(No Model.)

T. E. JONES.

BOILER FURNACE.

No. 263,182. Patented Aug. 22, 1882.

Fig. 1.

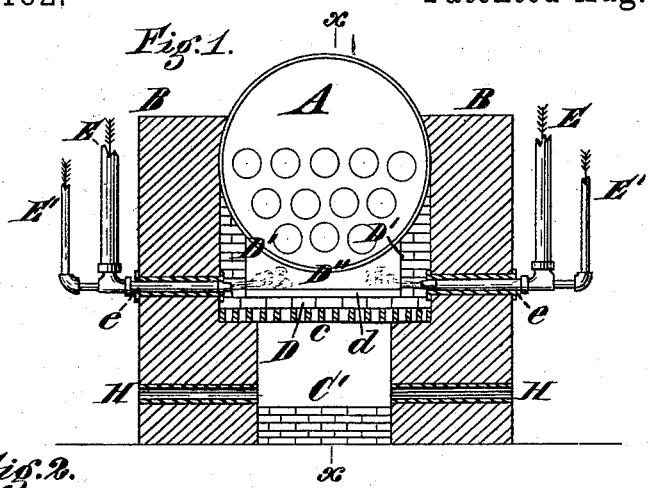


Fig. 2.

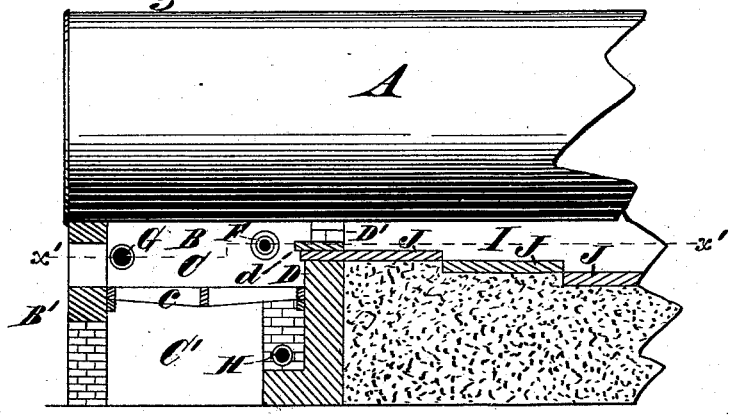


Fig. 4.

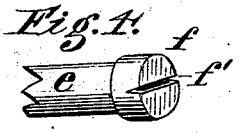


Fig. 5.

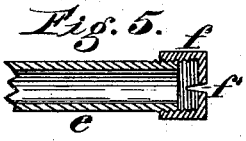
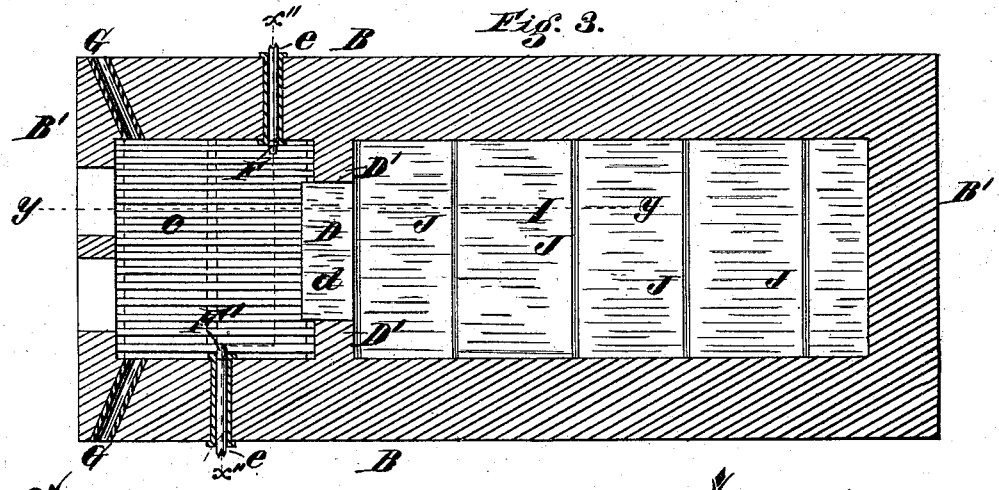


Fig. 3.



Attest,
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UNITED STATES PATENT OFFICE.

THOMAS E. JONES, OF CINCINNATI, OHIO.

BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 263,182, dated August 22, 1882.

Application filed June 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, THOMAS E. JONES, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Boiler-Furnaces, of which the following is a specification.

My invention relates to improvements in boiler-furnaces, or more particularly to devices for the consumption of smoke.

The object of my invention is to provide a narrow throat or opening between the bridge-wall, which has a forwardly-projecting deflecting-ledge, and the boiler by building from the bridge-wall up to the boiler a shallow wall projecting inwardly from both sides of the furnace, and combining therewith a jet or jets of steam and air arranged to operate transversely across the fire-box or furnace-chamber, above the fire at the rear end thereof, near the said bridge-wall, to check the too rapid passage of the smoke and gases produced by the burning of the fuel into the flue before they are fully utilized.

Another object of my invention is to provide suitable passages in the front of the furnace-chamber, above and below the grate, for the admission of air to promote combustion and operate in connection with the narrowed throat over the bridge-wall and the transversely-disposed air and steam nozzles.

Another object of my invention is to provide a gradually-descending floor in the combustion-chamber from the bridge-wall to or near the rear end of the boiler to cause the flame and heated gases to spread and encompass the boiler, and thereby produce as uniform heat as possible to all parts of the boiler within the furnace and combustion-chamber.

In the drawings, Figure 1 is a transverse sectional elevation through the fire-box of a boiler-furnace on line $x'' x''$, Fig. 3, showing the bridge-wall, transversely-projecting walls, and the air and steam nozzles and connections embodying my invention. Fig. 2 is a broken longitudinal sectional elevation on line $x\ x$, Fig. 1, and $y\ y$, Fig. 3. Fig. 3 is a plan view on line $x'\ x'$, Fig. 2. Fig. 4 is a broken perspective view of a modified form of air and steam nozzles. Fig. 5 is a central section of the same.

A represents an ordinary steam-boiler; B, the side walls, and B′ the front and rear walls, upon and within which it is mounted.

C is the fire-box; *c*, the grate-bars, set in the usual manner, and C′ the ash-pit.

D represents the bridge-wall, preferably having for its top face a tile, *d*, whose forward edge projects beyond the face of the bridge-wall a short distance into the furnace-chamber C to act as a check for such gases and smoke that come in contact with it and direct them back into the fire-box to commingle with such other gases and smoke as are in circulation in the fire-box and combustion-chamber.

D′ D′ represent walls projecting transversely from the side walls, B, being shallow continuations of the bridge-wall D up to the boiler A, as shown in Fig. 1. These walls D′ D′ contract or narrow the opening D″ between the bridge-wall and boiler just sufficient to act, in connection with the ledge *d*, as a check to the smoke and gases between the fire-box and combustion-chamber, so as to hold them in abeyance, and thereby effectually ignite and consume them before they can escape into the flue.

E E′ represent air and steam pipes connecting with pipes *e*, tapping side walls, B, to supply ordinary jets or nozzles, F F′, which inject the air and steam, or either of them, transversely in the rear end of the fire-box above the fire to promote combustion and increase the draft. Nozzle F is preferably arranged a little in the rear of the line of nozzle F′, or nearer the bridge-wall, to cause circulation within the fire-box in front of the check-walls.

G G represent air-passages in the front of the fire-box above the grate-bars; H H, air-passages through the side walls, B, into the ash-pit C′ below the rear end of the grate-bars.

The floor of the combustion-chamber I is made gradually descending by laying the brick or tile J, composing it, preferably in step form, as shown in Figs. 2 and 3, from the upper rear end of the bridge-wall to or near the rear end of the boiler. This construction materially enhances the draft in the furnace and serves to spread the flame so as to encompass the boiler and produce uniform heat throughout the furnace.

The arrangement herein shown and described

of constructing a boiler-furnace is very advantageous and efficient. It is also economical in both operation and cost of construction, and can readily be applied to the ordinary boiler-furnaces heretofore in use with but little alteration thereto.

Instead of the ordinary jets or nozzles, F F′, a nozzle such as is shown in Figs. 4 and 5 may be employed. This nozzle is simply a cap, *f*, provided with a slit or opening, *f′*, cut in its head, and screwed onto the end of the steam and air injector pipes *e*. It will be seen that this form of nozzle will diffuse or spread the air and steam over the fire and operate effectively; but the ordinary jet hereinbefore mentioned will accomplish the desired end and is preferred.

I claim—

In a smoke-consuming furnace, the combined air and steam nozzles extending transversely through the opposite side walls of the furnace-chamber, and one arranged in rear of the other, as described, in combination with the bridge-wall in rear of the grate, having at its upper portion a forward-projecting ledge to direct the gas and smoke back to the fire-box, and the shallow walls projecting inward from the side walls of the furnace, between the bridge-wall and the boiler, to form the contracted throat, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

THOMAS E. JONES.

Witnesses:

FRED. A. LAMPING,

JNO. E. JONES.