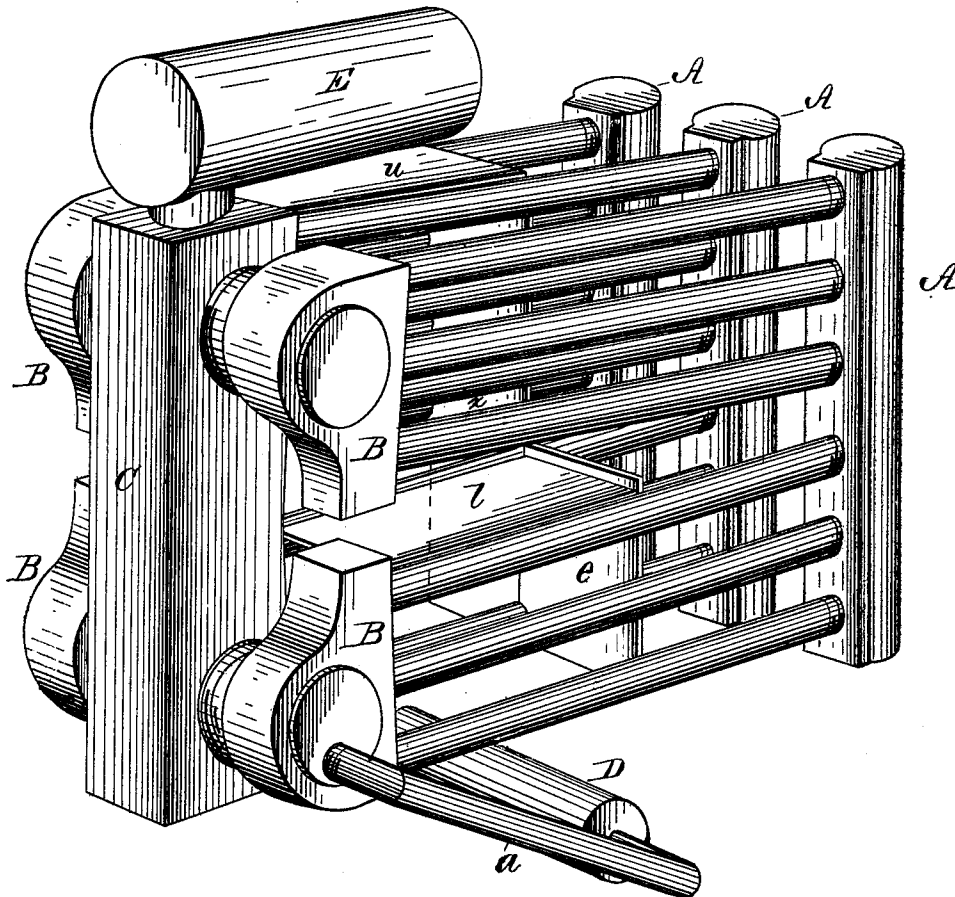


V. D. ANDERSON.
SECTIONAL STEAM BOILER.

No. 174,931.

Patented March 21, 1876.

Fig. 1.



Witnesses:
Will H. Dodge
Edwin J. McLean

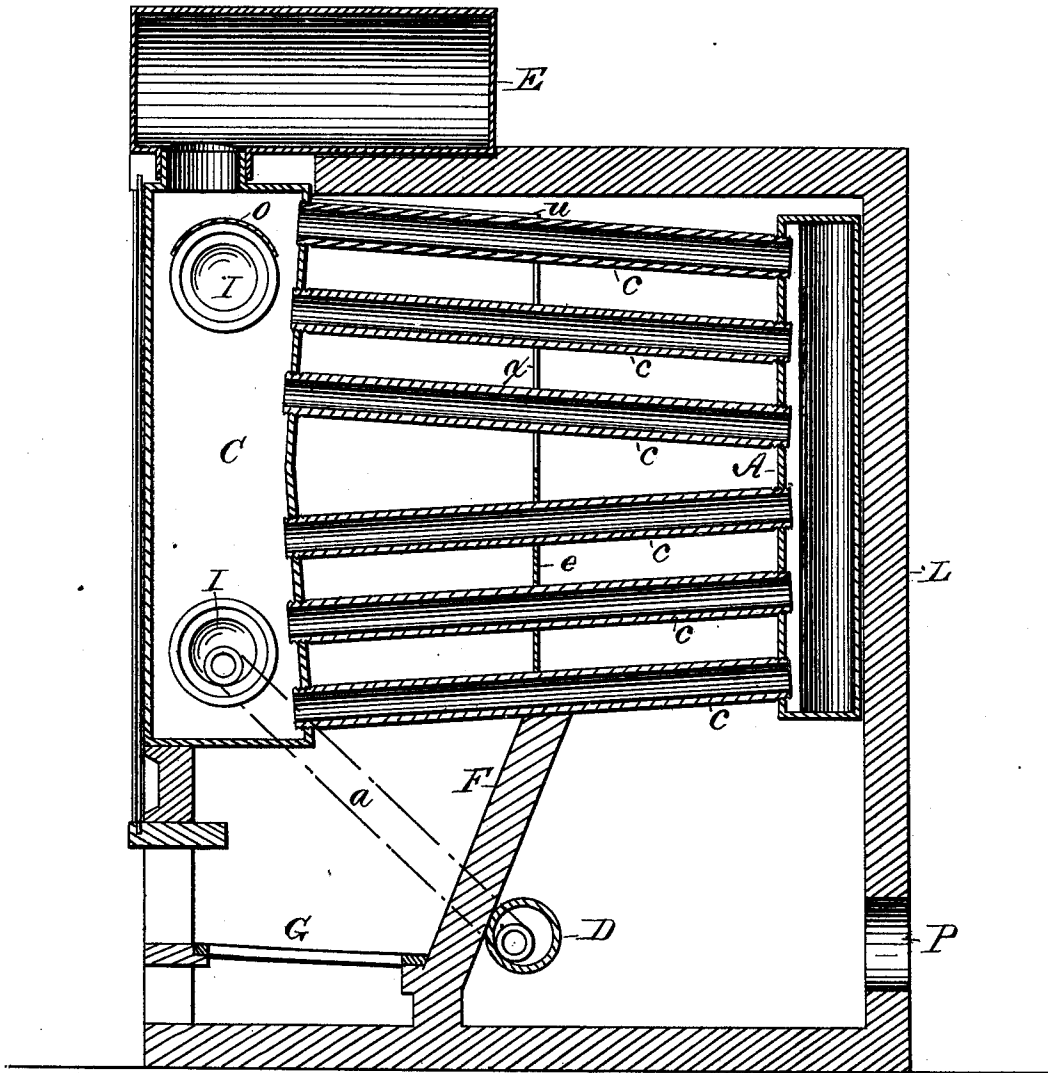
Inventor:
V. D. Anderson
by Dodge & Son
Attys.

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Fig. 2.



Witnesses:
Will H. Dodge
Edmund McLean

Inventor:
V. D. Anderson
by Dodge & Son
attys.

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Fig. 3.

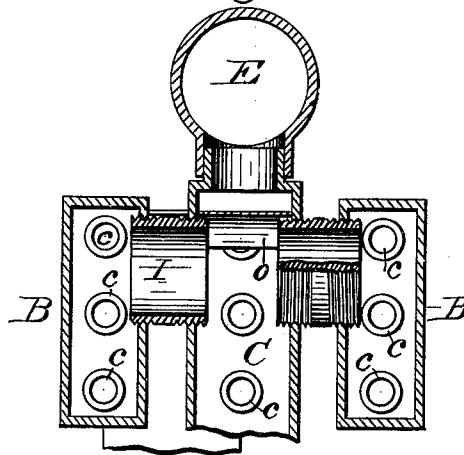
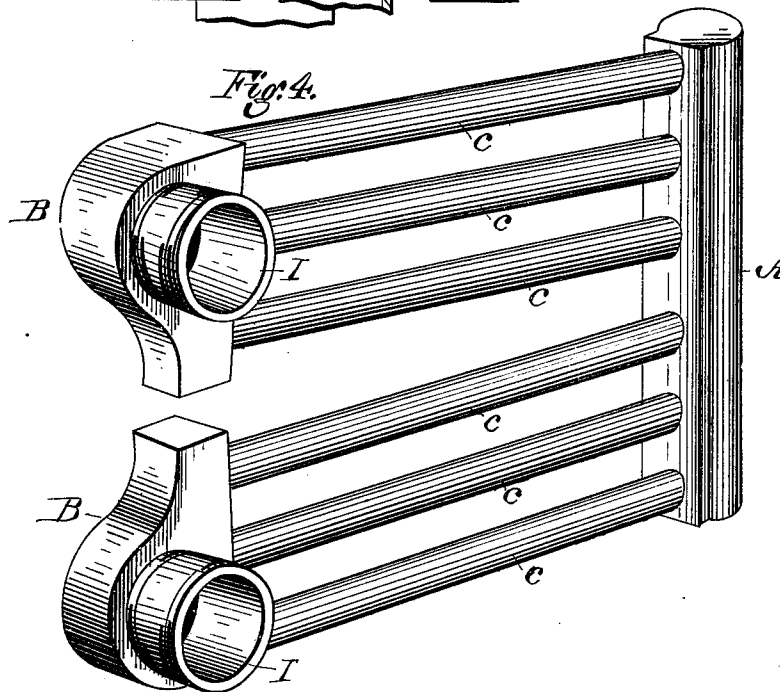


Fig. 4.



Witnesses:
Will H. Dodge.
Edwin J. McLean

Inventor:
V. D. Anderson
by Dodge & Son
attys.

UNITED STATES PATENT OFFICE.

VALERIUS D. ANDERSON, OF SPRINGFIELD, OHIO.

IMPROVEMENT IN SECTIONAL STEAM-BOILERS.

Specification forming part of Letters Patent No. **174,931**, dated March 21, 1876; application filed March 6, 1875.

To all whom it may concern:

Be it known that I, VALERIUS D. ANDERSON, of Springfield, in the county of Clarke and State of Ohio, have invented certain Improvements in Steam-Boilers, of which the following is a specification:

My invention consists of a steam-boiler composed of sections, each of which is, in turn, composed of a series of tubes screwed into cast-iron heads, the several sections being united by means of tubes having a screw-thread on each end, so that the boiler, as a whole, shall consist simply of a series of tubes and heads or manifolds, screwed together without the use of any bolts, rivets, tie-rods, or similar devices, and whereby a boiler of any required capacity can be produced by simply screwing on additional sections, as hereinafter more fully set forth.

Figure 1 is a perspective view of a boiler made on my plan. Fig. 2 is a longitudinal section of a boiler set in brick-work. Fig. 3 is a sectional view, showing the manner of connecting the sections; and Fig. 4 is a perspective view of a single section detached.

The object of this invention is to afford a very simple and cheap method of constructing boilers, and also to enable them to be increased or reduced in size, as may be required, to adapt them to the various uses for which they may be required.

To construct a boiler on my plan I provide a hollow cast-iron head, A, as represented in Figs. 1 and 4, and also two cast-iron heads or boxes, B, for each section. I then provide a series of wrought-iron tubes, *c*, all of uniform lengths, and having right and left hand screw-threads cut on their ends, there being corresponding holes with screw-threads cut in the cast-iron heads to receive the ends of the tubes *c*, the heads A and B being technically known as "manifolds." The tubes *c* and the manifolds, being thus provided, are united by simply screwing the tubes into the cast-iron manifolds, thereby forming a section, as shown in Fig. 4. The parts B have large holes made in their sides to receive the short tubes I, by which one section is united to another, these tubes, like the others, being provided with a right and left hand thread at their ends. The

tubes *c* are divided into two sets, the lower set inclining upward from front to rear, while the upper tier is inclined in the opposite direction, as shown in Figs. 2 and 4, for the purpose of insuring a rapid circulation of the water and the more ready escape of the steam into the steam-drum E, located over the central section, as shown in Figs. 1, 2, and 3.

The central or main section of the boiler is constructed like the others, except that, instead of the two short manifolds B, it has one longer and larger, C, at its front end, as shown in Figs. 1 and 2, it having a neck at the top, to which the steam-drum E is attached by a collar that screws thereon, as shown in Fig. 3.

It will thus be seen that the boiler is composed wholly of the wrought-iron tubes and the cast-iron heads or manifolds, and that they are united by simply screwing the parts together, thereby dispensing with all flanges, bolts, rivets, and tie-rods ordinarily used in boilers, thus rendering them exceedingly cheap to construct and easy to set up or take down. By this mode of construction the boilers can be shipped in pieces, and set up by any ordinary workman; and one great advantage of them is that they can thus be carried in pieces through doors and passages where an ordinary boiler could not pass, and be then set up, when in place, in a short space of time and with but little labor.

The sections may be made of any desired size, the tubes being increased in diameter as they are increased in length, the size of the sections depending somewhat upon the purpose for which the boilers are intended. It will be seen that any number of sections may be added at each side of the central section, and that thus a boiler of almost any capacity may be produced without altering the size of the sections. If a very large number of sections be thus united in one boiler it would be advisable to interpose, at intervals, two or more of the central sections C, with a steam-drum for each, all the steam-drums being united by a pipe for the purpose of allowing a more ready escape of the steam from the sections, and equalizing the pressure.

As shown in Figs. 2 and 3, I locate a curved plate, O, in the upper part of the manifold C,

at the point where the steam passes up into the drum E, to assist in preventing the water from being forced or carried up with the steam.

It is obvious that very small boilers made on this plan may be provided with a metallic casing; but for those of any considerable size I prefer a brick setting; and in order to obtain the best results I set them as represented in Fig. 2, in which L represents the brick-work surrounding and inclosing the entire boiler. The fire-place is built under the front end, G representing the grate-bars. The bridge-wall F extends up to the lower tubes; and for the purpose of directing the flame and heated gases I arrange a series of plates, *e*, *l*, *x*, and *u*, as shown in Fig. 1, and, partially in section, in Fig. 2. By these means the flame and gases which rise from the fuel first pass up at the front under the plate *l*, by which they are made to pass laterally between the tubes and up under the plate *u* in front of plate *x*, from whence they pass laterally back over the plate *l*, and from thence backward among the tubes in the rear part, and thence downward to and out of the opening P at the rear, as shown in Fig. 2.

A mud-drum, D, is located in rear of the wall F, and is connected, by pipes *a*, with the lower manifolds B, as shown in Figs. 1 and 2, though the connection may be made at other points, if desired.

By this mode of setting or casing the boiler and arranging the plates for directing the flame and heat a most economical use of the fuel is effected.

A boiler constructed on this plan is capable of use for all the ordinary purposes for which steam-boilers are used, both for heating buildings and for supplying engines. It is exceedingly strong, and therefore safe, thus specially adapting it for use by farmers and for all domestic purposes, as well as for shops and factories. Its simplicity and cheapness of construction, together with the ease by which it may be increased or decreased in size, render it especially well adapted to the great variety of purposes for which boilers are now used.

Having thus described my invention, what I claim is—

1. A section for a steam-boiler, composed of the manifolds A and B B, each cast complete in a single piece, and united by the wrought-iron tubes C, having a right-hand screw-thread on one end and a left-hand thread on the opposite end, substantially as described.

2. A steam-boiler composed of a series of sections, constructed as above set forth, said sections being united by the connecting-thimbles I, substantially as shown and described.

3. In combination with a steam-boiler having a series of horizontal tubes, the plates *e*, *l*, *x*, and *u*, arranged substantially as set forth, whereby the products of combustion are made to pass laterally and vertically, forward and back, up and down, as described.

VALERIUS D. ANDERSON.

Witnesses:

H. S. SHOWERS,
D. L. CRAFT.