(No Model.)

R. W. AITKEN.

STEAM BOILER.

No. 344,071. Patented June 22, 1886.

Fig. 1.

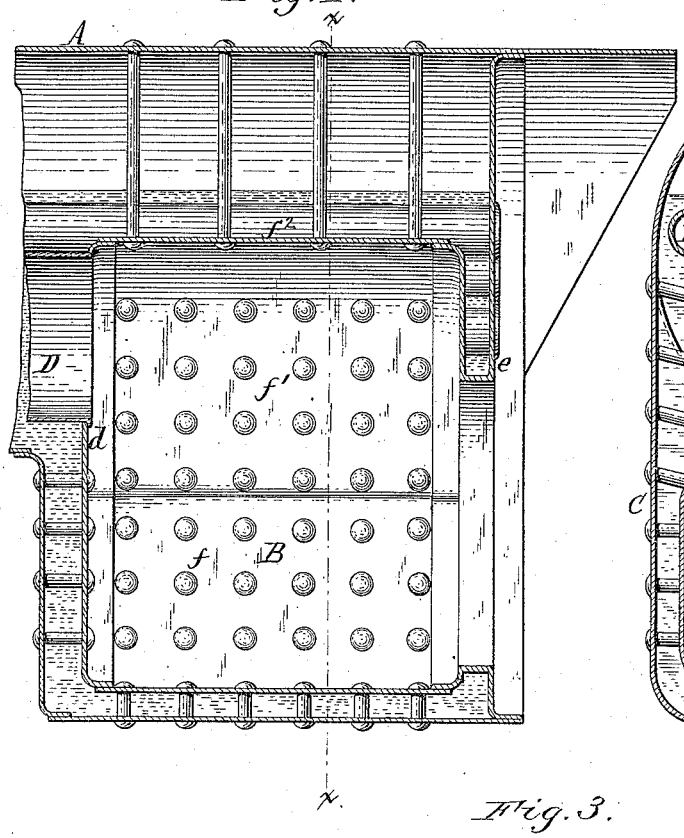


Fig. 2.

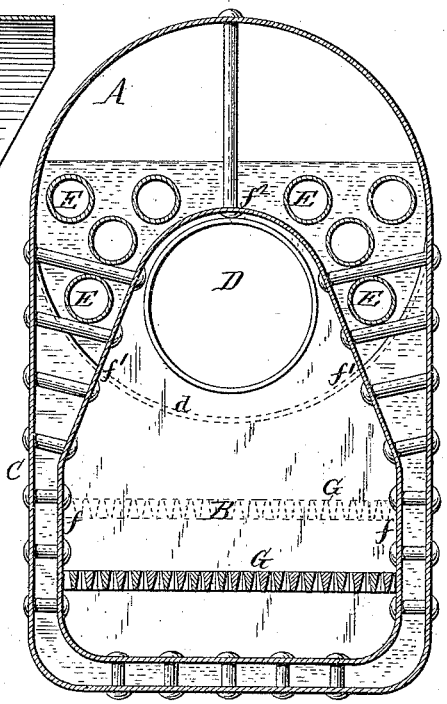
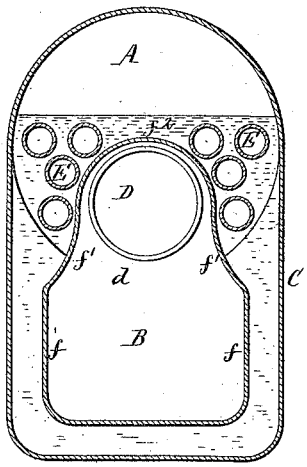


Fig. 3.



Witnesses.
Chas. J. Buchheit.
Theodor L. Popp.

R. W. Aitken Inventor.
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UNITED STATES PATENT OFFICE.

ROBERT W. AITKEN, OF BUFFALO, NEW YORK, ASSIGNOR OF ONE-HALF TO THE PITTS AGRICULTURAL WORKS, OF SAME PLACE.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 344,071, dated June 22, 1886.

Application filed September 1, 1885. Serial No. 175,937. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. AITKEN, of the city of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Steam-Boilers, of which the following is a specification.

This invention relates to an improvement in that class of steam-boilers which are provided with a direct flue extending from the fire-box to a combustion-chamber at the rear end of the boiler, and with a number of return-flues running from said combustion-chamber to a smoke-box at the front end of the boiler.

The object of my invention is to improve the construction of the fire-box in such manner as to facilitate the adjustment of the grate and to improve the arrangement of the return-flues.

My invention consists to these ends of the improvements which will be hereinafter fully set forth, and pointed out in the claim.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of the fire-box and adjacent parts of a steam-boiler provided with my improvements. Fig. 2 is a cross-section in line *x x*, Fig. 1. Fig. 3 is a similar view on a reduced scale, showing a slightly-modified form of the fire-box.

Like letters of reference refer to like parts in the several figures.

A represents the cylindrical boiler, B the fire-box, and C the water-jacket surrounding the fire-box.

D represents the direct flue, extending from the upper portion of the flue-sheet *d* of the fire-box in a well-known manner to the combustion-chamber at the opposite end of the boiler, which is not shown in the drawings.

E represents the return-flues, which are arranged in the shell A on both sides of the direct flue D, and which extend beyond the fire-box to the flue-sheet *e*, through which they open into a suitable smoke-box. The side plates of the fire-box are composed of lower vertical portions, *f*, and upper contracted or converging portions, *f'*. The crown-sheet f^2, connecting the upper ends of the contracted portions *f'*, is made concentric with the direct flue D. This construction of the side walls of the fire-box permits the return-flues E to be arranged lower in the shell A on both sides of the flue D than ordinarily, thereby increasing the heating-surface of the return-flues and decreasing the height of the water-level above the flues, whereby steam is made more rapidly than heretofore. This construction also enables the grate G to be raised and lowered in the fire-box, thereby permitting the grate to be placed low for burning straw, as indicated in full lines, or higher for burning coal, as indicated in dotted lines.

I claim as my invention—

In a steam-boiler, the combination, with the direct flue D and return-flues E, of a fire-box having its side walls composed of lower vertical portions, *f*, and upper converging portions, *f'*, and having a crown-sheet, f^2, made concentric with the direct flue D, substantially as set forth.

Witness my hand this 8th day of August, 1885.

ROBERT W. AITKEN.

Witnesses:
O. H. KROTZ,
THEO. L. POPP.