

H. R. IVES.

Improvement in Boiler-Furnaces.

No. 126,965.

Patented May 21, 1872.

fig. 1

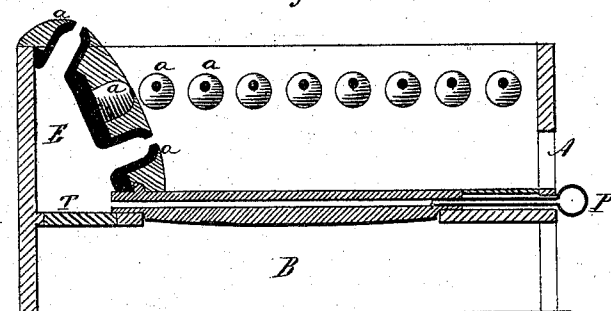


fig. 2

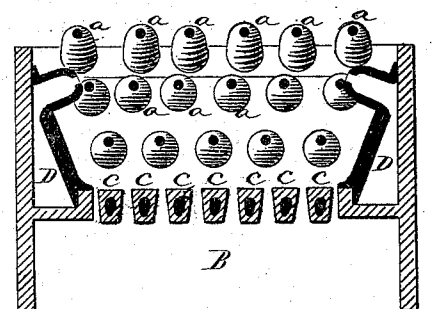


fig. 3



Witnesses

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HUBERT R. IVES, OF NEW HAVEN, CONNECTICUT.

IMPROVEMENT IN BOILER-FURNACES.

Specification forming part of Letters Patent No. 126,965, dated May 21, 1872.

To all whom it may concern:

Be it known that I, HUBERT R. IVES, of New Haven, in the county of New Haven and State of Connecticut, temporarily residing in Montreal, Canada, have invented a new and Improved Boiler-Furnace; and I do hereby declare the following, when taken in connection with the accompanying drawing and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawing constitutes part of this specification, and represents, in—

Figure 1, a longitudinal section, and in Fig. 2, a transverse section.

This invention relates to an improvement in the construction of furnaces for steam-boilers, the object being to construct the furnace for the introduction of steam directly into the products of combustion, for the purpose of more perfect consumption; and it consists in the arrangement of cones or tubes in the side of a fire-box embedded in clay, for the purpose of admitting jets of steam and air from outside the fire-box into the fire.

A is the feed-opening or door, as in ordinary furnaces; B, the ash-pit beneath the grate-bars; C, the fuel, resting upon the grate-bars in the usual manner. D D are the side chambers, and E, the rear chamber, which form the two sides and rear end of the fire-box. From these chambers numerous projections or tubes *a*, more or less in number, are formed, by preference cast in the same piece with the plate which forms the box, but may be inserted. Through these projections I form perforations opening into the said chambers, as denoted in the drawing. Those on the sides I make near the top of the box; but those on the rear may be further down, in order that the mass of fuel will be below the perforations; yet there is no material objection to the fuel extending up to or over the perforations, as it would be practically impossible, in consequence thereof, to stop the flow of steam and air.

To introduce steam from the receiver of steam, I arrange a pipe, P, along the front of the furnace, with branches opening into the chambers D, and also through the hollow grate-bars into the chamber E, as denoted in Fig. 1. The tubes which admit the steam to the chambers or grate-bars are of less diame-

ter than the openings into the said chambers or bars; therefore air flows freely into these, mingling with the inflowing steam, and the natural draught through the chambers and bars is accelerated by the force of the steam. The fire burning upon the grate-bars in the usual manner, a flow of steam and air is kept up in the chambers and grate-bars, and thence through the perforations directly into the fire-chamber, mingling with the products of combustion and causing the consumption of the gases or smoke, so that little or nothing escapes. I employ exhaust steam when the furnace is located to make such available. Live steam serves the same purpose, but being more expensive is less advantageous.

To protect the cones upon the sides of the fire-box, I cover or coat the plate with fire-clay, as denoted in section, Fig. 1, applied in a damp state and hardened thereon. I arrange the tubes or cones in such relative position to each other and the plate, as seen in Fig. 1, that they tend to confine the clay. They may be formed with a roughened surface to accomplish the same result. This protects the tubes and sides until the clay is destroyed, when it should be replenished.

In order to clear the chambers from any foreign substance which may enter therein, I form a trap or bottom, T, so as to be removed, to open the chamber and discharge whatever may have entered or formed therein.

It is not presumed to be necessary here to enter into the theory of mingling steam or moistened air with the products of combustion, as this is too well known, and I do not wish to be understood as broadly claiming the injection of jets of steam into a furnace fire-box, as such, I am aware, is not new; neither do I broadly claim the injection of combined air and steam into a furnace fire-box; but—

I do claim as my invention—

The cones *a* upon the plate which forms the side of a fire-box, embedded in a coating of fire-clay or suitable material, substantially as and for the purpose specified.

HUBERT R. IVES.

Witnesses:

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