

Dec. 15, 1931.

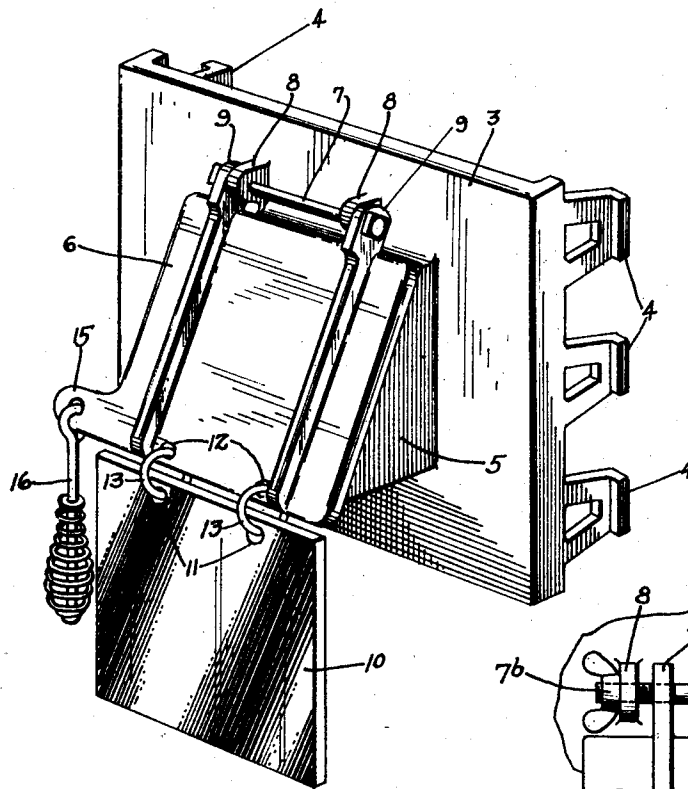
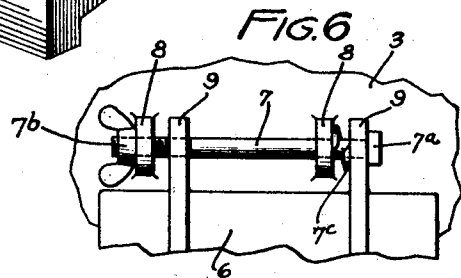
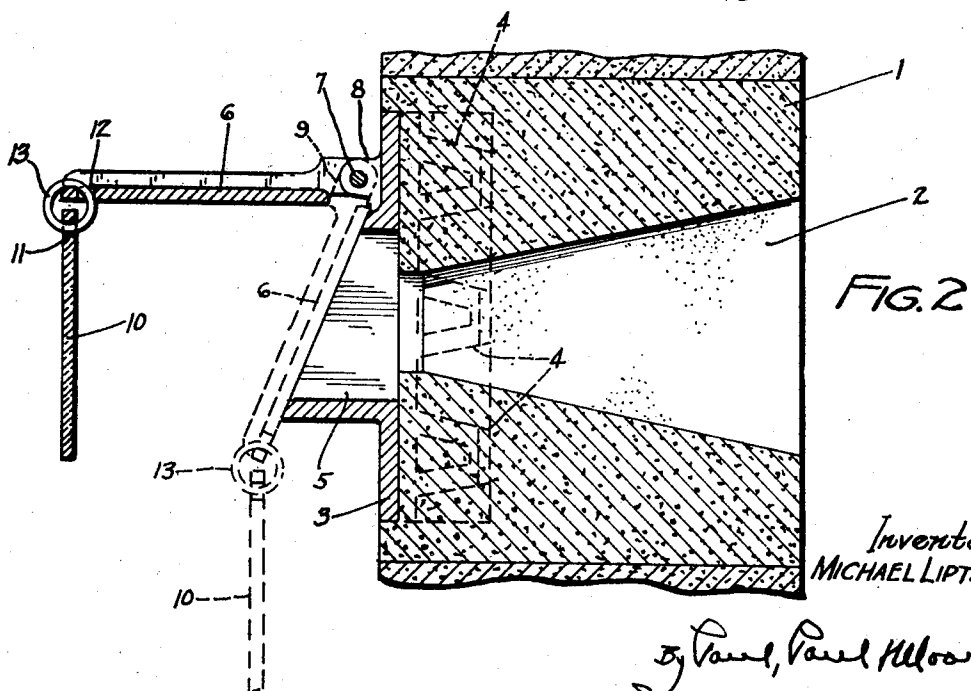
M. LIPTAK

1,836,478

INSPECTION DOOR

Filed June 10, 1929

2 Sheets-Sheet 1



Inventor
MICHAEL LIPTAK

J. Paul, Paul H. Moore
ATTORNEYS

Dec. 15, 1931.

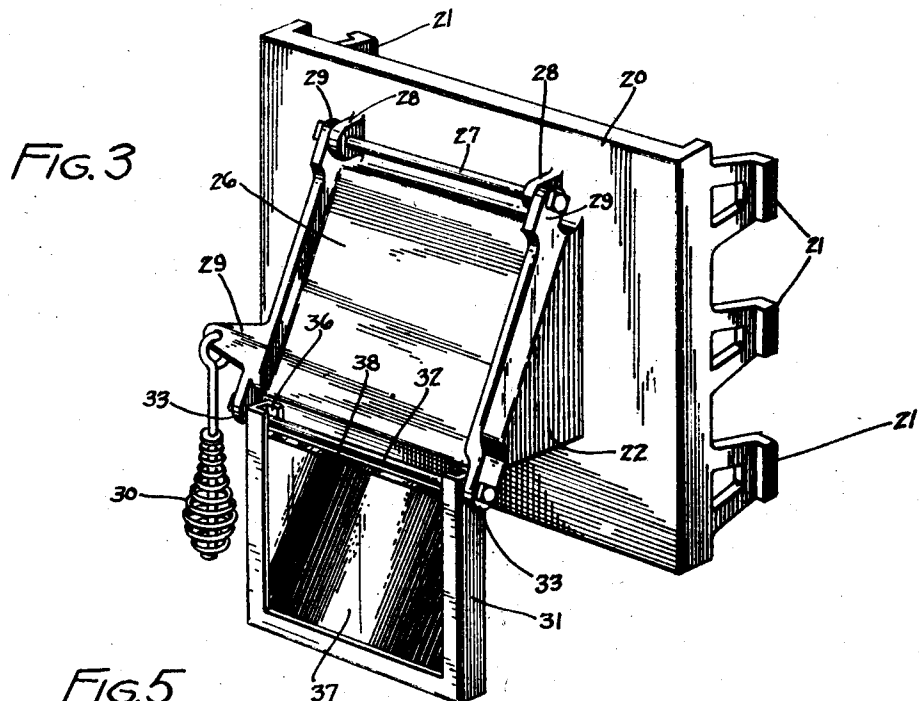
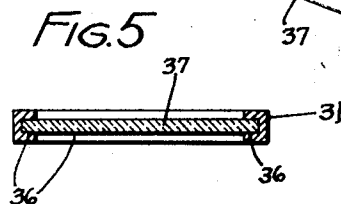
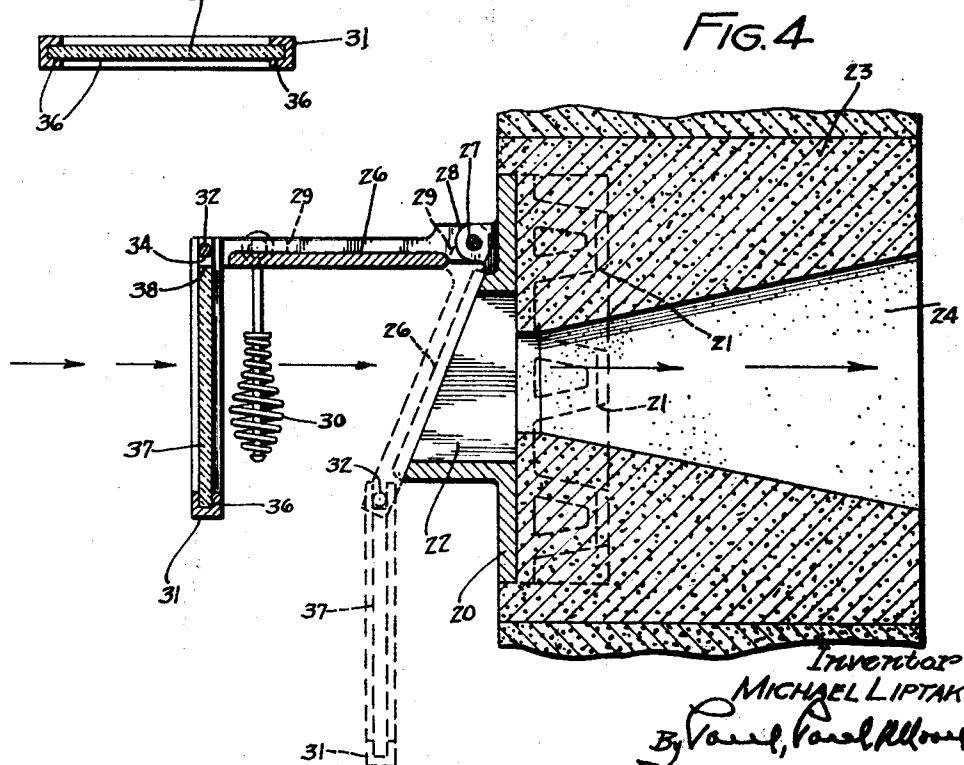
M. LIPTAK

1,836,478

INSPECTION DOOR

Filed June 10, 1929

2 Sheets-Sheet 2



INVENTOR
MICHAEL LIPTAK
By *Paul, Paul, & Alton*
ATTORNEYS

UNITED STATES PATENT OFFICE

MICHAEL LIPTAK, OF ST. PAUL, MINNESOTA

INSPECTION DOOR

Application filed June 10, 1929. Serial No. 369,778.

This invention relates to improvements in inspection doors for furnaces, and is particularly concerned with a door for the inspection opening of a furnace wall structure and provides a transparent shield, which will always be opposed to the inspection opening when the door is open, to protect the observer against heat and explosive gases, or flame or flares of any kind.

Objects are to mount the transparent shield in such manner that it will be brought in opposition to the inspection opening as the door is opened, and to arrange it so that it will always be interposed between the opening and the observer when the door is fully open; to arrange the parts so that the inspection shield is spaced a substantial distance from the inspection opening by the time it is in inspection position; to apply the invention to an inspection door which is gravity operable to close, and to mount the guard pendently at or adjacent the lower end of the door; to provide a guard having an area greater than the area of the opening; to hingingly mount a separate frame to the door, and removably mount the shield in this frame; to utilize the frame hinging element in a manner to prevent accidental removal of the shield; to provide a very simple and inexpensive device; and to provide for the automatic closing of the door.

Features of the invention include the broad idea of providing a movable closure, and attaching a shield thereto in such manner that as the movable closure opens, the guard is brought in opposition to the inspection opening, and so that when the door closes the guard is removed from its opposed position, and disposed at one side of the inspection opening, and in spaced relation to the structure which contains the inspection opening.

Objects, advantages and features of the invention will also be set forth in the description of the drawings forming a part of this application, and in said drawings

Figure 1 is a perspective view of a face plate having an inspection opening therein and showing one application of the invention;

Figure 2 is a section through a fire wall in-

cluding an inspection opening and showing application of the invention thereto;

Figure 3 is a perspective view showing a modified construction in which the shield is held in a pivoted frame and in which the frame pivoting means acts to prevent accidental disengagement of the shield;

Figure 4 is a vertical section substantially similar to Figure 2, but further illustrating the modified embodiment of the invention shown in Figure 3;

Figure 5 is a plan section through the shield-frame illustrating the construction permitting removal of the shield, but preventing accidental removal and

Figure 6 is a detail view illustrating means for securing the door in horizontal position, with the shield opposed to the inspection-opening.

One embodiment of the invention is illustrated in Figures 1 and 2. The numeral 1 indicates the fire wall of a furnace or equivalent structure having an inspection opening 2. A face plate is indicated at 3 and is suitably anchored within the wall by means of elements 4. This face plate has an outwardly projecting tubular portion 5 providing an inspection opening which is registered with the inspection opening 2. This element 5 will be referred to as the inspection opening but it will be understood that the inspection opening need not necessarily be formed in a face plate. The invention may be applied directly to the wall in opposition to the inspection opening 2. Of course, it is convenient to manufacture the unit as indicated in Figure 1 so that it may be connected to the wall in opposition to the inspection opening as shown in Figure 2. The invention is here applied to a furnace draft type of door which is gravity operable to close.

A door is indicated at 6 and is movably attached, in this case swingingly attached, by a horizontally arranged bolt 7 passing through ears 8 of the plate 3, and also passing through ears 9 of the closure member or door 6. The face of the opening is slanted downwardly and outwardly like a draft door of a furnace. The door, therefore, closes by gravity. It is possible, however, that the

door may be attached in other ways so that it constitutes an adjustable closure. The door is also provided with a lateral extension 15 to which is attached a suitable handle 16 for raising the door.

Movably attached to the door 6 in this case swingingly attached with its upper edge in substantial parallelism with the bottom of the door, is a sheet of transparent material 10 such as glass, which may be suitably reinforced with wire, not shown. In this instance the sheet of glass is simply drilled as at 11, the door is drilled as at 12, and rings or links 13 connect opposed pairs of these openings to pendently support the guard 10. It is conceivable that this attachment may be made in other ways and there is no intention to limit the claims entirely to this kind of an attachment, although it is claimed as a specific embodiment of the principle of the invention.

A very simple construction is thus provided in which a movable closure has a transparent guard movable independently of the closure and arranged to be brought in opposition to the inspection opening as the closure is opened, and further arranged to always be in horizontally opposed relation to the inspection opening whenever the door is in fully open position.

In devices of this kind, it is desirable to arrange the door so that it will automatically close and therefore so that it is, so to speak, fool-proof to prevent accidental lengthy exposure of the glass as the result of an attendant carelessly leaving the transparent guard in register with the inspection opening after the inspection period. In practice, the inspection interval is only about half a minute. After inspection, the closure is released and automatically falls into closed position, or may be carefully lowered to such position by the attendant. Its fall by gravity is found not to break the glass or injure it in any way. Reinforcement of the glass may be resorted to for large glass areas.

Another advantage is that when the door is fully open the guard is arranged at a substantial distance outwardly away from the inspection opening so that air may circulate between it and the opening, and thus reduce liability to fracture by heat.

In that form of the invention shown in Figure 3, the face plate is indicated at 20, and the connections by which it is attached to a wall at 21. The tubular projection 22 forms the inspection opening. The furnace wall is indicated at 23 and the inspection opening of this wall at 24. The door or closure is of the same type shown in Figure 1 and is indicated at 26. This door is pivoted by the bolt 27 co-operating with ears 28—29 respectively of the face plate and closure 26. The door has an extension 29, to which the operating handle 30 is secured.

In this instance the transparent guard is

arranged in a frame 31 pivoted by a bolt 32 which passes through ears 33 of the door and through opening 34 of the frame. This element 31 may be considered a window frame and is provided with a groove 36 continuous on three inner sides, and open on the fourth and top side. The transparent shield 37 is removably held in the groove and can be dropped into position therein. As shown in Figure 3, after assembly the bolt 32 lies above and adjacent, and in vertical alignment with the upper edge 38 of the shield, and prevents accidental removal of the shield. This relation is also well illustrated in Figure 4. The shielding action, as the door is opened, is substantially the same as that described for the first form.

A valuable feature of the invention is the arrangement whereby when the inspection door is closed, the transparent guard is arranged below the inspection door, and the arrangement may be such that it is spaced a substantial distance from the hot wall in which the inspection opening is formed. In this instance the arrangement which permits the outward spacing of this guard when the inspection opening is closed, is obtained by the tubular extension with its outwardly downwardly slanting closure receiving surface.

It will be noted that the angular relation of the door and the transparent element at the connecting point will constantly change as the door opens or closes, whereby the guard is maintained in a vertical pendent and swingable condition for all positions of the door.

Another feature of the invention is the provision of means whereby the door 6 may be secured in such position that the shield is held in opposition to the inspection opening during absence of the attendant. For this purpose, the hinge-lugs 9 are arranged at the same side of the hinge-lugs 8 and are spaced from these so that the door can be moved edgewise. Interposed between one pair of lugs 8—9 is a split spring washer or equivalent means 7^c which is adapted to frictionally engage the opposed faces of the elements 8—9 when the thumb nut or equivalent device 7^b (in threaded engagement with the bolt 7) is rotated to translate the bolt and through its head 7^a to translate the door 6 in direction toward the lugs 8. The result is that the spring washer is put under compression and frictionally engages the lug surfaces in a manner to prevent swinging motion of the door. This is a valuable feature of the invention.

I claim as my invention:

1. In combination with a furnace wall structure including an inspection opening, a movable closure for the opening, a transparent guard connected to the closure in such manner that the angular relations of the door

to the guard at the connecting point constantly change as the door moves.

2. In combination with a furnace wall structure including an inspection opening, a movable closure for the opening, a transparent guard connected to the closure in such manner that the angular relations of the door and guard at the connecting point constantly change as the door moves, and so that the guard is maintained in a vertical pendent and swingable condition for all positions of the door.

3. In combination with a furnace wall structure including, an inspection opening, a swinging closure for the opening, a transparent guard swingingly attached to the closure and adapted to be interposed between an observer and the opening as the closure is swung to open position.

4. In combination with a furnace wall structure including an inspection opening, a movable closure for the opening, a transparent guard attached to the closure in a manner to be maintained in vertical position and to be interposed between an observer and the opening when the closure is fully opened.

5. In combination with a furnace wall structure including an inspection opening, a door adapted to close the opening, and a sheet of transparent material mounted upon the door and swingingly secured thereto and arranged to be opposed to the inspection opening whenever the door is open.

6. In combination with a furnace wall structure including an inspection opening, a door gravity-operable to close the opening and a sheet of transparent material swingingly attached by its upper edge to the lower portion of the door in a manner to be brought into opposition to the inspection opening, as the door opens.

7. A device of the class described including a structure providing an inspection opening, a door for closing the opening, swingable about a horizontal axis, and a transparent guard pendently attached to the door and swingable about a horizontal axis, and adapted to lie in guarding opposition to said inspection opening when the door is open.

8. A device of the class described including a structure providing an inspection opening, a door adapted to close by gravity, and a transparent guard pendently attached by its upper portion to the lower portion of the door and adapted to lie in pendent opposition to the inspection opening when the door is open.

9. In combination with a furnace wall structure including an inspection opening, a closure adapted to swing in a vertical plane to open and close, a transparent shield attached to the closure in a manner to be maintained in a vertical position when the closure is moving or not moving, and adapted to be protectingly interposed between an observer

and the opening when the closure is fully opened.

10. In combination with a furnace wall structure including an inspection opening, a door movable for closing the opening, a transparent shield attached to the closure in a manner to be maintained in a vertical position when the closure is moving or not moving, and adapted to be protectingly interposed between an observer and the opening when the door is fully opened, and further adapted to be gradually brought into such interposed relation as the door opens.

11. In combination with a furnace wall structure including an inspection opening, a door movable for closing the opening, a transparent shield attached to the closure in a manner to be maintained in a vertical position when the closure is moving or not moving, and adapted to be protectingly interposed between an observer and the opening when the door is fully opened, and adapted to be gradually brought into such interposed relation as the door opens, and further adapted when in such opposed position to be spaced a substantial distance outwardly from the inspection opening in freely suspended relation thereto.

12. A device of the class described including a structure providing an inspection opening, a door for closing the opening, means for hinging the door to swing about a horizontal axis including a bolt translatably mounted, means operable by the bolt when translated to frictionally engage the door and secure it in any desired angular relation to the inspection opening, and a transparent guard pendently attached to the door and swingable about a horizontal axis and adapted to lie in guarding opposition to said inspection opening when the door is opened.

13. In combination with a furnace wall structure including an inspection opening, a closure movable to cover the opening, a transparent guard, and connections between the closure and guard adapting the guard to move independently of the closure and so that the guard is progressively protectingly interposed between the operator and the inspection opening as said opening is gradually exposed, and so that it moves a greater and greater distance outwardly away from the opening, during the opening motion of the closure.

14. In combination with an inspection opening, a movable closure for the opening, and a transparent guard swingingly attached to the closure and adapted to be interposed between an observer and the opening as the closure moves to open position.

15. In combination with an inspection opening, a movable closure for the opening, a transparent guard connected to the closure in such manner that the angular relations of

the closure and guard at the connecting point
constantly change as the door moves, so that
the guard is interposed between an observer
and the opening as the closure moves to open
position.

5 In witness whereof, I have hereunto set my
hand this 24th day of May 1929.

MICHAEL LIPTAK.

10

15

20

25

30

35

40

45

50

55

60

65