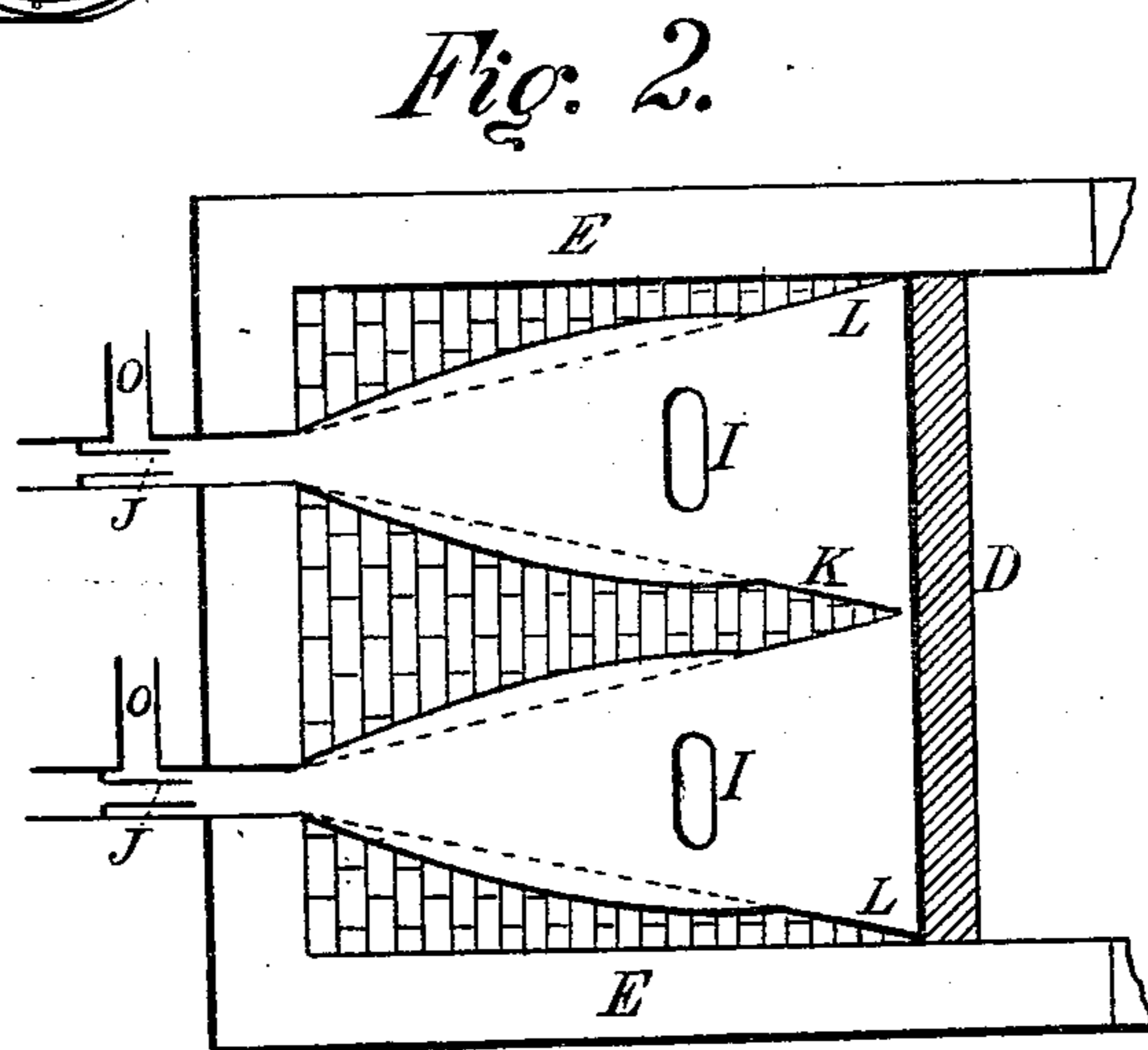
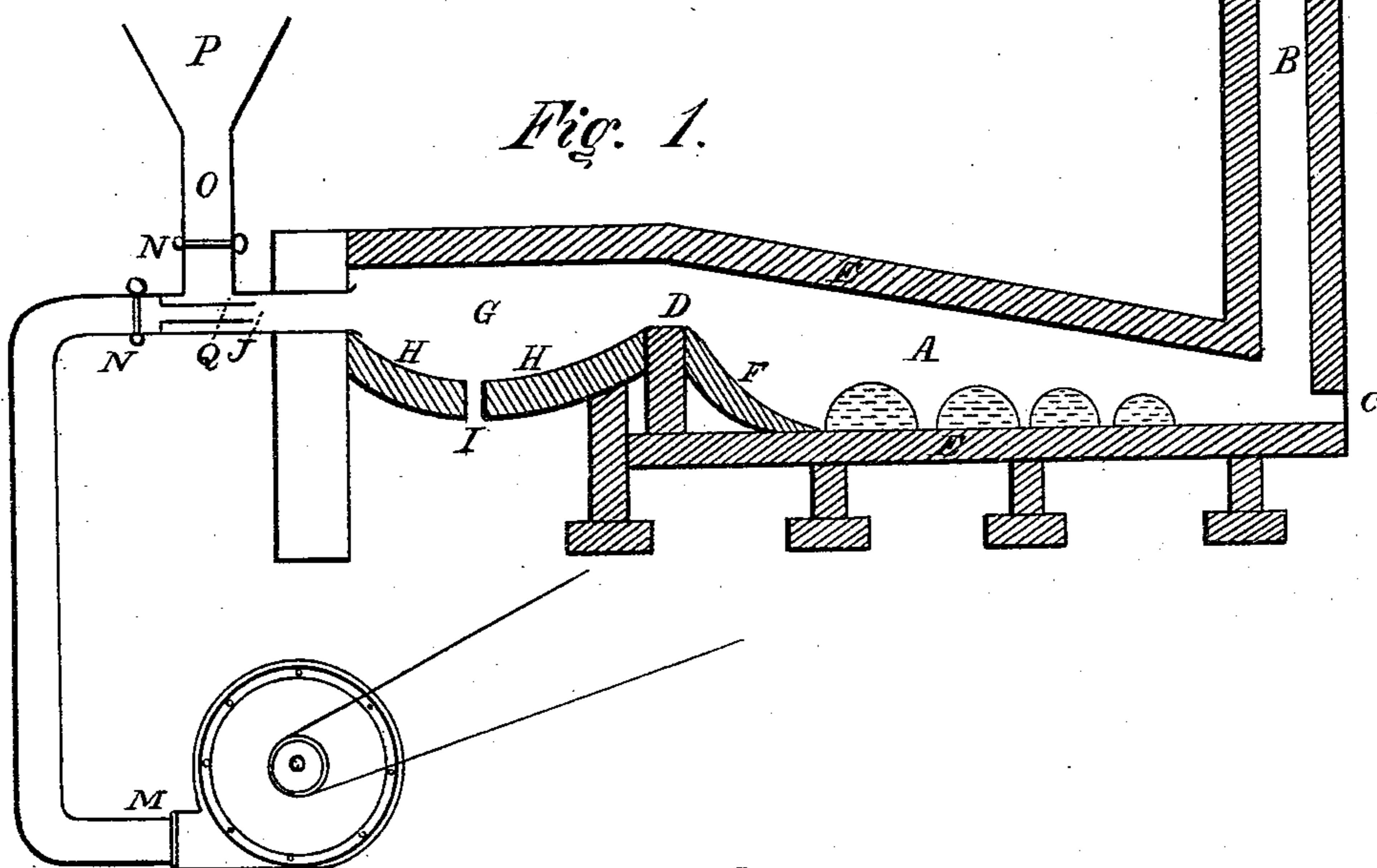


(No Model.)

J. G. McAULEY.
Furnace.

No. 243,593.

Patented June 28, 1881.



WITNESSES.
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UNITED STATES PATENT OFFICE.

JOHN G. MCAULEY, OF NEW YORK, N. Y.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 243,593, dated June 28, 1881.

Application filed October 12, 1880. (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 Furnace, of which the following is a specification.

My invention relates to that class of furnaces used for smelting, melting iron, or heating iron for rolling-mills, and other purposes requiring an intense and equal heat; and it consists in the construction and arrangement of the combustion and heating chambers which are designed to consume granulated, pulverized, or liquid fuel, and also in the mode of supplying the fuel to the furnace. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of the feeding and injecting apparatus, and a vertical longitudinal section of the furnace. Fig. 2 is an end elevation of the furnace, and a section of the feeding and injecting apparatus, and also a top view, on a line with the injectors, showing the construction of the combustion-chamber.

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

A, Fig. 1, is the heating or melting chamber, the inside surface being lined with fire-brick or other fire-proof material in the usual manner. The shape of the furnace is nearly the same as those in general use, having a smoke or draft pipe, B, and a gate or draw-off, C, at the end of the heating or melting chamber.

D is the fire-bridge or bridge-wall.

E E are the walls of the furnace.

F is a sloping or curved bottom resting against or on the bridge-wall and on the bottom of the heating-chamber. The object of this false bottom is to prevent the accumulation of any unconsumed carbon in the angle at the bottom of the heating-chamber at the bottom of the bridge-wall. When new furnaces are made the bottom of the heating-chamber, near the bridge-wall, conforms to the sloping or curved shape above described.

G is the combustion-chamber, which is constructed with a double sloping or curved bottom, in place of the ordinary grate-bars or flat bottom, as shown at H H. The bottom H slopes or curves from near the entrance of the carbonized air pipe or injector to the bottom of the combustion-chamber, and up to the top of the fire-bridge or bridge-wall. At the lowest

point in the combustion-chamber is an opening, I, through which slag or ashes may be removed or air admitted when required.

Fig. 2 is a section of the combustion-chamber, showing its construction. The combustion-chamber is constructed with a sloping or curved bottom, and with discharge-openings at the lowest point in the bottom, as before described and shown at I. In this view two injectors, J J, and also two openings, I I, in the bottom are shown, it being a double combustion-chamber. Between the two injectors is built a wedge or curved shaped wall, of fire-brick or other material, extending from the top to the bottom of the combustion-chamber, and extending back nearly to the bridge-wall, as shown at K. In the front and along the sides of the said combustion-chamber, inside, is built a wedge or angle shaped fire-brick wall, extending from the top to the bottom, and from the injectors to the walls of the combustion-chamber near the bridge-wall, as shown at L L. These walls can be made to extend back any distance required, or they can be built curving, leaving a larger space in the combustion-chamber. From this construction it will be observed that it is impossible for any unconsumed carbon to find lodgment or remain in the combustion-chamber. The fuel is supplied to the combustion-chambers by the injectors J J. The injectors are constructed of metal, in the form of a pipe or tube. One end of the injectors is connected to an ordinary blower or air-blast, as shown at M, Fig. 1. In this pipe is a regulating valve or slide, N. This slide or valve is hinged to the air-pipe, and can be raised or lowered in the pipe as occasion requires. A similar slide or valve is arranged in the fuel-pipe O, both being to regulate the supply of air, the fuel-supply being regulated by a screw-conveyer and cone-pulley connected with the hopper P. A short distance from the slide or valve N the air-pipe is contracted and carried beyond the outlet of the fuel-pipe O, as shown at Q, Fig. 1. The fuel-pipe O is connected with the hopper P, or placed below it, and is also connected with the injector J. The object of the air-pipe being contracted and carried beyond the entrance of the fuel-pipe O is that a more thorough commingling of the fuel and air takes place, and it also prevents the fuel blowing back through

the pipe O. The arrangement of these pipes can be reversed. The fuel-pipe can be contracted and carried beyond its line of entrance into the air-pipe. The air-pipe being enlarged
5 at that point, the result would be the same. The injectors J J are flattened at the discharging-outlet, so as to spread the carbonized air over or above the bottom of the furnace, and they can set at an angle, so that the carbon-
10 ized air will impinge on the sloping or curved bottom at any point required. The same arrangement of combustion-chamber can be used for heating steam-boilers, and other purposes.

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

1. A furnace constructed with a double sloping or curved bottom, and with an opening in the combustion-chamber at the lowest place
20 in said chamber, and with a sloping or curved

bottom extending from or near the top of the bridge-wall to the floor of the heating-chamber, as described.

2. A furnace provided with injectors for injecting air and fuel, and constructed with a
25 wedge or curved shaped wall between the injectors, and with a wall extending at an angle or curved from the injectors on each side to the inside wall of the combustion-chamber, at or near the bridge-wall, as described, and for
30 the purpose specified.

3. The combination of the feeders or injectors J J with a furnace having double sloping or curved bottoms and wedge or curved shaped walls in the combustion-chamber, substantially
35 as described.

JOHN G. MCAULEY.

Witnesses:

S. T. McDOUGALL,
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