No. 676,607. Patented June 18, 1901.

W. M. GREEN & J. R. GENT.

FURNACE INSPECTION DOOR.

(No Model.) (Application filed Oct. 17, 1900. 2 Sheets—Sheet 1.

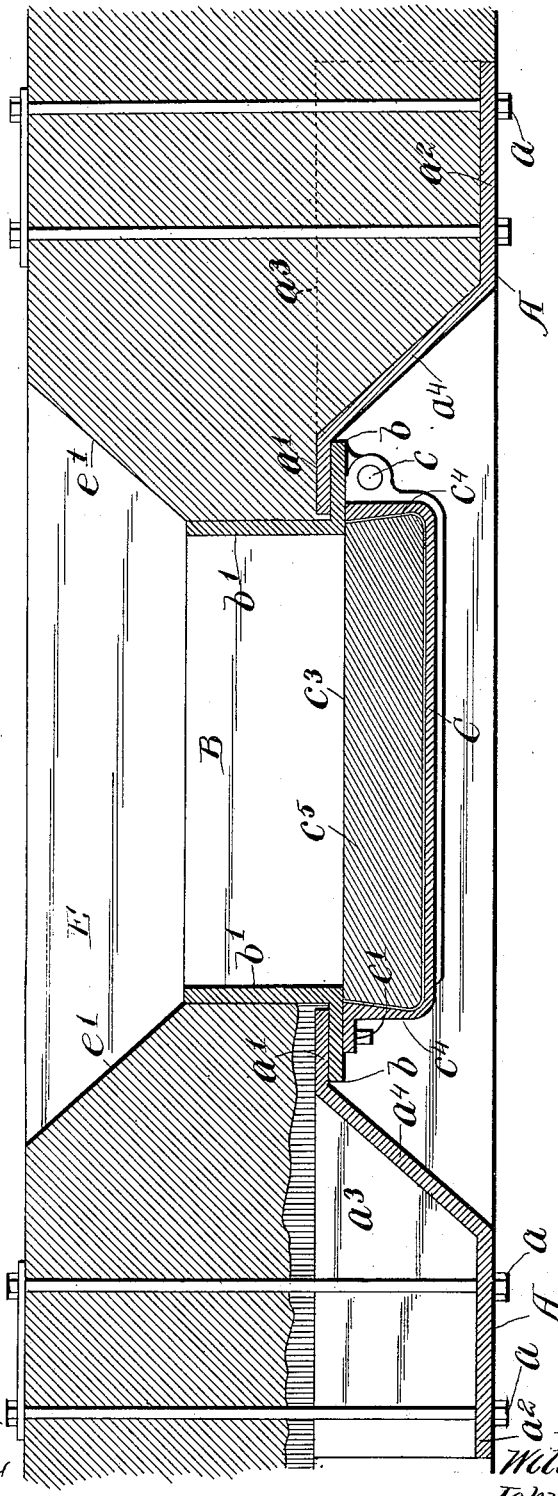

Fig 1

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by Poole & Brown their Attorneys

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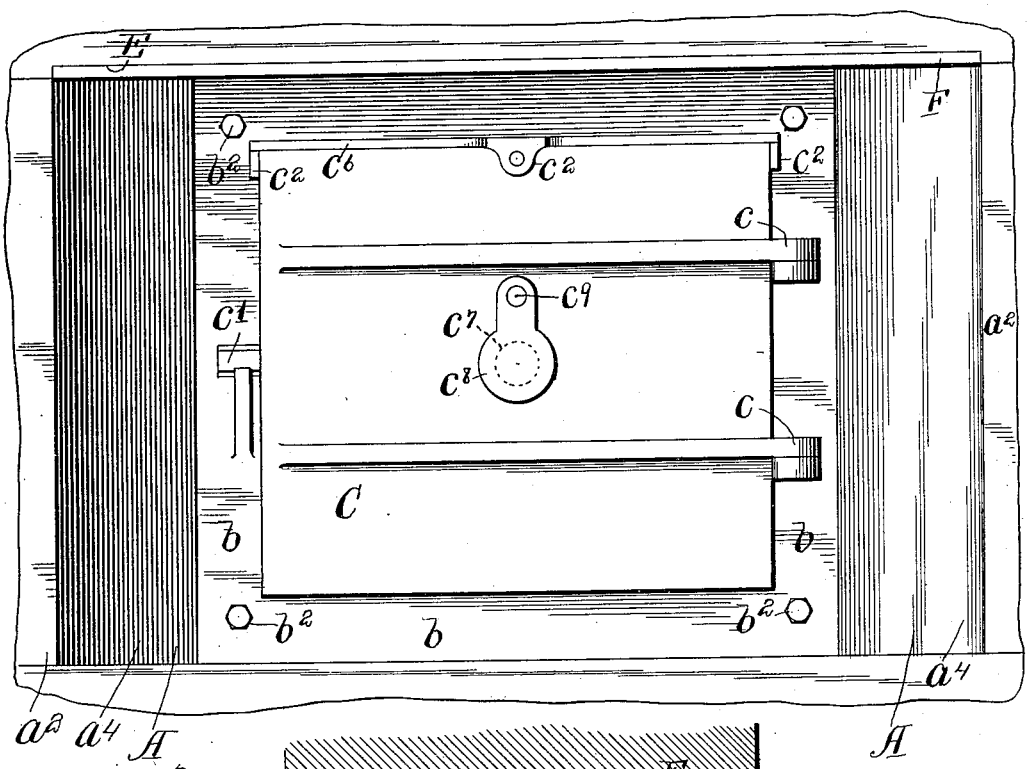

Fig 2

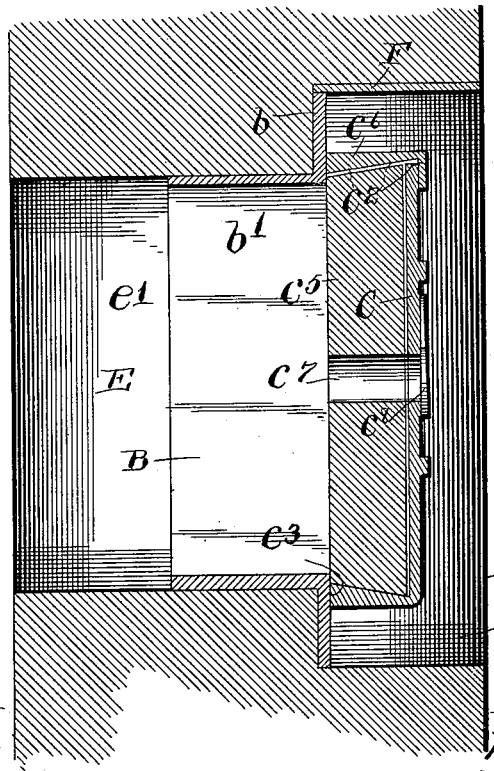

Fig 3

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UNITED STATES PATENT OFFICE.

WILLIAM M. GREEN, OF EVANSTON, AND JOHN R. GENT, OF CHICAGO, ILLINOIS, ASSIGNORS TO JOSEPH F. GENT, OF INDIANAPOLIS, INDIANA.

FURNACE INSPECTION-DOOR.

SPECIFICATION forming part of Letters Patent No. 676,607, dated June 18, 1901.

Application filed October 17, 1900. Serial No. 33,354. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM M. GREEN, a resident of Evanston, and JOHN R. GENT, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Furnace Inspection-Doors; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in inspection-doors for that class of boiler-furnaces which are provided with automatic stoking devices.

The invention consists in the matters hereinafter set forth, and pointed out in the accompanying claims.

In the drawings, Figure 1 is a view in longitudinal section of an inspection-door of the class above noted. Fig. 2 is a front elevation of the door. Fig. 3 is a central vertical section through the door.

Referring to the drawings, E is an opening in the masonry of a furnace-wall. This wall is reduced in thickness and cut away obliquely, as shown at *e e*, to give a wide field of vision within the furnace. B is a door-frame set in said opening and held therein by wing-plates A A. These wing-plates are fastened to the masonry in a manner to be detailed hereinafter. C is a door suitably hinged by pivot-pins *c c* to said door-frame and secured when closed by a latch c' of usual construction. Said door has the usual observation-aperture c^7 centrally located therein, with a cover or closure c^8. Said closure consists of a flat plate pivoted above the aperture on the stud c^9, so as to cover and close said aperture when said plate is in its normal position.

F is a flat plate or lintel resting on the upper edges of the wing-plates A A and is designed to carry the masonry over the door-opening.

In introducing a door for the purpose indicated into the masonry wall of a furnace the necessary cutting away of the masonry on lines oblique to the face of the wall in order that the angle of vision into the furnace may be as wide as possible reduces the thickness of the masonry adjacent to the door-frame, so that the masonry is liable to become affected and weakened structurally by the heat. The holding of the door-frame solidly in place therefore is a matter of difficulty.

The position of the door in the furnace exposes it at times to high temperatures, and it is desirable to have refractory linings to cover the metal of the door which can be easily and quickly replaced as occasion requires.

To securely fasten the door-frame in the masonry and also provide means for keeping the door protected from the heat, certain special features of construction are provided, which will now be pointed out.

A is a wing-plate whose main portion or face-plate a^4 extends along the oblique outer face of the opening E. From the outer edge of said face-plate a^4 a lateral flange extends over the masonry wall, where it is of full or unimpaired thickness, a sufficient distance so as to give a good holding ground for anchor-bolts. Said anchor-bolts *a a* extend from anchor-plates on the interior face of the masonry through the flange a^2 of said wing-plate A, so that the latter is firmly clamped to the wall. To further prevent displacement, horizontal fins or webs a^3 extend from the rear face of said wing-plate A and are inserted or fitted between the courses of the masonry. From the inner edges of the the face-plate a^4 an inner flange a' extends in a plane parallel to the plane of the outer flange a^2. The jambs b' b' of the door-frame B are likewise provided with lateral flanges *b b* at their outer edges.

The outer faces of the flanges *a* of the wing-plates A afford bearing-surfaces against which the flanges *b* of the door-frame B are secured by bolts or rivets or other suitable means. Thereby the door-frame is made fast to the masonry wall at its thick portion, where said masonry is liable to be least affected by the heat, and is held rigidly and securely in position.

The door comprises a hollow metal body, preferably an integral casting, provided with a lining c^5 of refractory material. Said body is open at its top and its inner or fire face and has the inner faces of its side and bottom walls c^4 undercut to afford interlocking engagement with said lining. The lining c^5

consists of a fire brick or tile, which is held in place by its side and bottom edges by said side and bottom walls c^4. Said lining is further secured by a top plate c^6, which is removably fastened over the top or upper edge of said lining to the body of the door. The securing devices consist of the depending lugs c^2, which overlap the front and end walls of the body and are fastened thereto by screws or other suitable means. By this method of construction the protecting-lining is easily and quickly changed as necessity requires. The refractory lining is made larger than the opening of the door-frame, so as to overlap the outer face of said door-frame at all sides of the same, so that no part of the metal of the door is exposed to the heat from the interior of the furnace.

We claim as our invention—

1. The combination with a furnace-wall having an inspection-aperture and made flaring at both its inner and outer surfaces at the sides of said aperture, of a door-frame fitting the smaller part of the orifice, wing-plates to the inner margin of which the door-frame is secured and which have oblique parts fitting the outer oblique surfaces of the wall and having at their outer margins flanges which are parallel with and extend over the outer face of the wall, and securing means engaging said flanges and the parts of the wall exterior to said flared portions and where it is of full thickness.

2. The combination with a furnace-wall having an inspection-aperture, and flared on its outer face at either side of said aperture, of a door-frame fitting the said aperture, and wing-plates having oblique parts fitting the flared face of the wall, and provided with outer flanges extending over the outer face of said wall exterior to the flared faces thereof and also with horizontal webs which extend inwardly from the rear faces thereof and are adapted to lie between the masonry courses of the wall.

3. The combination with a furnace-wall having an inspection-aperture and made flaring at its outer face at either side of said aperture, of a door-frame fitting said aperture and provided on its jambs with lateral outwardly-extending flanges, wing-plates having oblique parts fitting the flared faces of the wall, and provided on their inner margins with flanges which lap the jamb-flanges and provided also with outer flanges which are parallel with and extend over the outer face of the wall, and securing means engaging said outer flanges on the wing-plates and said wall.

4. An inspection-door for a boiler-furnace comprising a hollow metal body consisting of front, bottom and side walls, and having the inner faces of its sides and bottom walls undercut, a refractory lining detachably interlocked at its side and bottom edges with said side and bottom walls, said undercut inner faces of said side and bottom walls being extended to the inner face of the said lining so that said side and bottom edges of the lining are supported and retained for their full width by said side and bottom walls, and a plate extending over the upper edge of said lining and detachably secured to said body.

5. The combination with a door-frame, of an inspection-door fitted to close on said frame, said door comprising a hollow metal body consisting of front, bottom and side walls, and having the inner faces of said side and bottom walls undercut, a refractory lining detachably engaged throughout its entire thickness at its side and bottom edges by the undercut surfaces of said side and bottom walls, said lining being larger than the opening of the door-frame so that it overlaps the margins of the door-frame opening when closed thereon, and a plate applied over the top edge of said refractory lining and removably secured to said hollow body.

In testimony that we claim the foregoing as our invention we affix our signatures, in presence of two witnesses, this 15th day of October, A. D. 1900.

WILLIAM M. GREEN.
JOHN R. GENT.

Witnesses:
TAYLOR E. BROWN,
CLEMENTS R. STICKNEY.