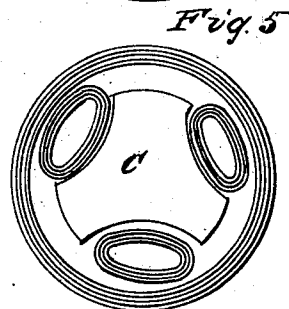
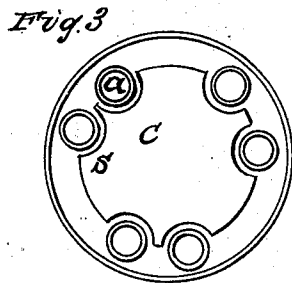
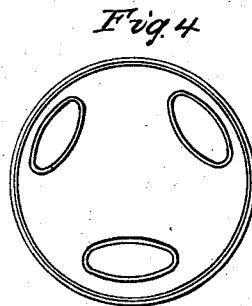
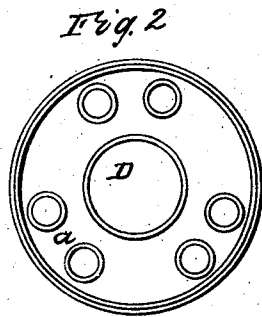
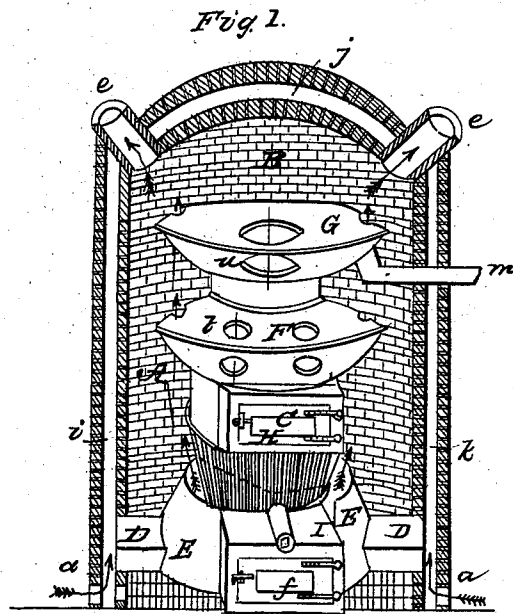


T. W. CHATFIELD.
Hot-Air Furnace.

No. 10,700.

Patented March 28, 1854.



UNITED STATES PATENT OFFICE.

THOMAS W. CHATFIELD, OF UTICA, NEW YORK.

IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. 10,700, dated March 28, 1854.

To all whom it may concern:

Be it known that I, THOMAS W. CHATFIELD, of the city of Utica, in the county of Oneida and State of New York, 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 construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is an exterior elevation of the furnace standing within the usual double-walled inclosure, the front of which is here cut away, so as to exhibit the furnace. Figs. 2, 3, 4, and 5 are face views of the separate parts of the radiators F and G, Fig. 1, showing the interior thereof.

The space A B, Fig. 1, is the hot-air chamber. *e e* are the issues for the heated air, and *m* the smoke-pipe.

i j k is the cold-air chamber.

c is the door for feeding the furnace, and *f* that of the ash-pit.

H is the fire-pot, the ash-pit being underneath it.

The usual circular grate is located at the bottom of the fire-pot H, which is moved in the usual manner through its projecting shaft I. All these parts are arranged substantially in the known and usual manner.

The novelty consists in the arrangement D E D E for introducing the cold air, and in the radiators F and G for distributing the heat. The object of this new arrangement for introducing the cold air is to confine it more closely to the heated surfaces of the ash-pit and the lower part of the fire-pot H, in order the more effectually to absorb the heat of those surfaces. The conical inclosure E E is for this purpose thrown round the ash-pit and within a few inches thereof and extending a little above the bottom of the fire-pot H, as here shown.

The conductors D D receive the cold air from the chamber *i k* and deliver it within the inclosure E E, where it receives with great advantage the heat radiated from the surface of the ash-pit and bottom portion of the fire-pot, from whence a favorable direction is given to it in its ascent around the body of the furnace.

Each of the conductors D D is constructed in connection with a segment of the conical inclosure E E. The conductors occur at sev-

eral other points in the rear, (not here seen,) so that when they are put into the wall, as here shown, they form the circular inclosure E E quite round the ash-pit, with the exception of the space occupied by the doorway in front. They may be constructed of sheet metal or may be cast solid, each including a conductor D and a segment of the inclosure E E, as before described.

The cold air is introduced into the cold-air chamber in the usual manner through the apertures *a a* at the base of the outer inclosure, or it may be introduced at any other point in this inclosure, as may be found convenient.

The elliptical radiators F and G successively receive the heat as it rises from the interior of the furnace, and they are so constructed as to evolve the same in its passage in such a manner as to keep it as much as possible in contact with the outer plates of the radiators. They are each formed of two semi-elliptical plates, so that when put together, the concave side of each being inward, they form an elliptical box, as seen in the figure. A proper groove or channel is cast in the rim of the lower half to receive the edge of the upper, thus forming by the use of ashes or sand an air-tight joint.

Figs. 2 and 3 show the inside of the two halves of the radiator F, Fig. 1, and Figs. 4 and 5 show the same as to the radiator G.

The orifices *t u*, Fig. 1, represent tubes that pass vertically through the radiators for the free passage of the air and to increase the radiating surfaces. They do not communicate with the interior of the furnace, but are for the circulation of the heated air only. They are cast in short tubes on the inside of the two opposite plates, and when the plates are put together these also close by a tight joint in the manner described for the plates themselves. These tubes are more distinctly shown in the reverse faces of the separate halves of the radiators in Figs. 2, 3, 4, and 5. It will be seen that they are larger and of an oval form in the upper radiator, Figs. 4 and 5. This is for the purpose of meeting the expansion of the air as it becomes more rarefied in ascending and to afford still greater surface for radiating the heat.

The plates shown in Figs. 3 and 5 represent the lower halves of the radiators F and G, Fig. 1. They have central orifices like that seen at D, Fig. 2, for the passage of the draft

air and heat from the furnace below. These orifices are, however, covered here by the loose irregular plates CC, Figs. 3 and 5. These plates are laid upon the top of small posts cast on the under plates of the radiators, and they lie about midway in the interior space of the radiators horizontally. The office of these loose plates is to spread the draft air and heat as it rises into the radiators, and to keep it as much as possible in contact with the metal plates of the radiators.

Having thus fully described the hot-air furnace with my improvement therein, what I claim as my invention, and desire to secure by Letters Patent, is—

The radiators F and G, constructed as described and for the purposes described, the whole being arranged and combined substantially in the manner above set forth.

I am aware of the patents of Gordon Fox, patented in 1843, and of G. Walker, patented in 1844. I do not claim anything contained in either of those patents, but only those points and contrivances wherein I have improved upon both of those patents, as set forth in the foregoing specification.

THOMAS W. CHATFIELD.

Witnesses:

WM. BAKER,

WILLIAM R. ANTHONY.