

(No Model.)

E. E. JONES.

FURNACE.

No. 344,317.

Patented June 22, 1886.

Fig. 1.

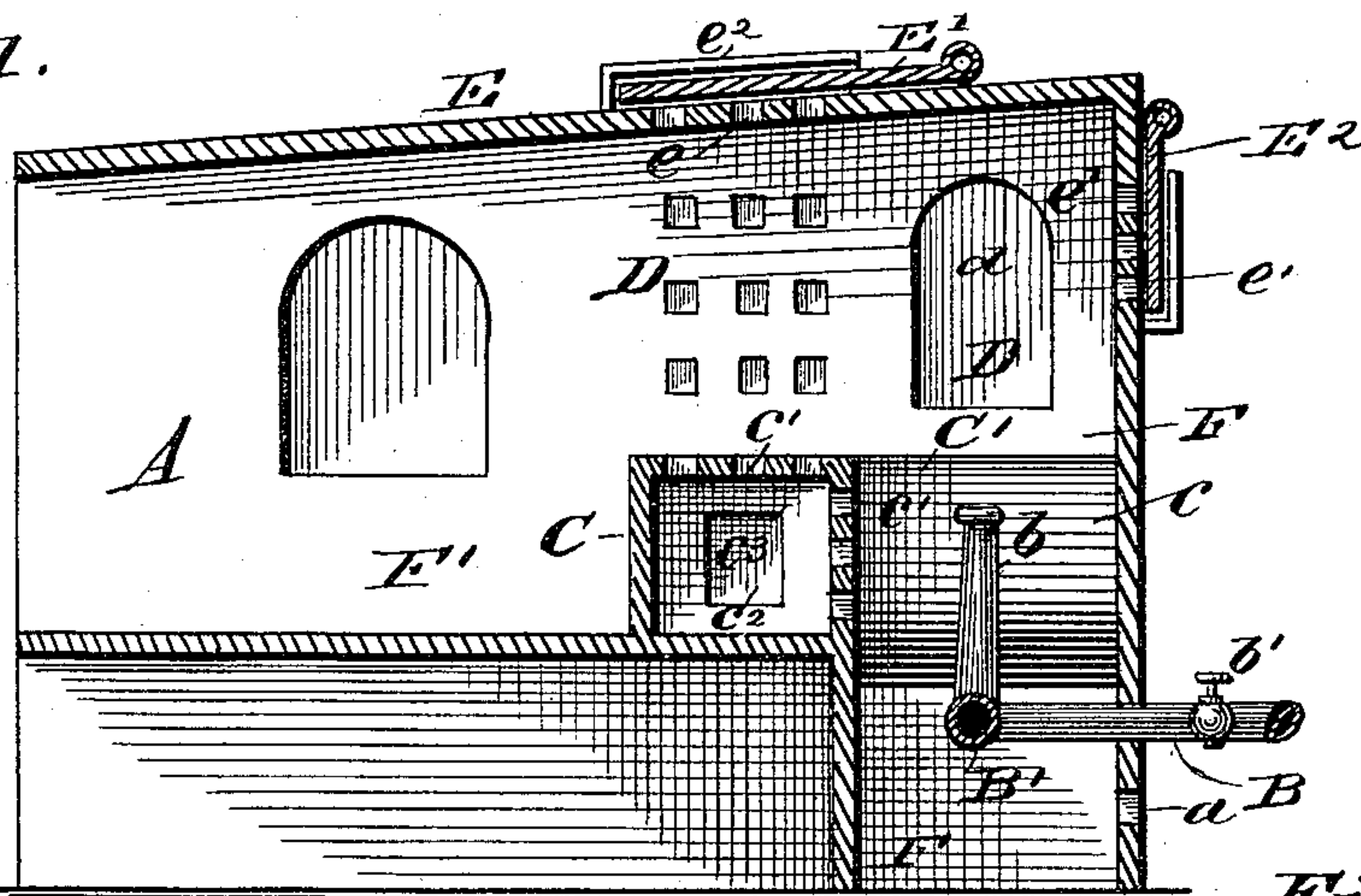


Fig. 2.

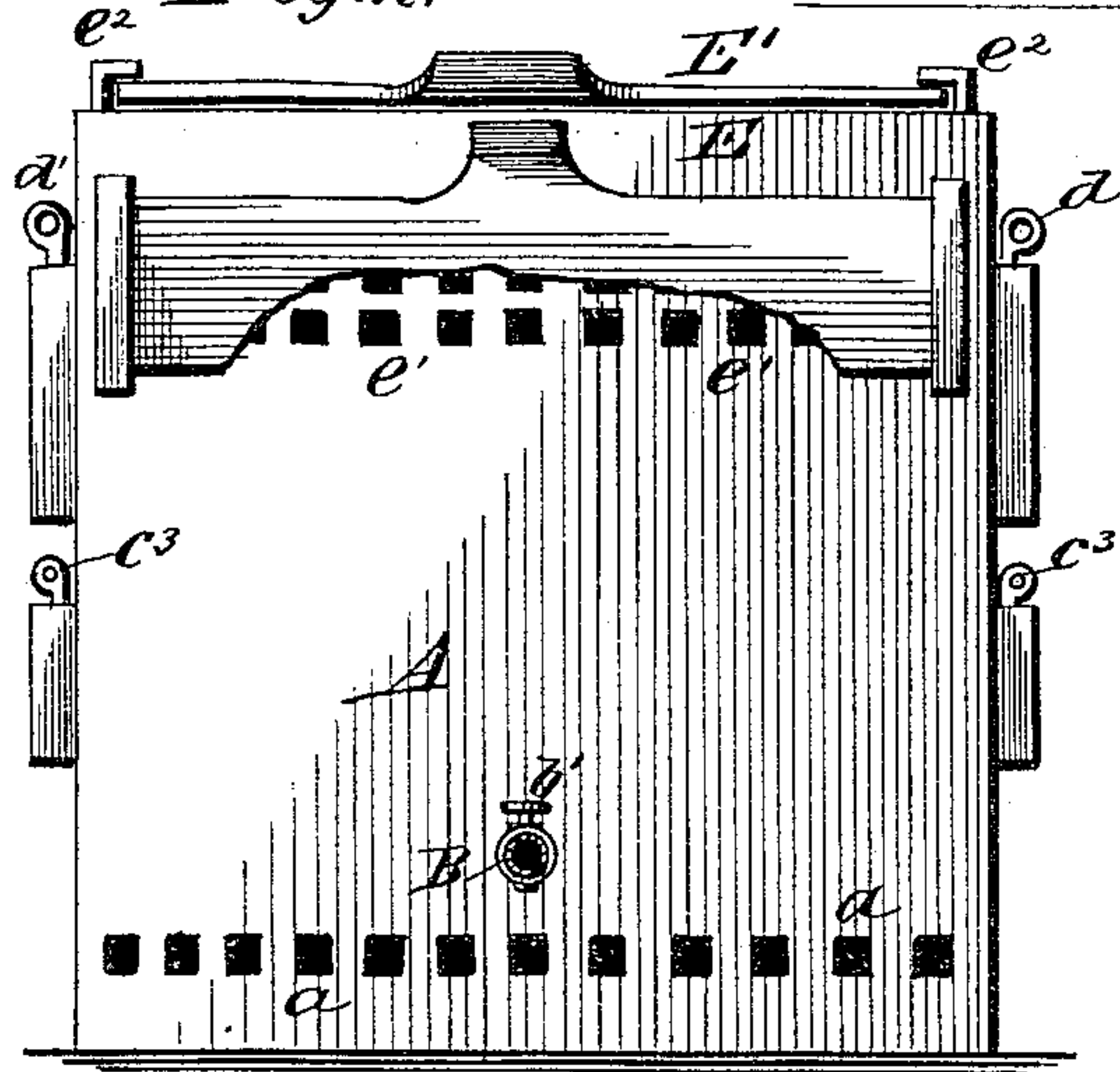


Fig. 3.

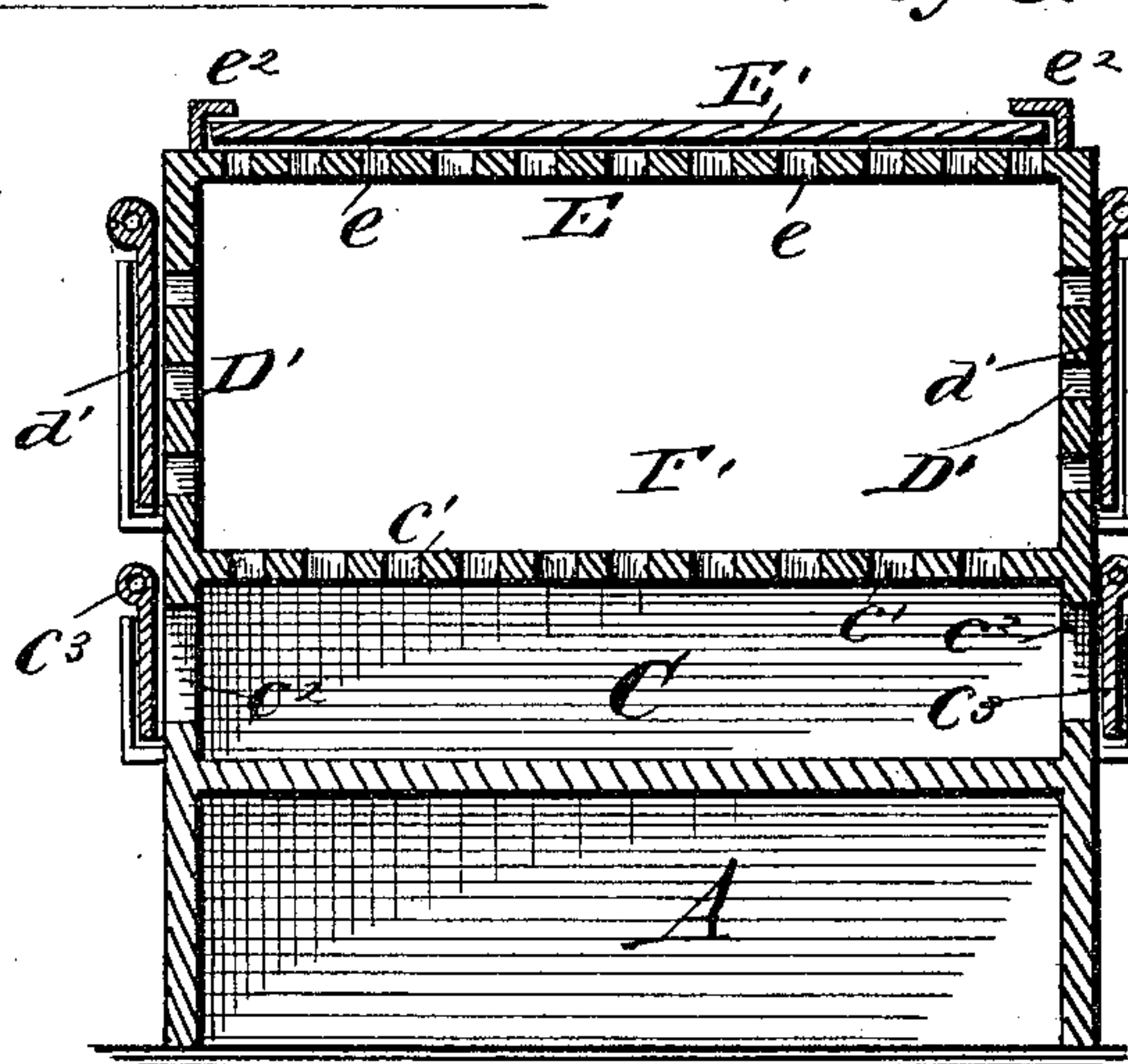
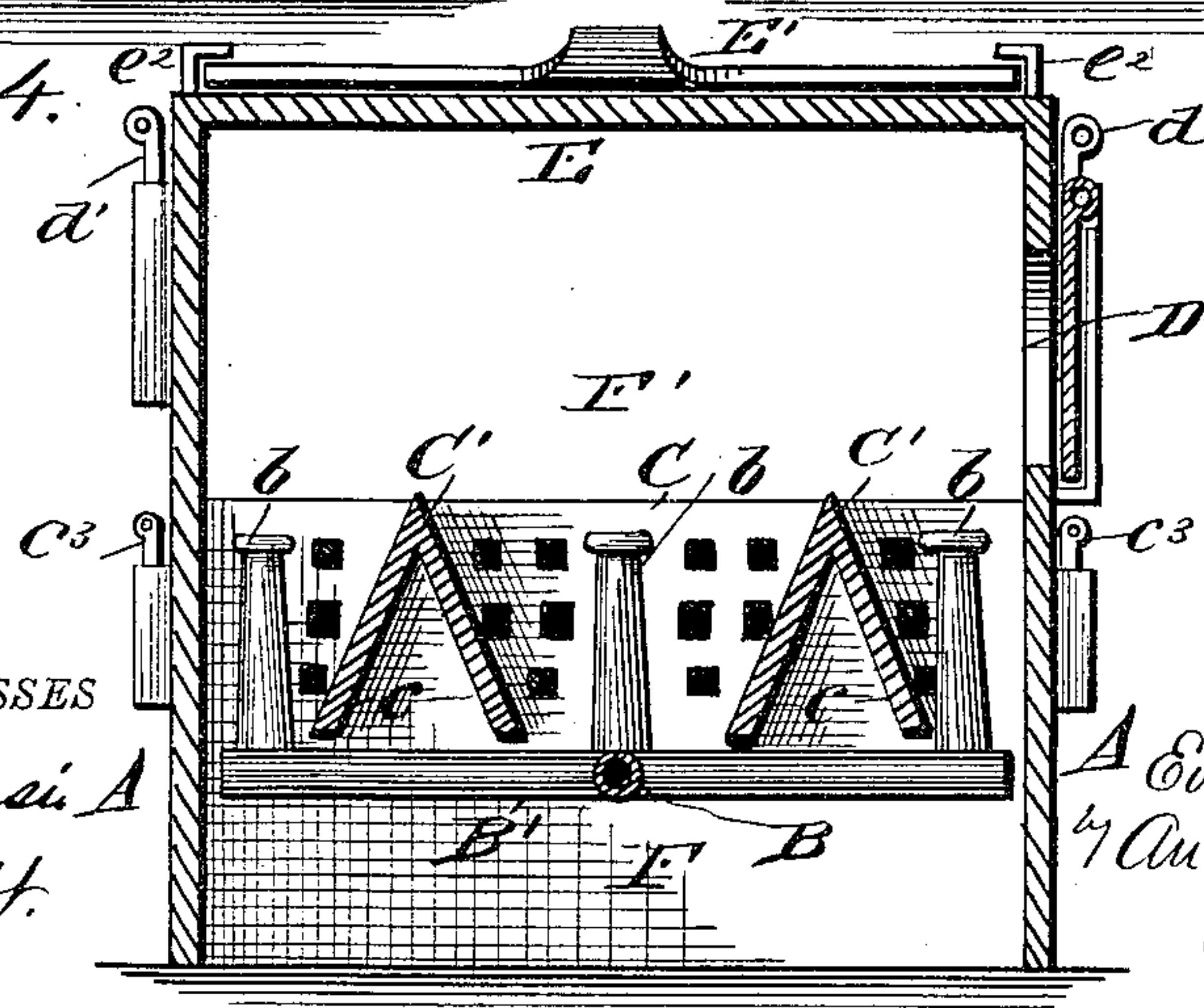


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

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FURNACE.

SPECIFICATION forming part of Letters Patent No. 344,317, dated June 22, 1886.

Application filed January 30, 1886. Serial No. 190,328. (No model.)

To all whom it may concern:

Be it known that I, EVAN ELIAS JONES, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces; and I do 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of his specification.

Figure 1 of the drawings is a representation of a vertical section. Fig. 2 is an end elevation. Fig. 3 is a transverse section through the bridge. Fig. 4 is a similar section through the combustion-chamber.

This invention relates to improvements in furnaces, having especial reference to that class in which gas, either natural or artificial, is used as fuel; and its object is to effect perfect combustion of the said fuel, economizing the same, and not producing smoke nor wasteful combinations of the fuel.

The invention consists in the construction and novel arrangement of the parts of the furnace, whereby air is admitted at proper times and in proper proportions to the burning fuel, and which are hereinafter described, and particularly pointed out in the claims appended to this specification.

Referring to the accompanying drawings by letter, A designates the body or housing of the furnace, built of suitable material, and provided at its rear end with the combustion-chamber F.

a a are small air-ports in the rear side of the combustion-chamber, near its lower end. The said ports are preferably made in a transverse line, a suitable distance below the gas-jets, hereinafter described.

B is the main gas-pipe, entering the combustion-chamber through its rear side above the ports *a*, and opening into the transverse horizontal pipe B' in said chamber.

b b are burners rising from the pipe B', of any convenient number, and situated a suitable distance apart. The said burners may be controlled by separate valves, or by one valve, *b'*, on the main pipe B.

C is a hollow furnace-bridge, preferably rectangular in cross-section, and forming the front wall of the combustion-chamber proper.

C' C' are deflectors situated between the said burners, running from the front to the rear wall of the combustion-chamber, and each composed of the plates *c c*, which are united at their tops, and diverge thence downward, so that they radiate heat upward from the burners and mix the air ascending from the ports *a* and the gas from the burners, and distribute the mixture before it passes over the furnace-bridge. The deflecting-surfaces are preferably the inclined sides of brick partitions triangular in cross-section. The bridge C has in its top and in its side next to the rear combustion-chamber, F, the perforations *c' c'*, and in its ends the openings *c'' c''*, which pass through the walls of the furnace, so that air can pass through said perforations and openings, and can combine with the burning gas as it comes from the top of the combustion-chamber F over the bridge, and mix with the same, so that it will be perfectly consumed and produce no smoke. The openings *c''* are covered by the sliding doors *c''*, by means of which the circulation of air through the interior of the bridge may be cut off when necessary.

D is a torch-hole in the side wall of the furnace, through which the burners may be lighted, and D' D' are openings in the side walls of the furnace, vertically above the bridge, and admitting air, when necessary, over the same. The torch-hole D may be closed by the sliding door *d*, and the openings D' D' by the similar doors, *d' d'*, on the outer surface of the furnace.

E is the roof of the furnace, provided with the perforations *e e*, above the bridge and combustion-chamber, to admit air to the latter above the burners and while the ignited gases are passing over the bridge.

e' e' are perforations similar to the perforations *e*, made through the rear wall of the furnace near its top, and admitting air above the rear part of the combustion-chamber. The air through the perforations *e e* may be cut off by the door E', which slides upon the roof of the furnace in the side ways, *e'' e''*, and the air through the perforations *e' e'* may be cut off by the door E'', sliding on the back of the furnace in similar ways.

F' is the front chamber of the furnace, into which the ignited gas enters after passing the bridge, and in which the same, thoroughly mixed with air, is perfectly consumed immediately after passing the bridge, so that no smoke is formed.

The method of operating the furnace is as follows: The burners being lighted, the air flows in through the ports *a* in the lower part of the rear wall of the furnace. These ports furnish air to start combustion. To give sufficient air to completely consume the ignited gas before it leaves the chamber F, air must be again admitted through the perforations *c' c'* while the gas is passing over the bridge, or through the perforations *c' e e'* and ports *a*, so as to bring it into intimate contact on all sides of the ignited gas, and effect the perfect combustion of the latter upon entering the chamber F', without the production of smoke or other waste products.

The furnace may be arranged to burn solid fuel—such as bituminous coal—but is especially adapted and arranged to burn gas, and is very useful and economical in localities in which natural gas wells exist.

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

1. The combination of the front and rear combustion-chambers, the gas-burners in the rear combustion-chamber above the air-ports in the rear wall of said chamber for the purpose of starting the combustion of the gas, the

hollow bridge separating the two chambers and provided with end openings and perforated sides and top, the roof of the furnace perforated for the admission of air vertically above the bridge and rear combustion-chamber, the perforations in the rear wall of said chamber above the line of burners, and the sliding doors on the roof and rear wall of the furnace and over the end openings in the bridge for the purpose of regulating the admission of air at various points, substantially as specified.

2. The herein-described furnace to effect perfect combustion, composed of the rear and front combustion-chamber, F F', respectively, the rear chamber having the ports and perforations *a e'* and torch-hole D, the furnace-top E, having the perforations *ee*, the hollow bridge C, separating the two combustion-chambers and provided with the perforations *c'* and end openings, *c'*, the gas-burners *b* in the rear combustion-chamber and receiving gas from the pipes B B', the deflectors C', situated between the burners, and the sliding doors, substantially as described, whereby any or all of the air-entrances may be closed to regulate the amount and direction of the entering air, substantially as specified.

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

EVAN ELIAS JONES.

Witnesses:

WM. S. JONES,
ROBT. L. JONES.