M. L. BALLARD.

Furnace.

No. 221,018. Patented Oct. 28, 1879.

Fig. 1.

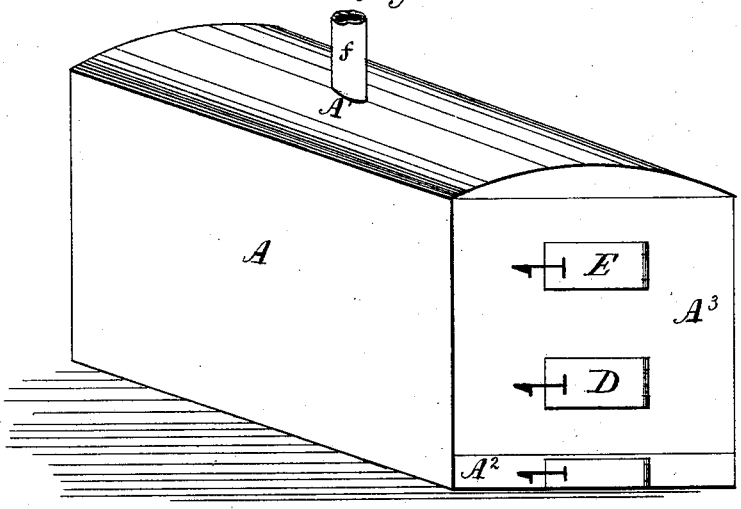


Fig. 2.

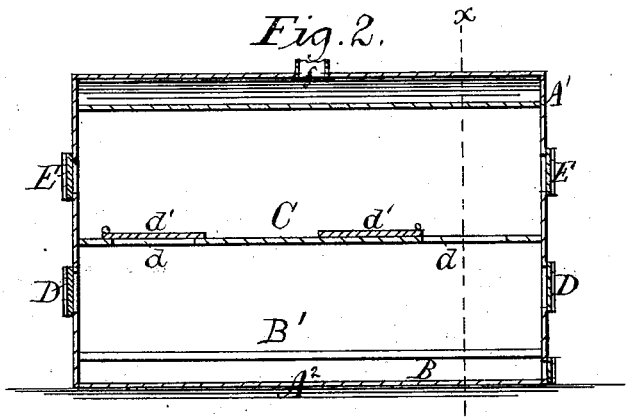
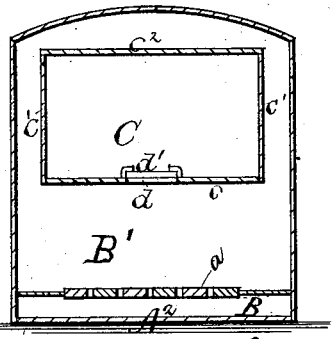


Fig. 3.



Witnesses:

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W. A. Bliss

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UNITED STATES PATENT OFFICE.

MARTIN L. BALLARD, OF CANTON, OHIO, ASSIGNOR TO HATTIE W. BALLARD, OF SAME PLACE.

IMPROVEMENT IN FURNACES.

Specification forming part of Letters Patent No. **221,018**, dated October 28, 1879; application filed May 23, 1878.

To all whom it may concern:

Be it known that I, MARTIN L. BALLARD, of Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the invention, which 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 of reference marked thereon, which form a part of this specification.

Figure 1 is a perspective view of a heating-stove containing my invention. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a transverse vertical section.

A represents the side, A′ the top, A^2 the bottom, and A^3 one end, of the heater. B is the ash-pit and draft-box, and *f* the smoke-pipe or draft-flue.

Within the upper part of the heater I construct the chamber C, as shown in Fig. 3, the walls of this chamber being arranged at short distances from the sides and top of the heater in such manner as to leave flues or passage-ways for the products of combustion around the sides and top of the chamber C, which is thus inclosed by the sides *c c′* c^2, as is fully shown in Fig. 3.

D E are the doors closing the entrances into the combustion-chamber B′ and the upper chamber or compartment, C, at each end.

The lower part of the heater is provided with suitable grate-bars *a*.

d are openings at each end of the floor of the chamber C. *d′* represent sliding doors for closing the openings *d*.

From an examination of the drawings it will be seen that when the doors E are open the walls of the chamber C constitute radiating-surfaces, and thus increase the heating capacity of the stove. It will, of course, be understood that when the chamber C is used for this purpose the doors *d′* should close the openings *d* in the floor of this chamber.

When it is found desirable, from any cause, to heat the fuel employed in the stove before it is introduced into the combustion-chamber, this fuel may be thus heated in the chamber C, and introduced into the combustion-chamber through the openings *d* whenever required; and it will also be seen that any gases or vapors given off by the fuel while being thus heated will be drawn through the openings *d*, and thence through the combustion-chamber, where they may be burned, or, at all events, they will not escape into the room in which the heater is placed, the doors E being closed during this process of heating the fuel.

From the above description it will be seen that almost the entire space within the walls of the heater is utilized to good advantage, from the fact that when the chamber C is not used for heating the fuel its walls are made to increase the radiating-surface of the stove.

While I prefer to employ the door E and opening *d* and door or slide *d′* at both ends of the chamber C, I do not wish to be limited to such construction, it being evident that some of the advantages which are incident to the employment of my invention may be obtained even though one end of the chamber may be entirely closed.

I do not claim, broadly, a stove provided with a chamber in which the fuel may be heated, and with openings through which the fuel, after being heated, may be passed into the combustion-chamber; but my heater has certain novel features of construction which adapt it especially for the use for which it is designed.

I am aware that heating-stoves have heretofore been constructed with ovens adapted for baking purposes, which ovens have in the bottom plates an opening to receive a kettle, which opening closes with a cover, and also doors to permit the introduction of fuel into the stove independently of the pot-hole; but, so far as I am aware, such stoves were not intended to operate as my heater does, nor could they be so operated in practice from the fact that the ovens were not intended as fuel-drying and heating chambers, nor were they adapted to contain fuel which might be dried and then fed into the combustion-chamber by opening or removing the pot-hole cover, it being apparent from examination that an oven having a pot-hole in which the cover is sunk, and is prevented from being moved sidewise readily on account of its being seated in a re-

cess or having a downwardly-projecting rib or flange, as is the case with such covers, is not adapted to be used for heating or drying fuel in an oven, whereas my construction is especially adapted for that purpose, because the sliding doors may be closed and covered with fuel to almost any depth, and yet readily opened such distance as will permit the passage of the fuel into the combustion-chamber. Neither is an oven having a circular pot-hole in the bottom adapted to be filled with fuel when the cover is partly removed from the hole, whereas in my heater the sliding door or cover can be left open any required distance without danger of displacement as the heating-chamber is being filled with fuel; and then, in case it be found desirable to close the sliding door to prevent communication between the heating-chamber and the combustion-chamber, this door can be easily closed, even though nearly covered with fuel—an operation which cannot be performed with a pot-hole cover.

It will also be seen by an examination of such stoves that it would be impracticable to remove the cover without first emptying the oven of the fuel which had been dried therein.

From an examination of the drawings it will be seen that my heater can be operated as follows: Fuel can be placed in the chamber C with the doors *d'* nearly closed, the doors E being subsequently entirely closed. A fire may be kindled in the combustion-chamber and replenished as needed through door D. The gases or vapors driven off from the fuel will be drawn into the combustion-chamber, as has been explained, and there consumed or partially consumed, and while this consumption of gases from the chamber C is taking place the combustion-chamber may be supplied with such fuel as may be most advantageously used in connection with such gases or vapors.

After the fuel in chamber C has been sufficiently heated or dried, it may be fed through the floor of the chamber at such rate as may be desired, the doors *d'* E being used for this purpose, and other fuel may be introduced into the combustion-chamber through door D, which latter fuel may sometimes be of an inferior kind.

When, however, it is found desirable to use the walls of the chamber C as radiating-surfaces, the door *d'* may be closed, and the door E opened, when all communication between this chamber and the combustion-chamber will be cut off, and the escape of noxious vapors into the room prevented, while the heat radiated by the walls *c c' c²* will pass into the room.

Thus it will be seen that the chamber C, the openings into it, and the openings or doors D, all co-operate to render my heater effective.

Although I have shown doors at both ends of my heater, yet I do not wish to be limited to such duplication.

What I claim is—

The herein-described heater consisting of the combustion-chamber B', provided with the door D, in combination with the heating and drying chamber C, provided with the door *d'*, opening into the combustion-chamber, and with the door E, which constitutes a passage-way into the chamber C, but not into the combustion-chamber except through the chamber C, all arranged to operate substantially as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

MARTIN L. BALLARD.

Witnesses:
JOSEPH FREASE,
JNO. W. WOLFE.