G. H. STARBRUCK.

Sectional Steam-Generator.

No. 163,820. Patented May 25, 1875.

Fig. 1.

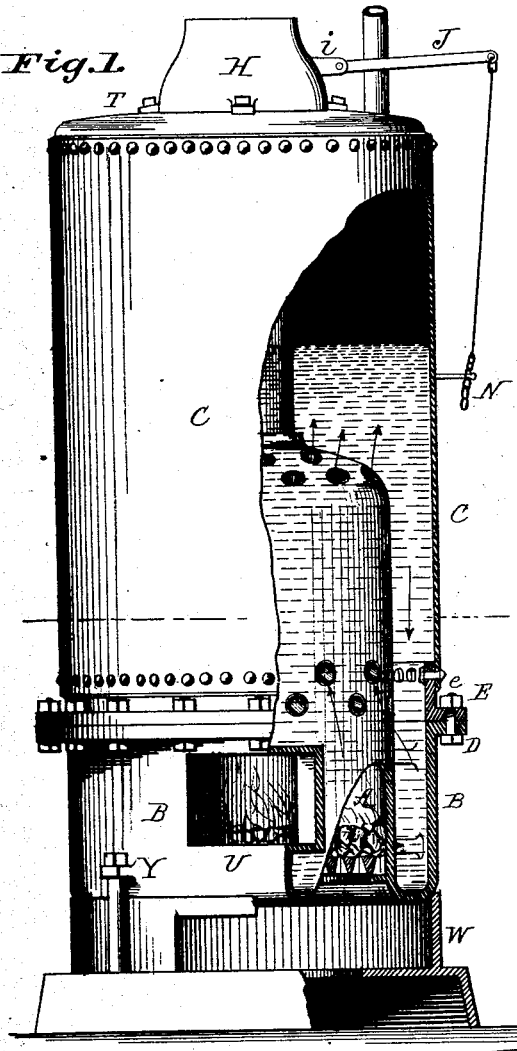


Fig. 2.

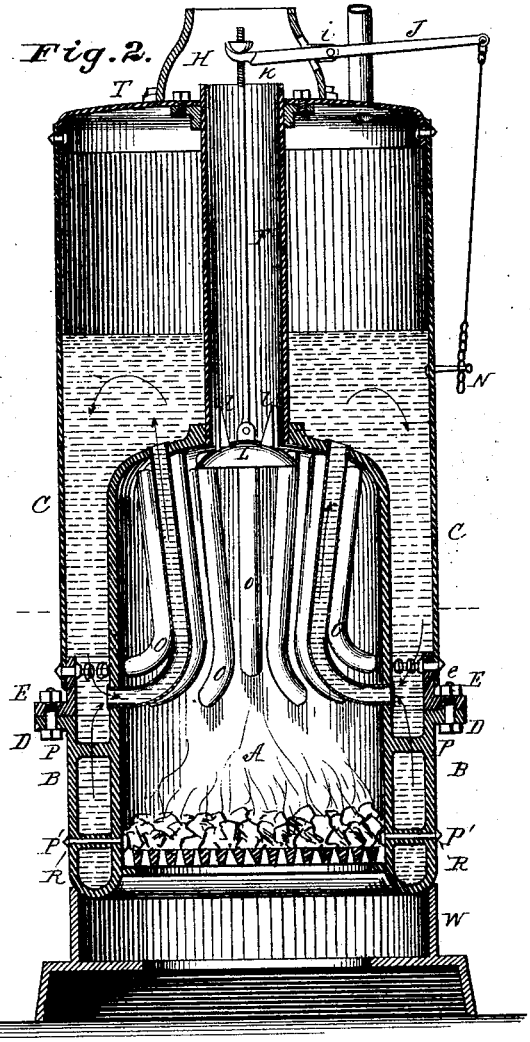
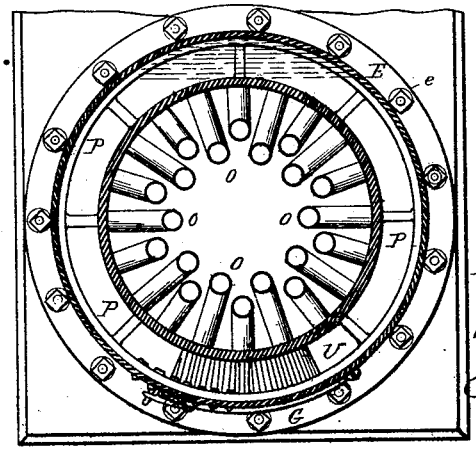


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE H. STARBUCK, OF TROY, NEW YORK.

IMPROVEMENT IN SECTIONAL STEAM-GENERATORS.

Specification forming part of Letters Patent No. **163,820**, dated May 25, 1875; application filed March 15, 1875.

To all whom it may concern:

Be it known that I, GEORGE H. STARBUCK, of Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Combination-Boilers, of which the following is a specification:

This invention relates to certain improvements in the construction of tubular steam-boilers, the object being to provide a boiler cheaper in construction than those in ordinary use, and better adapted to bear the crushing and tensile strain to which the different portions of the same are subjected, as will be hereinafter fully set forth.

This invention consists of a peculiar construction and combination of parts, which will be fully hereinafter described, and pointed out in the claim.

In the drawings, Figure 1 represents a vertical view of my improved boiler partly in section. Fig. 2 represents a vertical section of the same. Fig. 3 represents a horizontal section.

The letter A designates the fire-box or furnace of the boiler, constructed of cast-iron; and C, the outer case or shell made of wrought or boiler iron. The water-leg B is cast in one piece with the furnace or fire-box, having a flange, D, cast upon it of sufficient size to receive and hold the flange E, which is riveted to and forms part of the shell C, the flanges being secured together and held in place by bolts or nuts *e*. The top of the furnace is connected to the top head T of the boiler by a tube, F, of suitable size, which forms the smoke-flue, and is secured to the said furnace by being expanded into the same, or it may be secured by a flange, or in any other convenient manner. The upper end of said tube is similarly secured to the head T, and opens into the smoke-stack, which is secured to the collar H. Said collar is provided with ears *i* to support a lever, J, which passes through the walls of said collar, the inner end carrying a rod, K, extending downward through the smoke-flues, terminating with a damper or valve, L, by means of which the draft may be regulated. Said valve is provided with a series of guides, 7, upon its upper side, by means of which it will be at all times kept in proper position in the lower end of the smoke-flue.

To the outer end of said lever is attached a chain, which can be secured over a stop, N, on the shell of the boiler to hold the damper in any desired position.

From the crown of the furnace or fire-box, projecting downward, are a number of wrought-iron, steel, or copper tubes, O, passing into the side of the fire-box or furnace at a point just above the flange of the water-leg. Between the two walls of the water-leg B, and cast with said water-leg, are a series of socket ties or braces, P P′, to support and strengthen the two walls.

Both series of said socket-ties may be drilled or cored to receive a socket-rivet, R, or the bolt may be cast in order to additionally strengthen the same to withstand the internal pressure. The water-leg is cast with an opening, U, extending through both walls, forming the doorway to the furnaces, and on the interior of the inner wall of said water-leg is cast a ring or projection, S, forming a support for the grate. The fire-leg rests upon and is supported by a cast-iron ring, W, which forms the ash-box of the furnace, being clamped thereto by means of a series of screw-bolts, Y, passing through lugs attached to the outside of the water-leg; said bolts being firmly secured to the lower part of the ring W, and provided with screw-nuts at their upper ends, which hold and secure the lugs upon the same. The boiler is provided with a manhole, G, for access to the interior for cleaning, &c.

As thus constructed the interior parts of the boiler, as well as the lower portion of the same, which are necessarily in such position as to receive the whole of the crushing pressure of the steam, are constructed of cast-iron, which being more rigid and homogeneous, is better adapted to bear such strain than the wrought-iron usually employed, and is besides much cheaper. The outer casing or shell, which is subjected to the tensile strain, is con-

structed as usual of wrought or boiler iron, and the two portions are united in such manner that they may be readily separated in order to get at the interior of the boiler for repairs when the same are necessary.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A steam-boiler composed of a cast-iron inner shell, A, and water-leg B, with strengthening-braces P and flange D, all cast in one piece, and an upper shell, C, of boiler-iron, provided with a flange, E, secured to the flange D of the water-leg by means of screw-bolts and nuts *e*, substantially as herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand.

GEORGE H. STARBUCK.

Witnesses:
A. N. BELCHER,
O. E. VAN ZILE.