Jan. 27, 1953 M. E. OUELLETTE 2,627,004

FIRE DETECTOR

Filed April 17, 1951

Fig. 1.

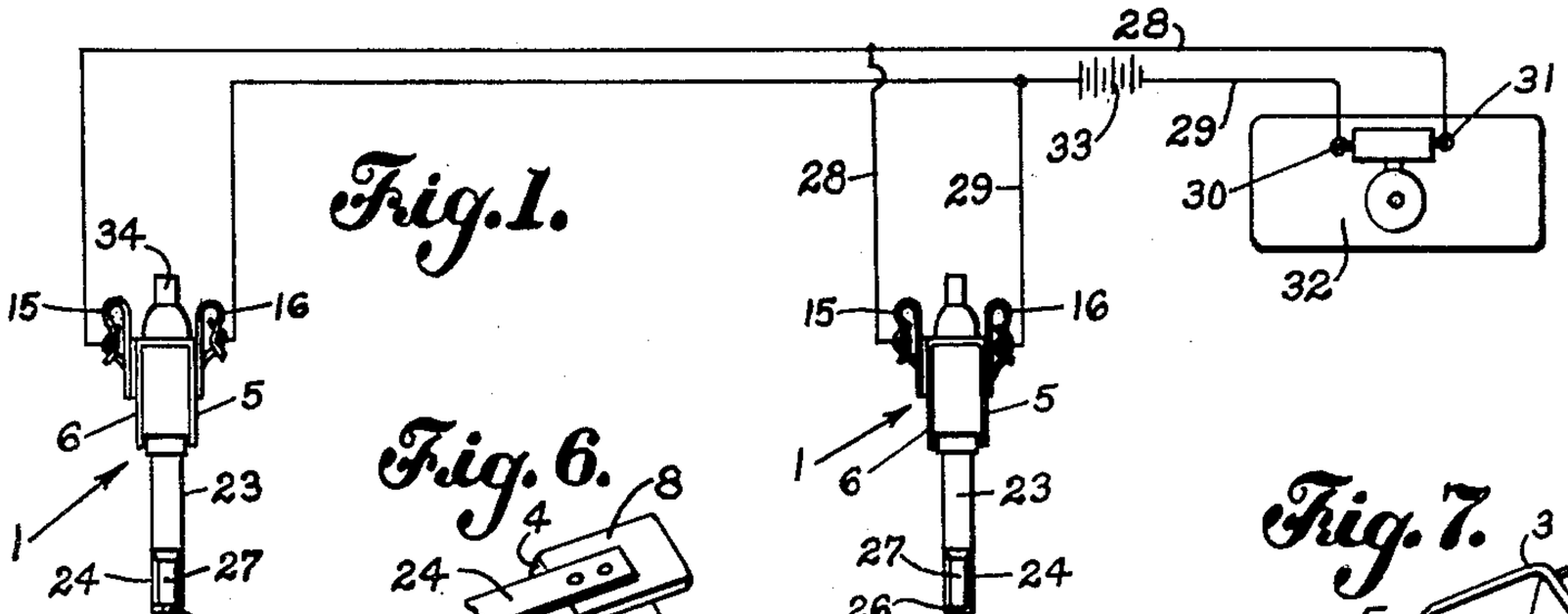


Fig. 6.

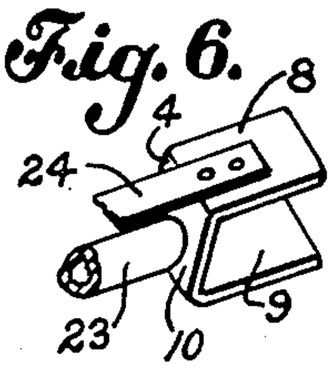


Fig. 7.

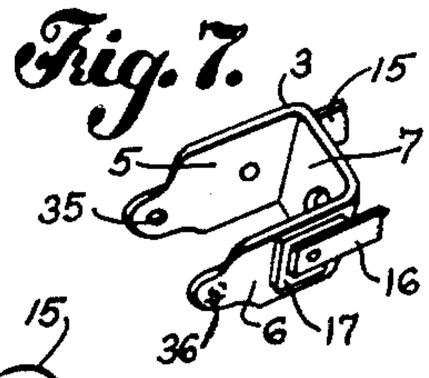


Fig. 2.

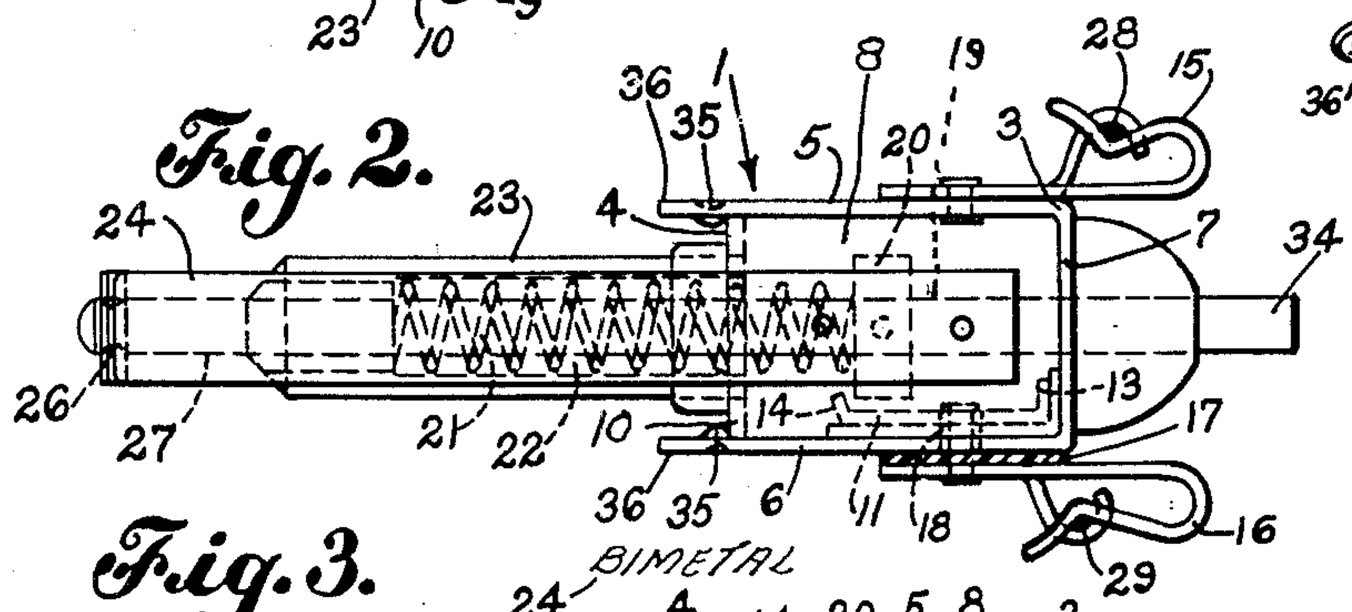


Fig. 3.

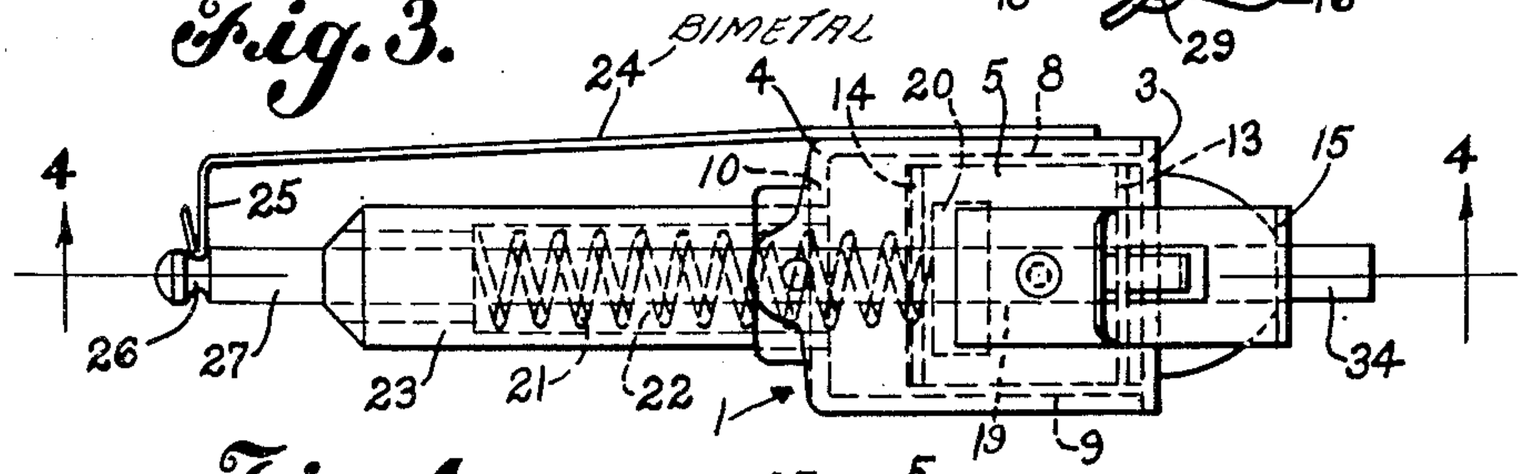


Fig. 4.

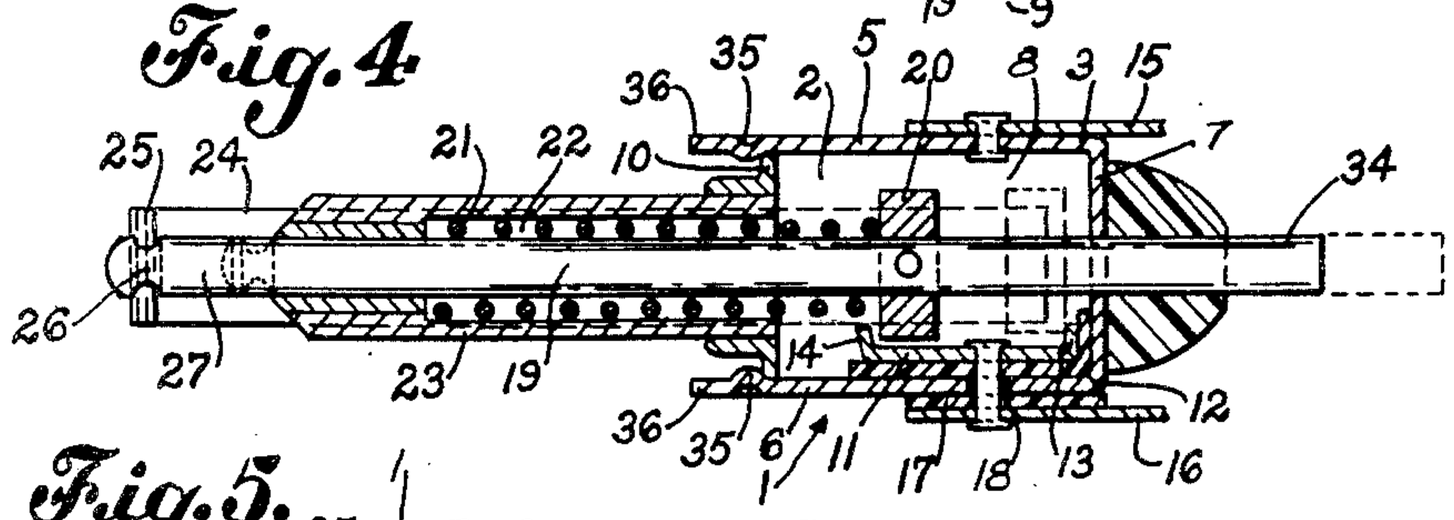
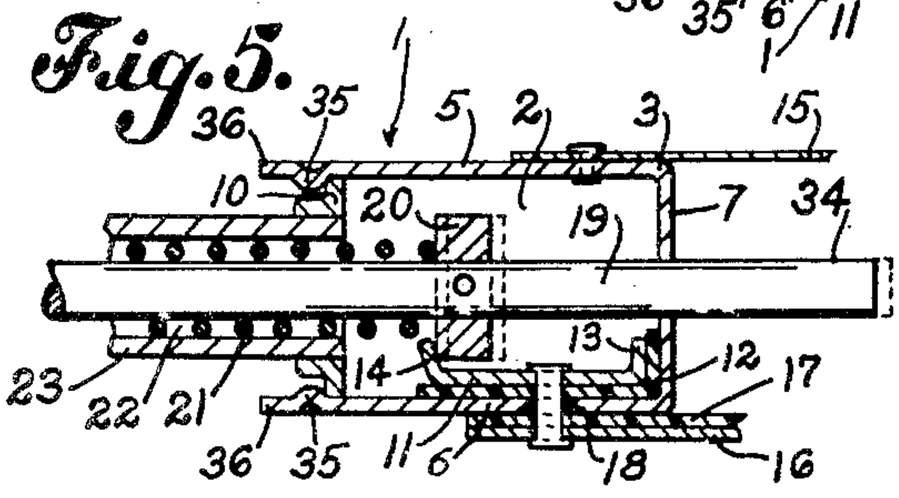


Fig. 5.



INVENTOR.
Maxime E. Ouellette
BY Louis C. Smith
Attorney.

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FIRE DETECTOR

Maxime E. Ouellette, Macwahoc, Maine

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2 Claims. (Cl. 200—138)

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This invention relates to fire detectors which detect the existence of a fire in the vicinity of the detector and also indicate such fire conditions by an audible or visual signal.

One object of the invention is to provide a fire detector which is relatively simple in construction and inexpensive to manufacture, but which is effective in giving indication of the existence of abnormal temperature in its vicinity.

In order to give an understanding of the invention I have illustrated a selected embodiment thereof in the drawings which will now be described and the novel features of the invention are then pointed out in the appended claims.

In the drawings,

Fig. 1 is a more or less diagrammatic view showing the improved detector connected up to the indicator;

Fig. 2 is a side view of the detector;

Fig. 3 is a view of the detector as seen from the top of Fig. 2;

Fig. 4 is a section on the line 4—4 Fig. 3;

Fig. 5 is a fragmentary sectional view illustrating the manner in which the detector can be manipulated for testing purposes;

Fig. 6 is a view of one of the U-shaped sections of the body of the detector;

Fig. 7 is a view of the other U-shaped section of the detector body.

My improved fire detector has a body portion indicated generally at 1 which is provided with an enclosed contact-receiving chamber 2 within which the contact elements of the signal circuit are located. The body member 1 presents two U-shaped sections 3 and 4 which form between them the enclosed contact-receiving chamber 2, the U-shaped member 3 being a contact-supporting member and the U-shaped member 4 being a thermostat-supporting member. The section 3 forms the opposite side walls 5 and 6 and also the end wall 7 of said chamber, and the U-shaped section 4 forms the other two side walls 8 and 9 and the other end wall 10 of said chamber.

Located within the chamber 2 is a contact element 11 which is secured to the side wall 6 of the chamber, but is insulated therefrom, as shown at 12. The contact element 11 has two spaced contact sections 13 and 14. The U-shaped part 3 carries two terminals 15 and 16 of any suitable design, the terminal 15 being secured to the side wall 5 of said U-shaped member 3, and the terminal 16 being secured to the side wall 6 thereof. The terminal 16 is insulated from the U-shaped member 3, as shown at 17,

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but is electrically connected with the contact member 11 by the rivet connection 18.

Extending through the chamber 2 and projecting beyond the end walls thereof at each end is a plunger 19 which has mounted thereon a contact collar or contact flange 20 that is normally located between the contact sections 13 and 14 of the contact element 11, as shown in Fig. 4. The plunger 19 is acted on by a spring 21, one end of which engages the collar 20 and the other end of which bottoms in a spring recess 22 which is formed in a tubular extension 23 of the U-shaped member 4, said spring normally urging the plunger toward the right in Fig. 4 thereby to bring the contact flange 20 into engagement with the contact section 13.

The plunger is normally held in its inoperative position shown in Fig. 4, in which it is out of engagement with the two contact sections 13 and 14, by means of a thermostatic element carried by the U-shaped body section 4 and situated externally thereof, said thermostatic element being in a position to respond rapidly to any abnormal rise in temperature in the air surrounding the detector such as would result from fire conditions. This thermostatic element is shown at 24 and may be in the form of a bimetallic thermostat member. The end 25 of the thermostatic element is bent laterally and normally has yielding interlocking engagement with a groove 26 with which the projecting end 27 of the plunger 19 is provided, as shown in Fig. 3. This interlocking engagement normally holds the plunger in a position in which the contact flange 20 is closely adjacent to but spaced from the contact section 14 of the contact 11, as shown in Fig. 4. When, however, the thermostat is subjected to an elevated or abnormally high temperature, such as would result from the existence of a fire in the viciinty of the thermostat, said thermostat will be flexed by the high temperature so as to disengage the end 25 from the groove 26, thereby releasing the plunger which will then be moved toward the right by the spring 21 to bring the contact flange 20 into engagement with the contact section 13, as shown in dotted lines Fig. 4, thereby closing the signal circuit as will now be described.

Referring to Figs. 1 and 2, terminals 15 and 16 of the detector are shown as connected to the two sides 28, 29, of a signaling circuit leading to the terminals 30 and 31 of an audible signaling device 32 which may be in the form of a bell, gong, or buzzer. The circuit 28, 29, may be powered by a battery 33.

It will be understood that under normal conditions when the thermostat 24 has interlocking engagement with the plunger 27, as shown in Fig. 3, the contact flange 20 will be out of engagement with both contact portions 13 and 14 and hence the circuit 28, 29, will be open, but whenever fire conditions arise which cause the thermostat to disengage the plunger, then said plunger will be moved into the dotted line position Fig. 4, thereby closing the circuit and sounding the alarm.

If desired two or more detectors can be used in the same circuit, as shown in Fig. 1, said detectors being connected in parallel so that the circuit will be open so long as normal temperature conditions exist, but will be closed as above described whenever abnormally high temperaperature arises in the vicinity of either detector.

The detector herein shown has provision for manually testing the detecting circuit. It has been stated above that normally the contact flange 20 is closely adjacent to but spaced from the contact section 14, as shown in Fig. 4. The testing of the installation can be accomplished by merely pressing against the exposed end 34 of the plunger, thereby to bring the contact flange 20 against the flange section 14, as shown in full lines Fig. 5. By this means the circuit will be closed and the alarm sounded if the installation is in working order.

The two U-shaped members 3 and 4 which form the body of the detector are separable from each other, as shown in Figs. 6 and 7, so that the chamber 3 may be opened for inspection or any necessary repairs. When the two U-shaped members are in their assembled relation the end wall 10 of the member 4 lies between and is interjacent to the outer end edge portions of the side walls 5 and 6 of the U-shaped member 3 and the two U-shaped members are held in their operative positions by means of inwardly directed protuberances 35 on the end portions 36 of the U-shaped section 3, which have interlocking engagement with the end wall 10 of the body section 4.

The side walls 5 and 6 of the U-shaped section 3 are slightly resilient so that they can be spread sufficiently to permit the end wall 10 to pass between the protuberances 35 when the two U-shaped members 3 and 4 are being assembled or separated from each other.

I claim:

1. A fire detector for closing a signal circuit when fire conditions arise in the vicinity thereof, said fire detector having a body provided with a contact-receiving chamber and comprising two separable U-shaped members, one of which constitutes a contact-supporting member and forms two opposite sides and one end wall of said chamber, and the other of which constitutes a thermostat-supporting member and forms the other two opposite side walls and the other end wall of said chamber, means yieldingly holding the two U-shaped members in their operative relation, a contact element within said chamber secured to but insulated from one of the side walls of the contact-supporting member, said contact element having two inwardly directed contact portions spaced from each other, means electrically connecting the contact element to one side of the signal circuit and the thermostat-supporting member to the other side of said circuit, a plunger member extending through the end walls of said chamber and projecting at both ends beyond said end walls, a contact flange secured to the plunger and located between the contact portions of the contact member, a spring acting on said plunger member and normally urging it toward a position in which the contact flange engages one of the contact portions, and a thermostat element secured to the thermostat member and located externally thereof and normally having a yielding interlocking engagement with an end portion of the plunger which projects beyond said chamber by which the plunger is held in a position in which the contact flange is out of contact with both contact portions of the contact element, said thermostat being responsive to an abnormal rise in temperature in the air surrounding the detector to release the plunger, whereby the spring operates the latter to close the signal circuit.

2. A fire detector as defined in claim 1 in which the side walls of one of the U-shaped members are slightly resilient and the end edge portions thereof embrace the end wall of the other U-shaped member, each of said end portions having an inwardly directed protuberance which engages the interjacent end wall of the other U-shaped member and thereby yieldingly holds the separable U-shaped members in their operative relation.

MAXIME E. OUELLETTE.

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The following references are of record in the file of this patent:

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