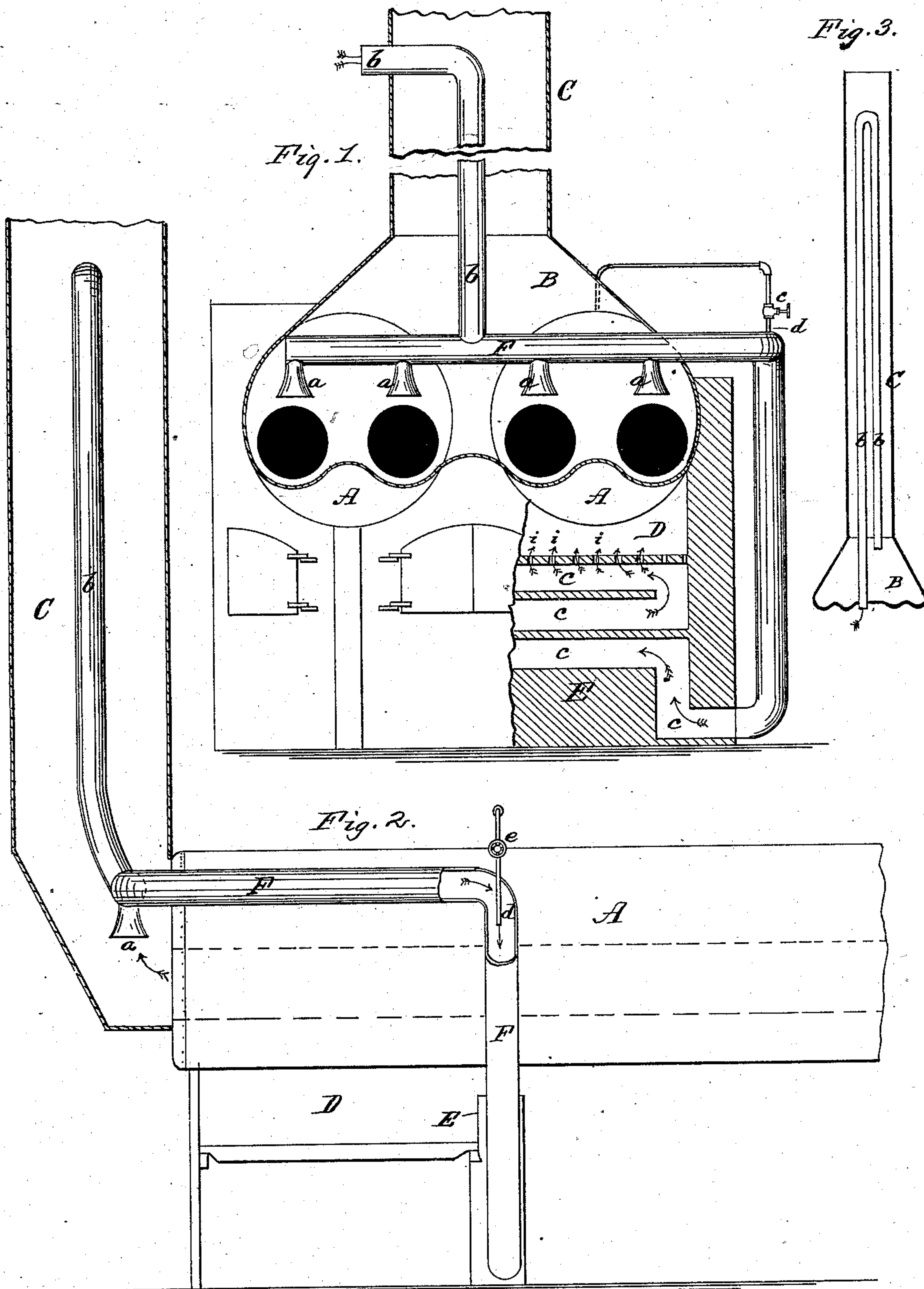


(No Model.)

O. A. WAGGONER.
Furnace.

No. 237,345.

Patented Feb. 1, 1881.



Witnesses
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UNITED STATES PATENT OFFICE.

OLIVER A. WAGGONER, OF PITTSBURG, PENNSYLVANIA.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 237,345, dated February 1, 1881.

Application filed September 1, 1880. (No model.)

To all whom it may concern:

Be it known that I, OLIVER A. WAGGONER, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain
5 new and useful Improvements in Smoke-Burning Attachments for Furnaces; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in
10 which—

Figure 1 is an end view of a boiler-furnace with part of the breeching removed, and partly in section, to show the interior of the bridge-wall. Fig. 2 is a side view of same,
15 partly sectional. Fig. 3 is a modification of the air-pipe.

My invention relates to attachments to furnaces, particularly steam-boiler furnaces, for the purpose of burning the gases and waste
20 products of imperfect combustion.

My invention consists in the novel construction, combination, and arrangement of parts, as hereinafter described and claimed.

A A represent two ordinary flue-boilers; 25 B, the breeching, and C the stack. D is the furnace, and E the bridge-wall. Across the breeching B, I place a large pipe, F, having the inlets *a a a a* above the respective boiler-flues. A large pipe, *b*, comes down the stack
30 to pipe F, its upper end being open and extending laterally out through the stack, as shown. Pipe F extends out laterally and bends down toward the ground, and when as low as the lower portion of the bridge-wall E
35 it passes into it, as shown. Bridge-wall E is built with the circuitous passage or flue *c*, and its upper section opens to the furnace by means of a number of jet-holes or perforations, *i*. A steam-jet exhaustor, *d*, enters pipe
40 F at the bend, as illustrated, and the steam taken from the boiler is controlled by a valve, *e*.

Ordinarily a furnace with full draft does not consume the fuel, but a large percentage goes off in the shape of solid carbon and com-
45 bustible gases. These gases are to a great extent consumed by my invention, whose operation is as follows: The steam being admitted to the exhaustor *d*, produces an artificial draft or suction in the pipes F *a* and
50 *b*. The gaseous products coming unconsumed from the flues of the boiler, after traversing the same, are drawn, to a great extent, up the inlets *a a a a* to pipe F. A large volume of fresh air is also drawn down through pipe *b*,

which, being in the heated atmosphere of gase- 55
ous products, heats the air passing through it. The air and gases are thus together drawn through pipe F, where the steam-jet strikes them, mingles them, and impels them forcibly
60 down through the pipe to the hollow bridge-wall. Traversing the passage *c* in the bridge-wall, the mingled air and gases become still more highly heated, and finally emerge into the furnace in a condition for perfect combustion at the openings *i*. All the smoke thus
65 abstracted from the stack or breeching, on being burned in this manner in the furnace, adds to its heat without in any manner interfering with the customary workings of the furnace. It is inexpensive, and can be readily
70 adapted.

Instead of the hollow bridge-wall receiving the products from the exhaustor, they may be introduced simply into the furnace in a direct manner, above or below the grate-bars, 75
or they may be passed through the tile lining of the furnace-front, constructed for the purpose.

The steam for the exhaustor may come directly from the boiler, or may be superheated 80
in the furnace-walls in suitable pipes, if so desired.

The pipe *b*, for air, may enter the stack below and pass up into the same, and then down again, as in Fig. 3. The operation would be 85
the same as before.

By the above invention I utilize a source of heat which otherwise goes to utter waste in ordinary furnaces.

I claim as my invention— 90

1. The combination, with stack C and breeching B, of the air-pipe *b*, inlets *a a* for smoke, and combining-pipe F, provided with jet-exhaustor *d*, and communicating with the interior of the furnace, substantially as de- 95
scribed.

2. The combination of stack C, breeching B, air-pipe *b*, inlets *a*, pipe F, exhaustor *d*, and passage *c* in bridge-wall E, communicating with the furnace D by perforations *i*, substan- 100
tially as described.

In testimony whereof I have hereto set my hand.

OLIVER A. WAGGONER.

Witnesses:

T. J. MCTIGHE,
T. J. PATTERSON.