A. S. VALENTINE.

STEAM BOILER.

No. 2,748. Patented Aug. 6, 1842.

Fig. 3.

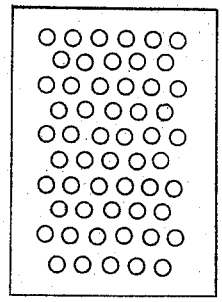


Fig. 2.

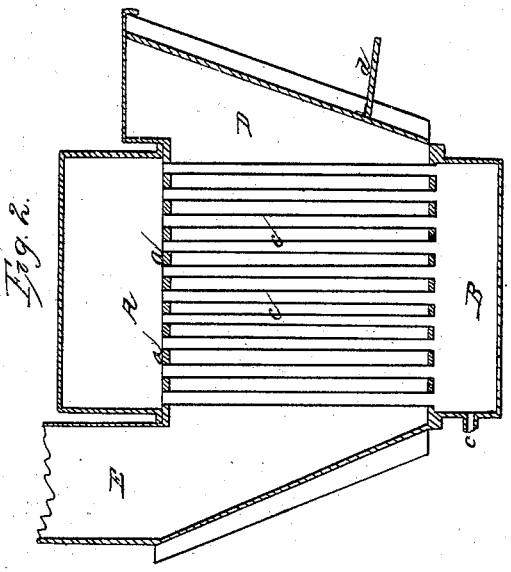
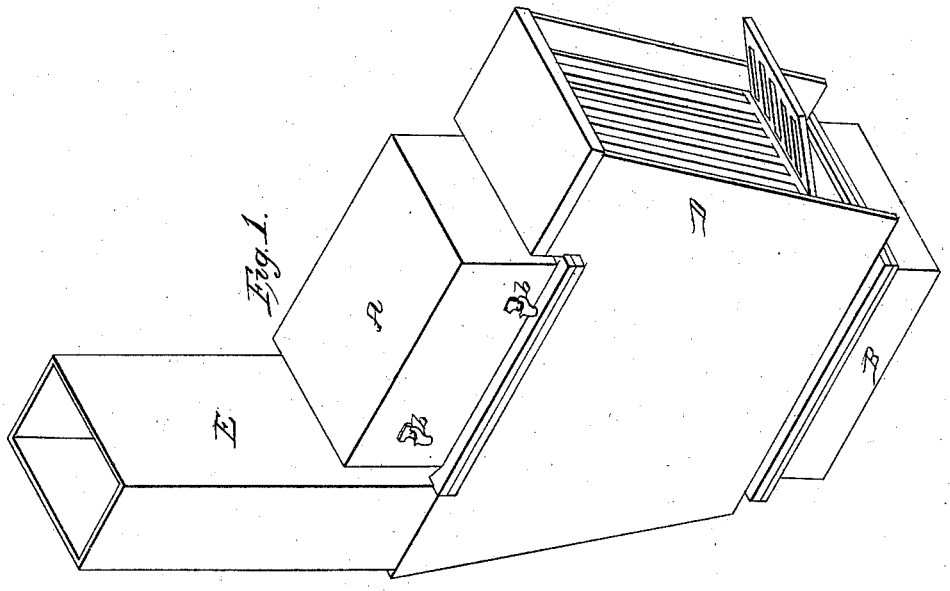


Fig. 1.



UNITED STATES PATENT OFFICE.

ABRAM S. VALENTINE, OF BELLEFONTE, PENNSYLVANIA.

CONSTRUCTION OF STEAM-BOILERS.

Specification of Letters Patent No. 2,748, dated August 6, 1842.

To all whom it may concern:

Be it known that I, ABRAM S. VALENTINE, of Bellefonte, in Center county and State of Pennsylvania, have invented a new and useful Improvement in Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, which make a part of this specification, in which—

Figure 1 is a perspective view of the boiler. Fig. 2, is a vertical longitudinal section. Fig. 3, a plan showing the arrangement of the tubes.

The nature of my invention consists in forming two square or other shaped reservoirs (A, and B,) which are connected together by tubes (C,) standing vertical, their ends opening into said reservoirs, the front tubes of the boiler thus constructed are made to form the back of the fire chamber (D). From the lower reservoir a fire grate extends upward at an angle of about 70°. The smoke, &c., passes through between the pipes (C) and up the chimney (E) at the back of the boiler.

The construction of the boiler is as follows, viz. the top and bottom reservoirs are made entirely independent of each other the inner plates (*a*) being pierced with holes for the insertion of tubes (C) which connect them, the ends of the tubes being riveted into said plates, the tubes are placed so that those in one row shall stand opposite the spaces between the tubes of the row adjoining; the blaze will thus be made to impinge on the tubes as it passes. The fire grate (*c*) being attached at the bottom to the lower reservoir by its outside bars may be made of hollow bars and thus form a part of the boiler or it may be composed of a simple grating as in the drawing the lower part (*a*) can be hinged so as to remove the ashes or conveniently this boiler is inclosed at the sides by plates of metal or brick work, of either of which the chimney is also constructed.

When a boiler constructed as above described is filled with water up to the trial cocks (*b*) by means of the induction pipe (*c'*) in the usual way and a fire is made in the grate the tubes nearest the fire will be heated with great rapidity and the steam and water will ascend in them while those further from the fire not being acted on so directly by the heat afford a return passage for the water down them thus keeping up a constant circulation; as the blaze from the fire is made to wind around the tubes by this arrangement the whole heat will be given out in the most economical and direct way causing a rapid generation of steam with a great saving of fuel. If while the boiler is in operation the water should get so low as to leave the tubes no more steam could be made on account of the position of the fire above the lower reservoir of the boiler; the danger consequent upon a want of water in other boilers, will thus be avoided in this.

What I claim as my invention and desire to secure by Letters Patent is:

The construction of the generator consisting of the separate steam chamber or upper reservoir A, and lower separate reservoir B, so as to allow them to move apart, as the tubes which unite them expand, in the manner above described in combination with the fire chamber formed between the tubes of the boiler and grate constructed and arranged in the manner and for the purpose herein set forth.

A. S. VALENTINE.

Witnesses:

R. I. POLLARD,

J. S. GREENOUGH.