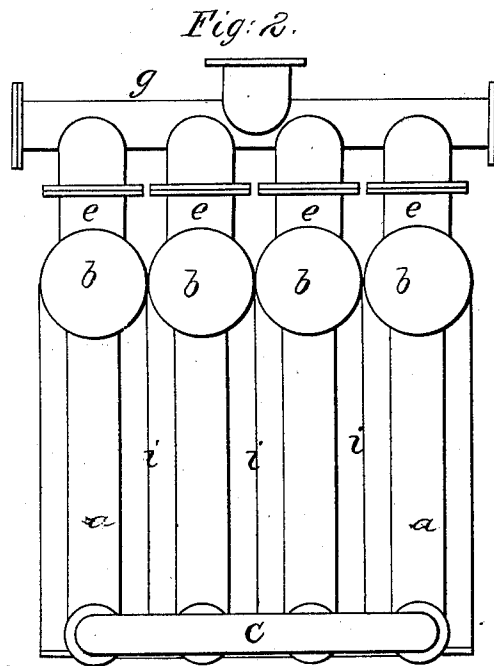
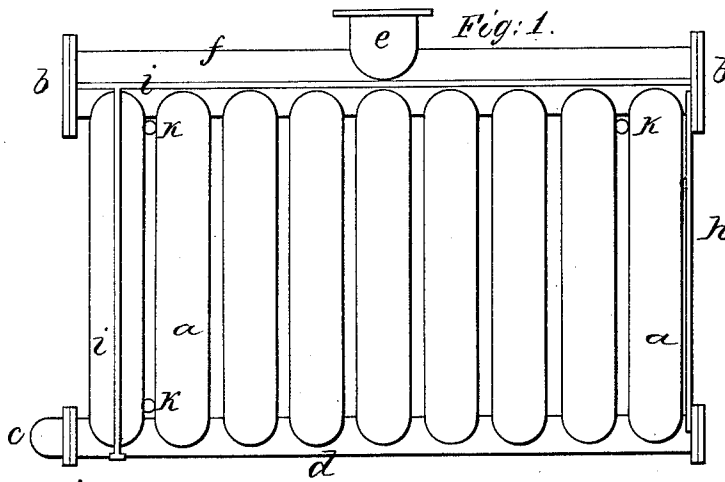


T. Shaw

Steam Generator

N^o 94,781.

Patented Sep. 14, 1869.



Witnesses;
E Cobb

Philip S. Justice

Inventor;
Thomas Shaw

United States Patent Office.

THOMAS SHAW, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 94,781, dated September 14, 1869.

IMPROVEMENT IN STEAM-GENERATORS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, THOMAS SHAW, of the city and county of Philadelphia, Pennsylvania, have invented a new and improved Steam-Boiler; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention consists in the casting of a cluster of tubes in one piece, in the manner and for the purpose as hereafter described.

The object of the invention is to furnish a safe and reliable boiler, of cheap construction, useful as a marine or stationary boiler.

In order to enable others to use and practise my invention, I will proceed to describe its construction and operation.

On reference to the accompanying drawing, which forms part of this specification—

Figure 1 represents a side view of a cluster of tubes in one piece, of which *a* represents the vertical tubes united at their bottom ends by inlet and blow-off tube *d*, and at their top ends by tube *f*, which has a central outlet at *e*.

The cluster of tubes is of cast-iron, and the caps *b* are for closing the apertures formed by the cores.

The intervening space between tubes *a* is cast closed by metal of the same thickness as the tubes.

A rib, *i*, is projected from the casting on the top and front end of the cluster, for the purpose of meeting a like rib on a similar cluster, in order to regulate the

distance between the same, and for the purpose of dispensing with a brick wall to close said space.

Four clusters of said tubes are joined together, as represented in Figure 2, and steam connection is made with the same by pipe *g*, and water connection is made by pipe *c*.

The inner clusters of tubes need not have the intervening space between tubes *a* cast shut, as that is only useful on the outside, to render a brick wall unnecessary. The ordinary felting-materials can be substituted instead.

Ordinary bolts can be run through apertures *k*, to hold the several clusters in close contact, and the whole mass is rested upon an ordinary grate and fire-place, provided with the ordinary bars, and the back end *h* communicates with the smoke-stack or ordinary chimney.

This construction of boiler is of the cheapest character, affords great opportunity for blowing out foreign substances, and will permit a low water-line, and is independent of heavy brick walls.

What I claim, and desire to secure by Letters Patent, is—

The construction and arrangement of the described boiler, in the manner and for the purpose substantially as set forth.

THOMAS SHAW.

Witnesses:

E. COBB,

PHILIP S. JUSTICE.