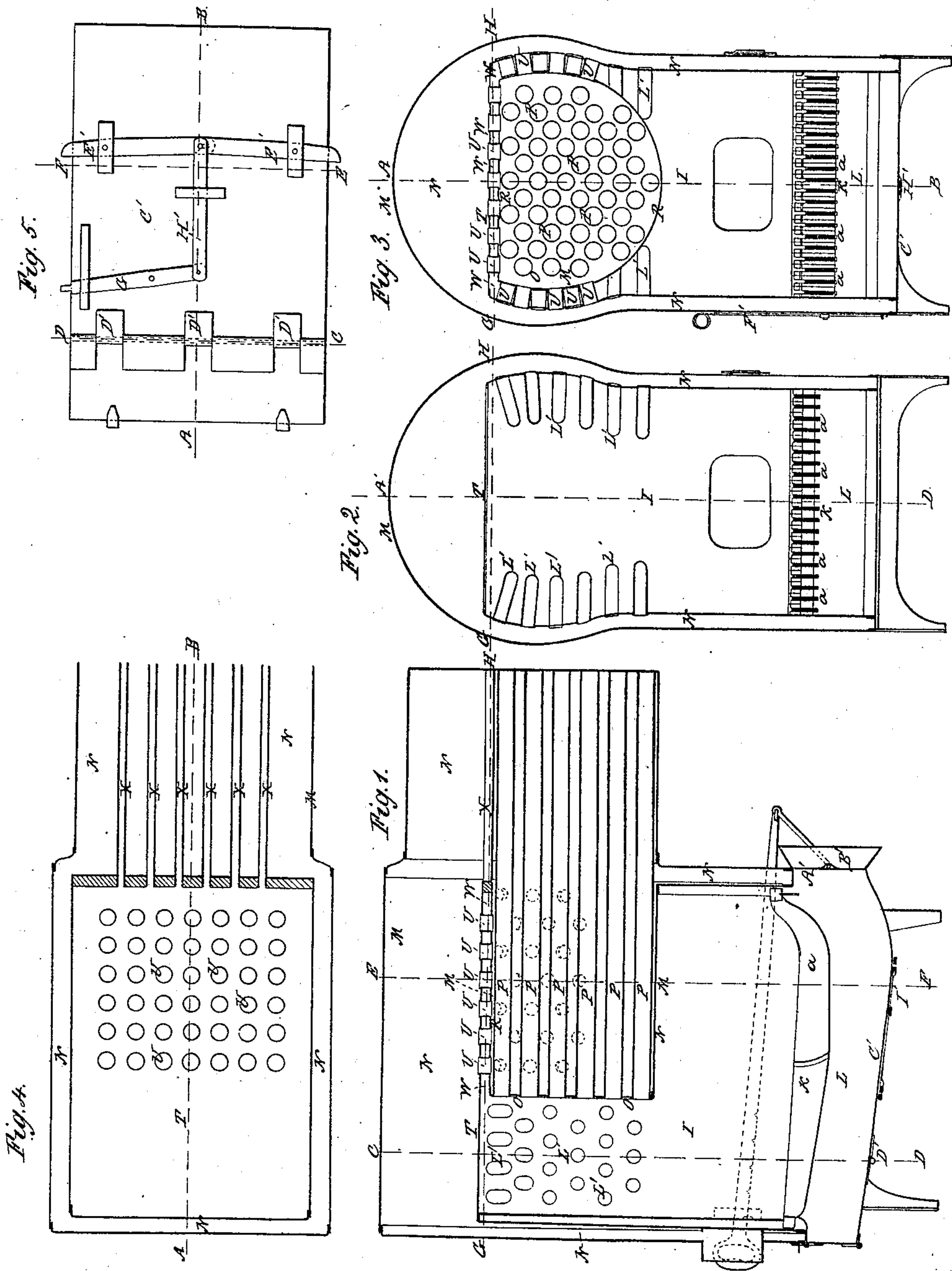


*C. F. Thomas,*  
*Steam-Boiler Fire-Tube.*

*N<sup>o</sup> 13,111.*

*Patented June 19, 1855.*





# UNITED STATES PATENT OFFICE.

CHARLES F. THOMAS, OF TAUNTON, MASSACHUSETTS.

## STEAM-BOILER.

Specification of Letters Patent No. 13,111, dated June 19, 1855.

*To all whom it may concern:*

Be it known that I, CHARLES F. THOMAS, of Taunton, in the county of Bristol, in the State of Massachusetts, have invented an Improved Steam Generator or Boiler for either Locomotive or Stationary Engines; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, letters, figures, and reference thereof.

Of the said drawings, Figure 1, denotes a central, vertical, and longitudinal section of such a boiler; Fig. 2, is a vertical and transverse section of it, such being taken through the fireplace or furnace and on the line C, D, of Fig. 1; Fig. 3, is another transverse and vertical section thereof it being taken through the furnace, the stack of smoke tubes, and through the line E, F, of Fig. 1; Fig. 4, is a horizontal section taken on line G, H, of Figs. 1, 2, and 3; Fig. 5, is an underside view of the bottom of the ash pit.

In these drawings, I, exhibits the furnace or fireplace of a locomotive steam boiler, the same being provided not only with a grate as seen at K, but with an ash pit under the same as shown at L. The furnace is disposed within a boiler M, and so that there shall be a water space extending around it as seen at N, N, N, in the drawings.

Instead of arranging the tube sheet O, at the extreme back of the furnace in the usual way I bring it or the boiler and stack of smoke tubes P, P, P, forward into the furnace or fire place I, as seen in Figs. 1 and 3, and more particularly in the former; the boiler or inclosing sheet of said tubes being made to extend over the grate in such manner that the flame and gases from the fire may not only pass against the said tube sheet O, O, and the said inclosing sheet R, R, but through the extended part of the tubes.

By this improvement a very great and highly important increase of the extent of the heating surface exposed to the fire is attained.

For the purpose of supporting the crown sheet T, as well as the sides of the furnace under the great pressure of steam to which such are exposed I employ the said extension, R, R, of the boiler in the furnace, sustaining said crown sheet thereon by means of suitable posts or standards or by hollow tubes U, U, as seen in Figs. 1 and 3, through which communication may be opened be-

tween the water space N, N, above the crown sheet and that within the extended part R, R, of the boiler. These hollow tubes having their extended surfaces subjected to the action of the smoke and volatile products of combustion proceeding from the fuel of the furnace serve to aid in facilitating the introduction of heat into the water.

The above described mode, of sustaining the crown sheet T, and portions of the sides of the furnace, (viz, by means of the extension R, R,) is a very advantageous means of accomplishing such a result. Between the top of the extension R, R, and the crown sheet T, there is a flue space W, through which the smoke and gases from the fire are enabled to circulate, and not only heat the crown sheet, T, but at the same time impart heat to the top plate of the extension R, R.

In order to discharge the surplus heat and gases from the flue space, W, I carry a series of pipes, X, X, X, out of the same and through the water space of the boiler as seen in Figs. 1, and 4.

For the purpose of readily discharging the ash pit, I provide its bottom with an opening to which I apply a large door C, and so that said door may turn downward on hinges as seen at D'. In order to close the opening, the said door may be fastened by means of lever latches, E', E', connected with a hand lever, F', by a lever, G', and joining rod, H', as seen in Fig. 5, each of said latches being made to operate in combination with a suitable hook or staple, I', affixed to the ash pit.

I would take occasion to remark that in connection with the extension of the boiler and its tube stack into the furnace or fireplace in the manner hereinbefore described, such boiler may be provided with a series of hollow tubes as seen at, L', in Figs. 1, 2, and 3, they being made to project into the furnace, to open into the water space surrounding it, and to have their ends which are within the furnace closed. These tubes serve as so many additional means of heating the water or contents of the boiler. Their application and use are not however to be understood as making any part of my invention.

I claim—

The improvement of extending the tube sheet, (O), smoke tubes (P, P,) and boiler, (M), or its inclosing sheet, R, into the fire place, (I) and over the fire grate (K) in

manner described in order not only, that  
the part so extended may serve as a beam  
or strut to support the crown sheet against  
the superincumbent pressure of the steam  
5 but, that the flame and gases from the fire  
may not only pass against the tube sheet and  
inclosing sheet, R, of the extended part of  
the boiler, but also through the extended  
parts of the tubes within such projected  
10 part of the boiler as specified; the same

serving to greatly increase the extent of  
heating surface exposed to the fire.

In testimony whereof I have hereunto set  
my signature this third day of March A. D.  
1855.

CHAS. F. THOMAS.

Witnesses:

R. H. EDDY,

F. P. HALE, Jr.