

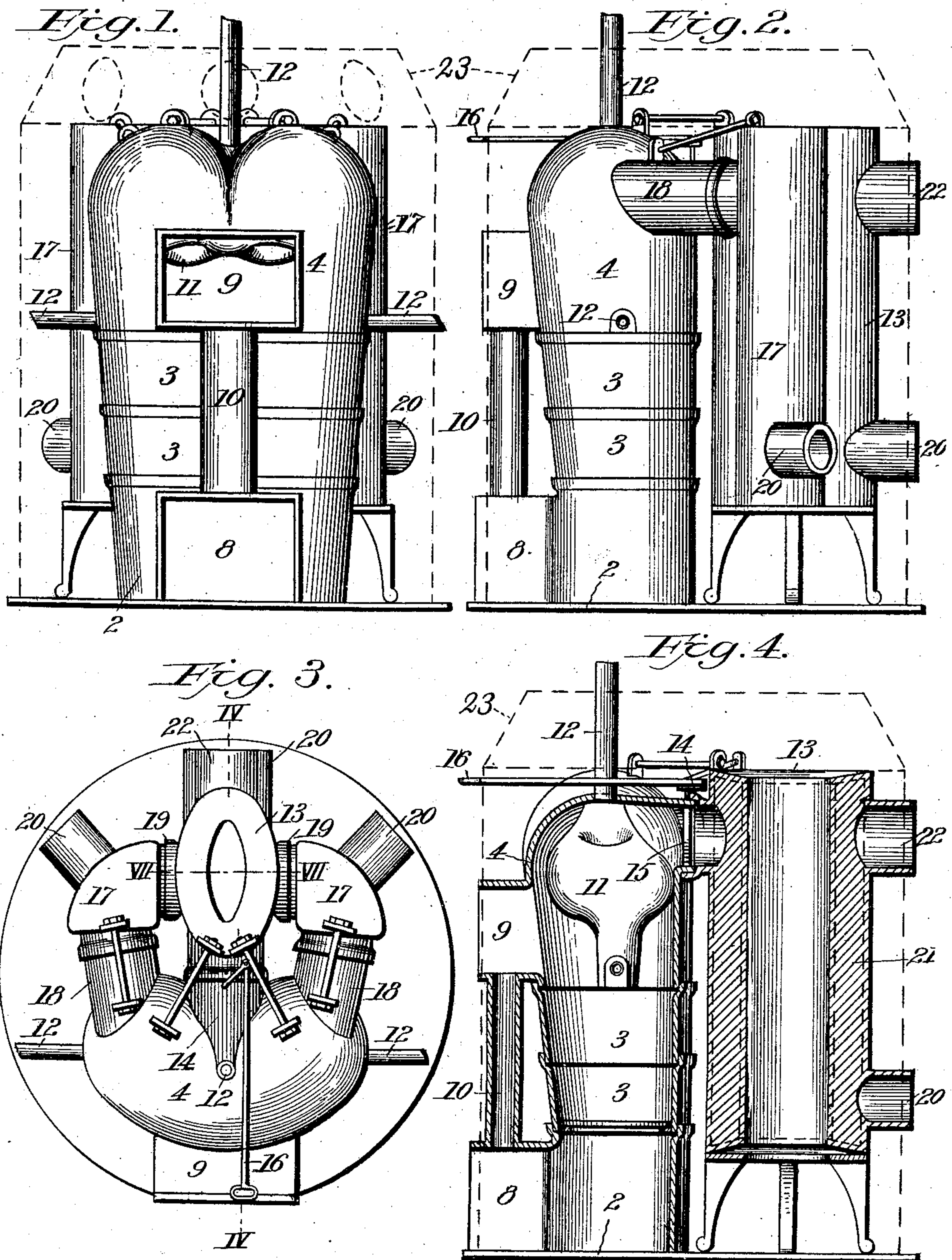
No. 845,607.

PATENTED FEB. 26, 1907.

L. J. BAIR.
HOT AIR FURNACE.

APPLICATION FILED MAR. 30, 1905.

2 SHEETS—SHEET 1.



WITNESSES:

C. H. Walker

L. J. Hauey

INVENTOR,

Lemuel J. Bair,
By

W. B. Conwin, Attorney

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2 SHEETS—SHEET 2.

Fig. 5.

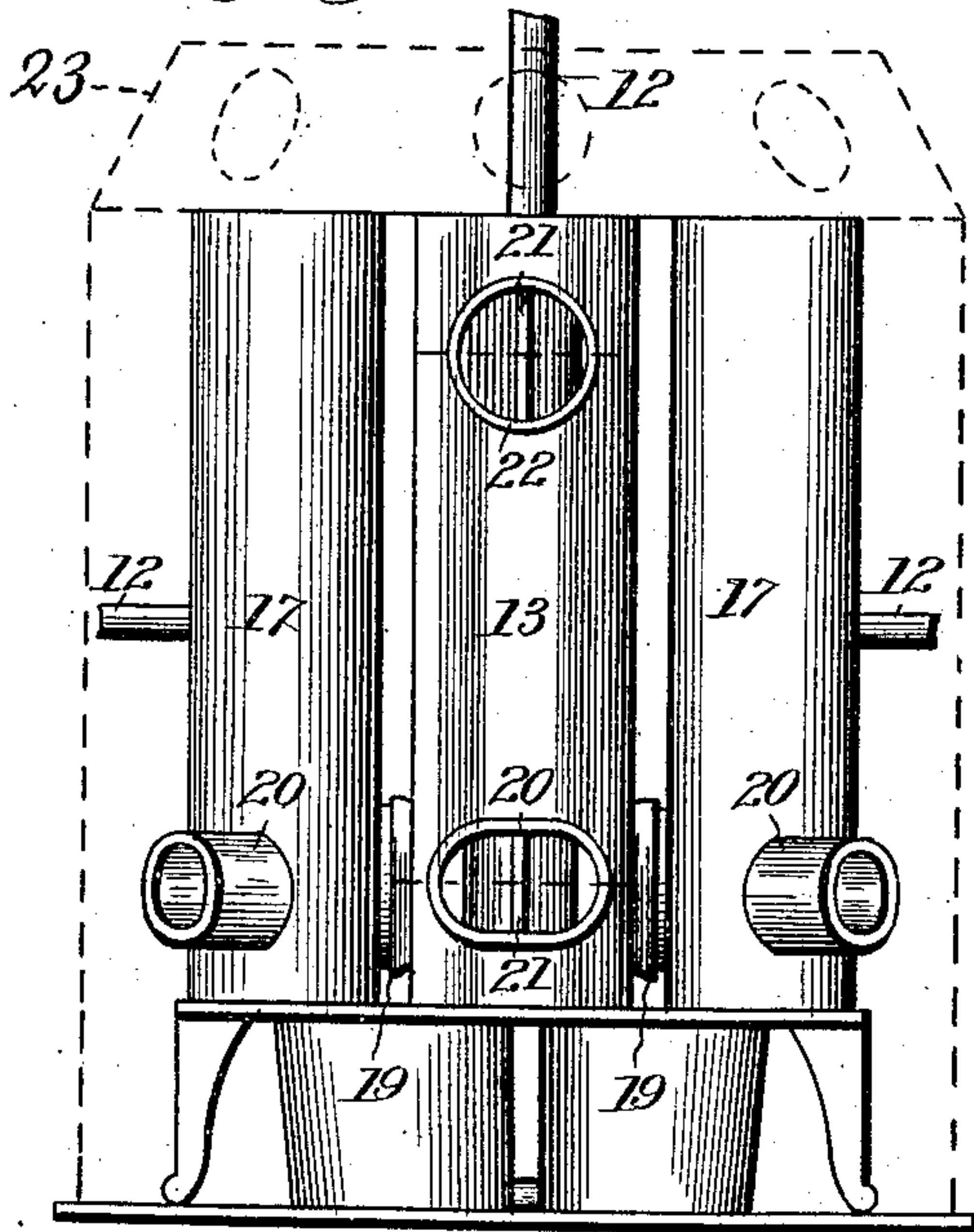


Fig. 6.

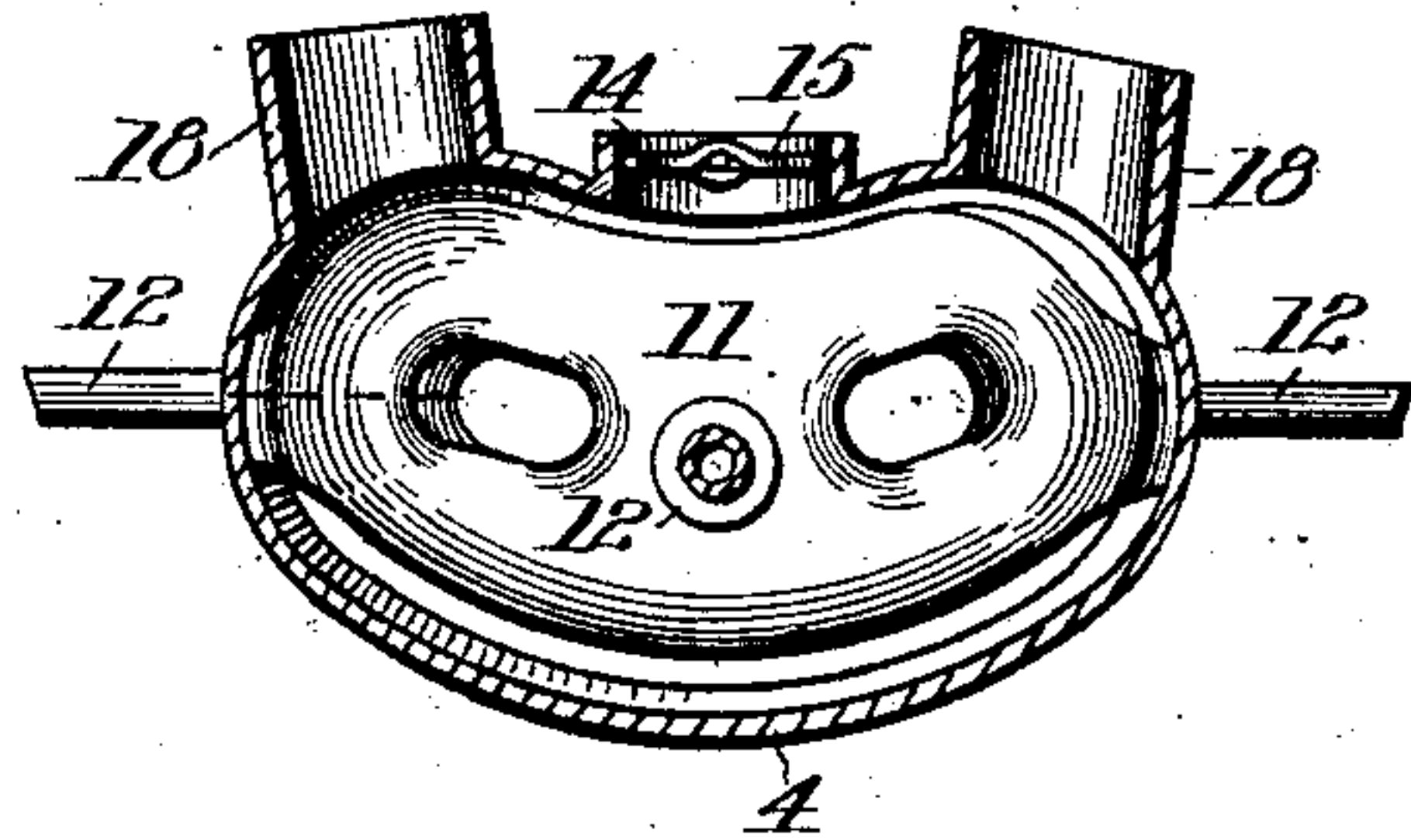


Fig. 11.

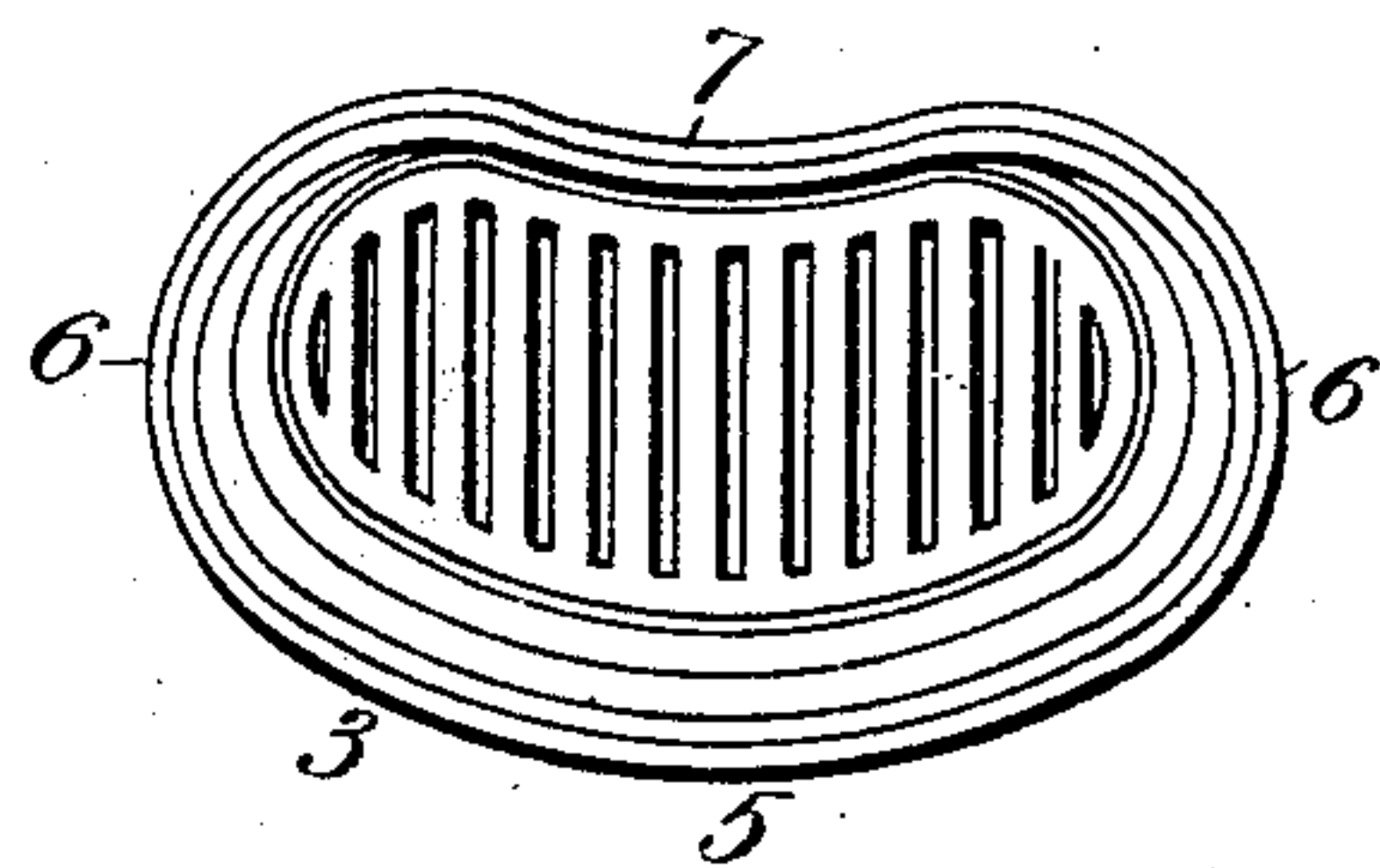


Fig. 7.

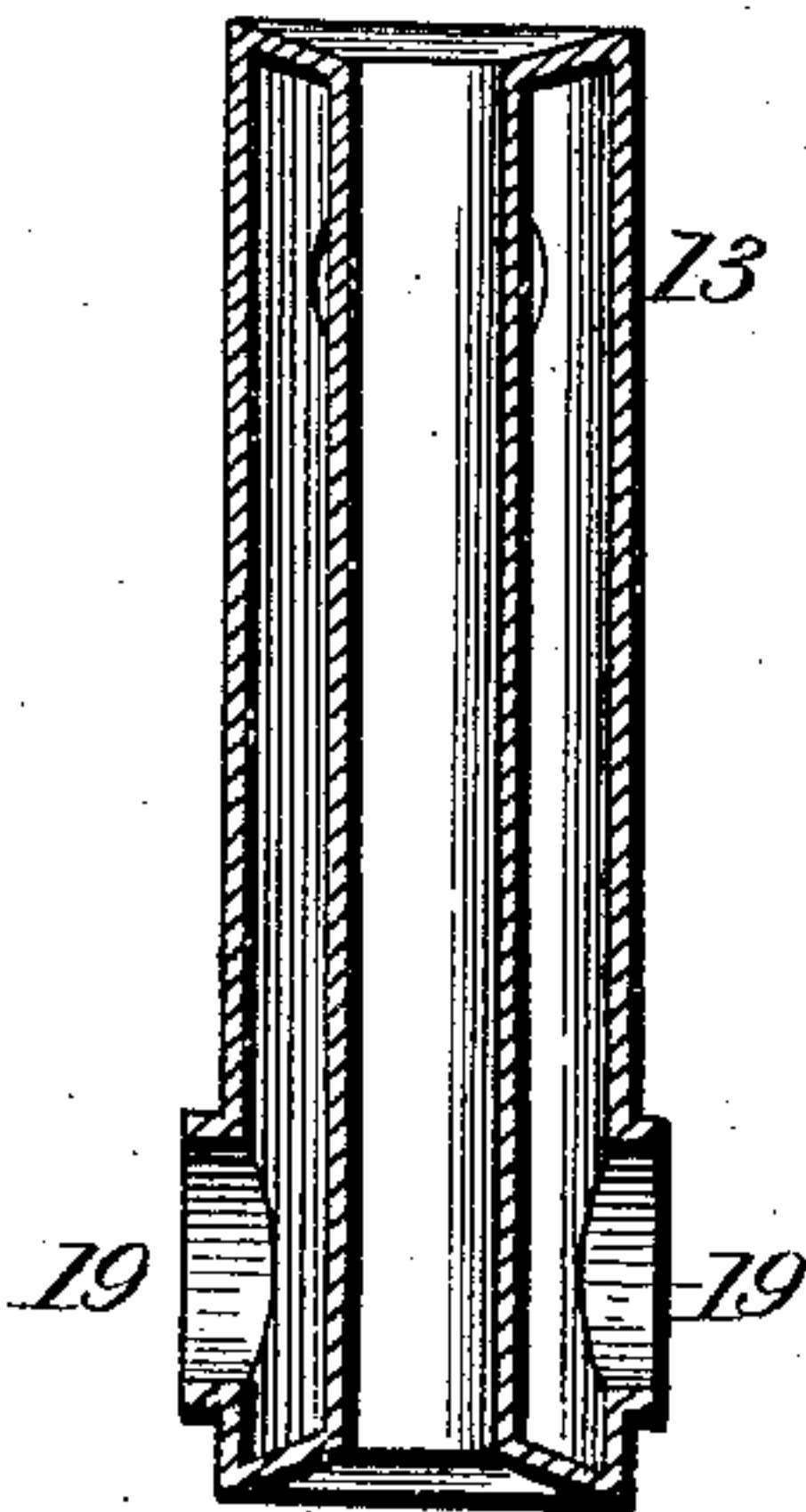


Fig. 9.

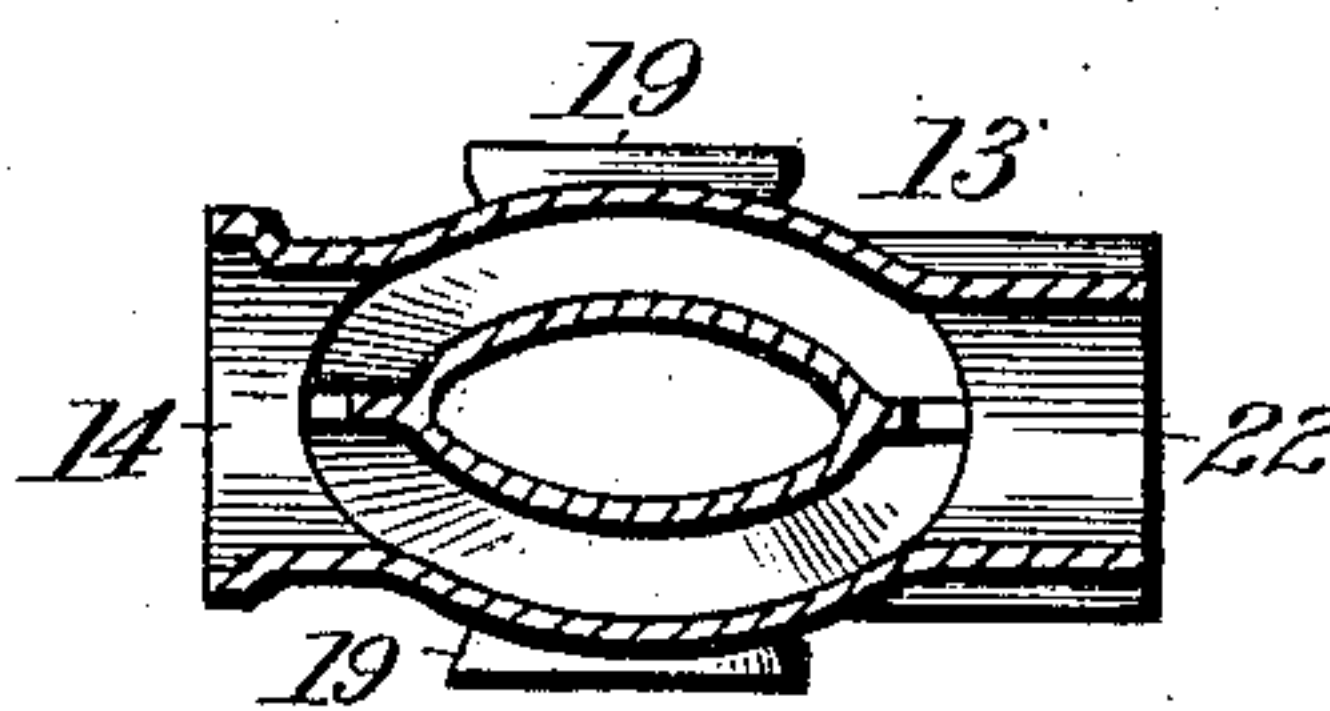


Fig. 10.

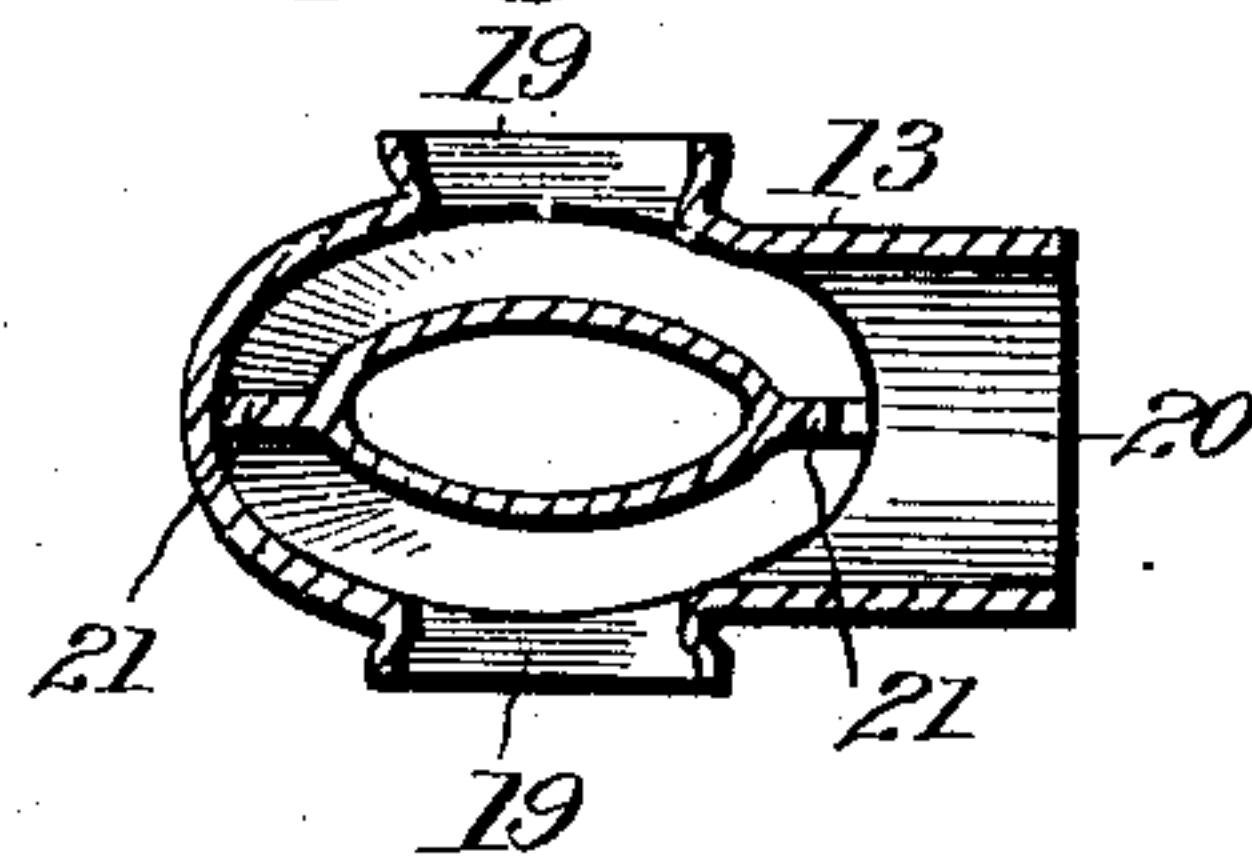
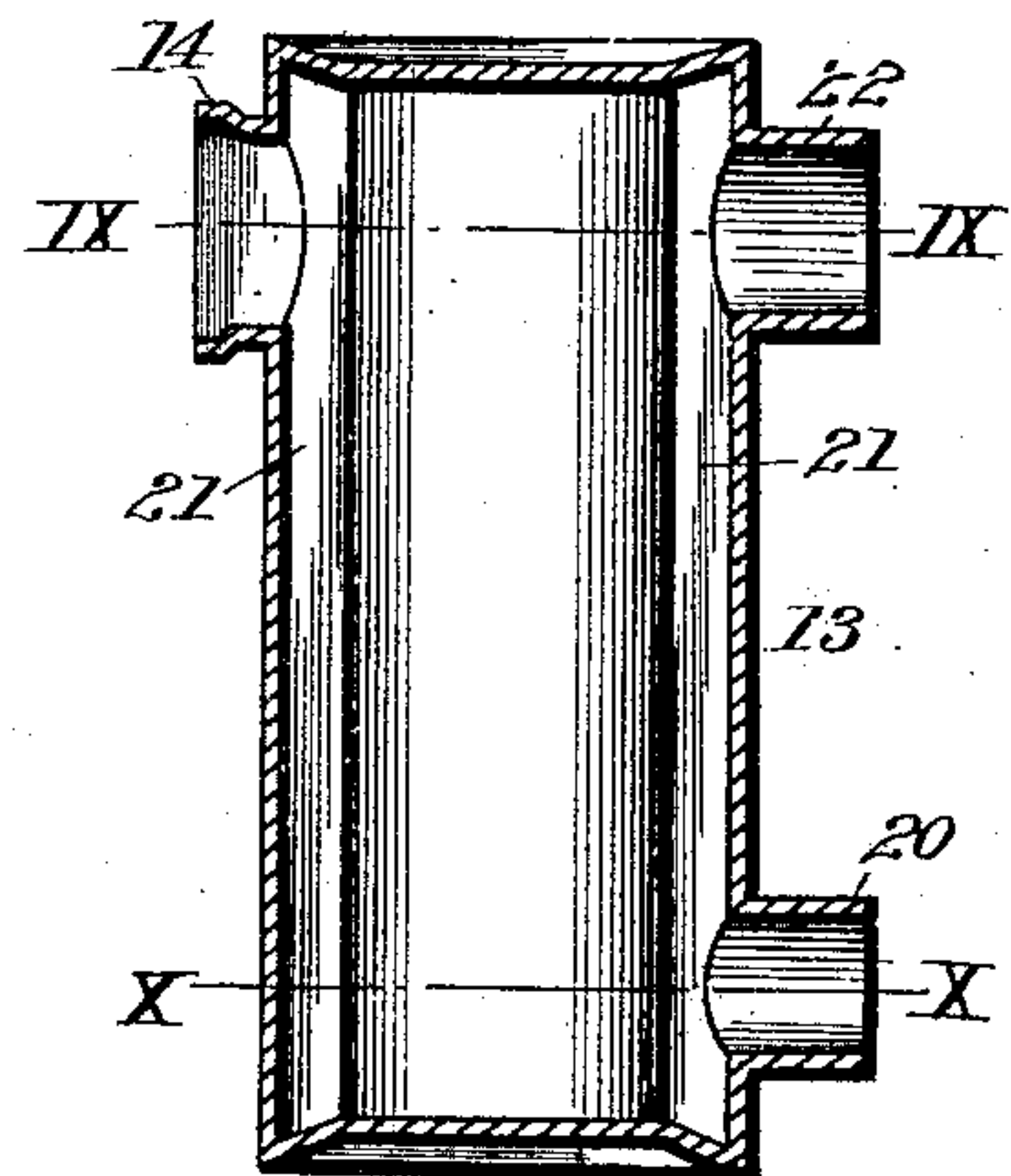


Fig. 8.



WITNESSES:

C. H. Walker
R. J. Hauey

INVENTOR,

Lemuel J. Bair

By

W. B. Corwin Attorney.

UNITED STATES PATENT OFFICE.

LEMUEL J. BAIR, OF STRASBURG, PENNSYLVANIA.

HOT-AIR FURNACE.

No. 845,607.

Specification of Letters Patent.

Patented Feb. 26, 1907.

Application filed March 30, 1905. Serial No 252,878.

To all whom it may concern:

Be it known that I, LEMUEL J. BAIR, a citizen of the United States, residing at Strasburg, in the county of Lancaster and State of Pennsylvania, have invented a new and useful Hot-Air Furnace, of which the following is a specification.

My invention relates to an improvement in hot-air furnaces, the object of the invention being to utilize to the greatest extent the heat from the products of combustion, thus producing economy in fuel, and also to produce a compact and durable furnace.

I shall now describe my invention so that others skilled in the art may manufacture and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation, Fig. 2 a side view, and Fig. 3 a top plan view, of my improved furnace. Fig. 4 is a vertical section on the line IV IV of Fig. 3. Fig. 5 is a rear elevation of the furnace. Fig. 6 is a horizontal section through the upper portion of the combustion-chamber with the water-heater shown in full lines. Fig. 7 is a vertical section of the central radiating-drum, taken on the line VII VII of Fig. 3. Fig. 8 is a similar section of the same drum, taken at right angles to that of Fig. 7. Fig. 9 is a horizontal section on the line IX IX of Fig. 8. Fig. 10 is a similar section on the line X X of Fig. 8. Fig. 11 is a top plan view of the fire-pot of the furnace.

Like symbols of reference indicate like parts in each figure of the drawings.

In the drawings the furnace portion of the structure is shown as composed of an ash-pit 2, a fire-pot 3, and a combustion-chamber 4, surmounting the fire-pot. The general shape in cross-section of these three parts is substantially the same, being that illustrated in Figs. 6 and 11. In Fig. 11 the front and side walls 5 and 6 of the fire-pot 3 are substantially elliptical in form; but the rear wall 7 is curved inwardly, the purpose of which will be hereinafter referred to.

8 is the usual entrance to the ash-pit, and 9 is the doorway for feeding fuel to the fire-pot, these two parts being connected by the ordinary dust-flue 10. The doorway 9 is provided with a door (not shown) of any suitable character.

Suspended in the upper portion of the combustion-chamber 4 is a water-heater 11,

having the usual supply and circulating pipes 12 connected thereto. Located in the rear of the furnace-chamber is a central annular radiating-drum 13, elliptical in outline with its longer diameter extending substantially at right angles to the longer diameter of the furnace-chamber. The drum 13 has a direct connection with the combustion-chamber by means of the flue 14, provided with a damper 15, connected to an operating-rod 16. At each side of the central drum 13 is a triangularly-shaped auxiliary drum 17, each auxiliary drum being connected at its upper end by means of a flue 18 with the combustion-chamber, and at its lower end by means of a flue 19 with the main drum 13. Each of the drums 13 and 17 is provided with the usual cleaning-out hole 20. 23 is the usual casing for the furnace.

Extending between the inner and outer walls of the drum 13 are partitions 21, dividing the drum into two chambers or compartments and compelling the gases coming from the drums 17 to traverse separate courses on their way to the exit-flue 22.

The operation of the furnace is as follows: In starting the furnace the damper 15 is opened, which will afford a direct draft for the products of combustion from the combustion-chamber through the flue 14 to the exit-flue 22 of the drum 13; but in the normal working of the furnace the damper 15 is kept closed, compelling the gases to pass out through the flues 18 down the drums 17, through the passage-ways 19, and up the two compartments of the drum 13.

The advantages of my invention will be appreciated by those skilled in the art. By making the fire-pot 3 of the peculiar shape shown and described its fuel capacity is less than a circular or elliptical form having the same surface area, but at the same time its heating surface remains the same, thus effecting a substantial economy in fuel without diminution of heating capacity. Also by making the combustion-chamber 4 of the same shape as the fire-pot, the central radiating-drum, also of elongated or elliptical shape and having its longer diameter extending substantially at right angles to the longer diameter of the fire-chamber, and the two side circulating-drums of substantially triangular form, an increase of radiating-surface is provided, giving a compact furnace with increased radiating capacity.

The inward or concave curvature of the inner walls of the fire-pot and combustion-chamber not only, as before mentioned, increases the heat-radiating surface of the same without increasing the consumption of fuel but also enables an elongated heating-drum, such as shown at 13, to be used, and the whole inclosed in a circular casing, whereas if a regular elliptical or circular form of fire-pot and combustion-chamber were employed the outer casing would necessarily have to be elongated, or if the circular form were preserved it would be unduly large and cumbersome, or compel the connections to be made so short that they would quickly burn out.

Modifications may be made in the form and details of construction of the various parts, without departing from my invention, since

What I claim is—

1. In a hot-air furnace, a fire-pot having one side convex and the opposite side concave, a combustion-chamber surmounting said fire-pot and being substantially of the same shape or outline in horizontal cross-section as the fire-pot, and a casing inclosing the fire-pot and combustion-chamber and affording an air-heating chamber, substantially as described.

2. In a hot-air furnace, a fire-pot three of whose sides are elliptical in outline, the fourth side being inwardly curved, a combustion-chamber surmounting said fire-pot and being substantially of the same shape or outline in horizontal cross-section as the fire-pot, and a casing inclosing the fire-pot and combustion-chamber, affording an air-heating chamber, substantially as described.

3. In a hot-air furnace, a fire-pot having one side convex and the opposite side concave, a combustion-chamber surmounting said fire-pot and being substantially of the same shape or outline in horizontal cross-section as the fire-pot, a radiating-drum of elongated form in cross-section situated on the concave side of the combustion-chamber, the longer diameter of said drum extending in a direction substantially at right angles to the longer diameter of the fire-pot and combustion-chamber, pipes connecting the said drum and combustion-chamber, and an outer inclosing casing, affording an air-heating chamber, substantially as described.

4. In a hot-air furnace, a fire-pot having one side convex and the opposite side concave, a combustion-chamber surmounting said fire-pot and being substantially of the same shape or outline in horizontal cross-section as the fire-pot, a radiating-drum situated on the concave side of the combustion-chamber, pipes connecting said radiating-drum and combustion-chamber, and an

outer inclosing casing affording an air-heating chamber, substantially as described.

5. In a hot-air furnace, a fire-pot, three of whose sides are elliptical in outline, the fourth side being inwardly curved, a combustion-chamber surmounting said fire-pot and being substantially of the same shape or outline in horizontal cross-section as the fire-pot, an annular radiating-drum of elongated form in cross-section situated on the concave side of the combustion-chamber, the longer diameter of said annular drum extending substantially at right angles to the longer diameter of the fire-pot and combustion-chamber, pipes connecting the said drum and combustion-chamber, and an outer inclosing casing affording an air-heating chamber, substantially as described.

6. In a hot-air furnace, a fire-pot three of whose sides are elliptical in outline, the fourth side being inwardly curved, a combustion-chamber surmounting said fire-pot and being substantially of the same shape or outline in horizontal cross-section as the fire-pot, an annular radiating-drum of elongated form in cross-section extending from the inwardly-curved side of the fire-pot and combustion-chamber with its longer diameter substantially at right angles to the longer diameter of the fire-pot and combustion-chamber, and two auxiliary radiating-drums connected at their upper ends by pipes to the upper end of the combustion-chamber and at their lower ends to opposite sides of the radiating-drum, and a circular outer inclosing casing; substantially as described.

7. In a hot-air furnace, a fire-pot three of whose sides are elliptical in outline, the fourth side being inwardly curved, a combustion-chamber surmounting said fire-pot and being substantially of the same shape or outline in horizontal cross-section as the fire-pot, an annular radiating-drum of elongated form in cross-section extending from the inwardly-curved side of the fire-pot and combustion-chamber with its longer diameter substantially at right angles to the longer diameter of the combustion-chamber and fire-pot and having division-plates at its ends extending between the inner and outer walls thereof, and two auxiliary radiating-drums connected by pipes at their upper ends to the upper end of the combustion-chamber and at their lower ends to opposite sides of the radiating-drum, and a circular outer inclosing casing; substantially as described.

In testimony whereof I have hereunto set my hand.

LEMUEL J. BAIR.

Witnesses:

W. R. ROHBACH,
E. JAY SHROY.