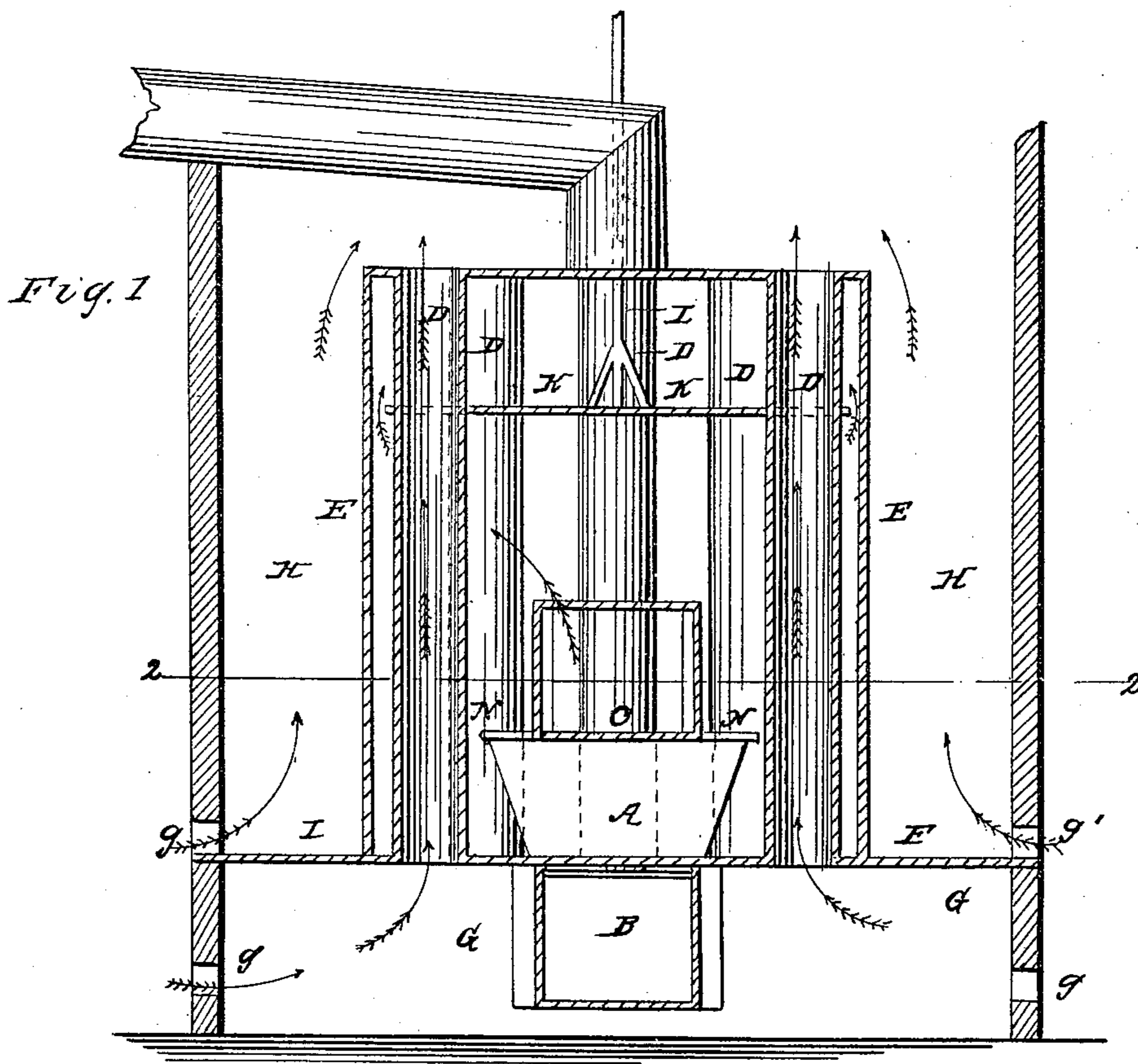


S. MACFERRAN.

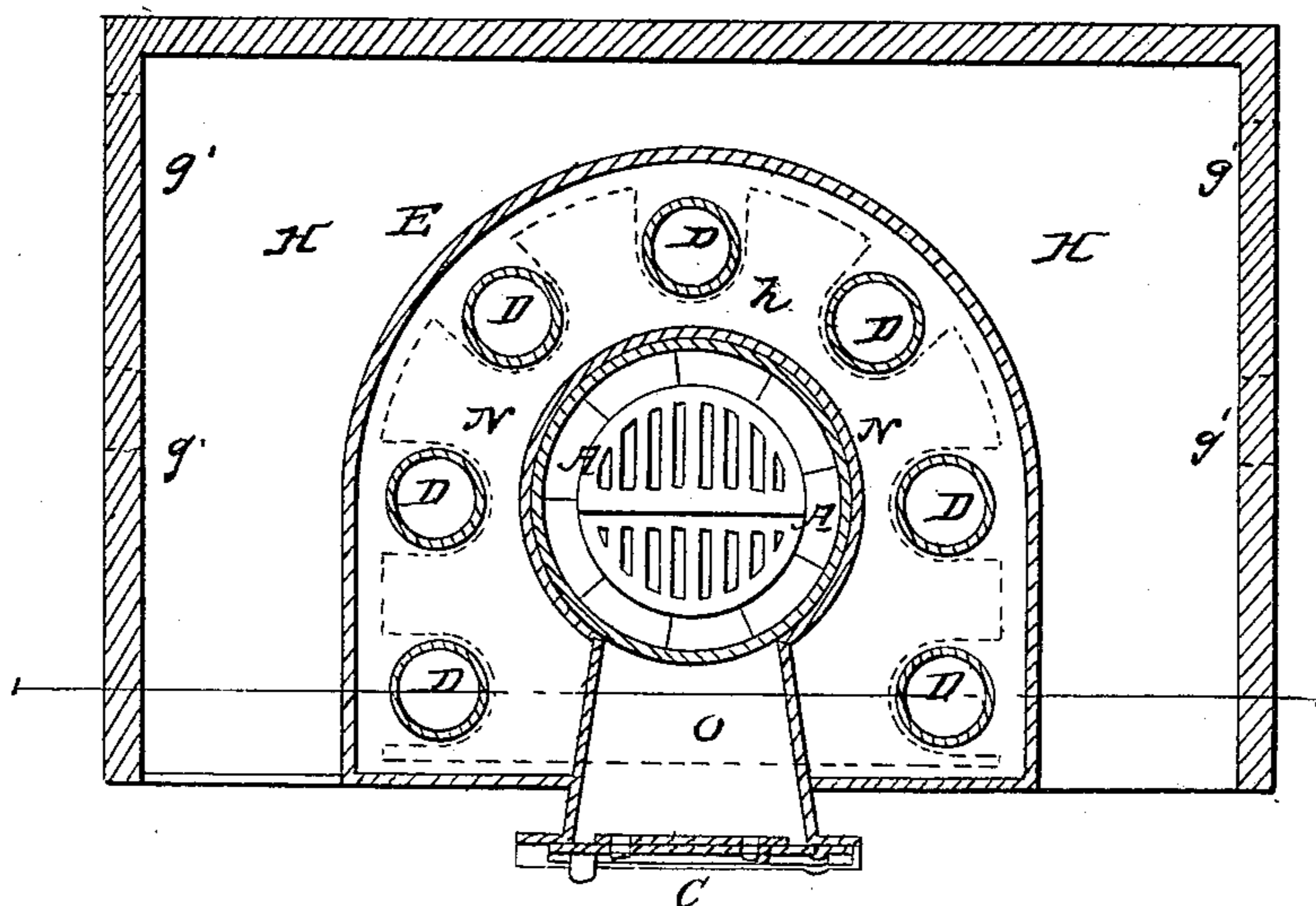
Hot-Air Furnace.

No. 14,196.

Patented Feb. 5, 1856.



*Fig. 2*

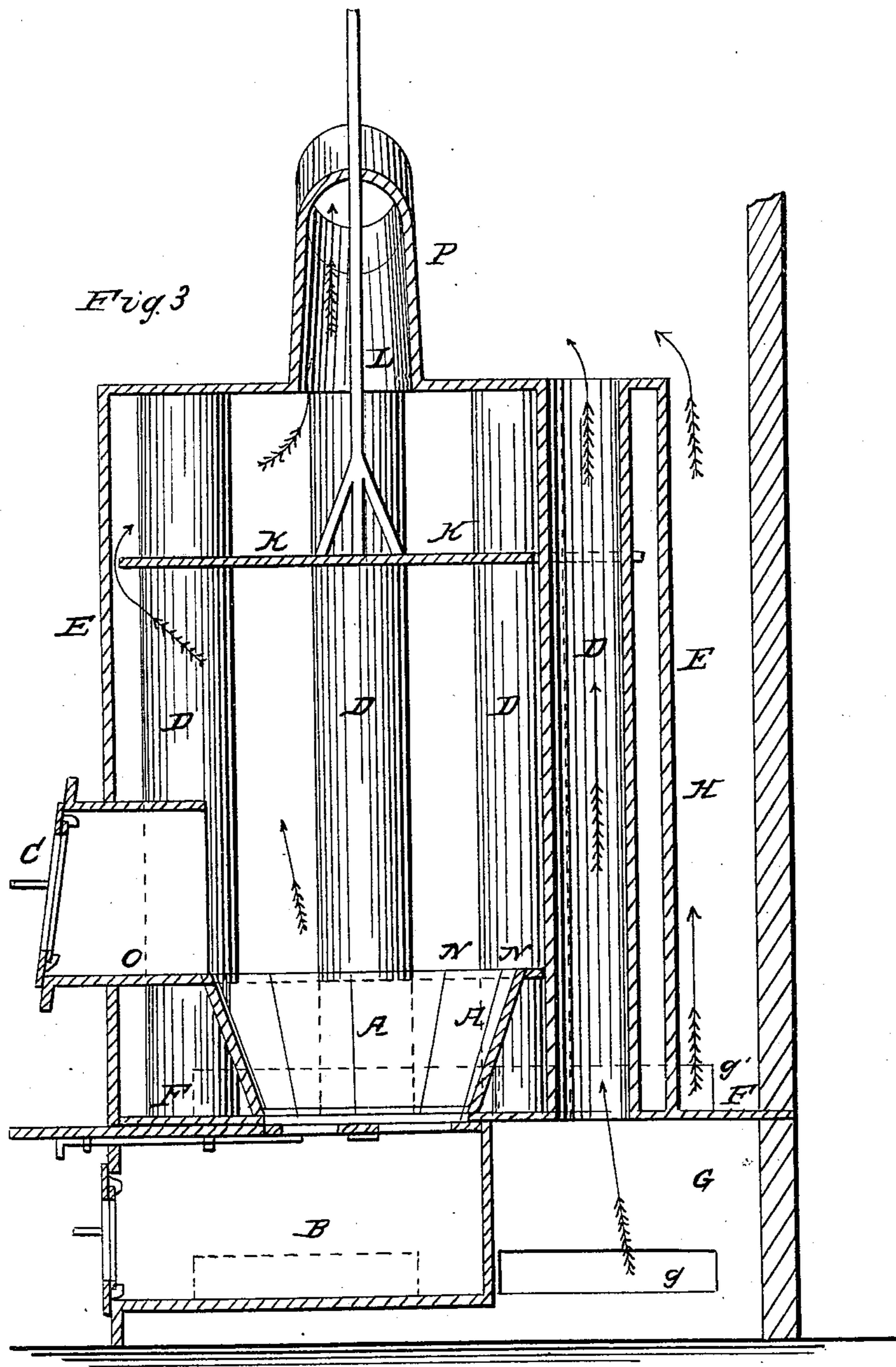


S. MACFERRAN.  
Hot-Air Furnace.

2 Sheets—Sheet 2.

No. 14,196.

Patented Feb. 5, 1856.



# UNITED STATES PATENT OFFICE.

SAMUEL MACFERRAN, OF PHILADELPHIA, PENNSYLVANIA.

## HOT-AIR FURNACE.

Specification of Letters Patent No. 14,196, dated February 5, 1856.

*To all whom it may concern:*

Be it known that I, SAMUEL MACFERRAN, of the city and county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Hot-Air Furnaces for Heating Apartments; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawings, making part of this specification.

Figure 1, is a vertical section of the improved furnace at the dotted line 1, 1 of Fig. 2. Fig. 2, is a horizontal section of ditto at the dotted line 2, 2, of Fig. 1, the horizontal graduating plate for regulating the draft and directing the heat around the radiating pipes, and against the radiating casing being expressed by dotted lines. Fig. 3, is a vertical section through the center of the heater.

Similar letters in the figures indicate corresponding parts.

The nature of my invention and improvement consists in holding the upper part of the fire pot together by means of a ring on the lower plate of the supply opening and also in placing a horizontal graduating plate in the fire chamber above the fire pot, capable of being either raised or lowered, for the purpose of distributing the heat around the pipes and radiating casing, and regulating the draft of the furnace.

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

The lower part of the fire-pot A, ash pit B, feeding door C, upright heating pipes D, and sheet iron radiating casing E, may be made and arranged in the usual or most approved manner. The lower perforated plate F, on which the fire pot A, and heating pipes D rest projects sufficiently far beyond said pipes to enable its outer edges to be embedded in the brick work surrounding the furnace so as to divide the space between the brick work and the furnace into two apartments G, H, the lower one of which G, is supplied with air to be heated through oblong openings I, formed in the brick work, and the upper one H, through corresponding openings I' immediately above the same in such a manner as to keep the currents of air for supplying the heating pipes and the space surrounding the sheet iron radiating casing distinct from each other until they

join and intermingle above, thereby enabling the two drafts to be supplied in quantities proportionate with the different capacities of heating surface possessed by the pipes, and space around the radiating casing, and preventing the superior draft of the pipes, arising from their increased degree of heat, from retarding or in any manner interfering with the draft through the outside space as is the case where the two are supplied with air from the space G, below; after the two drafts intermingle above they assume one common temperature and ascend through the ordinary pipes into the apartments to be heated.

The fire pot A is composed of a series of inclined segmental plates, their lower ends resting in a groove formed on the upper surface of the perforated plate F, and forming when together an inverted frustum of a cone, their upper ends being held together by a ring N, cast on the lower plate O, of the space through which the furnace is fed with fuel, the said segmental plates being held in their places by small projections on their outer sides which rest against the lower surface of the ring O, in such a manner as to enable the plates to be held firmly together and supported in their proper positions. By thus casting the ring N, with the plate O, it will be firmly supported and secured in its horizontal position, by the plate O, being fastened at the front part of the heater, and in the event of it being desired to remove the plates of the fire pot when burned out or from other cause, it can readily be done and their places supplied with other and corresponding plates.

The horizontal plate K, is suspended by a vertical rod L, or chain or other convenient means within the fire chamber above the fire pot, and has spaces or recesses cut out of its edges, somewhat corresponding with, but made larger than the heating pipes D which fit in the same so as to form tongues, between the pipes which almost fill the spaces between the said pipes and extend to within a short distance of the sheet iron casing. This plate K can be raised or lowered, nearer to or farther from the fire pot, as occasion may require by means of the wire rod L, or chain by which it is suspended, and is for the double purpose of directing the heat from the fire pot around the entire surfaces of the upright heating pipes.

and inner surface of the radiating casing E, and regulating the draft of the furnace by adjusting it in such relation to the fire pot and the top of the furnace as to produce  
5 the effect desired. When the plate K is suspended at the point represented in Figs. 1 and 3 of the drawings, a full draft will be given to the furnace, the heat from the fire pot being diverged from the lower surface  
10 of the said plate and caused to pass all around the heating pipes and in contact with the radiating casing E, and up through the spaces between the same and the plate K, and thence over the top of the latter into  
15 the pipe S leading to the chimney. In case it is desired to decrease the draft the plate K is raised and with the diminution of the space between the same and the top plate of the furnace, a corresponding decrease in  
20 the draft will be produced, until in fact it may be entirely stopped by said graduating plate being brought in actual contact with the top of plate of the furnace so as to form an air tight heater of the furnace. In this  
25 manner the heat can be brought in contact with the most available radiating parts for imparting heat to the air passing the same, and the draft of the furnace regulated to correspond with the state of the fire, and

the degree of warmth required in the 30 apartments.

What I claim as my invention and desire to secure by Letters Patent of the United States is—

1. Connecting with the inner end of the 35 bottom plate O of the space for supplying the furnace with fuel, a ring N, for supporting and holding together the segmental plates of the fire pot, so as to enable said ring to be held firmly by its connection with 40 the plate O, which is secured to the front part of the furnace as herein described.

2. I claim arranging the adjustable horizontal plate K, having spaces in its edges in which the heating pipes fit, above the fire 45 pot and capable of being raised or lowered, for the double purpose of diverging the heat entirely around the said heating pipes and in contact with the sheet iron radiating casing and regulating the draft of the furnace 50 and in fact converting it into an air tight heater if desired, substantially as before described.

SAMUEL MACFERRAN.

Witnesses:

J. H. GODDARD,  
DANL. RATCLIFFE.