

No. 842,189.

PATENTED JAN. 29, 1907.

W. B. ESTES.
SMOKE CONSUMING FURNACE.
APPLICATION FILED OCT. 26, 1906.

Fig. 1.

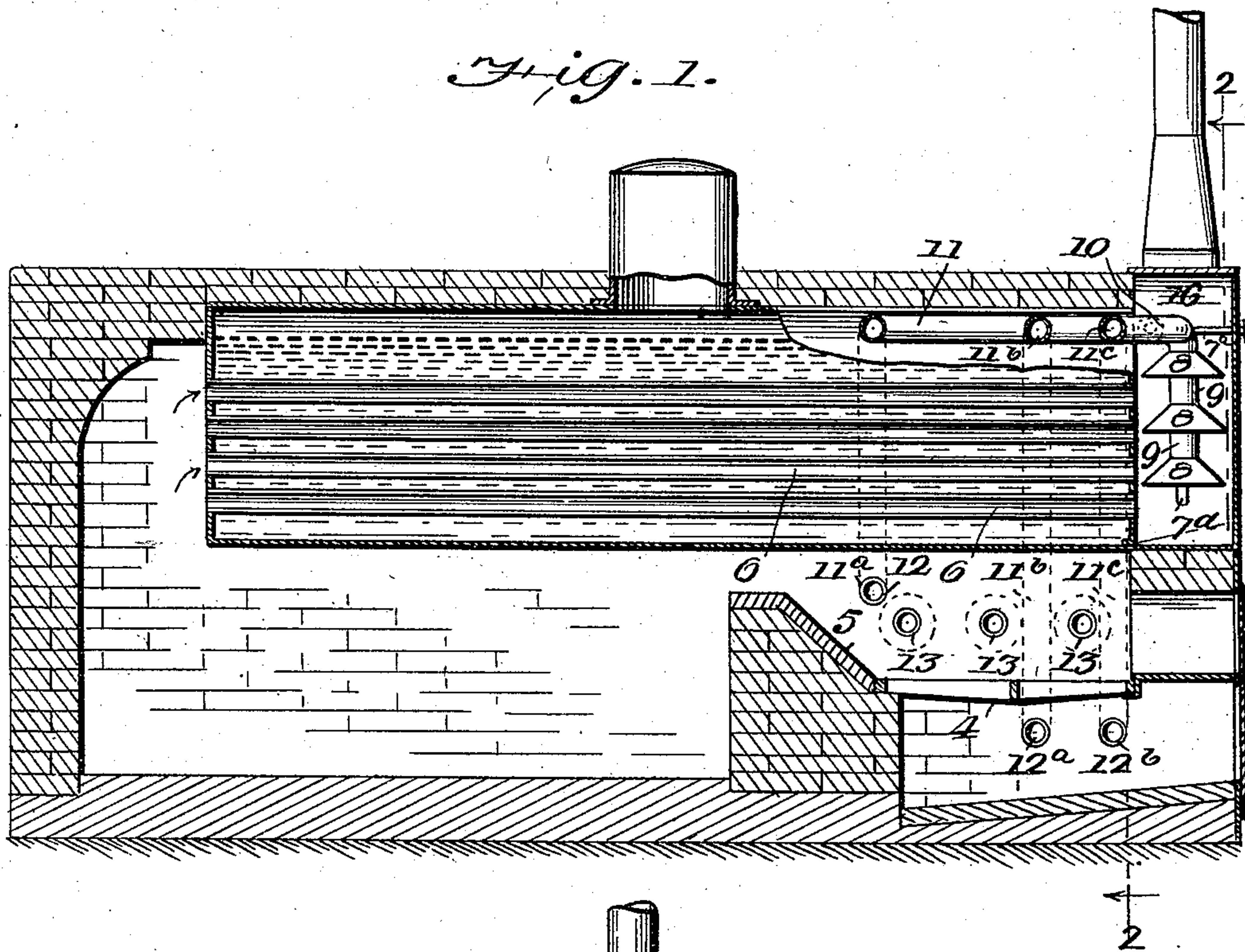
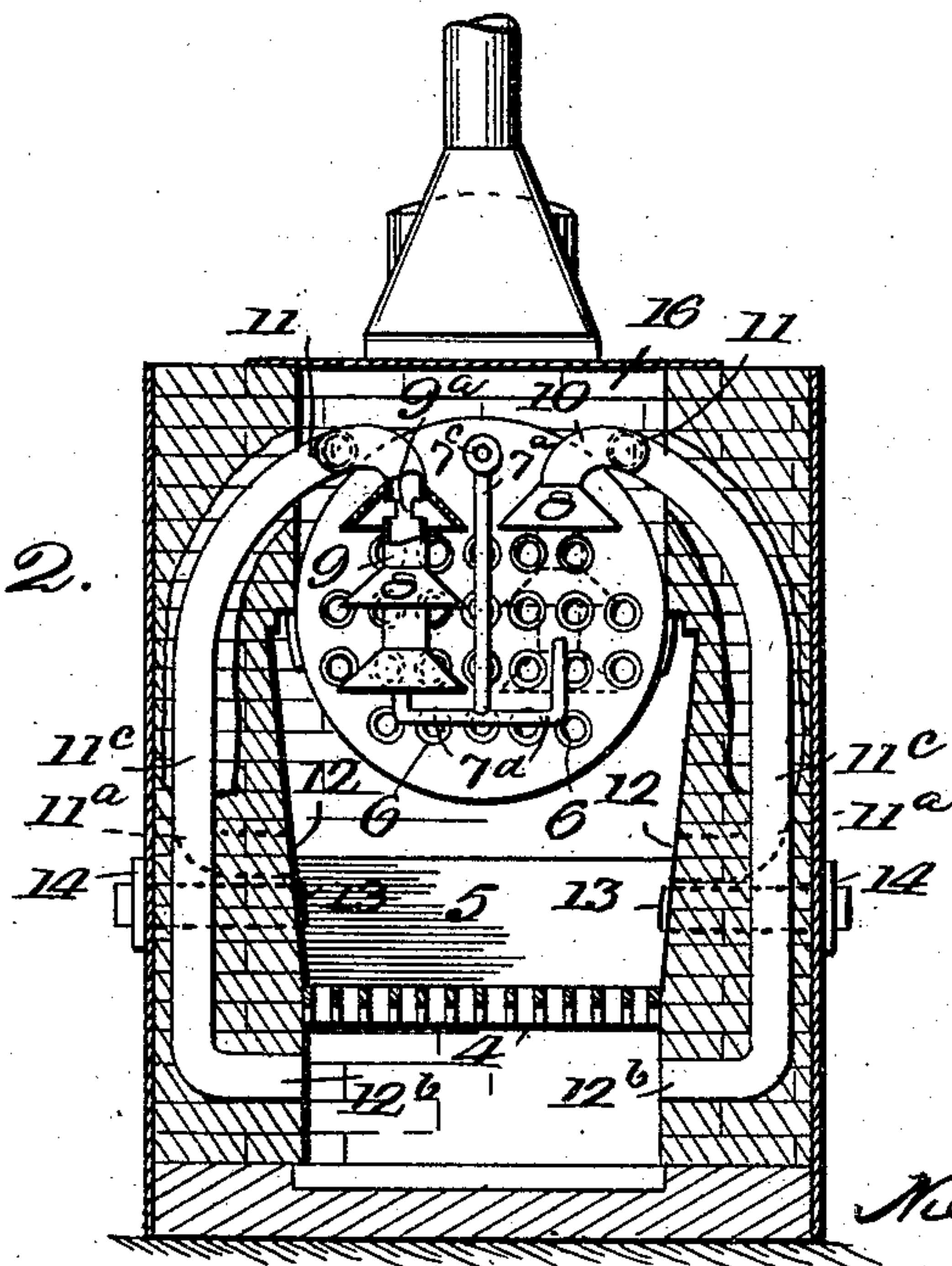


Fig. 2.



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WILLIAM B. ESTES, OF DANVILLE, ILLINOIS.

SMOKE-CONSUMING FURNACE.

No. 842,189.

Specification of Letters Patent.

Patented Jan. 29, 1907.

Application filed October 26, 1906. Serial No. 340,661.

To all whom it may concern:

Be it known that I, WILLIAM B. ESTES, a citizen of the United States; residing at Danville, in the county of Vermilion and State of Illinois, have invented new and useful Improvements in Smoke-Consuming Furnaces, of which the following is a specification.

This invention relates to furnaces, and has for its object to provide a furnace which will consume the smoke and save fuel.

The furnace is of that type in which the smoke and gases after passing through the boiler-flues are returned to the combustion-chamber, together with a certain amount of steam injected therein, the steam-jet also serving the purpose of inducing a draft through the return-pipe to assist in carrying the products of combustion therethrough.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of a boiler-furnace provided with the invention. Fig. 2 is a vertical cross-section on the line 2-2 of Fig. 1.

Referring specifically to the drawings, 4 indicates the grate, 5 the bridge-wall, 6 the boiler-flues, and 16 the breeching or smoke-box at the front end of the boiler, these parts being of the usual or ordinary construction.

For returning the products of combustion from the smoke-box to the combustion-chamber I employ pipes which are mainly embedded in the side walls of the furnace. The ends of the pipes are located in the smoke-box in the form of depending parts 9, which are provided with a series of hoods 8, located at various heights along the same. The purpose of having a series of hoods is to catch the smoke from the various levels or sets of flues. The pipes 9 have openings 9^a therein within the hoods, so that the smoke which enters the hood passes through the openings 9^a and into the pipes. The vertical parts or pipes 9 are connected at the top by elbows 10 to horizontal pipes 11, which extend rearwardly through the brickwork above the boiler and have a series of branches 11^a, 11^b, and 11^c, which extend downwardly

through the side walls of the boiler-setting. One branch 11^a opens, as indicated at 12, into the combustion-chamber above the grate. The others, 11^b and 11^c, open, as indicated at 12^a and 12^b, in the ash-pit under the grate and assist the draft. To increase the draft and also to induce the flow of smoke through the return-pipes, steam-jet pipes 7^d are provided, which enter the mouths or lower ends of the pipes 9 and discharge a jet upwardly into said pipes. Steam is supplied through a pipe 7^a, which taps the boiler and which is controlled by a valve 7^c.

To further assist combustion, air-feeding means are provided consisting of thimbles 13, which extend through the side walls of the setting and open into the combustion-chamber above the grate. Valves 14 on the outside control the flow of air through these thimbles. The supply of air to the top of the fire may accordingly be varied without forcing a great draft through the fuel-bed.

The combined effect of the supply of finely-divided carbon in the form of smoke and of hot gases and of steam and air is to greatly assist combustion, resulting in consumption of the smoke and consequent increase of heating capacity and saving of fuel.

I claim—

In a boiler-furnace, a return-pipe for smoke and gases, having an inlet end depending vertically within the breeching and provided with a series of inlet-openings at various heights opposite the rows of flues in the boiler, a series of hoods above said openings, said pipe extending rearwardly and downwardly to the fire-box, in combination with a steam-jet pipe discharging into the pipe.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM B. ESTES.

Witnesses:

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