Jan. 23, 1934. D. L. FELTHAM 1,944,156

SAFETY DOOR

Filed Nov. 10, 1930

Fig. 1

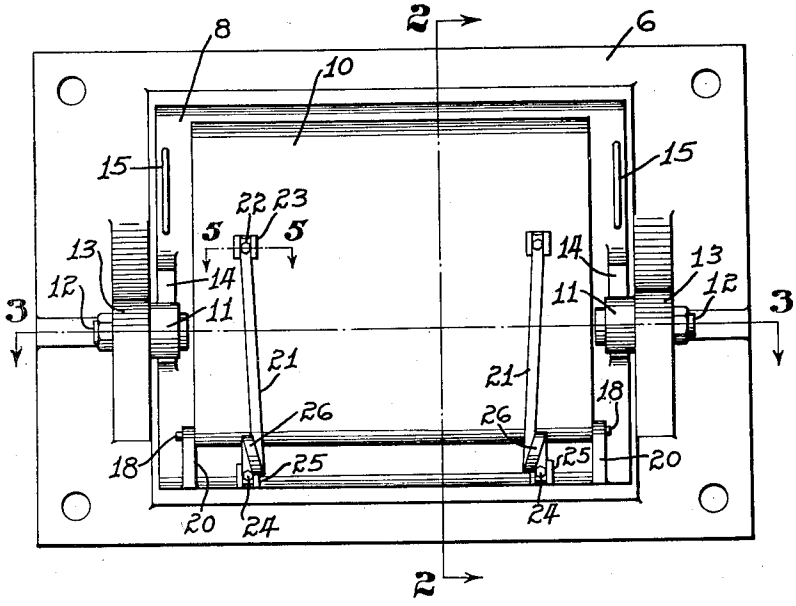


Fig. 2

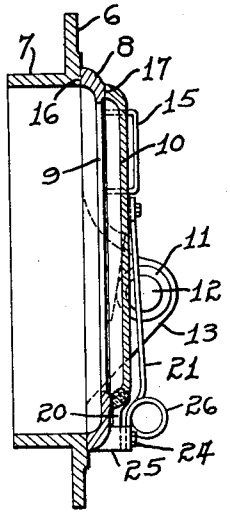


Fig. 5

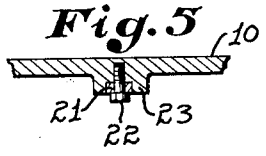


Fig. 3

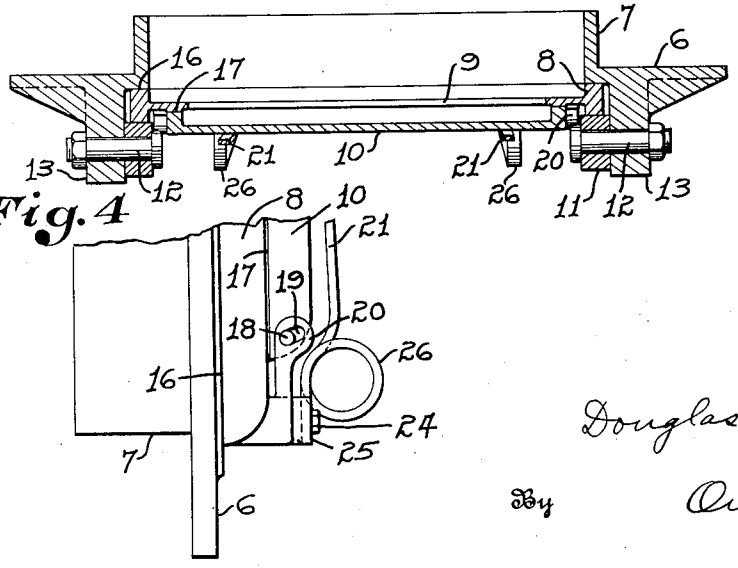


Fig. 4

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SAFETY DOOR

Douglas L. Feltham, Toledo, Ohio

Application November 10, 1930
Serial No. 494,541

5 Claims. (Cl. 110—173)

This invention relates to a safety door adapted for use on steam boilers or in other similar locations where there is a possibility of an explosion of gas within the space enclosed. Such a door may take the place of one of the usual inspection or clean-out doors.

The general object of the invention is to provide a door of this character which may be comparatively light and easily handled, yet is so arranged that it closes tightly and is not likely to be warped by the heat. The safety feature comprises a panel which is yieldably held in closed position against a ground seat so that it may be momentarily forced open by a sudden excessive pressure caused by an explosion. The panel is hung in such a manner, however, that when hot gases created by such an explosion are released, they will be directed upwardly away from any workmen who may be in the vicinity of the door.

The objects and advantages of the invention will be more fully explained in connection with the accompanying drawing in which

Figure 1 is a front elevation of a door embodying the invention.

Figure 2 is a section taken on the line 2—2 of Figure 1.

Figure 3 is a section taken on the line 3—3 of Figure 1.

Figure 4 is an enlarged detailed view of the lower part of the door.

Figure 5 is an enlarged detailed sectional view taken on the line 5—5 of Figure 1.

In the construction to which the invention relates, the door frame 6 is bolted or otherwise secured to the wall of the boiler or the like and is formed with an internal flange 7 which defines the door opening. The door comprises a hollow rectangular frame 8 which is usually cast from suitable metal and is preferably dished so that it may not be easily warped by the heat. The opening 9 in this hollow rectangular door frame is normally closed by a panel 10 which is also dished and held in position by means hereinafter described.

In order to hold the frame 8 rigidly and removably in the proper position, it is preferred to mount rollers 11 on pins 12 which are supported in lugs 13 formed on the frame 6 at opposite sides of the doorway. The rollers 11 overhang the sides of the doorway and engage wedge-shaped lugs 14 formed on the door frame 8 so that the latter as it is lowered into position becomes seated firmly against the doorway frame 6. Suitable handles 15 may be provided for lifting the door.

The meeting surfaces 16 of the doorway frame 6 and the hollow door frame 8, as well as the meeting surfaces 17 of the frame 8 and the panel 10 are ground so as to effect a tight closure.

The panel 10 is provided near its lower edge with a pintle 18 which engages slots 19 formed in lugs 20 which are preferably cast integral with the frame 8 at each side of the panel. The panel 10 is normally held against its seat with considerable pressure exerted by springs 21. Each of these springs is firmly secured at one end to the panel 10 and at the other end to the lower part of the frame 8. In the present embodiment the upper end of the spring is secured by a machine bolt 22 in a channel-shaped lug 23 formed on the panel and the lower end is secured by a similar bolt 24 in a channel-shaped lug 25 formed on the frame 8. Each spring 21 is represented as having a coil 26. The shape of the springs, however, and the means for securing them may be considerably modified without departing materially from the principle of the invention.

It will be noted that the entire door may be readily removed as a unit for the purpose of inspection or cleaning. When the door is closed both the frame 8 and the panel 10 are held firmly against their seats and cannot easily be warped by the heat. In case an explosion occurs, there will be a tendency for the lower edge of the panel 10 to move outwardly until the pintle 18 engages the outer ends of the slots 19. This frees the lower part of the panel and the force of the explosion will then cause the panel to pivot about the pintle 18 so that the gas will be released upwardly and will not endanger a workman who may chance to be beneath the door. As soon as the force of the explosion is spent the pressure of the springs 21 will return the panel to its seat, during which movement it will be guided by the pintle 18 which is restricted in its movement to the slots 19.

What I claim is:

1. A safety door comprising a hollow rectangular frame, means for rigidly and removably securing said frame in closed relation to a doorway, a panel adapted to close the opening in said hollow frame and having near its lower edge a lost motion pintle connection with said frame, and means exerting pressure against the outside face of the panel and tending to swing the panel about the said pintle connection into closed relation to said opening, the contact of said means with the panel being above the center line of the latter, so that an internal explosion tends first to unseat the

panel adjacent the pintle connection and then to swing the panel about said connection.

2. A safety door comprising a hollow rectangular frame, means for rigidly and removably securing said frame in closed relation to a doorway, a panel adapted to close the opening in said hollow frame and having near its lower edge a pintle constituting a horizontal axis for the panel, said frame having slots receiving said pintle and so disposed as to permit a limited initial outward movement of the lower edge of the panel in the event of an internal explosion, and yieldable means for normally holding the panel in closed relation to said opening.

3. A safety door comprising a hollow rectangular frame, means for rigidly and removably securing said frame in closed relation to a doorway, a panel adapted to close the opening in said hollow frame and having near its lower edge a lost motion pintle connection with said frame, and spring means having rigid connection with the hollow frame and the panel and exerting pressure tending to swing the panel about said pintle connection into closed relation to said opening.

4. A safety door comprising a hollow rectangular frame, means for rigidly and removably securing said frame in closed relation to a doorway, a panel adapted to close the opening in said hollow frame and having near its lower edge a pintle constituting a horizontal axis for the panel, said frame having slots receiving said pintle and so disposed as to permit a limited initial outward movement of the lower edge of the panel in the event of an internal explosion, and spring means secured to the hollow frame and the panel and normally holding the latter in closed relation to said opening.

5. A safety door comprising a hollow rectangular frame, a panel adapted to close on said frame and provided with pintles, and outwardly yieldable means engaging the panel above its center of gravity for holding said panel normally closed, said frame having slots in which said pintles are guided outwardly about the upper edge of the panel as an axis whenever internal pressure on the panel overcomes the resistance of said yieldable means.

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