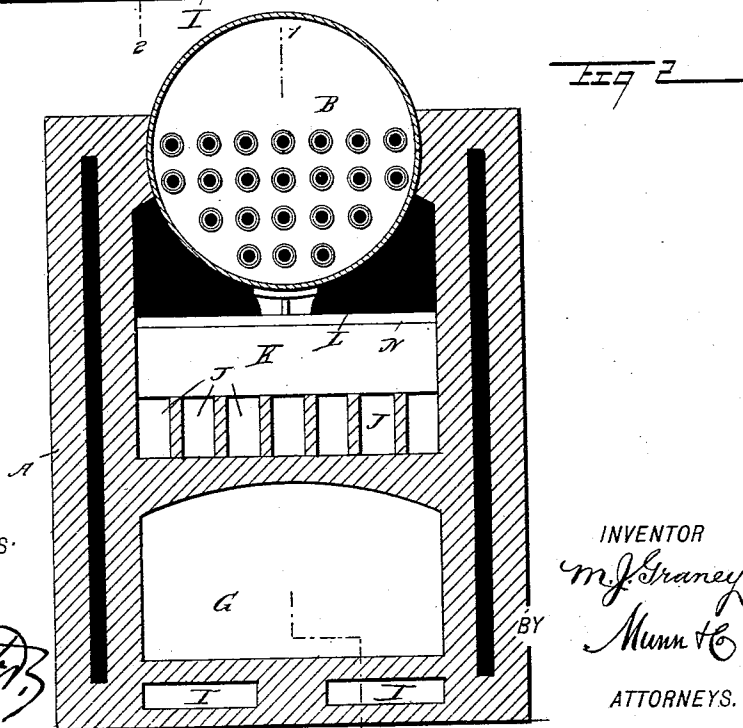
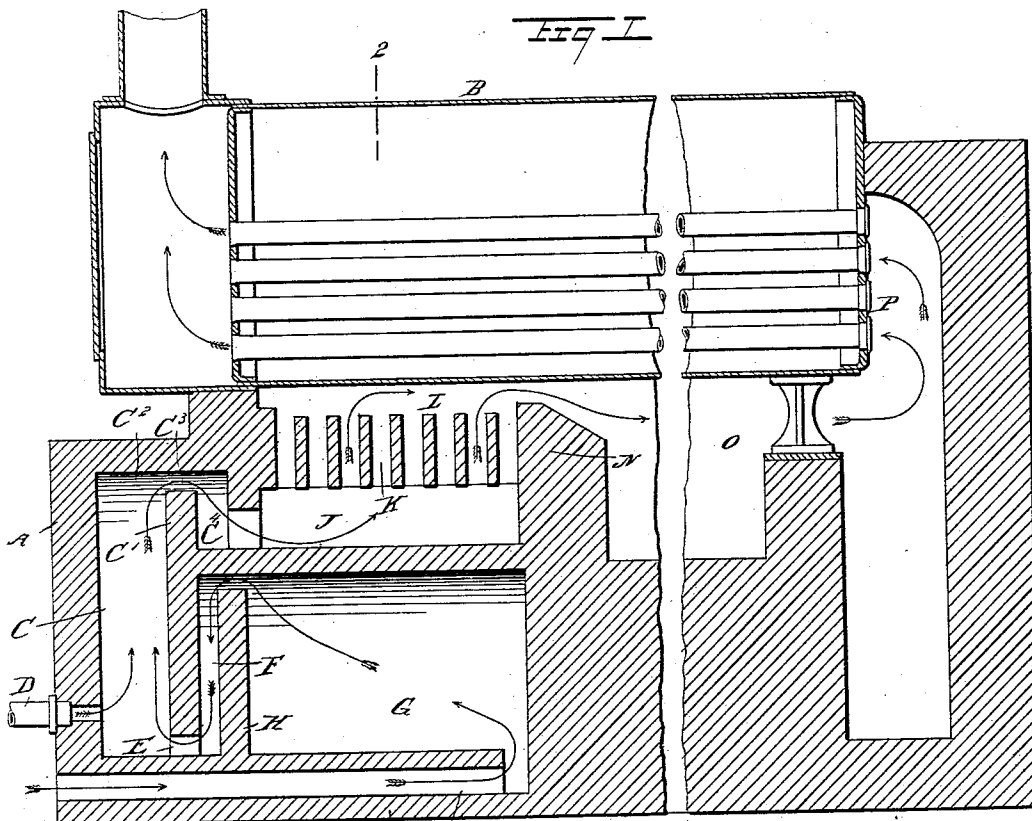


(No Model.)

M. J. GRANEY.
FURNACE.

No. 555,371.

Patented Feb. 25, 1896.



WITNESSES:

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MICHAEL J. GRANEY, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR TO JOHN L. GRANEY AND WILLIAM J. GRANEY, OF SAME PLACE.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 555,371, dated February 25, 1896.

Application filed May 15, 1895. Serial No. 549,410. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL J. GRANEY, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Furnace, of which the following is a full, clear, and exact description.

The invention relates to furnaces burning gas as a fuel; and its object is to provide a new and improved furnace which is simple and durable in construction, very effective in operation, and arranged to utilize the gas to the fullest advantage without waste or incomplete combustion.

The invention consists, principally, of a combustion-chamber into which opens a mixing-chamber provided with a gas-supply near its bottom, and a hot-air chamber located under the combustion-chamber and connected at its rear end with a cold-air inlet, the said hot-air chamber being formed in its front with a downwardly-extending passage leading to the bottom of the mixing-chamber.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both the figures.

Figure 1 is a sectional side elevation of the improvement on the line 1 1 of Fig. 2, and Fig. 2 is a transverse section of the same on the line 2 2 of Fig. 1.

The improved furnace supports in a suitable brickwork A a boiler B of any approved construction, and in the front of the said brickwork below the boiler is arranged a mixing-chamber C, into which leads, near the bottom, one or a series of gas-supply pipes D, connected with a suitable gas supply.

From the bottom of the mixing-chamber C extends through the rear wall C' an opening or port E, leading to the lower end of a passage F extending upwardly in the front end of a hot-air chamber G, the said passage being formed by a transverse wall H set in the bottom of the hot-air chamber G, and terminating a suitable distance from the arched top thereof.

The rear end of the hot-air chamber G connects with one or more longitudinally-extending channels I, opening at their front ends to the outside, so that cold air can pass through the said channels into the rear end of the hot-air chamber G. The channels I also extend under the chamber C.

The arched top C² of the mixing-chamber C forms with the upper end of the wall C' a passage C³, leading to the downwardly-extending channel C⁴, opening into a series of longitudinally-extending combustion-chambers J, located directly above the hot-air chamber G, so that the cold air entering the latter at the channels I is heated by the heat radiated from the roof of the chamber G.

The combustion-chambers J open upwardly into transversely-extending chambers K, forming with the said chambers J the combustion-chamber, the said chambers K terminating at their upper ends in a space L surrounding the forward lower part of the boiler B. The space L opens at its rear end over the projecting wall N into the back chamber O, connected with a channel P leading upwardly to the inner ends of the flues of the boiler B, as plainly shown in Fig. 1.

Now it will be seen that the gas entering the pipes D and the air passing through the channels I are heated in the chamber G and mixed in the chamber C, it being understood that the heated air from the hot-air chamber G passes upwardly and forwardly over the wall H, down the passage F, and through the opening E into the bottom of the chamber C. Thus it will be seen that the air enters the chamber C a little below the entrance of the gas into the said chamber, and as both gas and air rise they are mixed and pass through the channel C³ and passage C⁴, which is the highest point of combustion, into the combustion-chambers J. The mixture of gas ignited at the passage C⁴ passes forwardly into the chambers J and K, so that the heat is utilized for heating the incoming air by heating the chamber G and also for heating the boiler, as the heat passes in and through the space L, chamber O, channel P and flues of the boiler before passing through the smoke box and stack.

By the arrangement described the fuel is utilized to the fullest advantage and an incomplete combustion is completely prevented. A perfect mixing of the gas takes place, so that all the valuable properties are readily
5 burned and no residue whatever is left.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

- 10 1. A furnace, comprising a combustion-chamber, a mixing-chamber forward of and opening into the said combustion-chamber and provided with a gas-supply, a hot-air chamber located under the said combustion-chamber and connected at its rear end with a
15 cold-air inlet, and a downwardly-extending passage formed in the front end of the said hot-air chamber and leading to the bottom of the mixing-chamber, substantially as shown
20 and described.

2. A furnace, provided with a combustion-chamber formed with a series of longitudinally-extending chambers opening at the top into a series of transversely-extending cham-

bers leading to a space under the boiler, substantially as shown and described.

3. A furnace, comprising a combustion-chamber formed of a series of longitudinal chambers opening at the top into a series of transversely-extending chambers leading be-
30 neath the boiler, a mixing-chamber connected by a passage with the said longitudinal chambers, a gas-supply leading into the mixing-chamber near the lower end thereof, a hot-air chamber located under the said longitudinal
35 chambers, and provided in its front with a passage leading from the top of the chamber down to connect with the bottom of the said mixing-chamber, and cold-air flues leading from the outside to the inner end of the
40 said hot-air chamber at or near the bottom thereof, substantially as shown and described.

MICHAEL J. GRANEY.

Witnesses:

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