(Model.)

P. FITZGIBBONS

STEAM BOILER.

No. 313,307. Patented Mar. 3, 1885.

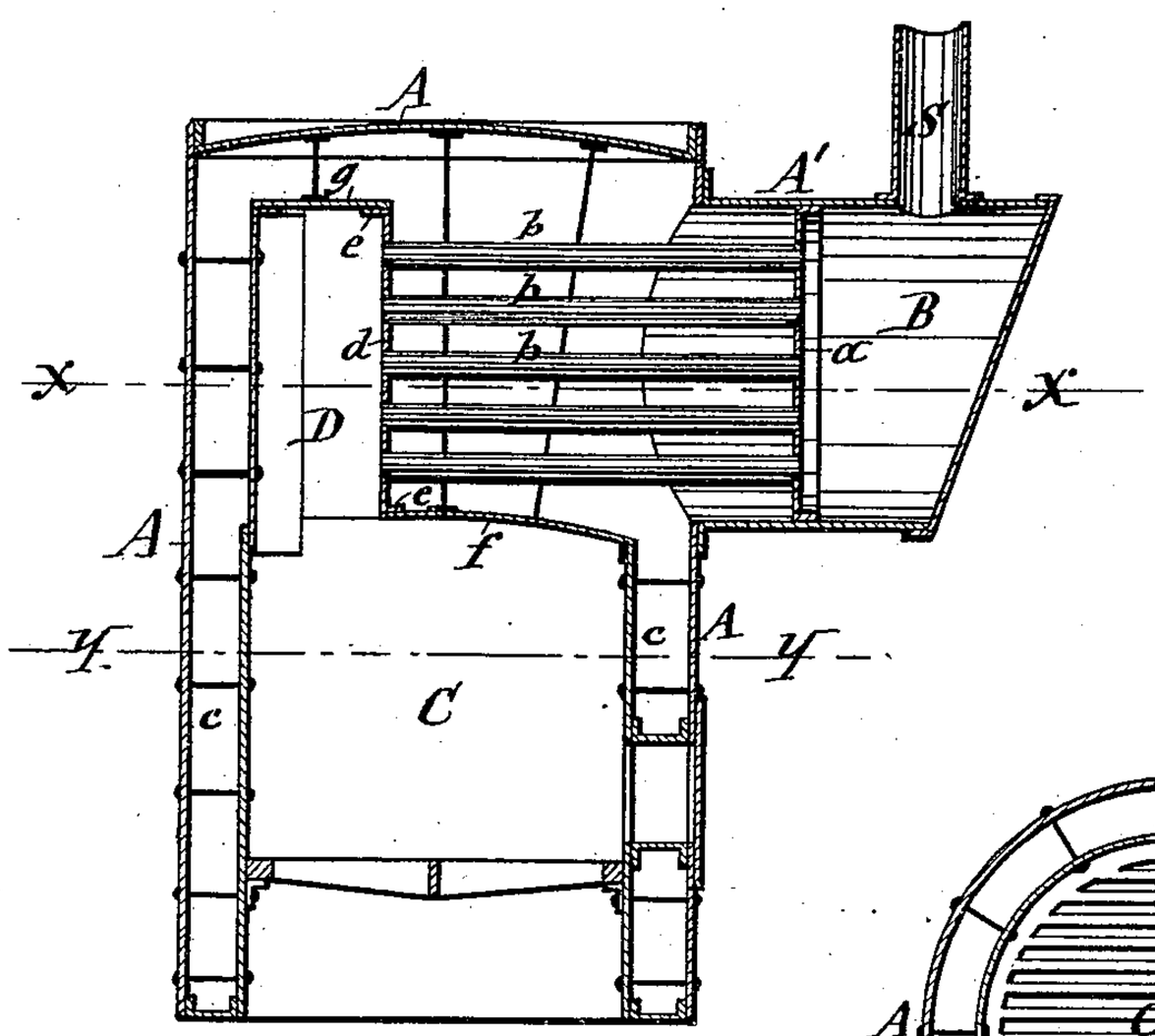

FIG-I-

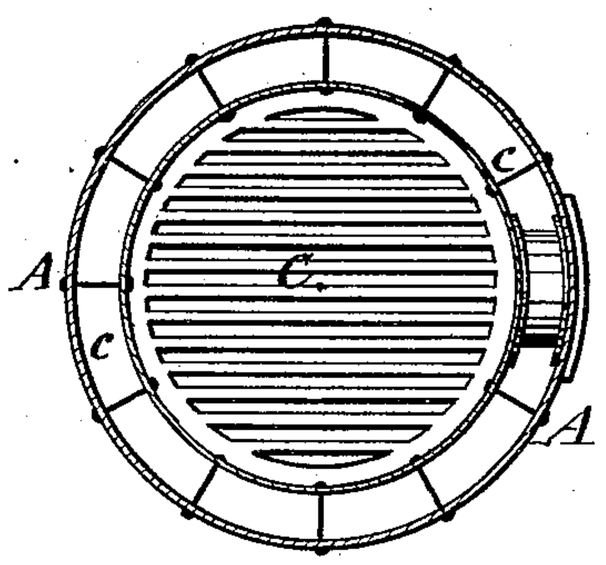

FIG-III-

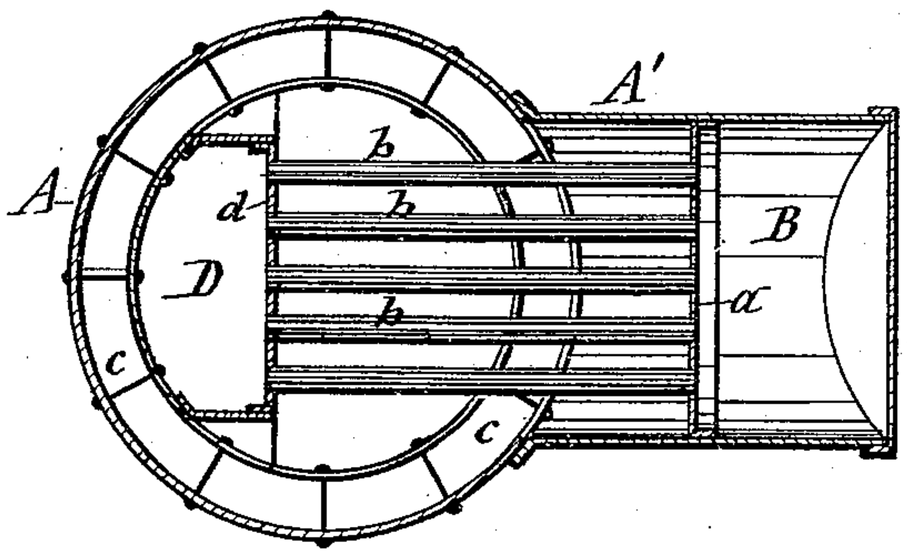

FIG-II-

WITNESSES

C. Bendixon

Wm C. Raymond.

INVENTOR

Patrick Fitzgibbons

per Hull, Laacc & Hey

his attys

UNITED STATES PATENT OFFICE.

PATRICK FITZGIBBONS, OF OSWEGO, NEW YORK.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 313,307, dated March 3, 1885.

Application filed August 11, 1884. (Model.)

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 new and useful Improvements 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 the class of steam-boilers which are placed in a vertical or upright position, with a fire-box arranged inside thereof, and horizontal flues extended across the upper part of the boiler and communicating with the fire-box and with a smoke-box projecting horizontally from the side of the boiler-shell.

The invention consists in certain peculiarities in the construction and combination of the component parts of the boiler, as hereinafter described, and specifically claimed, whereby said boiler is rendered more effective and the joint around the inner flue-sheet is rendered easily accessible for calking and tightening the same.

In the annexed drawings, Figure I is a vertical section of my improved steam-boiler; and Figs. II and III are horizontal transverse sections, respectively, on lines *x x* and *y y* in Fig. I.

Similar letters of reference indicate corresponding parts.

A represents the boiler-shell or boiler proper, made of cylindrical form and placed in a vertical position, the upper portion being formed with a horizontal extension, A′, in which is secured the flue-sheet *a*, for the reception of the outer end of horizontal flues *b b*, which are sustained in the upper part of the boiler, as hereinafter described. The extension A′ terminates in a smoke-box, B, to which is connected the smoke-stack S, the end plate of the said extension being made removable to afford access to the flues for cleaning or repairing the same.

C denotes the fire-box, formed of a cylindrical shell set concentric inside of the lower portion of the boiler A, with a water-space, *c*, between them.

In the lower portion of the boiler A, at the same side from which the extension A′ projects, a feed-door extends into the fire-box C, and above said feed-door a crown-sheet, *f*, spans the fire-box from the feed-door side part way to the opposite side and terminates at the base of a combustion chamber, D, which rises vertically from the top of the fire-box and communicates directly therewith. Said combustion-chamber is formed of a flue-sheet, *d*, which is attached to the free edge of the crown-sheet *f*, and has attached to it the inner ends of the flues *b b*, said flue-sheet constituting one side of the combustion-chamber D. The opposite side of the combustion-chamber consists of a vertical extension of a portion of the fire-box shell, which extension is maintained in concentricity with the portion of the boiler-shell immediately back of it, so as to form a water-back to the combustion-chamber. The aforesaid two sides of the combustion-chamber are united by end plates secured to the vertical edges of the said sides, and a supplemental crown-sheet, *g*, attached to the top edges of the sides and ends of the combustion-chamber completes the latter. The flue-sheet *d*, I form with bottom and top flanges, *e e*, turned in opposite directions and joined, respectively, to the crown-sheet *f* of the fire-box and to the top plate, *g*, of the combustion-chamber, as shown in Fig. I of the drawings, thereby rendering the said joints easily accessible for calking and tightening the same.

In some of the boilers of this class, as heretofore constructed, the crown-sheet of the fire-box has been dispensed with and the side of the fire-box was carried obliquely from the base of the fire-box direct to the bottom edge of the inner flue-sheet, and in this, as well as other similar boilers which have the fire-box extending under the horizontal flues, the fire-door has been arranged at the same side of the fire-box from which the combustion-chamber rises.

It will be observed that the first-mentioned construction excessively increases the width of the water-space between the sides of the fire-box and boiler-shell directly under that portion of the boiler which contains the horizontal flues, and at the same time reduces the heating-surface to such an extent as to greatly impair the efficiency of the boiler, and the aforesaid arrangement of the fire-door allows the cold air to rush from said door when opened directly up to the combustion-cham-

ber, thus cooling the same and the flues of the boiler while introducing fuel into the fire-box. These defects are entirely obviated by my invention, inasmuch as the arrangement of the cylindrical fire-box set concentric in the cylindrical boiler-shell forms an annular water-space of uniform width around the fire-box, which water-space presents maximum heating-surface, and the crown-sheet *f* serves to equalize to a certain degree the water-space over the fire-box, and materially augments the heating-surface under that portion of the boiler which contains the horizontal fire-flues. Furthermore, by the arrangement of the fire-door at the side of the fire-box opposite that from which the combustion-chamber rises I compel the air which enters the fire-door while introducing fuel to pass through the fire before it reaches the combustion-chamber, and thus prevent the cooling of the latter and of the flues; hence

I claim specifically as my invention—

The combination, with the cylindrical upright boiler A, provided with the horizontal extension A′ and horizontal flues *b b*, as shown, of the fire-box consisting of a cylindrical shell set concentric in the boiler-shell under the flues and formed with the crown-sheet *f*, the combustion-chamber D, rising from one side of the fire-box, and the fire-door arranged at the opposite side of the fire-box, all constructed and combined substantially in the manner specified and shown.

In testimony whereof I have hereunto signed my name and affixed my seal, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 22d day of July, 1884.

PATRICK FITZGIBBONS. [L. S.]

Witnesses:

C. H. DUELL,

F. H. GIBBS.