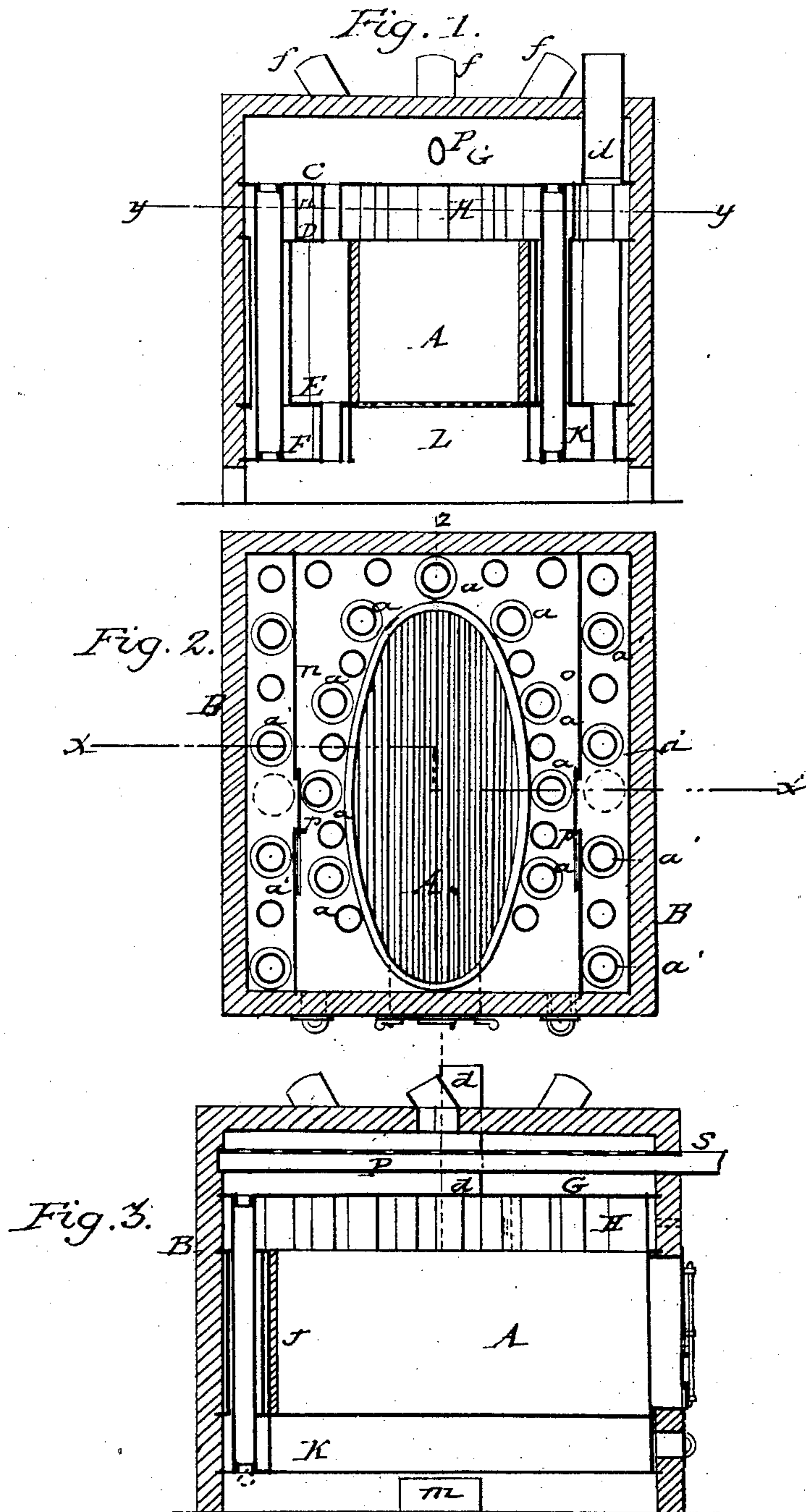


H. G. BURR.
Hot-Air Furnace.

No. 76,397.

Patented April 7, 1868.



WITNESSES:
Thos. Fische
J. A. Service

INVENTOR:
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United States Patent Office.

H. G. BURR, OF MINNEAPOLIS, MINNESOTA.

Letters Patent No. 76,397, dated April 7, 1868.

IMPROVEMENT IN HOT-AIR FURNACES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, H. G. BURR, of Minneapolis, Hennepin county, Minnesota, have invented new and useful Improvements in Hot-Air Furnaces; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and improved method of constructing hot-air furnaces for warming buildings, and it consists in an arrangement of vertical flues and tubes, and horizontal plates, whereby the heat-radiating surface of the furnace is greatly increased.

Figure 1 represents a front sectional elevation of the furnace through the line *x x* of fig. 2.

Figure 2 is a horizontal section through the line *y y* of fig. 1.

Figure 3 is a vertical section through the line *z z* of fig. 2.

Similar letters of reference indicate corresponding parts.

A represents the fire-box or furnace proper, which is oval in form and surrounded by vertical tubes and flues. B represents the furnace-wall.

As represented in fig. 1, this hot-air furnace is divided into four compartments, by four horizontal plates or partitions, marked C, D, E, and F, and the compartments are marked G, H, J, and K. G is the hot-air chamber, H is the combustion-chamber, J is the air-heating chamber; and K encloses the ash-pit, L, and into which the products of combustion pass, through diving-flues, as will be described.

The air enters the furnace from without, through apertures, *m*, in the wall, below the tubes, and is discharged by the tubes into the hot-air chamber G, being heated on its passage upwards through the tubes.

The top of the fire-box is open to the combustion-chamber H, and the products of combustion spread through this chamber, but, as seen in fig. 2, there are two vertical plates or partitions, which divide this combustion-chamber into three compartments. These plates are marked *n* and *o*. *a* represents annular diving-flues, which surround many of the air-tubes, and through which the products of combustion pass from the chamber H to the chamber K, and from thence upward through outside annular flues, marked *a'*, back into the two outside compartments of the combustion-chamber H.

The flues, which conduct the smoke and gases from the chamber H, pass up through the hot-air chamber G. The apertures from which they start are seen in dotted lines in fig. 2, and one of the flues is also seen in figs. 1 and 3, marked *d*. There are apertures through the dividing-plates *n* and *o*, which are closed by slides, marked *p*, but through which a portion of the products of combustion may pass when the slides are drawn back, and which might be desirable for the purpose of increasing the draught through the fire-box.

The fire-box is protected by fire-brick within the chamber J, and the partition plates are made of cast iron or some equivalent material.

The walls of the furnace, B, may be constructed of masonry. P (seen in fig. 3) is a water-tube, which passes through the hot-air chamber, and is perforated with holes through its upper side, as seen. One end of this tube passes through the wall, to which end is attached a water-vessel marked *s*. Water is poured into this vessel, and passes through the tube, from which it is evaporated. The vapor passes off through the holes in its upper side, and mingles with the air, thus moistening it, and rendering it fit for respiration. The hot air is discharged from the chamber G through the pipes *f*, seen on the top of the furnace.

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

1. The arrangement and combination of the chambers G, H, J, and K, in a hot-air furnace, substantially as shown and described.

2. I claim the annular flues *a* and *a'*, in combination with the chambers H and K, as and for the purposes set forth.

The above specification of my invention signed by me, this 4th day of April, 1867.

H. G. BURR.

Witnesses:

J. S. BURD,

S. P. SPEAR.