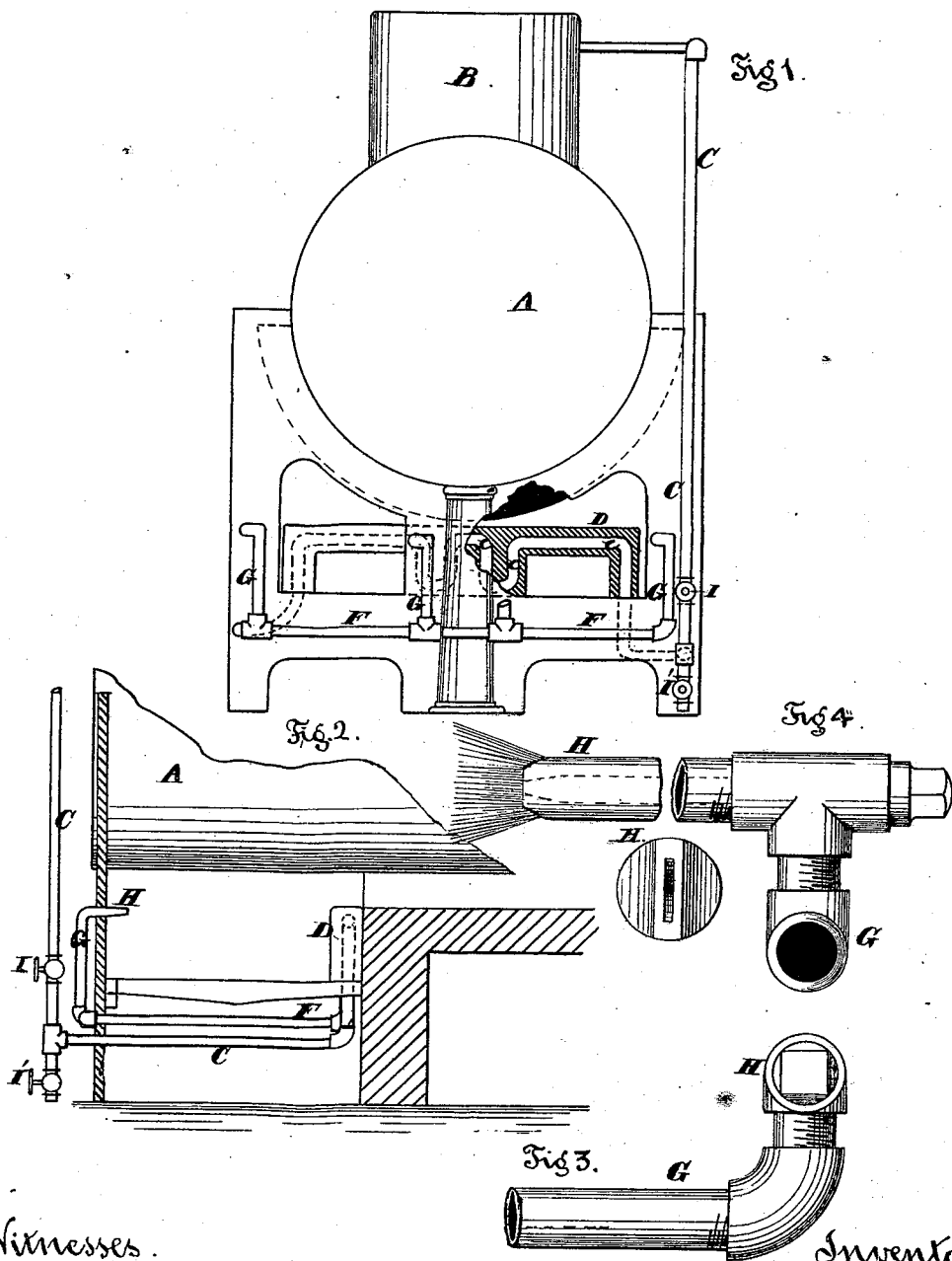


W. L. POWLESON.
Smoke-Consuming Furnace.

No. 159,964.

Patented Feb. 16, 1875.



Witnesses.

Helloueteverde.

Paul F. Martin

Inventor

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Per G. W. M. Smith, Atty.

UNITED STATES PATENT OFFICE.

WILLIAM L. POWLESON, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN SMOKE-CONSUMING FURNACES.

Specification forming part of Letters Patent No. **159,964**, dated February 16, 1875; application filed July 27, 1874.

To all whom it may concern:

Be it known that I, WM. LEE POWLESON, of San Francisco, in the State of California, have invented an Improvement in Furnaces, of which the following is a specification:

My invention relates to steam-boiler furnaces, and the burning of smoke therein. It consists in a novel construction of furnace, or of the combination of certain devices therein, for the purpose of superheating a portion of steam, and then in a novel manner of mixing the same with the smoke, all of which will be more fully set forth herein. The steam is introduced to the fire in a thin sheet set transversely to the current of the draft, and the quantity of steam is carefully regulated to correspond with the quantity of carbon floating in the smoke, and liable to be wasted by passing off into the atmosphere.

In the accompanying drawings, Figure 1 is a front elevation of my improved furnace, part of the figure being in section. Fig. 2 is a side view, also partly in section. Figs. 3 and 4 are detached views of the steam-discharge nozzle or burner with part of the steam-pipes.

In the drawings, part of an ordinary steam-boiler is seen at A, Fig. 1, with the dome B thereon. From this dome a steam-pipe, C, extends down below the furnace or fire-chamber, for conducting the steam to the pipe *e*, embedded in the superheater D, forming a lining for the bridge-wall, which is in the back wall of the fire-chamber. This pipe C has a stop-cock, I, for regulating the flow of steam according to the amount desired for burning the smoke, and also a second stop-cock, I', for discharging the water formed by condensing steam within the pipe. The steam admitted

through the pipe C passes through pipe *e* in the superheater D, and thence through the pipes F and G to the four nozzles H, which are set in the front of the fire-chamber above the burning fuel. Each of these nozzles gives a fan-tail jet or sheet of steam, spreading horizontally across the upper part of the fire-chamber, and in the hottest part or throat of the flue. Now, the current of smoke or draft strikes the sheet of steam transversely. Thus a complete mixture of the smoke and steam is effected, while the quantity of steam may be so regulated as to convert the carbon of the smoke into the common illuminating-gas, which immediately burns, thus increasing the intensity of the heat. Care is required to regulate the amount of steam, and also the draft or the current of smoke, in order to secure the complete combustion of the carbon in the smoke, and this is easily done by observing the character of the smoke, and also the intensity of the heat.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

The supply-pipe C, provided with the cocks I and I', in combination with the superheating-pipe *e*, embedded in the superheater D, forming a lining for the bridge-wall, the conducting-pipes F and G, and the fan-jet nozzles H, all these devices being arranged in relation to each other, with the fire-chamber, and combined to operate substantially as and for the purposes set forth.

WILLIAM L. POWLESON.

Witnesses:

A. D. ALLEN,
JOHN H. REDSTONE.