

[54] CURTAIN WALL SAFETY PANEL

2,604,790	7/1952	Derby et al.	49/2 X
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[75] Inventor: **John S. Dougherty**, Miami, Fla.

FOREIGN PATENTS OR APPLICATIONS

[73] Assignee: **Allied Products Corporation,**
Chicago, Ill.

726,734	3/1955	Great Britain	49/374
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Primary Examiner—Kenneth Downey

Attorney—John A. Mitchell et al.

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52/1

[57] **ABSTRACT**

[51] Int. Cl..... E05f 15/20

A safety curtain wall panel in a building is disclosed which includes a safety sash normally held in a closed position by a latch but which is automatically moved to an open position with respect to the panel when a sensing device detects an undesired atmosphere in the building. By this means smoke or heat detected will cause the sash to open permitting the building to be ventilated.

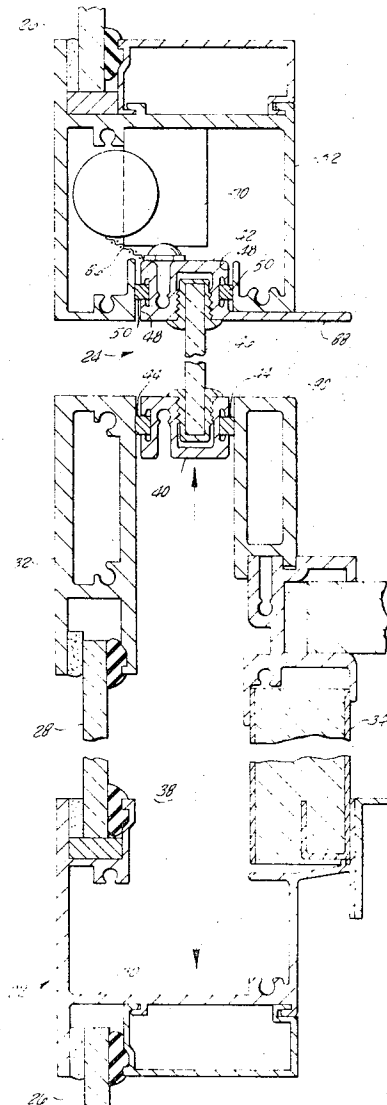
[58] **Field of Search** 49/1, 2, 7, 374,
49/31, 379, 141; 52/1, 235, 207; 160/6, 7, 27,
28, 100; 98/88; 236/49

[56] **References Cited**

UNITED STATES PATENTS

2,171,365 8/1939 Harding 49/2 X

2 Claims, 5 Drawing Figures



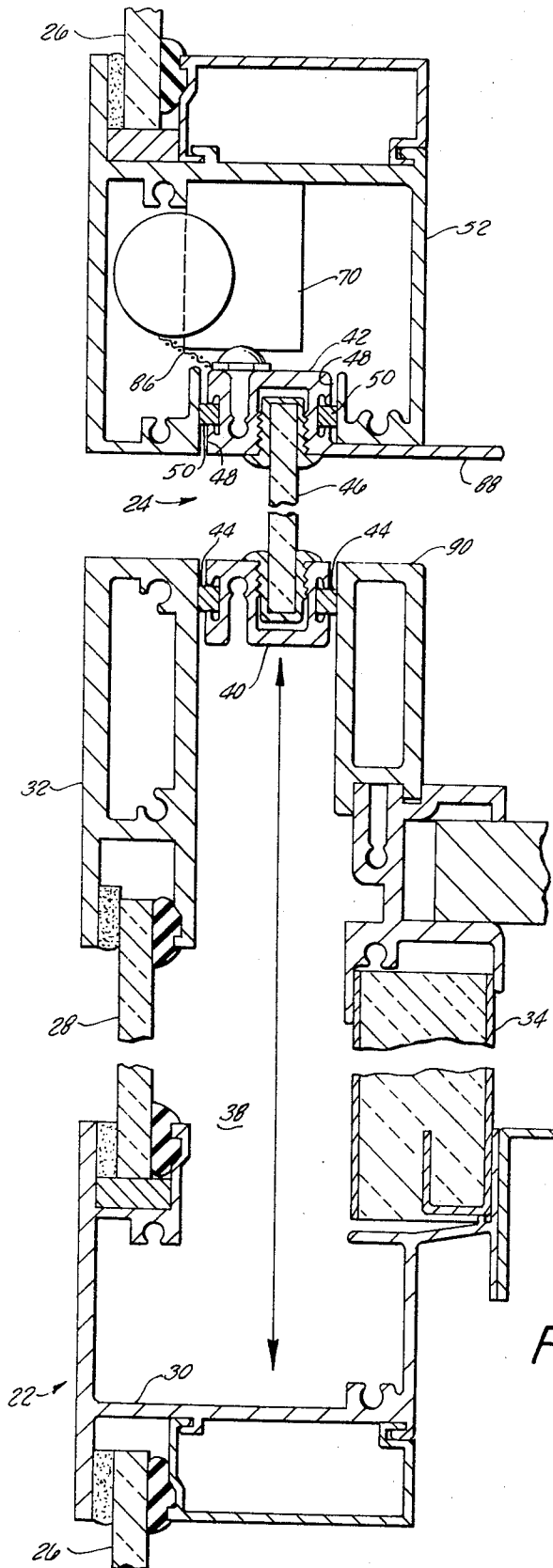
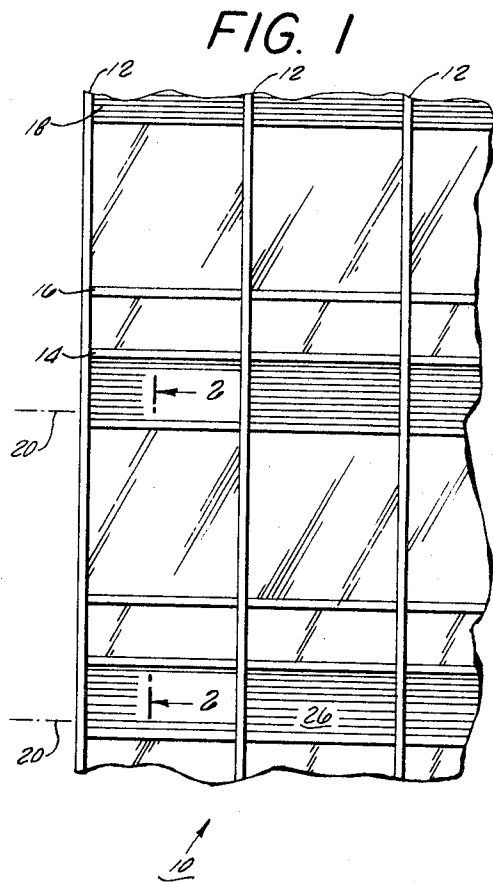


FIG. 2

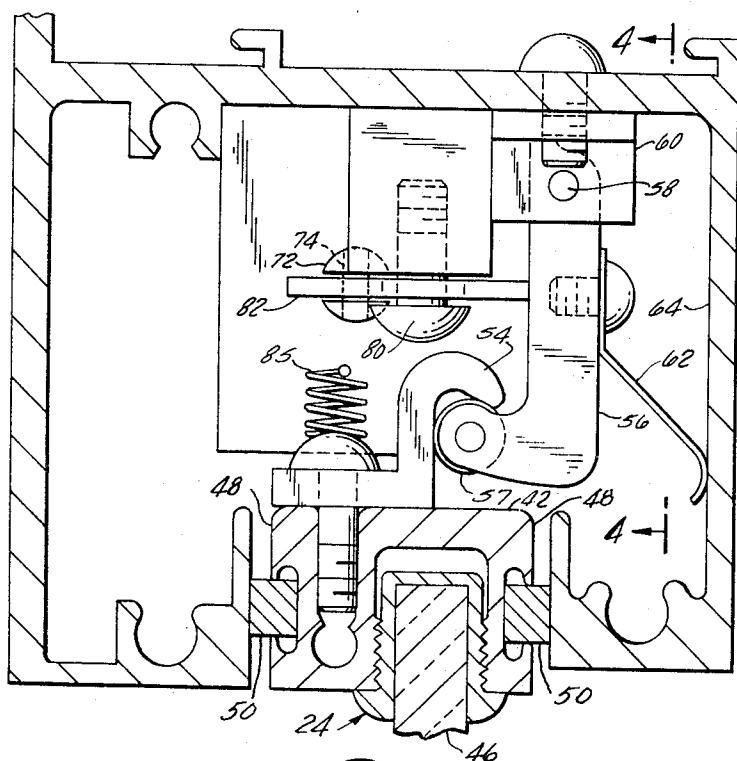


FIG. 3

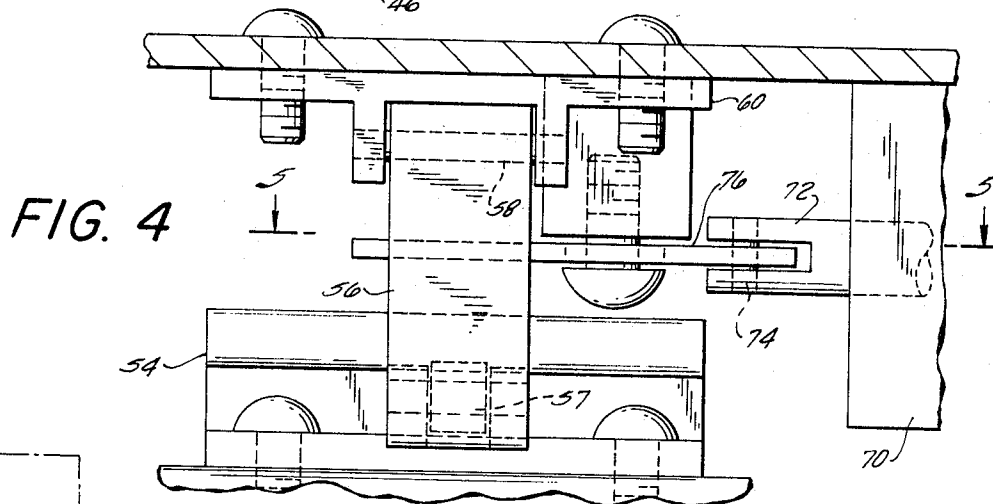


FIG. 4

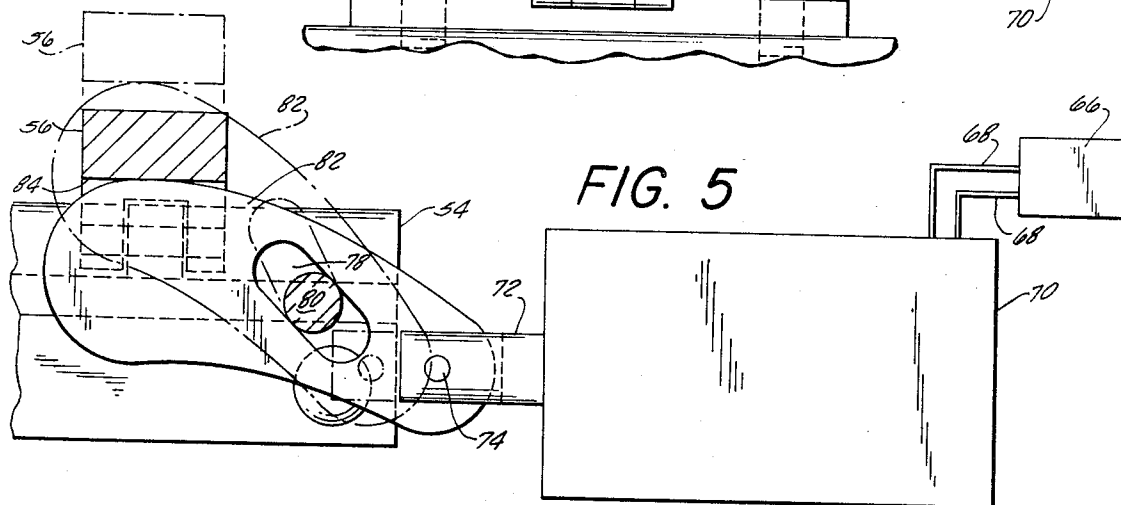


FIG. 5

CURTAIN WALL SAFETY PANEL

SUMMARY OF THE INVENTION

This invention relates to curtain wall designs for buildings, particularly "high rise buildings," with a safety sash as an integral part of said curtain walls.

Curtain wall designs are widely used in many building structures and particularly in "high rise" buildings. A curtain wall system basically consists of an assembly of vertical and horizontal mullions hung and anchored to the exterior perimeter of a basic building structure. Mullions serve as structural framing members at each floor for fixed or operable vision glass areas, for obscure glass areas, or metal spandrel panels which may be used to cover the building's structural beams and other members supporting the floors and ceilings. In addition, other panels, usually metal, although they may be of other materials, are hung to cover the building structural column supports and normally run from the grade line to the roof.

For economy purposes, many metal curtain wall systems are of the "fixed" type. By "fixed" is meant there are no operable window sash units and, therefore, the exterior facing of the building may be designed with continuous, straight and uninterrupted vertical and/or horizontal lines. If operable sashes, usable for ventilation or window cleaning, are used, major modifications must be made to the design of the building to incorporate additional materials and, with the resulting additional labor, thus increasing the cost of construction. Also, such modifications would cause the generally esthetically desired clean, continuous and straight lines of the otherwise fixed system to be interrupted.

While the fixed systems have been desired for esthetic and economy reasons, serious deficiencies have been found with these systems. In some cases minor fires within the building have resulted in serious injuries from heat, smoke and toxic fumes. Deaths have even occurred. As a result of these shortcomings of the fixed system, there has been a demand for a solution which would permit the venting of such buildings to relieve the hazard of heat which builds up during a fire as well as the hazard of trapped smoke contained therein.

Accordingly, it is an object of the present invention to provide an operable safety sash which may be incorporated into what would be a normally appearing fixed curtain wall system, yet the sash would be operable to vent a building of heat and smoke in the event that a fire were to occur. It is a further object of the present invention to obtain the foregoing objective without unduly interfering with the desired esthetic appearance of the building which is normally found with a fixed system.

Therefore, in the present invention, a safety curtain wall construction is utilized whereby a safety sash making up but one component of the curtain wall is normally latched in place in a closed position. Sensing means are provided and the sensing means are responsive to a selected undesired atmosphere such as smoke or heat. Means such as a solenoid is connected to the sensing device and activated by the heat or smoke. The solenoid in turn causes the latch to become disengaged permitting the sash to open and vent the adjacent area.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary front view of a curtain wall in accordance with the present invention;

FIG. 2 is a section through the curtain wall structure of FIG. 1 taken along lines 2—2;

FIG. 3 is a sectional view of the latch housing cam means relating to the operable safety sash;

FIG. 4 is a sectional view of the latch means of FIG. 3 taken along lines 4—4; and

FIG. 5 is a sectional view of the solenoid and cam device of FIG. 4 taken along lines 5—5 thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings and to FIGS. 1 and 2 in particular, a curtain wall 10 usable in a building such as a high rise structure is shown. The wall 10 includes vertical mullions 12 and a series of lateral or horizontal mullions. The horizontal mullions include a spandrel mullion 14, a drop sash mullion 18 and a fixed sash mullion 18. The relationship of the mullions to the building floor lines may be noted by reference to floor line 20.

The curtain wall also includes a series of sash units. These sash units consist of a spandrel sash 22, a drop sash 24 and a fixed sash 26. The spandrel sash 22 includes a spandrel panel 28 which in the illustrated embodiment is an obscure glass, although it may be made from metal or other material if desired. The panel 28 is set by conventional means in a bottom spandrel 30. The upper portion of the panel 28 is also connected to conventional means to the upper spandrel panel rail 32. The spandrel sash 22 further includes an inner insulating panel 34, which is attached to the lower rail 30. The upper portion of the insulating panel 34 is connected to an upper insulation rail 36.

The bottom spandrel panel 28 and the insulating panel 34 along with their upper rails 32 and 36 and the bottom rail 30 cooperate to form a U-shaped well 38. It is into the U-shaped well 38 that the drop sash 24 is moveable.

The drop sash 24 includes a lower drop rail 40 and an upper drop rail 42. In order to provide a tight fit within the well 38, seals 44 are provided on the lower drop rail 40 and these contact the inner surfaces of the upper spandrel rail 32 and the upper insulating rail 36. A drop panel 46, normally made of vision glass, extends between the lower drop rail 40 and the upper drop rail 42. A pair of seals 48 are provided on the outer surfaces 50 of the upper drop rail 42. The seals 44 and 48 insure that there will be no substantial transfer of moisture or cold about the drop sash 24 and into the U-shaped well 38 or an upper housing 52.

The interior dimensions of the housing 52 only have to be sufficient to accommodate a release mechanism which is contained therein. In a practical application the cross sectional dimensions of the housing 52 may be as small as 2 inches by 3 inches.

Mounted on the upper drop rail 42 is a hook 54. The hook 54 engages a latch 56 which includes a roller 57. The roller 57 is in intimate contact with the hook when the drop sash 24 is in a closed position relative to the curtain wall.

The latch 56 is pivoted on a pin 58 which in turn is supported on a fixed bracket 60. To insure that the latch will be in engagement with the hook 54, a spring 62 is biased against the housing wall 64 urging the latch into hook engagement.

As shown in FIG. 5 a sensing device 66 is connected by wires 68 to a solenoid 70. The sensing device 66 may

be made sensitive to either heat or smoke or both. It in turn is connected to a source of electricity not shown.

The throw 72 of the solenoid 70 has a yoke end through which a pin 74 is inserted. One end of a cam 76 is also inserted into the yoke and the pin 74 is passed therethrough. While the cam 76 is only pivoted at pin 74, it also has a cam slot 78. Into the cam slot 76 a cam pin 80 in the form of a bolt is fitted. One end 82 of the cam which is away from the pivot pin 74 bears against a surface 84 of the latch 56.

In actual operation the drop sash 24 is held in a closed position so that it functions as an integral part of a fixed curtain wall system. In the event that a fire occurs in the vicinity of the sensing device 66, and the intensity of the heat or smoke is sufficient to activate the device the following operation occurs. The solenoid 70 is activated and the throw 72 is moved forward moving the cam to the phantom line position shown in FIG. 5. When that occurs the latch 56 is moved out of engagement with the hook 54 with this engagement being facilitated by the roller 57 and against the biasing action of the spring 62. Normally, the weight of the drop sash 24 should be sufficient to carry it by gravity into the well 38. However, in the event that it is not, an assist spring 85 may be provided to give it the initial downward push. The open sash area now permits smoke or heat to be ventilated from the adjacent portion of the building.

In addition to functioning as a safety device, it may at times be desirable to operate the drop sash when certain mechanical breakdowns occur within the building. For example, if there is a breakdown in air-conditioning, the interior of the building may become unbearable in warm weather. In order to vent it, it is a simple operation to provide an emergency switching device which would also activate the solenoid 70 causing the sash to drop. If that were to occur there may be a desire to maintain the interior of the building free of insects. This can be accomplished simply by means of a roll screen 86 which is connected to the upper rail 42. The screen will follow the sash downwardly covering the open space with the screening.

When the drop sash 24 moves into the well 38, a stop 88 in a flange form is provided on the upper rail to limit the travel of the sash into the well. This stop 88 bears against the upper surface 90 of the inner insulating rail 34 in its rest position. The stop also functions as a lifting surface to raise the sash.

While the present embodiment has been shown as an individually operated sash member, it is to be understood by those skilled in the art that if desired a number of sash units may be tied in by a single control point so that all the sash on a particular floor or in a particular section of a building may be operated automatically at one time.

Further, while the moveable sash has been shown as a drop sash, the sash may be pivoted inwardly or outwardly rather than dropped into a wall.

To those skilled in the arts, many combinations or variations on the present invention will be obvious and such modifications are not beyond the scope of the present invention.

What is claimed is:

1. A safety curtain wall construction comprising:

- a. a curtain wall panel,
- b. a support structure for said panel,
- c. at least one moveable safety sash in said panel,
- d. a sash receiving well beneath said safety sash and in said curtain wall into which said safety sash is adapted to be moved,
- e. latch means for engaging and maintaining said sash in a closed position relative to said panel, said latch means including a pivoted latch engaging the moveable sash,
- f. cam means for disengaging said latch means from said sash whereby said sash may move to an open position with respect to said wall panel, said cam means including a slotted cam pivoted on a pin with said cam contacting said latch,
- g. a sensing device responsive to a selected undesired atmosphere, and
- h. means connected to said sensing device and activated thereby to cause said cam means to disengage said latch, said means including a solenoid having a throw on which the slotted cam is pivoted whereby energizing of the solenoid causes the throw to move the cam to disengage the latch from the moveable safety sash.

2. A safety curtain wall construction comprising:

- a. a curtain wall panel,
- b. a support structure for said panel,
- c. at least one moveable safety sash in said panel,
- d. a sash receiving well beneath said safety sash and in said curtain wall into which said safety sash is adapted to be moved,
- e. latch means for engaging and maintaining said sash in a closed position relative to said panel, said latch means including a pivoted latch engaging the moveable sash,
- f. cam means for disengaging said latch means from said sash whereby said sash may move to an open position with respect to said wall panel, said cam means including a slotted cam pivoted on a pin with said cam contacting said latch,
- g. a sensing device responsive to a selected undesired atmosphere, and
- h. means connected to said sensing device and activated thereby to cause said cam means to disengage said latch.

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