(No Model.)

3 Sheets—Sheet 1.

P. FITZGIBBONS.

STEAM BOILER.

No. 354,467. Patented Dec. 14, 1886.

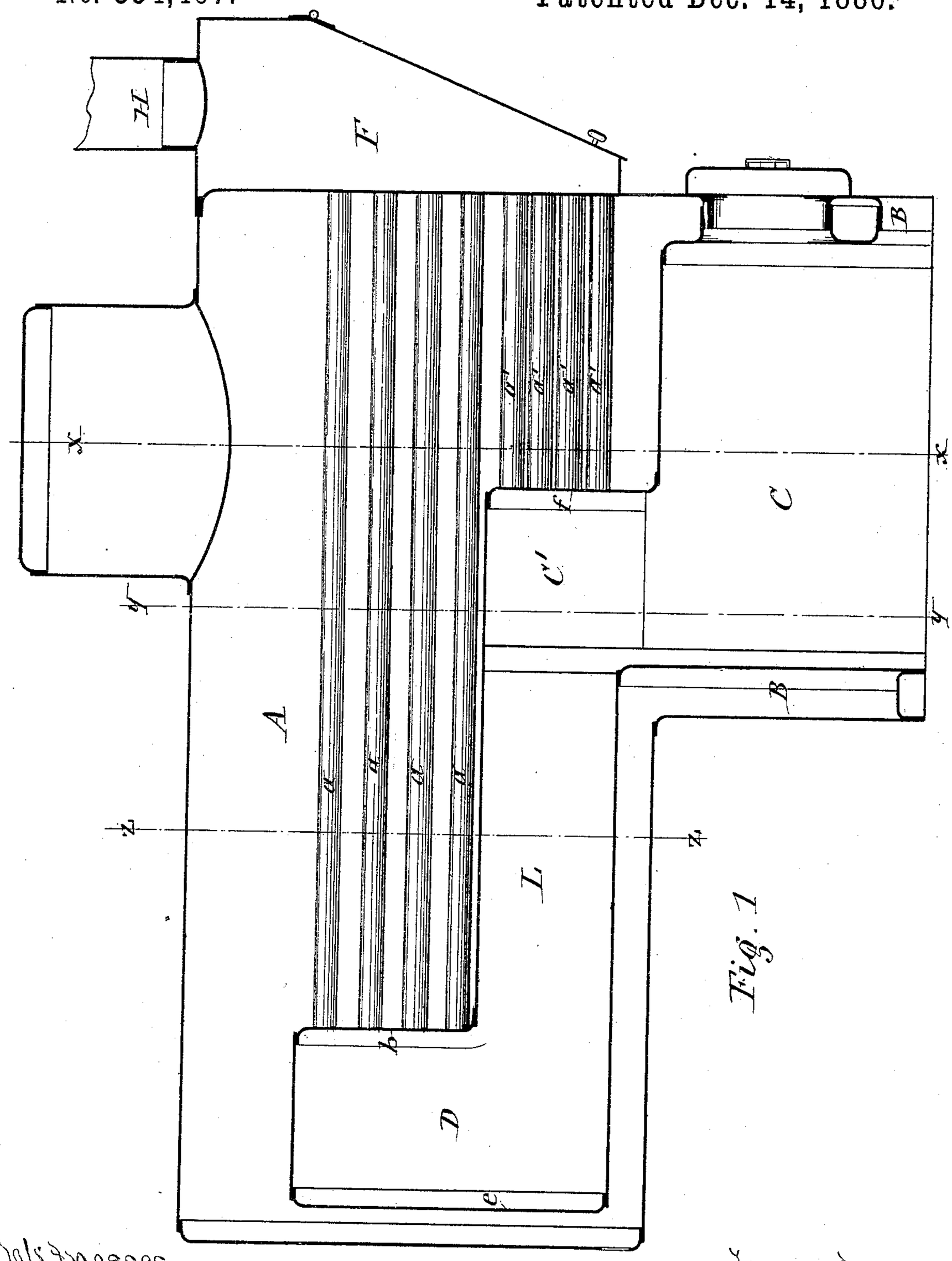

Fig. 1

Witnesses
C. Bendixon
A. F. Walz

Inventor.
Patrick Fitzgibbons
per Dodd, Lacey & Dodd
his Attys

(No Model.) 3 Sheets—Sheet 2.

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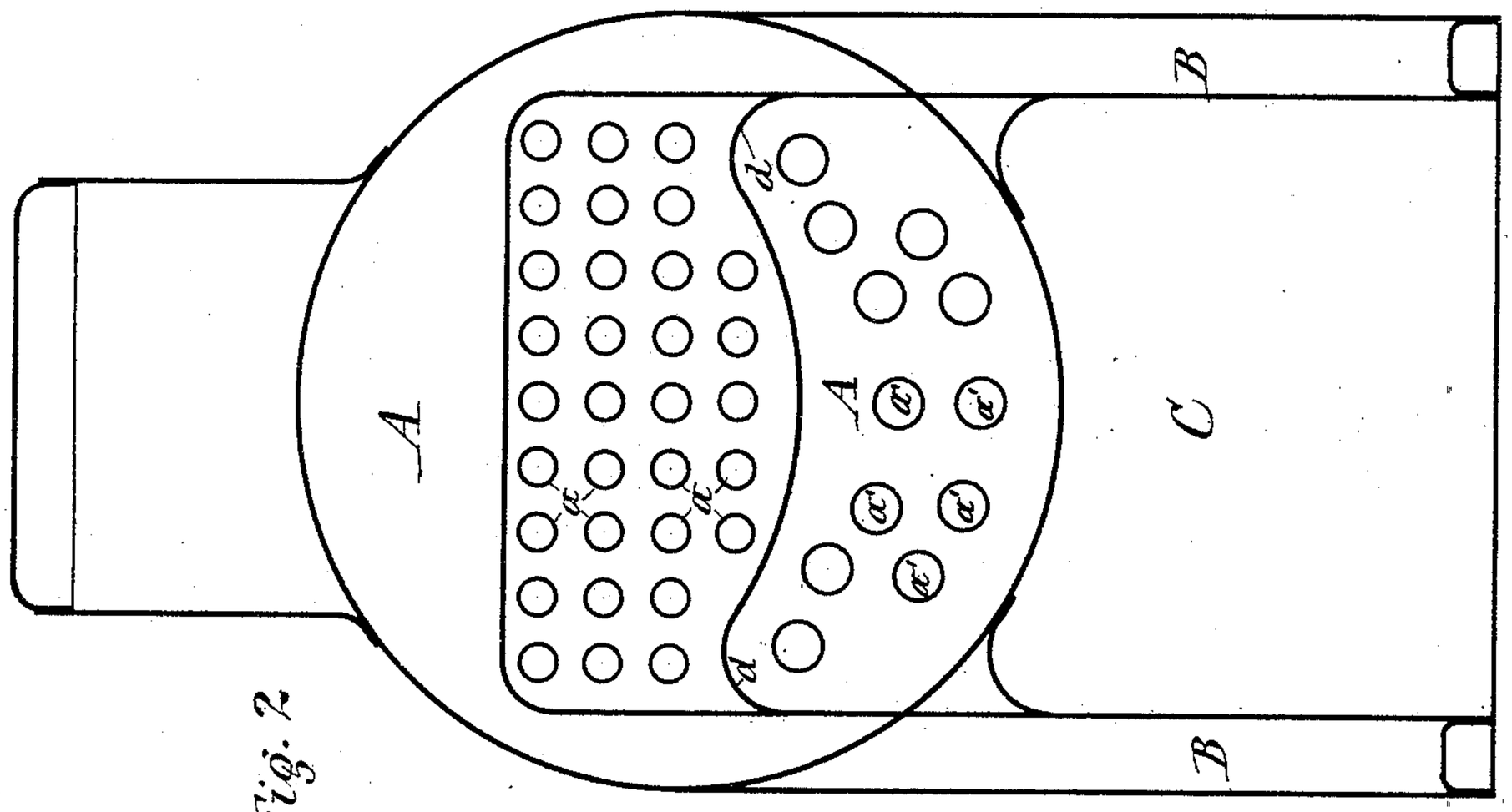

Fig. 2

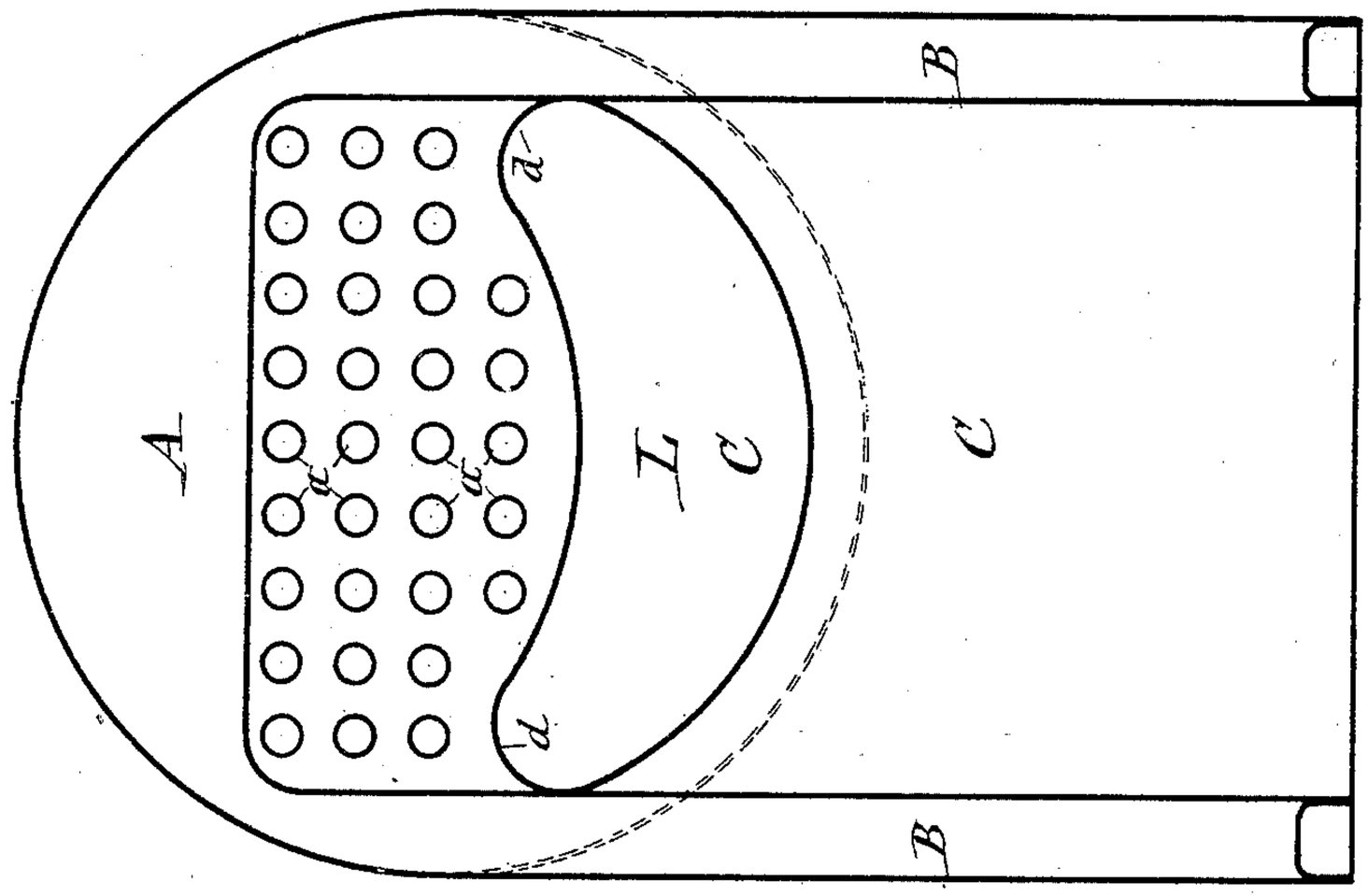

Fig. 3

Witnesses.
C. Bendixon
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his Attys

(No Model.) 3 Sheets—Sheet 3.

P. FITZGIBBONS.

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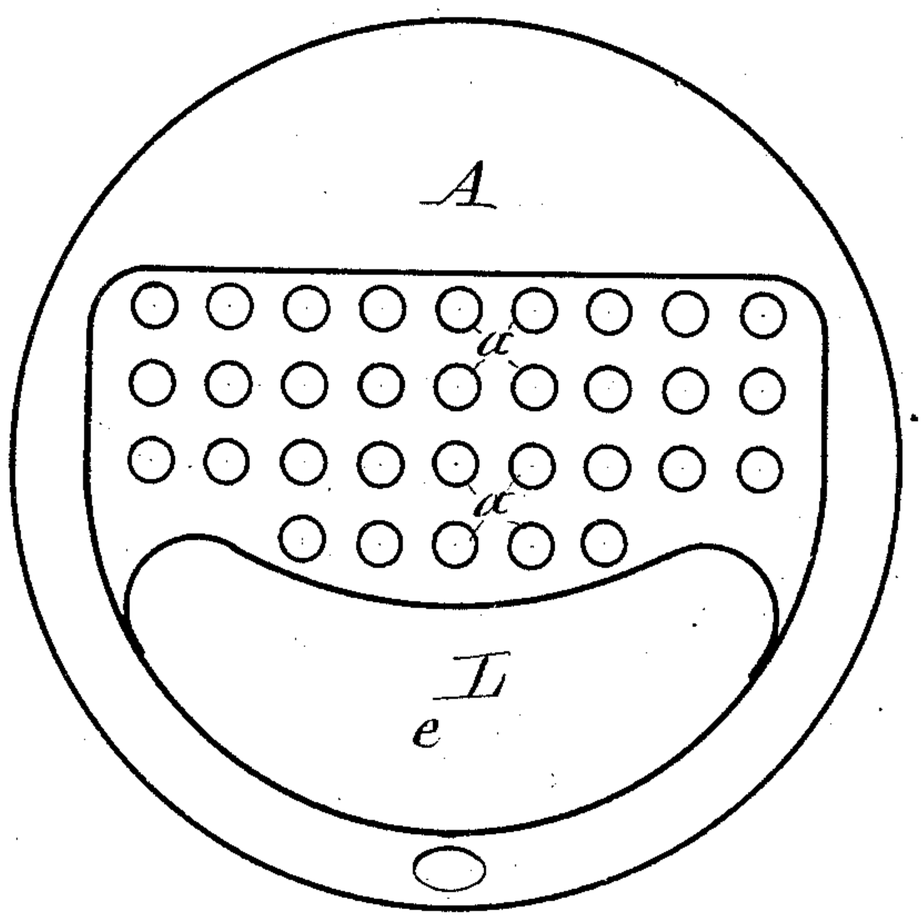

Fig. 4

Witnesses.
C. Bendixon
A. F. Walz.

Inventor.
Patrick Fitzgibbons
per Duell, Laass & Duell
his attys

UNITED STATES PATENT OFFICE.

PATRICK FITZGIBBONS, OF OSWEGO, NEW YORK.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 354,467, dated December 14, 1886.

Application filed October 23, 1886. Serial No. 217,009. (No 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 designated "return-flue boilers," and has special reference to such of the aforesaid boilers which have the fire-box formed with a vertical extension projecting part way into the boiler proper, and fire flues extending from said fire-box extension to the combustion-chamber at the rear end of the boiler.

My present invention consists in a novel construction of a single flue, extending from the fire box extension to the combustion-chamber, as aforesaid, which flue is laterally elongated and occupies the greater portion of the bottom of the boiler, and thus greatly augments the heating-surfaces of the boiler, and also affords access for a person through the fire-box and through the aforesaid flue to the combustion-chamber, for setting or repairing the ends of the flues in the rear flue-sheet.

The invention also consists in a peculiar form of the aforesaid flue and its connection with the fire-box extension and combustion-chamber, as hereinafter fully described, and specifically set forth in the claims.

In the annexed drawings, Figure 1 is a vertical longitudinal section of a boiler embodying my improvements, and Figs. 2, 3, and 4 are vertical transverse sections taken, respectively, on lines *x x*, *y y*, and *z z*, in Fig. 1.

Similar letters of reference indicate corresponding parts.

A represents a horizontal cylindrical boiler-shell, formed at its front end with water-legs B B, which surround the subjacent fire-box C in the usual manner. The rear end of the fire-box is formed with the vertical extension C′, which projects part way into the boiler proper.

D denotes the combustion-chamber, which has heretofore been made to communicate with the vertical extension C′ of the fire-box by cylindrical flues extended through the boiler, and *a a* represents the return-flues extending from the combustion-chamber through the boiler to the smoke-box F on the front of the boiler, and H is the smoke-stack, mounted on the smoke-box in the usual manner.

a′ a′ represent short flues extending from the vertical fire-box extension C′ to the smoke-box F.

As already stated, I have heretofore employed cylindrical flues for conducting the products of combustion from the fire-box extension C′ to the combustion-chamber D. In doing this I was compelled to extend a flue-sheet across the back of the fire-box extension C′ and to extend the back flue-sheet, *b*, to the bottom of the combustion-chamber D, for supporting the cylindrical flues, and also had to provide the bottom of the combustion-chamber with a man-hole to admit a man, when required, for the purpose of setting the flues or repairing the ends of the flues in the flue-sheet *b*. To obviate these defects, and at the same time increase the heating-surface of the boiler, I now employ a single flue, L, extending through the water-space of the boiler from the vertical extension C′ of the fire-box to the combustion-chamber D, the shell of which flue I elongate laterally, so as to occupy the greater portion of the bottom of the boiler proper; and in order to simplify the construction of said flue and its connection with the fire-box extension C′ and combustion-chamber D, and at the same time provide the requisite room for the return-flues *a a*, I form the bottom sheet of the shell of the flue L concave and concentric with the bottom of the boiler proper, and from the top sheet of said shell also concave and curve the longitudinal side portions, *d d*, thereof reverse and downward, and join the same to the longitudinal edges of the bottom sheet of said shell.

The bottom sheet of the flue-shell I extend to the back sheet, *e*, of the combustion-chamber and secure it thereto, and thus form the bottom of the combustion-chamber of the aforesaid extension of the bottom sheet of the flue-shell, as shown in Fig. 1 of the drawings. The top sheet of the flue-shell I extend across the fire-box extension C′ and rivet it to the front flue-sheet, *f*, in said extension, and thus form the crown-sheet *h* of the fire-box extension C′. Said flue L affords convenient access for a person through the fire-box and through the flue

to the combustion-chamber, when necessary to set the flues in the flue-sheet *b*, or to repair the same or any portion of the interior of the combustion-chamber. The downward deflection of the longitudinal central portion of the top sheet of the flue-shell enlarges the room over it, for the arrangement of the return-flues *a a*.

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

1. In a return-flue boiler having the rear end of the fire-box formed with a vertical extension projecting part way into the boiler proper and the combustion-chamber at the rear end of the boiler, a fire-flue extending through the water-space of the boiler from the vertical extension of the fire-box to the combustion-chamber, and the shell of said flue laterally elongated to occupy the greater portion of the bottom of the boiler, substantially as set forth.

2. In a return-flue boiler having the rear end of the fire-box formed with a vertical extension projecting part way into the boiler proper and the combustion-chamber at the rear end of the boiler, a fire-flue extending through the water-space of the boiler from the vertical extension of the fire-box to the combustion-chamber, and the shell of said flue laterally elongated, and the bottom sheet of said shell extended to the back sheet of the combustion-chamber to form the bottom of the latter, substantially as described and shown.

3. In a return-flue boiler having the rear end of the fire-box formed with a vertical extension projecting part way into the boiler proper and the combustion-chamber at the rear end of the boiler, a fire-flue extending through the water-space of the boiler from the vertical extension of the fire-box to the combustion-chamber, the shell of said flue being laterally elongated and the bottom sheet of said shell formed concentric with the bottom of the boiler and extended to the back sheet of the combustion-chamber to form the bottom of the latter, substantially as described and shown.

4. In a return-flue boiler having the rear end of the fire-box formed with a vertical extension projecting part way into the boiler proper and the combustion-chamber at the rear end of the boiler, a fire-flue extending through the water-space of the boiler from the vertical extension of the fire-box to the combustion-chamber, the shell of said flue being laterally elongated and the top sheet of said shell extended across the vertical extension of the fire-box to form the crown-sheet of the latter, substantially as described and shown.

5. In a return-flue boiler having the rear end of the fire-box formed with a vertical extension projecting part way into the boiler proper and the combustion-chamber at the rear end of the boiler, a fire-flue extending through the water-space of the boiler from the vertical extension of the fire-box to the combustion-chamber, the shell of said flue being laterally elongated and the bottom sheet of said shell formed concentric with the bottom of the boiler and extended to the back sheet of the combustion-chamber to form the bottom thereof, and the top sheet of said flue-shell extended across the vertical extension of the fire-box to form the crown-sheet of the latter, substantially as described and shown.

6. In a return-flue boiler having the rear end of the fire-box formed with a vertical extension projecting part way into the boiler proper and the combustion-chamber at the rear end of the boiler, a fire-flue extending through the water-space of the boiler from the fire-box extension to the combustion-chamber, the shell of said flue being laterally elongated and the bottom sheet of said shell formed concentric with the bottom of the boiler, and the top sheet of the flue-shell concaved and the longitudinal side portions thereof curved reverse and downward and joined to the longitudinal edges of the bottom sheet, substantially as described 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 25th day of September, 1885.

PATRICK FITZGIBBONS. [L. S.]

Witnesses:
HOWARD P. DENISON,
C. H. DUELL.