

No. 767,097.

PATENTED AUG. 9, 1904.

G. M. BEARD.
HOT AIR FURNACE.

APPLICATION FILED FEB. 13, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

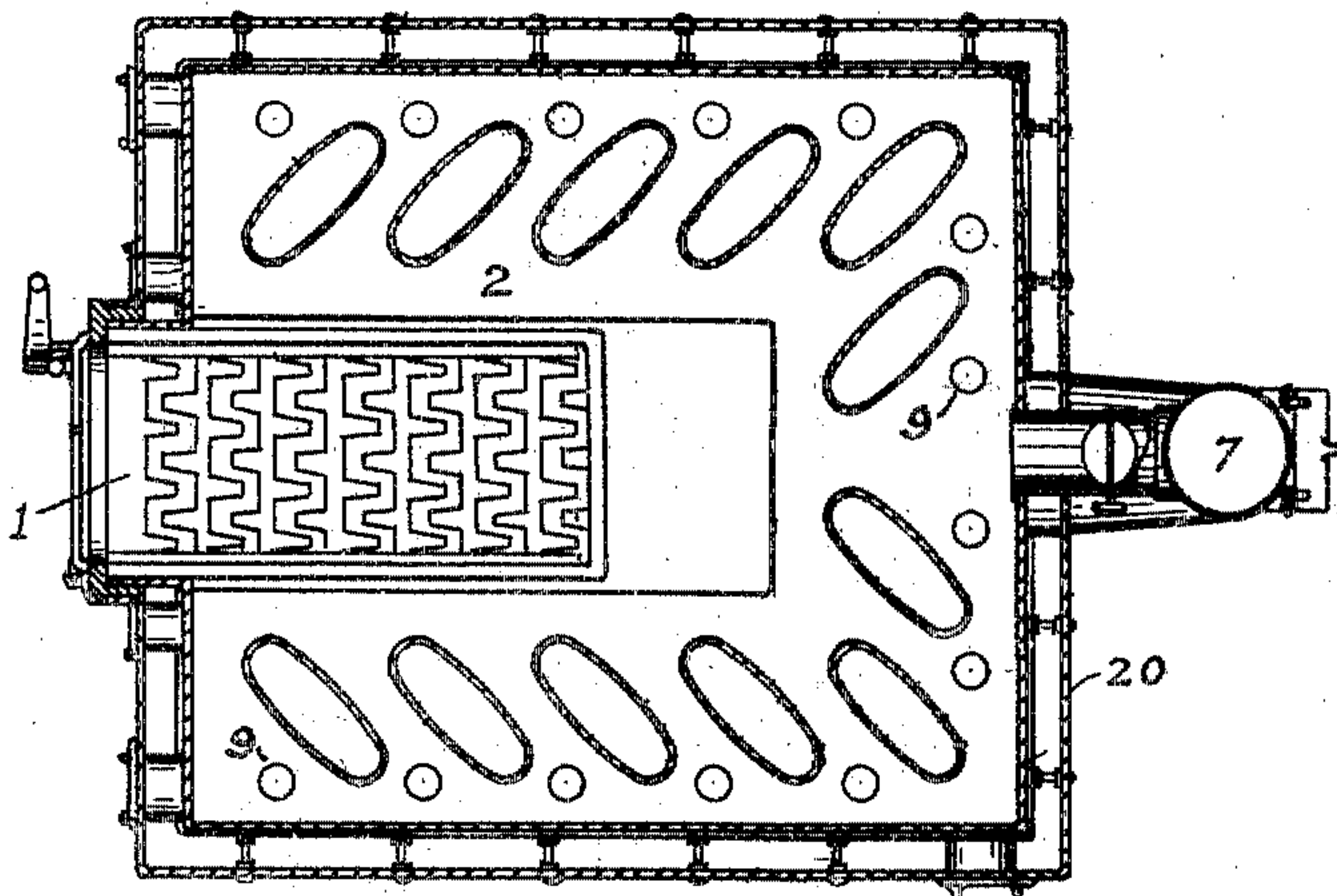
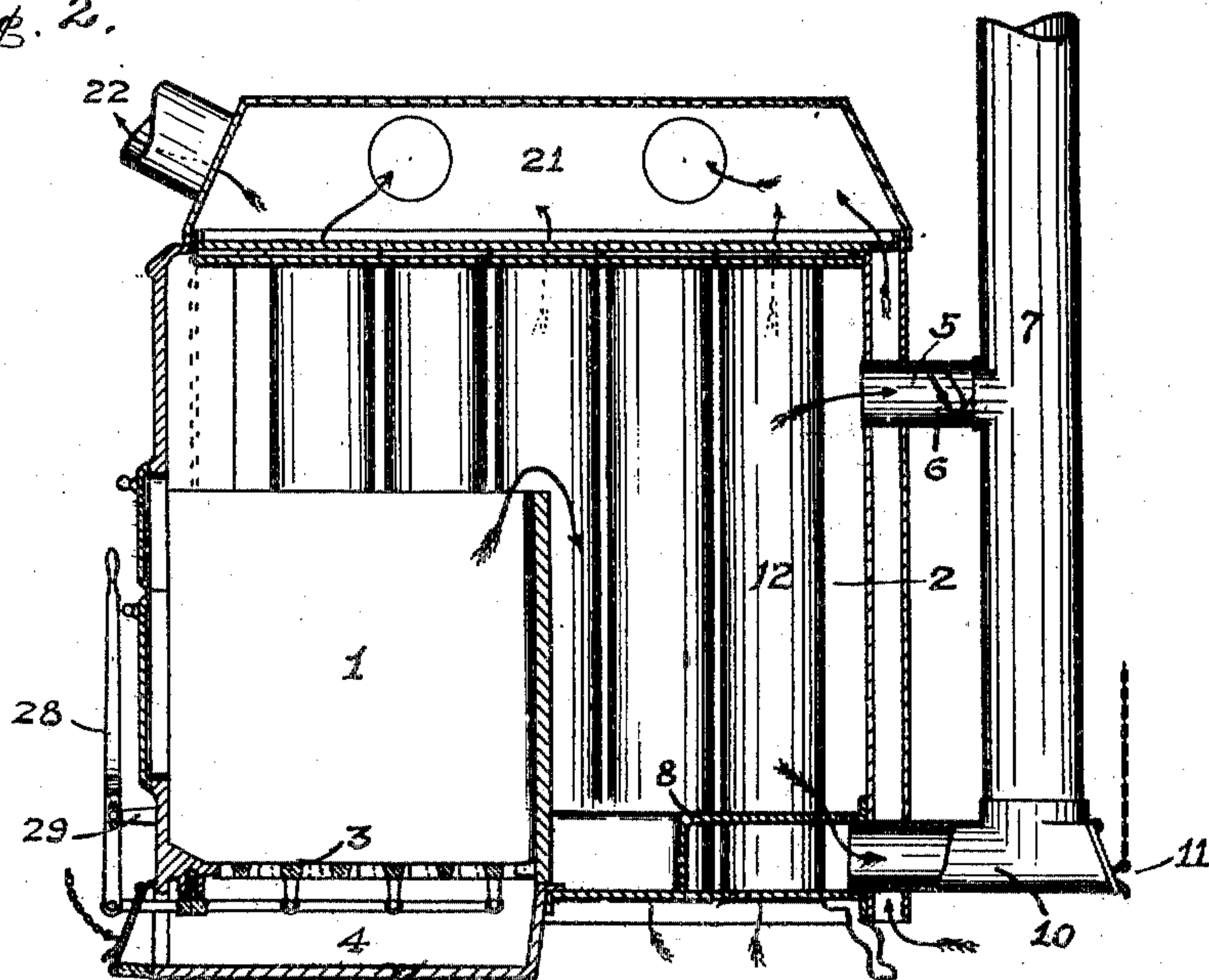


Fig. 2.



WITNESSES:

Edw. P. Prince
George Calvert

INVENTOR
George M. Beard

BY
Henry J. Pugh
ATTORNEYS

No. 767,097.

PATENTED AUG. 9, 1904.

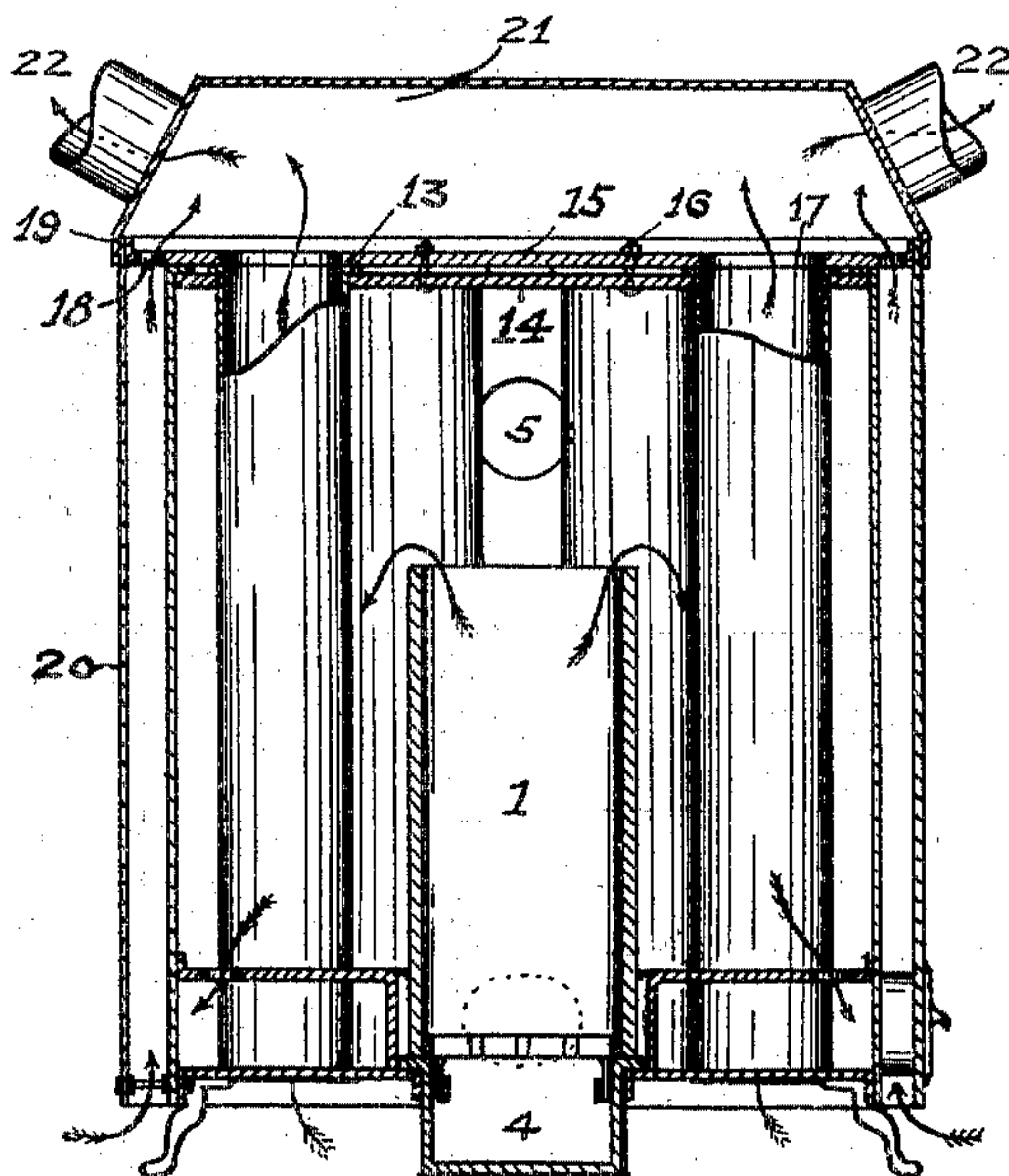
G. M. BEARD.
HOT AIR FURNACE.

APPLICATION FILED FEB. 13, 1904.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. 3.



WITNESSES:

Earl D. Rinde
George Calvert

INVENTOR

George M. Beard

BY

Henry V. Fong
ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORGE M. BEARD, OF ANGOLA, INDIANA.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 767,097, dated August 9, 1904.

Application filed February 13, 1904. Serial No. 193,414. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. BEARD, a citizen of the United States, residing at Angola, county of Steuben, and State of Indiana, have
 5 invented certain new and useful Improvements in Hot-Air Furnaces, of which the following is a specification, reference being had to the accompanying drawings.

This invention has relation to hot-air furnaces; and it consists in the novel construction and arrangement of its parts, as hereinafter shown and described.

The object of the invention is to provide a furnace having a fire-box which is surrounded by a smoke and heat chamber, said smoke and heat chamber having a series of vertically-arranged air-pipes leading therethrough and connecting at their upper ends with a hot-air chamber. The said smoke and heat chamber is surrounded by a jacket which is spaced from the said chamber, and cold air is adapted to pass up between said jacket and said chamber and is heated by coming in contact with the said smoke and heat chamber and enters
 25 the hot-air chamber. The bottom of the smoke and heat chamber is provided with an elevated partition having a number of perforations, and a smoke-outlet provided with a damper enters the said smoke and heat chamber at an elevated point thereof.

In the accompanying drawings, Figure 1 is a horizontal sectional view of the furnace. Fig. 2 is a vertical sectional view of the furnace. Fig. 3 is a transverse sectional view
 35 of the furnace.

The fire-box 1 is located in the forward end of the smoke and heat chamber 2, the said fire-box being open at its upper end and provided with the grate 3. The ash-pit 4 is located below said grate. The smoke-outlet 5 enters the said smoke and heat chamber 2, said outlet being provided with a damper 6 and connects with the flue 7. The partition 8 is located in the lower part of the smoke and heat chamber 2 and is provided with a number of perforations 9. The smoke-outlet 10 enters the smoke and heat chamber 2 below the said partition 8 and also connects with the flue 7. The said flue at or near its
 50 lowest point is provided with a check draft-

door 11. The air-pipes 12 pass vertically through the smoke and heat chamber 2, said pipes also passing through the partition 8. The said pipes are open at both ends and are made preferably elliptical in horizontal cross-section. The said pipes are arranged as shown in Fig. 1—that is, with the longest axes of the ellipses extending at acute angles to a line drawn from the front to the back of the fire-box 1—and the perforations in the partition are located between the ends of the adjacent pipes 12. The upper ends of the pipes 12 are provided with the external flanges 13, which are located on top of the diaphragm 14, which forms a portion of the heat and smoke chamber 2. The plate 15 rests on top of the flanges 13 and is bolted to the diaphragm 14, as at 16. The said plate 15 is provided with openings 17, which register with the upper ends of the pipes 12, and the edges of the said plate 15 project beyond the side walls of the smoke and heat chamber 2, and in such projections are provided the perforations 18. The extreme edges of the said plate 15 are flanged, as at 19, and to said flanges are secured the upper edges of the jacket 20. The said jacket 20 surrounds the said smoke and heat chamber 2 and is spaced from the same. The hot-air chamber 21 is located above the plate 15 and is provided with a number of heat-distributing pipes 22.

A description of the course of the air and the smoke and heat is as follows: A fire having been started in the fire-box 1, the flames pass out at the top of said box and enter the chamber 2. The said flames then pass around the pipes 12 and pass out through the outlet 5, the damper 6 of which having been previously opened. When the fire is well started, the damper 6 is closed, and the heat and smoke are then forced down through the perforations 9 into the outlet 10 and then out through the flue 7. While the fire is being started and after it has gained headway the cold air passes up through the pipes 12 into the hot-air chamber and cold air also passes up through the space between the jacket 20 and the walls of the chamber 2 through the perforations 18 into said chamber 21, where it is distributed through the pipes 22 to dif-

ferent parts of the building. The advantage of arranging the pipes 12 as shown in Fig. 1 is that the heat and smoke will pass from the fire-box 1 along the longer sides of the pipes 5 12 and out through the perforations 9. Thus the metal constituting the said pipes is afforded an opportunity to absorb the heat, which is taken up by the cold air passing through them.

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

1. A hot-air furnace consisting of a fire-box, a smoke and heat chamber inclosing the same, 15 said chamber having a suitable outlet, a perforated partition located in said chamber, air-pipes passing vertically through said chamber, said pipes being elliptical in horizontal cross-section, and being arranged with the longer 20 axes of the ellipses at acute angles to a line extending from the front to the back of said fire-box, the said longer axes of the ellipses on each side of said line being parallel, the perforations of the partition being located between 25 the air-pipes.

2. A hot-air furnace consisting of a fire-box,

a smoke and heat chamber inclosing the same, a perforated partition located in said chamber, said chamber having outlets above and below said partition, and vertically-arranged 30 air-pipes passing through said chamber and said partition, the perforations in said partition being located between said pipes.

3. A hot-air furnace consisting of a fire-box, a smoke and heat chamber inclosing the same 35 and having suitable outlets, vertical air-pipes passing through said chamber and being flanged at their upper ends, a diaphragm forming a portion of the top of the chamber and receiving the upper ends of said pipes 40 and being located below the flanges thereof, and a plate located above said flanges and having openings registering with the upper ends of said pipes and being connected with said diaphragm. 45

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

GEORGE M. BEARD.

Witnesses:

STEPHEN A. POWERS,
MABEL BEARD.