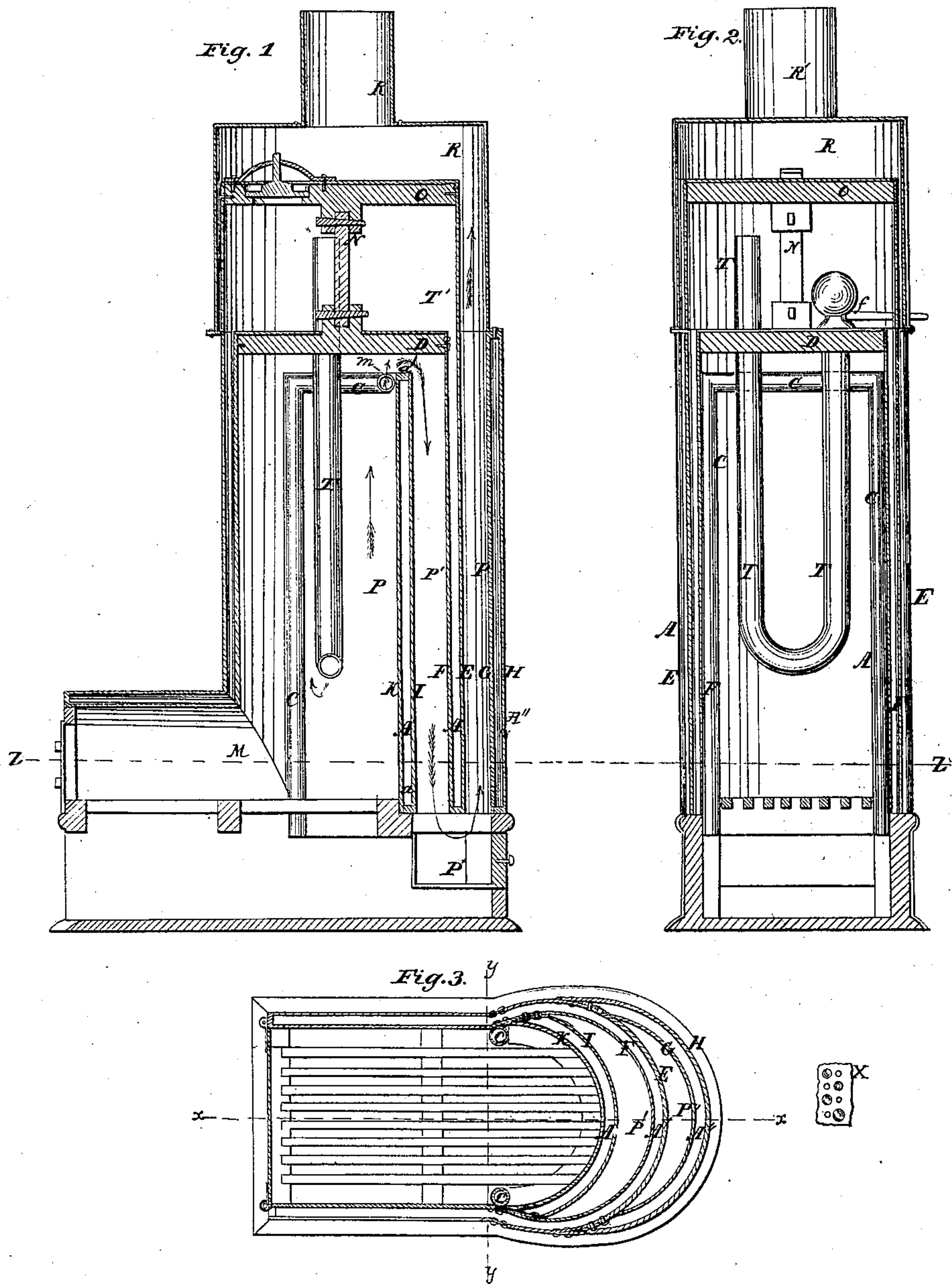


*R. Ferguson,*  
*Steam-Boiler Furnace,*  
*N<sup>o</sup> 17,924,* *Patented Aug. 4, 1857.*





# UNITED STATES PATENT OFFICE.

ROBERT FERGUSON, OF NEW ORLEANS, LOUISIANA.

## STEAM-BOILER.

Specification of Letters Patent No. 17,924, dated August 4, 1857.

*To all whom it may concern:*

Be it known that I, ROBERT FERGUSON, of New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and  
5 useful Improvement in Steam-Boilers; 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 annexed drawing  
10 forming part of this specification, in which—

Figure 1 is a vertical section of the boiler on  $x x$  of Fig. 3. Fig. 2 is a vertical section on  $y y$  Fig. 1:—and Fig. 3 is a horizontal  
15 section on  $z z$  Figs. 1 and 2.

Similar characters of reference in the several figures denote the same part.

The nature of my invention consists in a peculiar arrangement of flues and water  
20 space hereinafter to be set forth.

The construction of the boiler will readily be understood from the following description and reference to the drawing.

A A' A'' are the water spaces, rising  
25 from the bottom of the boiler, and terminating at the respective elevations shown in the drawing. Partitions E and F are concentric portions of right cylinders of circular base, they are separated the required  
30 distance and connected together at bottom as shown in Fig. 1. Partition F rises to within about five inches of the water line, and is riveted to head D, which constitutes the termination of the first part P of the  
35 flue and the commencement of the downward portion P'. Partition E rises to the top of the boiler and is riveted to head O. The heads D and O are connected by a stay N.

40 The partitions I and K which form the internal water space, are closed at top and bottom as seen at  $a a'$ , and are riveted to partition F throughout their vertical contact with said partition. The partitions G H  
45 constituting the walls of the external water space are riveted to partition E along their contact in the same manner as I and K to partition F. The junction I with F and G with E have one half of their rivet holes  
50 open, as shown in Fig. 3, and in detached view X, for giving a free circulation in the water spaces. The fire chamber M is semi-cylindrical, the arch constituting a water space in communication with water space  
55 E F. The descending and ascending flues P' P'' have the cross section of a lune, as

shown in Fig. 3, and are of such dimensions as to allow the free transmission to the chimney of the products of combustion. The two are connected at bottom by the box  
60 P\*, which can be removed at pleasure for cleaning. Flue P'' terminates in the smoke drum R surrounding the top of the boiler, and from which the chimney R' issues. The steam pipe T descends through the head D  
65 into the fire box to the surface of the fuel, and again rises to such a position in the steam drum T' as may appear convenient for discharge. The valve  $f$  placed in the  
70 steam pipe close to the head where it enters the boiler, is for the purpose of charging the pipe with water, to prevent it from being injured by fire while in the act of generating steam, or during any temporary suspension of operations. The stem  
75 of the valve being carried through the side of the boiler by means of an ordinary stuffing box. The object of this steam pipe is the superheating of the steam when required  
80 for boiling syrup or other liquid.

The pipe C rises vertically to a level with the top of the internal water space and there has a horizontal portion following the curve of said water space. The lower  
85 extremities of this pipe are open, and the horizontal portion is perforated as shown at  $m$  Fig. 1. This pipe receives a supply of air at bottom, which becomes heated as it rises and issuing through the perforations  $m$   
90 furnishes a supply of oxygen for the more complete combustion of the gases which are leaving the furnace unconsumed.

The construction of flues and water spaces above described furnishes a large amount of heating surface; and the form of the  
95 water spaces renders them capable of sustaining a very high degree of pressure without the use of stays.

I claim—

The eccentric arrangement of the water  
100 spaces A A' A'', connected with each other, and alternating with the flues of lune cross section, substantially as, and for the purpose specified.

In testimony whereof, I have hereunto  
105 signed my name before two subscribing witnesses.

ROBT. FERGUSON.

Witnesses:

F. M. CORRY,  
J. H. HEDGES.