

(No Model.)

F. B. GIESLER.

SMOKE CONSUMING FURNACE.

No. 313,071.

Patented Mar. 3, 1885.

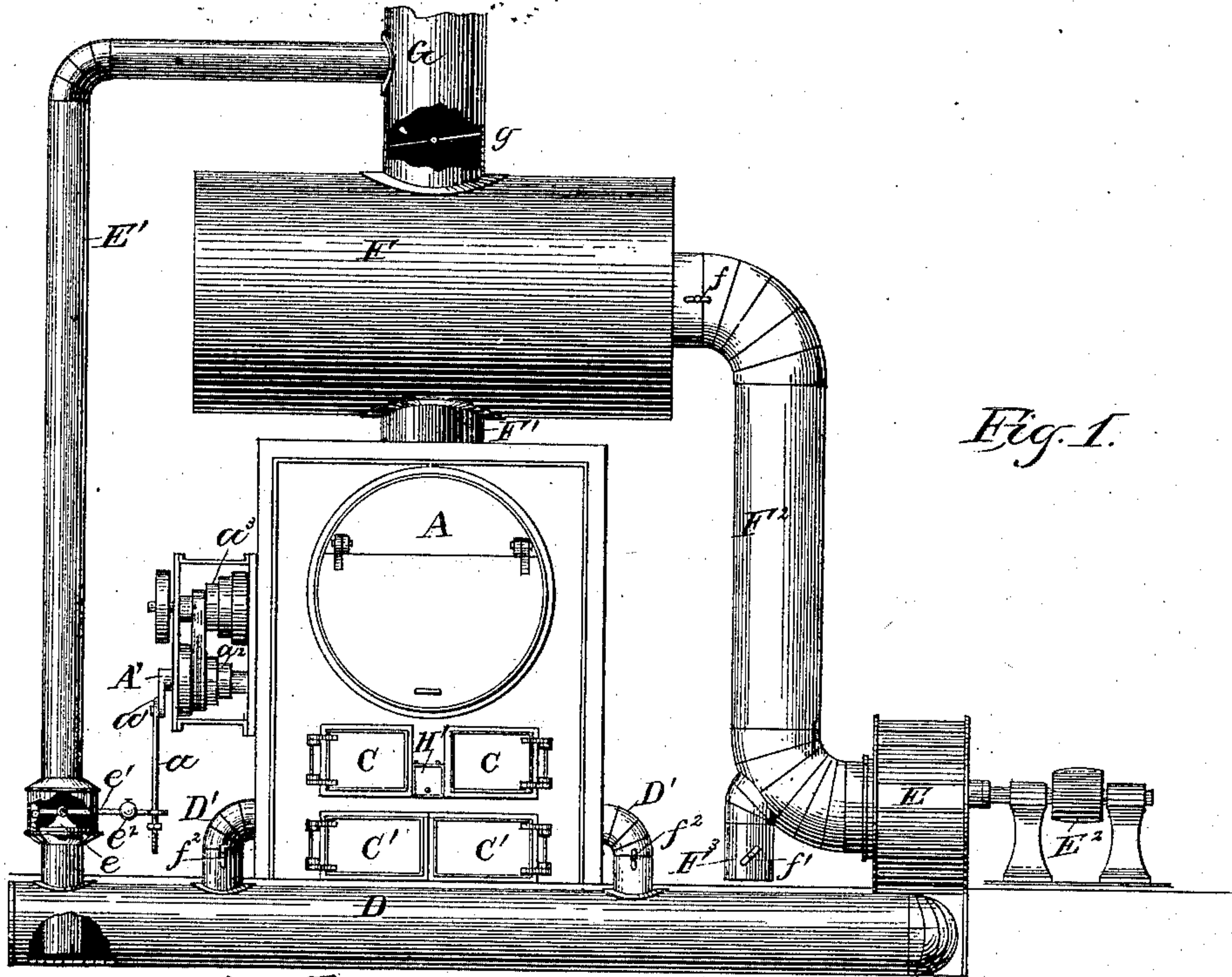


Fig. 1.

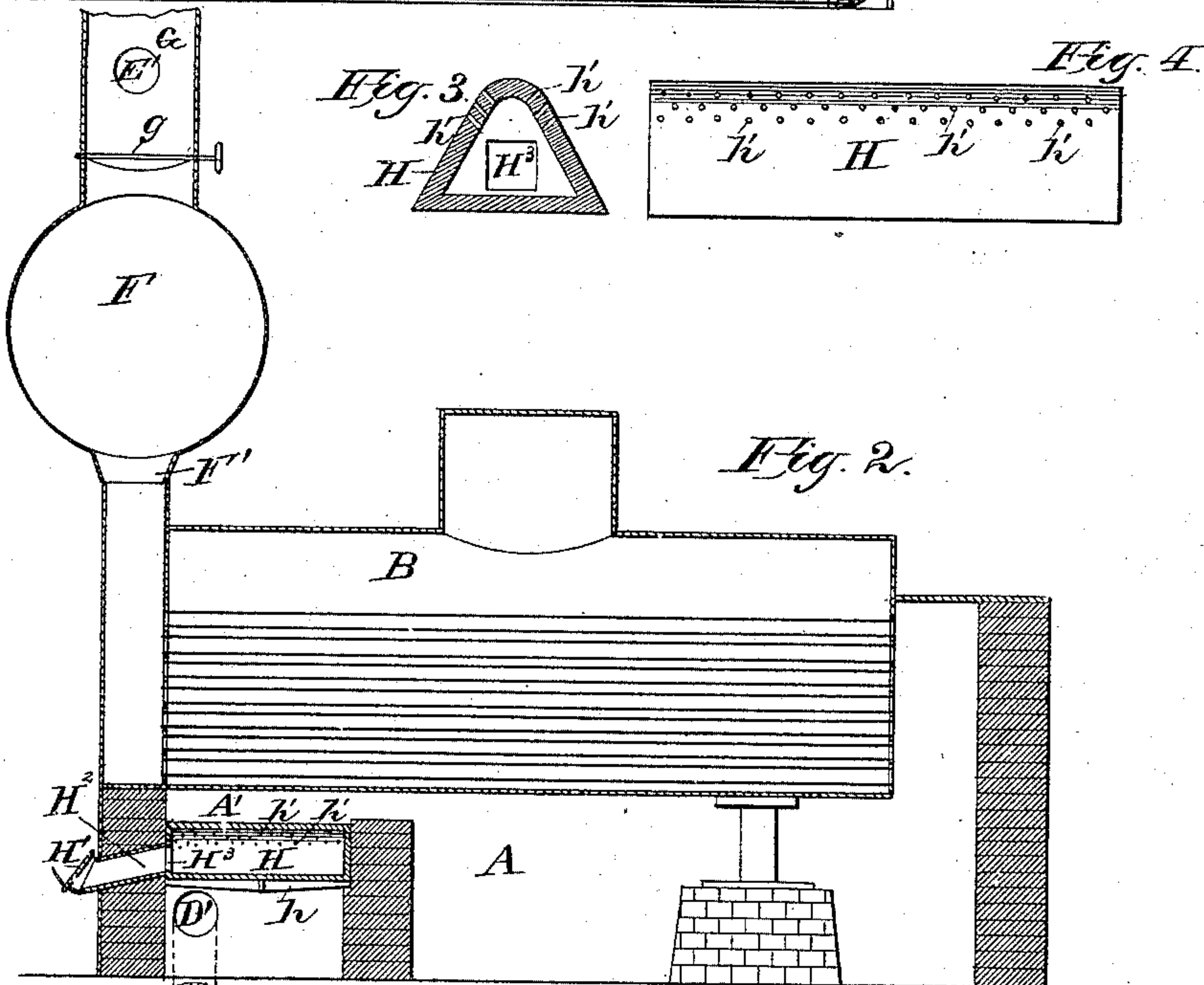


Fig. 2.

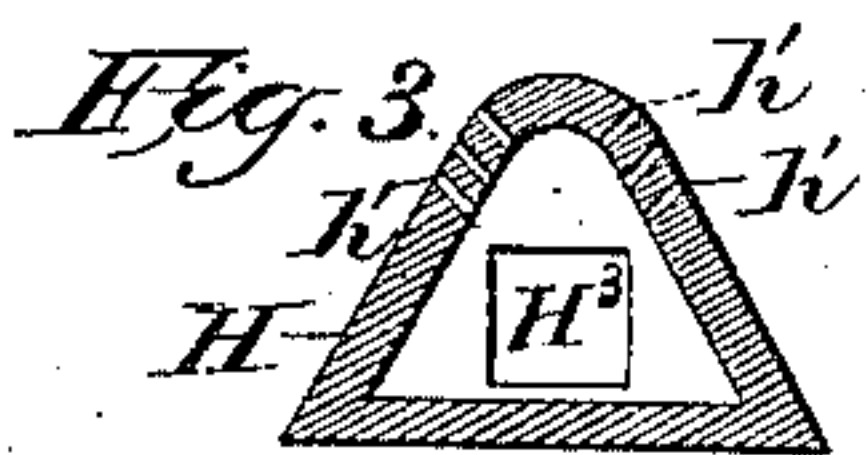


Fig. 3.



Fig. 4.

Witnesses  
E. G. Jones  
R. Platz

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# UNITED STATES PATENT OFFICE.

FRANKLIN B. GIESLER, OF MILWAUKEE, WISCONSIN.

## SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 313,071, dated March 3, 1885.

Application filed September 26, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, FRANKLIN B. GIESLER, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Smoke-Consuming Furnaces; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to improvements in smoke-consuming furnaces, and will be fully described hereinafter.

In the drawings, Figure 1 is a front elevation of a furnace embodying my invention. Fig. 2 is a vertical longitudinal section through the center of the furnace, and Figs. 3 and 4 are details.

A is the furnace, having the usual boiler, B.

C C are doors that open in the combustion-chamber, and C' C' are doors that give access to the draft-chamber beneath the grate, and from this draft-chamber short flues D' D' lead into a horizontal flue, D, which latter is connected at one end with a blower, E, and at the other has an exhaust-pipe, E', leading down into it.

F is a smoke-chamber, which is connected with the furnace by a flue, F', and with the blower E by a pipe, F<sup>2</sup>.

G is the smoke-stack, which is provided close to its point of connection with the smoke-chamber with a damper, *g*, a slight distance above which the exhaust-pipe E' enters the said smoke-stack. Another damper, *f*, is fitted in the pipe F<sup>2</sup> close to the smoke-chamber, and connected to the lower part of the said pipe F<sup>2</sup> is a small flue, F<sup>3</sup>, open at its lower end to admit fresh air through the regulating-valve *f'*. The short flues D' D', which connect the horizontal flue D with the draft-chamber, are also provided with dampers *f*<sup>2</sup> *f*<sup>2</sup>.

The lower end of the exhaust-pipe E' passes down into the flue D, and terminates close to its bottom. It is provided with a lift-valve, *e*, the stem *e'* of which carries an adjustable weight, *e*<sup>2</sup>, and is projected far enough toward the furnace to come in the line of travel of a plate or rod, *a*, that is freely connected to the crank *a'* of the shaft A', carrying the cone-pulley *a*<sup>2</sup>, mounted with its companion pulley *a*<sup>3</sup> in any suitable form of hanger on the corresponding side of the furnace. The cone-pul-

ley *a*<sup>3</sup> is connected in any suitable manner with the driving mechanism.

In the center of the combustion-chamber I provide a flue, H, of any suitable form, but preferably of the shape shown in Figs. 3 and 4. This flue extends the whole length of the fire-bed, its closed bottom resting on top of the grate-bars *h h*. In the upper part of this flue a series of perforations, *h' h' h' h'*, are made on each side.

A passage, H<sup>2</sup>, is formed in the front of the furnace, between the doors C C, to admit fresh air from the outside to said flue H through a corresponding opening, H<sup>3</sup>, in the end wall of the flue, and this passage has a trap-door, H', which may be kept more or less open by means of any form of adjustable latch in use.

The blower E is belted in any suitable manner, as at pulley E<sup>2</sup>, with the driving mechanism.

The operation of my device is as follows: When the furnace fire is first lighted, the damper *g* in the smoke-stack G is opened and the smoke passes out in it until sufficient steam has been raised to operate the blower; but when this occurs the damper *g* is closed, and the dampers *f* of pipe F<sup>2</sup>, as well as the dampers *f*<sup>2</sup> *f*<sup>2</sup> in the short flues D', being open, the blower will draw the smoke from the chamber F and force it through the flue D and its branches D' and into the fire-box, together with a certain quantity of fresh air that is induced in the same time through the small flue F<sup>3</sup>, the amount of air thus admitted being regulated by means of the valve *f'*.

The valve *e* in the lower end of the exhaust-pipe E' is lifted at intervals determined by the position of the belt that connects the cone-pulleys *a*<sup>2</sup> and *a*<sup>3</sup>, and this intermitting opening will permit the carbonic-acid gas and surplus smoke to pass out and away. This valve may, moreover, be set so as always to be partly open, so that there may be a constant draft that will carry off the carbonic-acid gas in flue D, while the smoke is forced through the fire-box to form part of the fuel. As the fresh air admitted through the door H' and opening or passage H<sup>2</sup> into the flue H becomes sufficiently heated it rushes up through the perforations in the upper portion of the said flue, and besides producing a current that powerfully in-

duces the return smoke up through the fire-bed it contributes its additional volume of oxygen to materially aid the combustion of the gases.

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

1. The combination, with a furnace, of pipes D, D', F', F<sup>2</sup>, and F<sup>3</sup>, the reservoir and blower,  
10 pipe E and its valve, and mechanism for lifting the latter at set intervals, substantially as described.

2. In a smoke-consumer, in combination with the furnace A, the horizontal flue D, and  
15 branches D' D', of a chamber or flue formed

above the grate-bars in the center and the whole length of the furnace, and having its closed bottom resting on the grate-bars, suitable perforations on each side near its top, and an adjustable door opening in the furnace 20 front, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, 25 in the presence of two witnesses.

FRANKLIN B. GIESLER.

Witnesses:

S. S. STOUT,

H. J. FORSYTHE.