J. JENKS.

FEEDING AIR TO FURNACES.

No. 188,913. Patented March 27, 1877

Fig. 1.

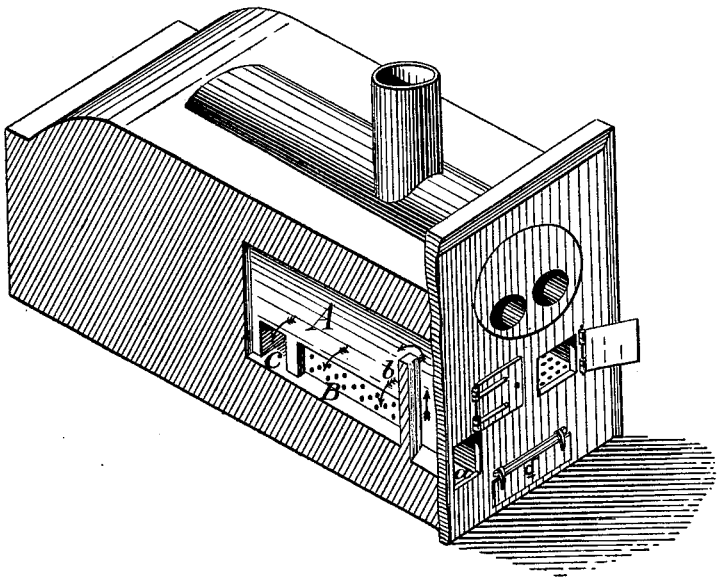
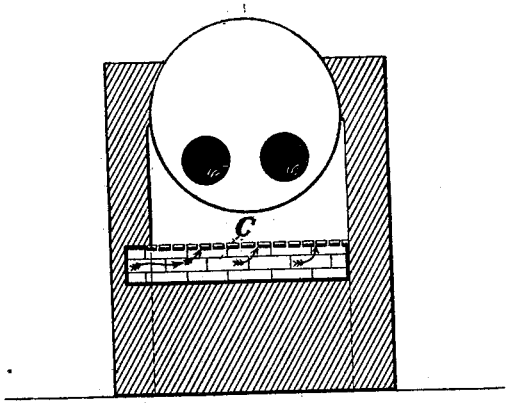


Fig. 2.



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UNITED STATES PATENT OFFICE.

JAMES JENKS, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF HIS RIGHT TO GEORGE A. JENKS, OF SAME PLACE.

IMPROVEMENT IN FEEDING AIR TO FURNACES.

Specification forming part of Letters Patent No. **188,913**, dated March 27, 1877; application filed October 31, 1876.

To all whom it may concern:

Be it known that I, JAMES JENKS, of Detroit, in the county of Wayne and State of Michigan, have invented an Improvement in Boiler-Furnaces, of which the following is a specification:

The nature of my invention relates to certain improvements in the construction of boiler-furnaces, by means of which the gases evolved from the burning fuel in the combustion-chamber are mingled with a fresh supply of heated air, admitted thereto at points above the fuel, and supplying the necessary oxygen to produce a perfect combustion of such gases, at the points where the heat thus produced will be utilized with great economy and effect upon the boiler.

In a large proportion of the boiler-furnaces in use in the manufacturing districts of the country coals are employed as fuel, and these coals, in the progress of combustion, throw off a large volume of gases, which are not consumed unless some provision for supplying them with the necessary oxygen is made other than the usual draft-supply through the ash-pit. When such provision is made, the air admitted should be heated and thoroughly mixed with the gases, so that when brought into contact with flame they will be ignited and be consumed.

My invention therein consists in the combination, construction, and arrangement of the parts for effecting the above purposes, as more fully hereinafter explained.

Figure 1 is a perspective of a boiler-furnace, with a portion of the wall broken away to show the flues in the sides of the combustion-chamber. Fig. 2 is a vertical cross-section through the hollow bridge-wall.

Like letters refer to like parts in each figure.

In the drawings, A represents a flue built into the wall of the combustion-chamber, and connecting with an opening, *a*, through the front or side, and which is provided with a suitable valve or stopper; or it may be connected with a blower, if it is desired to force the blast at any time. A flue-strip, *b*, may be inserted, which guides the air entering to the upper part of the flue A, where it is heated to a high degree by contact with the heated wall of the combustion-chamber.

The area of the opening for the admission of the air is larger than the perforations in the plates B, which are inserted into the side walls of the combustion-chamber, above the fuel in said chamber; consequently a larger volume of air is admitted than can pass through those perforations, and the excess will pass through the flue into the hollow bridge-wall C, the top of which is perforated.

The air admitted through the perforated plates in the side walls mingles with and furnishes the necessary supply of oxygen, in a highly-heated condition, for the consumption of the gases, near the sides of the combustion-chamber. Those gases evolved near the center of the fire, in passing toward the outlet, pass over the bridge-wall, where they mingle with the heated air entering through the top of said bridge-wall by means of the aforesaid perforations, and are consumed, so that less fuel is required than under ordinary circumstances.

As the combustion in a boiler-furnace is designed to be rapid, as compared to that of an ordinary heating-stove, a proportionately larger amount of air is admitted through the ash-pit and grate bars, as usually arranged. This amount of air, being largely in excess of that required for the preliminary combustion of the fuel, as boiler-furnaces are usually constructed, passes through the fire and escapes at the outlet, with a very large proportion of its oxygen not utilized, and, to a certain degree, converted into carbonic-acid gas, which will not assist in the burning of the gases; consequently I prefer to use a perforated grate, as shown, and a closed ash-pit, provided with a suitable valve or door, *d*, by means of which only a sufficient amount of air will be admitted through the grate to afford the necessary oxygen to ignite the coal and keep up a good preliminary combustion on the grate. Then the gases evolved from such combustion, being mingled with a fresh supply of heated air in the manner I have above described, will be thoroughly and effectually consumed, emitting great heat with a correspondingly good effect.

I do not desire to confine myself to a closed

ash-pit and perforated grate, as my invention is applicable to furnaces provided with open ash-pits, or any other style of grate.

What I claim as my invention, and desire to secure by Letters Patent, is—

In a boiler-furnace, the combination of the flues A, opening *a*, flue strip *b*, perforated plates B, and perforated bridge-wall C, all constructed and arranged substantially as described and shown.

JAMES JENKS.

Witnesses:
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