J. WHITEHILL.

Hot Air Furnace.

No. 26,064. Patented Nov. 8, 1859.

Fig. 3

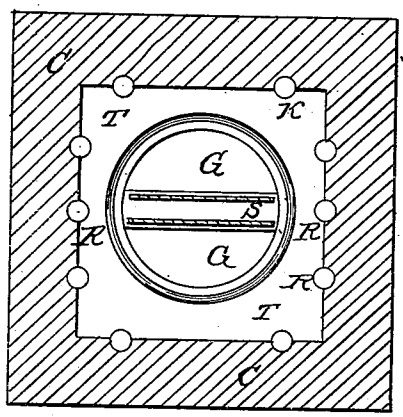


Fig. 1

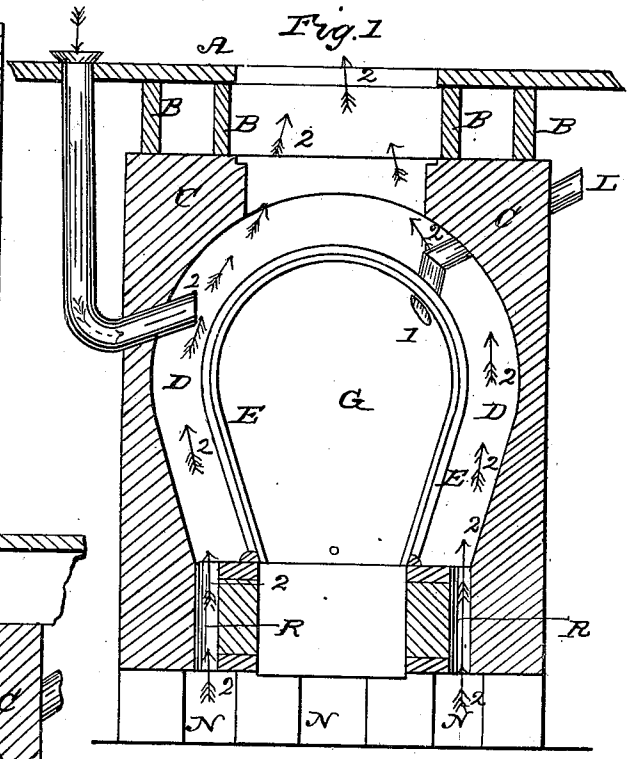


Fig. 2

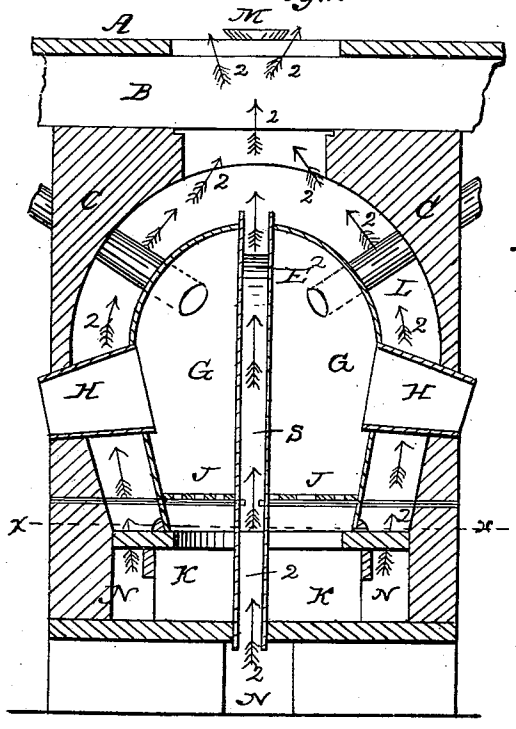
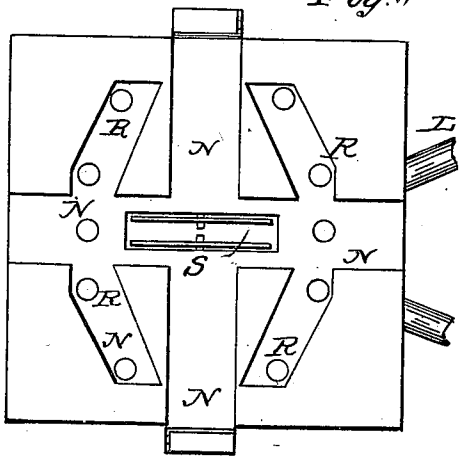


Fig. 4



Witnesses
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UNITED STATES PATENT OFFICE.

JAMES WHITEHILL, OF FREDERICK, MARYLAND.

IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **26,064**, dated November 8, 1859.

To all whom it may concern:

Be it known that I, JAMES WHITEHILL, of Frederick, in the county of Frederick and State of Maryland, have invented a new and useful Improvement in Hot-Air Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a vertical section through the middle of the furnace; Fig. 2, the same at right angles to section Fig. 1; Fig. 3, a horizontal section in the red line *x x* of Fig. 2, and Fig. 4 an inverted plan of labyrinthian air-passage with apertures to the air-chamber.

Similar letters of reference in each of the several figures indicate corresponding parts.

The nature of my invention consists, first, in a furnace constructed with two separate fire chambers and grates, with an air-passage between the chambers, closed at the sides, but open at the bottom and top.

It consists, secondly, in the combination, with the peculiar construction of furnace herein described, of the peculiar construction of labyrinthian air-passage, in the manner and for the purpose hereinafter set forth.

It consists, thirdly, in the combination, with the peculiar construction of furnace and labyrinthian air-passage, of the curved cold-air pipe, in the manner and for the purpose herein described.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A represents the floor of the room to be warmed; B, the joists upon which the floor rests; C, brick walls inclosing the furnace; D, air-chambers between the brick walls and furnace; E, flanges upon the edge of the iron castings of the sides or walls of the fire-chambers. Between these chambers, on each side, are castings the width of the air-passage between the chambers, with similar flanges on each side, and by means of screw-bolts, these flanges upon the castings upon the fire-chambers, and those upon the castings between them, the chambers are held in the proper relative position to each other.

F are side walls of the fire-chambers; G G, fire-chambers; H H, passages for the supply of fuel; J J, grates; K K, ash-chambers; L L, smoke-pipes; M, cold-air pipe leading from the room to be warmed to the hot-air chamber D; N N, labyrinthian air-passages; R R, openings from the air-passages into the air-chamber surrounding the fire-chambers; S, air-passage between the fire-chambers. This passage is closed at the sides to avoid any conflicting currents of air.

T is a cast-iron bed-plate, upon which rests the furnace or walls F of the fire-chamber and the grates J.

The floor of the ash-chamber may be cast large enough for the brick walls to rest upon it, and the walls of the labyrinthian air-passage cast with it, which, with cast-iron feet at each corner, would support the whole; or the brick walls inclosing the furnace may start from the ground or floor and the walls of the air-passage be made of brick also. In the passage of the heated air from the air-chamber, pipes may be used to convey it to distant rooms, as it may pass immediately up to the room above the furnace.

In the operation of this furnace it will be seen that after the fire is kindled the strongest upward current of air will be through the air-passage I between the fire-chambers, in consequence of the greater rarefaction there by the heat from both sides of the air-passage, while in the air-chamber between the brick walls and the furnace the heat is only on one side. By this stronger upward current in the middle increased draft is given to the air through the cold-air pipe leading from the room to be warmed, thus at the same time taking out the cold air in the room and returning it warmed by its passage through the heated air-chamber. This draft through the cold-air pipe is also aided by the upward current of the air coming in through the opening R R from the labyrinthian air-passage. By this passage it will be seen that there are openings to the air-chamber for drafts of air from each of the four sides; and come from whichever direction it may, or from each, the course that it takes, and the number of apertures through which it enters the air-chamber, the supply must be uniform, and not subject to the extremes of drafts of the furnaces heretofore in use from strong currents in one peculiar direction.

Another important feature in this furnace is that in moderate weather, when but little fire is required, only one grate and fire-cham-

ber may be used, by which fuel is economized and the danger of overheating the house avoided. With only one fire-chamber in use the same uniformity is obtained as when both are used.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A furnace constructed with two separate fire-chambers and grates, with an air-passage between the chambers, closed at the sides, but open at the bottom and top, substantially as and for the purposes set forth.

2. The combination of the peculiar labyrinthian air-passage described with the peculiar furnace described, in the manner and for the purpose set forth.

3. The combination, with the peculiar furnace and peculiar labyrinthian air-passage herein described, of the curved cold-air pipe M, substantially in the manner and for the purpose set forth.

JAMES WHITEHILL.

Witnesses:
EDW. TRAIL,
GEO. W. HAYES.