

(No Model.)

2 Sheets—Sheet 1.

O. FRIEDERICI.
BOILER FURNACE.

No. 531,525.

Patented Dec. 25, 1894.

Fig. 1.

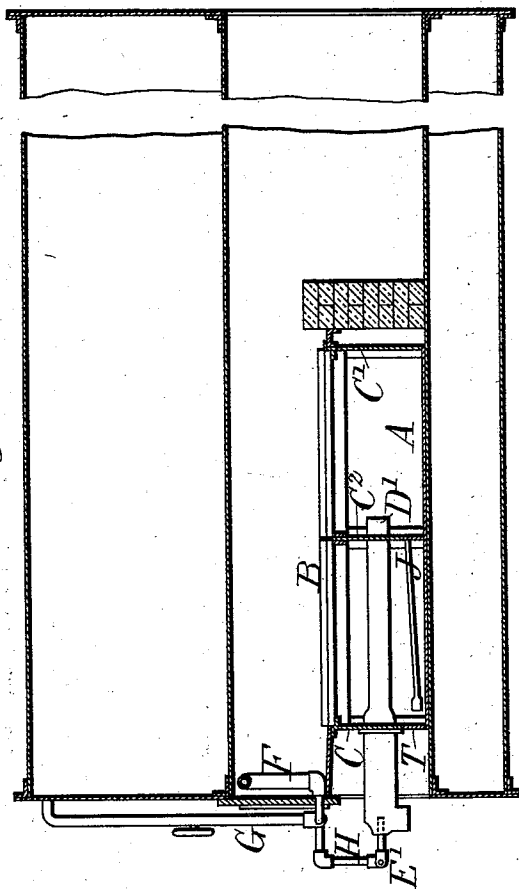
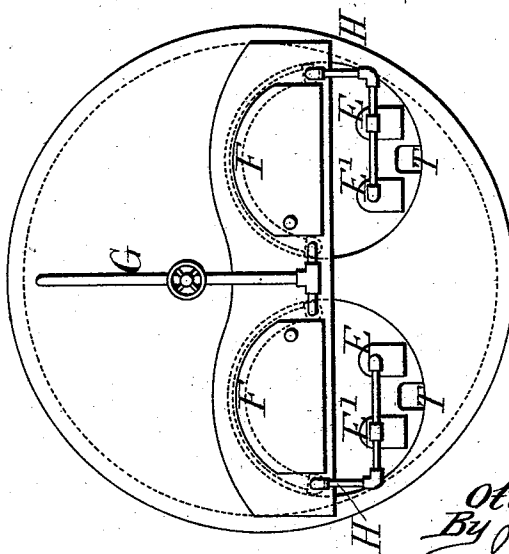


Fig. 2.



Witnesses:

Geo. W. Orea,

Robert Conant,

Inventor.

Otto Friederici,

By James L. Norris,
Atty.

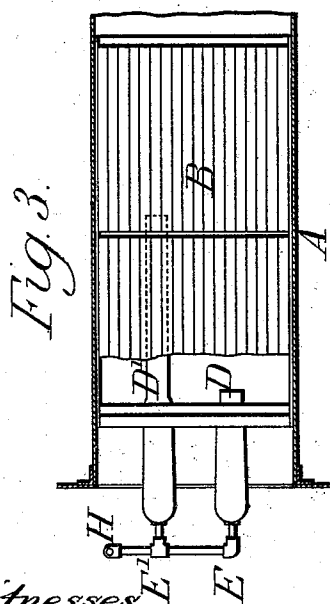
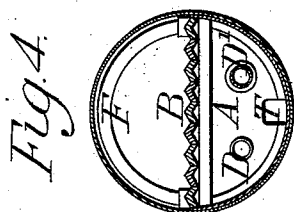
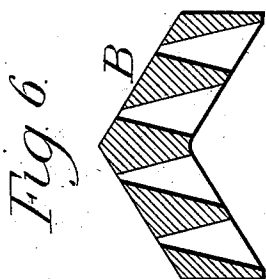
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2 Sheets—Sheet 2.

0. FRIEDERICI.
BOILER FURNACE.

No. 531,525.

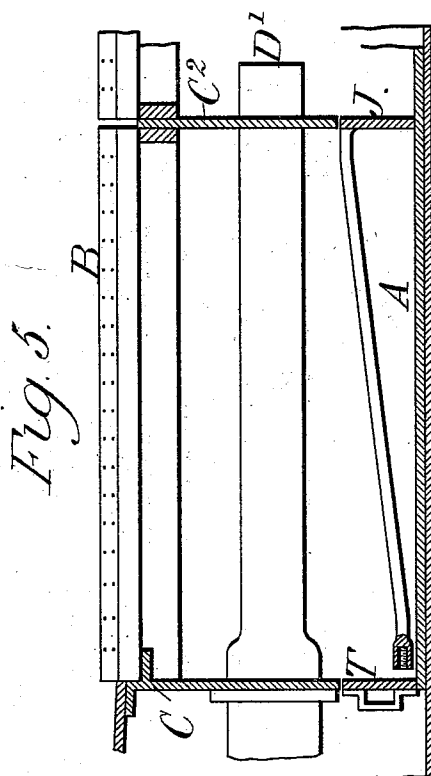
Patented Dec. 25, 1894.



Witnesses:

Geo. W. Rea,

Robert Couett.



Inventor.
Otto Friederici.
By *James L. Norris.*
Atty.

UNITED STATES PATENT OFFICE.

OTTO FRIEDERICI, OF LONDON, ENGLAND.

BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 531,525, dated December 25, 1894.

Application filed August 28, 1894. Serial No. 521,512. (No model.) Patented in Belgium August 6, 1894, No. 111,278.

To all whom it may concern:

Be it known that I, OTTO FRIEDERICI, a citizen of England, residing at 58 Lombard Street, in the city of London, England, have invented certain new and useful Improvements in Boiler-Furnaces, (for which I have obtained Letters Patent in Belgium, dated August 6, 1894, No. 111,278,) of which the following is a specification.

My invention relates to boiler furnaces in which closed air chambers are provided underneath the fire grate, in which a forced air supply is induced by means of steam jets. In arrangements heretofore proposed for this purpose such air chambers were made to extend along the whole length of the fire grate, with the result that the air pressure produced by the steam jets was considerably greater at the inner end of the furnace than at the front end, whereby an unequal combustion of the fuel was effected. According to one of my present improvements, I obviate this defect, and insure a practically uniform air pressure throughout the fire grate, by dividing the air chamber or chambers beneath the grate by means of transverse partitions into two or more separate compartments, and providing each compartment with a separate air supply pipe and steam jet, the supply pipe for the second or inner compartment being made to pass through the first or outer compartment and through the partition dividing the two, while the supply pipe for the third compartment if such be used, is carried through both the first and the second compartments. By this means I can insure that the air pressure beneath the front part of the fire grate shall be practically the same as that beneath the inner part of the grate, or by suitably regulating the steam injectors, I can maintain the exact difference of air pressure that may be required at the inner and front parts of the furnace. Thus when the furnace is to be adapted to burning very gaseous coal, I prefer to construct the air chamber with a third smaller compartment at the inner end next the fire bridge, and I regulate the steam jet to this so that the air pressure therein shall be greater than in the two other compartments, in order that an excess of air may be supplied to the fire at this point for effecting the combustion of the com-

bustible gases that may have passed away unconsumed from the front part of the fire.

The accompanying drawings show a furnace constructed according to my above described invention.

Figure 1 shows a longitudinal section; Fig. 2, a front view; Fig. 3, a sectional plan; Fig. 4, a cross section, and Fig. 5 a part longitudinal section to an enlarged scale. Fig. 6 is a section of one of the grate bars.

The invention is here shown as applied to a Cornish boiler with two cylindrical flues. Into these flues are fitted separate semicylindrical air chambers A the upper surface of which is formed by the grate B, which is here shown to be of the sectional form shown to an enlarged scale at Fig. 6, but which may be of any other suitable construction, and forms no part of my present invention. The air chamber A is closed at each end by a plate C C', and is separated at or about the middle of its length by a partition C² into a front and back compartment. The front compartment is supplied with air through the nozzle D, while a separate nozzle D' passes through the front compartment and partition C² into the back compartment for supplying air to the latter. A forced air supply of any desired pressure is induced through each nozzle by means of steam jets E E' supplied from the steam space of the boiler. I prefer to superheat the steam before issuing from the jets, for which purpose I arrange an arched pipe or chamber F above the dead plate of the furnace, into one end of which the steam is led from the boiler through the pipe G and from the other end of which it is supplied to the steam jets through a pipe H.

As before stated, there may be provided a third compartment in the air chamber, next the fire bridge, which would be supplied with air through a third nozzle passing through both the other compartments and through the plate C'.

For enabling the small quantity of ashes that may accumulate in the course of time in the several compartments of the air chamber to be removed from time to time, I form openings at the bottom of the plates C and C², the opening of C being closed by a door T, while the opening of C² is closed by the blade of the rake J used for removing the ashes,

as shown at the enlarged section at Fig. 5, the rake being ordinarily kept in the position shown in the front air chamber, so as to close the opening in C², the configuration of which opening is made to coincide with that of the rake. The handle of the rake is formed with a screw socket at its end, as shown, into which is screwed an extension when the rake is to be used.

10 If a third compartment is employed the partition of the latter is also provided with an opening through which the rake can pass, but which is provided with a hinged flap opening inward so as to open freely when the rake is pushed through and to close of itself when the rake is withdrawn.

15 It will be evident that my above described invention can also be applied where there are two or more separate air chambers arranged side by side beneath the furnace grate.

20 Having thus described the nature of my said invention and the best means I know for carrying the same into practical effect, I claim—

25 1. In a boiler furnace, the combination of a chamber A closed upon its sides and bottom and divided by a transverse partition C² into a front and a rear compartment, said chamber being arranged beneath the fire grate, a nozzle D communicating at one end with the atmosphere and at its other end with the front compartment, a nozzle D' passing through the front compartment and at one end communicating with the atmos-

35 phere and at its other end with the rear compartment, and steam jets discharging into said nozzles for forcing air into said compartments, substantially as described.

2. In combination with the nozzles D D' and steam jets E E' for supplying forced air to the air chambers of a furnace, an arched steam pipe or chamber F, within the furnace, supplied with steam from the boiler and connected to the nozzles E E' for superheating the steam supply to the latter, substantially as described.

3. An air chamber below a furnace grate divided by a partition into a front and a back compartment each of which receives a separate forced air supply, an opening in the said partition for the removal of ashes and a rake for removing the ashes from the air chamber, whose blade forms the door closing the said opening substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 17th day of August, A. D. 1894.

OTTO FRIEDERICI.

Witnesses:

CHAS. D. ABEL,
Chartered Patent Agent, 28 Southampton Buildings, London, W. C.

JNO. P. M. MILLARD,
Clerk to Messrs. Abel & Imray, Consulting Engineers and Patent Agents, 28 Southampton Buildings, London, W. C.