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(19)



(54) A MULTI-STOREY BUILDING HAVING A FIRE ESCAPE

(71) We, SHU-LIEN LIOU and CHIN-CHIH CHUANG, both Chinese citizens residing at 195 Chung King North Road, Section 3, Taipei, Taiwan, and 10, Lane 123 Sung Chiang Road, Taipei, Taiwan, respectively, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a multi-storey building having a fire escape.

A conventional fire escape of a building usually comprises escaping stairways or ladders provided at an emergency exit on each floor, when an exit is opened, the flames tend to pass through the exit and lick the escapers thereby causing casualties. Another kind of fire escape is established in the centre of building which acts as a chimney and leads the fire there through.

According to the present invention, there is provided a multi-storey building having a fire escape, said fire escape comprising an upstanding shaft extending between a level allowing evacuation of a person from the building and the uppermost storey of the building; a plurality of conduits adjacent said shaft, each conduit extending between two adjacent storeys; means allowing access for a person to a said conduit at each storey; means allowing movement of a person within each said conduit; means allowing access for a person to said shaft from said conduits; means allowing movement of a person between either end of said shaft; and an exit from said shaft at said evacuation level, said exit and said access means when closed each being arranged to seal said shaft in gas tight manner.

The building may include means causing or allowing a supply of gas to pass into said shaft to provide an excess of gas pressure in said shaft with respect to the pressure of gas in said building.

The invention will now be described by way of example only with reference to the accompanying drawings in which:—

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Fig. 1 is a plan view of part of a multi-storey building having a fire escape in accordance with the invention;

Fig. 2 is a part section of the side elevation of the building shown in Fig. 1;

Fig. 3 is an end elevation of the building shown in Fig. 2;

Fig. 4 is a plan view of an embodiment of the building having a fire escape as shown in Fig. 1; and

Fig. 5 is a part section of the side elevation of the building shown in Fig. 4.

Referring to Figures 1 to 3 of the drawings, an upstanding shaft 11 is formed so as to be integral with a marginal portion 1 of a multi-storey building. With respect to the building 1, the innermost side of the shaft 11 constitutes the outer wall of an upstanding elongate conduit 61 of rectangular cross section. Each conduit extends from one storey of the building to the storey immediately below. Every second conduit is displaced laterally with respect to the other conduit such that the conduits are in a staggered and spaced but upstanding parallel relationship. The upper portion of each conduit includes an opening 6 which is shut by a trap door 5 hingedly connected to the upper portion of the conduit. Each trap door 5, and its associated conduit 61, is accessible from a corridor 10 of the building 1. Each conduit 61 includes a plurality of ladder rungs 9 constituting a downwardly extending ladder, the lower end of each ladder terminating adjacent a door 7 shutting off an access 8 to a platform 21 within the shaft 11. Each platform 21 is constituted by an extension of each floor of the building and the platform 21 is connected by a stairway 2 to an inwardly extending platform 211 disposed on the inner surface of the outer wall of the shaft 11. Each platform 211 lies in a plane intermediate the planes containing adjacent floors of the building. The lowermost platform 211 is connected by a downwardly inclined stairway 27 leading to a landing from which a further downwardly inclined stairway 28 leads to a shaft exit door 3 of self-closing

type. It will be appreciated that the doors 7 are also of the self-closing type.

As an alternative, each conduit 61 may extend between more than two adjacent storeys of the building. In an embodiment of the invention, each ladder formed by the ladder rungs 9 is replaced by a chute (not shown) allowing an escapee to pass from one end of the conduit to the other by sliding down the chute.

In an embodiment of the invention, as shown in Figures 4 and 5, an exterior wall of the shaft 11 has an airduct 111 attached thereto by known methods. The lower end 12 of the duct 111 acts as either the inlet for a natural draft up the duct or, is connected to an air blower driven by any convenient method thereby forcing a draft into the duct. The exterior wall of the shaft 11 includes an access 13 between the duct and the shaft, the access being substantially at the level of the plane containing each floor of the building. The access 13 is shut by a flap valve 14 hingedly connected to the inner surface of the exterior wall associated with the duct 111. The flap valve 14 is constituted by a flap door hingedly connected upwardly of the access so as to normally be disposed downwardly in the shut position with respect to the access 13. The arrangement is such that when a draft, either natural or forced is induced in the duct 111, the gas or airflow passes up the duct and through each access 13 forcing each flap 14 to open such that the airflow passes into the shaft 11. It will be appreciated that as a result of the air being passed into the shaft, the pressure in the shaft 11 will be higher than the pressure in the building.

To use the fire escape when the building is on fire, an escapee proceeds along respective corridor 10, raises trapdoor 5 and passes down the associated conduit 61 by means of the ladder rungs 9 or the chute, till the escapee reaches the door 7 associated with the respective conduit. The door 7 is opened, and the escapee passes through the access 8 to the platform 21, and from which platform the escapee proceeds down the stairs 2, 27 and 28 to leave the shaft through exit door 3.

It will be appreciated that because of the higher pressure in the shaft, flames from the burning building will not reach people in the shaft; additionally, as soon as doors 7 between the conduits and the shaft are opened, the higher pressure will pass into the conduits thereby reducing the risk of flames reaching people in the conduits even if the trapdoors 5 are inadvertently left open.

All components of the fire escape adjacent the building are formed of suitable fire resistant materials.

Fire fighting personnel may utilize the conduit 61 as hiding place: by lifting up the trap door 5, they can easily apply a fire extinguisher or fire water nozzle aimed toward the corridor. Because of the positive pressure maintained in the conduit 61, fire in the corridor (or building) would be restricted in licking back to the conduit.

WHAT WE CLAIM IS:—

1. A multi-storey building having a fire escape, said fire escape comprising an up-standing shaft extending between a level allowing evacuation of a person from the building and the uppermost storey of the building; a plurality of conduits adjacent said shaft, each conduit extending between two adjacent storeys; means allowing access for a person to a said conduit at each storey; means allowing movement of a person within each said conduit; means allowing access for a person to said shaft from said conduits; means allowing movement of a person between either end of said shaft; and an exit from said shaft at said evacuation level, said exit and said access means when closed each being arranged to seal said shaft in gas tight manner.

2. A building as claimed in Claim 1 and including means causing or allowing a supply of gas to pass into said shaft to provide an excess of gas pressure in said shaft with respect to the pressure of gas in said building.

3. A building as claimed in Claim 1 or Claim 2 wherein said shaft includes a stairway extending between the levels of each storey.

4. A building as claimed in Claim 3 wherein said conduit includes a ladder extending between said storeys.

5. A building as claimed in Claim 3 wherein a said conduit includes a chute extending between said storeys.

6. A building as claimed in any one of the preceding claims wherein said exit and said access means each comprise a door, said door including means for biasing said door to a shut position.

7. A building as claimed in Claim 2 wherein said supply means comprise a duct external to said shaft, said shaft having at least one access communicating with said duct, the or each access being shut by a sealing flap, said duct allowing gas to flow to said access whereby an excess of gas pres-

type. It will be appreciated that the doors 7 are also of the self-closing type.

As an alternative, each conduit 61 may extend between more than two adjacent storeys of the building. In an embodiment of the invention, each ladder formed by the ladder rungs 9 is replaced by a chute (not shown) allowing an escapee to pass from one end of the conduit to the other by sliding down the chute.

In an embodiment of the invention, as shown in Figures 4 and 5, an exterior wall of the shaft 11 has an airduct 111 attached thereto by known methods. The lower end 12 of the duct 111 acts as either the inlet for a natural draft up the duct or, is connected to an air blower driven by any convenient method thereby forcing a draft into the duct. The exterior wall of the shaft 11 includes an access 13 between the duct and the shaft, the access being substantially at the level of the plane containing each floor of the building. The access 13 is shut by a flap valve 14 hingedly connected to the inner surface of the exterior wall associated with the duct 111. The flap valve 14 is constituted by a flap door hingedly connected upwardly of the access so as to normally be disposed downwardly in the shut position with respect to the access 13. The arrangement is such that when a draft, either natural or forced is induced in the duct 111, the gas or airflow passes up the duct and through each access 13 forcing each flap 14 to open such that the airflow passes into the shaft 11. It will be appreciated that as a result of the air being passed into the shaft, the pressure in the shaft 11 will be higher than the pressure in the building.

To use the fire escape when the building is on fire, an escapee proceeds along respective corridor 10, raises trapdoor 5 and passes down the associated conduit 61 by means of the ladder rungs 9 or the chute, till the escapee reaches the door 7 associated with the respective conduit. The door 7 is opened, and the escapee passes through the access 8 to the platform 21, and from which platform the escapee proceeds down the stairs 2, 27 and 28 to leave the shaft through exit door 3.

It will be appreciated that because of the higher pressure in the shaft, flames from the burning building will not reach people in the shaft; additionally, as soon as doors 7 between the conduits and the shaft are opened, the higher pressure will pass into the conduits thereby reducing the risk of flames reaching people in the conduits even if the trapdoors 5 are inadvertently left open.

All components of the fire escape adjacent the building are formed of suitable fire resistant materials.

Fire fighting personnel may utilize the conduit 61 as hiding place: by lifting up the trap door 5, they can easily apply a fire extinguisher or fire water nozzle aimed toward the corridor. Because of the positive pressure maintained in the conduit 61, fire in the corridor (or building) would be restricted in licking back to the conduit.

WHAT WE CLAIM IS:—

1. A multi-storey building having a fire escape, said fire escape comprising an up-standing shaft extending between a level allowing evacuation of a person from the building and the uppermost storey of the building; a plurality of conduits adjacent said shaft, each conduit extending between two adjacent storeys; means allowing access for a person to a said conduit at each storey; means allowing movement of a person within each said conduit; means allowing access for a person to said shaft from said conduits; means allowing movement of a person between either end of said shaft; and an exit from said shaft at said evacuation level, said exit and said access means when closed each being arranged to seal said shaft in gas tight manner.

2. A building as claimed in Claim 1 and including means causing or allowing a supply of gas to pass into said shaft to provide an excess of gas pressure in said shaft with respect to the pressure of gas in said building.

3. A building as claimed in Claim 1 or Claim 2 wherein said shaft includes a stairway extending between the levels of each storey.

4. A building as claimed in Claim 3 wherein said conduit includes a ladder extending between said storeys.

5. A building as claimed in Claim 3 wherein a said conduit includes a chute extending between said storeys.

6. A building as claimed in any one of the preceding claims wherein said exit and said access means each comprise a door, said door including means for biasing said door to a shut position.

7. A building as claimed in Claim 2 wherein said supply means comprise a duct external to said shaft, said shaft having at least one access communicating with said duct, the or each access being shut by a sealing flap, said duct allowing gas to flow to said access whereby an excess of gas pres-



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sure causes or allows said flap to open such that said gas flow passes into the shaft.

5 8. A building as claimed in Claim 7 wherein said gas flow is increased by a gas blower.

10 9. A building as claimed in any one of the preceding claims wherein marginal portions of said conduit and portions of said shaft adjacent said building are made of a fire resistant material.

10. A multi-storey building substantially as hereinbefore described with reference to, and as shown in, Figures 1 to 3, or Figures 4 to 5, of the accompanying drawings.

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