

(No Model.)

E. McK. BENSTER.
STOVE OR FURNACE.

No. 583,447.

Patented June 1, 1897.

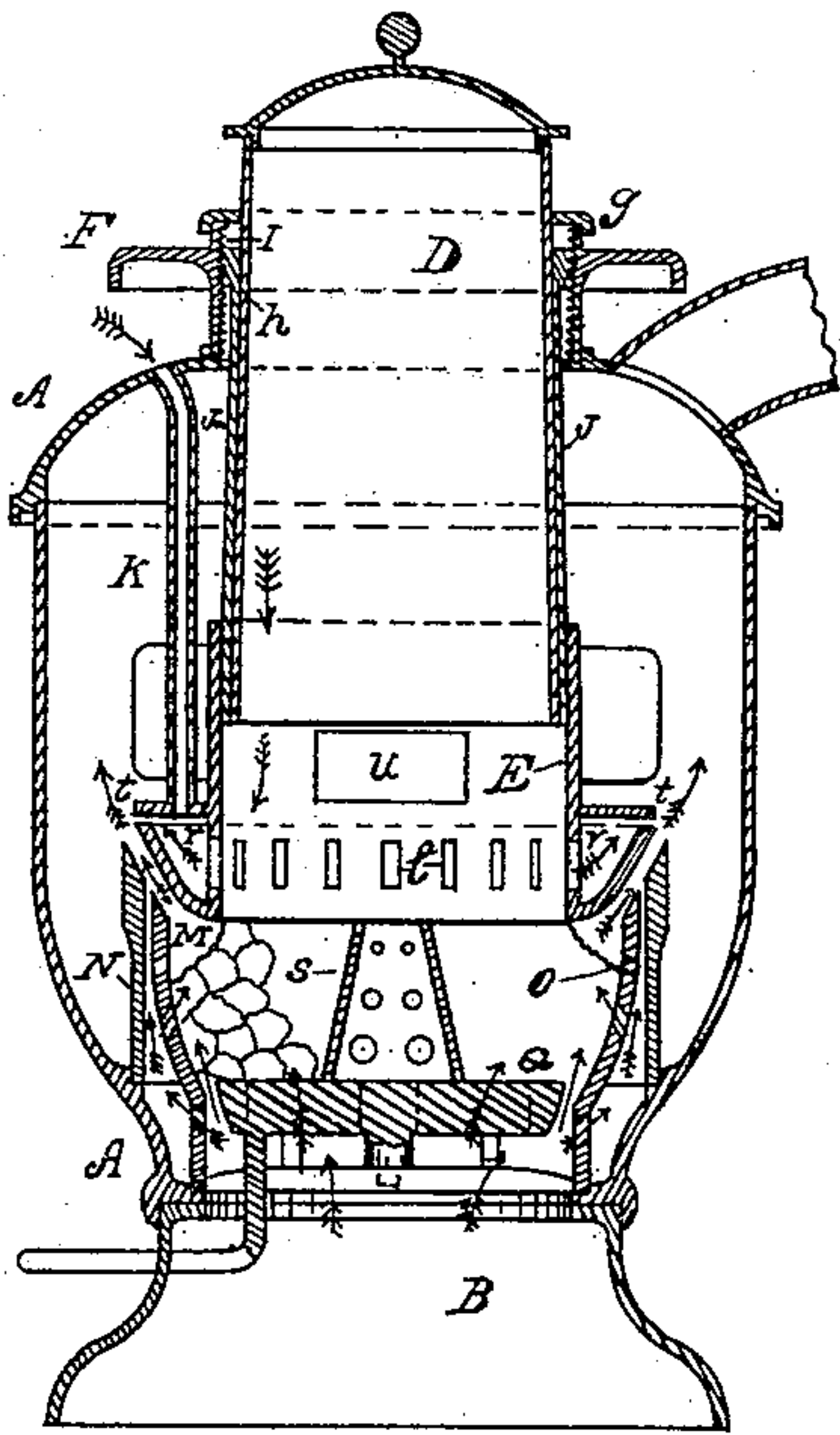


Fig: 1.

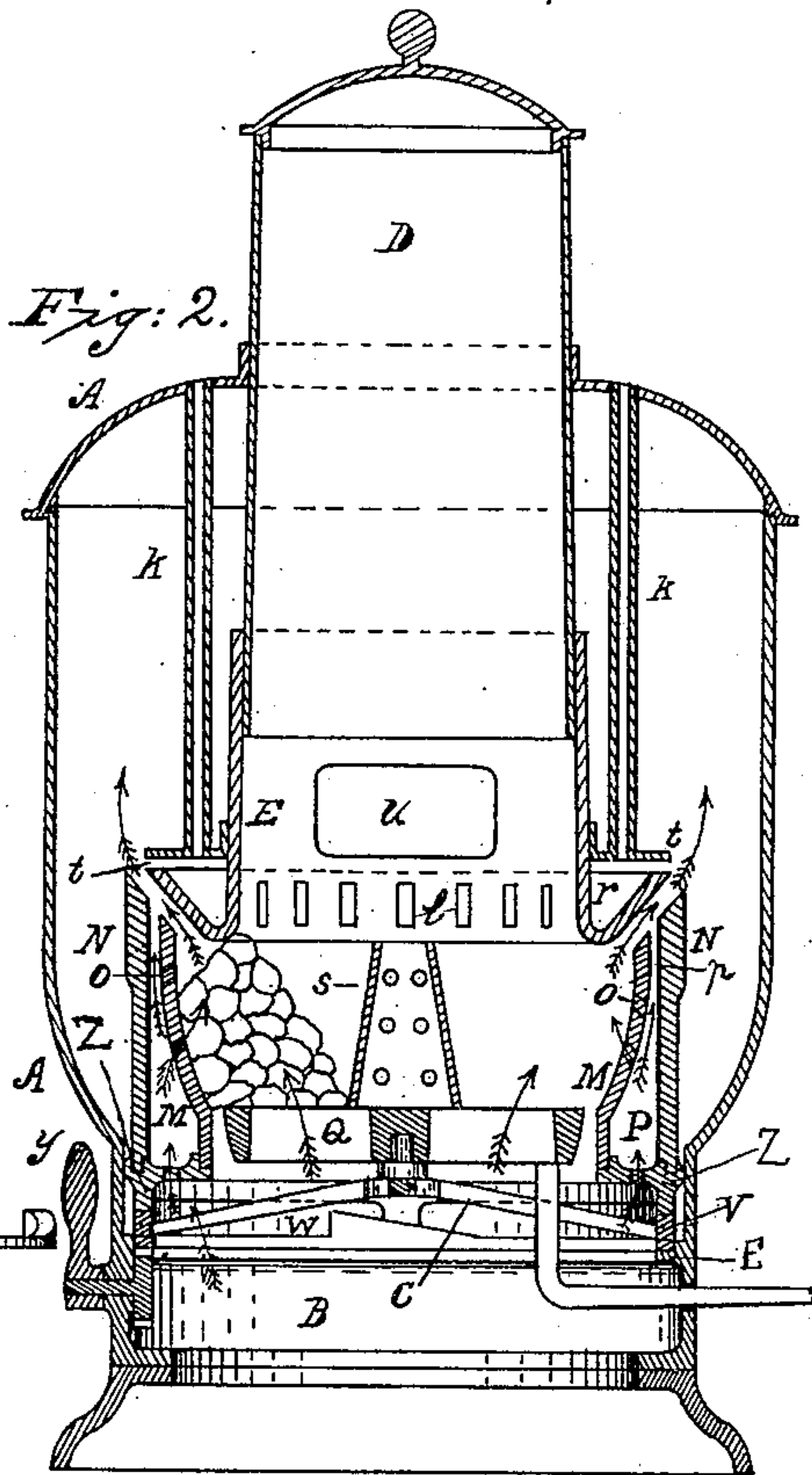


Fig: 2.

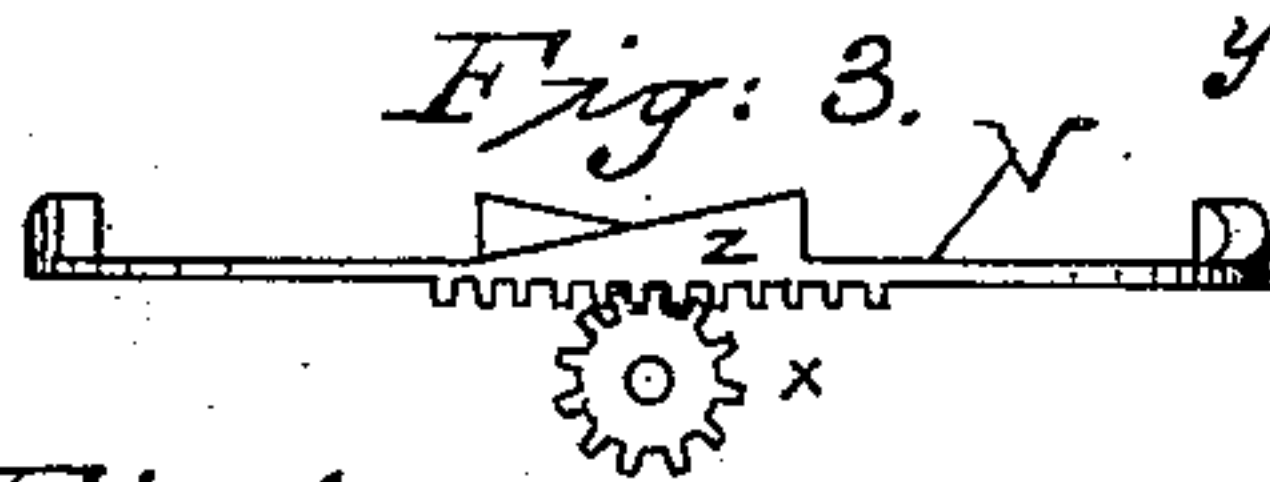


Fig: 3.



Fig: 4.

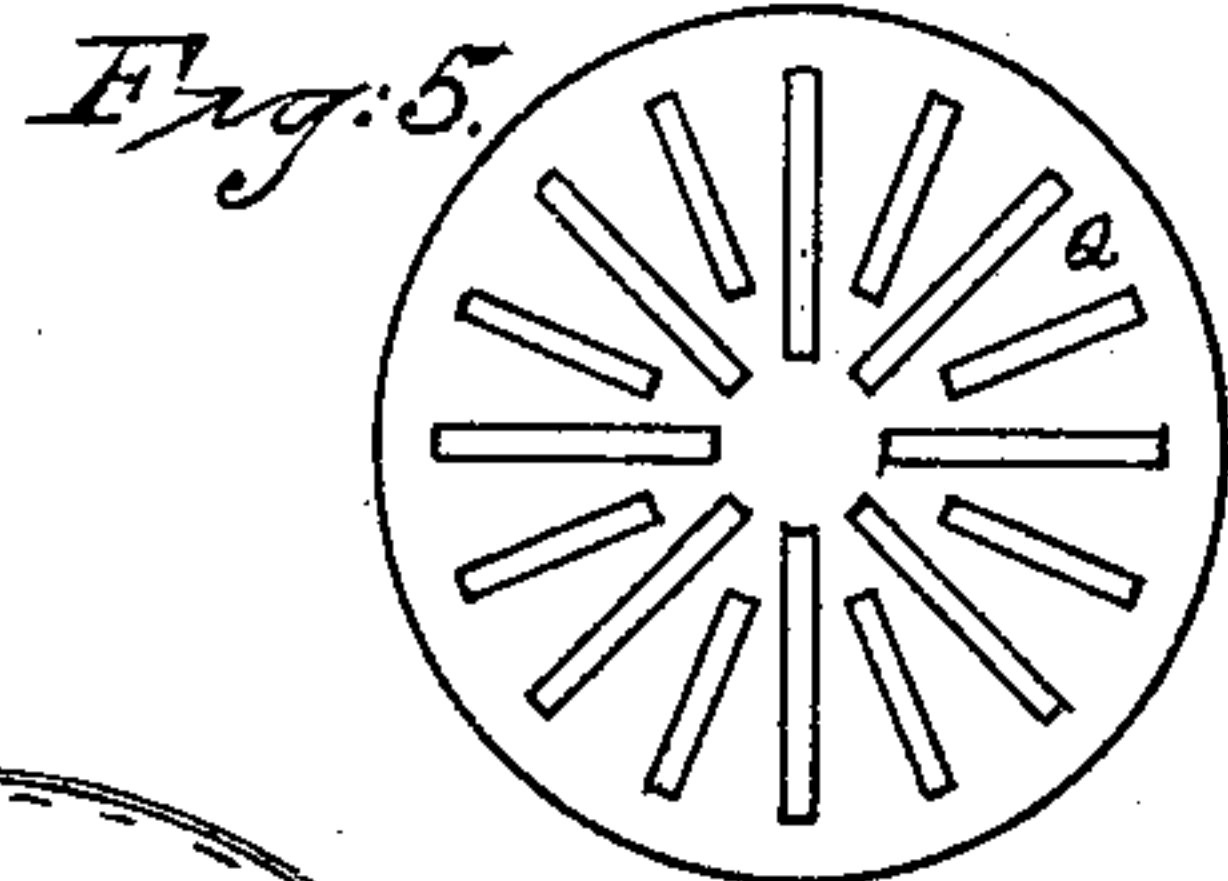


Fig: 5.

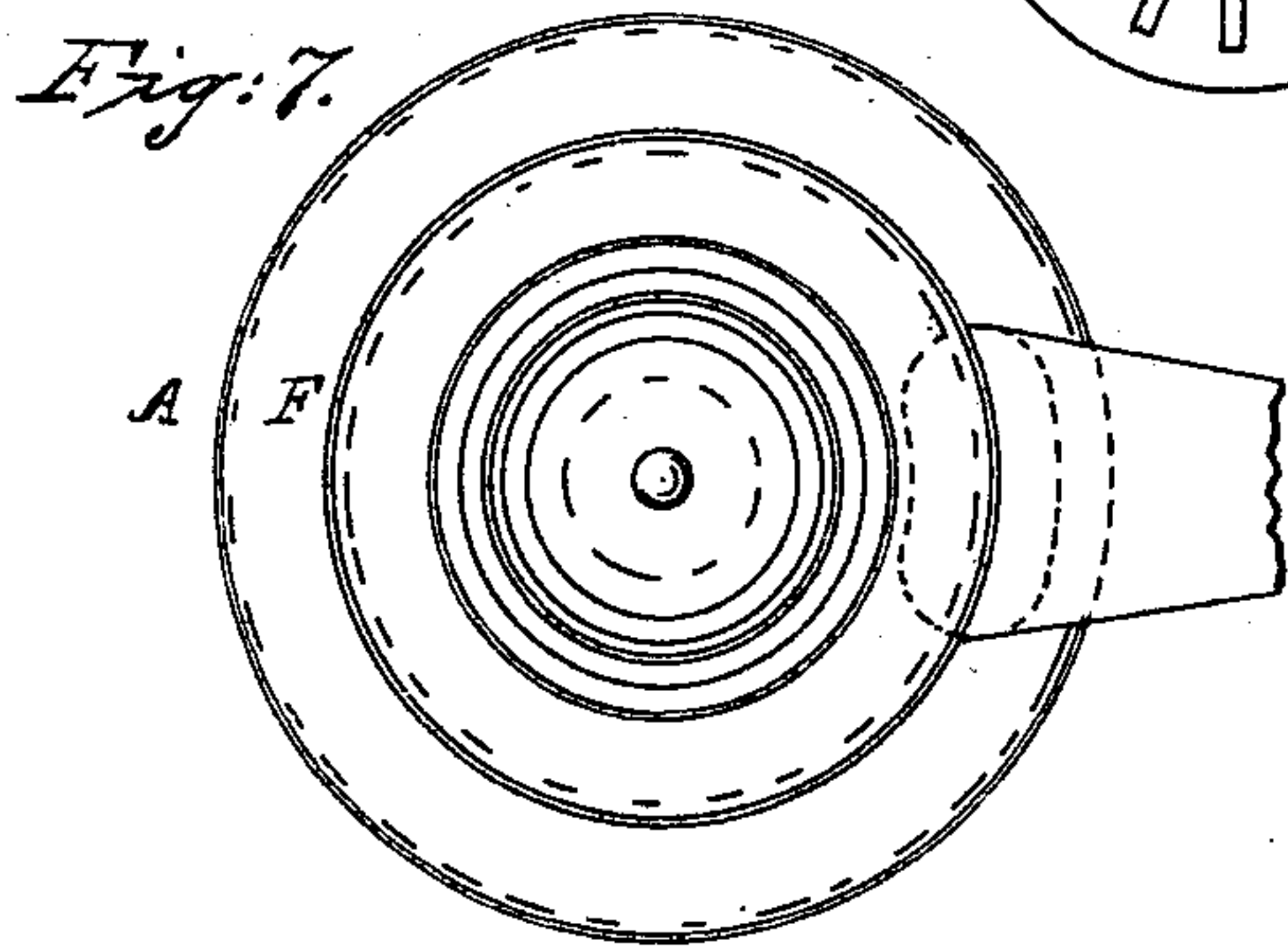


Fig: 7.

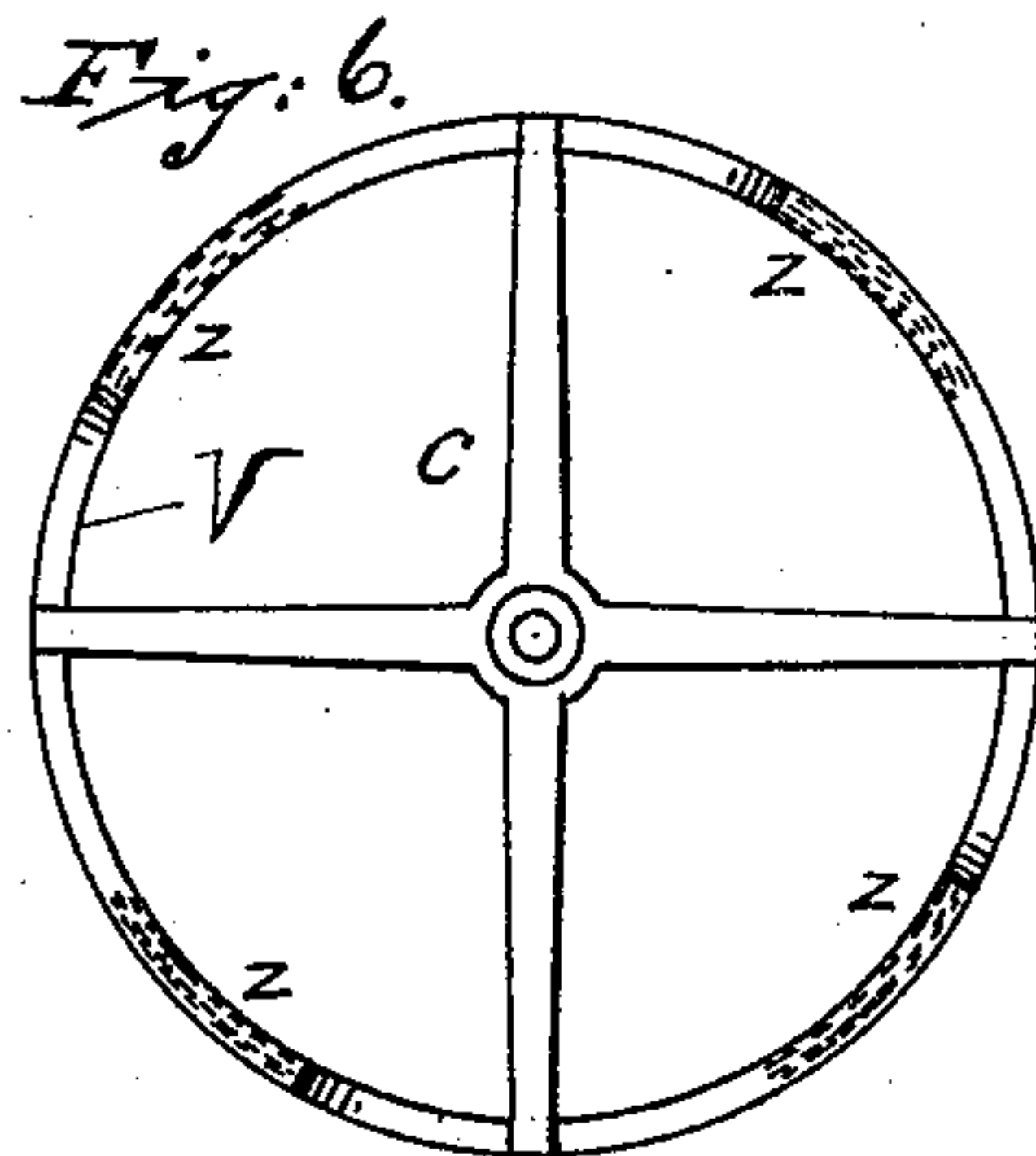


Fig: 6.

WITNESSES.

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EMORY MCKENDREE BENSTER, OF TOLEDO, OHIO.

STOVE OR FURNACE.

SPECIFICATION forming part of Letters Patent No. 583,447, dated June 1, 1897.

Application filed May 11, 1894. Renewed November 16, 1896. Serial No. 612,384. (No model.)

To all whom it may concern:

Be it known that I, EMORY MCKENDREE BENSTER, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Stoves or Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in stoves and furnaces of every description where coal and wood are used as a fuel.

The objects of my invention are, first, to environ the flame where it leaves the burning coal with mechanical conditions that will supply air and necessitate the complete combustion of the escaping carbon before it leaves the hotter parts of the flame, and, second, to control the combustion at or near the exterior limits of the burning coal, so as to be able to provide the necessary mechanical conditions for the perfecting of combustion and its control. I attain these objects by mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the entire stove with device for adjustment of upper fire-gate for the control of combustion. Fig. 2 is a vertical section of a modified form of a stove. Fig. 3 is a detail view of the adjusting-ring shown in Fig. 2. Fig. 4 is a detail view of part of the adjusting-ring. Fig. 5 is a top plan view of the grate. Fig. 6 is a top plan view of the adjusting-ring shown in Fig. 2, and Fig. 7 is a top plan view of the stove.

Similar letters refer to similar parts throughout the several views.

Shell A and the wall of the ash-pit B constitute the framework of the stove. The coal-chamber D is surrounded at its base by the upper fire-gate E, which in Fig. 1 is adjustable above with a hand-wheel F, sliding in a grooved seat *g* at the top of the coal-chamber. The interior surface of the hand-wheel next to the groove on the coal-chamber is provided with a screw *h*, that meshes into a corresponding male nut *i*, which is secured to the top of the perpendicular straps *j j*, that run down the outside of the coal-chamber to the fire-

gate E and are secured to the same. This completes the system of adjustment of the upper fire-gate E and enables the operator, by a slight turn of the hand-wheel F, to control the combustion or temperature desired in his room to the minutest shade and to hold it there even after the grate Q becomes clogged, for the combustion will be carried on through tube K, slots *l*, and air-chamber *r*, and cone S on grate Q without interruption.

In Fig. 1 the fire-pot or lower fire-gate M N both inner and outer walls are stationary and rest on frame A. These walls or shells close nearly together at the top and form a thin circular air-passage for the admission of fresh air to the opening between the fire-gates at their closest approach. Toward the upper edge of the ring or section M of fire-gate M N, just above the point where the flame leaves the burning coal, is a series of orifices O for the admission of fresh air to the hottest part of the flame, compelling it to pass the closest approach of the fire-gates M N E in absolute contact with the disintegrated carbon and concentrated heat.

The upper fire-gate E is provided with an air-chamber *r* at and around its base. The air in this chamber is received from tube K, which can be as large as desired. At the outer and upper extreme of fire-gate E is a thin circular orifice *t*, that connects with the air-chamber *r* and provides fresh air to the flame at its point of escape from the fire-gate for the completion of the combustion. On the interior circle of this air-chamber *r* is a series of slots *l*, that admit air to the upper part of the fire-pot to assist in carrying on combustion if grate Q becomes clogged. In the center of grate Q is a conical air-chamber *s*, that rises to the upper limit of combustion, that also provides air to the fire-pot if the grate becomes clogged. The door *u* is for convenience of putting kindlings in the fire-pot to start a fire.

Fig. 2 differs from Fig. 1 only where necessitated by its system of under adjustment. (Shown in detail in Figs. 3, 4, and 6.) The upper fire-gate E in this arrangement is stationary, and the lower fire-gate M N is adjustable, the exact reverse of Fig. 1 in this respect.

In Fig. 2 the outer or inner walls of the

lower fire-gate M N rest upon a circular frame V, which is provided with four wedges that correspond to the four wedges z. (Illustrated in Figs. 2, 3, and 6.) This circular frame V rests upon a flange E, extending inward from the shell or frame A. This circular ring-frame V is operated with a gear x and lever y and forms the rest for the frame C, that supports the grate Q. Consequently when circular frame V is operated the combusting-space in the fire-pot is increased or diminished according as the opening between the fire-gates M N E is increased or diminished by the adjustment made at the lever y.

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

1. In a stove, the combination with a grate, of an upper and lower fire-gate above the grate forming an opening between the same for the escape of the products of combustion, and means for adjusting the fire-gates in relation to each other to regulate the size of the opening.

2. In a stove, the combination with a grate,

of an upper and lower fire-gate above the grate forming an opening between the same for the escape of the products of combustion, the lower fire-gate being formed of two separate walls and means for raising and lowering the walls to adjust the size of the opening between the gates.

3. In a stove, the combination with a grate, of an upper and lower fire-gate above the grate forming an opening between the same for the escape of the products of combustion, an air-chamber surrounding the upper fire-gate, a passage-way leading from the air-chamber to the outside of the casing, and means for adjusting the fire-gates in relation to each other to regulate the size of the opening.

In testimony whereof I affix my signature in presence of two witnesses.

EMORY MCKENDREE BENSTER.

Witnesses:

CARROLL J. WEBSTER,
FRED W. RIDENOUR.