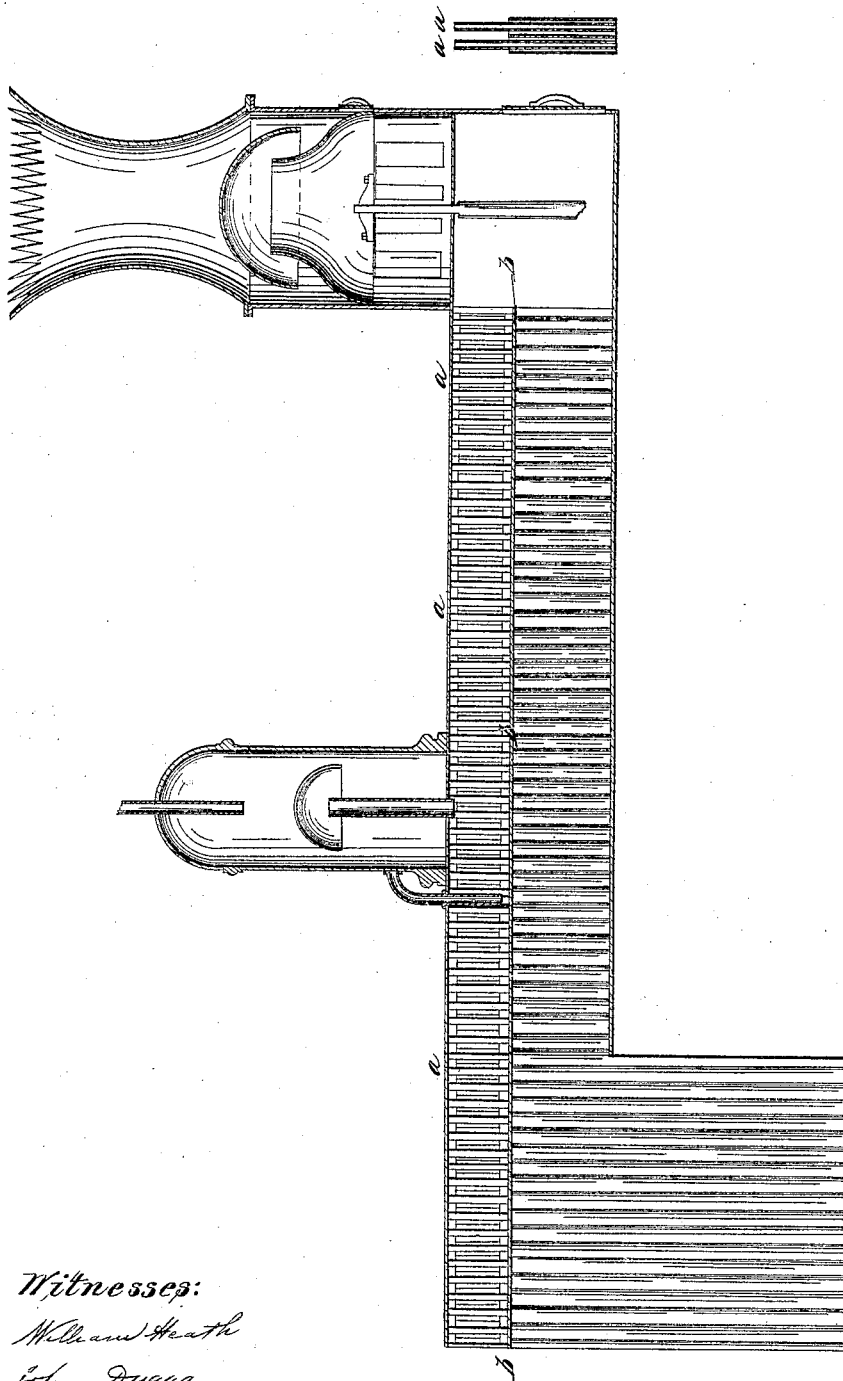


J. Perkins,
Steam-Boiler Water-Tube.
Nº 1034 *Patented Dec. 15, 1838.*



Witnesses:
William Heath
John Duggan

Inventor:
Jacob Perkins

UNITED STATES PATENT OFFICE.

JACOB PERKINS, OF GREAT BRITAIN, ASSIGNOR TO ANGLIER M. PERKINS.

BOILERS OF LOCOMOTIVE AND OTHER STEAM ENGINES.

Specification of Letters Patent No. 1,034, dated December 15, 1838.

To all whom it may concern:

Be it known that I, JACOB PERKINS, a citizen of the United States of America, but now residing in Great Coram street, Russell Square, in the county of Middlesex, in the Kingdom of Great Britain, have invented or discovered a new and useful improvement in boilers used for locomotive and other steam engines and for other purposes and for heating and evaporating fluids; and I, the said JACOB PERKINS, do hereby declare that my improvement consists in generating steam and heating and evaporating fluids through the medium of certain closed tubes marked *a a a* in the accompanying drawing A containing confined and surcharged steam.

The boiler contains a series of these (*a a*) tubes, the one part of each tube projecting downward into the fire or flue, the other extending above the bottom of the boiler *b b b*, and this part of them is consequently surrounded by the water in the boiler. The tubes *a a a* are closed in all parts to prevent the escape of steam. By this arrangement important results will be obtained. There will be no incrustation of the interior of the tubes, and as the heat from the furnace will be quickly transmitted upward, the outer surfaces of the tubes will not be liable to scaleage or oxidation, which will of course tend much to preserve the boilers so constructed. These tubes are affixed in the bottom of the boiler, as shown in the before mentioned drawing at *b b b*, by passing through holes formed therein. These tubes are each to have a small quantity of water in them depending on the degree of pressure required to the engine, and in order to the working of this construction of boiler to the greatest advantage, I recommend that the density of the steam in the tubes should be somewhat more than that intended to be produced in the boiler, and for steam and other boilers under atmospheric pressure, then the quantity of water to be applied in each tube is to be about one one thousand eight hundredth part of the capacity of the tube for a pressure of two atmospheres; two one thousand eight hundredth parts for three atmospheres; and so on for greater or less degrees of pressure, by which means the tubes will when the boiler is at work be per-

vaded with steam, and any additional heat applied thereto will rise quickly to the upper parts of the tubes and be given off to the surrounding water contained in the boiler, for steam already saturated with heat requires no more to keep the atoms of water in their expanded state, and consequently becomes a most useful means of transmitting heat from the furnace to the water in the boiler.

I would remark that although I have recommended water to be put into the closed tubes, I am aware that vapors generated from other fluids will answer the purpose, and as the fluid in such tubes is not evaporated no loss will take place. I do not therefore confine myself to the use of water though I believe it to be the cheapest material.

I would remark that variations in the arrangement of the tubes and the figure of the boiler may be made without departing from my invention, and it will be evident that steam being generated in the boiler may by ordinary steam pipes be conveyed to the working of steam engines whether for locomotive or other purposes, or to various other apparatus where steam is commonly employed, and also that the heated water or other fluid may be conveyed in the same manner for any required purposes. And I would have it understood that I am aware that double boilers have been before employed wherein steam has been generated in the outer and applied to heat the fluid in the inner boiler, I do not therefore claim such construction of apparatus, but only claim the combining a series of closed tubes having quantities of water therein, which in being heated, is expanded, and becomes the means of conducting any additional heat which may be given off by the furnace, to the water in the boiler, according to the principle above described.

In witness whereof I, the said JACOB PERKINS, have hereunto set my hand this seventeenth day of October, 1838.

JACOB PERKINS.

Witnesses:

WILLIAM HEATH,
JOHN DUGGA.