Sept. 9, 1952 C. H. FINK 2,609,785

FIRE ALARM

Filed May 5, 1950 2 SHEETS—SHEET 1

Fig. 1

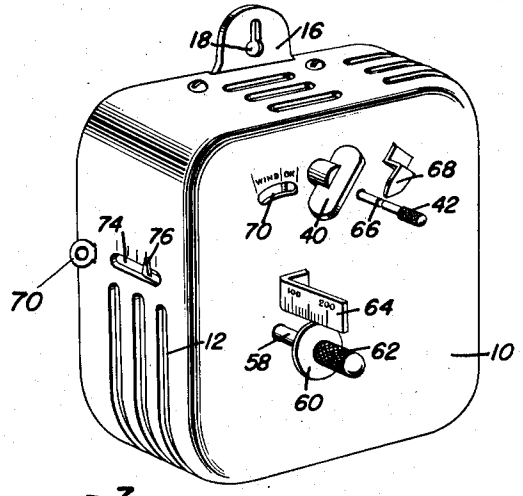


Fig. 2

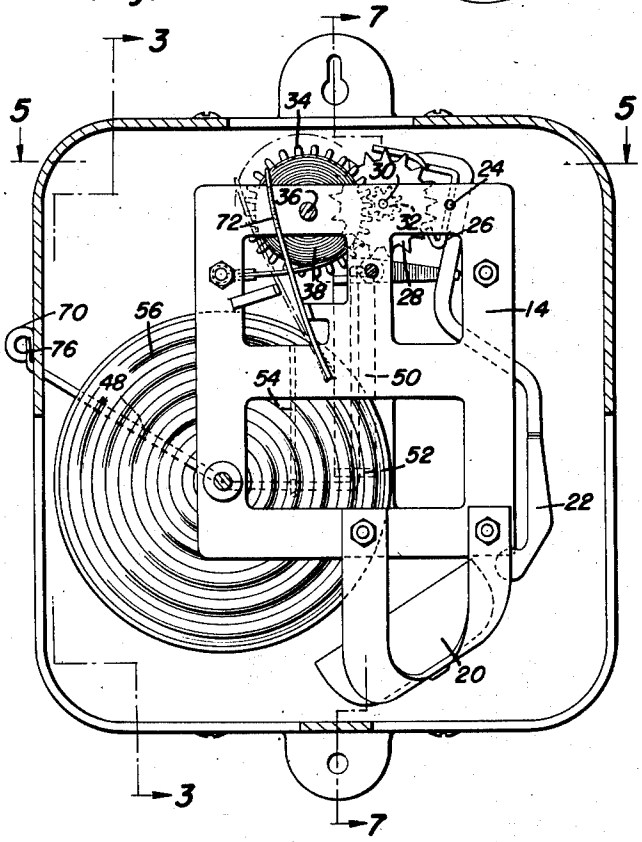
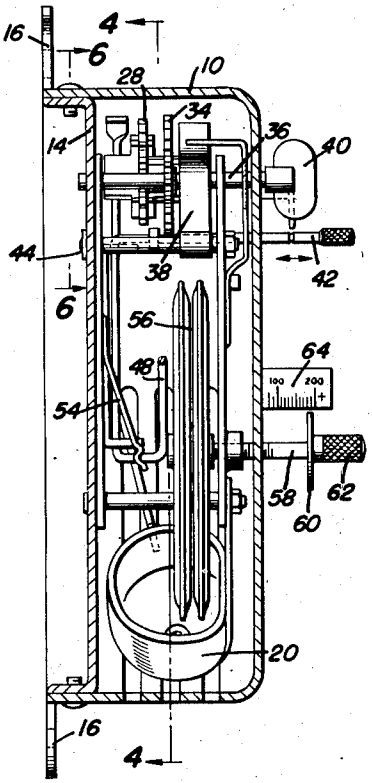


Fig. 3



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FIRE ALARM

Filed May 5, 1950 2 SHEETS—SHEET 2

Fig. 4

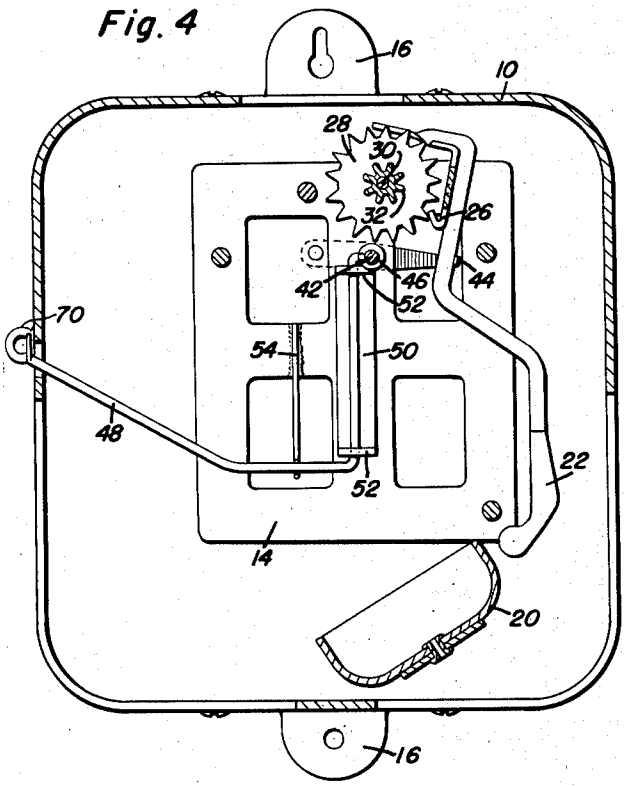


Fig. 7

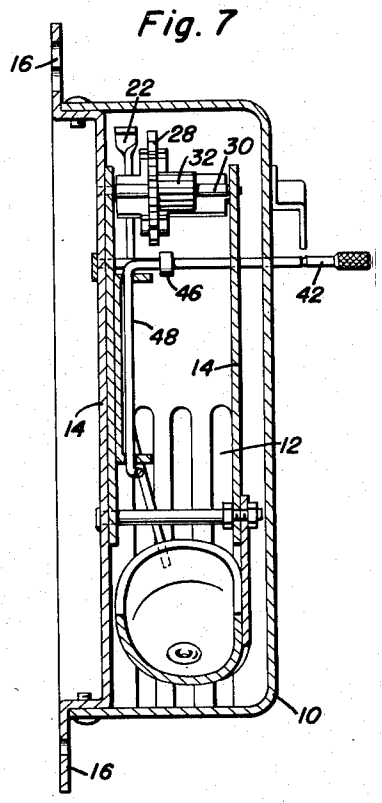


Fig. 5

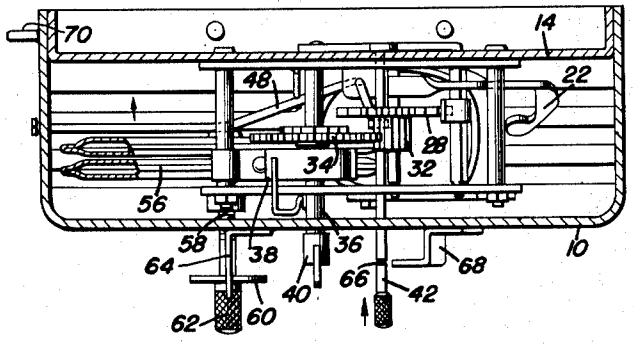


Fig. 8

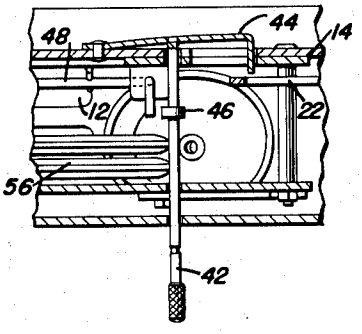
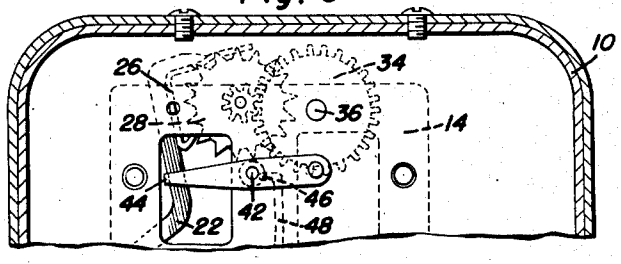


Fig. 6



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UNITED STATES PATENT OFFICE

2,609,785

FIRE ALARM

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Application May 5, 1950, Serial No. 160,143

3 Claims. (Cl. 116—102)

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This invention relates to signalling devices, and more particularly to a temperature-responsive fire alarm.

An object of this invention is to provide a fire alarm having means for actuating an audible signal in response to subjection to a predetermined critical temperature, which may vary over a wide range.

A further object of this invention resides in the provision of a fire alarm which has means for setting the fire alarm at a given temperature at which the audible signal thereof will be actuated.

A still further object of the invention resides in the provision of a fire alarm having means included therein for determining whether or not the spring activated means for sounding the alarm is properly wound or not.

Still another object of the invention resides in the provision of a fire alarm having a suitable arm with indicia thereon so as to provide information as to the temperature at which the alarm will become actuated.

Still further objects of the invention reside in the provision of a fire alarm that is strong, durable, highly efficient in operation, simple in construction and design, capable of being encased in a highly attractive casing, capable of being manufactured from readily available parts, and which device will be comparatively inexpensive.

These, together with the various ancillary objects of the invention will become apparent as the following description proceeds, are attained by this fire alarm, a preferred embodiment of which has been illustrated in the accompanying drawings, by way of example only, wherein:

Figure 1 is a perspective view showing the fire alarm comprising the present invention;

Figure 2 is an enlarged side elevational view of the device comprising the present invention with the casing thereof being shown in section to show the other parts in greater detail;

Figure 3 is a vertical sectional view as taken along line 3—3 in Figure 2;

Figure 4 is a vertical sectional view as taken along line 4—4 in Figure 3;

Figure 5 is a horizontal sectional view as taken along line 5—5 in Figure 2;

Figure 6 is a sectional detail as taken along line 6—6 in Figure 3;

Figure 7 is another vertical sectional view as taken along line 7—7 in Figure 2; and

Figure 8 is a sectional detail of one element of the present invention.

Reference numeral 10 designates a casing of

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ornamental configuration having slots or apertures 12 therein in order that heat may pass to the working elements of the fire alarm so as to impart the temperature of the room or space in which the fire alarm is located to these working elements. Secured within the casing 10 is a frame 14 of any suitable design on which the various elements of the invention may be readily emplaced. There is also secured to the casing 10 lugs 16 which are provided with suitable apertures 18 to enable the device to be readily secured to a wall or other surface, thus permitting the fire alarm to be readily seen and easily set.

Secured to the frame 14 is a bell 20 and a striker arm 22 for the bell 20 is pivotally mounted on the frame 14 by means of a shaft 24 on which a pawl 26 is also provided for engagement with the ratchet wheel 28 secured to shaft 30 which is journaled in the frame 14. Also secured to the shaft 30 is a gear 32 which is actuated by the gear 34 mounted on the drive shaft 36. A coiled spring 38 is held at one end of frame 14 while its inner end is connected with the shaft 36. A key 40 is mounted on the end of the shaft 36 for winding the spring 38, and a pawl and ratchet holds the spring 38 in a wound position.

For preventing the striker 22 from actuating and sounding the alarm 20, a rod 42 having a knurled head thereon is provided which has a hook portion 44 for engagement with the striker 22 so as to prevent it from striking the bell 20. Positioned on the rod 42 is a collar 46 which is engaged by an inwardly turned lug of a trigger 48. The trigger 48 is carried by a plate 50 secured to the frame having suitable guide flanges with apertures therein, as indicated at 52. A spring 54 is welded at one end to the frame and continuously urges the trigger 48 into engagement with a temperature-responsive bellows 56 which is adjustably secured to the frame by means of a threaded shaft or rod 58. A disk 60 is secured to the rod 58, as is a knurled head 62 for rotating the rod. The disk 60 is adapted to be used in conjunction with the arm 64 which has suitable indicia of temperatures thereon calibrated to the temperature at which the bellows 56 will cause the trigger 48 to urge, by engagement with the collar 46, the release of the striker 22, which will then sound the bell 20. A groove is formed in the rod 42, as is indicated at 66, so that a pointer 68 can be used to indicate whether or not the rod 42 is in position to engage the striker or not. Obviously, upon rotation of the knob 62 and hence the shaft 58 the

bellows may be moved inwardly against the trigger 48, thus reducing the amount of heat necessary to expand the bellows enough to actuate the trigger 48.

To indicate whether or not the spring 38 is wound there is provided an aperture in the casing 10 as indicated at 70, and a spring wire 72 which is welded to the frame 14 is engaged about the outer loop of the spring 38, and hence moves with it according to the amount of tension thereon. As the spring is unwound, it will slip off to the side, thus indicating that it should be wound. Further, an additional aperture 74 is formed in the side of the casing 10 in order that a free end 76 of the trigger 48 will extend therethrough so as to indicate the position of the trigger 48.

There is provided an eye 70 on the casing through which a wire, string or thread may run which is attached to the member 48 which extends through the casing 10. The wire, thread or string may be connected to a door, window, etc. The alarm will then be sounded if the door or window is opened. This will in no way interfere with the alarm settings for fire.

However, since numerous modifications will readily occur to those skilled in the art after a consideration of the foregoing specification and accompanying drawings, it is not intended to limit the invention to the precise embodiment shown and described, but all suitable modifications and equivalents may be readily resorted to which fall within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A fire alarm device comprising a portable casing provided with slots, a frame within said casing, signal means secured to said frame, including a movable signal producing member, spring activated means mounted on said frame for actuating said signal producing member, locking means for said signal producing member, a thermostatic bellows consisting of elastic, disk shaped plates mounted for expansion in an axial direction, a rockable trigger member controlling said locking means, a flanged guide member for journaling and rockably holding said trigger member, supported by said frame, said trigger member having a section forming an axle rockable within said guide member, a further section of said trigger member extending at an angle thereto and projecting towards the bellows and being substantially parallel to and in operative near contact with the central side portion of the disk shaped bellows so that said trigger member is rocked upon a predetermined axial expansion of the bellows, a further section of said trigger member forming an end section projecting at an angle from the first named section of the trigger member and forming a lug, and a further section of the trigger member projecting from the section parallel to the bellows beyond the frame and outwardly through one of the slots of the casing, a collar on said movable locking member, being engaged by the end section of the trigger member forming a projecting lug, an adjusting means for positioning said bellows relatively to said frame and relatively to the trigger section parallel to the disks of the bellows to keep the bellows out of contact with the trigger section until a predetermined temperature has been reached, said adjusting means including a shaft threadedly engaging said frame, said bellows being secured to the shaft at one end thereof, spring means for urging the section of said trigger member closest to the bellows into a position in which it is reached by said bellows upon a predetermined expansion thereof, indicating means operatively connected with said trigger member and projecting through one of the slots of the casing, means carried by the frame engaging said spring activating means and indicating the condition of winding of said means, said means being further provided with an indicator, projecting through one of the slots of the casing to indicate the condition of said spring activating means on the outside, a shield having indicia thereon secured to said frame and a disk carried by the shaft threadedly engaging said frame at right angles to said indicia carrying shield for indicating the adjustment of the bellows.

2. A fire alarm device comprising a portable casing provided with slots, a frame within said casing, signal means secured to said frame, including a movable signal producing member, spring activated means mounted on said frame for actuating said signal producing member, an axially movable locking member provided with a transverse locking projection, the latter engaging and locking said movable signal producing member, and adapted to lock and to release the last-named member upon being shifted axially, said locking member having a section projecting outwardly from said casing, manual means on the said projecting section for shifting said axially movable locking member, a collar on said axially movable locking member, a thermostatic bellows consisting of elastic disk shaped plates mounted for expansion in an axial direction, a rockable trigger member for controlling said locking means, a flanged guide member for journaling and rockably holding said trigger member, said trigger member having a section forming an axle rockable within said guide member, a further section extending at an angle thereto and projecting towards the bellows, substantially parallel to and in operative near contact with the central portion of the disk shaped bellows, so that said trigger member is rocked upon a predetermined axial expansion of the bellows, a further section of said trigger forming an end section projecting at an angle from the first named section and forming a lug, a still further section of the trigger member projecting from the section parallel to the bellows beyond the frame and outwardly through one of the slots of the casing, said last named section being attachable to objects moved upon intrusion into a room, thus adapting the trigger member for use in a burglar alarm, a collar on said movable locking member, being engaged by the end section of said trigger forming a projecting lug, an adjusting means for positioning said bellows relatively to said frame and parallel trigger section, so as to keep the bellows out of contact with the parallel trigger section until a predetermined temperature has been reached, said adjusting means including a shaft threadedly engaging said frame, said bellows being secured to the shaft at one end thereof, and means for urging said trigger into its end position closest to said bellows.

3. A fire alarm device comprising a portable casing provided with slots, a frame within the casing, signal means secured to said frame, including a movable signal producing member, spring activated means mounted on the frame for actuating said signal producing member, an

axially movable locking member provided with a transverse projection, the latter engaging and locking said movable signal producing member, said locking member being adapted to lock and to release the last-named member upon being shifted axially and said locking member having further a section projecting outwardly from said casing, manual means on said outwardly projecting section for shifting the movable locking member, a collar on said movable locking means, an indicator mark on the outwardly projecting section of the axially movable member, a pointing member on the outside of said casing for cooperating with said indicator mark, a thermostatic bellows consisting of elastic disk shaped plates mounted on said frame for expansion in an axial direction, a rockable trigger member controlling said locking means, a flanged guide member for journaling and rockably holding said trigger member, supported by the frame, said trigger member having a section forming an axle rockable within said guide member, a further section extending at an angle thereto and projecting towards the bellows and being substantially parallel to and in operative near contact with the central portion of the disk shaped bellows, so that said trigger member is rocked upon a predetermined axial expansion of the bellows, a further section of said trigger member forming the end section projecting at an angle from the first named section of the trigger member and forming a projecting lug, and a further section projecting from the section parallel to the bellows outwardly through one of the slots of the casing, said section being attachable to objects moved upon intrusion, so as to adapt the trigger member for operation in connection with a burglar alarm, a collar on said movable locking member being engaged by the end section of said trigger forming a projecting lug, an

indicator mark on the outwardly projecting section of said axially movable locking member, a pointing member on the outside of said casing for cooperating with said indicator mark, an adjusting means for positioning said bellows relatively to the frame and parallel trigger section, so as to keep the bellows out of contact with the parallel trigger section until a predetermined temperature is reached, said adjusting means including a shaft threadedly engaging said frame, said bellows being secured to said shaft at one end thereof, spring means for urging said trigger member into its end position closest to said bellows, indicating means operatively connected with said trigger and projecting through one of the slots of the casing, means carried by the frame engaging said spring activating means and indicating the position of winding of said means, said means being provided with an indicator projecting through one of the slots of the casing to indicate the condition of said spring actuating means on the outside, a shield having indicia thereon secured to said frame, and a disk carried by the shaft threadedly engaging said frame at right angles to said inidcia carrying shield for indicating the adjustment of the bellows.

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