(No Model.) 2 Sheets—Sheet 1.

W. MASTERS.

STOVE OR FURNACE.

No. 263,552. Patented Aug. 29, 1882.

Fig. 1.

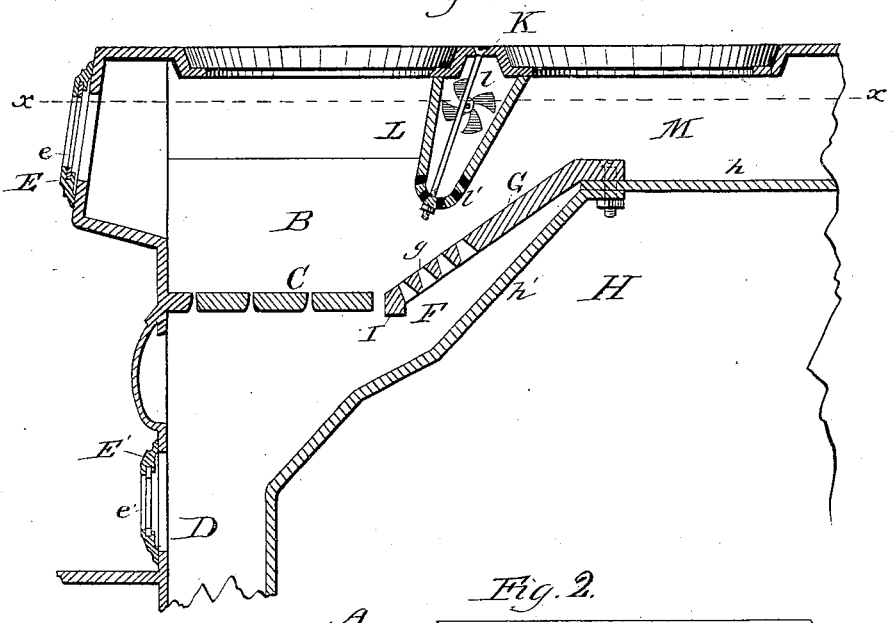
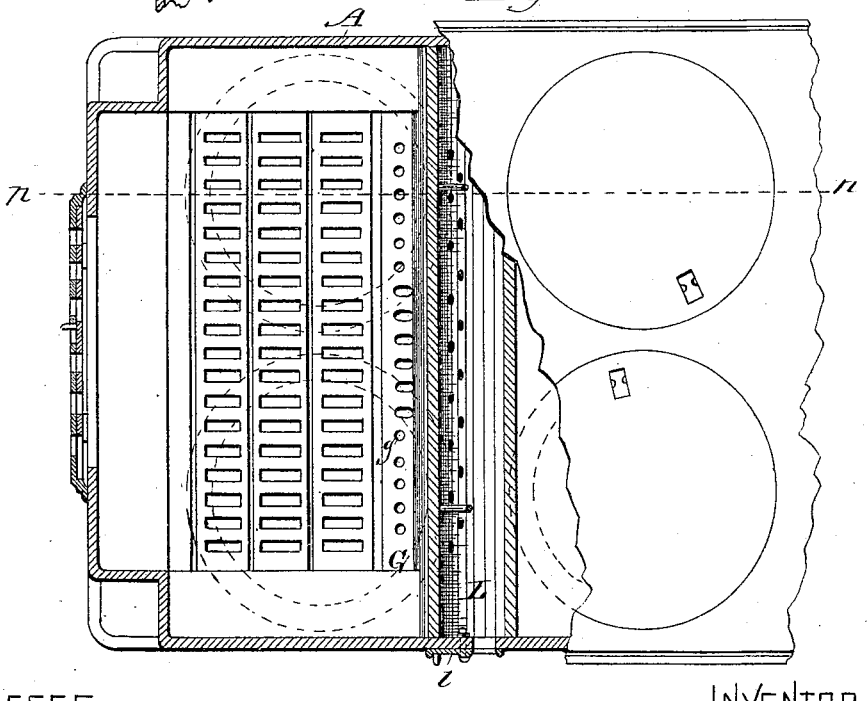


Fig. 2.



WITNESSES—
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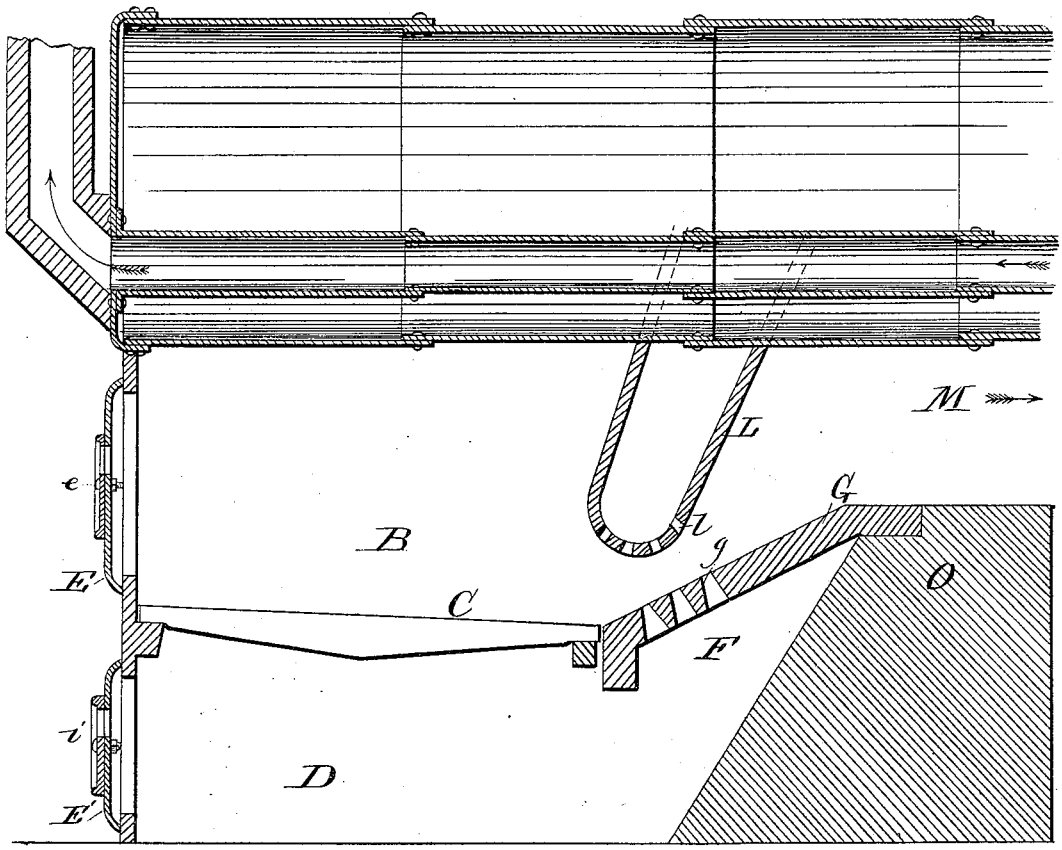
Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM MASTERS, OF KANSAS CITY, MISSOURI.

STOVE OR FURNACE.

SPECIFICATION forming part of Letters Patent No. 263,552, dated August 29, 1882.

Application filed June 10, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MASTERS, of Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful improvements in stoves or furnaces for burning bituminous coal or other fuels rich in hydrocarbon, of which the following is a specification.

My invention relates to that class of stoves and furnaces wherein the fire-box is separated from the combustion-chamber and air is introduced at a point intermediate the two for the purpose of producing more complete combustion.

The object of my invention is to provide a stove or furnace of such improved construction and with air-delivery orifices so arranged as to insure the more effective combustion of the rich hydrocarbon gases and particles of free carbon usually carried away by the draft as a waste product. This object of my invention I accomplish by certain novel features of construction hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the claims at the end of this specification.

Figure 1 is a longitudinal vertical sectional view on line *n n* of Fig. 2 of a cooking-stove embodying my invention, the rear portion of the stove being broken away. Fig. 2 is a plan view of the same, partly in section, on line *x x* of Fig. 1. Fig. 3 is a vertical longitudinal mid-section of a boiler-furnace with my improvement applied thereto, a portion of the boiler being broken away.

Like letters of reference indicate corresponding parts in the several views of the drawings.

A designates the outer wall or casing of a stove, having a fire-box, B, provided at its bottom with the grate C, below which is the ash-pit D. The fire-box B and the ash-pit D are furnished respectively with the doors E and E′, having dampers *e* and *e′* therein. From the ash-pit D extends the draft-chamber F, the top of which is formed by the inclined fire-wall G, the lower half of which is provided with the series of perforations *g*, extending laterally across the same. Instead of perforations, oblong slots may be made in the fire-wall, as shown in Fig. 2. The top of the fire-wall is bolted, as shown, to the top plate, *h*, of the oven H, the front plate, *h′*, of which constitutes one of the walls of the draft-chamber F. The bottom of the fire-wall G is formed with the angular portion I, the ends of which rest upon the grate-supports upon the sides of the stove.

To the long center plate, *k*, of the stove-top is securely bolted, by means of the rods *l*³, one near each end, the U-shaped pendent air-duct L, which extends laterally across the stove and opens outside the same. One or both ends of this air-duct are preferably provided with the dampers *l*. The bottom of the air-duct depends within a short distance of the fire-wall G at a point over the perforations or slots of said wall, and its lower portion is provided with the series of perforations *l′*, in substantially the position shown. Back of the air-duct L is formed the combustion-chamber M, from which extends the flue leading to the chimney.

When my invention is applied in connection with furnaces, as shown in Fig. 3, the air-duct L may be sustained in any suitable manner, as from the sides of the furnace, and the fire-wall G may rest upon the bridge O and upon ledges formed on the inner surface of the furnace sides. In this arrangement the several parts are designed to hold the same relation to each other and to act in substantially the manner as in the construction heretofore described. It will be noticed that by extending the air-duct, as described, in proximity to the lower portion of the inclined fire-wall there is formed a fire-box in which the complete distillation of the gases occurs, and separate therefrom a combustion-chamber, which is gradually enlarged from bottom to top, so as to permit the gases, when mixed with air, to expand. This last feature is of importance, since the freshly-distilled gases escaping below the air-duct, when mingled with the air, will not be thoroughly consumed unless they are allowed to freely expand. Hence were no enlarged chamber provided for this purpose a portion of the gases would pass unburned into the chimney or a portion of the stove or furnace, where its combustion would have but little effect. The preheating of the air by delivering the same through the ash-pit to the perforations of the inclined fire-wall is advantageous, as it enables more thorough combustion to be ef-

fected without chilling the stove; and the location of the perforations in the fire-wall and air-duct is important, as the air is thus delivered to the gas at the most effective point, permitting the two to become thoroughly commingled in the passage through the combustion-chamber.

In the operation of a stove or furnace of the character set forth the fresh fuel is fed into the fire-box as in stoves or furnaces generally and is there coked, giving off its more volatile compounds of rich hydrogen in the form of rich hydrocarbon gases, which are laden with particles of free carbon, forming smoke or soot, and as this fuel is coked fresh fuel is added. The gases generated, and with the free carbon, are compelled to pass under the pendent air-duct, and here, meeting with the oxygen from the air-duct and perforated or slotted inclined fire-wall, are ignited and consumed. By means of the several dampers the quantity of air admitted can be accurately controlled.

I am aware of the inventions described in Patent No. 181,634, granted to P. N. Burke August 29, 1876, and in Patent No. 220,530, granted to William A. Greene October 14, 1879, and I do not wish to be understood as claiming subject-matter described therein; but

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

1. A stove or furnace having a fire-box, an inclined fire-wall, and a pendent perforated air-duct, forming the rear wall of the fire-box and extending in proximity to the lower portion of the inclined fire-wall, the air-duct being related to the fire-wall in such manner as to form with it an enlarged combustion-chamber for the gases escaping from the fire-box, substantially as described.

2. A stove or furnace having a fire-box, an inclined fire-wall having perforations or slots near its bottom, and a pendent perforated air-duct located above said fire-wall and extending in proximity to its lower portion, so as to form therewith a combustion-chamber gradually enlarged from bottom to top, substantially as described.

3. A stove or furnace having a fire-box, a pendent perforated air-duct forming the back of said fire-box and extending to a point in proximity to the lower portion of an inclined perforated fire-wall, an ash-pit, and a chamber extending therefrom and communicating directly with the perforations in said inclined fire-walls, substantially as described.

WILLIAM MASTERS.

Witnesses:
JAMES CLARKE,
CHAS. A. MANN.