

H. B. SMITH.
Sectional Steam-Boilers.

No. 151,725.

Patented June 9, 1874.

Fig. 1.

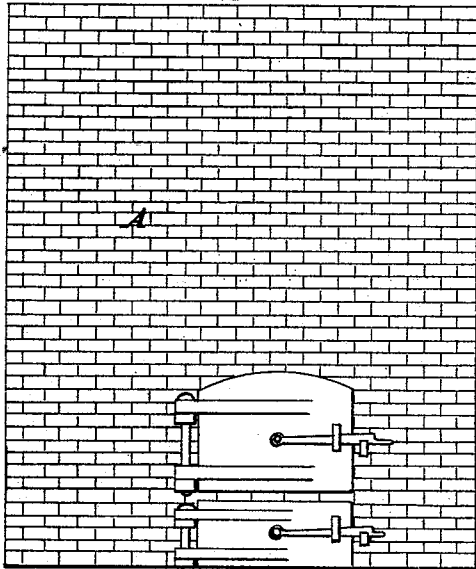


Fig. 2.

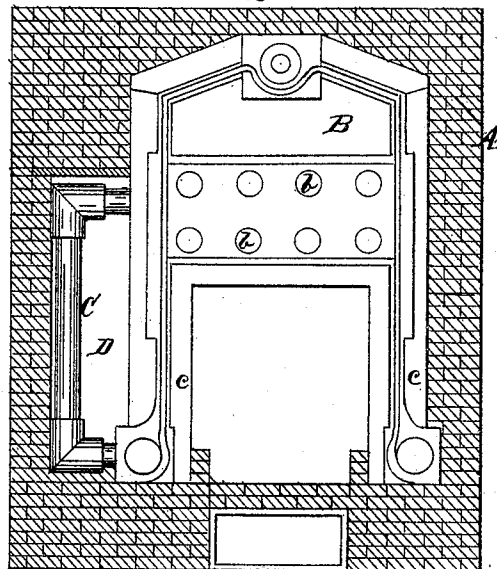


Fig. 3.

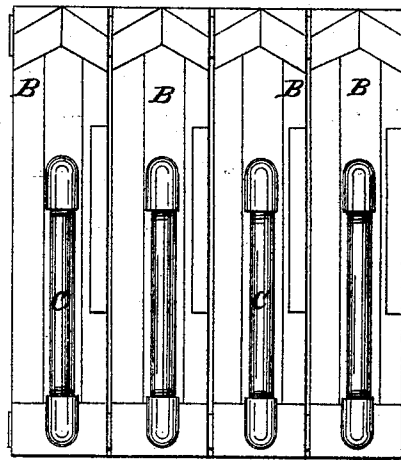


Fig. 4.

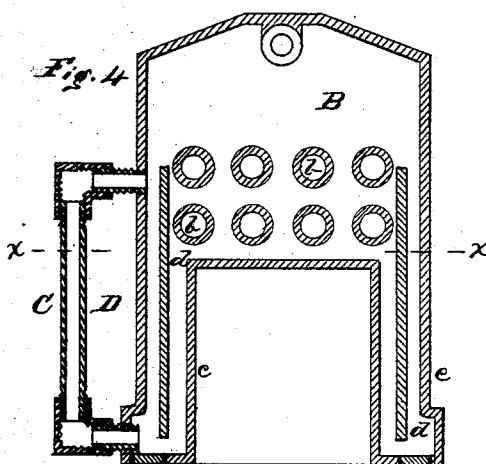
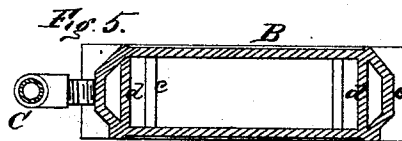


Fig. 5.



Witnesses
Jacob D. Colman.
Anna M. Northrop.

Inventor
Henry B. Smith
By Thos. P. How
Atty

UNITED STATES PATENT OFFICE.

HENRY B. SMITH, OF WESTFIELD, MASSACHUSETTS.

IMPROVEMENT IN SECTIONAL STEAM-BOILERS.

Specification forming part of Letters Patent No. **151,725**, dated June 9, 1874; application filed March 26, 1874.

To all whom it may concern:

Be it known that I, HENRY B. SMITH, of Westfield, in the county of Hampden and State of Massachusetts, have invented certain Improvements in Sectional Steam-Boilers, of which the following is a specification:

This invention is designed to be used chiefly in boilers adapted to warming buildings by steam, and especially in that class of boilers in which the boiler is made up in sections in such a manner that the capacity of the boiler and fire-box may be increased or diminished by the addition or removal of sections, and in which what are known as water-legs are made to form the sides of the fire-box.

The principal object of this invention is to secure a better circulation of the water in these water-legs than is realized by the ordinary construction. Another object is the formation of a flue outside of these water-legs for the products of combustion to pass through to utilize a portion of the heat remaining therein after passing through the hotter parts of the boiler. Part of said invention consists in combining with these water-legs, provided with diaphragms or division-plates, as hereinafter described, an outside pipe or channel for the water to pass through from the upper portion of these water-legs, or from a portion of the boiler above the water-legs to the lower portion of the water-legs, which furnishes an additional medium for circulation, and also serves to form a portion or the whole of a flue, through which the products of combustion may be made to pass advantageously when their heat is nearly exhausted, as hereinafter more fully set forth.

Figure 1 is a front elevation of a brick furnace adapted to contain my improved boiler. Fig. 2 is a vertical section on a plane parallel to the plane of Fig. 1, showing one of the sections of my improved boiler in front elevation. Fig. 3 is a side elevation on a plane transverse to the plane of Figs. 1 and 2, showing several sections of my boiler put together. Fig. 4 is a vertical section of one of the sections of my improved boiler, showing the internal construction of such section on a plane parallel to that of Figs. 1 and 2. Fig. 5 is a horizontal section of the same on the line *x x*, drawn across Fig. 4.

A is the brick-work, adapted to contain my improved boiler, which latter is shown as being made up in sections, so that the capacity of the boiler may be increased or diminished by the addition or removal of internal sections, in the manner set forth in the Letters Patent granted to Samuel F. Gold, June 21, 1859. B B are sections of my improved boiler, having flues *b b* through them for the return of the products of combustion, and having water-legs, as shown at *c c*. These sections are cast in a single piece each, and, to form a boiler, are set up together, as shown in Fig. 3, and as now practiced. *d d* are division-plates, placed in the water-legs *c c*, which division-plates I prefer to cast with the section B as a part of the same casting. These division-plates *d d* should extend up nearly, but not quite, to the surface of the water in the boiler. They are represented in the drawings as extending up to about the center of the upper range of flues, which is about the proper height for the best result. The heat being most intense inside of the fire-box will, of course, have a tendency to cause the water to rise upon that side of the division-plate which is nearest the fire, and it will consequently descend on the opposite side of the plate, thus giving a better circulation than would be realized without the division-plate, and a consequently better result in the generation of steam. C is a pipe or channel for the water, attached to the side of each section of the boiler in the position shown, or it may be cast with it and form a part of it. In most cases the latter will probably be found to be the better construction. This pipe C furnishes another medium for the circulation of the water in the water-legs to which it is attached, it being connected to it at the bottom, as shown, and also connected above with the water in the boiler in such a manner as to allow the water to circulate through it from above downward, and when used in connection with the division-plate above described it divides the circulation with the space between said division-plate and the outside of the boiler. I also propose to form a flue, D, between said pipe and the side of the boiler, as shown, and for that purpose it may be preferable to cast this pipe with, and as a part

of, the section, and make it of the same thickness in the direction of the length of the boiler as the section with which it may be cast. These improvements give a very perfect circulation of the water between the different parts of each section, and add materially to the efficiency of the boiler in the generation of steam.

I claim as my invention—
The combination of the section B, water-leg c, division-plate d, and pipe C, as hereinbefore described.

HENRY B. SMITH.

Witnesses:

PHILIP C. SMITH,
JOHN R. REED.