2 Sheets—Sheet 1.

P. N. BURKE.

FIRE-BOX FOR STOVES, RANGES, AND FURNACES.

No. 181,634. Patented Aug. 29, 1876.

Fig. 1

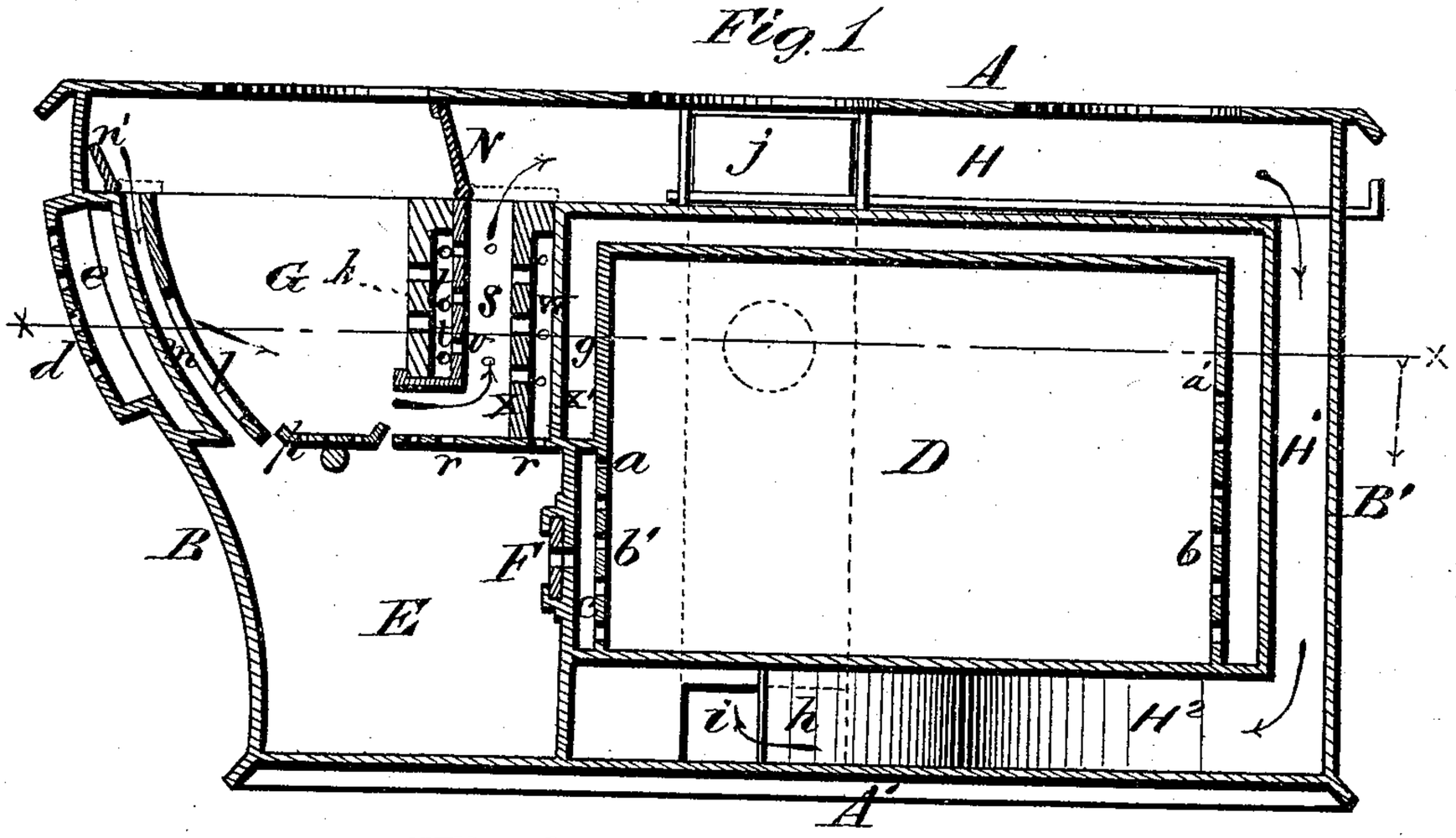
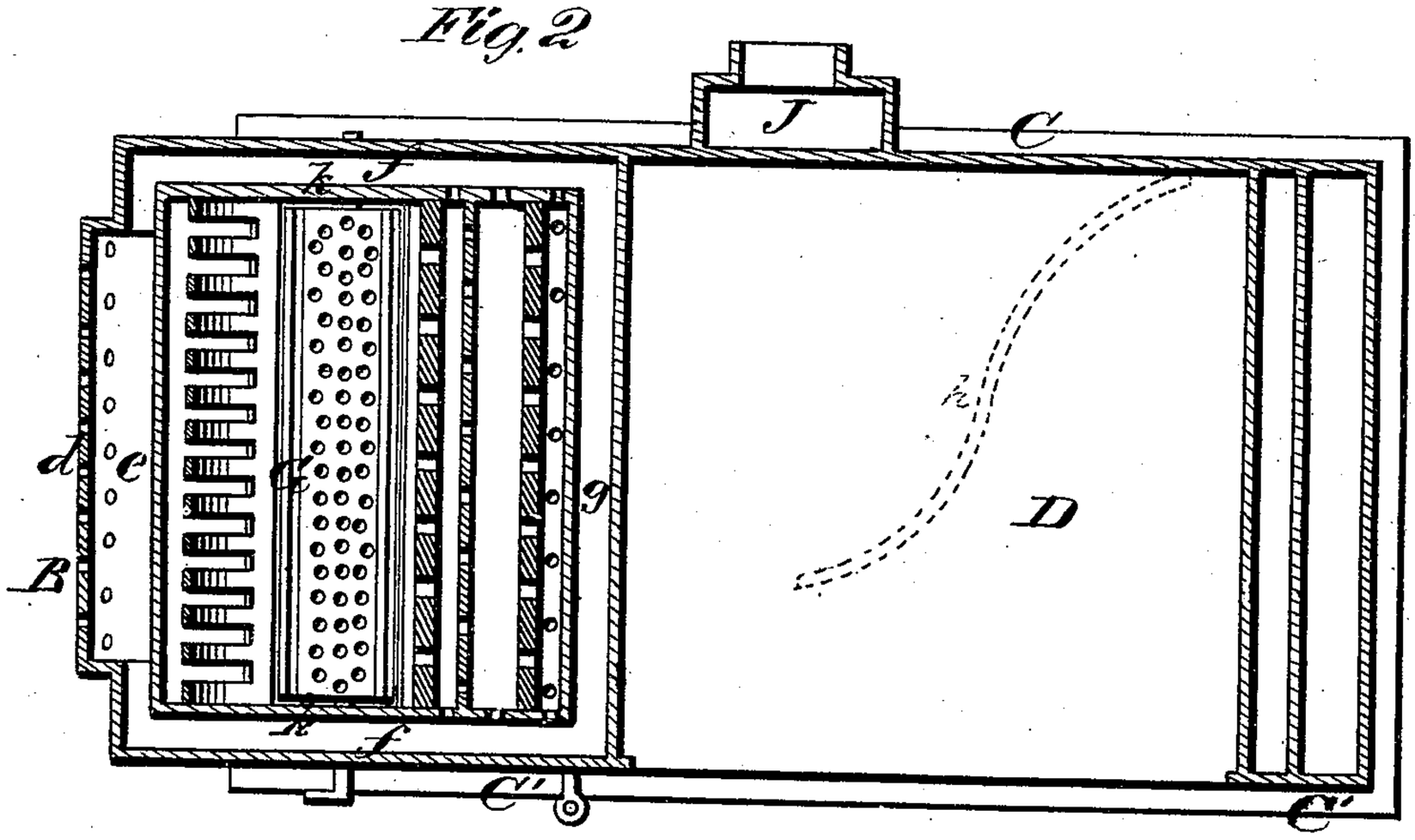


Fig. 2



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2 Sheets—Sheet 2.

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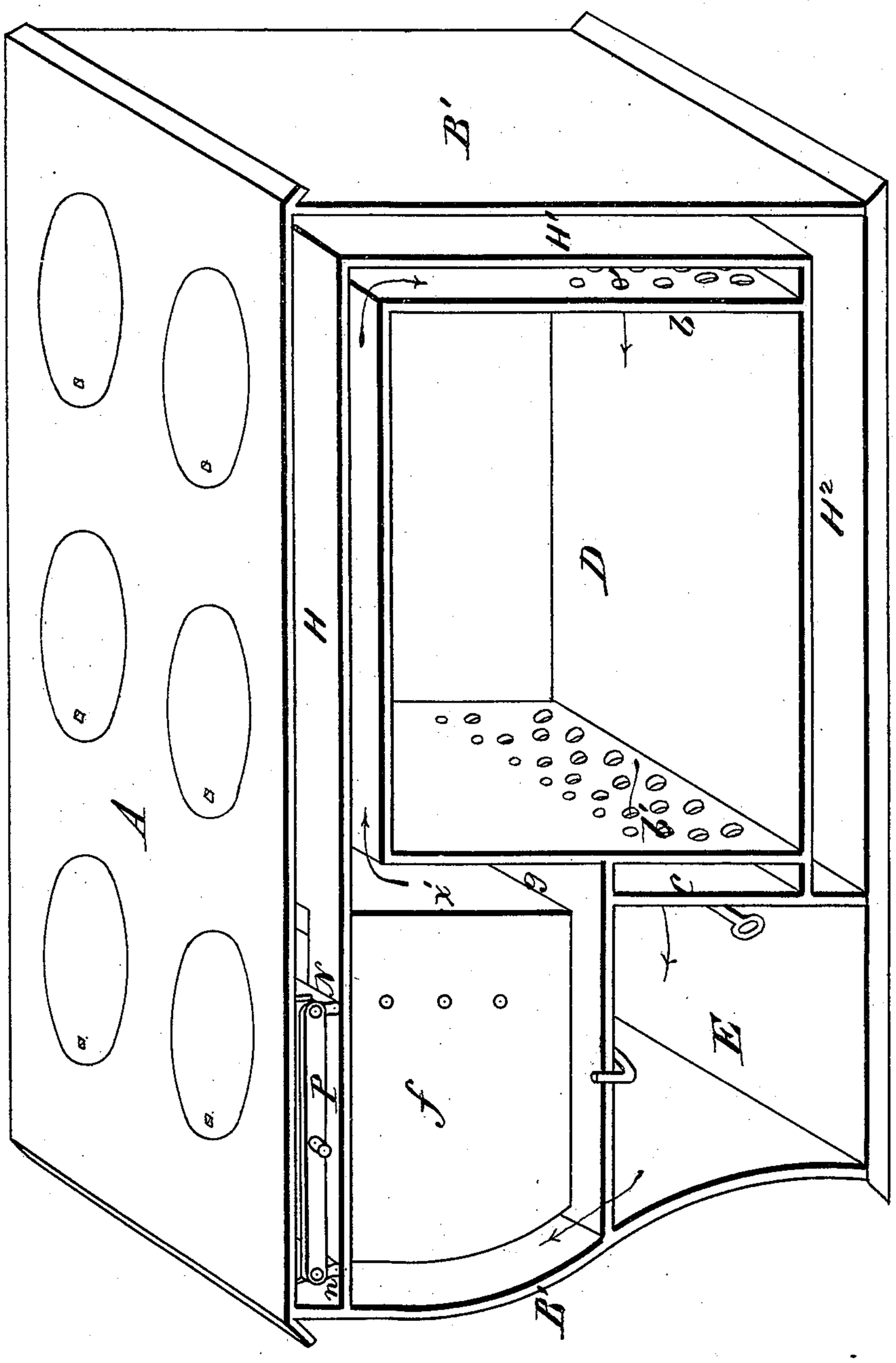
FIRE-BOX FOR STOVES, RANGES, AND FURNACES.

No. 181,634. Patented Aug. 29, 1376.

Fig. 3



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UNITED STATES PATENT OFFICE.

PETER N. BURKE, OF NEW YORK, N. Y.

IMPROVEMENT IN FIRE-BOXES FOR STOVES, RANGES, AND FURNACES.

Specification forming part of Letters Patent No. **181,634**, dated August 29, 1876; application filed April 21, 1875.

To all whom it may concern:

Be it known that I, PETER N. BURKE, of New York, in the county of New York and State of New York, have invented a new and valuable Improvement in Fire-Boxes for Stoves, Ranges, and Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a longitudinal vertical section of my fire-box, and Fig. 2 is a horizontal sectional view of the same. Fig. 3 is a perspective view.

This invention has relation to fire-boxes or furnaces which are applicable to various kinds of stoves and ranges, and also to furnaces which are designed for steam-generators, melting-cupolas, and for other purposes, as will be hereinafter explained.

In the annexed drawings, A designates the top plate of the stove; A′, the bottom plate; B, the front wall; B′, the rear-end wall, and C C′ the vertical side walls. D designates the oven, the front and rear plates *a a′* of which have rows of perforations *b b′* through them, of the same size or of different sizes, which allow heated air to circulate through the air passing into the oven D through the perforations *b*, and escaping from the oven through the perforations *b′*, entering a chamber, *c*, and thence escaping impregnated with the vapors of cooking into the ash-pit E. F is a valve, which is used for regulating the escape of heated air from the oven into the ash-pit, and also for cutting off the communication, to prevent ashes or dust entering the oven when the poker is used for clearing the grate.

If desired, chamber *c* may be omitted, and the valve F, or its equivalent, applied to the front oven-plate *a*. The chamber *c* is, however, preferably employed by me, as it is important and essential in cleaning the grate to prevent ashes from entering the oven, if the damper F were partially opened in poking the fire, and applied directly to perforations in the oven.

The front wall B is perforated, as shown in Fig. 1 at *d*, for the admission of air into a chamber, *e*, from which chamber the air is conducted through passages *f f* at the ends of the fire-pot G. (Shown in Fig. 2.) The air leaves the passages *f f*, enters a flue, *g*, and thence passes over the oven, down behind the oven, and through the same, as above described. The air-flues are broad sheet-flues, extending from one side to the other of the stove.

H designates a broad sheet-flue, which extends from the fire-pot G to a vertical flue, H^1, which flue is at the back of the oven, and communicates at its lower end with a horizontal flue, H^2, below the oven, in which latter flue is a deflector, *h*, around which the heated products pass on their way to an outlet, *i*, leading into the base of a vertical escape-flue, J. There is also another opening leading from the flue H directly into the escape-flue J, which opening is provided with a damper, *j*, for cutting off the direct draft.

The inner walls *k k* of the air-chambers *f f* constitute the end walls of the fire-pot G, and the front of this fire-pot is formed of grate-bars *l*, in front of which is an air-space, *m*, having a valve, *n′*, on top, and opening into the ash-pit E below. The bottom of the fire-pot is provided with a tilting grate, *p*, in rear of which are perforations *r*, for a purpose hereinafter explained.

At the back of the fire-pot is a broad auxiliary combustion-flue, *s*, into which air is admitted through its ends. Between this flue *s* and the fire-pot is a chamber, *t*, bounded in front by perforated fire-bricks *k*, or thick perforated iron plates, and in rear by a perforated plate, *v*, the lower end of which forms a supporting-shelf for the fire-brick in front. Air is admitted into the chamber *t* through the ends thereof, and when the air is highly heated it escapes into the fire-pot, and also into the flue *s*, and aids in supporting combustion therein. At the back of combustion-flue *s* is a chamber, *w*, bounded in front by a perforated fire-brick, *x*, and in rear by a vertical wall, *x′*. This chamber *w* is supplied with air through its ends, which air becomes highly heated, and escapes through the fire-brick *x* into the flue *s*. Air also enters the flue *s* from the ash-pit through the perforations, and

the air likewise is supplied to the chamber W through perforations *r* in its bottom.

When the damper N, at the upper end of flue *s*, and the damper *n'*, at the upper end of the air-space *m*, are opened, as shown in full lines, Fig. 1, the air and products of combustion pass downward through the bed of coals in the fire-pot, and thence up through the flue *s*, where a second combustion takes place, owing to the supply of air therein. By these means I am able to successfully burn soft or bituminous coal.

When the dampers N *n'* are shut, the air and combustible products will ascend and escape to the chimney, the damper *j* being closed through the flues H H^1 H^2, and when the damper *j* is open, the products of combustion will pass directly to the chimney. Dampers N *n'* may be connected by a rod, P, or they may be operated independently of each other.

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

1. The auxiliary combustion-flue *s*, with air-openings in its ends, in combination with the air-space *m*, fire-box G, and dampers N *n'*, substantially as described, and for the purpose set forth.

2. The auxiliary flue *s*, provided with air-openings in its side and ends, in combination with the air-chambers *t* and *w*, provided with air-openings, air-space *m*, dampers N *n'*, and fire-box G, substantially as described, and for the purpose set forth.

3. The auxiliary combustion-flue *s*, provided with air-openings, in combination with the fire-box G, air-chambers *t*, *w*, and *m*, and hot-air flues *f f*, substantially as described.

4. The auxiliary combustion-chamber *s*, provided with air-openings in its sides and ends, in combination with air-chambers L and W and damper N, substantially as described, as and for the purpose set forth.

5. The chamber *e*, into which air may be admitted through registers or perforations communicating with the chambers *f f*, in combination with fire-box G, auxiliary combustion-chamber *s*, and dampers N *n'*, substantially as and for the purpose set forth.

6. The oven D, having end perforations *b b'*, for the passage of hot air, in combination with the chamber *c*, damper F, and ash-pit E, substantially as described, and for the purpose set forth.

7. The flue *g*, in combination with the auxiliary combustion-chamber *s* and fire-box G, substantially as described, and for the purpose set forth.

8. The flue *g*, in combination with the chambers *f f* and *e*, auxiliary combustion-chamber *s*, and fire-box G, substantially as and for the purpose set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

PETER N. BURKE.

Witnesses:
D. D. KANE,
GEORGE E. UPHAM.