

No. 679,720.

Patented Aug. 6, 1901.

G. J. BOWE.

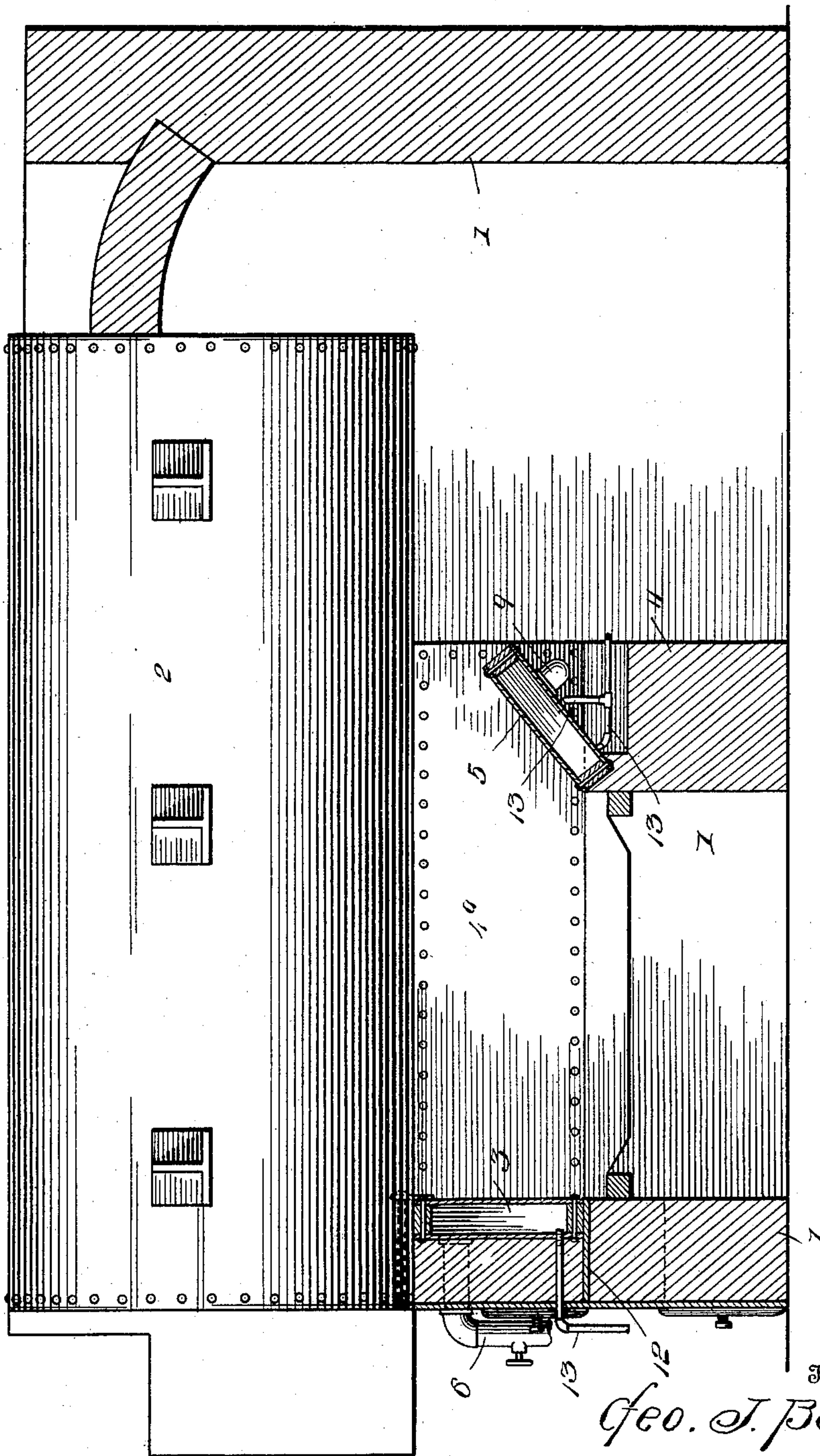
FIRE BOX FOR STEAM BOILER FURNACES.

(No Model.)

(Application filed Jan. 5, 1901.)

3 Sheets—Sheet 1.

Fig. 1.



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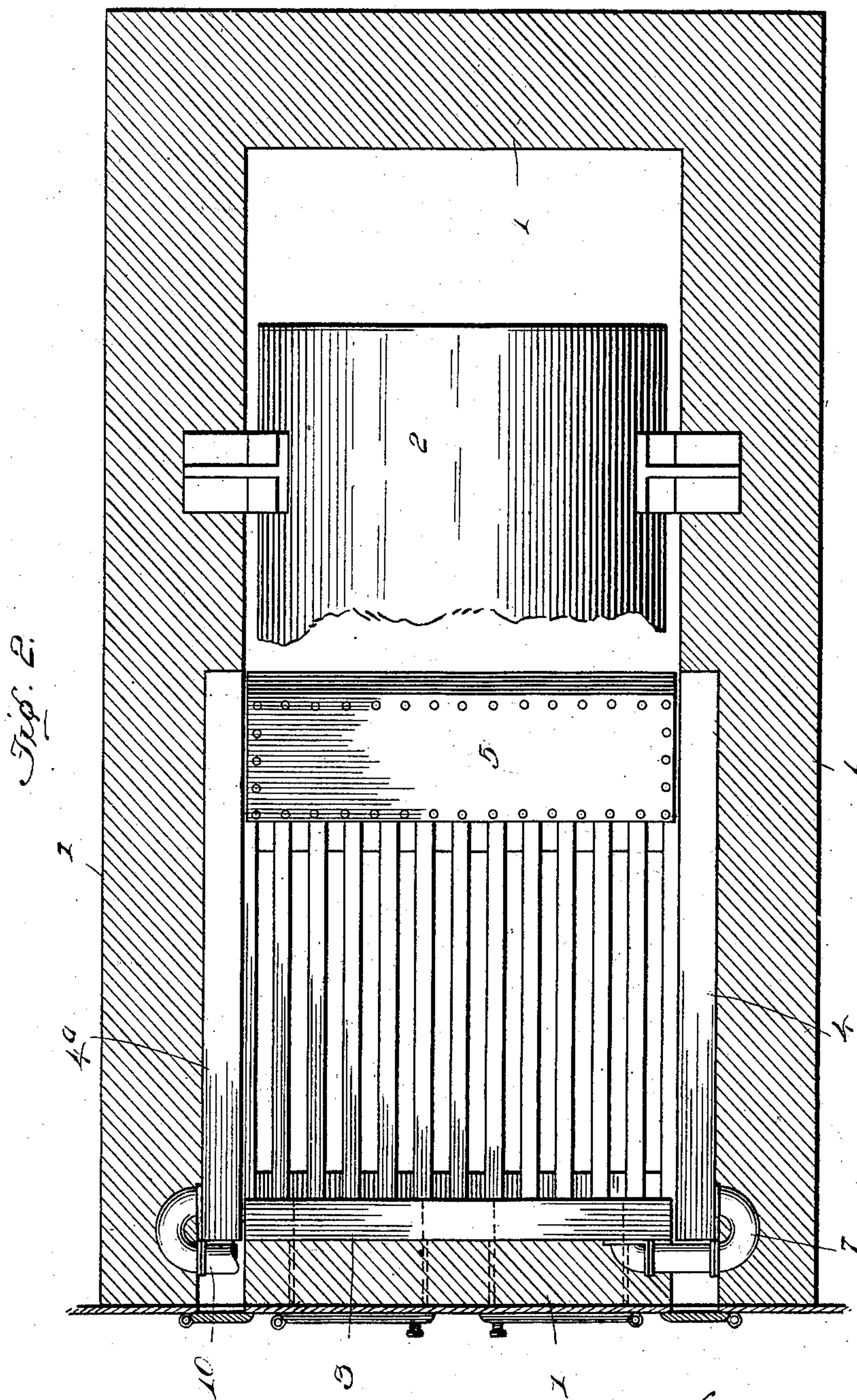
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3 Sheets—Sheet 2.



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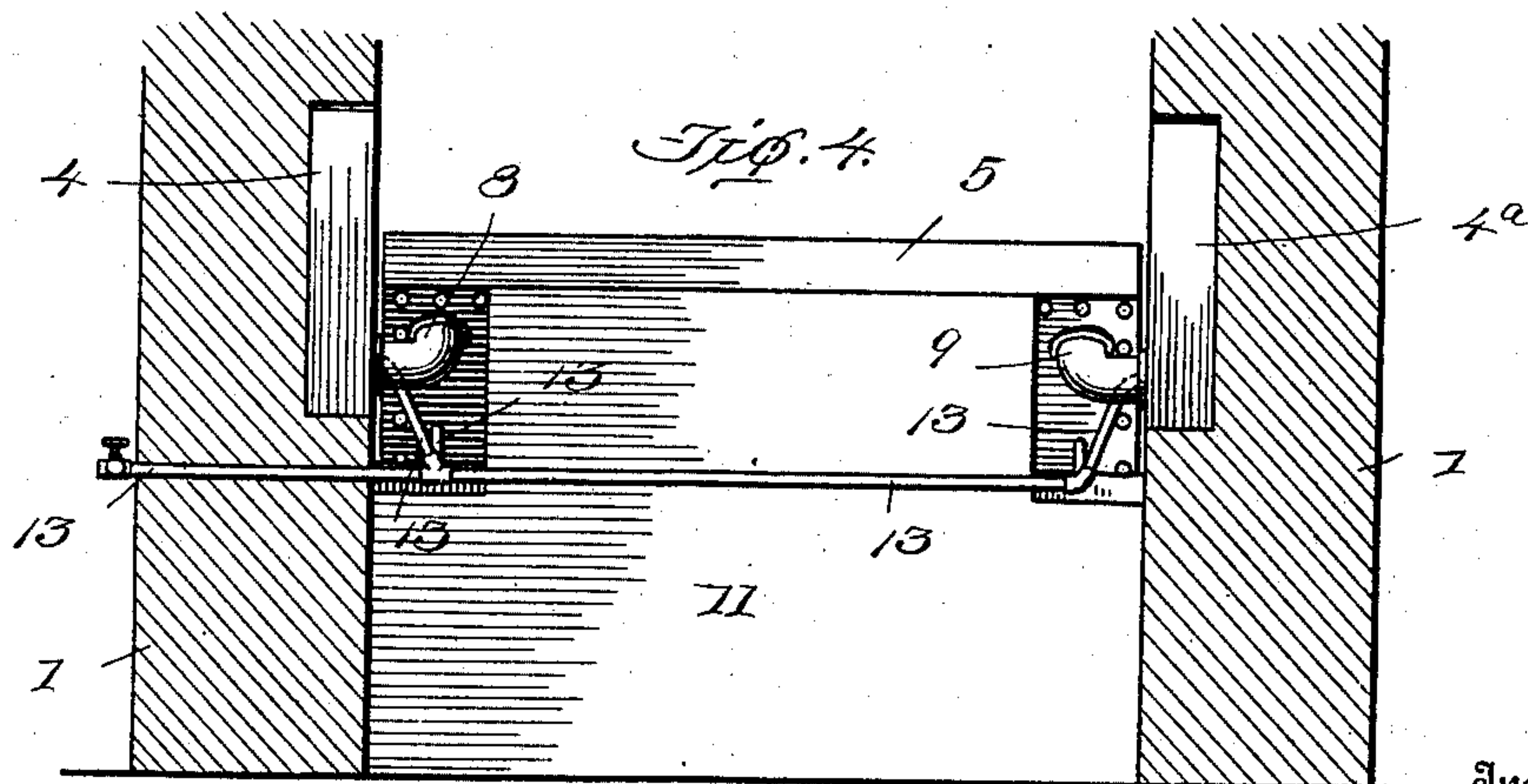
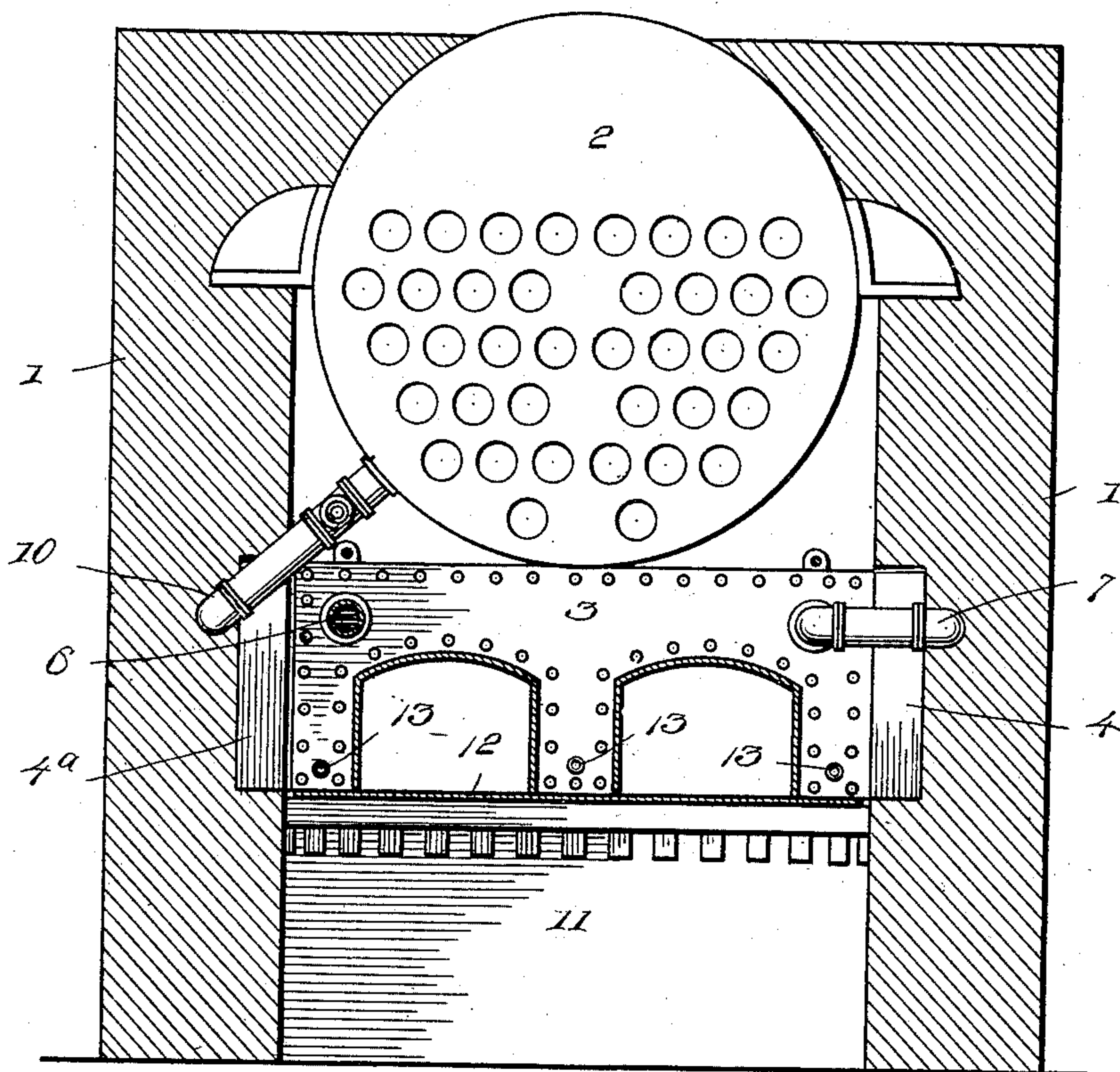
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3 Sheets—Sheet 3.

Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## FIRE-BOX FOR STEAM-BOILER FURNACES.

SPECIFICATION forming part of Letters Patent No. 679,720, dated August 6, 1901.

Application filed January 5, 1901. Serial No. 42,229. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE J. BOWE, a subject of the Queen of Great Britain, residing at Hydepark, in the county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Fire-Boxes for Steam-Boiler Furnaces, of which the following is a specification.

My invention relates to fire-boxes for steam-boiler furnaces; and its objects are to provide a sectional fire-box capable of being attached to an ordinary boiler without removing the boiler or the masonry-setting thereof, to insure a proper circulation of water through the fire-box, to provide means for removing sediment from the fire-box sections, to dispense entirely with fire-brick lining, thus avoiding the expense of such lining, both in original cost and for repairs or renewal, to provide for removability of the sections through the front of the furnace, and generally to improve the construction and add to the efficiency and durability of this class of fire-boxes.

The construction of the improvement will be fully described hereinafter in connection with the accompanying drawings, which form part of this specification, and its novel and characteristic features will be pointed out in the appended claims.

In the drawings, Figure 1 is a vertical section of a furnace provided with my improved fire-box, the boiler being shown in side elevation. Fig. 2 is a horizontal section of the furnace, the boiler being shown in plan and broken away. Fig. 3 is a vertical section showing the front end of the boiler and the front section of the fire-box in elevation, and Fig. 4 is a vertical section showing the rear section of the fire-box in elevation.

The reference-numeral 1 represents the masonry-walls of the furnace, and 2 the boiler, suitably supported by the walls.

The fire-box consists of a front section 3, parallel side sections 4 and 4<sup>a</sup>, and an inclined rear section 5. These several sections of the fire-box are hollow to adapt them to contain water, which is fed through an inlet-pipe 6 at the front of the fire-box. The front section 3 of the fire-box is connected with the side section 4 by a pipe 7, and the side sections 4

and 4<sup>a</sup> are connected near their inner or rear ends by pipes 8 and 9 with the rear section 5, as best shown in Fig. 4. The side section 4<sup>a</sup> is connected by a pipe 10 with the boiler to supply water thereto from the fire-box.

The rear section 5 of the fire-box rests upon the inclined bridge-wall 11 of the furnace.

The front section of the fire-box rests upon the head-plate 12, and the side sections 4 and 4<sup>a</sup> are set into the brickwork. The side and end sections of the fire-box are firmly secured together by rivets in a manner to form tight joints, and the front section is formed with openings conforming to the shape of the doors in the boiler-front, and its inner surface is flush with the inside edge of the head-plate 12. The space between the front section 3 and the furnace-front is filled by the brickwork. The front section 3 is secured to the brickwork of the boiler by anchor-bolts.

Each of the four sections of the fire-box is provided with a blow-off pipe 13 for removing the sediment.

The fire-box is supplied with cold water at the front of the boiler, the water first entering the section 3 and passing from thence into the section 4 through the pipe 7, and through the pipe connection 8 into the inclined rear section 5, and finally through the pipe 9 into the side section 4<sup>a</sup>, from whence it is fed to the boiler through the pipe 10. It will be obvious that this circulation of the water through the hollow fire-box sections serves to heat the water to a high temperature, in which condition it is supplied to the boiler, thus greatly facilitating the generation of steam.

My improved construction, as above described, avoids the necessity of employing the usual fire-brick within the fire-box, and thus a material saving in expense is effected, and the construction of the fire-box is such that it may be readily applied to any ordinary boiler without removing the same or the brick setting.

An important feature of the invention is that the sections are so arranged that pipe connections and valves are readily accessible through a door in the boiler-front, which lat-

ter should be of such size as to allow of the removal of the sides or front section of the fire-box.

I claim—

- 5 1. The combination with the walls of a furnace; of a fire-box comprising four independent hollow sections connected by pipes, the rear section of the fire-box being inclined and resting upon the bridge-wall of the furnace.
- 10 2. The combination with the walls of a furnace, and a steam-boiler; of a fire-box comprising four independent hollow sections the rear section of the fire-box being inclined; pipe connections between said sections; and
- 15 a pipe connection between one of said sec-

tions and the boiler whereby a circulation of water is provided for from the front of the fire-box, around the sides and back thereof in its passage to the boiler.

3. The combination with a steam-boiler furnace; of a fire-box consisting of four independent hollow sections the rear section being inclined; pipes connecting said sections; and blow-off pipes for said hollow sections.

In testimony whereof I affix my signature 25 in presence of two witnesses.

GEORGE J. BOWE.

Witnesses:

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