

(No Model.)

2 Sheets—Sheet 1.

DE WITT C. HILL.

SMOKE AND GAS CONSUMING FURNACE.

No. 264,158.

Patented Sept. 12, 1882.

Fig. 1.

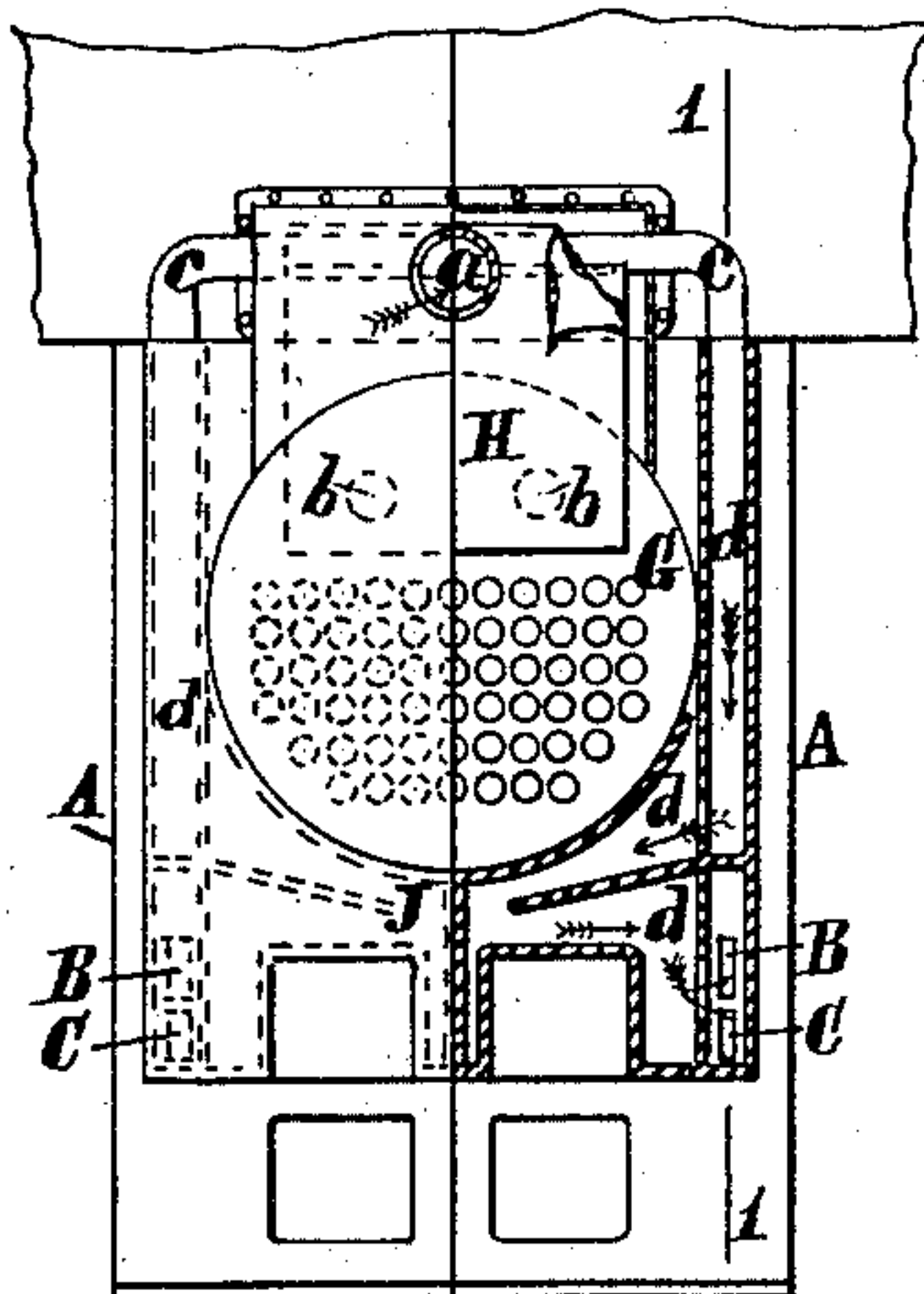
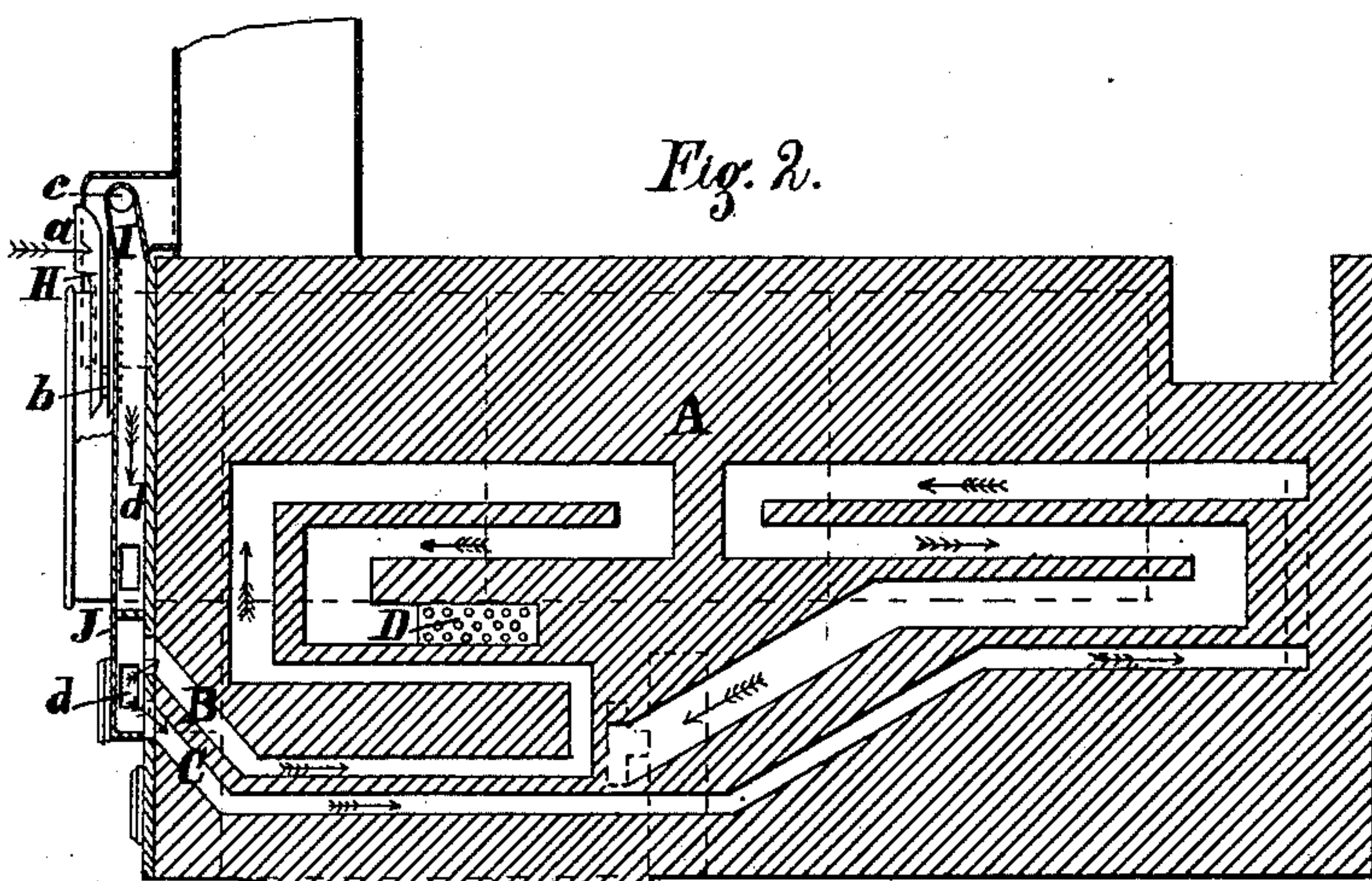


Fig. 2.



Attest;

Wm H. Drury.
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Inventor;

De Witt Clinton Hill,
per
Edw. Dummer,
Atty.

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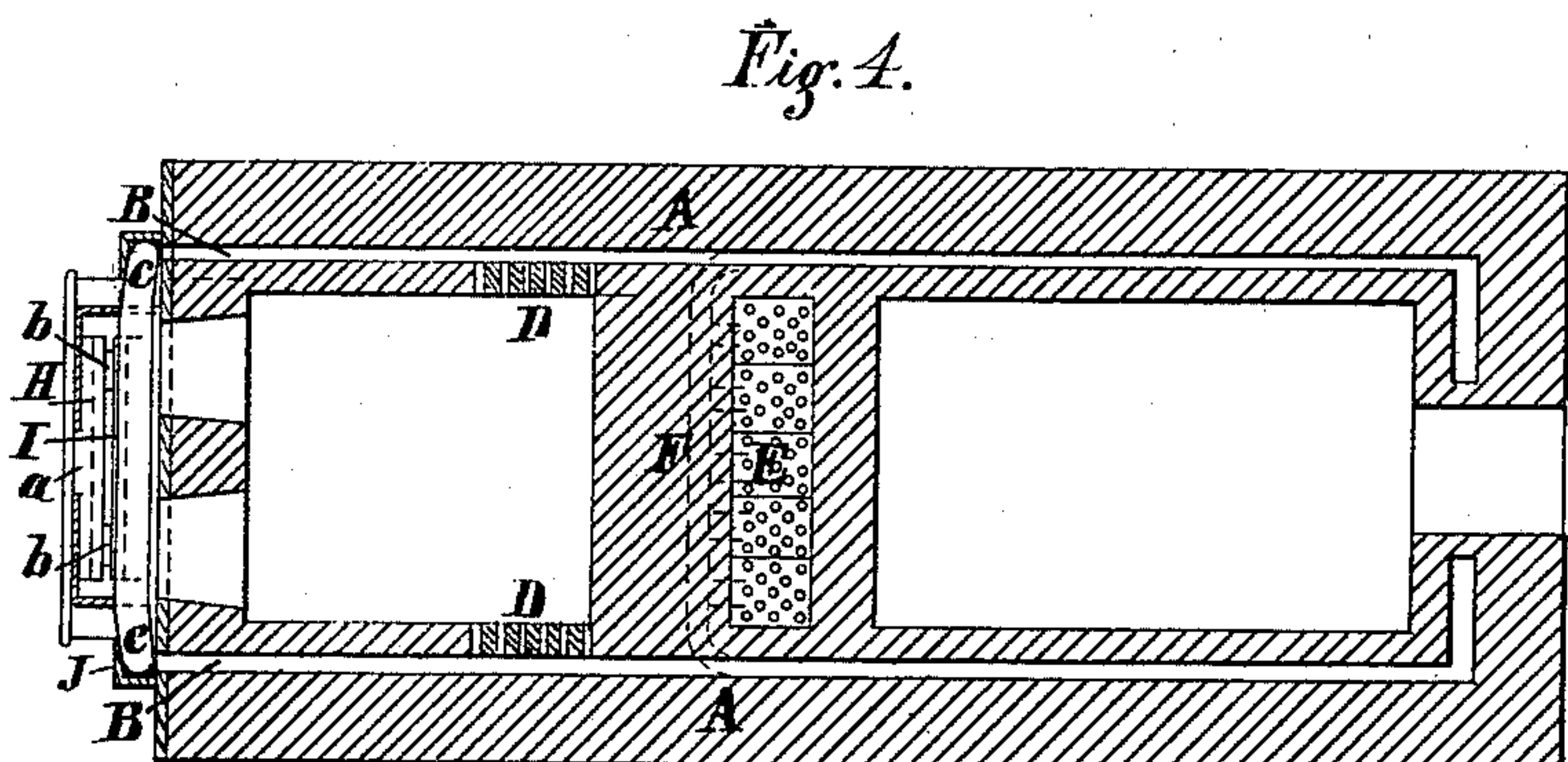
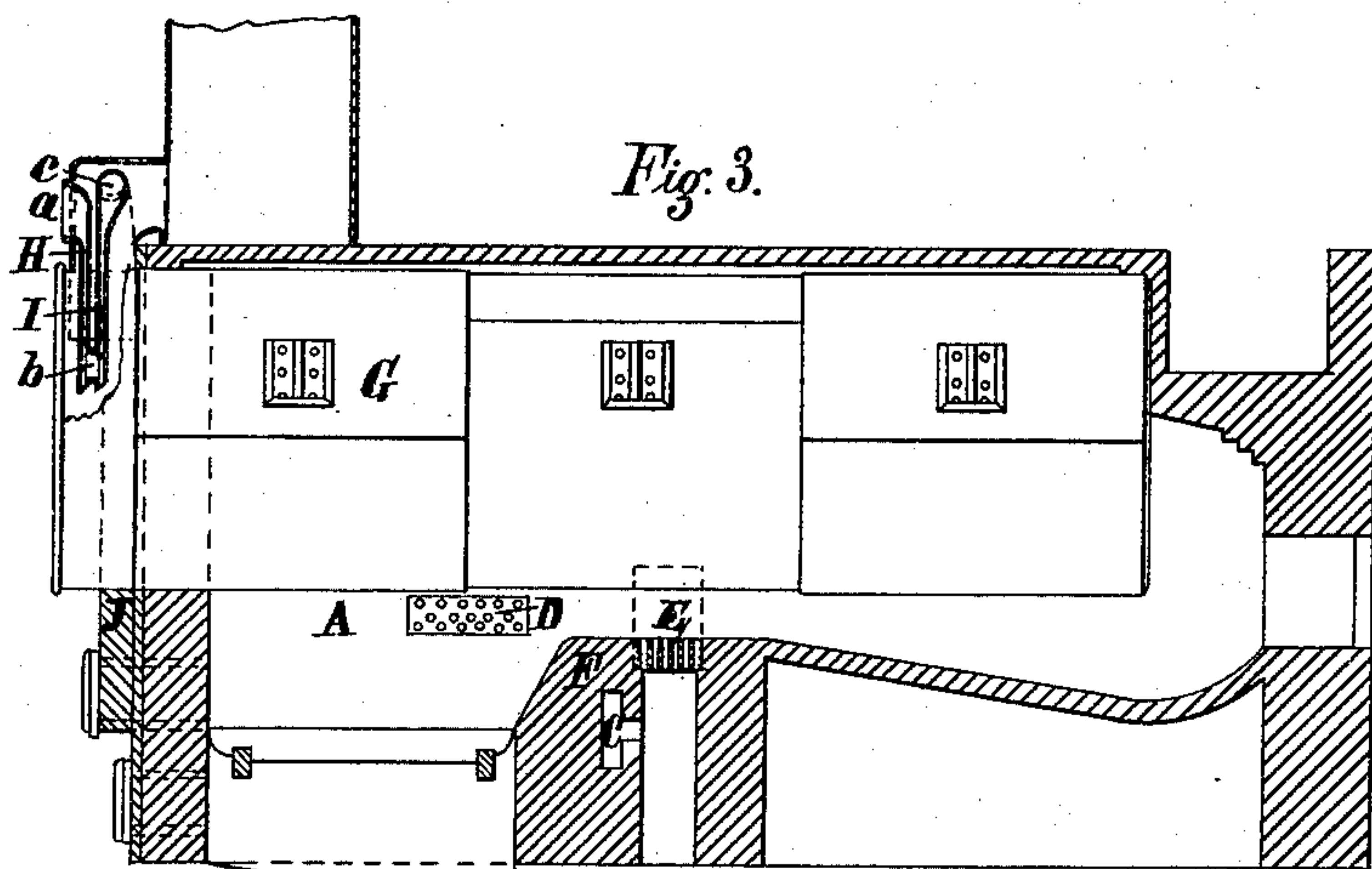
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UNITED STATES PATENT OFFICE.

DE WITT C. HILL, OF WILLIMANTIC, CONNECTICUT, ASSIGNOR OF TWO-THIRDS
TO JOHN SCOTT, OF SAME PLACE, AND WILLIAM E. BARROWS, OF HART-
FORD, CONNECTICUT.

SMOKE AND GAS CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 264,158, dated September 12, 1882.

Application filed August 25, 1881. (No model.)

To all whom it may concern:

Be it known that I, DE WITT CLINTON HILL, a citizen of the United States, residing at Willimantic, in the county of Windham and State of Connecticut, have invented a new and useful Improvement in Smoke and Gas Consuming Furnaces, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to means for increasing the heat of the air which is introduced into the combustion-chamber of a smoke and gas consuming furnace of the construction hereinafter set forth; and it consists in air receivers and heaters placed in the uptake or flue leading from the tubes of the boiler, and in passages in the front of the furnace, through which the air may pass, and in which it may be heated before entering the ducts or flues in the side walls of the furnace.

In the drawings, (two sheets,) Figure 1 is a front view of a furnace embodying my invention, a part being in section. Fig. 2 is a vertical section taken in the direction of line 1 1 in Fig. 1. Fig. 3 is a central vertical section, and Fig. 4 is a horizontal section.

In the side walls, A A, of the furnace, as furnaces to which my improvement is applied are now constructed, are the ducts or flues B B C C. The flues B B lead from the front of the furnace to the openings or perforated plates D D into the combustion-chamber, and the flues C C lead also from the front of the furnace to the combustion-chamber, but through openings or perforated plates E in the bridge-wall F. These ducts or flues, which wind back and forth in the walls, as shown, have hitherto in this style of furnace received the air at the front of the furnace directly from the atmosphere, and conducted the same to the combustion-chamber, heated only to that degree which is possible by passing through said ducts or flues.

I have found that the air after passing through said ducts or flues, when received by them at the temperature of the atmosphere, does not possess that amount of heat whereby it may cause that degree of consumption of the smoke and gases which is desirable. I have

also found that the air admitted to the combustion-chamber may hold a greater amount of heat, and when so heated the consumption of the smoke and gases is greatly increased. To accomplish this result I heat the air before it passes into the ducts or flues in the walls of the furnace.

I place in the uptake at the head of the boiler G air receivers and heaters, as many as are desirable—two, H and I, in this case. A passage, a, opening outward, conducts the air of the atmosphere to the receiver and heater H. The two receivers H and I are connected by pipes or ducts b b, and by pipes or flues c c to passages d, which are formed in the double-walled iron front J of the furnace, and lead downward, as shown. From the passages d the air passes to the ducts or flues B B C C in the walls of the furnace. The air, having passed through passage a, heaters H and I, flues and passages b, c, and d, enters the ducts and flues in the walls of the furnace at a high degree of heat, and enters the combustion-chamber and mingles with the flame and gases at a much greater heat than it would had it not been heated before passing into the ducts or flues in the walls.

The heat thus utilized is that which might otherwise be lost, not only because taken from the uptake or passage leading from the tubes of the boiler, but also since it is that which ordinarily escapes in a great measure by radiation at the front of the boiler and furnace.

I claim as my invention—

1. In a furnace having air ducts or flues winding back and forth in the side walls, and leading to openings or perforated plates located with reference to the combustion-chamber, as specified, the combination of one or more air receivers or heaters located in the uptake, said air ducts or flues and air-passages connecting said air receivers or heaters and said ducts or flues, substantially as and for the purpose set forth.

2. In combination with air ducts or flues winding back and forth in the side walls of a furnace, and leading to openings in perforated plates located with reference to the combustion-chamber, as specified, one or more heat-

ers placed in the uptake, and air-passages in the front of the furnace, substantially as and for the purpose set forth.

3. The combination of the heaters H and I, passage *a*, pipes *b*, pipes *c*, passages *d* in the double front J, and ducts or flues B C in the side walls, substantially as described.

4. The combination of one or more heaters

in the uptake, having one or more openings outward, passages *d* in the double front J, and ducts or flues B C in the side walls, substantially as described.

DE WITT CLINTON HILL.

Witnesses:

IRAD W. STORRS,

HUBER CLARK.