

Feb. 3, 1959

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FIRE DETECTING DEVICE

2,871,815

Filed May 2, 1957

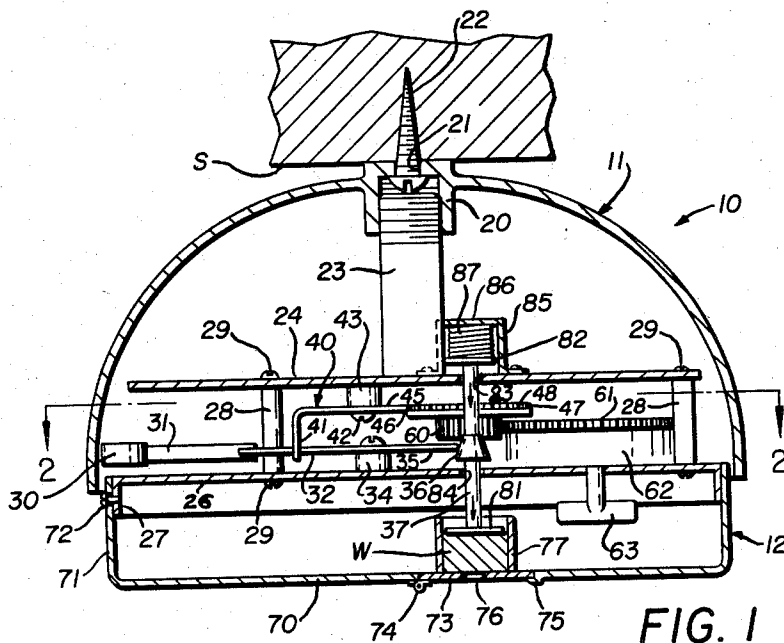


FIG. 1

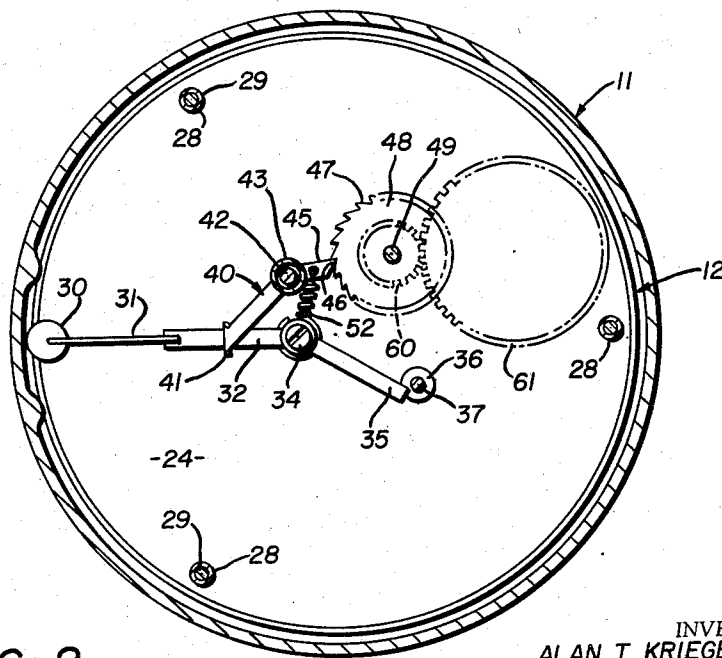


FIG. 2

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2,871,815

## FIRE DETECTING DEVICE

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Application May 2, 1957, Serial No. 656,672

4 Claims. (Cl. 116—106)

This invention relates to the art of fire-detection devices, and in particular has references to that type of fire-detection device wherein the initiation of the warning signal commences upon the melting of a certain fusible component element of the device.

It has long been known in the prior art that fusible component parts can be utilized to initiate operation of a fire-detection device, with the arrangement generally being such that upon the melting of these fusible components, a spring wound mechanism will become initiated to cause the giving of a warning signal of some kind. It has also been known in the prior art that fusible devices can be utilized to hold the parts in position during normal usage while upon melting, the same will allow the parts to be movable so as to give the warning signal.

While various types and forms of warning devices embodying these general principles have been advanced in the prior art, it has been found that without exception, the same normally require a specific type form and configuration of fusible link elements with the result that these devices are primarily a "one-operation" type of device that are not capable of resetting after the giving of a warning signal. It has also been found that due to this peculiar configuration and shape required in fusible components shown in the prior art, that the same must be normally supplied by the manufacturer at the point of origin with the result that it is not possible to adjust the device to operation under varying circumstances. Thus, for example, while it might be desired that the fusible elements melt at one temperature during one season of the year, it is entirely possible that a different and higher temperature would be desired during a second season of the year. The prior art contemplates no such provision for change.

As an additional disadvantage in the prior art type of device, it has often been found that the fusible component is located interiorally of the housing with the result that the same does not accurately and promptly detect the presence of excessive heat until such time as is too late to take preventive measures.

It has also been found that the prior art devices of this general type require a specialized mechanism designed to perform this individual function of fire-detection. It has however been found in this regard that the device of the present invention lends itself to being adapted to standard alarm mechanisms wherein a pull-out type of pin is employed for the purpose of setting the alarm mechanism.

It has been found that all the aforementioned difficulties can be obviated by the use of a simplified type of alarm system wherein the alarm component is retained out of warning condition by the use of a fusible block that is positioned within a compartment easily accessible from the exterior of the signalling device. In this manner, insertion of another block or insertion of a block having a different melting temperature is easily facilitated. Similarly by use of a block of this type, the

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action of the release pin may be restricted against its normal path of movement under tension, with the result that upon melting of the fusible block element, a positive and direct release of the alarm mechanism will occur to thus permit one hundred percent efficiency of the warning device, due to the absence of parts that can jam.

It accordingly becomes the principal object of this invention to provide a simplified type of fire or excessive heat detection device that is characterized by the use of replaceable meltable block that is located in the position of easy access from the exterior of the fire-detection alarm device.

It is a still further object of this invention to provide a fire detector of the type described wherein the fusible component can be adapted for use in positioning on the conventional alarm mechanism with a minimum of change in component arrangement of parts therein.

These and other objects of the invention will become more apparent upon a reading of the following brief specification considered and interpreted in the light of the accompanying drawings.

Of the drawings:

Figure 1 is a vertical elevation having the cover portion of the device broken away to show the internal construction thereof in elevation.

Figure 2 is a sectional view taken on the lines 2—2 of Figure 1.

Referring now to the drawings and in particular to Figure 1 thereof, the improved safety device, generally indicated by the numeral 10, is shown as being of generally two-piece construction so as to include a base 11 and a replaceable cover 12, with these parts being capable of being releasably secured together as is clearly shown in the drawings.

To the end of mounting the base portion 11 with respect to a wall surface S, the center portion thereof is shown provided with a boss 20 having an aperture 21 within which may be received a screw member 22. To the end of accommodating a gear train mechanism, as will presently be described, the base portion 11 is illustrated in the preferred embodiment of the invention as being of dome-like configuration with a spacer bolt 23 serving to centrally locate a base plate 24 interiorally of the housing 11, as clearly shown in Figure 1 of the drawings. A similar base plate 26, having an inturned peripheral edge 27, is shown spaced with respect to the base plate 24 by a series of spacers 28, 28 with bolts 29, 29 or other equivalent fastening devices being employed in this regard for maintaining the plate members 24, 26 in the spaced apart relationship illustrated.

As has been previously indicated, the alarm device 10, is equipped with a sounding device illustrated herein in the form of a striker head 30 that is mounted, through flexible arm 31, on a crank arm 32, that is in turn pivoted about a stud member 34, as is best shown in Figure 2 of the drawings. This crank arm 32 has the projecting end 35 thereof normally out of contact with a tapered bushing 36 that is provided on release pin 37, although it is believed apparent that when the device is in the loaded condition of Figures 1 and 2, that the members 35 and 36 will be in contact with each other to prevent reciprocatory movement of the crank arm 32 about the pivot point 34.

While any one of several different types of reciprocating mechanisms could be employed to facilitate rapid reciprocation of the head 30, the preferred embodiment illustrated herein contemplates the use of a second crank arm 40, that is pivoted about bolt 42 and spaced from base plate 24 by spacer 43. In this manner arm portion 41 thereof, will overlies crank arm 32, while the opposed arm portion 45 will, through point end 46 thereof engage

the notched teeth 47 of a sprocket 48. This sprocket 48 is, as best shown in Figure 2 of the drawings, concentrically disposed about a shaft 49, the arrangement being such that the individual teeth of the notched sprocket 48 are engaged by point end 46 with bias spring 52 normally serving to retain the end 46 in contact with the teeth 47. In this manner, movement of the end 41 will occur upon rotation of the ratchet 48.

In addition to the aforementioned component parts, there is also mounted concentrically about the shaft 49 a spur gear 60 that meshes with a larger diameter spur gear 61 that is driven by a spring-winding mechanism generally designated by the numeral 62, with winding of the mechanism 62 being through handle 63 in a manner well-known and understood in the prior art of record.

Turning now to Figure 1 for a detailed consideration of the removable cover plate 12, it will be seen that the same includes a base section 70, having an upturned peripheral edge 71 that is concentrically telescoped with respect to the flange portion 27, so that a screw 72 may retain the component parts together as shown clearly in Figure 1 of the drawings. Additionally, this base plate 70 is shown including a door 73, that is hinged, as at 74 and secured by a latch 75, so as to be normally in a closed position of Figure 1, with the door 73 being apertured, as at 76, for the purpose of permitting air to pass through the same. Disposed adjacent the innermost surface of the door is a receptacle 77, within which may be received a block W of wax or other meltable material, such as paraffin.

Acting upon this block W of wax is a piston head 81 that is secured to one axial end of the shaft member 37, with a similar piston like head 82 being secured to the opposed axial end of the shaft 37 as clearly shown in Figure 1. In this regard, it is to be noted that clearance apertures 83 and 84 are provided in the base plates 24 and 26 to facilitate free axial shifting movement of the shaft member 37. By like token, the upper base plate 24 also has an enclosed housing 85 that has an end wall portion 86 that serves as a seat for a spring 87, with this spring 87 being shown compressed in Figure 1 of the drawings so as to exert a continual downward pressure on the wax block W as shown by the direction of the arrow in Figure 1 of the drawings.

In use or operation of the improved device, it will first be assumed that the alarm device is unloaded and accordingly the compartment 77 will not have any block W of wax received therein. In this condition, the spring 87 will have urged the shaft 37 downwardly of its position shown in Figure 1 with the limit of such movement being controlled by contact between a piston head 82 and the base plate 24.

At such time as the device has been installed as by inserting the screw 22 in the wall, it is believed apparent that a block of wax may be inserted in the housing 77 by merely opening the hinged door 73 and placing the block W therein and forcing the shaft 37 towards the position of Figure 1 against the force of spring 87, at which time the door 73 may be closed and the latch 75 secured so as to firmly retain the component parts in the position of Figure 1.

With the device thus assembled, it is believed apparent that the crank arm 35 will be blocked from arcuate movement by virtue of its contact with the tapered bushing 36, with the result that there will be no pivotal movement of the crank arm 32 around the pivot point 34 and accordingly the striker head 30 will be silent. However, when the heat in the immediately surrounding area becomes sufficient to melt or even soften the wax W, the wax being flowable will move outwardly through the opening 76, as a result of the force afforded by the piston head 81. As such movement continues, the bushing 36 will be released from contact with the crank arm 35, at which time a reciprocatory movement of the striking bell 30 will occur due to the unleashing of the gear train mechanism that has been previously wound as by winding up of the handle 63.

anism that has been previously wound as by winding up of the handle 63.

At this time, an audible alarm will have been sounded to apprise the occupants of the house that the temperature therein is excessive and appropriate safeguards can then be taken to determine the source of overheating.

In the event that during use it is desired to change the composition of the meltable block W to one with a higher melting point, it is believed apparent that it is only necessary that the door 73 be opened and a new block of wax W of the proper consistency be inserted within the housing 77 in place of the one just removed. It is also believed apparent that in the event that an alarm is given and the device unwinds, it is merely necessary that the screw 72 be backed off, at which time the handle can be rewound to reenergize the device. With the device rewound, it is believed apparent that upon reinsertion of another meltable block W, the device will be ready for re-use.

With regard to the substance of meltable composition used in making up the block W, it is to be understood that the preferred form of the invention contemplates the use of a paraffin block having a melting point of preferably around 98 degrees F. However, to avoid unnecessary operation of the device during unseasonably hot weather, a higher melting point in the neighborhood of 110 or 115 degrees could be inserted during the summer months, so that false alarms would not be given due to the melting of the block at ordinary room temperatures that would be relatively high during the summer months. Similarly other conventional materials having different flow or melting temperatures could be employed.

It will be seen from the foregoing that there has been provided a new and novel type of fire or other heat detecting alarm that is characterized by extreme simplicity of operation and adaptability to ready installation by the average home. It has been shown in the preceding paragraphs how the operating point of the device can be varied to suit the particular requirements of the individual user regardless of the climate in which the same is used, and it has further been shown how the new and novel construction and coaction of parts permits use of the device without the necessity for the obtaining of expensive replacement parts. It has also been shown how the device is improved in that operation thereof is predicated upon a softening of the block and does not require a complete melting to occur before operation.

While a detailed description of the invention has been set forth in accordance with the dictates of the patent statutes, it is to be understood that the invention is not intended to be so limited.

Accordingly, modifications of the invention may be resorted to without departing from the spirit hereof or the scope of the appended claims.

What is claimed is:

1. A fire detecting device of the character described, comprising; a mounting base; an alarm mechanism, carried by said base; a cover releasably secured to said base and enclosing said alarm mechanism; means defining a chamber carried by cover and disposed adjacent said alarm mechanism; a meltable block received in said chamber; a means retaining said block in said chamber; a release pin in releasable engagement with said alarm mechanism, and having one axial end thereof engaging against said block; a housing carried by said base and receiving the opposed axial end of said pin; and a spring interposed between said housing and said pin and urging said pin away from said housing towards a position of disengagement with said alarm mechanism.

2. The device of claim 1 further characterized by the fact that said pin and said block will move in unison relatively of said chamber upon movement of said closure member out of a position of closure with respect to said chamber.

3. The device of claim 1 further characterized by the fact that said means retaining said block in said chamber include a closure door carried by said cover and being moveable into and of a position of closure with said chamber.

4. The device of claim 3 further characterized by the fact that said door is apertured.

## References Cited in the file of this patent

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