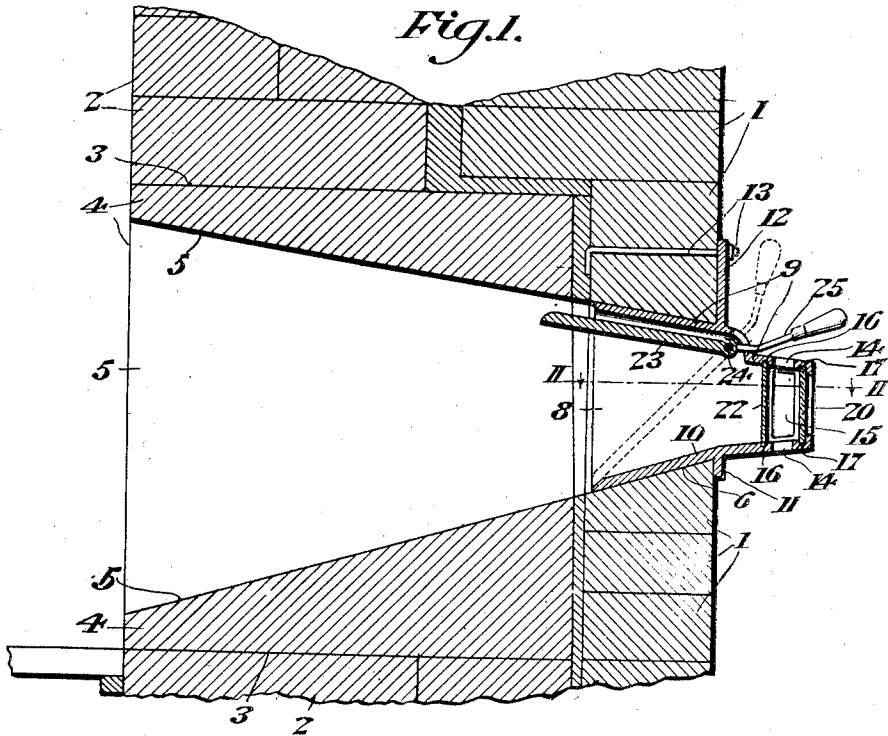
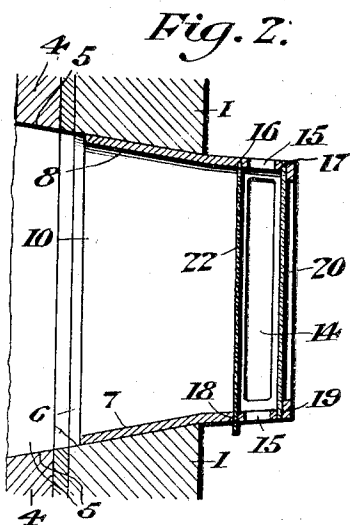
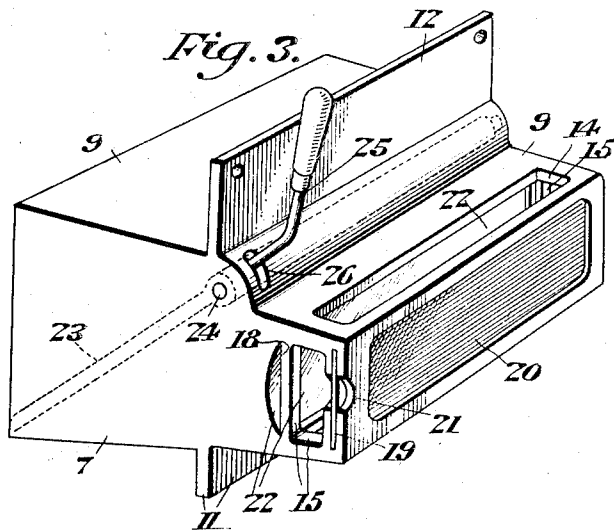


M. CURRY.
OBSERVATION WINDOW FOR FURNACES.
APPLICATION FILED JULY 17, 1919.

1,349,562.

Patented Aug. 17, 1920.



Inventor
Malcolm Curry
By *his* Attorneys
David Davis

UNITED STATES PATENT OFFICE.

MALCOLM CURRY, OF SCARSDALE, NEW YORK, ASSIGNOR OF ONE-HALF TO STARR H. BARNUM, OF NEW HAVEN, CONNECTICUT.

OBSERVATION-WINDOW FOR FURNACES.

1,349,562.

Specification of Letters Patent. Patented Aug. 17, 1920.

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To all whom it may concern:

Be it known that I, MALCOLM CURRY, a citizen of the United States, and resident of Scarsdale, county of Westchester, and State of New York, have invented certain new and useful Improvements in Observation-
5 Windows for Furnaces, of which the following is a specification.

This invention relates to improvements in furnaces and has for its principal object the provision of means whereby the fireman or stoker may readily and clearly observe the fuel bed without opening the fire door and without being subjected to the heat
15 from the combustion chamber or fire box.

Another object of the invention is to provide a furnace structure having an opening through the wall of the fire box or other part thereof through which the fuel bed
20 may be observed, and an observation window extending across said opening at all times to prevent the entrance of cold air into the furnace through said opening, and to provide means for normally protecting the transparent panel or panels of the window from the direct heat of the furnace,
25 said means being shiftable at will to permit observation of the fuel bed through the window.

Another important object of the invention is to provide a double window for an observation opening in a furnace having an outer panel of blue glass or other transparent glare eliminating material, and an inner
35 panel of isinglass or other transparent heat-resisting material interposed between the glass panel and the interior of the furnace to protect the glass panel from the direct heat of the furnace.

A further important object of the invention is to provide a window for a furnace peep-opening having an inner panel of transparent heat-resisting material, an
40 outer panel of transparent glare-eliminating material, and an air circulation space between said panels.

In the drawings, Figure 1 is a fragmentary vertical transverse section through a wall of a furnace equipped with one
50 form of observation means illustrating the preferred embodiment of the invention;

Fig. 2 a fragmentary horizontal section on the line II—II of Fig. 1; and

Fig. 3 a detail perspective view of the observation window detached from the furnace wall.

While I prefer to provide the peep opening in the brick wall of a furnace, as shown, it will be obvious that the peep opening may be formed through any suitable part
60 of the furnace casing, and that the observation window may be set in the casings or doors of furnaces of various constructions.

Referring to the drawings by numerals, 1 designates the outer section of a furnace fire-box wall formed of courses of red brick, and 2 designates the inner fire-resisting section or lining of the furnace wall formed of the usual standard fire brick. A rectangular recess 3 is provided extending through the section 2 of the wall and partly through the section 1 of the wall. The recess 3 is lined with a block of fire-resisting material 4 having an opening 5 therethrough having top and bottom walls flaring outwardly toward the inner end of the block and side walls also flaring outwardly toward the inner end of the block. An opening 6 extends through the outer section 1 of the fire-box wall and communicates at its inner end with the recess 3. The walls of opening 6 flare outwardly toward the inner end of the opening and form continuations of the walls of opening 5, said registering openings 5 and 6 thus forming a flaring observation opening extending entirely through the furnace wall and lined with heat-resisting material throughout the greater portion of its length.

A metallic window frame or casing having outwardly flaring side walls 7 and 8 and outwardly flaring top and bottom walls 9 and 10 fits within the opening 6 with the smaller end of the frame projecting beyond the outer face of the furnace wall. The bottom wall 10 of the frame is formed with a depending flange 11 which abuts against the outer side of the fire box wall, and the top wall 9 is provided with an upwardly extending flange 12 which also abuts against the outer side of the fire box wall. Suitable anchoring bolts 13 pass through flange 12 and are anchored in the fire box wall. The projecting outer end portions of the top and bottom walls 9 and 10 are provided with elongated registering openings 14, and the side walls 7 and 8 are formed with

elongated registering openings 15. The walls 8, 9 and 10 are formed with ways or channels 16 and 17 adjacent the inner and outer sides of the openings and the wall 7 is formed with vertical slots 18 and 19 through which transparent panels may be slid into and out of the ways or channels. A sheet or panel 20 of blue glass or other transparent glare-eliminating material is removably held in the channel 17, the side wall 7 being preferably cut away to provide a finger notch 21 to permit the end of the glass plate or panel 20 to be easily grasped when it is desired to remove the same from the window frame. A sheet or panel 22 of isinglass or other suitable transparent fire and heat resisting-material is removably held in the channel 16, and is preferably formed with a rounded end portion projecting through the slot 18 in wall 7 to permit the panel to be readily withdrawn from the frame when desired. The transparent panel or sheet 22 of isinglass serves to prevent the entrance of cold air into the furnace through the open outer end of the window frame and also serves to protect the blue glass panel 20 from the heat of the furnace and prevents soot or smoke from the fire box from collecting on said glass panel. The openings 14 and 15 also provide a free circulation of air through the window frame between the transparent panels 20 and 22 to assist in keeping the panels from becoming heated.

In order to further protect the transparent panels from the direct heat of the fire box and to prevent the collection of soot, dirt, etc., upon the inner side of the isinglass panel 22, I prefer to provide a shiftable protecting plate adapted to normally prevent the passage of heat, soot, and smoke through the box-like window frame to the isinglass panel. The protecting plate or shutter 23 is preferably formed of metal and is held at its upper edge to a rock shaft 24 supported in the side walls of the window frame closely adjacent the under side of the top wall 9. The lower edge of the pivoted plate, shutter, or protecting flap 23 normally rests upon the bottom wall 10 of the frame and said plate extends entirely across the frame, the side edges thereof flaring outwardly and downwardly and engaging the side walls 7 and 8 of the frame when the pivoted plate is in its normal position. A rock arm 25 is held to the upper edge of plate 23 and extends outwardly through a slot 26 in the top wall 9 of the window frame. The rock arm 25 is provided with a suitable handle at its outer end preferably so constructed as to prevent the transfer of heat thereto through the rock arm and protecting plate. When it is desired to inspect the fuel bed the rock arm is swung downwardly, thus rocking plate or shutter

23 to the position shown in full lines in Fig. 1 where it will not obstruct the view through the transparent panels of the observation window.

By providing a flaring peep opening through the furnace wall a maximum field of vision is obtained, permitting the fuel bed to be inspected through a comparatively small window. By recessing the furnace wall as shown at 3 and providing the relatively long passage 5 lined with heat-resisting material 4 leading to the observation window, it will be seen that the window and frame are protected from flames in the fire-box and somewhat protected from the direct action of the heat of the furnace by the depth of the wall.

It will be obvious that several peep openings and windows may be provided, if desired, and that the peep opening may be of any suitable shape and may be lined in any suitable manner. It will also be obvious that the window frame and shutter may be constructed and supported on the furnace in various other ways without departing from the invention.

What I claim is:

1. The combination with a furnace provided with a peep opening communicating with the fire-box thereof, of an observation window fixed to the furnace in position to close the peep opening at all times and having an inner panel of transparent heat-resisting material and an outer panel of transparent glare-eliminating material arranged in spaced relation and registering at all times with the peep opening, both of said panels being supported in the window-frame at points distant from the furnace wall so as to be accessible for renewal without dismantling the apparatus.

2. The combination of a furnace having a peep opening communicating with the fire-box thereof, a window frame held to the furnace, an inner panel of transparent heat-resisting material held in the frame and closing the peep opening at all times, and an outer panel of transparent glare-eliminating material held in the frame in spaced relation with the inner panel and in constant register with the peep opening, the air space between said panels being in open communication with the external atmosphere, both of said panels being supported in the window-frame at points distant from the furnace wall so as to be accessible for renewal without dismantling the apparatus.

3. The combination of a furnace provided with a peep opening through one of its walls which flares toward the inner end of the opening, a metallic frame held in said opening and flared inwardly and having its outer end projecting beyond the outer side of the furnace wall, a sheet of transparent glare-eliminating material supported in the out-

wardly projecting end of the frame, a sheet of transparent heat-resisting material supported in the frame at the inner side of the sheet of glare-eliminating material and spaced therefrom, the projecting outer end of the frame being provided with openings connecting the air space between said transparent sheets of material with the atmosphere exteriorly of the furnace, and a shutter mounted within the flared portion of the window-frame and operable from the exterior of the furnace.

4. The combination of a furnace provided with a peep opening through one of its walls which flares toward the inner end of the opening, a metallic frame held in said opening and flared inwardly and provided with openings communicating with the external atmosphere, a sheet of transparent glare-eliminating material supported in the frame at the outer side of the openings therein, a sheet of transparent heat-resisting material supported in the frame at the inner side of the openings therein and completely closing the peep opening, and a shutter plate shiftably supported on the frame and movable to a position closing the peep opening at a point at the inner side of the sheet of heat-resisting material or to a position permitting inspection of the fuel bed of the furnace through the peep opening.

5. The combination of a furnace having an outer wall lined with fire brick on its inner side and provided with a peep opening through said wall and lining increasing in width horizontally toward the inner end thereof, a metallic frame mounted in said opening terminating at its inner end adjacent the outer side of the fire brick lining and having its outer end projecting beyond the outer face of the wall, a sheet of transparent glare-eliminating material supported in the projecting outer end of the frame, a sheet of transparent heat-resisting material supported in the frame at the inner side of the sheet of glare-eliminating material and spaced therefrom, the projecting outer end of the frame being provided with openings connecting the air space between said transparent sheets of material with the atmosphere exteriorly of the furnace, a shutter normally closing the peep opening extending across the frame at the inner side of the sheet of heat-resisting material and pivotally held adjacent its upper edge to the frame closely adjacent the top of the frame, and a rock arm connected with the shutter for rocking the shutter upwardly at will.

6. The combination with a furnace provided with a peep opening communicating with the fire box thereof, of a window supported on the furnace in position to close the peep opening and having an inner panel of transparent heat-resisting material and an outer panel of transparent glare-eliminat-

ing material held in register with each other and with the peep opening, and a shutter located between the inner panel of the window and the interior of the furnace and shiftable toward and from a position closing the peep opening, said shutter being mounted within that portion of the window-frame extending into the furnace and being provided with an operating handle which extends to a point exterior of the furnace.

7. The combination with a furnace having a peep opening, of a window frame held to the furnace, an outer panel of transparent glare-eliminating material supported in the frame, an inner panel of transparent heat-resisting material closing the peep opening and supported in the frame in register with the outer panel, said frame being provided with an air space between the panels communicating with the atmosphere, a shutter pivotally supported entirely within the frame at a point within the area of the furnace wall, and means for swinging the shutter to and from a position closing the peep opening and extending to a point exterior of the furnace.

8. In combination with a furnace provided with a peep-opening in one of its walls which opening flares inwardly laterally, a metallic window-frame set in said opening and flaring correspondingly therewith, the outer end of said frame being closed by a transparent panel, and a flap shutter mounted in the flared portion of the window-frame on a pivot extending across the top of the window-frame near its outer end, said shutter being adapted to gravitate to closed position and being shaped to fit the flared side-walls of the window-frame, and a handle affixed to said shutter and extending through an opening in the window-frame to a point exterior of the furnace.

9. In combination with a furnace one of whose walls is provided with a laterally elongated peep-opening, a similarly shaped metallic frame fitted into said opening and having its outer end closed by a transparent panel, a shutter mounted in said frame at a point between said panel and the inner open end of the frame and within the area of the furnace wall, said shutter being provided with an operating handle extending outwardly through the frame to a point exterior of the furnace.

10. In combination with a furnace one of whose walls is provided with a horizontally elongated peep-opening, a metallic box-like frame fitting into said opening, the inner end of the frame being open and the outer end being closed by a transparent panel, and a shutter pivotally mounted within that part of said frame fitting within the peep-opening on an axis extending across the top side of the frame, said shutter being adapted

to gravitate to closed position and being provided with a handle extending through a slot in the top wall of the frame to a point exterior of the furnace, for the purpose set forth.

11. In combination with a furnace one of whose walls is provided with a horizontally elongated peep-opening, a metallic box-like frame similarly shaped and fitted into said opening, this frame having its inner end open and its outer end closed by a transparent panel, and a shutter pivotally mounted within that part of the frame fitting within the peep-opening and on an axis extending across the top side of the frame so that said shutter will normally gravitate to a closed position in which position it will incline downwardly and inwardly, and a handle connected to said shutter and extending through the casing wall to a point exterior of the furnace.

12. In combination with a furnace provided with a peep-opening through one of its walls, said opening being elongated and flared inwardly laterally, a metallic window-frame affixed to the furnace in position to close said peep-opening and provided with a transparent panel coincident with said peep-opening, and a shutter pivotally mounted in said frame and extending into said peep-opening and adapted to gravitate to the bottom of said opening at its inner edge, said shutter being widened toward its inner end to conform to the laterally-flared shape of the peep-opening and being provided with an operating handle extending

through said window-frame to a point exterior of the furnace.

13. In combination with a furnace provided with a peep-opening in one of its walls, said peep-opening being elongated laterally, a metallic window-frame fastened to the furnace wall over said opening and provided at its outer end with a transparent panel, a shutter shiftably mounted in said window frame at a point between said panel and the inner side of the frame, said shutter having its inner end extending into the peep-opening formed in the wall, said shutter being provided with a handle extending through said frame to a point exterior of the furnace.

14. In combination with a furnace one of whose walls is provided with a peep-opening or passage, a window-frame fastened to the furnace wall and provided with a transparent panel in alinement with the opening, a shutter pivotally mounted on a horizontal axis in the upper part of the frame at a point between the panel and the inner side or end of the frame, said shutter being adapted to gravitate downwardly so as to have its inner edge rest on the bottom of said peep-opening or passage and thus close the same against heat radiation, said shutter being provided with a handle extending through said frame and terminating at a point exterior of the furnace.

In testimony whereof I hereunto affix my signature.

MALCOLM CURRY.