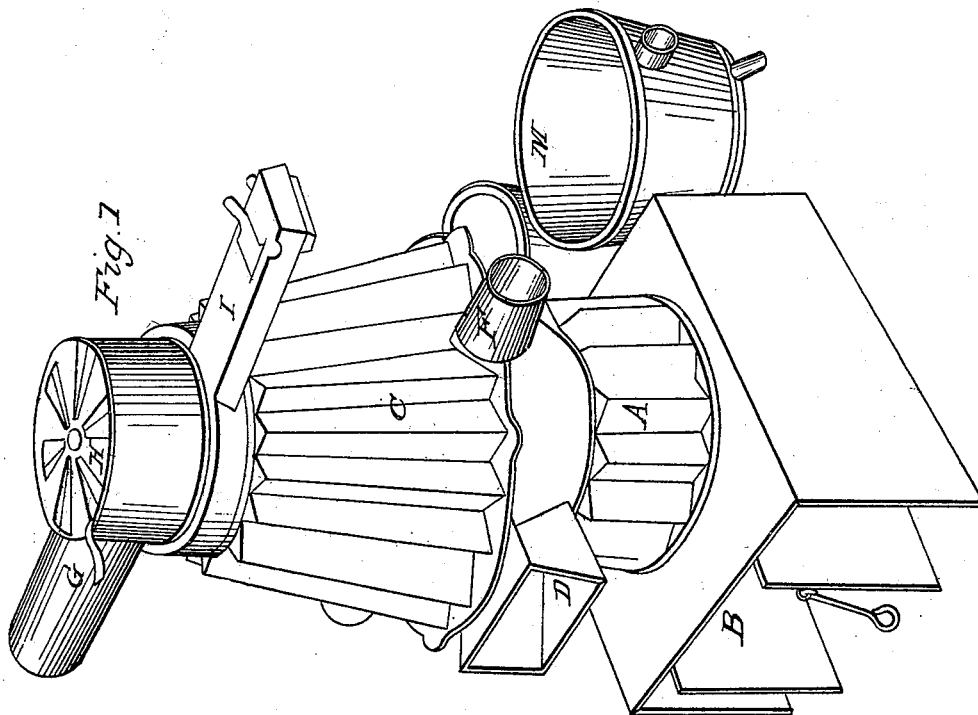
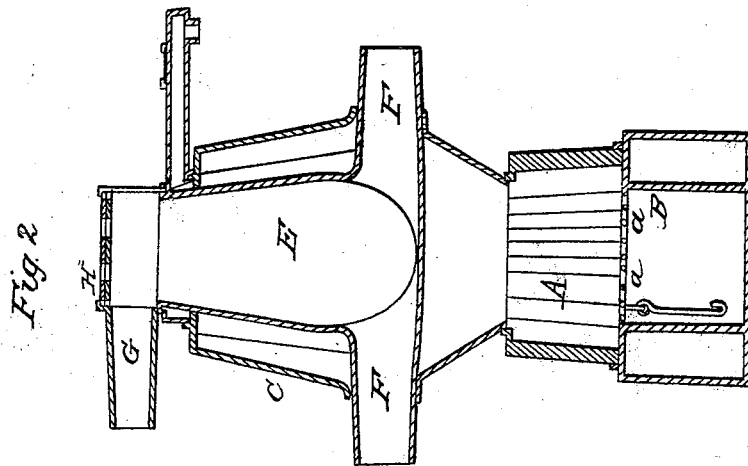


E. BARROWS.
Hot Air Furnace.

2 Sheets—Sheet 1.

No. 4,301.

Patented Dec. 11, 1845.

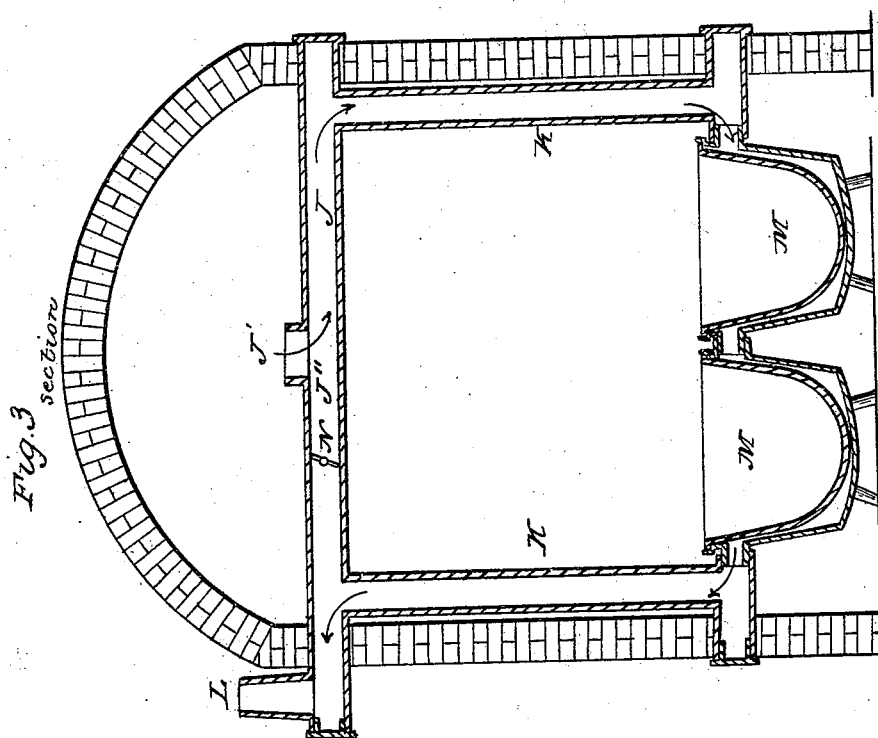


E. BARROWS,
Hot Air Furnace.

2 Sheets—Sheet 2.

No. 4,301.

Patented Dec. 11, 1845.



UNITED STATES PATENT OFFICE.

EBENEZER BARROWS, OF NEW YORK, N. Y.

AIR-HEATING FURNACE.

Specification of Letters Patent No. 4,301, dated December 11, 1845.

To all whom it may concern:

Be it known that I, EBENEZER BARROWS, of the city of New York, in the State of New York, have invented certain new and useful Improvements in the Manner of Constructing Air-Heating Furnaces for the Warming of Buildings; and I do hereby declare the following is a full and exact description thereof.

10 The general constructing of my air heating furnace is the same with those now in use; but I have added thereto an apparatus by means of which, apartments on the same level with that containing the hot air furnace may have warm air introduced into them without interfering in any degree with the supply that is given to apartments on a higher level; the supply of air to be heated and the tubes through which it is conducted into the lower apartment being independent in their action on the general tubes of conveyance, although heated by the same fire.

I have also made an improvement in the manner of constructing and arranging an evaporating and radiating apparatus, by means of which a large portion of water may be evaporated and conveyed into the rooms to be warmed along with the heated air, such evaporation being effected principally by that heat which as such furnaces have been heretofore constructed, is allowed to run to waste, it being generally found that the air passing from the chimney is in a highly heated state, while under my arrangement the amount of waste heat is much reduced.

In the accompanying drawing, Figure 1 is a perspective representation of my furnace, separate from the chamber within which it is to be contained. Fig. 2 is a vertical section through its center, and Fig. 3 a section through that part of the air heating chamber which contains the evaporators or radiators.

In each of these figures where the same parts are represented they are designated by the same letters of reference.

A is the fire chamber of the furnace, B the ash-pit and *a, a*, the grate bars.

C is the body of the furnace above the fire chamber, and D the opening for feeding the fire, which is closed by a door in the ordinary way.

55 The castings A, and C, are shown as corrugated for the purpose of increasing the

radiating surface and of admitting a free expansion and contraction of these parts.

Within the chamber C, of the furnace I place a large air heating vessel, or retort E into which cold air is to be admitted from without, for the purpose of being heated, and from which it is to be conducted when required to rooms on a level with the furnace chamber.

F, F, are tubes communicating with the external air, and leading into the retort E. A single tube may if preferred, be used for introducing the cold air.

G is a tube proceeding from the upper part of the retort for the conveyance and distribution of the air which has been heated therein, which air may be conducted off horizontally or otherwise. On the upper part of the retort E, there is a revolving or other register H, which may be opened when the air that is heated in said retort is not required to be conveyed through the tube G; it will then commingle with that in the general heated air-chamber, and constitute a part thereof.

I is the escape pipe leading immediately from the furnace, for carrying off the gaseous products of combustion; this connects with the pipes J J Fig. 3 at J' and the portion J'' being closed by a damper N the draft will be through the pipes K, K, in the direction indicated by the arrows and will be conveyed into the chimney at L. When the damper in J'' is open the heated air will pass directly to the pipe L. Between the pipes K, K, and resting on the floor of the heated air chamber, are the evaporators M, M. I have represented two of these, but one only may suffice. These evaporators are double vessels the space between them constituting a portion of the flue. I have made the inner vessels with a capacity of twenty-five gallons each; but this may be governed as circumstances and experience may dictate. By placing these evaporators at the bottom of the air chamber they are situated below the level of the fire, and receive but little direct heat from it by radiation; and this may be lessened by interposing a screen between them and the furnace, it being the intention that the heat by which the water is evaporated shall be that which passes between the double vessels, and which would otherwise escape by the chimney. It has been found in practice that at the point of final escape the cooling

influence of the evaporators is such that the hand may be borne on the pipe without difficulty.

5 The advantage resulting from the employment of the vessels M, M, is not limited to their operation as evaporators for if they were not supplied with water they would still operate as radiators; their large surface serving to deprive the air passing
10 through them of its heat and communicating it to the air within the general chamber.

Having thus fully described the nature of

my improvements in the air heating furnace, what I claim as new therein, and desire to secure by Letters Patent is—

15

Combining with such a furnace the evaporating and radiating vessels, or vessel M, arranged, combined and operating—substantially in the manner and for the purpose herein made known.

EBENEZER BARROWS.

Witnesses:

THOS. P. JONES,

EDWIN L. BRUNDAGE.