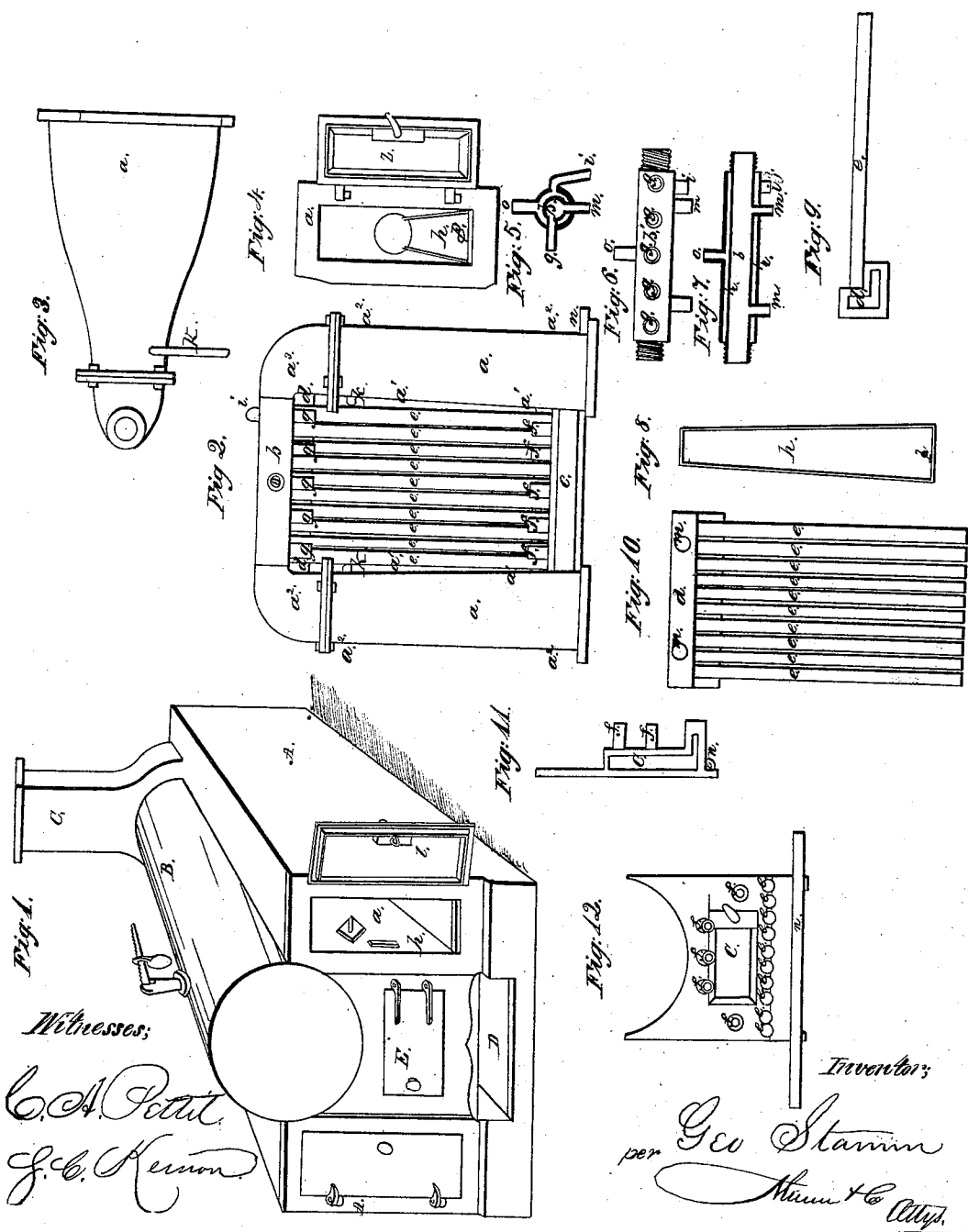


G. Stamm.

Oxygenating Furnace.

N<sup>o</sup> 94,120.

Patented Jun. 29, 1869.



Witnesses:  
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# United States Patent Office.

GEORGE STAMM, OF PITTSBURG, PENNSYLVANIA.

Letters Patent No. 92,120, dated June 29, 1869.

## IMPROVED OXYGENATING-FURNACE.

The Schedule referred to in these Letters Patent and making part of the same

### To all whom it may concern:

Be it known that I, GEORGE STAMM, of Pittsburg, in the county of Allegheny, and State of Pennsylvania, have invented a new and improved Oxygenating-Furnace; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view.

Figure 2 is a view of the oxygenating-apparatus, detached.

Figure 3 is a section taken through line *x x* of fig. 2.

Figure 4 is an end view of the part shown in fig. 3, the door *l*, figs. 4 and 1, being open.

Figures 5, 6, 7 represent details of construction of the part *b*.

Figure 8 is a top view of pan *h*.

Figures 9, 10, 11, 12, represent details of construction of the grate-bars and air-chambers.

The object of this invention is to increase the proportion of oxygen in the air that supports combustion in the furnace, and thereby to cause the gases to be consumed more thoroughly, and a greater intensity of heat to be produced than in ordinary furnaces.

In the drawings—

A A represent the brick side-walls of the furnace;  
B, the boiler;  
C, the chimney;  
D, the ash-pit; and  
E, the furnace-door.

*e e e* are tubular grate-bars, connected at their rear end with an air or steam-chamber, *d*, and at their front end with another, *c*, through which is made the opening for the door E.

*b* is a large tube at the rear end of the furnace, above and parallel to the air-chamber *d*, and connected to it by two short tubes *m m*.

During the operation of the furnace, jets of water are charged with a greater proportion of oxygen, are thrown from the tube *b*, through small tubes *g g*, into the fire at the rear end of the furnace, and from the chamber *c*, through small tubes *f f*, into the front end of the furnace, the interior of tube *b* and chamber *c* communicating with each other, through pipes *e e*, chamber *d*, and short tubes *m m*.

Around the tube *b* is a jacket, *b'*, shown in fig. 7, and between the tube and the jacket a water-space, *r*, in which the water is heated before it passes into the boiler.

The water is forced into the space *r* through a pipe, *i*, and from the space to the boiler through a pipe, *o*.

The interior tube *b*, represented in fig. 7, is connected at each end to a large vaporizing-chamber, *a a*, arranged in the brick wall A, as shown in fig. 1, the fire being in contact with the walls *a' a'* of the chambers, fig. 2, and the walls *a'' a''* being imbedded

in the bricks A A, so that radiation from the part *a* is checked as much as possible.

The walls of the chambers *a a* are made of metal, fire-clay, or other refractory material, and are preferably of the form shown in figs. 2 and 3, expanding toward their front end, and at their rear end connected to the part *b b'*, by means of an elbow, *a''*.

The floor of each chamber *a* is inclined from the rear downward to the front, as shown in figs. 1, 3, 4, and a loose removable slide, or flat "tray," *h*, is placed thereon.

A jet or spray of water is thrown into the rear end of the chamber, from a pipe, *k*, leading from the hydrant or pump.

This jet or spray is partially vaporized at once by the intense heat of the chamber. That portion of it which is not vaporized falls on the inclined tray *h*, and runs down toward the door *l*, being wholly or partially converted into vapor on its passage.

If any water collects at the lower end of the tray, it escapes through a waste-pipe, *p*, and is afterwards pumped into the boiler.

The oxygenated air, thus prepared in the chambers *a a*, passes into the pipe *b*, from which a portion is thrown into the fire at *g g*, and the remainder goes into chamber *d*, and thence, through pipes *e e*, into chamber *c*, at each stage of its progress becoming more highly heated, until it is finally reduced to the condition of a dry gas or mixture of gases, in which condition it is ejected from pipes *f f* into the fire, as above described, greatly increasing the intensity of the heat produced by the furnace.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. An oxygenating-furnace, constructed substantially as above described, that is to say, having the two chambers *a a* arranged on each side of the fire, the chambers *b d* back of it, the chamber *c* front of it, and the hollow grate-bars *e e* beneath it, and communicating with and connecting the parts *c d*, substantially as and for the purposes set forth.

2. In combination with the parts *a b c d e*, all constructed and arranged as described, the jacket *b'*, water-space *r*, and pipes *i o*, arranged and operating as and for the purposes set forth.

3. The arrangement of the inclined tray *h*, waste-pipe *p*, and jet *k*, in connection with the chambers *a a*, as and for the purposes specified.

4. The described construction of the parts *a a*, *a'' a''*, *b b'*, when said parts are shaped and connected together as shown and specified, and for the purposes set forth.

The above specification of my invention, signed by me this 6th day of April, 1869.

Witnesses:

GEORGE STAMM.

CHAS. A. PETTIT,  
S. C. KEMON.