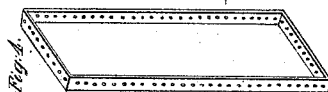
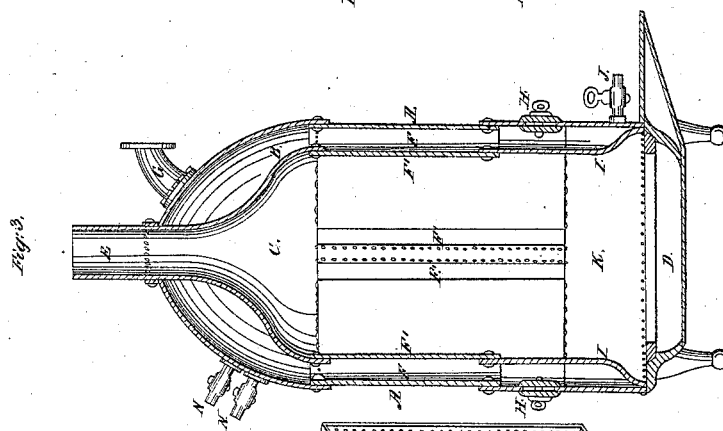
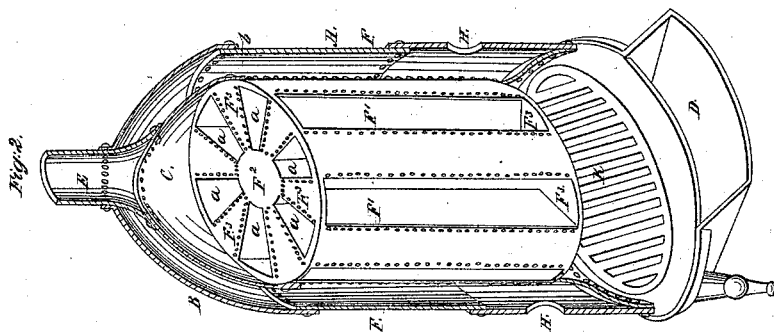
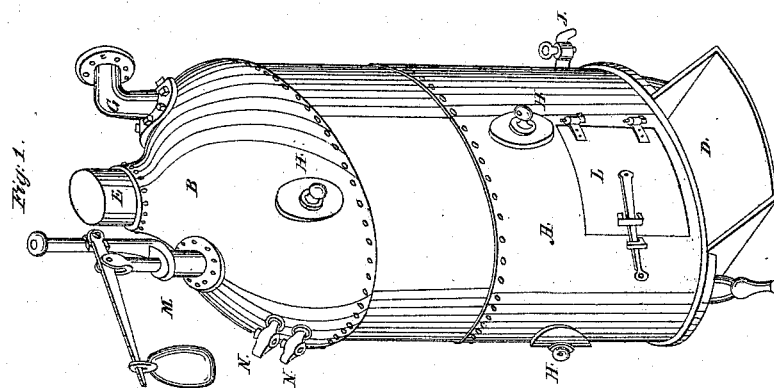


*L. E. Hopkins,*  
*Steam-Boiler Water-Tube.*

*N<sup>o</sup> 2,678.*

*Patented June 18, 1842.*



# UNITED STATES PATENT OFFICE.

LANSING E. HOPKINS, OF NEW YORK, N. Y.

## IMPROVEMENT IN STEAM BOILERS OR GENERATORS.

Specification forming part of Letters Patent No. 2,678, dated June 18, 1842.

*To all whom it may concern:*

Be it known that I, LANSING E. HOPKINS, of the city of New York, in the State of New York, have invented a new and useful Manner of Constructing Steam Boilers or Generators; and I do hereby declare that the following is a full and exact description thereof.

The main body of my boiler consists of a vertical cylinder which is surmounted by a dome, and has within it a furnace and a structure consisting of a series of flues and of water-compartments combined together in a peculiar manner, which structure is also surrounded by a water-space.

In the accompanying drawings, Figure 1 is a representation of the exterior of my boiler in perspective. Fig. 2 is a view of the interior, also in perspective, a part of the outer cylinder, dome, &c., being removed for the purpose of showing the flues and water-spaces. Fig. 3 is a vertical section through the middle of my boiler.

In each of the figures like parts are designated by the same letters of reference.

A A is the exterior case or cylindrical body of the boiler. B is the dome by which it is surmounted, and the upper part of which constitutes the steam-chamber.

C is an interior dome, through which the smoke and gaseous products of combustion pass to the smoke-pipe E.

F F' is the water-space which surrounds and passes in between the radiating flue-spaces *a a a*. These flue-spaces are open to the fire at their lower ends and to the dome-space C at their upper ends, so that the draft passes freely through them. Between these flue-spaces the water-spaces F' extend and communicate with each other in the axis of the boiler under the plate F<sup>2</sup>, which, with the radiating portions F<sup>3</sup> of said plate, incloses said water-spaces. The lower ends of the water-spaces between the flues are inclosed by a similar plate.

The dome C is at its lower edge *b b* firmly affixed by riveting or otherwise to the rim of the plate F<sup>2</sup> F<sup>3</sup>, and the lower plate F<sup>3</sup> has attached to it, in like manner, the upper portion of the curved plate I I, the lower por-

tion of said curved plate being at *c c* riveted to the exterior cylinder, and it thus forms the side wall of the furnace K, and the lower portion of the water-space D is the ash-pit.

G is the steam-pipe.

H H are man-holes; J, a cock for drawing off the water or for blowing out.

L is the furnace-door; M, a safety-valve, and N N try-cocks, all constructed in the ordinary way.

Fig. 4 represents the manner in which I form the plates which constitute the sides of the flue-spaces *a a* and of the water-spaces F'.

By this arrangement of the parts there is a large portion of heating-surface exposed to the action of the fire, while the flue-passages are large and competent to the free and unobstructed passing of the smoke and heated air from the furnace.

I have represented six radiating flue-spaces and the same number of radiating water-spaces between them; but this number may be varied to any desired extent without altering the general arrangement and combination of the respective parts.

Having thus fully described the manner in which I construct my improved steam-boiler or generator, what I claim therein as new, and desire to secure by Letters Patent, is—

The manner in which I have constructed and arranged my flues and water-spaces and combined the same with the other parts of the apparatus, as herein set forth—that is to say, the particular manner of constructing the flues and water-spaces in radiating sections or compartments, and of combining the same with the other parts, as described and represented, by which construction and arrangement the said spaces are in the same number of divisions rendered more convenient to enter, repair, or clean, while a larger surface is exposed to the action of the fire than when the flue-spaces consist of round tubes, as heretofore.

LANSING E. HOPKINS.

Witnesses:

THOS. W. HARVEY,  
WM. AUSTIN.