

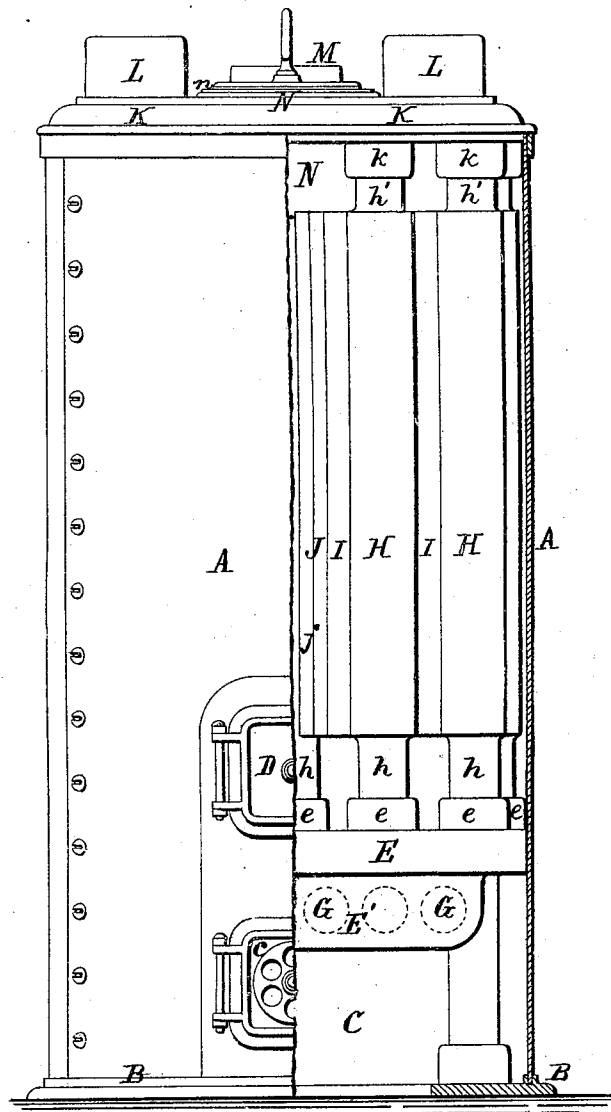
A. MARRIOTT.

Water-Heaters for Heating Buildings.

No. 150,335.

Patented April 28, 1874.

Fig. 1.



ATTEST:

Robert Burns.
H. F. Farmer.

INVENTOR:

Ambrose Marriott
By Pringle B. A.
Atty.

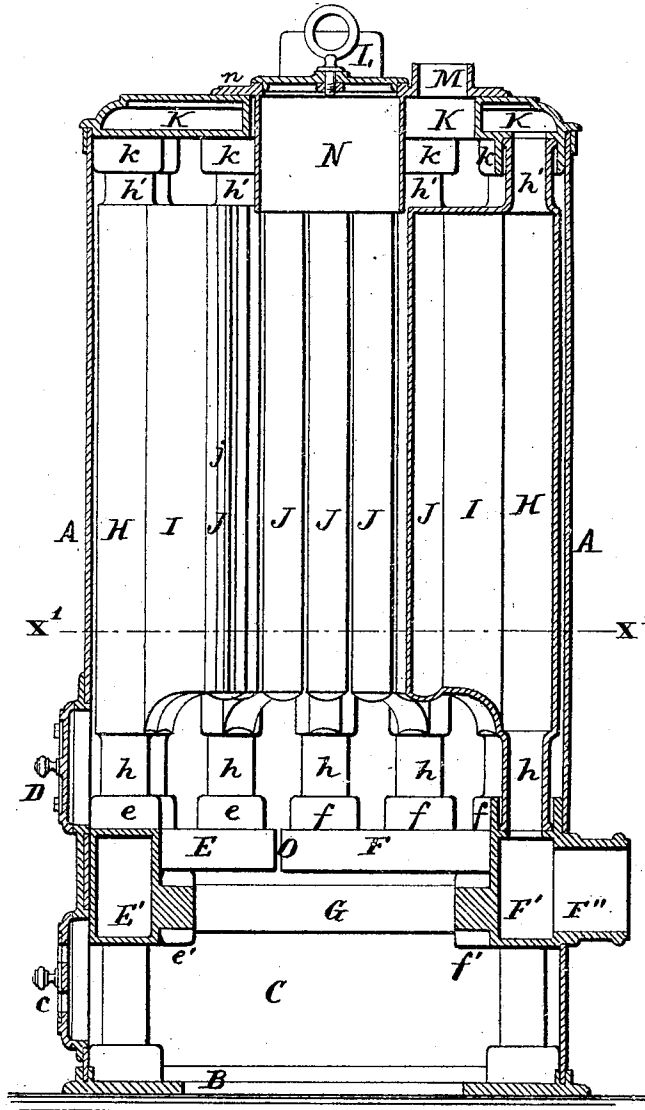
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No.150,335.

Patented April 28, 1874.

Fig.2.



ATTEST:

Robert Burrus.
H. P. Cammer

INVENTOR:

Amos Marriott
By *Wm. H. Wright*
Atty.

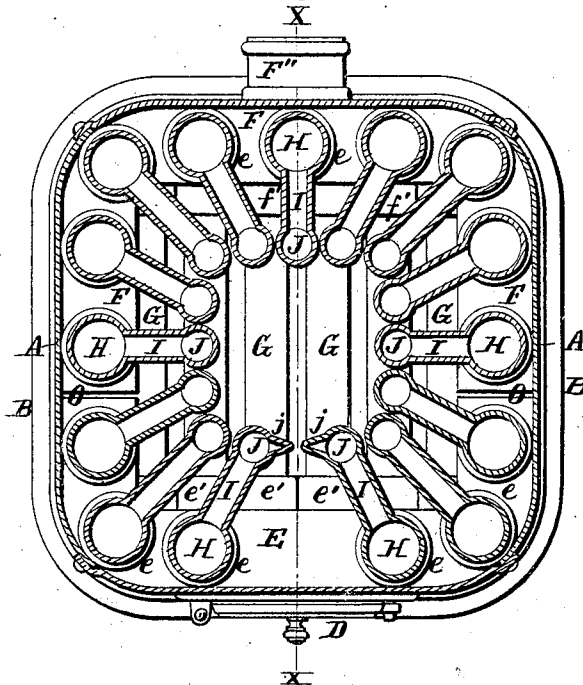
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Fig. 3.



ATTEST:

Robert Burns.
H. P. Farmer

INVENTOR:

Ambrose Marriott
By Knight & Bow.
Atty.

UNITED STATES PATENT OFFICE.

AMBROSE MARRIOTT, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN WATER-HEATERS FOR HEATING BUILDINGS.

Specification forming part of Letters Patent No. **150,335**, dated April 28, 1874; application filed March 7, 1874.

CASE A.

To all whom it may concern:

Be it known that I, AMBROSE MARRIOTT, of St. Louis, St. Louis county, Missouri, have invented certain Improvements in Water-Heaters for Heating Buildings, of which the following is a specification:

The first part of my improvement relates to the vertical water ducts or pipes, which are made of considerable breadth in a radial direction, as shown in Fig. 3. The said pipes have at each end a rounded part connected by a hollow web, so as to obtain a large amount of heating-surface and yet to have a form easy of construction by casting. The second part of my improvement consists in the construction of the castings at the bottom of the said vertical pipes, and the manner of application thereto of the grate-tubes.

In my former patent on a heater for a similar purpose, No. 135,135, dated January 21, 1873, similar hollow bars were shown, but these were connected to a separate casting at each end, said castings being connected to the casting at the foot of the vertical water-pipes by a joint-pipe, so that the grate-castings could be secured to the grate-tubes before connection with the casting above. In my present improvement the grate-castings are made in one piece with the upper castings, (aforesaid,) and consequently there would be no means of inserting the grate-pipes into the sockets of the casting unless the casting were made in two pieces, (open at the side,) so that the bars may be inserted before the front and rear portions of the casting are put in position.

In the drawings, Figure 1 is one-half in front elevation and one-half shows the interior, the shell being broken away for that purpose. Fig. 2 is an axial section at the line $x x$, Fig. 3. Fig. 3 is a horizontal section at the line $x' x'$, Fig. 2.

A is the case, which may be of metal or brick-work, and may stand on a base, B. C is the ash-pit having a door, c . D is the furnace-door. E and F are, respectively, hollow castings to contain water, and consisting each of a main and upper semi-annular portion and a lower straight portion, E' and F', re-

spectively. Upon the inner sides of the portions E' and F' are cast projecting sockets e' and f' , to receive the ends of the grate-tubes G, which are inserted and cemented in the sockets, and in communication with the inside of the castings, so that the water has free circulation from casting to casting through the grate-tubes. F'' is a tube through which the return water from the heat-radiators enters the chambers in the casting F. Upon the upper sides of the castings E and F are projecting sockets e and f , to receive the lower necks h of the vertical water-pipes. These pipes have an outer rounded side, H, nearly in line with the necks $h h'$, a flattened central portion extending inwardly, and a rounded inner side, J, as shown clearly in section in Fig. 3. The upper necks h' enter the downwardly-projecting sockets k at the lower side of the upper annular casting K, forming the top of the case, and from whose chamber the water flows upward through the pipes L. M is the smoke-flue. In the casting K is a central orifice closed by a cap, N, whose flange n extends downward to the enlarged part of the pipes H I J, as shown, so as to force the products of combustion to take an outward course to penetrate between the water-pipes and heat the whole of their surface. A space in front within the furnace-door D is left open for the introduction of fuel, and the enlarged edges J of the pipes on each side of this vacancy are peculiarly formed with a hollow rib, j , so as to almost close the orifice between the pipes. (This is clearly shown in Fig. 3.)

At O, Figs. 2 and 3, is shown the opening between the castings E and F. These castings might be made in one piece except for two reasons—first, the unequal expansion and contraction resulting from change of temperature would fracture the metal, (as set forth in my patent No. 135,135, where a somewhat similar casting is made in two parts, but in a different manner;) second, the making of the castings in two pieces, E F, disconnected at the sides, enables the insertion of the grate-tubes between them.

I claim as my invention—

1. The vertical water-heating ducts having rounded sides H and J, and contracted central part I, and connected to the lower and upper water-chambers or castings E, F, and K by contracted necks *h h'*, all substantially as set forth.

2. The tubes H I J, castings E F, having

lower portions E' F', provided with sockets *e' f'*, and the grate-tubes G, all arranged and combined substantially as set forth.

AMBROSE MARRIOTT.

Witnesses:

SAML. KNIGHT,
ROBERT BURNS.