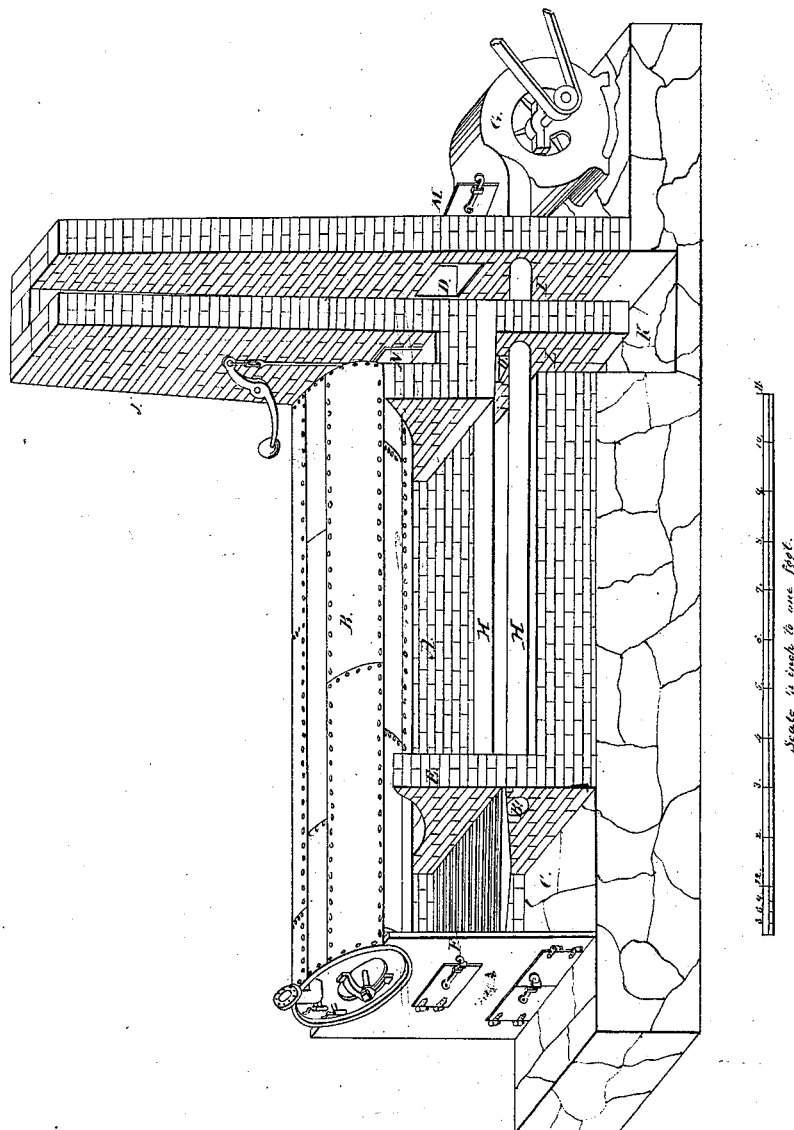


*J. Seabury,*  
*Steam-Boiler Furnace.*  
*No 5,213.                      Patented July 31, 1847.*



# UNITED STATES PATENT OFFICE.

JACOB SEABURY, OF NEW YORK, N. Y., ASSIGNOR TO DANIEL GRIFFIN, OF NEW YORK, N. Y.

## BOILER-FURNACE.

Specification of Letters Patent No. 5,213, dated July 31, 1847.

*To all whom it may concern:*

Be it known that I, JACOB SEABURY, of the city of New York, in the State of New York, have invented a new and useful Improvement in the Manner of Setting Boilers of Steam-Engines and of Detaining the Heat in Furnaces Constructed for the Generating of Steam and for other Purposes; and I do hereby declare that the following is a full and exact description thereof.

My method of setting the boilers of steam engines, and of detaining the heat in furnaces for that and other purposes, is an improvement on the apparatus described in the specification of Letters Patent for an "improvement in the manner of constructing the flues of furnaces of various descriptions" granted to Jeremiah Clute, and to the subscriber, Jacob Seabury, under date of the 5th of December in the year 1842.

In the accompanying drawing I have given a perspective representation of a steam boiler set in my improved manner; the wall on one side thereof being removed for the purpose of exhibiting the arrangement of the interior.

B is the boiler, which is represented as of the ordinary cylindrical kind; but this form is not necessary to my improved mode of setting, which is independent altogether of the particular shape of the boiler.

F is the fire chamber, and C the ash-pit; both of which are to be provided with closely fitting doors, as the air necessary to combustion is to be supplied by means of a blowing apparatus of any suitable kind.

G represents a fan wheel which may be used for this purpose.

H, H, are air tubes leading from the blowing apparatus, and opening into the ash pit, as shown at H'. The air tubes H, are shown as passing through the heated air space A, which, although not absolutely necessary, is to be preferred. The air space A, I make of considerable capacity, as represented, as it is intended to hold and retain a large portion of the air that has been heated, or generated in the fire chamber F, and which has passed thence over the bridge E into said space.

J is the chimney stack, in which I is the ascending flue, and the air in passing from the chamber A into the ascending flue I, has first to pass down through the descending flue L and along the flue space K.

O is an opening leading directly from the chamber A into the ascending flue L, this

opening being furnished with a sliding shutter N by means of which it may be closed at pleasure. The intention of this opening is to facilitate the firing up by allowing a direct draft into the ascending flue but this opening is to be closed when the fire is in full action; it may however be dispensed with, as not being absolutely necessary in using the apparatus.

I have mentioned the heated air space A as of considerable capacity, and it is represented as extending to an unusual depth below the boiler and this is necessary to the full application of the principle upon which the action of the furnace is dependent, it being intended to confine a large volume of heated air under pressure in that space. This space may, as I believe, be increased considerably beyond that represented in the drawing by carrying the bottom of it lower down; which will have the effect of shortening the descending flue (L); but the said flue may also be made to pass down to an increased depth should it be desired. The opening shown at (D) in the ascending flue (I) is however the main improvement made in the present apparatus, when compared with that for which Letters Patent were granted to Clute and Seabury and hereinbefore referred to. By means of this improvement I am enabled to counteract all tendency to an upward draft in said flue; the opening being left so as to admit the full action of the external air excepting when in the act of firing up, at which time the door (M) is to be closed, but at other times it is to be left entirely open. A column of the cold and dense external air will thus be made to press upon the heated internal air and will contribute to a great extent in preventing its free discharge.

I am aware that the flues of stoves and chimneys have been made with apertures in them for the admission of cold air at some point beyond the fire place; in chimneys this has been done under the erroneous supposition that the draft would thereby be increased, or the smoking of the chimney be prevented; and in cooking stoves for the purpose of cooling the oven when some part of the culinary operation requires a high degree of heat, and the oven or some part thereof requires but a moderate degree of heat; but these objects are entirely different from that which I have in view, and the combined means employed are also different.

As for instance, my object is to check the draft at some point entirely beyond the boiler flues, or beyond the parts of the apparatus which are to be heated, and to retain  
5 the products of combustion within the flues, &c., under pressure that the flame produced by the combustion in the fire chamber and by the combustion of the combustible gases in the flues may have full play and not escape  
10 until the full amount of caloric due to a full combustion shall have been given out. To this end therefore I have placed the aperture which opens the ascending flue to the external air at a point, entirely beyond the  
15 parts of the apparatus which are to be heated and beyond the diving or descending flue so that the pressure of the external air shall resist the upward tendency of the heated products of combustion before they  
20 shall have risen to so great an elevation as to give the preponderance of pressure to the upward current, an end which could not have been attained without the diving or descending flue, for without this the products  
25 of combustion could not be retained in the flue or flame space under pressure.

It will be obvious that instead of a vertical diving flue the heating chamber may be carried down to the lower end of the ascending  
30 flue as the object is to have the ascending

flue or stack communicate with the fire chamber below the level of the fire bridge and below the level of the upper part of the heating chamber or the flues under the boiler, to avoid an upward direction of draft  
35 from the heating chamber or flues into the escape chimney or stack which would be aided instead of being checked by the aperture in the stack.

Having thus fully described my improvement in the manner of setting the boilers of  
40 steam engines, and of detaining the heated air in furnaces for generating steam, and for other purposes, what I claim therein as new, and desire to secure by Letters Patent, is—

The forming of an opening or openings near to the lower part of the ascending flue  
I, in the chimney stack, as shown at D, in the accompanying drawings, in combination  
50 with the descending flue, substantially as described, to check the draft up the chimney, and thereby to detain the heated gases under pressure within a furnace, in the manner set forth.

JACOB SEABURY.

Witnesses:

RICHARD E. DIBBLE,  
JOHN N. CRANE.