

J. W. BONTA.
STEAM BOILER FURNACE.

No. 182,056.

Patented Sept. 12, 1876.

Fig. 3.

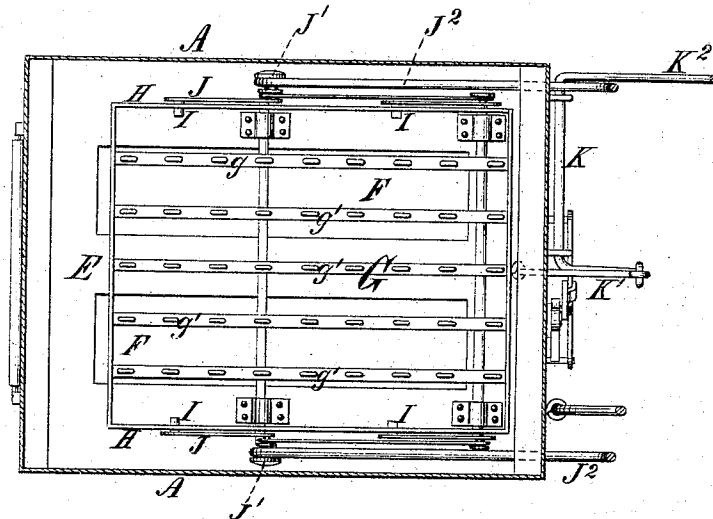
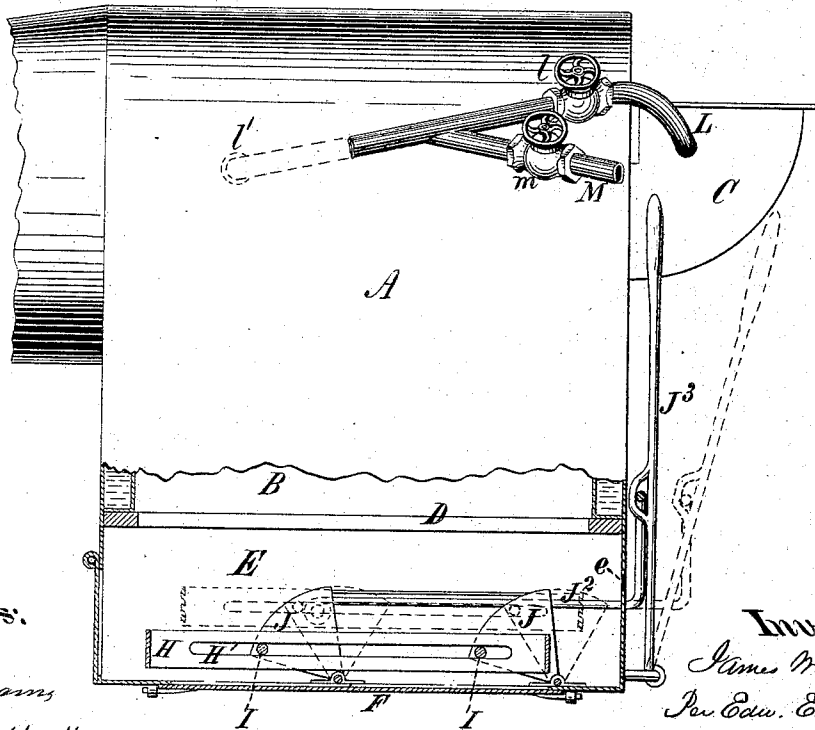


Fig. 4.



Witnesses:

E. A. Williams,

Geo. W. Mott,

Inventor:

James W. Bonta
Per Edw. E. Lumby
Atty.

UNITED STATES PATENT OFFICE.

JAMES W. BONTA, OF NEW BRIGHTON, PENNSYLVANIA, ASSIGNOR TO
BONTA-FURNACE COMPANY, OF HARTFORD, CONNECTICUT.

IMPROVEMENT IN STEAM-BOILER FURNACES.

Specification forming part of Letters Patent No. **182,056**, dated September 12, 1876; application filed February 1, 1876.

To all whom it may concern:

Be it known that I, JAMES W. BONTA, of New Brighton, Pennsylvania, have invented certain Improvements in Furnaces for Steam-Boilers, of which the following is a specification:

My improvement relates to devices for regulating the generation and combustion of gas in a furnace provided with a magazine-retort for containing coal, and feeding it automatically to the grate-surface after it has been more or less coked.

My invention consists of a pipe attached to the upper part of the coal-magazine, for the discharge of the gas generated therein into the fire-chamber of the furnace, and in providing that pipe with a valve, and in connecting with it, at an acute angle, a pipe for carrying a blast of air into the fire-chamber, by the operation of which gas generated in the coal-magazine, which is also a retort, is drawn from the upper part of the coal-magazine and carried into the fire-chamber.

When the valve of the gas-discharge pipe is closed, the coal in the magazine cokes slowly, and the gas therein generated finds its way out of the magazine at its bottom only; but by opening the valve, and injecting air, as has been described, through the blast-pipe, I increase the combustion of the coal in the lower part of the magazine-retort, and generate gas in the retort more rapidly. I am thus enabled to suddenly increase the combustion, and consequent heating-power of the furnace, or to regulate it, as may be desired, by governing the gas-generating power of the magazine-retort and the quantity of gas discharged into and burned in the fire-chamber.

The accompanying drawings, which exhibit my improvements applied to the furnace of a locomotive-boiler, are as follows:

Figure 1 is a front view of the furnace, showing that part of the magazine-retort which projects outside the fire-chamber, and exhibiting the pipe for discharging gas from the magazine-retort into the fire-chamber, with its valve, and the valve for the operation of the air-injection pipe. Fig. 2 is a vertical section through the line *xx* on Fig. 1, showing the fire-chamber, a portion of the tubes of a loco-

motive-boiler, and the magazine-retort. Fig. 3 is a horizontal section through the line *yy* on Fig. 1. Fig. 4 is a side view of the furnace, partly in section, showing the pipe for the discharge of gas from the magazine-retort and the air-injection pipe, with their respective valves.

In the drawings, A represents the shell of the furnace of a locomotive-boiler. A portion of the fire-chamber B is occupied by the jacketed magazine-retort C, from which coal is discharged automatically upon the grate-bars D. The ash-pit E is provided with openings *ee*, for the reception of air-blast pipes.

My magazine-retort is similar in its construction and arrangement to that described in my application for a patent filed October 19, 1875; but differs therefrom in respect of not having perforations in that portion of it situated within the upper part of the fire-chamber.

Instead of allowing the gas as fast as generated to escape through perforations in the magazine-retort, I discharge the gas through the upper part of the magazine-retort through the pipe L, provided with the valve *l*, for the purpose of checking or wholly arresting the exit of gas from the upper part of the magazine-retort. The gas-discharge pipe L is joined at an acute angle by an air injection pipe, M, which is to be connected with an air-pump or blower, and is provided with the valve *m*. When the valves *l* and *m* are open, air rushes through the injection-pipe M, and draws gas from the magazine-retort through the pipe L, by means of which the mixed air and gas is conducted into the furnace-chamber, as shown at *V*, Fig. 4, or carried forward into a supplementary combustion-chamber situated in front of the tube-sheet.

The point selected for the injection of the gas into the furnace is immaterial, as far as regards the main purpose of the invention, which is to place the generation of gas in the magazine-retort under the control of the engineer. When gas is drawn from the magazine-retort through the gas-discharge pipe L, the draft through the magazine-retort from the grate-surface is increased, and the coal contained in the magazine is more rapidly coked, and gas is more rapidly generated. I

am thus enabled to suddenly increase the heating-power of the furnace by providing for injection and combustion therein a rapidly increased quantity of gas.

The drawings show devices for stirring coal upon the grate-surface and for discharging ashes from the bottom of the ash-pit; but I make no claim for those devices herein, because I propose to make them the subject of a separate application for a patent.

I claim as my invention—

In a steam-boiler furnace, provided with a magazine-retort, partially contained within the fire-chamber and partially projecting therefrom externally, a gas-discharge pipe, connected at one end with the external portion

of the magazine-retort and at the other end with the fire-chamber, and provided with a valve, in combination with an air-injection pipe, also provided with a valve, the whole constructed and arranged substantially as shown and described, for the purpose of drawing gas from the magazine-retort and injecting it into the fire-chamber, and thus creating a draft through the magazine-retort, and increasing the rapidity with which gas is generated therein.

JAMES W. BONTA.

Witnesses:

EDWIN A. ALGER,
ALFRED F. LEARS, Jr.