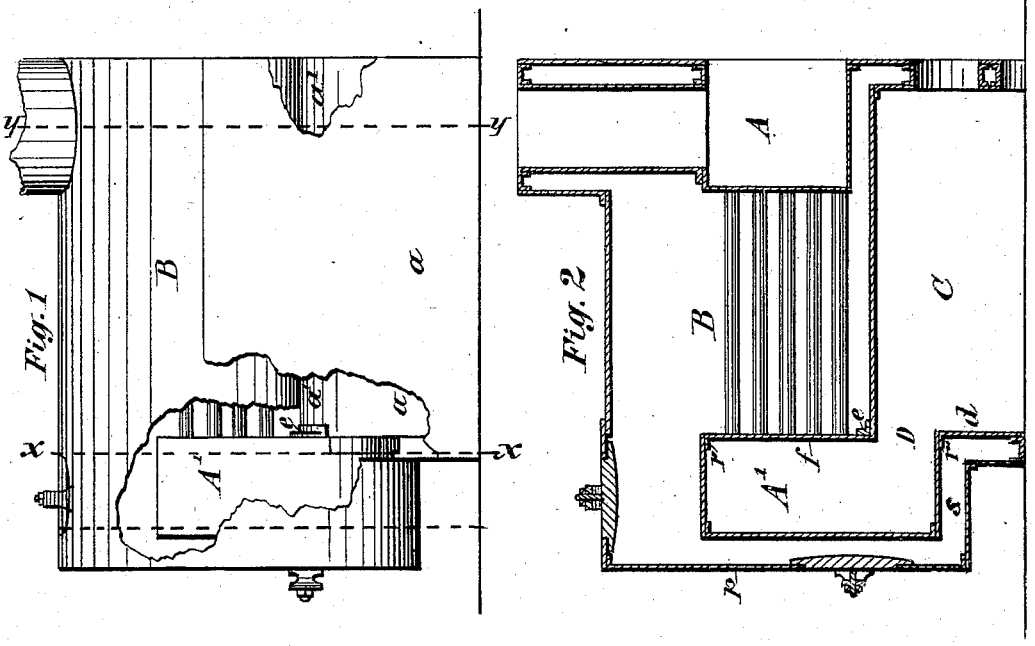
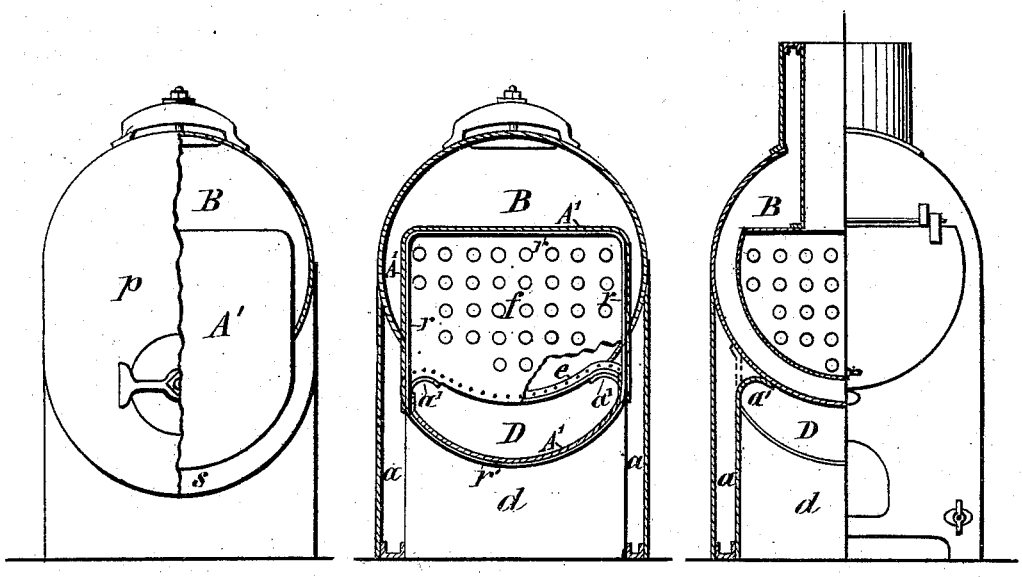
P. FITZGIBBONS.

STEAM-BOILER.

No. 189,930. Patented April 24, 1877.





Witnesses:
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Inventor:
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per E. Laass Atty.

UNITED STATES PATENT OFFICE.

PATRICK FITZGIBBONS, OF OSWEGO, NEW YORK, ASSIGNOR OF ONE-HALF HIS RIGHT TO RALPH E. STONE, OF SAME PLACE.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **189,930**, dated April 24, 1877; application filed February 21, 1877.

To all whom it may concern:

Be it known that I, PATRICK FITZGIBBONS, of Oswego, in the county of Oswego, in the State of New York, have invented a new and useful Improvement in Steam-Boilers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description:

This invention relates to that class of steam-boilers which are composed of a cylindrical shell, constituting the boiler proper, a fire-box underneath the same, a smoke-box or combustion-chamber at the rear end, in direct communication with the fire-box, and a smoke-box with the exit or smoke-stack in front communicating with the rear smoke-box through flues within the boiler proper, and having a water-space around the respective parts.

The invention consists, first, in a novel construction of the throat and back smoke-box connected therewith, whereby the products of combustion are more uniformly distributed around the bottom of the boiler proper and in their passage through the flues; also better access to the smoke-box for repairs is obtained, and to the bottom of the smoke-box a stronger form is given for water-space under it, and the removal of accumulated soot and ashes in the smoke-box facilitated; second, in an improved method and means of attaching the back flue-sheet to the shell of the boiler proper and its contiguous parts, whereby the said flue-sheet is rigidly secured to the bottom of the boiler proper and to the inside sheet of the water-leg, and which also braces the said sheet at the throat of the fire-box; third, in a novel and ingenious method of joining the back smoke-box with the flue-sheet and throat-sheet, whereby two easily-accessible calking-edges around the entire joint are obtained, and the attachment of the smoke-box greatly facilitated, all constructed substantially in the manner hereinafter fully described, for the purposes specified.

In the accompanying drawings, Figure 1 is a side view of a boiler constructed on my improved plan, with portions removed to show some of the essential features of same. Fig. 2 is a longitudinal section of same; Fig. 3, a rear end view with half of the end plate removed to show more fully the form of the rear smoke-box and the water-space surrounding it. Fig. 4 is a transverse section taken on line *x x* in Fig. 1; and Fig. 5 partly a front view of the boiler and partly a transverse section on line *y y* in Fig. 1.

Similar letters of reference indicate corresponding parts.

B is the boiler proper, cylindric in form, and having the smoke-box A at the front end and the smoke-box A′ at the rear end communicating with each other through flues in the boiler. C is the fire-box, communicating with the rear smoke-box through the throat D. *a* is the water-space, or so-called water-leg, at the side of the fire-box.

The second part of my invention pertains to the throat D and rear smoke-box A′, the former of which is made with the view to better distributing the products of combustion in their passage, and cause the same to impinge upon all parts of the bottom of the boiler proper with uniform intensity, and also to allow free access to the smoke-box for cleaning and repairs. It is made in the shape of an inverted arch, formed by the bottom of the boiler proper at the top, the curved upper ends *a′* of the water-leg *a* at the sides, and a segmental or crescent-shaped upper end of the throat-sheet *d* at the bottom. The smoke-box A′, having its bottom curved correspondingly to fit the segmental top of the throat-sheet *d*, is thus strengthened to better resist the pressure in a water-space underneath it, and the soot and ashes which, in cleaning the flues and otherwise, accumulates in the smoke-box, are caused to fall toward the center, and are easily removed therefrom through the throat D.

The back flue-sheet *f* is extended in width to bring its side edges to coincide with the sides of the throat, and is rigidly secured to the bottom of the shell of the boiler proper, and to the arched top portion *a′* of the water-leg *a*, by means of an angle-iron or L-shaped band, *e*, spanning across the bottom portion of the boiler-shell, and over the arched top portion *a′* of the water-leg and riveted thereto, to which band the flue-sheet is riveted. The band *e*, besides holding the flue-sheet *f*, also

braces the inner sheet of the water-leg at the throat. The flue-sheet is provided with a rearward-projecting flange, *r*, around the top and sides, coinciding with a rearward-projecting flange, *r'*, on the throat-sheet, and forming with it one continuous flange for the attachment of the smoke-box.

For the purpose of rendering the rivets and calking edges easy of access, the top and sides of the smoke-box are applied to the outside of the flange on the flue-sheet, and the semicircular bottom portion of the smoke-box is fitted to the inside of the flange on the throat-sheet, thus forming two calking-edges all around easy of access from the interior of the smoke-box through the man-hole in the top of the boiler proper, and from the fire-box.

Having formed one substantial side of a water-space, *s*, under the smoke-box by the semicircular bottom of same, I complete the said water-space by likewise giving the bottom portion of the end plate *p* of the exterior shell of the boiler a semicircular form and vertically elongating the said plate, so as to bring its bottom portion a few inches below the bottom of the smoke-box and concentric therewith, thus forming under the smoke-box a water-space of great strength, and which collects the sediments of the water in one place, where readily removed and least liable to do injury.

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

1. The throat D, having the shape of an inverted arch, formed by the bottom portion of the shell of the boiler proper at the top, the curved top portion *a'* of the water-leg *a* at the sides, and a segmental or crescent-shaped top of the throat-sheet *d* at the bottom, and the rear smoke-box A', having a correspondingly-curved bottom, all constructed and combined substantially in the manner specified, for the purposes set forth.

2. The back flue-sheet *f*, extended in width to cause its side edges to coincide with the sides of the throat D, and attached to the bottom portion of the shell of the boiler proper and to the curved top portion *a'* of the water-leg *a*, by means of the angle iron or L-shaped band *e*, extended across the bottom portion of the boiler-shell, and over the curved top portion *a'* of the water-leg, substantially as described and shown, for the purpose specified.

3. The flue-sheet *f* and the throat-sheet *d*, having the rearward-projecting flange *r* forming one continuous flange, and the smoke-box A' attached with its top and sides to the exterior of the flange on the flue-sheet, and with its semicircular bottom to the interior of the flange on the throat-sheet, substantially in the manner and for the purpose shown and described.

In testimony whereof I have signed my name and affixed my seal in the presence of two attesting witnesses at Oswego, in the county of Oswego and State of New York, this 13th day of February, 1877.

PATRICK FITZGIBBONS. [L. S.]

Witnesses:

JOHN J. WHITE,

FRANK WILLIAMS.