms 112a and 112b in an upward position about their pivots 118 and 120.

Accordingly, the circuits for the battery actuated siren and the lights will be open and the substance 82 in the receptacle 80 will not be capable of being smelled, since the frangible wall or closure 84 will seal off the receptacle 80.

Under given danger conditions, where the temperature of the air surrounding the alarm will rise, the seal 62 will be melted and the weight 52 will be released, so that the heavier gravity driven weight 76 will swing the lever arm 26 about the fulcrum 24 and the weight 76 will break the closure 84 and permit the substance 82 to flow out into the surrounding air, where it can be smelled. Simultaneously, the weight 76 in its gravitational movement, through the secure anchored connection of the flexible element or line 68 with the non-conductive outer end portion 130 of the knife blade switch contacts, will cause the blades to move about their pivots and to make contact with the fixed contacts 134 and 136 and complete the electrical circuits for the battery powered siren and the constant and flashing lights or illumination means 98 and 100.

Therefore, it can be appreciated that the alarm, although compact, inexpensive and extremely portable, will give off multiple indications of the presence of a fire hazard, since it will have a warning appeal to the senses of smell, sight and hearing.

If desired, the audible signal means and the visual signal means can be structurally disassociated from the support plate 14 and the supporting means 12 and disposed in other parts of the room or other rooms of the dwelling.

What is claimed as new is as follows:

1. A fire alarm comprising an audible signal means, electrical power means for actuating said audible signal means, a visual signal means, electrical power means for actuating said visual signal means, odor producing signal means, means for actuating said odor producing signal means, a common control means for all of said actuating means and means normally retaining said control means in an inoperative relation and responsive to a rise in temperature for rendering said control means operative whereby said audible signal means, visual signal means and odor producing means are operative to alert the senses of a person to the fact that a high temperature condition indicative of the presence of a fire is present.

2. The invention of claim 1, wherein odor producing means includes a container adapted to contain an odor producing substance and said container having a frangible portion which when broken releases the odor of the substance to the atmosphere around the alarm.

3. The invention of claim 2, wherein said control means includes a gravitational weight adapted to break the frangible portion of the container.

4. The invention of claim 1, wherein said control means includes electrical circuits for the power means of the audible and visual signal means, fixed contacts in said circuits, movable contacts cooperative with the fixed contacts to complete the circuit and gravity driven means carrying said movable contacts.

5. The invention of claim 4, wherein said control means includes a weight, a lever pivoted intermediate its ends, a flexible element connected to one end of the lever and supporting the weight and said retaining means being associated with the other end of the lever and means connecting the flexible element to the movable contacts.

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6. The invention of claim 5, wherein said last means includes a non-conductive end portion on the movable contacts, said end portion having a transverse bore through which the flexible element fixedly passes.

7. The invention of claim 5, wherein said retaining means includes a flexible element connected to the other end of the lever, a member on said last flexible element, a seat means for said member and means for releasably anchoring said member in the seat means.

8. The invention of claim 7, wherein said last named means includes a fusible connection releasably adhering the member in the seat means.

9. The invention of claim 7, wherein said seat means includes a socket in which the member is adapted to seat and fusible means releasably fixing said member in the socket with the fusible means being adapted to melt under high temperature conditions to release the member from the socket.

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