(No Model.)

J. KOHLER.

HEATING APPARATUS.

No. 368,153. Patented Aug. 9, 1887.

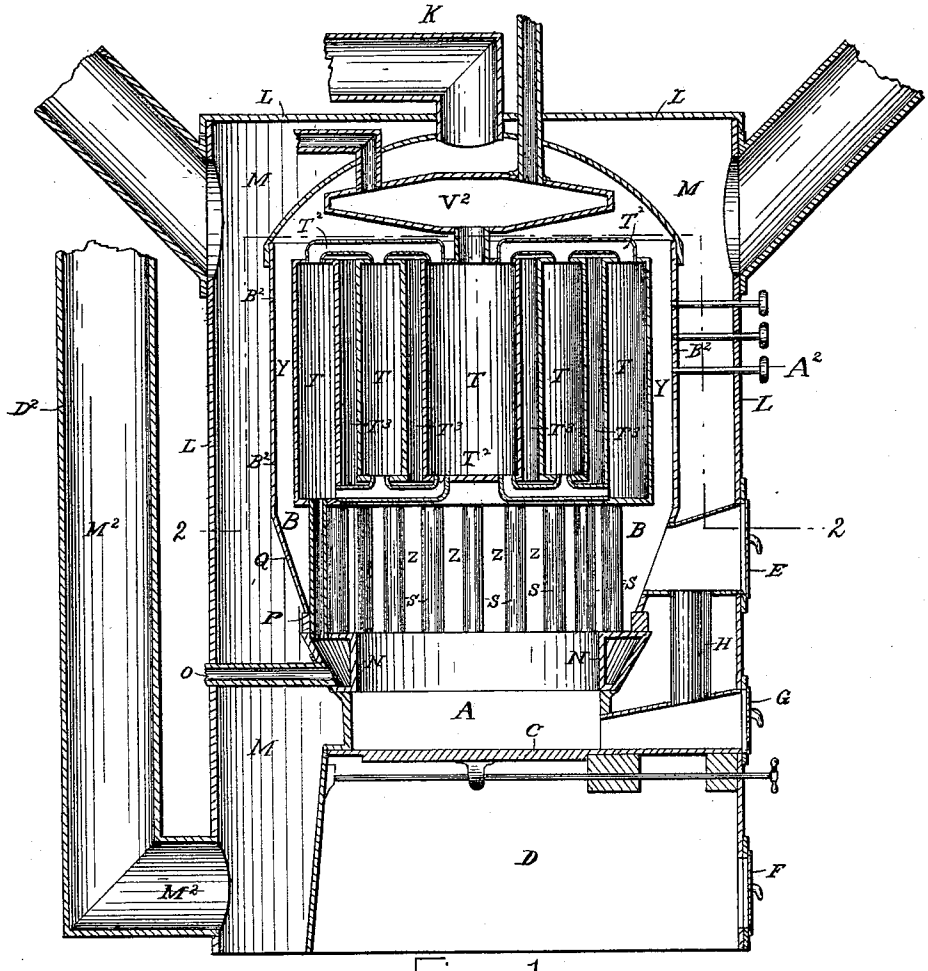


Fig. 1.

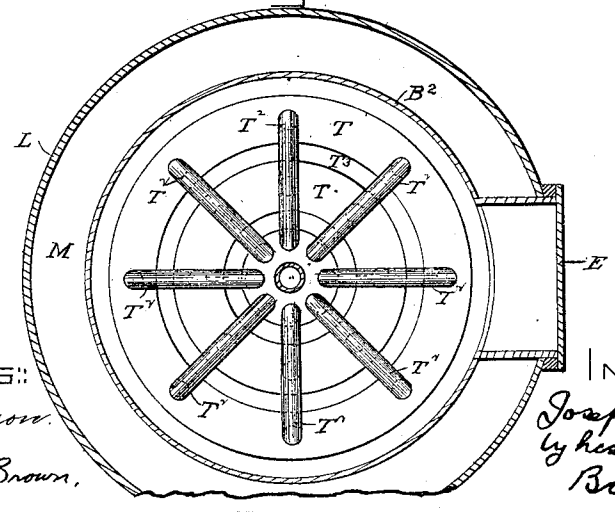


Fig. 2.

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UNITED STATES PATENT OFFICE.

JOSEPH KOHLER, OF BOSTON, MASSACHUSETTS.

HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 368,153, dated August 9, 1887.

Application filed November 30, 1886. Serial No. 220,270. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH KOHLER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Heating Apparatus, of which the following is a full, clear, and exact description.

This invention, relating to water and air heating furnaces and apparatuses, consists in certain constructions and arrangements of the parts composing such apparatuses, all as hereinafter fully described, and set forth in the claims.

In the drawings forming part of this specification, Figure 1 is a central vertical section, and Fig. 2 is a horizontal section, line 2 2, Fig. 1.

In the drawings, A is the fire-pot.

B is the combustion-chamber, inclosed within a wrought-iron jacket or shell, B.

C is the fire-grate.

D is the ash-pit.

E is the feed-door to fire-pot A.

F is the door to ash-pit D.

G is the clinker-door.

H is a dust-flue making communication with the ash-pit D and passage at feed-door E.

K is the pipe-connection between chimney-flue and combustion-chamber of furnace.

L is a shell or casing surrounding the furnace above described, and making an inclosed hot-air chamber or space, M, around all sides and the top of the furnace, and having a cold-air box or flue, M^2, leading into it, all, except as to the features of this invention, the same as ordinary, and therefore needing no more particular description herein.

The fire-pot A at its central portion is surrounded by a cast-iron hollow or chambered ring, N, connected by a pipe, O, to a suitable water-supply, (not shown,) and on its upper side provided with a circular vertical flange, P, preferably in one piece therewith, and to which is secured the bottom edge of the cylindrical hopper Q in continuation of the fire-pot, and through which communication is made with the fire-pot at the feed-door E. This cylindrical hopper is continued into the shell or jacket B^2, making the combustion-chamber, and which is closed around its sides and top, except where connection is made through the latter by pipe K with the chimney-flue. (Not shown.)

S S are a series of separate vertical water-tubes in a circular row around the combustion-chamber B, and connected and in communication at their lower ends with the water-ring N on its upper side. These vertical water-tubes are preferably dispensed with opposite the feed-door E. Again, the vertical water-tubes S at their upper ends are connected to and in communication with the lower end of an annular and vertical water-tank, which is the outer tank of a series of water-tanks, T, in the present instance consisting of two annular and vertical tanks, one within the other, and a central and vertical tank within the inner annular and vertical tank, and severally concentric with each other.

T^3 are annular and vertical spaces between the tanks T, of the form and arrangement above described, and open at both ends to the chamber inclosed by the shell or jacket B^2.

T^2 are horizontal water-pipes joining the series of water-tanks T at both the upper and lower ends thereof to each other, and thereby making free communication between the several tanks for the circulation from one to the other of their contents in the working of the apparatus, as hereinafter explained.

Y is an open space or portion of the combustion-chamber around the sides of the outer annular water-tank of the series of water-tanks T and across the top of all of the tanks and between said outer tank and the jacket B^2, making the combustion-chamber.

Z Z are open spaces between the vertical tubes S, connecting the outer water-tank with the water-ring N, and also back of the same, and all so that the products of combustion can freely circulate around them.

The water-ring N, vertical tubes S, and series of water-tanks T are charged with water through the pipe O from a suitable water-supply to the proper level, and in the operation of the furnace the so-contained water is heated and generated into steam to be used for heating purposes, leading it as generated from the steam-space of the inner and circular water-tank of the series of water-tanks T either directly or indirectly to and through the heating or other apparatus wherein it is to be utilized for heating or other purposes.

The series of water-tanks T, vertical tubes S, and horizontal water-ring N about fire-pot,

in the combination and arrangement all as described, obviously secure a most effective and active heating of their contained water and a generation thereof into steam; and again, as the furnace for the steam-generating parts above described is surrounded by an air-chamber, M, subject to the heat arising from the products of combustion of the furnace, and which is radiated through the walls of the fire-pot and the shell of the combustion-chamber, obviously heated air is also obtained to be used for heating or other purposes, as may be desired, and which is to be conducted therefor through suitable pipes to the places desired.

The water-tanks T are to be provided with test-cocks, such as at A^2, for testing the height of their contained water and otherwise, all as well known and forming no part of this invention.

V^2, Fig. 1, is a steam reservoir or cylinder connected by a steam-passage with the central water-tank of the series of water-tanks T at its upper end, for receiving and holding the steam generated in the tanks.

As is plain, the invention as particularly described, combines in one apparatus means for securing hot air and steam from the combustion of the same fuel.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a furnace of otherwise suitable construction, a water-ring, N, having a water-connection and surrounding the fire-pot, in combination with vertical water-tubes S at their lower ends, connected to said water-ring N and having open spaces Z between them, vertical annular and concentric water-tanks T, having vertical annular open spaces T^3 between them, horizontal pipes T^2, joining them at their upper and lower ends, and one having said vertical water-tubes S connected to it, and one a steam-outlet, and all and severally arranged within the combustion-chamber of the furnace and for the circulation of the products of combustion around them, substantially as described, for the purpose specified.

2. In a furnace of otherwise suitable construction, an inclosed chamber, M, entirely surrounding it and having a cold-air flue, M^2, a water-ring, N, having a water-connection and surrounding the fire-pot A, in combination with vertical water-tubes S at their lower ends, connected to said water-ring N and having open spaces Z between them, vertical annular and concentric water-tanks T, having vertical annular open spaces T^3 between them, horizontal pipes T^2, joining them at their upper and lower ends, and one having said vertical water-tubes S connected to it, and one a steam-outlet, and all and severally arranged within the combustion-chamber of the furnace and for the circulation of the products of combustion around them, substantially as described, for the purposes specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOSEPH KOHLER.

Witnesses:
ALBERT W. BROWN,
KATE E. BELLOWS.