J. A. LOCKE.

FURNACE FOR STEAM-BOILERS.

No. 169,455. Patented Nov. 2, 1875.

Fig. 2.

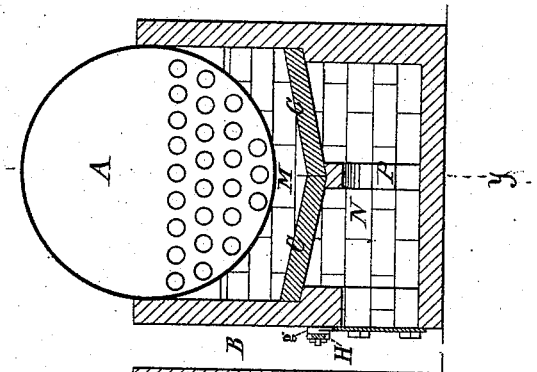


Fig. 1.

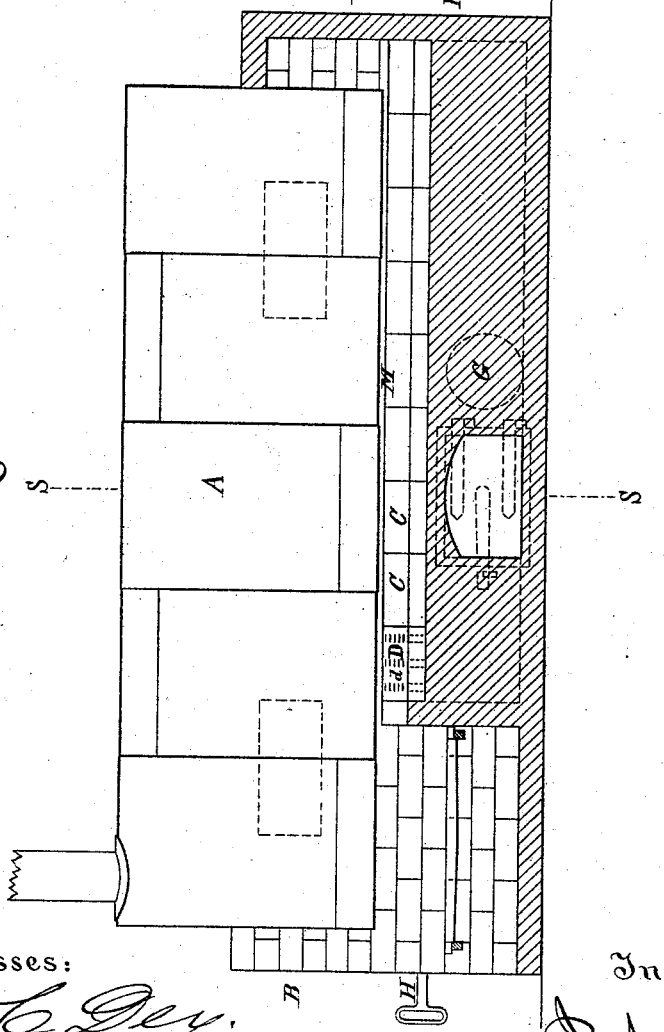
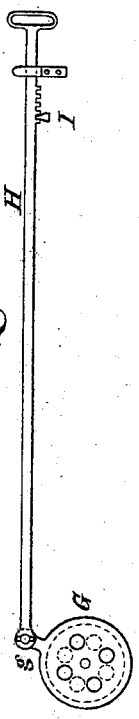


Fig. 3.



Witnesses:

Wm. C. Dey.

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Inventor:

J. A. Locke,

by his attorney F. A. Nelson.

UNITED STATES PATENT OFFICE.

JESSE A. LOCKE, OF NEW YORK, N. Y.

IMPROVEMENT IN FURNACES FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **169,455**, dated November 2, 1875; application filed January 8, 1875.

To all whom it may concern:

Be it known that I, JESSE A. LOCKE, of New York city, in the State of New York, have invented certain Improvements relating to Furnaces for Steam-Boilers, of which the following is a specification:

I employ the ordinary construction of the grates and of the walls surrounding, and of the means for supplying and controlling the air beneath the grate. The gaseous matter from the fire is conducted along the under surface of the boiler through a flue or passage formed of molded slag, stone, or analogous earthy and non-conducting material, which reflects the heat to the boiler, and does not convey it away. The material is described in the patent to F. A. Luckenbach, dated November 26, 1872. In the base of this flue, nearest the fire, and adjacent to the bridge-wall, I have numerous small perforations. The external air is admitted to a chamber beneath the tiles or plates through a passage controlled by a valve, which connects, by a suitable rod or the like, to the front of the boiler, so that the air-current through the apertures may be controlled with perfect freedom. In operating the boiler the attendant need not leave the front of the furnace. He can, through the ordinary small aperture or peep-hole in the door, see what is going on in the flue. Standing there he opens and closes the register or valve until he has supplied the property quantity of air to induce the most perfect combustion of the escaping gases.

The accompanying drawings represent what I consider the best means of carrying out the invention.

Figure 1 is a longitudinal central section on the line *y y* of Fig. 2. Fig. 2 is a cross-section on the line S S in Fig. 1. Fig. 3 represents details detached.

Similar letters of reference indicate like parts in all the figures.

A represents the boiler, supposed to be an ordinary cylindrical boiler with return-tubes. B represents brick walls inclosing the fire-space, and also forming the sides of the flue M, through which the products of combustion are carried along under the boiler. The same letter B also designates the shoulders or supports for the tiles or refractory earthy plates C D, which form the base of the flue, and which perform important functions. The tiles C D are in two breadths, placed a little inclined, as shown, and supported on the ledges at the sides, and on a wall in the center of the space under the boiler. The pair D, nearest the fire, are thickly perforated, as indicated by *d*. A man-hole is formed in the side of the brick-work, and also in the central wall, through which a person may enter to examine or replace the tiles. The opening in the center also allows the air admitted through the register G to act equally under both sides of the boiler. The register G controls a liberal aperture for the entrance of fresh air to the chamber N, to be thence delivered into the combustible gases through the perforations *d*. The flow of air through the perforations *d* depends on the amount of opening of the register G. This is controlled by a rod, H, which is hinged to a short arm, *g*, on the upper side of the register G, and is adapted to be conveniently set in various positions, and firmly held by means of the notches in the rod H engaging with the knife-edge or fence I. By extending the connection H from the register G to the front of the furnace the engineer or fireman is enabled to conveniently adjust it in any position desired, to induce the most perfect combustion, without leaving his place near the fire-door, and while actually inspecting the effect.

It is important that what I have termed the tiles C D be made of the most refractory non-conducting material accessible. I have experimented with the molded slag-stone referred to, and prefer that to any other material; but I propose to use fire-brick made in some extended forms, or any other sufficiently refractory material. It is preferable that the material should be of a light color, so as to more effectually reflect the heat to the boiler. Metallic plates in the position of my tiles C D are liable to not only corrode and become warped and destroyed, but in their best condition conduct away much heat, which my molded slag-stone or analogous earthy tiles reflects back and utilizes.

The tiles or plates C C D are so made as to incline downward toward the center throughout their entire length, so as to be, in a meas-

ure, concentric with the boiler, as shown at Fig. 2. This I consider an important feature of my invention, as it allows the ashes, cinders, &c., to gravitate toward the center, from whence they are easily removed.

The chamber N is divided by a partition, P, which is perforated to allow the current of air to pass to either side. This partition also serves as a support to the tiles.

I am aware that many of the features of my invention have been before known, but I deem the specific construction and arrangement described and shown by me important and useful.

I claim as my invention—

The earthy continuous tiles C C, perforated at its end in rear of the bridge-wall, forming a continuous downward incline toward the center throughout the entire length of the chamber, supported at the center by the perforated partition P, in combination with the register G and its operating means H, as and for the purposes specified.

In testimony whereof I have hereunto set my hand this 7th day of January, 1874, in the presence of two subscribing witnesses.

JESSE A. LOCKE.

Witnesses:

WM. C. DEY,

E. VOLKMANN.