

No. 627,525.

Patented June 27, 1899.

L. S. PFOUTS.
HOT AIR FURNACE.

(Application filed Jan. 20, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

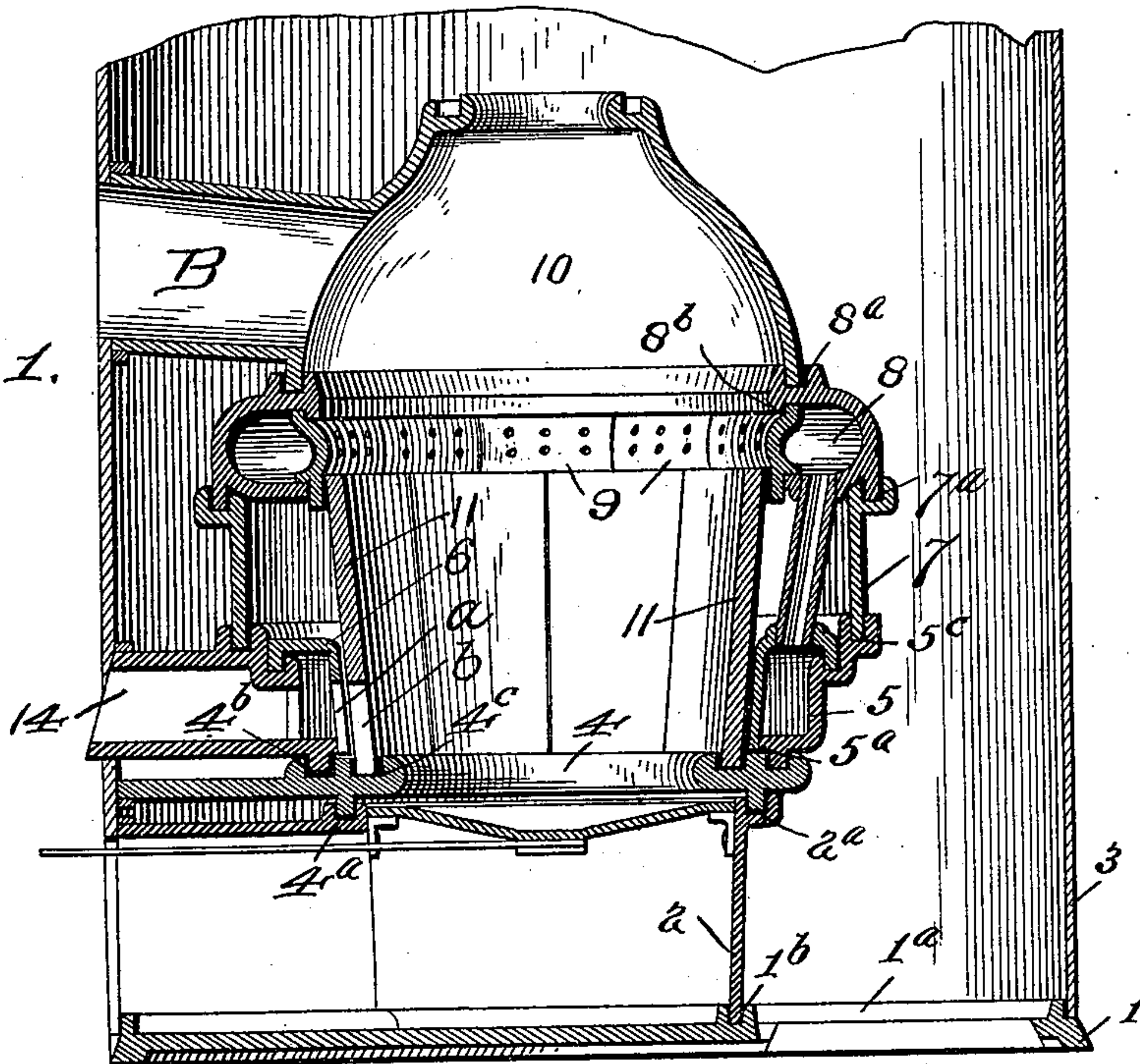
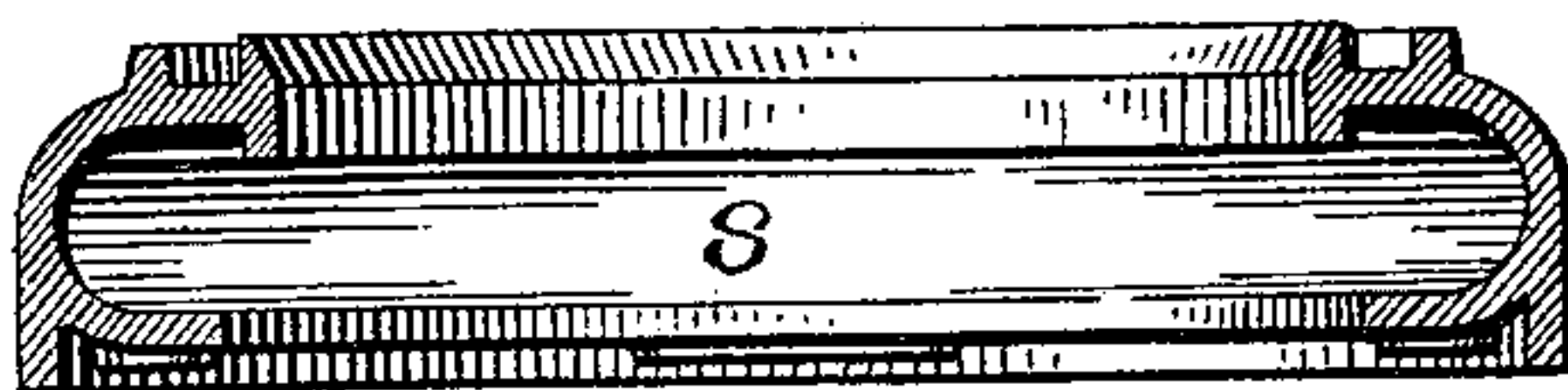


Fig. 2.



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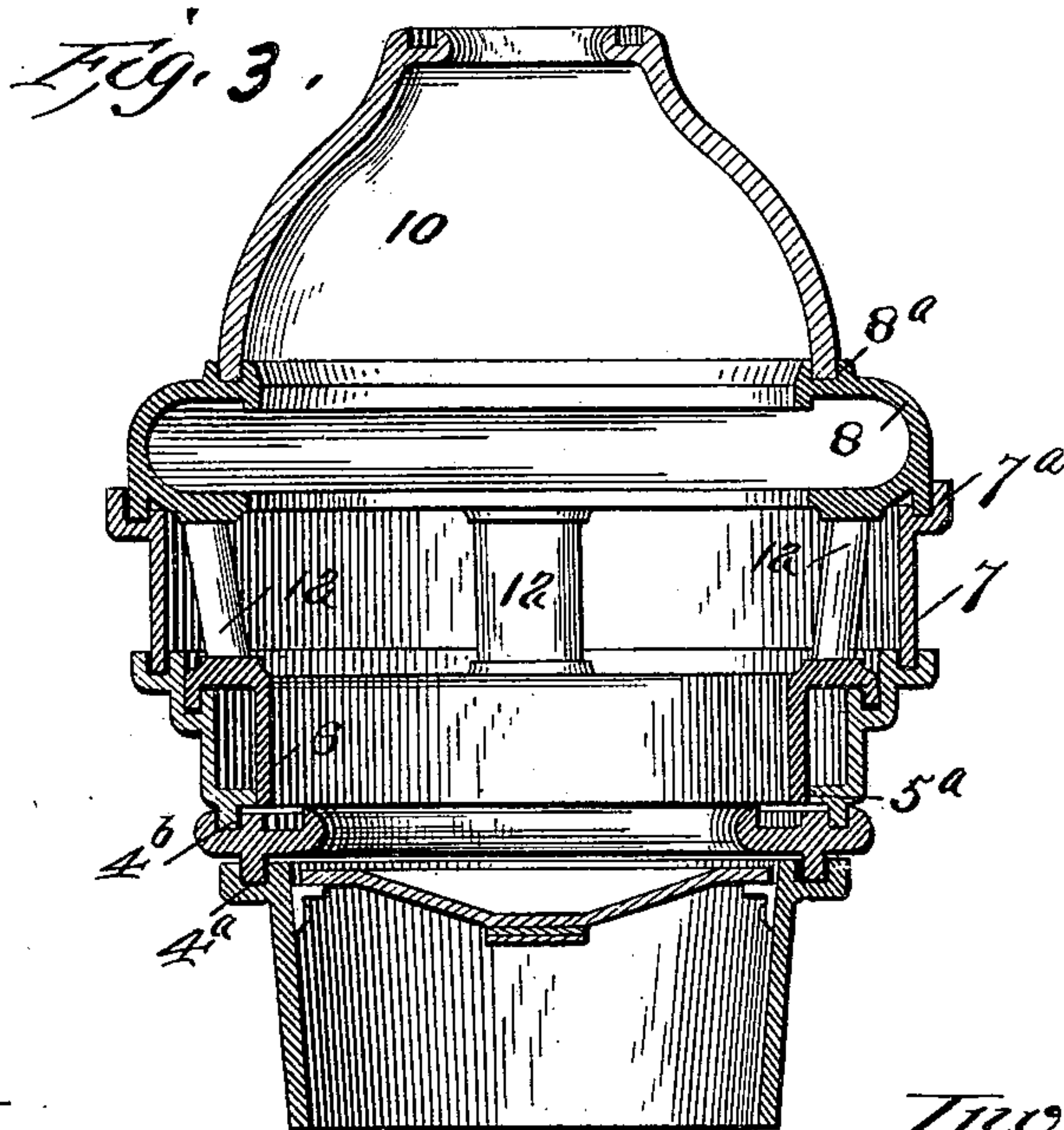
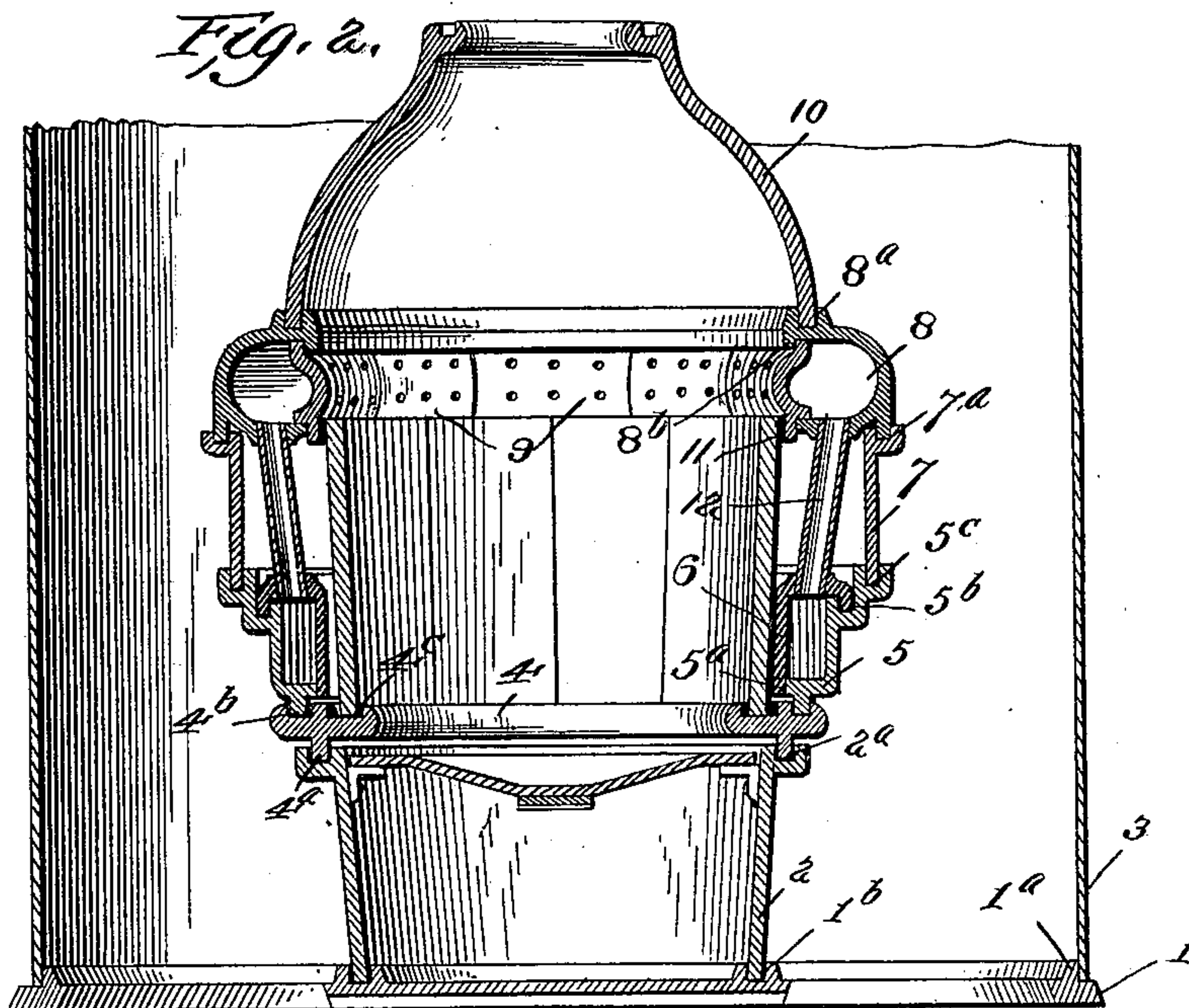
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UNITED STATES PATENT OFFICE.

LEROY S. PFOUTS, OF CANTON, OHIO, ASSIGNOR TO THE CANTON FOUNDRY AND MACHINE COMPANY, OF SAME PLACE.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 627,525, dated June 27, 1899.

Application filed January 20, 1899. Serial No. 702,854. (No model.)

To all whom it may concern:

Be it known that I, LEROY S. PFOUTS, a citizen of the United States, residing at Canton, county of Stark, and State of Ohio, have invented certain new and useful Improvements in Hot-Air Furnaces, of which the following is a specification.

One object of my said invention is to provide a furnace made up of a plurality of sections, any one of which may be readily replaced in case of breakage, and having a sectional inner fire-pot or lining which may be easily removed through the fuel-opening and replaced in the same manner without necessitating in any way the dismantling of the furnace.

A further object is to provide a sectional furnace in which in case of any gas escaping from the fire-pot the likelihood of its reaching the hot-air chamber will be reduced to a minimum.

A still further object is to secure a furnace in which the most complete combustion possible shall be secured by reason of hot air being sprayed over or upon the upper surface of the bed of coal.

I have illustrated the invention in the accompanying drawings, in which—

Figure 1 is a central vertical section through a portion of a furnace sufficient to illustrate my invention. Fig. 2 is a section taken at right angles to Fig. 1. Fig. 3 is a sectional view with the inner lining removed, and Fig. 4 a detail.

In the drawings, the numeral 1 represents a metal base of suitable form having a flange 1^a, forming a recess near its outer edge to receive the lower edge of the outside jacket or casing 3. A second groove or channel 1^b is formed near the center, preferably, by two equidistant ribs or beads, within which groove is seated the lower edge of section 2, which forms the ash pit or chamber, this section extending to the front of the casing, as shown in Fig. 1, to the point where the usual ash-pit door is provided. This section 2 is provided at its upper edge with a groove or channel 2^a, and also has inwardly-projecting ledges for the support of the ordinary or any desired grate.

Upon the ash-pit section is placed a fire-

pot-supporting section 4, which has a depending rib 4^a, fitting within the groove in the upper edge of the section 2. The upper face of the ring-section 4 is provided with two concentric grooves or recesses 4^b and 4^c, the inner, 4^c, being preferably wider than the outer. A circular section 5 surmounts this ring-section and is provided with a rib or flange fitting snugly the groove or channel 4^b, the lower edge of the section 5 being extended, preferably, inward slightly beyond the flange to form a bearing-ledge 5^a. From the ring-section 4 the section 5 flares or curves outwardly, and it is provided at its upper edge with two concentric channels or recesses 5^b and 5^c, the outer, 5^c, being preferably arranged at a higher elevation than the inner. A section 6 is located within the section 5 and is provided with a laterally-extending upper edge, which in its turn carries a downwardly-projecting rib or flange adapted to rest within the groove or channel 5^b, by which the section 6 is supported, while its lower edge abuts against the edge 5^a. From this construction it will be observed that the sections 5 and 6 together form a circular air space or ring, to which air is supplied from an air-trunk 14, which is formed integral with the section 5 and extends to the front of the furnace casing or jacket. In the other channel 5^c, before referred to, rests the lower edge of an outer section 7, the upper edge of which is also provided with a groove or channel, (indicated at 7^a.) Above this is located a ring-section 8, approximately semicircular in cross-section, which is provided at its lower face or edge with an annular flange or rib adapted to rest in the channel or groove 7^a, while its upper edge is provided with a groove or channel 8^a and an annular depending bead or flange 8^b. In connection with this upper ring-section 8 I provide a plurality of perforated sections 9, each of which is provided with an inwardly-extending rib or flange, which is adapted to rest on the inwardly-projecting lower edge of the section 8, while the upper end of the perforated section rests behind the depending flange 8^b. The ring 8 and sections 9 thus form an annular air ring or chamber, communicating by means of the plurality of perforations with the interior of the fire-pot above

the fuel-line. In order to supply air to this ring, a pipe or pipes 12 are provided, extending between the rings 6 and 8, as clearly shown in Fig. 2, and connected to each in any suitable or desired manner.

The numeral 11 designates the inner lining of the fire-pot, which is made up of a series of sections of fireproof material of a size adapted to be readily removed through the fuel-opening B. These sections rest at the lower ends in the groove or channel 4^c, while their upper ends abut against the lower portions of the inner faces of the sections 9, thus holding them against inward displacement. The section 8 is surmounted by a dome 10, having its lower edge resting in a groove in the upper edge of the ring 8, while above the dome may be placed the ordinary radiator, which, as it forms no part of the present invention, is not illustrated herein.

The manner in which the air for combustion passes to the fuel will be readily understood from the foregoing description. Cold air passing through the trunk 14 into the annular space between the ring 5 and 6 comes in contact with the highly-heated metal. Part of the air passes directly to the fuel through openings *a* and *b*, formed, respectively, in the ring or section 6 and one of the inner lining-pieces 11. The remaining air, heated by the walls of the circular chamber, passes upward into the upper circular chamber between sections 8 and 9, its temperature being raised during the passage, and in a highly-heated condition is sprayed through the openings in the sections 9 upon the body of fuel within the fire-pot, thus causing complete combustion of all gases and the like given off by the burning fuel.

Ordinarily where any cracks occur in the fire-pot gases can escape directly into the air-space. In my construction it will be observed that this is impossible, as owing to the dead-air space formed between the outer ring 7 and the inner lining any gas escaping from the combustion into this space will simply rise up into the upper portion of the fire-pot.

Having thus described my invention, what I claim is—

1. In a furnace, the combination with the fire-pot and outer casing, of a lower annular air-chamber, an upper air-chamber communicating through openings with the interior of the fire-pot, an outer wall or section extending between the two chambers and forming a dead-air space between the fire-pot and outer wall, and pipe communication between the lower and upper annular air-chambers, substantially as described.

2. In a furnace, a lower annular air-chamber, an upper annular air-chamber, air-pipe

connections between the same, a fire-pot lining consisting of a plurality of sections removably seated in an annular ring below the lower chamber and extending to the upper air-chamber, and an outer wall or section encircling the said fire-pot and pipe connections and forming a dead-air space between said air-chambers, substantially as described.

3. In a furnace, a base, a fire-pot-supporting section, a lower annular air-chamber supported therefrom, an outer wall or section supported from the wall of said lower chamber, an upper annular air-chamber supported from said outer wall, an inner fire-pot lining consisting of a plurality of sections resting at their lower ends upon the fire-pot-supporting section and extending upwardly to the upper annular air-chamber, and air-pipe connections extending between said chambers through the space between the fire-pot lining and outer wall with communicating openings between the upper air-chamber and the fire-pot, substantially as described.

4. In a furnace, a lower annular air-chamber encircling the fire-pot, an outer wall supported therefrom, an upper ring substantially semicircular in cross-section supported from said outer wall, a plurality of perforated sections removably seated against the open side of said upper ring, a fire-pot lining comprising a plurality of sections removably supported with their lower ends in proximity to the lower annular air-chamber and their upper ends abutting against the inner faces of the perforated sections, and pipe connections from the lower annular air-chamber to said upper ring, substantially as described.

5. In a furnace, a base, an ash-pit section 2 resting thereon, a ring 4 resting on said section 2, a section 5 curved in cross-section supported from said ring, an inner section 6 having an outwardly-curved upper edge engaging the upper edge of section 5 and forming therewith an annular chamber, an outer annular wall 7 supported by the section 5, an upper annular section 8 carried by the wall 7, removable perforated sections 9 closing the open side of section 8 and forming an annular chamber, air-pipe connections between said annular chambers, and a fire-pot lining comprising a plurality of sections removably supported upon the ring-section 4 and extending upwardly and abutting against the lower inner faces of the perforated sections, substantially as described.

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

LEROY S. PFOUTS.

Witnesses:

GEO. W. JAHN,
W. H. CAVNAH.