

No. 849,890.

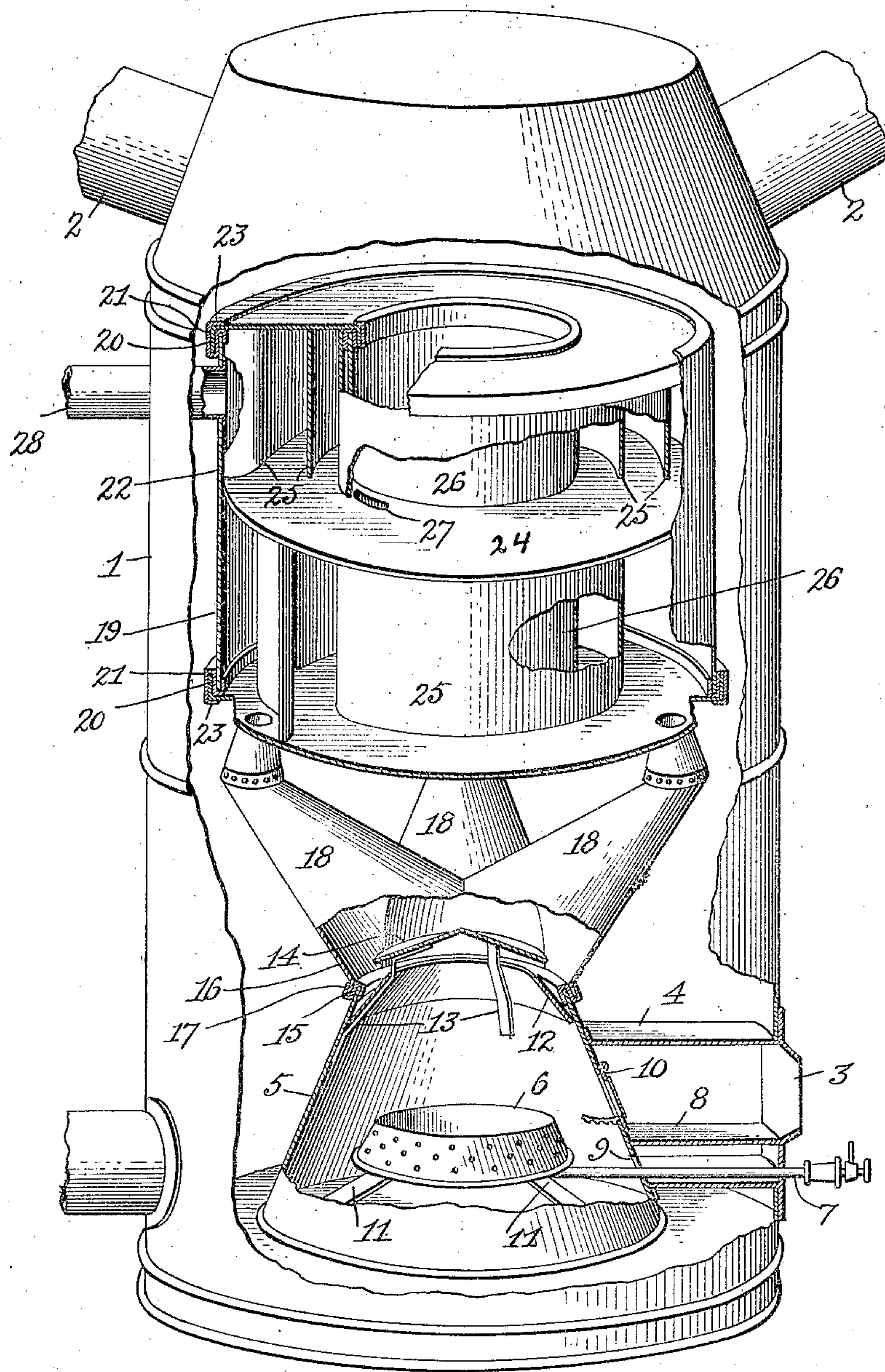
PATENTED APR. 9, 1907.

J. CROMIE.
FURNACE.

APPLICATION FILED NOV. 20, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



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Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

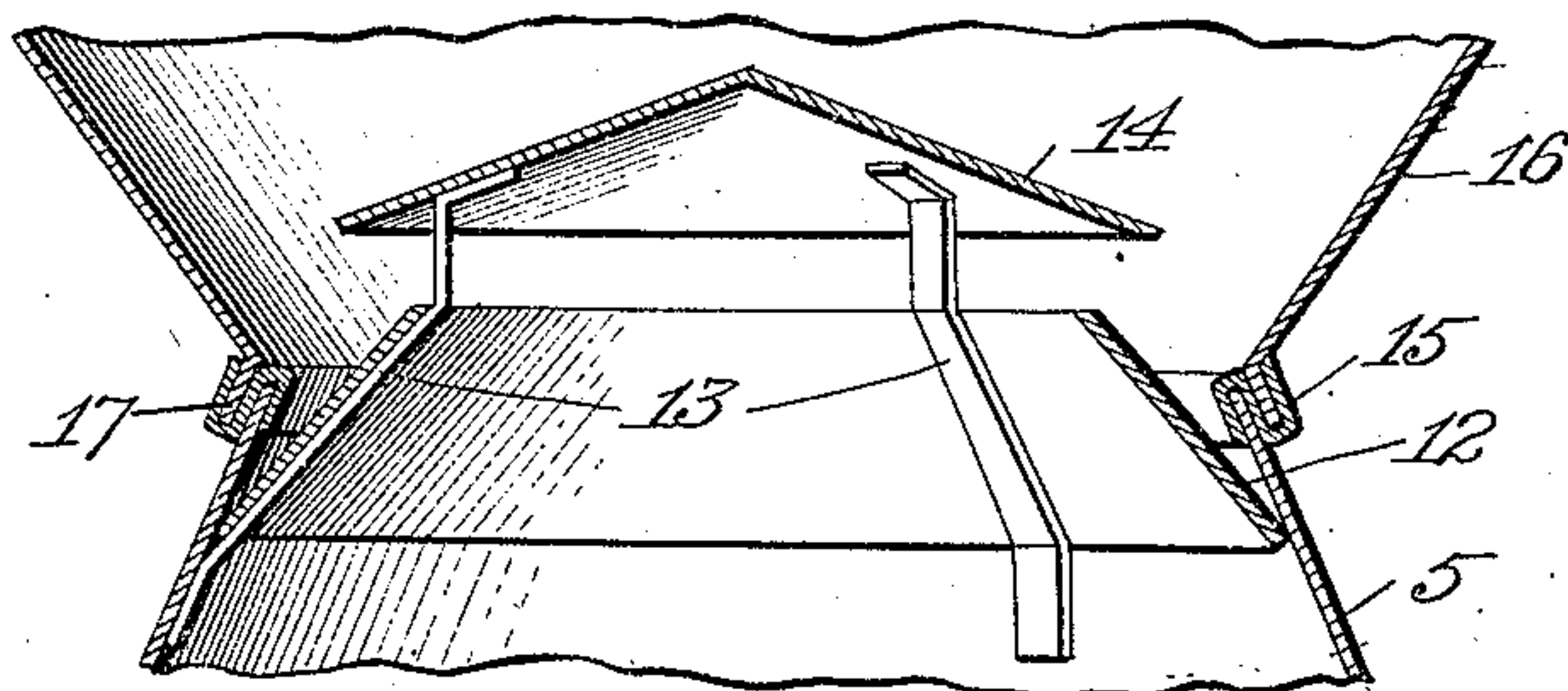


Fig. 3.

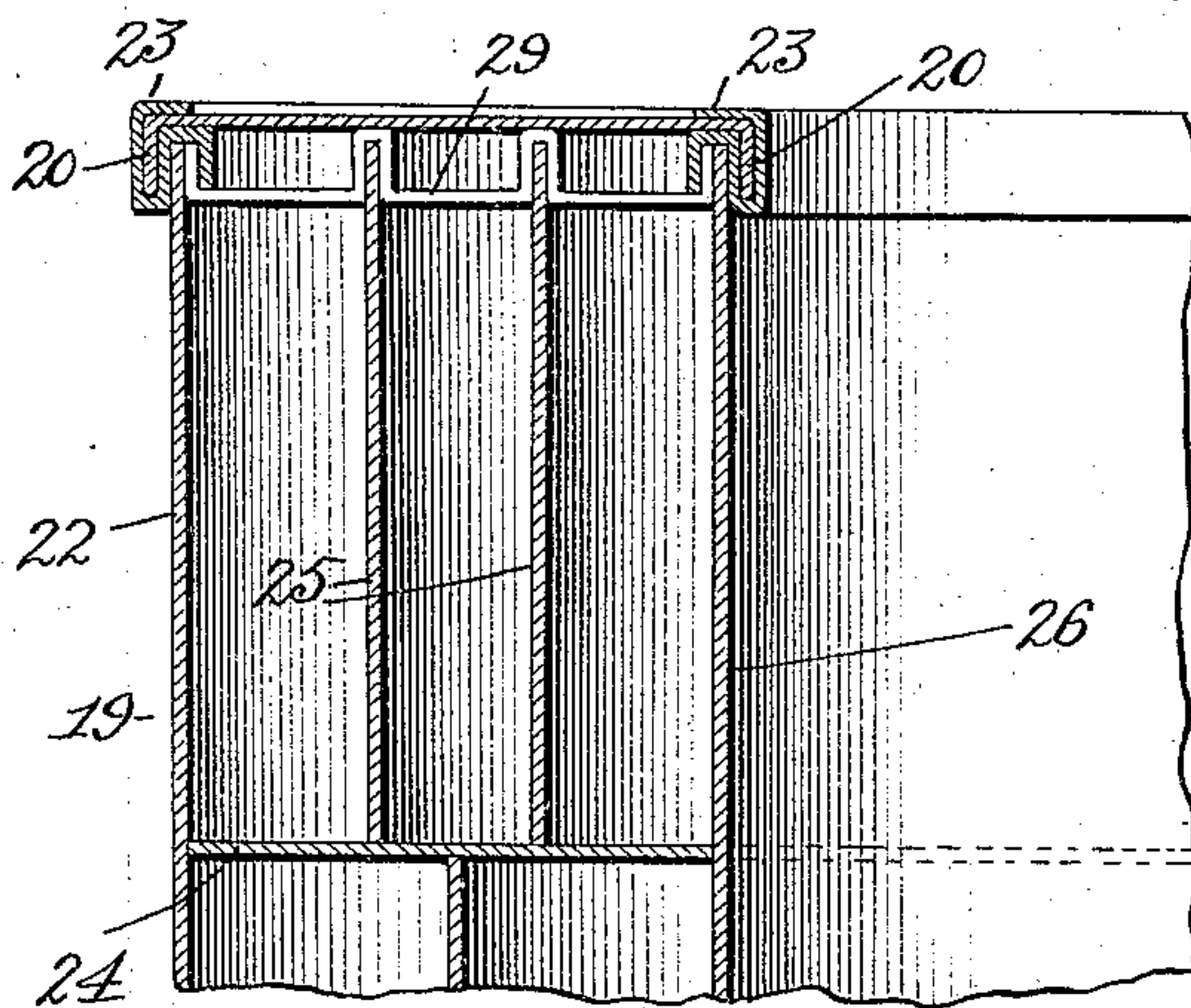
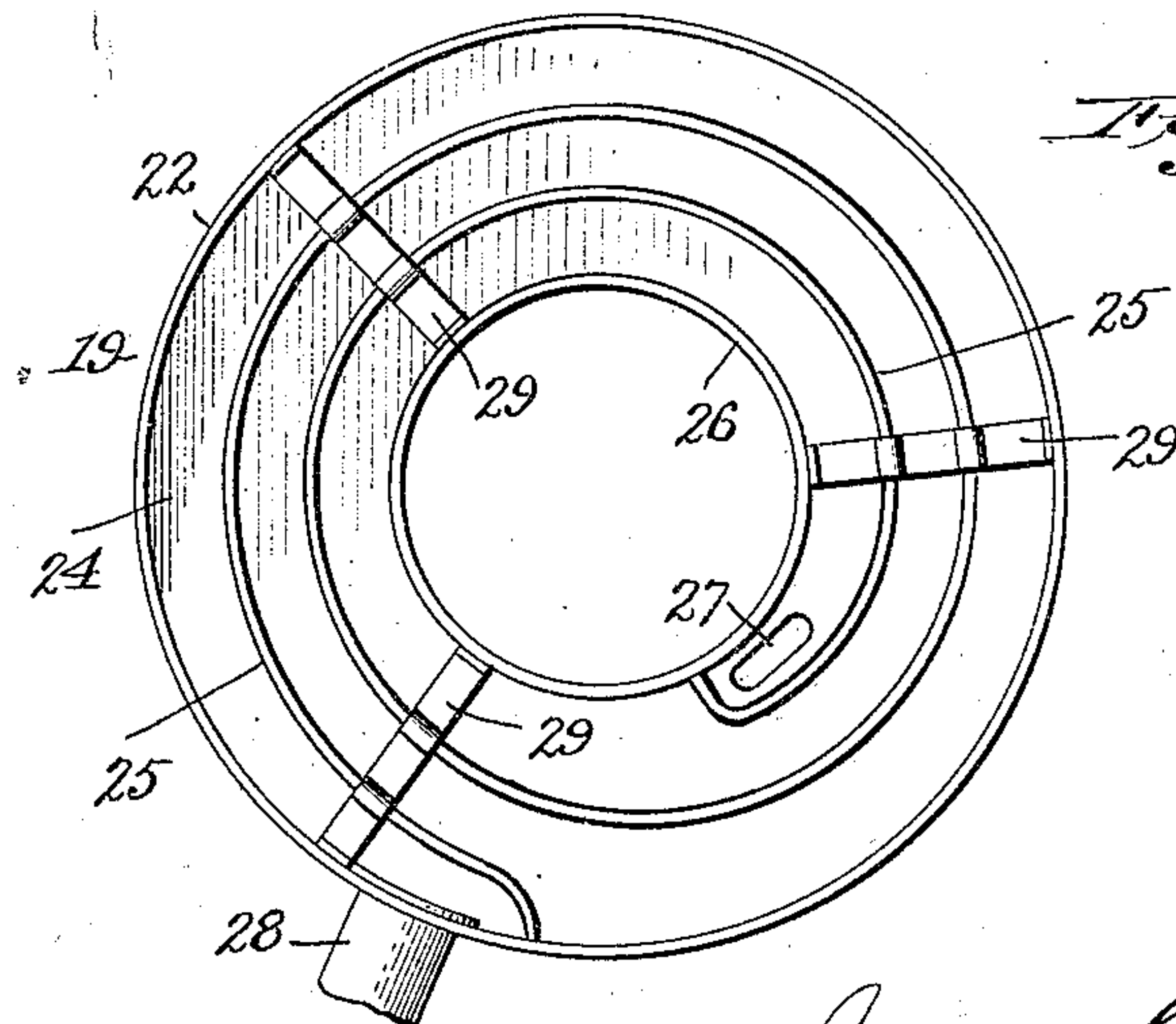


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES CROMIE, OF PITTSBURG, PENNSYLVANIA.

FURNACE.

No. 849,890.

Specification of Letters Patent.

Patented April 9, 1907.

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To all whom it may concern:

Be it known that I, JAMES CROMIE, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces, of which the following is such a full, clear, and exact description as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates more particularly to heating-furnaces which burn gaseous fuel; and it consists in certain novel features hereinafter first fully described and then particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of a furnace embodying my invention, parts being broken away to show the internal construction. Fig. 2 is a detail sectional view of a portion of the burner-chamber, the deflector, and the divergent flues. Fig. 3 is a detail vertical section of a portion of the drum, and Fig. 4 is a plan view of the drum.

The outer shell or casing of the furnace may be of the usual construction and may be connected at its bottom with a cold-air flue or otherwise arranged to permit the entrance of cold air.

At or near its top the shell or casing 1 is provided with flues 2 to carry the heated air to the different parts of the building. At the bottom of the shell is provided a door 3 at the outer end of a box 4, which extends from the shell inward to a conical chamber 5, in which the burner 6 is located. A feed-pipe 7 extends from the burner outward through the box 4 to any suitable source of supply and is provided with a suitable valve by means of which the flow of fuel to the burner may be regulated. Above the feed-pipe a horizontal partition 8 extends through the box, and below the said partition at the inner end of the box is an opening 9 to admit air to the burner-chamber in a steady flow without draft. Above the partition at the inner end of the box is a swinging door 10, fitted with isinglass, through which the condition of the flame may be observed. If more air is needed in the burner-chamber, this door may be raised to admit the proper quantity. The burner-chamber 5 is a frusto-conical shell of sheet metal or similar material, and it may, if desired, be lined with asbestos or brick to prevent diffusion of the heat and cause it all to ascend through the heating-flues and drum. The burner 6 is supported centrally

at the bottom of the chamber by brackets 11, projecting inward from the shell, while at the upper end of the chamber and just below the upper edge of the shell I arrange a ring or annular plate 12, which projects slightly above the chamber and is arranged at an angle to the shell, so as to turn the heat toward the center. This ring or annular plate 12 is supported by brackets or strips 13, which extend through the central opening of the same and have their upper ends secured to and supporting a conical deflector 14, the lower ends of the brackets being secured to the shell 5. On the upper annular edge of the shell 5 I fit a ring or support 15, which is S shape in cross-section and presents two grooves, one of which engages over the edge of the shell and the other is engaged by the lower edge of the triple heating-flue 16. This heating-flue consists of an annular chamber having a depending slightly-outturned flange 17, which enters the outer groove of the ring 15, and three horns or branches 18, rising and diverging from the chamber. These horns or branches are tapered toward their upper ends, which enter and support the heating-drum 19. The top and bottom plates of this drum are provided with annular flanges, as shown at 20, which engage the outer grooves of S-shaped rings 21, the inner grooves of which are engaged over the ends of the cylinder 22, forming the wall of the drum. The outer edges of the S-shaped rings are clenched over the top and bottom plates, as shown at 23, thus forming strong tight joints without the use of cement or solder.

The heating-drum is divided centrally by a horizontal partition 24, and in the chambers thus provided above and below the said partition are spiral vertical partitions 25, which extend from the outer wall of the drum to the inner central cylinder 26, forming the inner wall of the heating-drum, a single opening 27 being formed in the partition 24 between the inner cylinder 26 and the inner ends of the partitions to form a communication between the two chambers. A gas-escape flue 28 leads from the outer wall of the drum near the upper end of the same to carry off the products of combustion or obnoxious odors, and the upper and lower ends of the inner cylinder 26 are connected with the top and bottom plates of the drum through clenched S-shaped rings in the same manner as the outer cylinder is secured thereto. The interior of the cylinder 26 constitutes an air-flue

through which air may rise to pass to the flues 2, as will be readily understood.

The use of the furnace will be readily understood. The oil or gas being ignited at the burner, the heat will rise therefrom and pass to the triple flues and thence into the drum, where it will circulate horizontally through the upper and lower chambers of the same and finally pass out through the escape-flue. The heat will be turned equally into the several branches of the triple flue by the conical deflector and in its upward flight will raise the temperature of the said flues and the inner and outer walls of the drum, so that the air within the outer casing in contact with the flues and the drum will be heated before passing out into the building through the warm-air flues. All the joints or seams of my furnace are riveted, and no cement or solder is used. The use of the S-shaped clenching-rings in the joints provides a strong joint through which there will be no leakage and will require no attention or repairs. The heating-currents from the burner are so circulated as to constantly act upon the surfaces in contact with the air to be passed into the building, and there is no available heat allowed to pass off into the chimney, the result being that the desired temperature is quickly attained. As the heat is fed into the drum at three points and can escape at but one point and is forced to circulate spirally around the drum in reverse directions before leaving the same, the entire body of heat is utilized.

The spiral partitions have a slight tendency to expand under the influence of the heat, and to prevent them slipping out of proper position I provide spacers 29, which consist of strips of metal having their ends fitted in the clenching-rings and their intermediate portions formed into notches or grooves which engage the edges of the partitions, and thereby preserve the proper spacing of the partitions.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A furnace comprising a combustion-chamber, a deflector supported in the upper end of said chamber, a heating-drum, above said deflector and combustion-chamber, and a flue resting on the upper end of the combustion-chamber comprising a chamber around the deflector and having a series of divergent branches supporting the drum.

2. A furnace comprising a combustion-chamber, a heating-drum having upper and lower chambers containing spiral passages, and a flue resting on the combustion-chamber and having branches rising to and supporting the heating-drum and communicating with the lower chamber of the same.

3. The combination of the combustion-chamber, an annular plate within the upper end thereof, a deflector above the same, and brackets having their upper ends secured to the deflector and their lower ends secured to the combustion-chamber wall and their intermediate portions supporting the annular plate.

4. The combination of the combustion-chamber, an inwardly-projecting annular plate on the inner face of the said chamber in the upper end of the same but below the upper edge of its wall, a conical deflector above but out of contact with said plate, brackets secured upon the inner wall of the combustion-chamber and supporting the annular plate and the conical deflector, and a flue supported by the upper edge of the wall of the combustion-chamber.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JAMES CROMIE.

Witnesses:

GEORGE A. COOPER,
WILLIAM A. MILLER.