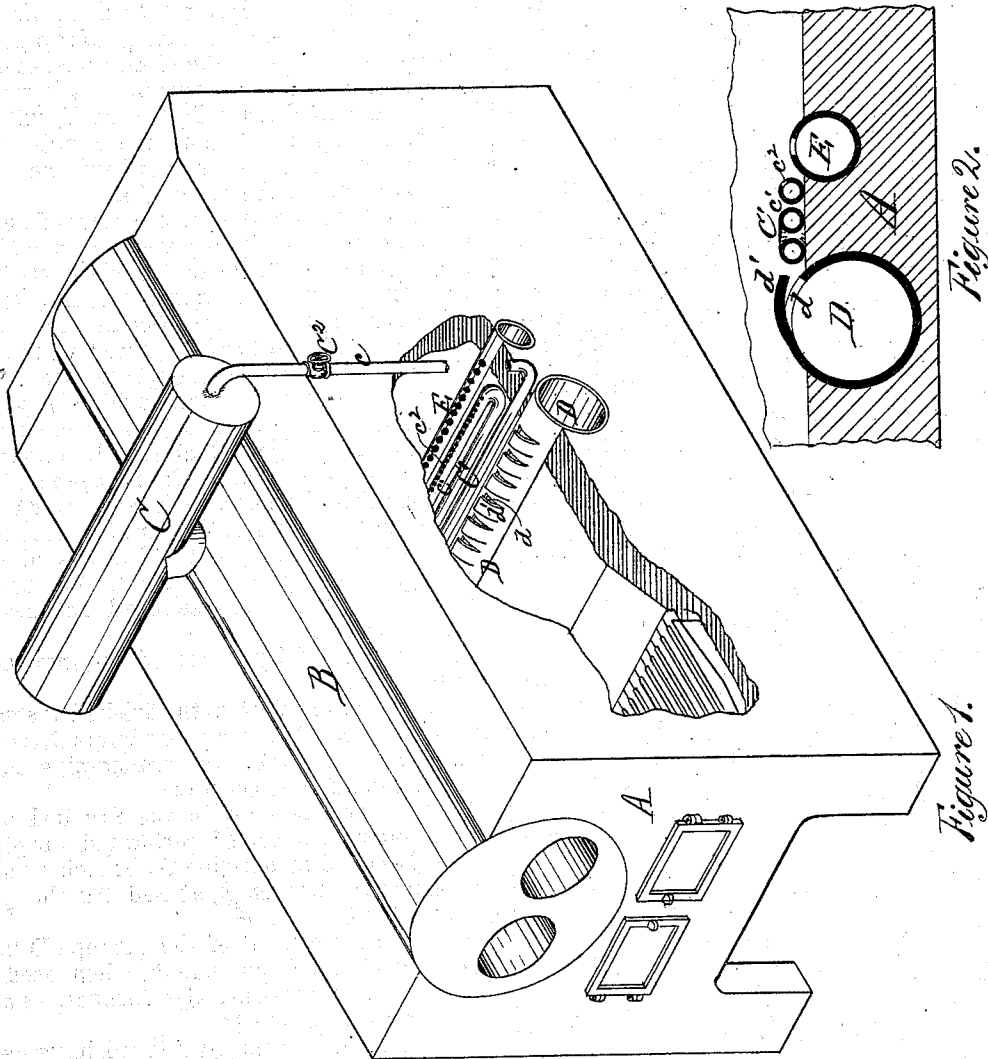


M. A. FOSTER.

Improvement in Steam-Boiler Furnaces.

No. 126,946.

Patented May 21, 1872.



WITNESSES:

Robert Burns
J. M. Fether.

INVENTOR:

Michael A. Foster.
per. L. Fether & Co.
attys.

UNITED STATES PATENT OFFICE.

MICHAEL A. FOSTER, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN STEAM-BOILER FURNACES.

Specification forming part of Letters Patent No. 126,946, dated May 21, 1872.

To all whom it may concern:

Be it known that I, MICHAEL A. FOSTER, of St. Louis, in the county of St. Louis and State of Missouri, have made certain new and useful Improvements in "Apparatus for Consuming Smoke and Gas in Steam-Boiler Furnaces;" and I do hereby declare the following to be a full and true description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

The object of this invention relates to an improved manner of introducing air and superheated steam into steam-boiler furnaces, for performing the proper oxidation or burning of the carbonaceous matter and volatile gases of the fuel escaping from the fire; and the nature of this invention relates to the arrangement of one or more perforated air-pipes and a coiled steam-pipe (one branch or coil of which is perforated) in a transverse horizontal position in the fire-bed, as will hereinafter more fully appear.

To enable those herein skilled to make and use my said improvements, I will now more fully describe the same, referring to—

Figure 1 as an isometrical perspective view; to Fig. 2 as a detail longitudinal section.

The furnace A, boiler B, steam-drum C are of the usual form and construction. Arranged transversely in the fire-bed of the furnace is an air-pipe, D, of earthenware or other suitable material. Said pipe D, passing through the side walls of the furnace, (see Fig. 1,) is provided with a series of perforations, *d*, opening into the fire-bed of the furnace. Said perforations may be of any suitable form, but preferably square, having lugs *d'* projecting over said perforations, as shown in Figs. 1 and 2. A secondary perforated air-pipe, E, may be arranged in the fire-bed, through which a further supply of air may be introduced into the furnace. Immediately back of pipe D is arranged the coiled pipe C¹, which connects with and receives steam from the steam-drum C through branch-pipe *c*¹, said branch being provided with proper valve C². The branch or coil *c*¹ of the coiled pipe C¹ has a series of perforations, *c*², through which su-

perheated steam discharges into the fire-bed at an angle of about twenty-five degrees, and causes a sufficient draught to draw air from the outside atmosphere, through air-pipes, into the fire-bed, and at the same time cause the heat to be reflected up against the bottom of the boiler. The pipes C¹, D, and E will usually be arranged at about the middle of the furnace, or a little back of where the direct flame or blaze of the fire strikes.

The combined action of the steam from the coils and air from pipes creates an eddy or current, and the smoke and highly-heated carbonaceous matter issuing from the fire, coming in contact therewith, is immediately ignited and consumed. A furnace-flame is thus created from the "fore to the aft" of the boiler. The continuous flame thus achieved can be regulated in degree and otherwise controlled by discharging a greater or smaller amount of superheated steam and air by means of the valve arrangement described and shown.

A perfect burning of the carbonaceous matter and volatile gases of the fuel is achieved, insuring economy in the use of fuel with a greater heat, and otherwise its advantages are readily apparent.

Having thus fully described my invention, what I claim is—

1. The arrangement, in the fire-bed of steam-boiler furnaces, of the perforated pipe D, steam-coil C¹ having perforated branch-pipe *c*¹, as and for the purpose set forth.

2. The arrangement, in the fire-bed of a steam-boiler furnace, of perforated air-pipes D and E, coiled steam-pipe C¹, branch *c*, valve C², perforated branch *c*¹, as and for the purpose set forth.

3. The arrangement of the air-pipe D having perforations *d* and lugs *d'*, when used in the fire-bed of a steam-boiler furnace, as and for the purpose set forth.

In testimony of said invention I have hereunto set my hand.

MICHAEL A. FOSTER.

Witnesses:

WILLIAM W. HERTHEL,
ROBERT BURNS.