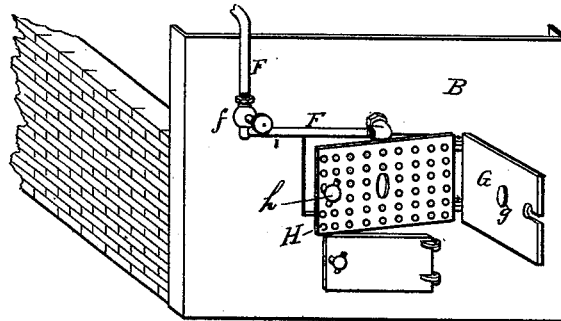


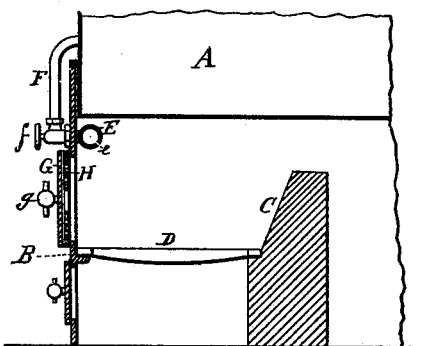
E. R. STEGE.  
Boiler-Furnace.

No. 219,994.

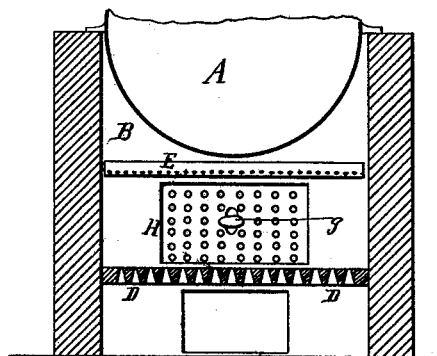
Patented Sept. 23, 1879.



*Fig. 1.*



*Fig. 2.*



*Fig. 3.*

*Witnessed.*  
Emil H. Drommery  
Ernst Gebauer.

*Inventor.*  
Edward R. Stege  
By Wm H. Lotz  
Attorney

# UNITED STATES PATENT OFFICE.

EDWARD R. STEGE, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN BOILER-FURNACES.

Specification forming part of Letters Patent No. **219,994**, dated September 23, 1879; application filed November 13, 1878.

### *To all whom it may concern:*

Be it known that I, EDWARD R. STEGE, of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Boiler-Furnace, which improvement is fully described in the following specification, reference being had to the accompanying drawings.

The nature of my invention relates to certain improvements in devices for supplying a sufficient amount of oxygen to the generating gases in a boiler-furnace by means of a steam-blast for the purposes of bringing about a more perfect combustion and for preventing the formation of smoke; and it consists, mainly, in the construction of the fuel-doors and the manner of securing them together, and, further, in the peculiar means for supplying a blast to the fire, as fully hereinafter explained.

In the drawings, Figure 1 represents a perspective front view of the boiler-front with my improvements attached. Fig. 2 represents a longitudinal vertical section, and Fig. 3 a transverse vertical section of the boiler-furnace.

A is the boiler; B, the boiler-front; C, the bridge-wall, and D the grate, all of which are arranged in the usual manner. E is a pipe, closed at both ends, and having a series of small holes, *e*, drilled through the wall of said pipe on a straight line and at equal distance apart. This pipe E is placed transversely against the internal face of the boiler-front above the fuel-door and below the boiler end, and so that the perforations therein will point to the rear end of the grate, and that the steam-jets issuing therefrom will blow in that direction. A train of pipes, F, placed exteriorly against the boiler-front, and arranged with a stop-valve, *f*, connects the pipe E at its center with the steam-space of the boiler, its coupling branch being projected through a hole in the boiler-front cut or bored for that purpose. G is the fuel-door, hinged to the boiler-front in the usual manner, and H is an auxiliary door interposed between the door G and the boiler-front, and swinging on common hinges with the said door G. This door H is perforated with

numerous small holes for admitting atmospheric air above the grate-bars in many small streams.

The perforated door H is secured in a closed position by a button turned by the handle *h*, while the door G is provided at its center with a button and handle, *g*, which button locks with a slot in the center of the perforated door, so that the solid door can be opened independently of the perforated door, or fastened to such perforated door and opened therewith.

When starting the fire, or if the condition of the same makes it desirable only to admit atmospheric air from below the grate-bars, both doors, G and H, are closed, while for feeding a fresh supply of fuel both doors are opened; but while the fire is in a regular condition only the door G is opened, while the door H is kept shut, when the interstitial volumes of air admitted through the perforations in the same will readily and thoroughly mix with the gases rising from the burning fuel.

The force of blast furnished by the jets of steam from above will not only facilitate the draft of air into the furnace, but will direct the same upon the incandescent coal, whereby the air and gases are heated to a high degree and are ignited before the same can pass over the bridge-wall.

As will be seen, the above arrangement is very simple, and can be easily attached to a boiler already mounted.

It will prevent smoke, and thereby will save fuel, and will enable the use of a low-grade coal as fuel.

I intend to apply the above device either by itself or in combination with the device for supplying steam-blast below the grate described in the Letters Patent which were granted to me on February 5, 1878.

What I claim as my invention is—

1. The combination, with the front B of a boiler-furnace, of the perforated fuel-door H, hinged thereto and secured in a closed position by a fastening, *h*, on its edge, and the solid door G, hinged independently of the perforated door, and secured to the center of the perforated door by a button, *g*, constructed

and arranged substantially as described and shown.

2. The combination, in a boiler-furnace, of a transverse steam-pipe just above the fuel-door, provided with downwardly-tending perforations, a fuel-door uniformly perforated throughout, and a solid fuel-door to shut off the air from the combined steam and air blast,

said doors being independently hung on the same pintle, substantially as described and shown.

EDWARD R. STEGE.

Witnesses:

EMIL H. FROMMANN,  
LOUIS FROMMANN.