Jan. 7, 1958 M. E. OUELLETTE 2,819,367

FIRE DETECTOR

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FIG. 1

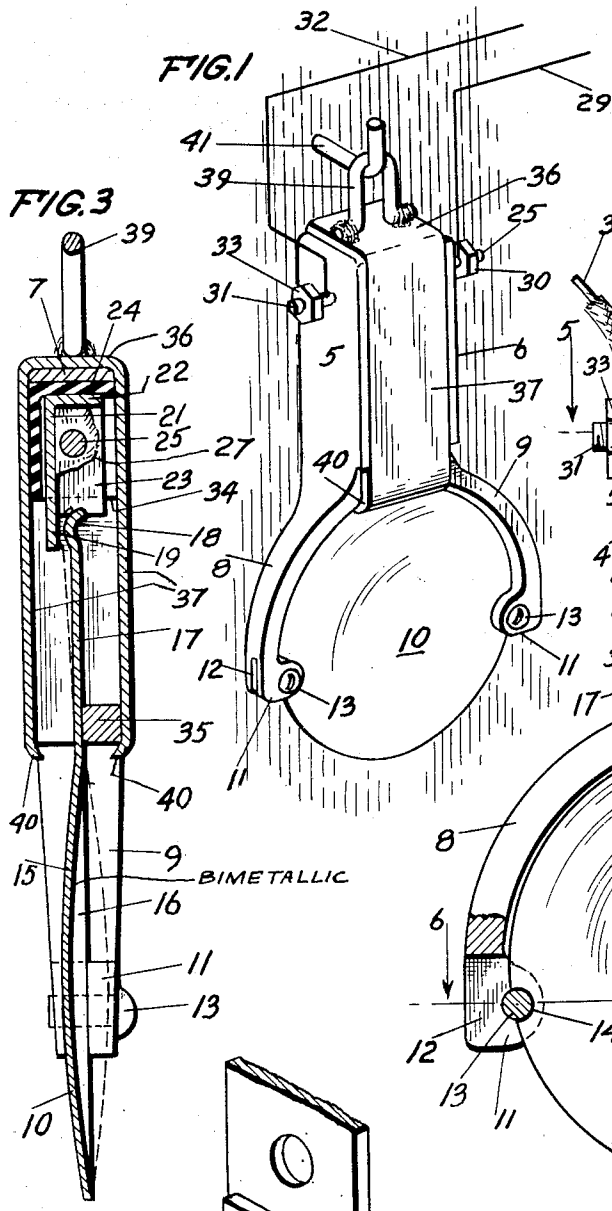


FIG. 3

FIG. 2

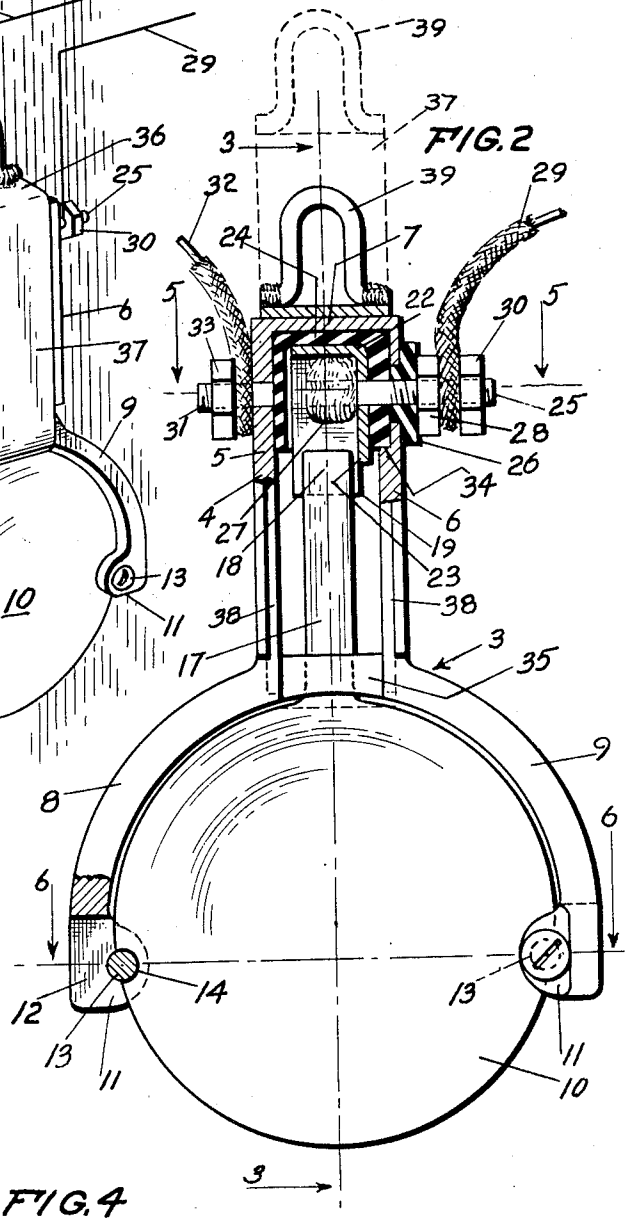


FIG. 4

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FIG. 5

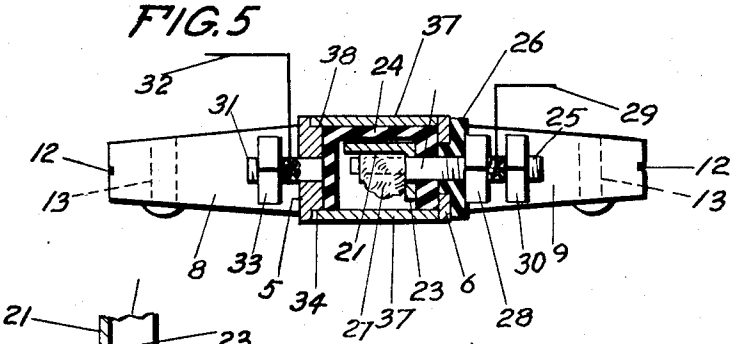


FIG. 7

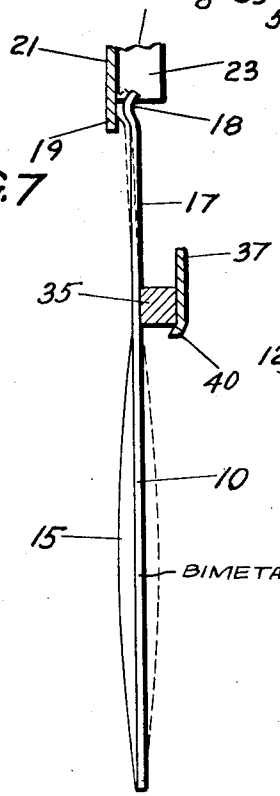


FIG. 6

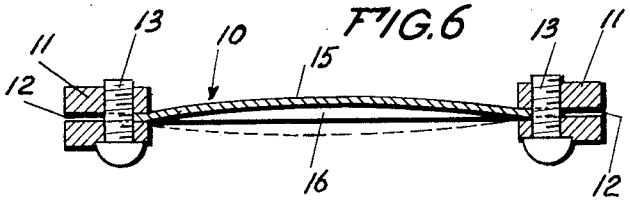
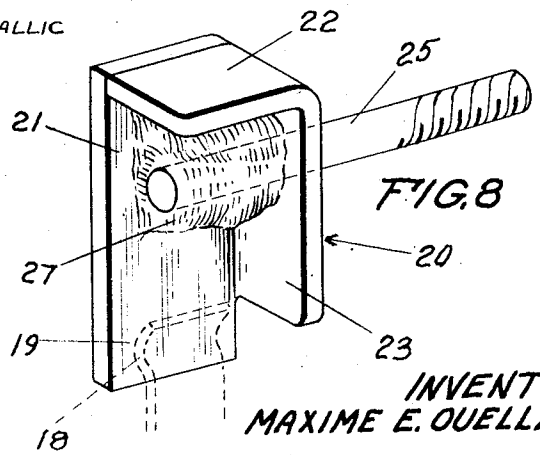


FIG. 8



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FIRE DETECTOR

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3 Claims. (Cl. 200—138)

This invention relates to fire detectors of the type which operate to close an alarm circuit when fire conditions exist in the vicinity of the detector.

One of the objects of the invention is to provide a fire detector of this type which is simple in construction and inexpensive to manufacture, and which can be either hung on a wall or placed in any other location in a room where it will be rendered operative when the temperature in the vicinity of the detector rises to a point which might indicate the existence of an incipient fire in the vicinity of the detector.

In the drawings wherein I have illustrated a selected embodiment of the invention;

Fig. 1 is a perspective view showing my improved fire detector as being hung on a wall;

Fig. 2 is an enlarged side view of the detector with parts broken out;

Fig. 3 is a section on the line 3—3, Fig. 2;

Fig. 4 is a fragmentary perspective view of a portion of the supporting frame;

Fig. 5 is a section on the line 5—5, Fig. 2;

Fig. 6 is a section on the line 6—6, Fig. 2;

Fig. 7 is a fragmentary view illustrating the operation of the device; and

Fig. 8 is a perspective view illustrating the fixed contact element.

The detector herein illustrated comprises a supporting frame 3 adapted to support a thermostatic element hereinafter described and which presents a body portion 4 having two spaced parallel side members 5, 6 which are illustrated as connected together at the top of the body portion by a bridge 7. Each side portion 5, 6 merges at its lower end into a curved arm, said arms being indicated at 8 and 9, by which a thermostatic element 10 is supported.

Each of the arms 8 and 9 span an arc of 90° and the free end of each arm is provided with an enlarged foot portion 11 which is provided with a slot 12.

The thermostatic element 10 is in the form of a circular bimetallic concavo-convex disk, the opposite edges of said disk occupying the slots 12 and said disk being held in position by clamping screws 13 which pass through notches 14 with which the edges of the disk 10 are provided.

The concavo-convex thermostatic element 10 has the characteristic that at normal temperature one face 15 thereof is a convex face while the oposite face 16 is a concave face as shown in full lines, Fig. 3. When, however, the thermostatic element is heated to a predetermined point said disk automatically reverses itself, so that the face 15 which was convex at normal temperature becomes a concave face, and the face 16 becomes a convex face, as shown by dotted lines in Figs. 3 and 7. When the temperature of the thermostatic element is reduced to below the critical point it will again reverse itself and assume its normal shape with the face 15 having convex curvature and the face 16 a concave curvature.

The thermostatic element 10 carries an arm 17 having

at its end a contact member 18 which constitutes a movable contact and which cooperates with a fixed contact 19 carried by but insulated from the frame 3. The fixed contact is part of a contact member 20 which presents a back element 21, a top element 22, and a side element 23 extending at right angles to the back element 21. This contact member 20 is located at the upper end of the body 4 of the supporting frame and is insulated therefrom by an insulating member 24 which covers the top 22 of the contact member and overlies the side flange 23 thereof, as best seen in Fig. 2.

The contact member 20 has rigidly connected to it a screw-threaded stem 25 which is also insulated from the frame by means of an insulating collar 26. The stem 25 is anchored to the contact member 20 by means of solder or some other suitable anchoring material 27, and said contact member is clamped in position by means of a clamping nut 28 screw-threaded to the stem 25. This stem 25 constitutes a terminal to which may be attached a circuit wire 29 that forms one side of an alarm circuit. 30 is a clamping nut screw-threaded to the stem 25 and by which the circuit wire 29 is securely fastened thereto.

The fixed contact member 20 is thus mounted on the side member 6 of the body member 4. The other side member 5 of said body carries a stud 31 to which a circuit wire 32 forming the other side of an alarm circuit may be clamped by means of a clamping nut 33.

To assist in holding the fixed contact element 20 in proper position, the side member 6 of the body is provided with a shoulder 34 which coperates with the insulated element 24 to prevent turning movement of the stem 25, thereby preserving the correct operative fixed position for the fixed contact 19. Body portion 4 is provided with a cross member 35 against which the lower portion of the arm 17 rests, as shown best in Fig. 3.

When the thermostatic element is at normal temperature or at any temperature below the critical temperature, said element has the shape shown in full lines, Fig. 3 and the movable contact 18 will be separated from the fixed contact 19. When the thermostatic element is heated to a point above the critical point then said element reverses itself, as shown by dotted lines in Fig. 3, thereby bringing the movable contact 18 into engagement with the fixed contact 19 and closing the alarm circuit 29, 32, thereby activating the alarm in said circuit.

When the temperature of the thermostatic element is reduced below its critical point it will again reverse itself, as stated above, thereby bringing it into the condition shown in full lines, Fig. 3, and thereby opening the alarm circuit.

The body 4 of the supporting frame is provided with a removable closure element 36 which has a U-shape comprising the two arms 37. The side members 5 and 6 are provided on each edge with a guideway 38 in which the edges of the arms 37 are received. This closure member is shown as provided with a loop 39 which may be grasped when said element is to be removed from the body 4 for the purpose of gaining access to the contact elements. The arms 37 are slightly resilient and the lower ends 40 thereof are bent inwardly slightly so that when the closure element is in its operative position, as shown in Fig. 3, the inturned end 40 of one of the arms coperates with the crosspiece 35 to yieldingly hold the closure member in its operative position.

The loop 39 not only provides a handle by which the closure member may be removed but also provides means by which the detector can be hung on a hook 41, as shown in Fig. 1.

One advantage of the device herein shown is that it can be readily tested by simply applying to the convex side of the thermostatic element when it is at normal

temperature sufficient pressure to reverse it, thereby closing the alarm circuit.

I claim:

1. A fire detector comprising a supporting frame having two spaced arms extending therefrom, a thermostatic element in the form of a convexo-concave disk situated between said arms, means at the ends of said arms for supporting said disk, said disk at normal temperature having one of its faces convexly curved and the opposite face concavely curved and when heated to a predetermined elevated temperature automatically reversing itself, a fixed electrical contact carried by but insulated from the frame said disk having a radially extending arm which constitutes a movable electrical contact and which is spaced from the fixed contact when the thermostatic disk is at normal temperature, but which is moved into engagement with the fixed contact when the thermostatic element is heated to said predetermined elevated temperature.

2. A fire detector comprising a supporting frame having extending therefrom two spaced arms, each of which is provided with a slot at its free end, a thermostatic element in the form of a circular concavo-convex disk situated between the arms and having diametrically opposite edge portions thereof mounted in said slot, said disk when at normal temperature having a convexly curved face on one side and concavely curved face on the other side, and when heated to a predetermined elevated temperature automatically reversing itself, a fixed contact carried by but insulated from the frame, said disk having a radially extending arm which constitutes a movable contact that

at normal temperature is spaced from the fixed contact but is moved into engagement therewith by the heat induced reversal of said disk.

3. A fire detector comprising a supporting frame having at its lower end two spaced arms, each of which has an enlarged free end provided with a slot, a thermostatic element in the form of a circular concavo-convex disk, the diametrically opposite edge portions of which are mounted in the slot in the free ends of the arms, said disk at normal temperature having one face convexly curved and the other concavely curved, and when heated to a predetermined elevated temperature automatically reversing itself, a fixed electrical contact carried by but insulated from the frame and cooperating movable electrical contact element carried by the thermostatic element and extending radially therefrom into a position to engage the fixed contact, said movable contact at normal temperature being spaced from the fixed contact and being moved by the heat induced reversal of the thermostatic element from its open position into a closed position in engagement with the fixed contact, said insulated contact member being in one side of an alarm circuit and the frame connected to the other side of said circuit.

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