

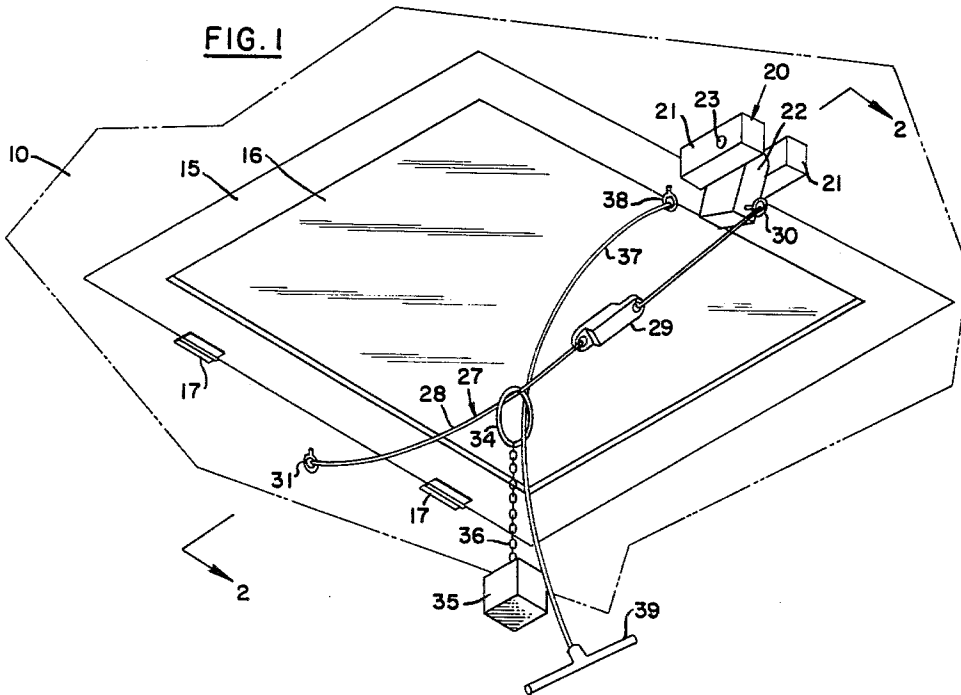
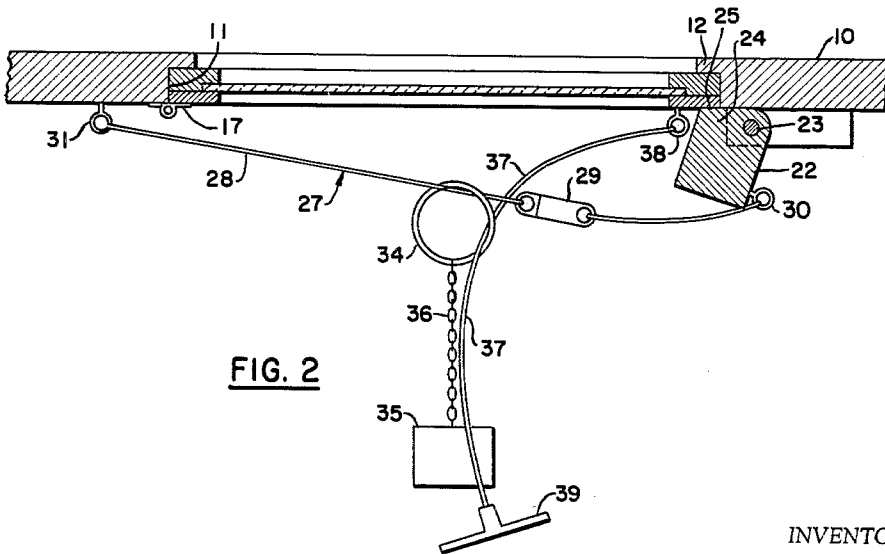
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M. LEVY ET AL
SAFETY FIRE DEVICE

3,236,343

Filed Dec. 18, 1963

2 Sheets-Sheet 1



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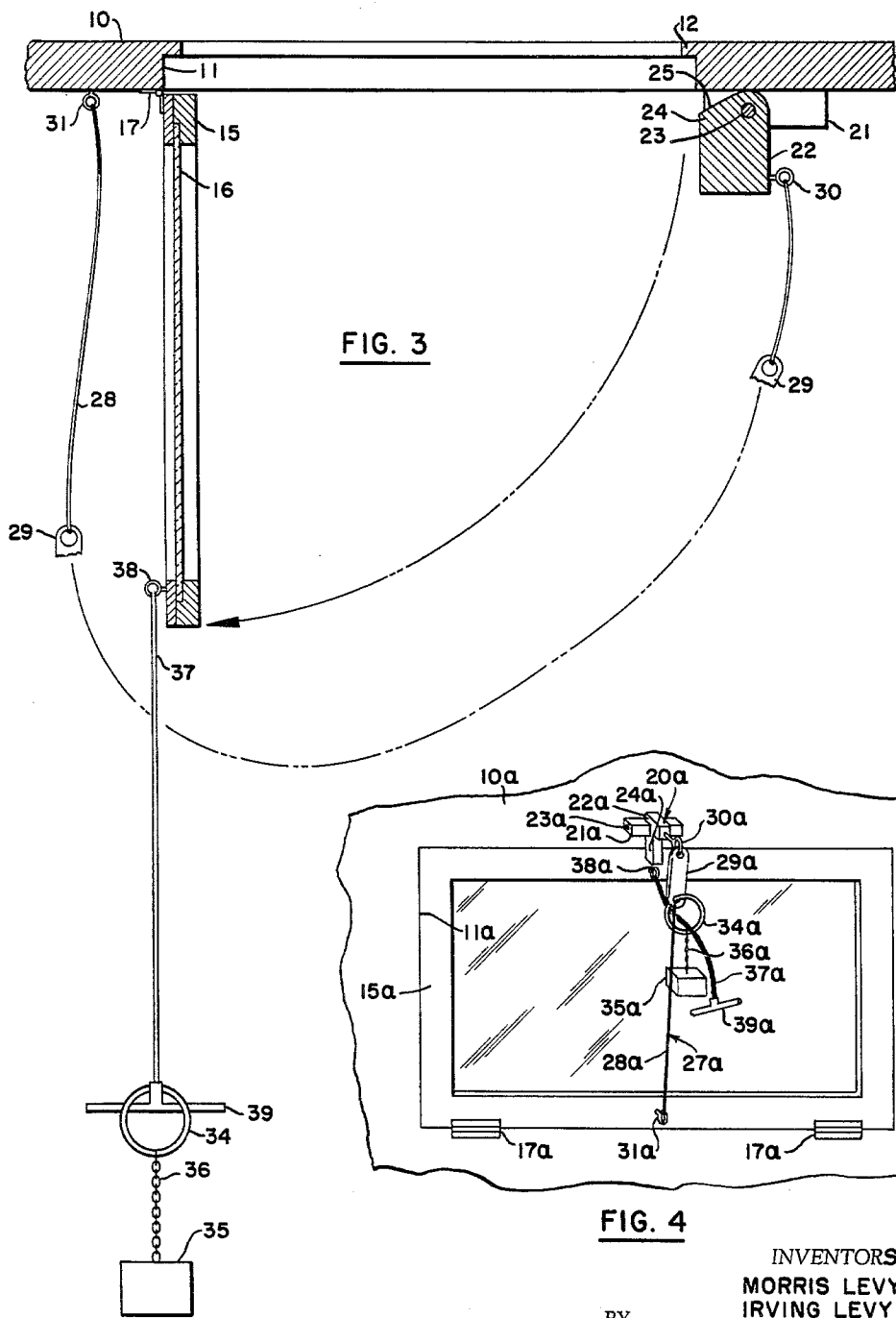
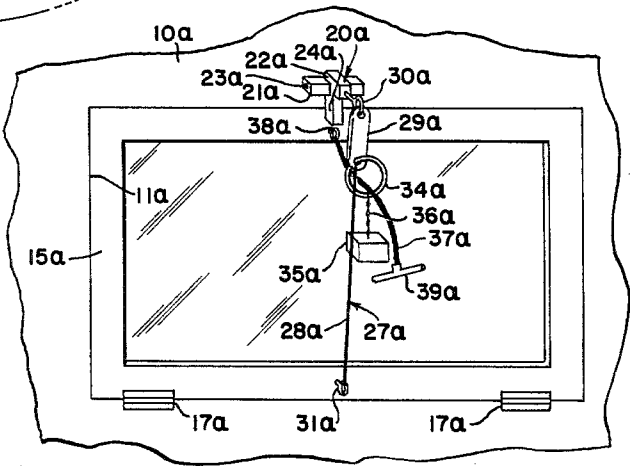
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SAFETY FIRE DEVICE

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This invention relates to safety fire devices, and is especially concerned with means for automatically opening an exterior building wall.

When building fires originate in a closed area, they necessarily spread, through partitions and the like, to other areas. This spreading is often concealed within the building walls so that the fire is not noticed until it finally escapes from the walls and quickly burns the entire building. However, if the original or starting fire can escape through an external building-wall opening it will usually be quickly recognized, and its spread throughout the building is delayed so that occupants have more time to escape and fire fighters may salvage more of the building.

It is therefore an important object of the present invention to provide a fire-safety device in the nature of an exterior-wall closure which automatically opens in the presence of sufficient heat, to thereby release pressure, smoke and heat to the exterior of the building and substantially reduce the speed of fire movement through the building.

It is another object of the present invention to provide a safety fire device of the type described which is extremely simple and durable in construction, entirely reliable and automatic in operation, and which can be economically manufactured and installed for sale at a reasonable price.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

In the drawings:

FIGURE 1 is a bottom perspective view showing a safety device of the present invention installed in the roof or top wall of a building;

FIGURE 2 is a sectional elevational view taken generally along the line 2—2 of FIGURE 1;

FIGURE 3 is a sectional view similar to FIGURE 2 but showing the safety device in its operative, open condition; and

FIGURE 4 is a perspective view showing a safety device of the present invention installed in an upstanding or side wall of a building.

Referring now more particularly to the drawings, and specifically to FIGURES 1-3 thereof, a building top wall or roof is there generally designated 10 and provided with a through opening 11. The opening may be of rectangular configuration, as illustrated, or otherwise if desired, and may include an internal peripheral lip or shoulder 12 spaced from the inner or undersurface of the roof.

Conformably disposed within the opening 11 is a generally rectangular panel 15 which may be glazed, as at 16 to provide a skylight. The panel 15 is suitably

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mounted for movement upward into closing relation within the wall opening 11, as in FIGURES 1 and 2, and downward movement out of the opening 11 as in the position of FIGURE 3. Any suitable means may be provided to mount the panel 15 for its closing and opening movement, one such means being shown for purposes of illustration as hinges 17 secured along one edge of the panel and to the adjacent portion of wall 10. The hinges 17 thus mount the panel 15 for upward swinging movement into the opening 11 and gravitational, downward swinging movement out of the opening.

Mounted on the underside of top wall 11, adjacent to the edge of panel 15 remote from hinges 17, is latch means 20 serving to releasably retain the panel in its uppermost, closed condition. The latch means 20 includes a pair of spaced support members or ears 21 fixedly depending from the underside of top wall 10 adjacent to and spaced along the margin of wall opening 11. Interposed between the support members 21 is a latch member or lever 22, being pivotally mounted by a pin 23 extending generally horizontally between the support members 21. The latch member or lever 22 may have one portion 24 swingable into and out of the path of swinging movement of the panel 15, the lever portion 24 being provided with a face 25 engageable with the underside of panel 15 to retain the latter in its closed position within the opening 11. That is, as best seen in FIGURE 2, the lever 22 may be swung to a limiting position with its face 25 in retaining abutment with the underside of panel 15, the latter being in its closed condition. However, the latch lever 22 is swingable out of its retaining position of FIGURES 1 and 2 to a releasing position shown in FIGURE 3, with the lever entirely beyond the path of swinging movement of panel 15. The lever 22 may be configured or weighted so as to gravitationally swing to its releasing position of FIGURE 3.

In order to hold the lever 22 in its closed or retaining position of FIGURES 1 and 2 against the weight of panel 15, suitable holding means is provided, such as generally designated 27. The holding means 27 may include an elongate flexible element, such as wire 28 having interposed therein a fusible link 29. Opposite ends of the elongate holding member 28 are respectively secured to the lever 22, as by a fastener or eye 30, and to the wall 10 by a fastener or eye 31. That is, the holding member 28 is secured by the fastener 30 to the lever 22 at a location remote from pin 23 and abutment portion 24, while the opposite end of holding member 28 may be secured by fastener 31 at a location on the opposite side of the panel 15. It will now be apparent that the holding means 27 exerts a force on lever 22 in the clockwise direction, as seen in FIGURE 2, to retain the panel 15 in its closed condition.

A ring or loop 34 is slidably circumposed about the elongate member 28, and a weight 35 is suspended from the ring 34 by a chain 36, or other suitable means. The weight 35 is thus suspended in elevated condition and provides a stored energy source, as will become apparent presently.

An elongate connection member, such as a flexible wire 37, or the like, may extend through the loop 34, having one end fixed, as by fastener 38 to the panel 15, preferably remote from the hinges 17. Provided on the other, lower end of the elongate connection member 37 may be an enlargement or stop 39 configured to retain the ring 34 on the connecting member 37.

In operation, with the device in the condition of FIGURES 1 and 2, the influence of heat effects melting and parting of the fusible link 29. This opens or releases the holding means 27 and permits swinging movement of the lever 22 out of the path of the panel 15, as well as downward opening of the panel. In the event that the panel 15 does not open immediately under its own weight, the parting of holding member 28 by fusion of link 29 permits the ring 34 to pass from the holding member and fall gravitationally downward until stopped by the enlargement 39. The weight 35 thereby imparts a momentarily delayed impact force to the panel 15, being transmitted through the connection member 37, to insure opening of the panel. This open condition is shown in FIGURE 3.

Referring now to the embodiment of FIGURE 4, a vertical or upstanding building wall is there generally designated 10a, and provided with a through opening 11a. Mounted in the wall opening 11a is a panel 15a movable between an upper closed position within the opening, and a lower open position out of the opening. Mounting panel 15a for such movement may be suitable hinges 17a secured along the lower edge of the panel and to the adjacent portion of wall 10a bounding opening 11a.

Mounted on the wall 10a above the panel 15a and normally retaining the panel closed is quick-acting latch means 20a. The latch means may include a pair of spaced support members or ears 21a outstanding from the wall 10a adjacent to the upper edge of the panel 15a. A lever 22a is interposed between the ears or support members 21a and there pivotally mounted by a pin 23a extending between the support members. The lever includes an abutment portion 24a extending into the path of movement of panel 15a and engageable with the panel to retain the latter in its closed position within the opening 11a. The lever 22a is swingable out of the path of movement of panel 15a to release the latter for its opening movement.

Holding means 27a serves to releasably hold the lever 22a in its position retaining the panel 15a closed. The holding means 27a may include an elongate holding member or wire 28a having one end connected through a fusible link 29a and fastener 30a to the lever 22a at a point remote from the pivot 23a and panel-engaging portion 24a. The other end of the holding member 28a may depend for securement by a fastener 31a to the wall 10a below the wall opening 11a. Thus, the latch lever 22a is held by the holding member 28a with the latch-member engaging portion 24a in position retaining the panel 15a closed.

Also aiding in holding the latch lever 22a in its retaining position is a weight 35a suspended by a chain 36a or other suitable means from a loop or ring 34a which is connected to the fusible link 29a at a location remote from the lever 22a. Thus, the weight 35a exerts a force against the lever 22a serving to hold it in its retaining position, but upon fusion or separation of link 29a the weight 35a is removed from the lever 22a to permit the latter to swing to its releasing position out of the path of movement of panel 15a.

A connection member 37a, such as an elongate flexible wire rope, or the like, may have one end connected by a fastener 38a to an upper region of panel 15a, and may extend therefrom through the loop 34a. On the other end of connection member 37a may be affixed an enlargement or stop 39a of sufficient size to retain loop 34a on the connection member. Thus, upon fusion of link 29a under the influence of heat, the loop 34a is slidable along the connection member 37a, under the gravitational force of weight 35a, to a limiting position in engagement with the enlargement 39a. At this time, the momentum of weight 35a is transmitted through the connection member 37a to the panel 15a, thereby insuring downward swinging or opening movement thereof.

From the foregoing it is seen that the present invention provides a fire-safety device which fully accomplishes its intended objects, is extremely simple in construction and entirely reliable and foolproof in operation, being devoid of electrical and nonpositive mechanical components, and is otherwise well adapted to meet practical conditions of manufacture, installation and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. A safety fire device for mounting in a building opening, said device comprising a panel adapted to be mounted in a building opening for movement into and out of said opening, quick-acting latch means adapted to be mounted adjacent to said building opening and movable between a retaining position for retaining said panel in said opening and a releasing position for releasing said panel from said opening, a heat-fusible holding member connected to said latch means for holding the latter in its retaining position, said holding member releasing said latch means under the influence of heat to release said panel for movement out of said opening, said panel being disposed in upward relation in said opening and movable downward out of said opening, said latch means being swingable into and out of the path of movement of said panel upon latch-means movement between its retaining and releasing positions, a weight connected to said latch means when the latter is in its retaining position to increase the retaining force thereof, and connection means for connecting said weight to said panel upon release of said holding member to impart an opening force to said panel, said connection means comprising a loop carried by said weight and connected to said holding member for disconnection from said latch means upon release of said holding member, an elongate member connected to said panel and extending through said loop, and an enlargement on said elongate member for retaining said loop, whereby said loop is movable along said elongate member to said enlargement upon falling of said weight to impart an impact force to said panel.

2. A safety fire device for mounting in a roof opening, said device comprising a panel adapted to be mounted in a roof opening for movement upward into and gravitationally downward out of said opening, quick-acting latch means adapted to be mounted adjacent to a roof opening and movable between a retaining position for retaining said panel in said opening and a releasing position for releasing said panel from said opening, said latch means being urged toward its releasing position by the gravitational force of said panel, a heat-fusible holding member connected to said latch means for holding the latter in its retaining position against the gravitational force of said panel, a weight connected to said holding member for increasing the latch-holding force of said holding member, and connection means connecting said weight to said holding member, said connection means being loose when said holding member is in its latch-holding relation for applying the force of said weight through said holding member to said latch means, whereby release of said weight by said holding member effects transmission of the force of said weight through said connection means to said panel, said holding member releasing said latch means and weight under the influence of heat to release said panel for movement out of said opening.

3. A safety fire device according to claim 2, in combination with loop means connected to said weight and slidably engaged over said holding member for removal therefrom on release thereof.

4. A safety fire device according to claim 3, said con-

nection means comprising an elongate flexible element extending spacedly through said loop means having one end anchored to said panel, and an enlarged head on the other end of said elongate element spaced from said loop means when said holding member is in its holding relation and engageable with said loop means upon downward falling movement of said weight to transmit the force of the latter to said panel.

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