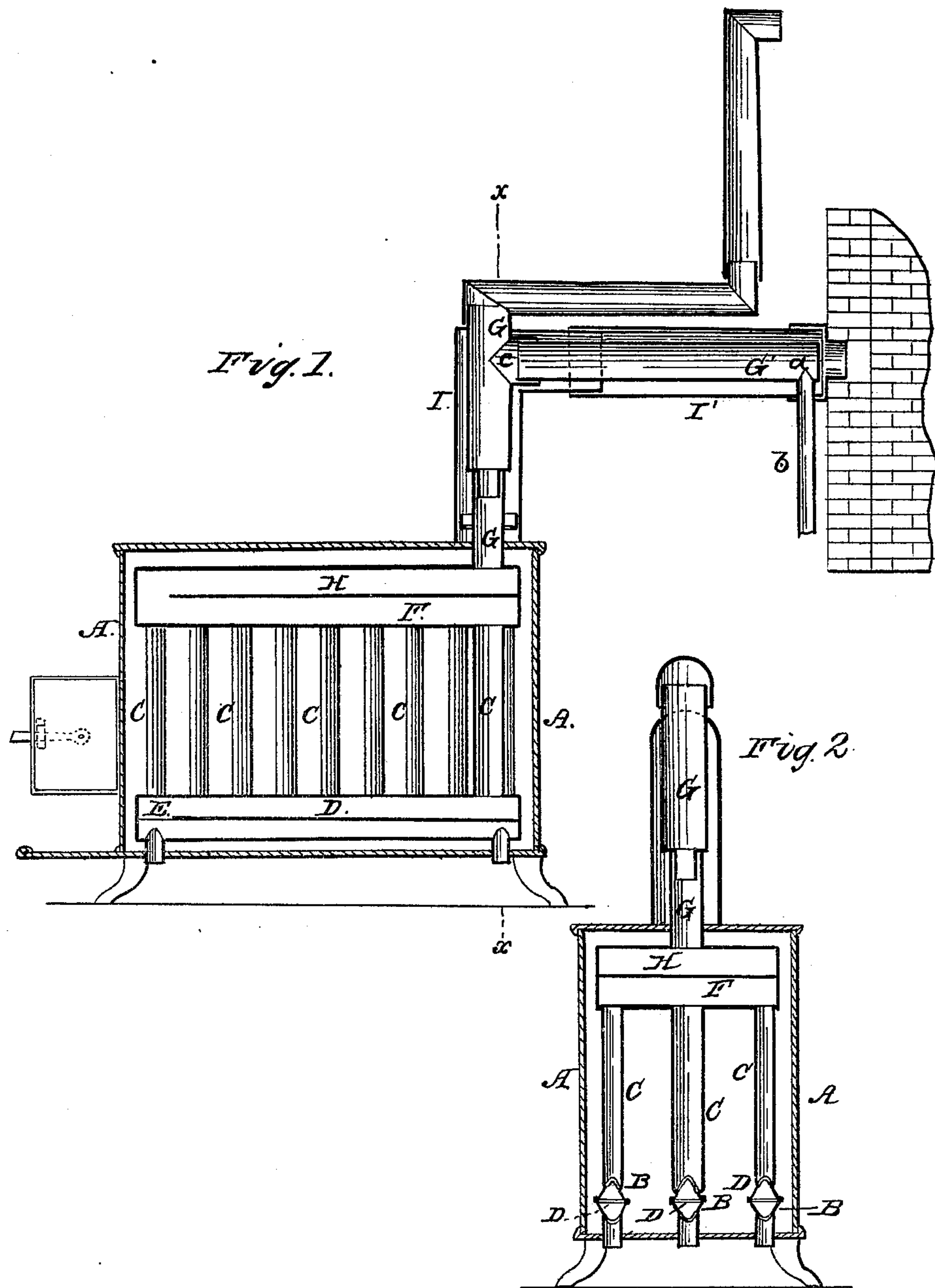


S. M. BAYARD.

Heating Drum.

No. 91,301.

Patented June 15, 1869.



Witnesses

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Inventor

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STEPHEN M. BAYARD, OF IONIA, MICHIGAN.

Letters Patent No. 91,301, dated June 15, 1869.

HEATING-DRUM.

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, STEPHEN M. BAYARD, of Ionia, in the county of Ionia, and State of Michigan, have invented certain new and useful Improvements in "Heating-Apparatus;" and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, making a part of this specification, in which—

Figure 1 represents a vertical longitudinal section of my appliances complete, the stove or furnace being represented in red outline.

Figure 2 represents a section of the same, taken on the line *xx* of fig. 1.

The same letters occurring in both figures denote like parts.

My invention relates to a heating-apparatus, simple and cheap in its construction, and adapted to purposes and places where cumbersome and expensive furnace-structures cannot be used.

This apparatus is designed to be used in any stove heated with wood, coal, or other kind of fuel. It is designed to warm, in addition to the room in which it stands, an adjacent one, or more, in the same or upper stories, which is done by admitting air, at openings in the bottom of the stove, through tubes, into hollow bars or grates, of diamond-shape, thus giving the greatest heating-surface possible, and which have a horizontal division, by a diaphragm, so as to cause the air to pass twice through their whole length. These bars or grates are placed in the hottest place, directly through the fire, and are also useful in keeping the fuel above the ashes. In connection with these grates, is a series of vertical tubes, placed at short intervals along both sides, and at the back end of a square stove, or in circular form in a round one, through which the heated air passes from the upper chamber of the grates. These tubes are so formed and arranged as not to keep the heat of the fire from the radiating-surface of the stove. The air, in its passage through these pipes, receives additional heat, and is then discharged into the lower portion of the hot-air chamber above, and thence passed to the front end, and into the upper portion, through openings in the diaphragm, and thence to the back end, where it enters a pipe extending upward, which is encased in another pipe, of, say, double its diameter, connected with the stove, and forming an annular flue around the said hot-air pipe, through which the products of combustion pass off to the chimney. The hot-air pipe may be passed out at the elbow, whence it is conducted into the apartments to be warmed thereby.

To enable those skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A represents, in red outline, an ordinary stove for heating-purposes, in which any kind of fuel may be used. Of course, other-shaped stoves may be used as well, by changing the form of my apparatus to fit

them, as, in a round stove, the hollow grate at the bottom must be circular, and also the double hot-air chamber in the top.

B represents a series of grates or hollow bars, of diamond-shape, set edgewise, on which to place the fuel, from which tubes pass down through the bottom of the stove at each end, through which cold air is admitted into the lower half of said hollow grates, below the diaphragms D, which divide them into two equal chambers, from the lower one of which it passes to the front end of the stove; thence up, through openings, E, in the diaphragm, into the upper chamber; thence upward through the tubes C, on each side, and on the back end of the hollow grates B.

These grates are of cast-iron, made in two halves, longitudinally, uniting by suitable means, to secure the diaphragm.

The vertical tubes pass from the two side-grates, and back end of the middle grate, to the lower half of the hot-air chamber F, below the diaphragm H, conveying heated air along its under surface to the front end; thence upward, through openings made for that purpose, and along the upper half, to the back end, into pipe G. The hot air is carried up to, and out at the elbow of the smoke-pipe I I', whence it is conducted into the apartments to be warmed.

The hot-air pipe G' may be extended along the smoke-pipe, to near the chimney, and is there closed, as at *a*, where the outside pipe begins to contract.

Another pipe, *b*, supplying cold air from near the floor, or from the cellar below, is inserted through the outside pipe, and into the inner one, conveying cold air toward the stove, until it mingles with the volume of hot air from the stove-heater, at *c*, receiving, in its passage through the pipe G', heat from the surrounding volume of smoke and heat that otherwise must have been lost in the chimney.

The outside pipe must necessarily be two or more inches larger in diameter than the inner pipe, which will give more radiating-surface into the room through which it passes, and the same amount ordinarily radiated outward is thus radiated into the hot-air pipe.

Having thus fully described my invention,

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

1. The diamond-shaped grates B, having a diaphragm separating them into two triangular-shaped chambers, as and for the purposes herein represented.

2. The arrangement of the air-supply pipe *b*, with relation to the smoke-pipe I' and stove, so that the air shall pass through the flue G' in the opposite direction to that in which the products of combustion pass around it, through the flue I', and thus be more thoroughly heated, as and for the purpose set forth.

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Witnesses:

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