W. S. HUTCHINSON.

DEVICE FOR AIDING COMBUSTION IN STEAM-BOILER AND OTHER FURNACES.

No. 192,168. Patented June 19, 1877.

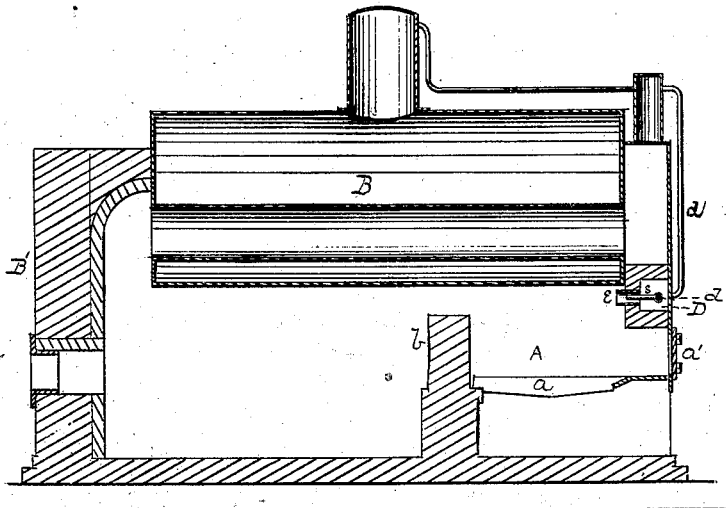

Fig. 1.

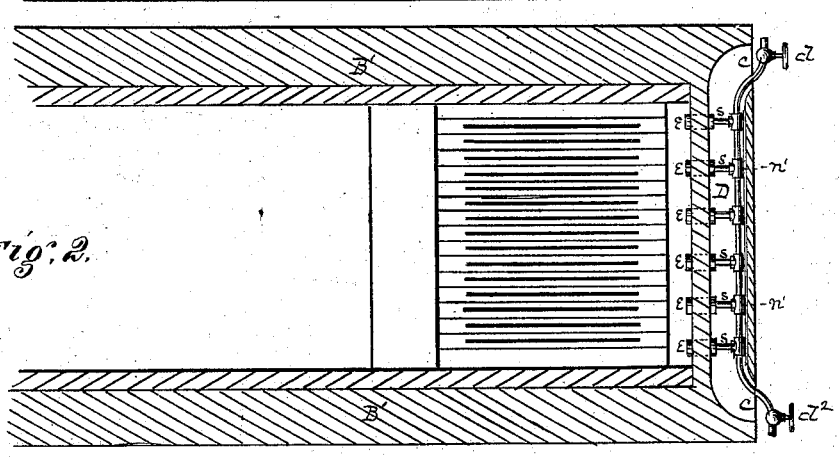

Fig. 2.

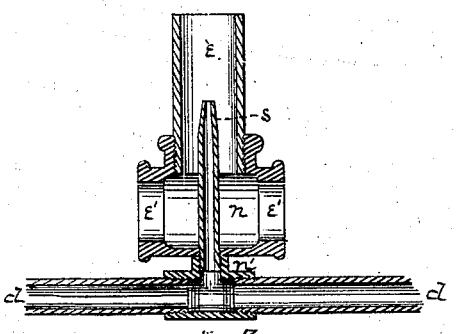

Fig. 3.

Witnesses
Fred. C. Klein
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UNITED STATES PATENT OFFICE.

WILLIAM S. HUTCHINSON, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN DEVICES FOR AIDING COMBUSTION IN STEAM-BOILER AND OTHER FURNACES.

Specification forming part of Letters Patent No. **192,168**, dated June 19, 1877; application filed March 20, 1877.

To all whom it may concern:

Be it known that I, WILLIAM S. HUTCHINSON, of Chicago, county of Cook, State of Illinois, have invented or discovered a new and useful Improvement in Steam-Boiler and other Heating Furnaces; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a longitudinal vertical section of a steam-boiler furnace, illustrating the application of my improvements thereto. Fig. 2 is a longitudinal horizontal section thereof just below the boilers, and Fig. 3 is an enlarged sectional view of one of the steam-jets with its immediate connections.

My improvement is designed to facilitate and perfect the combustion of the fuel ordinarily employed for heating purposes, in connection with steam-boilers, metallurgic furnaces, or the fire-chambers of other heating apparatus where steam is or can be made accessible.

For convenience of illustration I have shown it as applied to an ordinary flue-boiler; and from my description, taken in connection with the drawing, those skilled in this art will be able to apply the same improvements to other fire-chambers and furnaces generally.

B represents an ordinary flue-boiler, mounted on the usual inclosing-walls B′. A is an ordinary fire-chamber; *a*, the grate-bars, and *b* the fire-bridge wall. Immediately over the door a^1, and projecting forward any desired distance into the fire-chamber A, so as to be heated therefrom, is a transverse chamber, D, along which I run a steam-pipe, *d*, which leads from the boiler or other convenient steam-generator. A cock or valve to cut off, let on, and regulate the supply of steam, is arranged at d^1 and a blow-off cock at d^2. In the wall of the chamber D next the fire I make a series of openings, and line the same with air-inlet tubes or thimbles *e*, so made that air may pass freely through their open base ends, or through open lateral ports *e′*, and thence into the fire-chamber. A steam-jet tube, *s*, leads from the steam-pipe *d* into each wall-opening, or into its thimble *e*, as more clearly shown in Fig. 3, in such manner that the steam-jet escaping therefrom shall induce a current or flow of air into the fire-chamber, and at about such level that the commingled steam and air so entering the fire-chamber shall be intermixed with the heated smoke, gases of combustion, &c., given off from the fire on the grate-bars, and, by supplying the necessary amount of heated oxygen, promote their combustion. The air, passing into the chamber D by the openings *c* and along the heated walls of the chamber, will take up heat therefrom, and also from the steam-pipes, and from the steam itself, with which it intermixed on entering the fire-chamber.

My present improvement relates more particularly to the construction shown in Fig. 3, where the thimble *e* is screwed directly to the T-coupling *n*, the open ends of the T being the air-supply ports. The T-coupling *n* is tapped at the prolongation of the axis of the thimble *e*, and the jet-tube is screwed therein, and the base end of the jet-tube, by another T-coupling, *n′*, is secured to the steam-pipe *d*. This construction enables me to make and fit up this part of the apparatus complete at the machine-shop, so that it can be placed in position in the chamber D, and the inside vertical wall of the chamber be built up over and around the thimbles.

I claim herein as my invention—

The combination of thimble *e*, T-coupling *n*, jet-tube *s*, T-coupling *n′*, and pipe *d*, as a device complete for being built into the wall of the chamber D, arranged for the injection of air and steam into the furnace, substantially as set forth.

In testimony whereof I have hereunto set my hand.

WILLIAM S. HUTCHINSON.

Witnesses:
J. J. MCCORMICK,
GEORGE H. CHRISTY.