

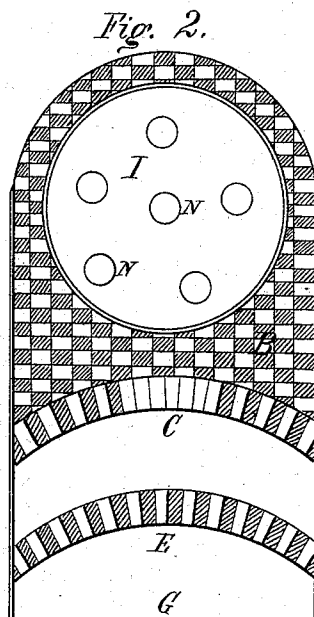
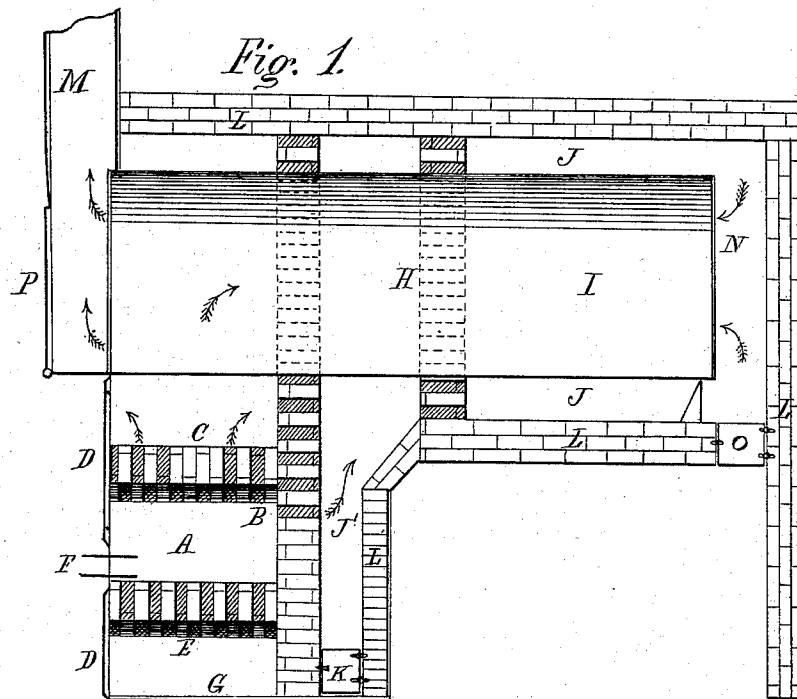
(No Model.)

J. G. McAULEY.

FURNACE.

No. 268,035.

Patented Nov. 28, 1882.



WITNESSES.

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UNITED STATES PATENT OFFICE.

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FURNACE.

SPECIFICATION forming part of Letters Patent No. 268,035, dated November 28, 1882.

Application filed October 22, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. MCAULEY, of the city, county, and State of New York, have invented a new and useful Improvement in Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the invention, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to improvements in the construction of the combustion-chamber, bridge-wall, and arches of furnaces designed to burn pulverized and other fuel; and it consists in constructing the bridge-wall, the arches in the combustion-chamber, and the arched walls surrounding the boiler with perforations through them, and also in the combination of the different parts, as hereinafter described.

Figure 1 is a longitudinal section and elevation of a boiler and furnace, showing the combustion-chamber, the perforated walls, and fuel-pipe. Fig. 2 is a cross-section on a line with the bridge-wall, showing the perforated arches in the combustion-chamber, and also the perforated wall or arch around the boiler.

The same letters represent the same parts in all the figures.

A, Fig. 1, is the combustion-chamber.

B is the bridge-wall. This wall extends to the top of the furnace-wall, and is perforated from near the center of the combustion-chamber to the top, as shown in Figs. 1 and 2.

C is a perforated arched wall in the top of combustion-chamber.

D D are doors in the front of the combustion-chamber and ash-pit. These doors are used when ordinary coal fuel is used in the furnace.

E is a perforated arched wall in the combustion-chamber in place of the grate-bars.

F is an injector-tube, through which pulverized fuel and air are conveyed into the combustion-chamber of the furnace. This injector has been described in my prior patent, dated October 25, 1881.

G is the ash-pit.

H is a perforated wall, made the same as the upper part of the wall B, and extends from the bottom to the top of the heat-chamber, and surrounding the boiler, thereby forcing the flame and products of combustion to pass through the perforations. The perforated walls may

be made to extend only partly around the boiler and produce a good effect.

I is a flue-boiler with the usual steam-chest, pipes, gages, and cocks, and is set in fire-brick or other fire-proof material, with the usual supports at the ends.

J is the heat-chamber around the boiler.

J' is a chamber back of the bridge-wall B. Near the bottom of this chamber is a door, K. The object of this door is so that any unconsumed material or ashes can be removed from the chamber, and also to admit air, if required, to aid the combustion of any unconsumed fuel that may have passed through the perforations in the bridge-wall B.

L is the furnace-wall, surrounding and supporting the boiler, and it is constructed of fire-brick or other fire-proof material.

M is the smoke-pipe.

N N are the flues through the boiler.

O is a door similar to the door K, and can be used for the same purpose.

P is a door in the chamber, connected with the smoke stack or pipe, and for the purpose of cleaning the flues in the boiler.

My improvements can be applied to nearly all the boilers now in use.

The perforated bridge and arched walls are constructed by leaving out a certain number of bricks in the walls or by bricks made for the purpose with perforations through them. The perforated wall E in the combustion-chamber is in the place of the ordinary grate-bar, which would be destroyed in a few hours by using pulverized fuel, owing to the intense heat generated. If ordinary fuel is used, it can be burned on the perforated arch, or grate-bars can be substituted for it without further alteration in the furnace. The advantages of the perforated walls are that they break up the smoothly-flowing current of flame into numerous jets, which are forced upward around, over, and under the boiler. It is evident from this subdivision of the flame that the fullest value from the flame is obtained. An additional advantage is the arches or perforated walls become highly heated, thus insuring a more complete combustion of the gases or any particles of unconsumed carbon that may pass from the combustion-chamber. Another advantage is that ordinary fuel can be used in any furnace.

I am aware that furnaces for burning pulverized and other fuel have been made with arches under the boiler for the purpose of retarding and making the flame reverberate.

5 This has only partly remedied the difficulty. My method of perforated arches and walls dividing the flame into numerous jets effects a saving of fuel.

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

1. The combination, with combustion-chamber A and boiler I, of perforated bridge-wall B and perforated wall H, the latter extending
15 from the bottom to the top of the heat-chamber J, and both of said perforated walls surrounding the boiler, substantially as and for the purpose set forth.

2. The combination of combustion-chamber
20 A, provided with injector-tube F, perforated

arched wall C in the top of the combustion-chamber, perforated hearth E, perforated bridge-wall B, boiler I, heat-chamber J, and chamber J', having door K, substantially as
25 and for the purpose described.

3. The combination of the fuel and air pipe F with the combustion-chamber A, the perforated arched walls C and E, and the perforated bridge-wall B, substantially as described.

4. In a furnace and boiler, the combination
30 of the following elements: the combustion-chamber A, the perforated bridge-wall B, the perforated arched walls C and E, the pulverized fuel and air pipe F, the chamber J', the
35 perforated wall H, the furnace L, and the boiler I, substantially as described.

JOHN G. MCAULEY.

Witnesses:

E. H. HART,

L. T. CANFIELD.