

U. B. STRIBLING.
Furnaces for Steam-Boilers.

No. 144,296.

Patented Nov. 4, 1873.

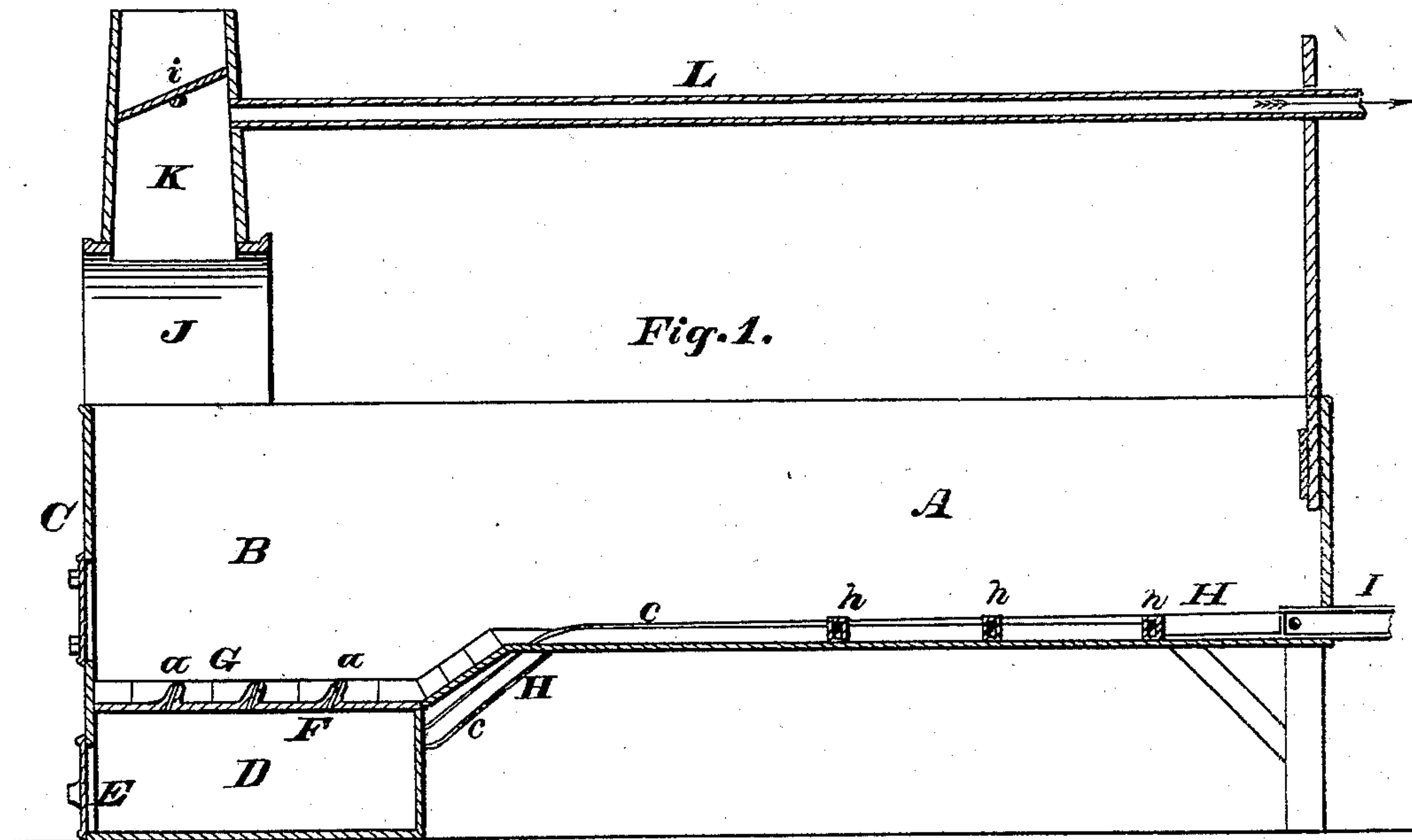
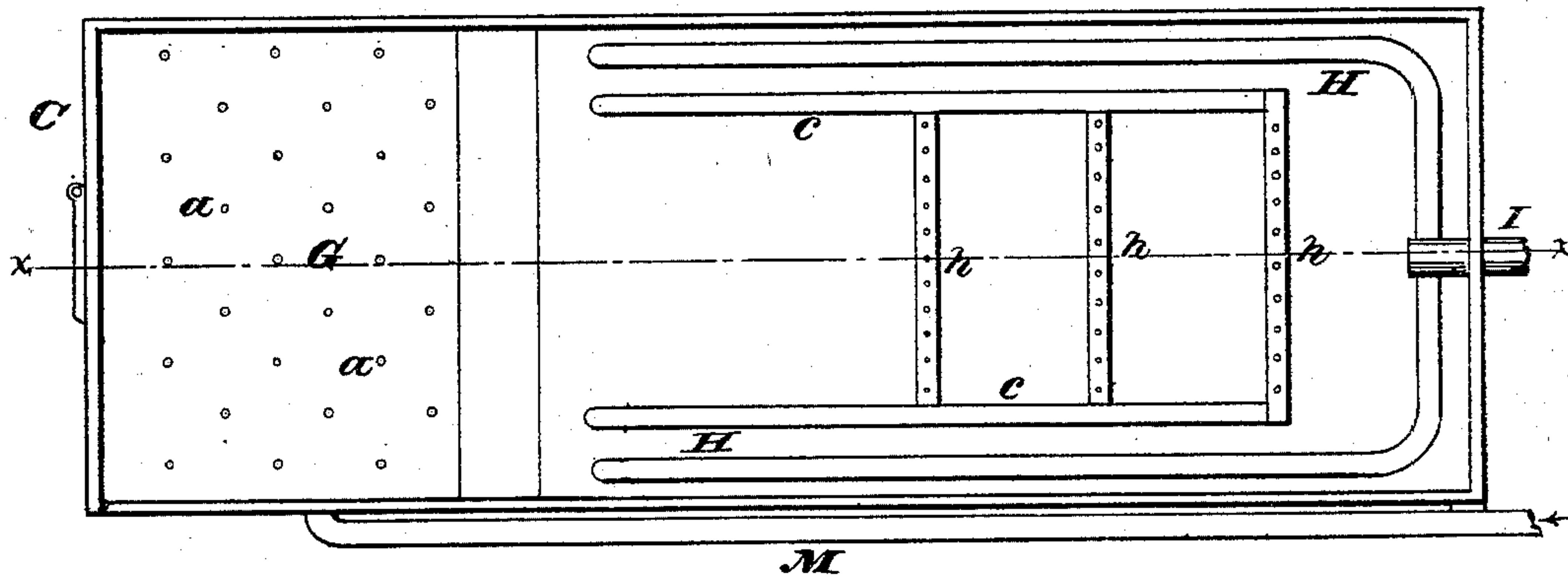


Fig. 2.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN FURNACES FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **144,296**, dated November 4, 1873; application filed December 19, 1872.

To all whom it may concern:

Be it known that I, URIAH B. STRIBLING, of Madison, in the county of Jefferson and State of Indiana, have invented certain Improvements in Furnaces for Steam-Boilers, of which the following is a specification:

My invention relates to that class of furnaces in which a forced draft is used, and is intended as an improvement on the furnace patented by me March 28, 1871, and numbered 113,110. In this invention I make use of a plate provided with air-tubes and overlaid with fire-brick or tiles, said tubes projecting upward between the tiles. This plate takes the place usually occupied by the grate-bars, and forms a cover for a hot-air chamber connected with the draft. Another feature of my invention is a pipe or system of pipes extending from the above-named hot-air chamber back under the boiler in the combustion chamber or space between the boiler and fire-bed, said pipes being connected at different points by hollow perforated castings, or their equivalents, by means of which hot oxygen is supplied to said combustion-chamber. Another feature of my invention is the device for drawing the carbonic acid and other unconsumed gases from the uptake by means of an exhaust-fan, and forcing them into the hot-air chamber or other air-reservoir, where they are mixed with oxygen, and thence upon the burning fuel in the furnace, where the carbonic acid combines with oxygen, is converted into carbonic oxide, and rendered combustible.

Figure 1 is a longitudinal vertical section of the furnace on the plane of the line *xx* in Fig. 2. Fig. 2 is a plan of the same with the upper portion omitted.

Let A represent the combustion chamber or space under a boiler, B the space over the fire, and C the fire-front. The boiler is not shown. D is a hot-air chamber, which also serves as an ash-box, and is provided with an air-tight door, E. The cover F of this chamber is the fire-bed, and is preferably constructed of cast-iron, with conical tubes *a a* cast upon it, and projecting from its upper surface. These tubes may be inclined toward the rear of the furnace, and they open into the chamber D. To protect the plate F from the action of the fire it may be overlaid with fire-brick or tiles, or other re-

fractory material, G, which should rise lightly above the tops of the tubes *a a*, so as to protect them. These tubes furnish the necessary air to the fire, said air being supplied to the chamber D, through the pipes H, H, and I, from a blower connected with the pipe I, but not shown.

The pipes H H may be exposed to any desired degree of heat in the combustion-chamber by leaving them uncovered; or they may be wholly or partially covered with fire-clay or tiles. By exposing these pipes the oxygen in the air-chamber is heated and combustion accelerated.

From the hot-air chamber D two or more pipes, *c c*, extend back to the rear of the combustion-chamber, and are connected at the end and at intervals by hollow metallic castings *h h*, perforated on the upper side. The object of this device is to supply heated oxygen from the chamber D to the combustion chamber or space A, for the more perfect combustion of the escaping hydrocarbon gases.

In Fig. 1, J is the "breeching," which connects the boiler-flues with the uptake K. In the uptake is a "butterfly"-valve, *i*, for regulating the amount of draft up the chimney. This valve is operated from the outside. The pipe L connects the uptake below the valve with an ordinary exhaust-fan, (not shown,) by which the unconsumed gases are taken up and forced thence through the pipe M (see Fig. 2) into the hot-air chamber D, where they are mixed with oxygen and pass into the furnace, thus effectually consuming all that is combustible.

If preferred, the gases from the uptake may be forced into a reservoir and mixed with oxygen before entering the chamber D.

It will be seen, by reference to the plan in Fig. 2, that the pipes H H curve inward at the rear of the furnace, and connect with the blower-pipe I.

In applying this furnace to steamboat-boilers, where a curved metallic back is used to turn the smoke and gases from the combustion-chamber into the rear end of the flues, I propose to use a curved hollow iron back, into which the pipe I will enter from the outside, and the pipes H H from the inside, the hollow pipe thus connecting the three.

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

1. The combination of a close perforated fire-bed, F, and a close hot-air chamber, D, which receives a blast of air through a heated pipe or pipes, H H, substantially as herein specified.

2. The combination, with the close hot-blast-supplying chamber D, of hot-air-supplying pipes *c c* and hollow perforated castings *h h* in the combustion-chamber A, substantially as herein specified.

3. In combination with the hot-air chamber D, pipes H, H, and I, plate F, and tubes *a a*, the device consisting of the system of pipes L and M, valve *i*, and an ordinary exhaust-fan, when arranged substantially in the manner shown, and for the purposes set forth.

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Witnesses:

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