

No. 704,309.

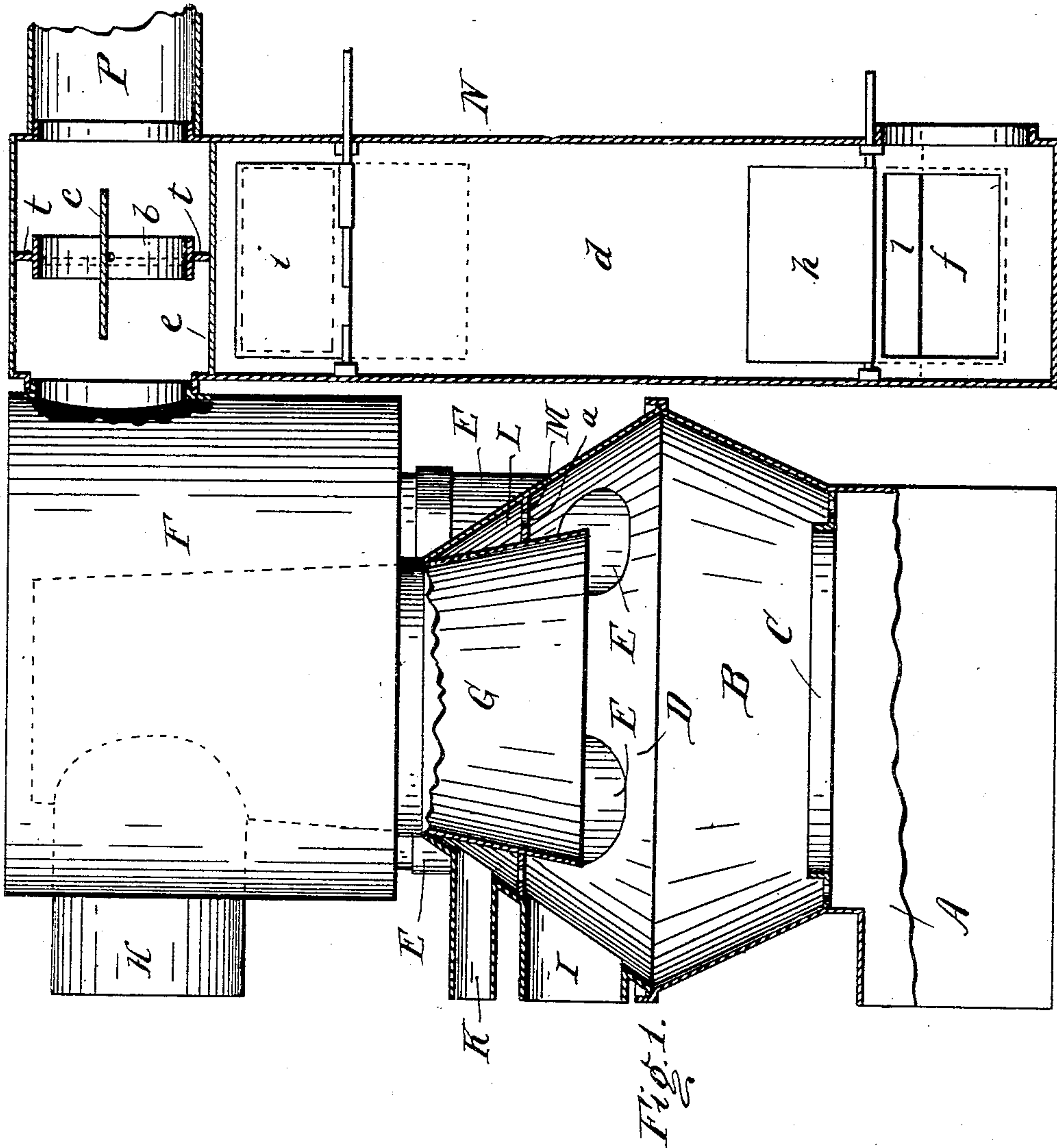
Patented July 8, 1902.

G. H. FOUTS.  
HOT AIR FURNACE.

(Application filed Jan. 13, 1902.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.  
G. B. Orndorff  
W. S. Kyle.

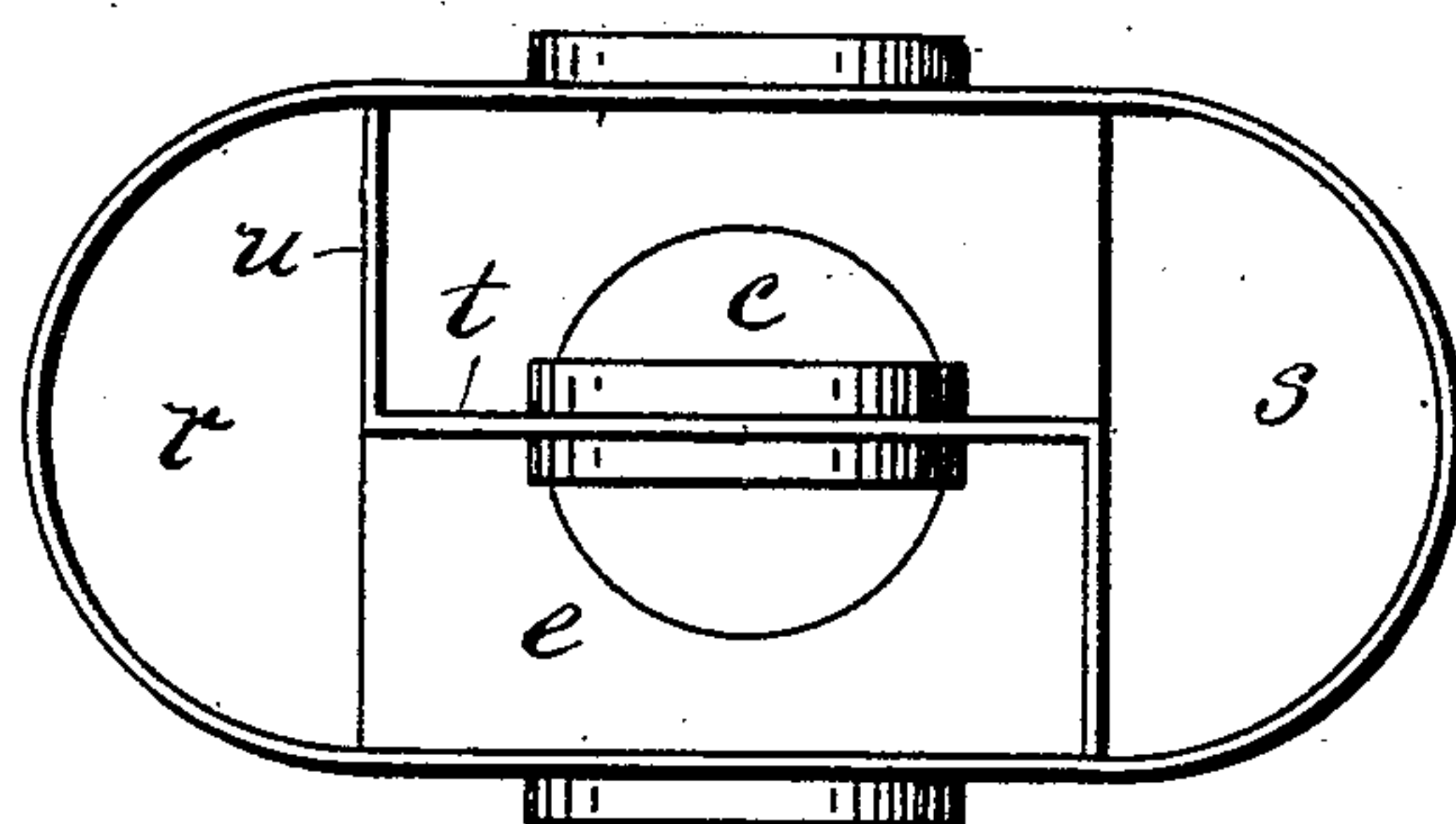
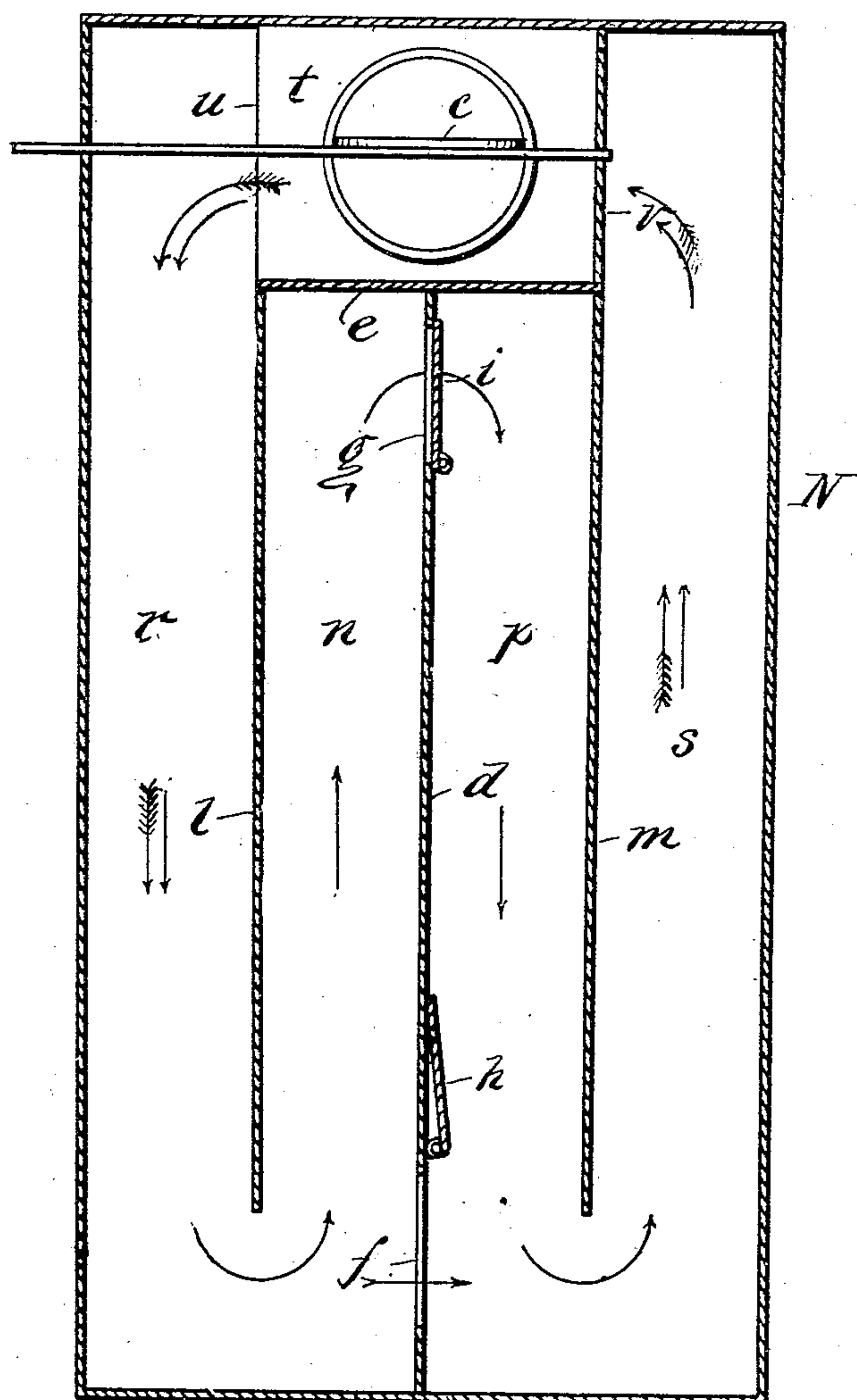
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HOT AIR FURNACE.

(Application filed Jan. 13, 1902.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

GEORGE H. FOUTS, OF DAYTON, OHIO.

## HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 704,309, dated July 8, 1902.

Application filed January 13, 1902. Serial No. 89,502. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE H. FOUTS, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Hot-Air Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to hot-air furnaces, either of the surface-burning or magazine construction; and it consists of a certain novel construction and arrangement of parts to be hereinafter particularly pointed out and claimed.

In the drawings, Figure 1 is a central vertical section of my improved hot-air furnace with the usual sheet-iron casing removed. Fig. 2 is a central vertical section of the smoke-retainer, taken on a plane at right angles to the section of Fig. 1. Fig. 3 is a top plan view of the smoke-retainer with the top case removed.

A is the ash-pit; B, the fire-pot; C, the grate-bars; D, the combustion-chamber of my hot-air furnace, which can be constructed in any of the well-known ways. Flues E lead from the combustion-chamber to the segment-shaped heating-drum F, and between the arms of the segment-shaped heating-drum is mounted the fuel-magazine G with passage-way H on the side for filling the magazine with coal.

I is the opening into the combustion-chamber for supplying the fire-pot with fuel for starting the fire or when the magazine is dispensed with.

L is an air-chamber completely encircling the lower end of the magazine G and provided with an air-inlet K for the entrance of air into the air-chamber. The bottom plate M in this air-chamber is provided with a series of perforations *a*, through which the air from the air-chamber L enters the combustion-chamber around the lower edge of the magazine for supplying an air-blast to the burning fuel. This air-chamber L, it will be noticed, is at the bottom of and terminates above the mouth of the magazine and does not surround the magazine from top to bottom. Heretofore it has been customary to provide a chamber

surrounding the magazine from top to bottom and to permit the air to enter to the burning fuel through the perforations through the bottom of this chamber; but I have found that with a construction of this kind the coal within the magazine is very apt to coke under the action of the fire and that by placing my air-chamber at the bottom of the magazine only and terminating it above the mouth thereof I entirely overcome this objection and am enabled to furnish a proper air-blast for the burning fuel.

The smoke and products of combustion pass from the segment-shaped heating-drum F into the smoke-retainer N. This smoke-retainer has a direct passage *b* therethrough at its upper end into the smoke-pipe P, the passage being controlled by a damper *c*.

*d* is a central partition running from the bottom of the smoke-retainer to the top plate *e*. This central partition is provided with an opening *f* near the bottom and another opening *g* at the top, which openings are controlled by the dampers *h* *i*, respectively.

*l* *m* are partitions running from side to side of the retainer and forming rectangular passage-ways *n* *p* with the central partition *d* and the front and rear walls of the retainer, and also passage-ways *r* *s* with the side walls of the retainer.

Resting on the top plate *e* of the inner compartment is a Z-plate with a central portion *t* and end portions *u* *v*, which extend to the walls of the smoke-retainer, the central portion *t* being located along the central line of the upper plate *e* of the inner compartment. This central plate *t* is provided with the opening *b*, in which works the controlling-damper *c*. With the damper *c* closed and the damper *i* closed, the damper *h* open, the passage of the smoke and the products of combustion is from the furnace into the passage-way *r*, through the opening *f* into the passage-way *s*, and up and out through the smoke-pipe, as indicated by the feathered arrows. With the damper *c* closed and *h* closed, with *i* open, the passage of the smoke is into the passage-way *n*, through the opening *g* into the passage-way *p*, and thence into *s* in the direction shown by the unfeathered arrows in Fig. 2.

It will be understood that the furnace



proper, as above described, and the smoke-retainer are inclosed in the usual metal casing, from which the hot-air flues lead up into the house to be heated, and that the cold air  
5 is taken from outside through a suitable air-duct and becomes heated by contact with the furnace, its flues, the heating-drum, and the smoke-retainer.

It will be noted that with my construction  
10 of smoke-retainer the heated products of combustion are taken from the top of the furnace to the floor, back again to the top, thence to the floor again, and then upward to the smoke-pipe, and in this way substantially all of the  
15 heat of the products of combustion of the furnace is radiated through the thin metallic walls of the smoke-retainer and serves to heat the cold air circulating within the furnace casing, so that very little, if any, heat is wasted  
20 and carried up through the smoke-pipe.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a hot-air furnace, the combination,  
25 with the fire-pot, combustion-chamber, and

fuel-magazine, of an air-chamber surrounding only the lower end of the magazine above the combustion-chamber, with air-inlet therefor, and a perforated bottom plate for said  
30 air-chamber above the mouth of said magazine to admit the air-blast into the combustion-chamber around the magazine but not at its mouth, substantially as shown and described.

2. In a hot-air furnace, the combination,  
35 with a fire-pot, combustion-chamber and heating-drum, of a smoke-retainer, having a direct passage therethrough to the smoke-pipe, and provided with medial partitions forming  
40 four passage-ways for the smoke from top to bottom of the furnace, with dampers for controlling said passage-ways, said passage-ways and dampers being so arranged that the products of combustion may be compelled to traverse  
45 only two of said passage-ways, when desired, substantially as shown and described.

GEORGE H. FOUTS.

Witnesses:

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