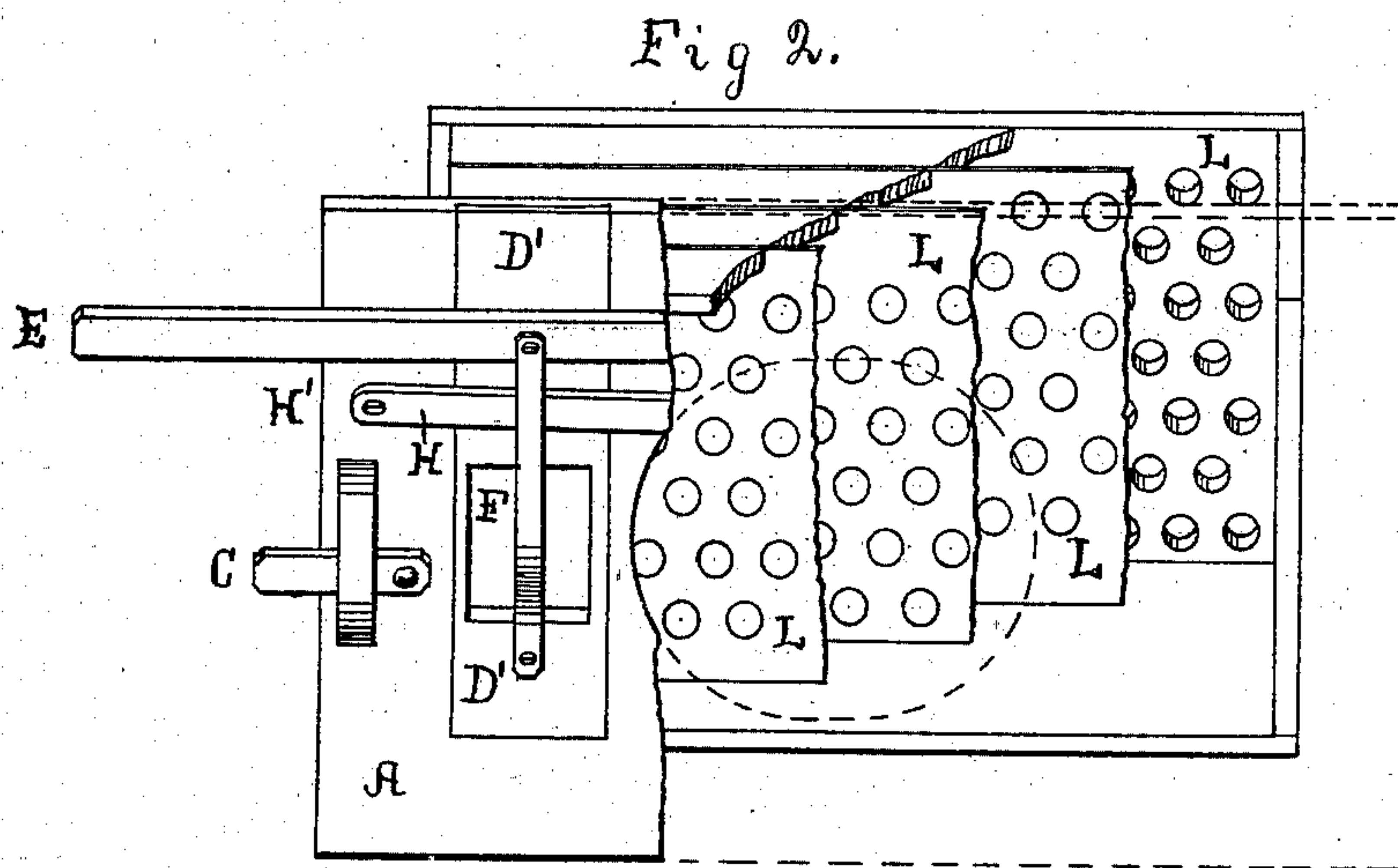
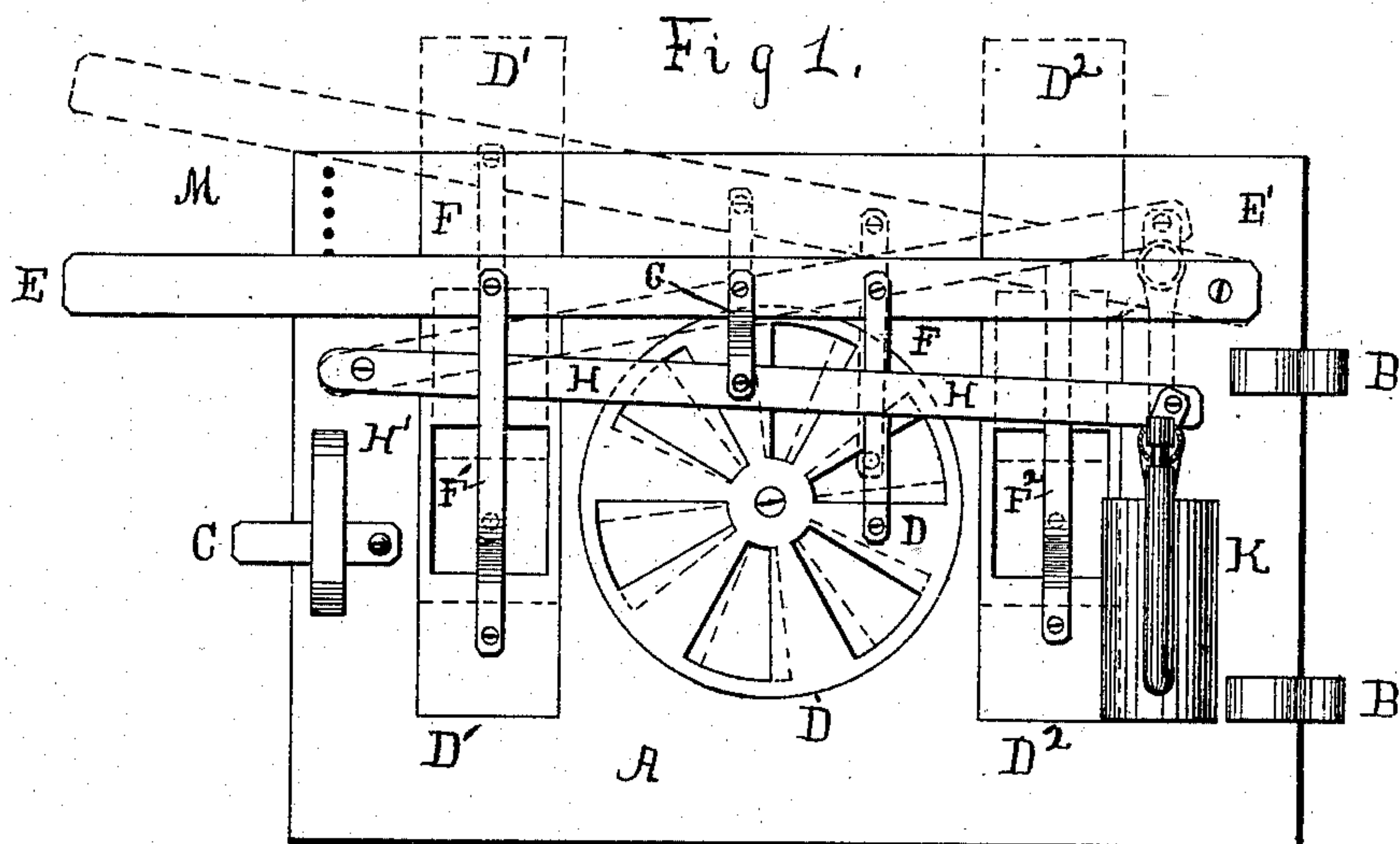


(No Model.)

J. SMITH.
Furnace Door.

No. 238,006.

Patented Feb. 22, 1881.



WITNESSES:
J. J. Lehman,
Jno. Crowell, Jr.

INVENTOR:
John Smith.
By Leggett & Leggett,
ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN SMITH, OF CLEVELAND, OHIO, ASSIGNOR TO HIMSELF, CASSIUS B. CLARK, AND BARNEY H. YORK, OF SAME PLACE, ONE-THIRD TO EACH.

FURNACE-DOOR.

SPECIFICATION forming part of Letters Patent No. 238,006, dated February 22, 1881.

Application filed August 28, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHN SMITH, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful
5 Improvements in Furnace-Doors; 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 pertains to make and use it, reference being
10 had to the accompanying drawings, which form part of this specification.

In the drawings, Figure 1 is a front view of a furnace-door constructed according to my invention, the solid lines indicating the mechanism in the position of ventilator closed, and
15 the dotted lines as in the position of ventilator open. Fig. 2 is also a front view with parts removed to illustrate the perforated plates that I employ to impede and prevent
20 direct draft.

A is the main plate or body of the door, and B B are hinges upon which it swings in opening and closing. C is the latch for keeping it closed. The door A is only opened when it is
25 necessary to feed coal to the fire. The furnace-door is provided with a central rotary slide, D, and with two vertical slides, D' D², located respectively on opposite sides of the rotary slide. Each of these slides controls a
30 draft-opening. Slide D is connected to the central portion of the primary lever E by link F. Slide D' is connected to the swinging extremity of said lever by link F', and slide D² is connected to the opposite extremity of the
35 lever by link F². This primary lever is pivoted to the door at E', and is connected with the secondary lever H by link G. This secondary lever is located below the primary lever, parallel therewith, and is pivoted to the door at
40 a point, H', below the swinging extremity of the primary lever. The free or moving end of the secondary lever H is connected with the piston-rod of a dash-pot, K.

The dash-pot K may be constructed by any
45 of the well-known methods of making dash-pots, and filled with glycerine, oil, water, or any fluid suitable for its function, which is to impede the downward movement of the secondary lever H, so that it shall fall with a
50 slow regular motion.

Instead of the dash-pot K any other suitable mechanism may be employed. For instance, clock-work could be employed and attached to the free end of the lever H, that shall impart to said lever a slow regular downward movement to any degree of rapidity required, and this degree of rapidity may be made adjustable to suit varying requirements.

The operation of one part of my device, as thus far specified, is as follows: The prime
60 lever E is raised to its position. (Shown by the dotted lines in Fig. 1 of the drawings.) This operates to open the ventilators. When allowed to drop the ventilator will be very slowly and regularly closed, on account of the
65 impeding action of the dash-pot K or clock-work, or any suitable mechanism, as just specified.

L L L L are perforated plates placed behind the door-plate A, and attached thereto
70 and swinging with it. These perforated plates L are supported a considerable distance from each other, and their perforations are so made that the openings in one plate shall not register with those of its neighbor. Thus air passing
75 into the ventilator-openings D is prevented from direct access to the furnace, and its draft is broken up and diffused in passing through the non-registering perforations of the plates L. Any suitable number of perforated plates
80 L may be employed, and these plates are placed, one behind the other, in the rear of the door-plate A, and secured to it, so as to form a single structure in any suitable way.

I have designed my invention to effect an
85 economy and a complete combustion in the burning of fuel in furnaces. When the coal is first fed to the furnace, unless preventive measures be taken, a large amount of the unconsumed products of combustion will pass off
90 in the form of smoke. To prevent this a supply of heated oxygen is necessary, and to supply this is the office of my furnace-door. When coal is first fed in the door A is closed and the ventilators are opened, as shown by the
95 dotted lines in Fig. 1 of the drawings. The air passing through the ventilators is impeded by the perforated plates L until it is thoroughly heated before it reaches the combustion-chamber. It is not only heated, but any
100

undue draft is broken up and the air is delivered in a uniform steady manner. As combustion progresses a less amount of oxygen will be required to burn the non-consumed products. Therefore the ventilator should be gradually closed as this combustion advances, and the action of the dash-pot K or clock-work, or equivalent impeding mechanism, performs the office of gradually closing the ventilator, and thus gradually decreasing the supply of oxygen, in the manner already sufficiently specified.

If for any reason it is desired that the ventilators be left open, or that they should be closed to a certain extent and there left open, a peg or stop introduced into any of the holes M may be employed to arrest the downward movement of the prime lever E at any point.

What I claim is—

1. In a furnace-door, the combination, with a slide governing a draft-opening and a lever, of a link connecting the latter with the slide, and a dash-pot, or its described equivalent, connected with said lever, substantially as set forth.

2. In a furnace-door, the combination, with a slide governing a draft-opening and a primary lever connected with the slide, of a secondary lever connected with the primary lever, and a dash-pot, or its described equivalent, connected with the secondary lever, substantially as set forth.

3. In a furnace-door, the combination, with a slide governing a draft-opening, a primary lever, and a link connecting the latter with the slide, of a secondary lever, a link connecting the two levers, and a dash-pot, or its described equivalent, connected with the secondary lever, substantially as set forth.

4. In a furnace-door, the combination, with a central rotary slide and two vertical slides, located respectively on opposite sides of the rotary slide, said three slides severally governing draft-openings, of a lever connected at its central portion with the rotary slide, and at its extremities with the vertical slides, and a dash-pot, or its described equivalent, connected with the lever, substantially as set forth.

5. In a furnace-door, the combination, with a central rotary slide and two vertical slides, located respectively on opposite sides of the rotary slide, said three slides governing draft-openings, of a primary lever, independent links connecting the latter with the slides, a secondary lever connected with a dash-pot, or its described equivalent, and a link connecting the two levers, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN SMITH.

Witnesses:

JNO. CROWELL, Jr.,
ALBERT E. LYNCH.