

J. Samuels,
Sectional Steam Boiler.
No 51,521. Patented Dec. 12, 1865.

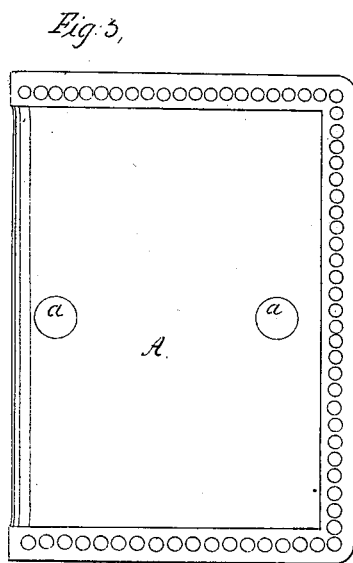
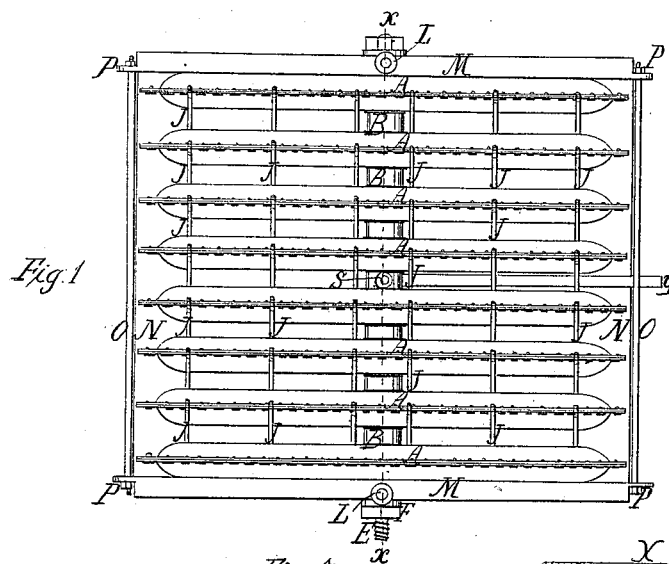
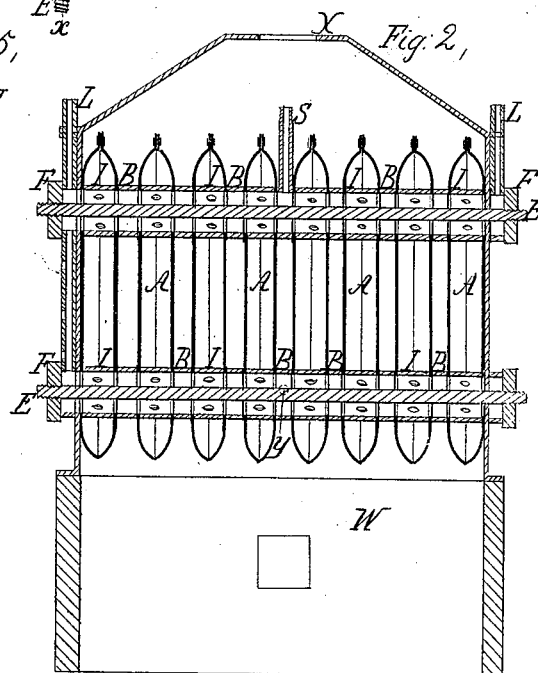
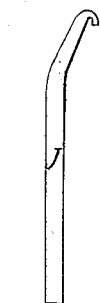


Fig 5,



Witnesses;
N. Ames.
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UNITED STATES PATENT OFFICE.

JAMES SAMUELS, OF LYNN, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND
GEO. W. OTIS, OF SAME PLACE.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. 51,521, dated December 12, 1865.

To all whom it may concern:

Be it known that I, JAMES SAMUELS, of Lynn, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Steam Generators or 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 accompanying drawings, forming a part of this specification, in which—

Figure 1 is a top view with the cover of the fire-box removed. Fig. 2 is a transverse vertical section in the line *xx* of Fig. 1. Fig. 3 is a plan or side view of one of the boxes or compartments of which the boiler is composed. Fig. 4 is a side view of one of the partition-stays placed between the different boxes; and Fig. 5 is a perspective view of one of the perforated thimbles placed around the pipe-holes *a* inside of the boxes or compartments.

Like parts are indicated by the same letters in all the drawings.

The nature of my invention consists in constructing a steam generator or boiler of a series of flat, shallow boxes or compartments, *A*, of wrought or cast iron, or other suitable metal, connected together and arranged parallel with each other, far enough apart to form the requisite flues between them, the whole being inclosed in a suitable fire-box or chamber, whereby I am enabled to produce a steam generator or boiler which is very cheaply made, readily put together or taken apart for repairs or transportation, and which affords a large amount of heating-surface in a comparatively little space, and is capable of generating steam with great rapidity and economy of fuel.

To enable others skilled in the art to make and use my invention, I will now proceed to describe the construction and operation of the same.

The boiler is composed of a series of flat, shallow boxes or compartments, *A*, of wrought or cast iron, or other suitable metal, the general shape and proportions of which are clearly shown in Figs. 1, 2, and 3. These drawings represent the boxes *A* as being made each of a single sheet of wrought-iron, or other suitable metal, bent into the requisite form and having three edges riveted water-tight, in the

usual manner of uniting the sections of steam boiler plates; or, each of the boxes *A* may be made of cast-iron, cast in a single piece, the inside being "cored" out in the usual manner.

When the boiler is required to generate steam of a low pressure, for heating buildings, &c., boxes of cast-iron answer a very good purpose, and are, of course, much cheaper than any other. In this latter method of construction each box may be cast with any required number of partitions or ribs, uniting the two sides, and thereby greatly increasing the strength of the boiler.

The boxes *A* (more or less of them) are arranged, as clearly shown in Figs. 1 and 2, parallel to each other, and just far enough apart to allow the heat and products of combustion to circulate freely through the spaces between them, *J J*, &c., being parallel bars or partitions placed between said boxes, by means of which the sides of the latter are prevented from bending outward by the internal pressure of the steam. The partitions *J*, reaching also from top to bottom of the boxes, form, in effect, separate flues for the more equal distribution of heat over the surfaces of the boiler.

The boxes *A* are united by means of short cylinders or rings *B*, which fit around the holes *a a*, (see Fig. 3,) near the top and bottom, *E* being a rod of iron or steel passing through said rings, holes, and sides *M M* of the fire-box, as shown in Figs. 1 and 2, and provided with nuts *F F*, which, being screwed onto the ends of said rod, will obviously force the rings *B* (if properly made and packed) steam-tight against the sides of the boxes.

In order to prevent the boxes *A* from collapsing from the pressure of the rings *B*, I place around the holes *a a*, on the inner side, the perforated rings *I*. As the rods *E E* are less in diameter than the bore of the rings *B* and *I*, the steam and water will have free passages from one box to another.

S is the steam-pipe leading from the upper row of rings, *B*.

L L are two safety-valve pipes.

Y is the injector-pipe.

The upper and lower rows of rings, *B*, may be connected by means of a pipe, in which may be inserted any required number of gage-cocks.

M M and N N are the sides and ends of the fire box or chamber, and W is the ash-pit and place where the fuel is thrown to be burned.

O O are rods provided with screw-nuts P, by means of which the sides and ends of the fire-chamber are held together.

X is the top of the fire box or chamber, in which the series of boxes A are contained.

The drawings represent the walls of the fire-chamber as being made of metal. It is obvious, however, that they may be made of bricks or other suitable material, if required.

Having thus described the nature of my in-

vention, what I claim as new, and desire to secure by Letters Patent, is—

1. The partition-stays J, arranged between the compartments A, substantially as and for the purpose described.

2. The combination and arrangement of the rings B and I, compartments A, rods E E, and nuts F F, substantially as and for the purpose described.

JAMES SAMUELS.

Witnesses:

N. AMES,

L. A. AMES.