

(No Model.)

L. D. YORK.
STEAM BOILER FURNACE.

No. 411,949.

Patented Oct. 1, 1889.

FIG. 1.

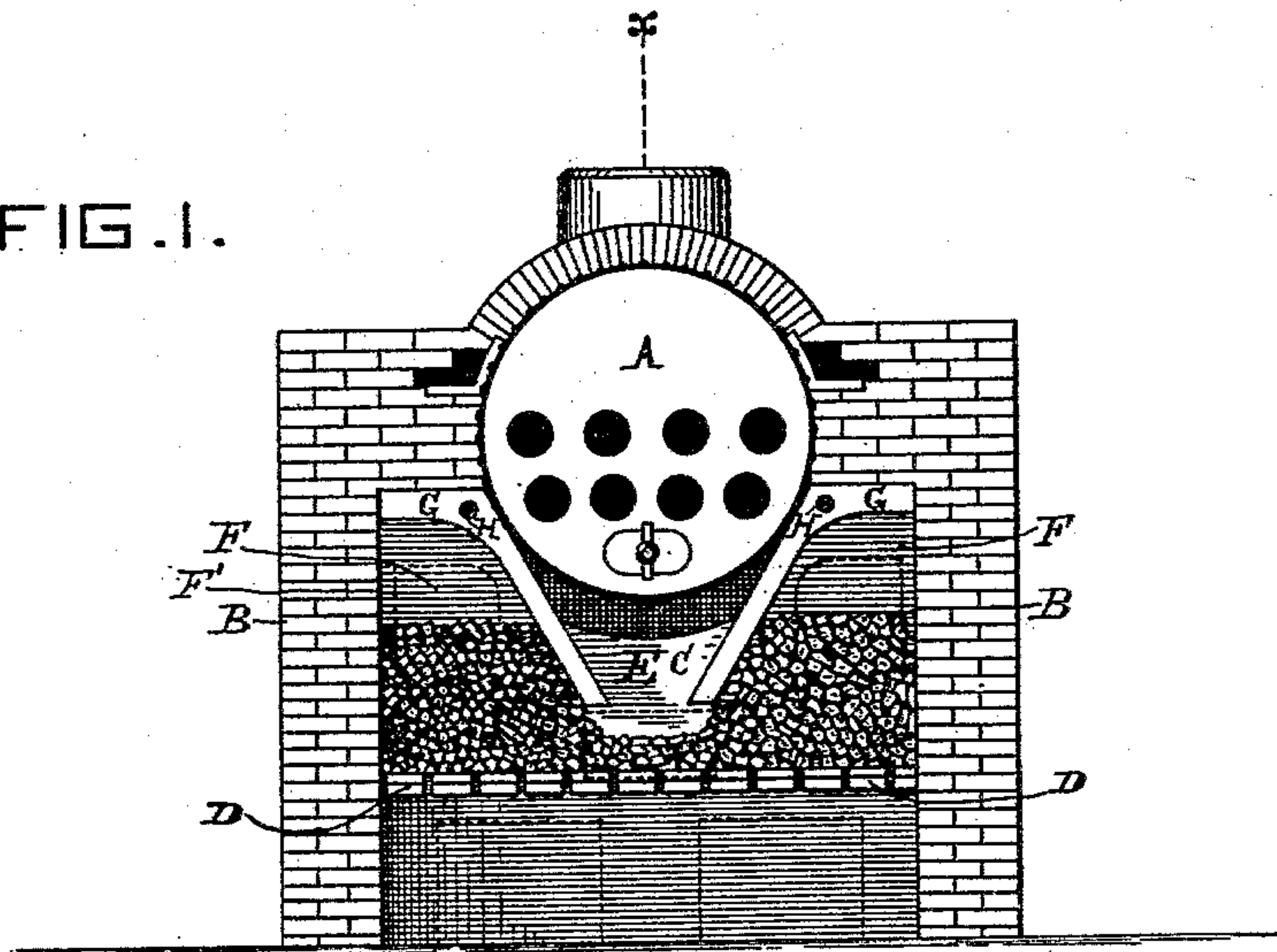
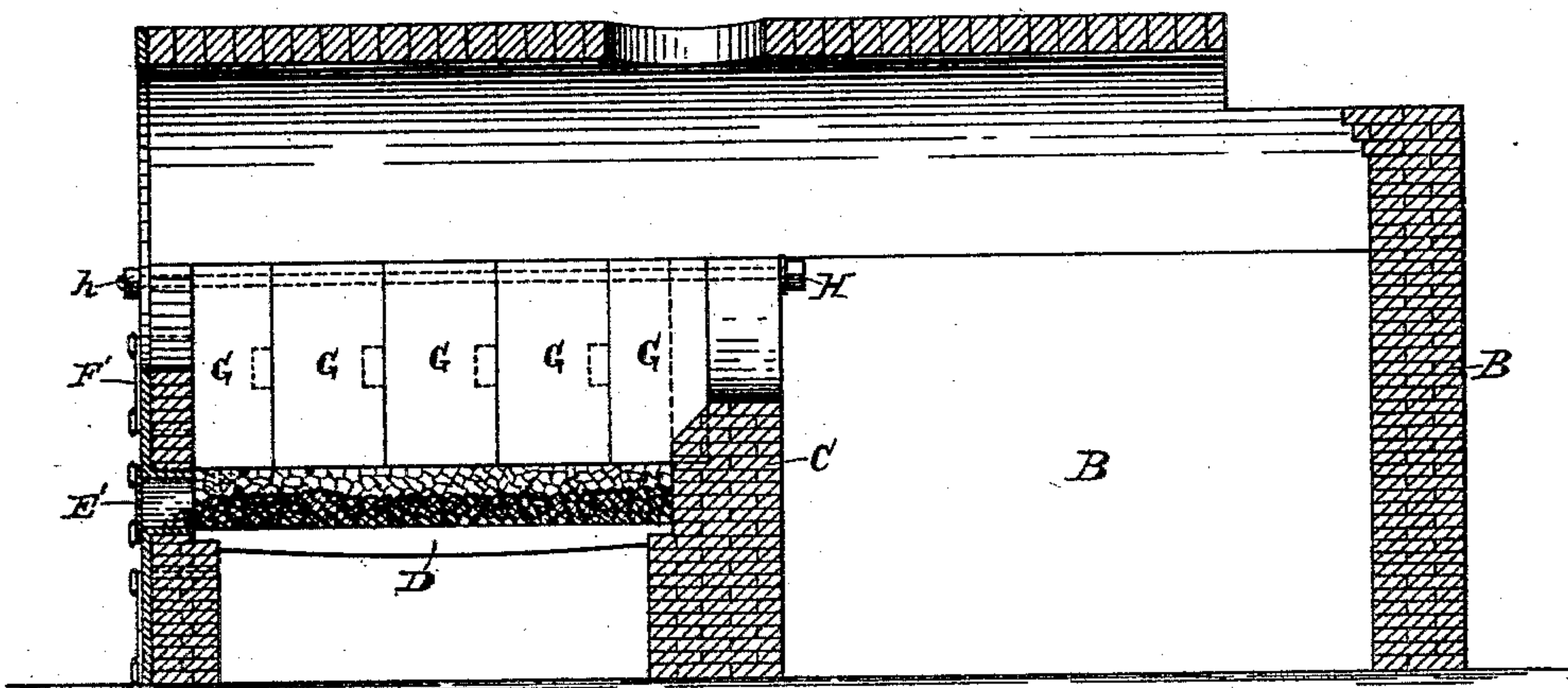


FIG. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

LEVI D. YORK, OF PORTSMOUTH, OHIO.

STEAM-BOILER FURNACE.

SPECIFICATION forming part of Letters Patent No. 411,949, dated October 1, 1889.

Application filed June 13, 1889. Serial No. 314,155. (No model.)

To all whom it may concern:

Be it known that I, LEVI D. YORK, a citizen of the United States, and a resident of Portsmouth, in the county of Scioto and State of Ohio, have invented certain new and useful Improvements in Steam-Boiler Furnaces, of which the following is a specification.

My invention relates to steam-boiler furnaces. Its object is a simple and economical means to economize fuel and prevent the formation of smoke.

The invention will be first fully described in connection with the accompanying drawings and will then be particularly referred to and pointed out in the claims.

Referring to the drawings, in which like parts are indicated by similar reference letters wherever they occur throughout the various views, Figure 1 is a front view of a steam-boiler furnace constructed according to my invention, the furnace-front lining being removed to expose the combustion-chamber and coking-chambers. Fig. 2 is a central longitudinal vertical section of the same, taken through line *xx* of Fig. 1, but with the furnace-front in position.

The boiler A, furnace-walls B, bridge-wall C, and grate-bars D may be of any approved form or construction, and my invention is applicable to either flue or tubular boilers.

The invention consists in dividing the ordinary fire-box into three chambers, the center one E of which is the combustion-chamber, and the chambers F F upon each side of the combustion-chamber I term the "generating" or "coking" chambers. The combustion-chamber is at a short distance above the grate-bars divided from the coking-chambers by the inclined partitions, which are preferably formed of angle fire-tiles G. The end tiles in front are built into the front brick lining of the furnace and the rear end ones are built into the bridge-wall. The edges of the tiles are matched together by tenons and grooves, as shown in dotted line, Fig. 2, and to more securely hold the partitions firmly in place the tiles are perforated at their angles to pass the bolts H, which pass through the front, the tiles, and bridge-wall. The bolts are anchored back of or in the bridge-wall and

are provided with nuts *h* in front. The chambers F are closed, except the spaces left between the bottom edges of the partitions and grate-bars, through which spaces they communicate with the combustion-chamber E.

The chambers F are provided with doors F' in front, (shown in dotted line, Fig. 1,) through which the chambers are supplied with fuel, and there is a small door E' in front of the chamber E for raking the fire or clearing the furnace of ash-clinkers, &c.

The operation of my furnace is as follows: A fire being first started upon the grate-bars, coal is fed in through the doors F', the intention being to keep these chambers well filled with fuel. Air being admitted through the ash-pit, there is of course perfect combustion immediately above the grate-bars, and as no fresh fuel reaches the chamber E there is necessarily perfect combustion on the grate-bars immediately below the contracted opening of the chamber E, and as there is but a thin bed of fuel upon the grate-bars at this point an excess of oxygen enters the chamber E. The highly-heated gas (carbon dioxide) passing up through the fuel in the bottom of the chambers F takes up another portion of carbon, forming carbon monoxide, and this being drawn into the chamber E over the incandescent fuel again receives its quotient of oxygen, forming again carbon dioxide and producing perfect combustion. It will thus be seen that the fuel in the lower part of the side chambers F is first coked, the gases passing into chamber E, where they are consumed upon the grate-bars, coking the fuel above. The inclined partitions direct enough of the coked fuel underneath the contracted opening to chamber E to keep the grate-bars sufficiently covered.

I have shown my invention as applied to a single-boiler furnace; but the skilled mechanic will readily understand from the foregoing how to apply the invention to a battery of any number of boilers.

It is also evident that mechanical changes may be made in the construction and relative arrangements of the parts without departing from the spirit and scope of my invention, and hence I do not confine myself to the ex-

act construction shown and described, but consider all mere mechanical changes to belong to me.

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

1. In a steam-boiler furnace, the combination of the boiler, a combustion-chamber arranged centrally under it and in line of the draft, the coking-chambers upon each side of said combustion-chamber and closed off from the draft except through said combustion-chamber, doors at the top of said chambers for the supply of fuel to said chambers, and the grate-bars extending under the three

chambers, substantially as and for the purpose set forth. 15

2. The combination, substantially as specified, of the boiler and fire-box with the inclined tiles G, dividing the said fire-box into three chambers E F F, said chambers F being closed, except at the bottom, so that their only communication with the draft is through the chamber E. 20

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Witnesses:

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