

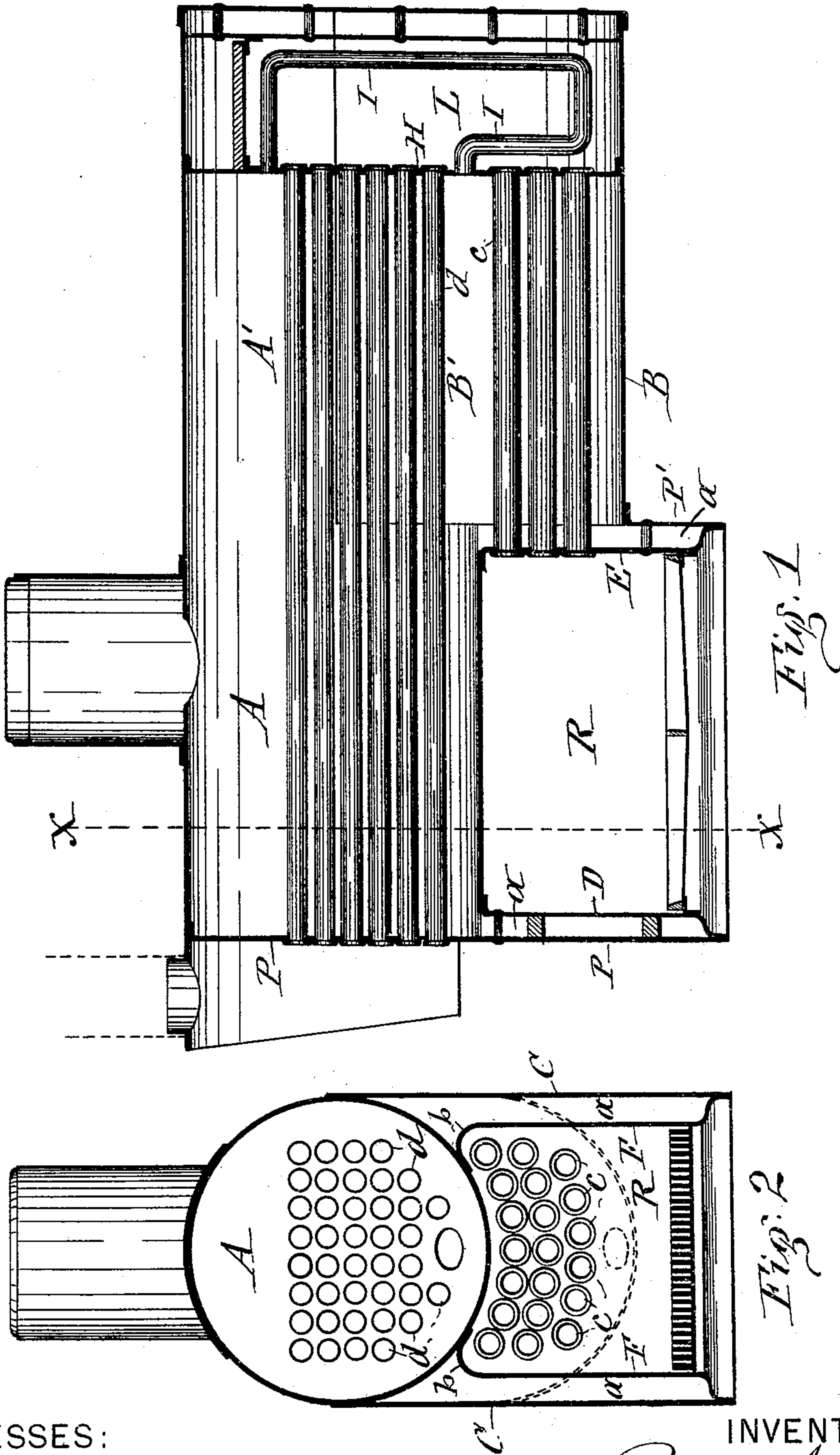
(No Model.)

2 Sheets—Sheet 1.

R. JOY.
STEAM BOILER.

No. 495,977.

Patented Apr. 25, 1893.



WITNESSES:

G. L. Bendixon
Geo. W. White.

INVENTOR:

Robert Joy
By Hull Laass & Hull
his ATTORNEYS.

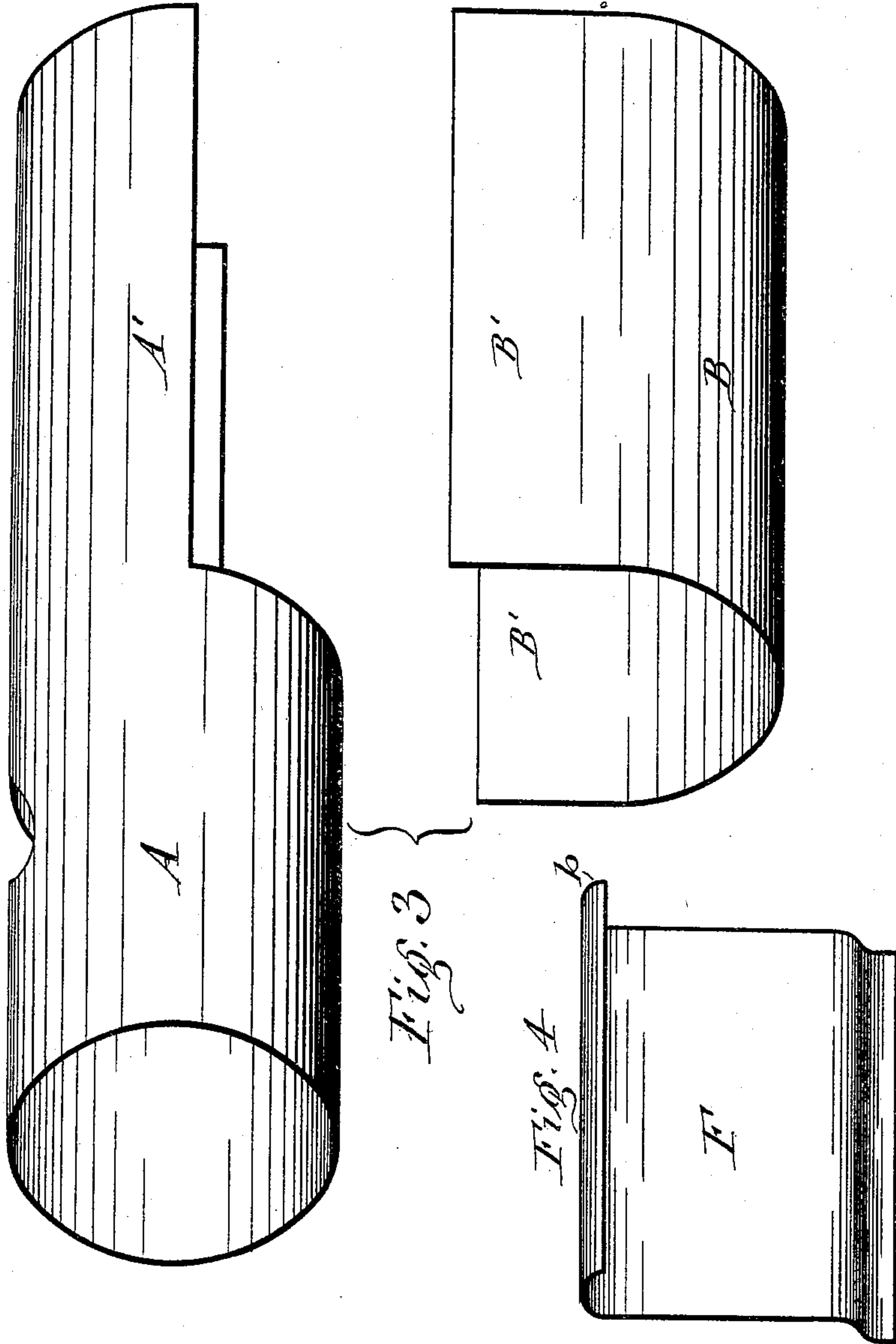
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2 Sheets—Sheet 2.

R. JOY.
STEAM BOILER.

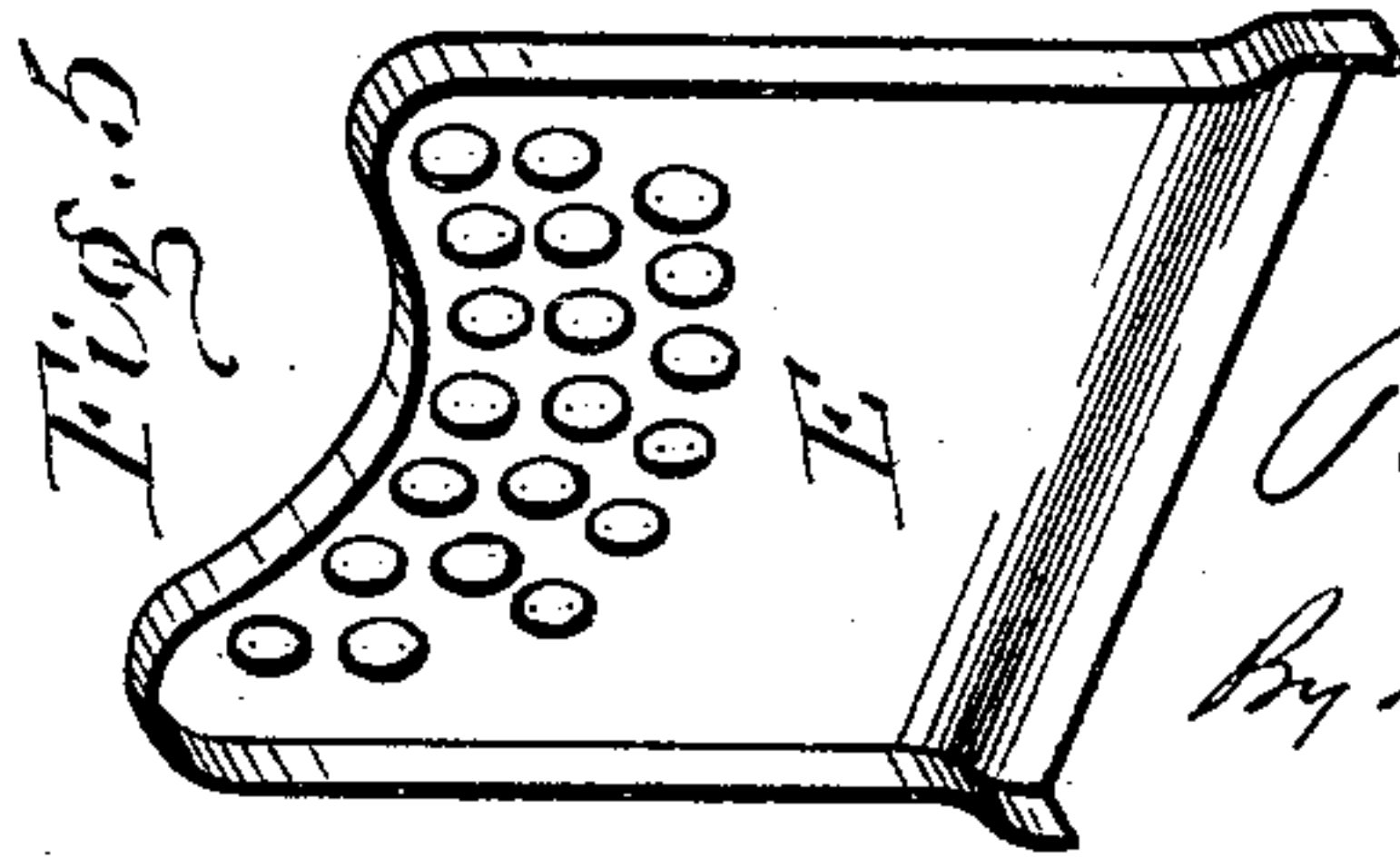
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WITNESSES:

C. L. Bendixon
Geo. M. White.



INVENTOR:

Robert Joy
By Knuth, Laess & Knuth
his ATTORNEYS.

UNITED STATES PATENT OFFICE.

ROBERT JOY, OF OSWEGO, NEW YORK, ASSIGNOR TO THOMSON KINGSFORD,
OF SAME PLACE.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 495,977, dated April 25, 1893.

Application filed January 31, 1893. Serial No. 460,411. (No model.)

To all whom it may concern:

Be it known that I, ROBERT JOY, of Oswego, in the county of Oswego, in the State of New York, have invented new and useful
5 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 re-
10 turn flue boilers in which the front end portion of the boiler-shell proper is of cylindrical form and the rear portion is vertically elongated and has the direct flues extending through it and connected to the fire-box
15 formed directly under the cylindrical front portion of the shell. And the invention consists in a novel construction and combination of the component parts of the boiler-shell and fire box shell which latter is surrounded by
20 a water leg and thus materially increases the heating surface of the boiler, as hereinafter more fully described and specifically set forth in the claim.

In the annexed drawings Figure 1 is a vertical longitudinal section of a steam-boiler
25 embodying my improvements. Fig. 2 is a vertical transverse section on line x, x , in Fig. 1. Fig. 3 is a perspective view of the component parts of the boiler shell proper. Fig. 4 is a detached perspective view of one
30 of the inner side plates of the fire-box, and Fig. 5 is a detached perspective view of the direct flue-sheet which forms the inner rear wall of the fire-box.

35 Similar letters of reference indicate corresponding parts.

The boiler-shell proper I form of the cylindrical front portion —A— and semi cylindrical rearward extension —A'— which is a continuation of the upper half of the cylindrical
40 portion as shown in Fig. 3 of the drawings, which also shows the section which forms the bottom and sides of the rear end portion of the boiler shell, and consists of the inverted semi-cylindrical bottom plate —B— formed
45 with the vertical extensions —B'—B'— at the top edges of which latter it is riveted to the bottom edges of the semi-cylindrical top portion —A'.

50 To the front of the cylindrical portion —A— is riveted the front flue sheet —P— which is

vertically elongated and extends beneath the plane of the bottom of the rear portion —B— as shown in Fig. 1 of the drawings. The rear
flue-sheet —H— is secured to the interior of 55 the boiler shell a proper distance from the rear end thereof to form the smoke-box —L—. To the front end of the rear portion —B— B'—B'— is riveted the vertical plate —P'— the bottom edge of which is on a level with 60 the bottom of the front plate —P. To opposite sides of the cylindrical front portion —A— are riveted the vertical side plates —C—C— which extend directly and tangentially from said shell and terminate in 65 the same plane with bottoms of the plates —P—P'. The said side plates together with the plate —P'— and lower portion of the plate —P— form the outer walls of the fire box —R— which is surrounded by a water- 70 leg formed of the inner front plate —D— attached to the bottom portion of the cylindrical shell —A— and arranged with a water space —a— between it and the front plate —P. The inner rear plate —E— which con- 75 stitutes the front direct flue sheet, is also attached to the bottom portion of the cylindrical shell —A— and arranged with the water space —a— between it and the plate —P'. The inner side-plates —F—F— are prefer- 80 ably bent inward at their upper ends as shown at —b— in Figs. 2 and 4 of the drawings so as to form small arches over the sides of the fire-box. The longitudinal edges of said bent or arched portions of the side plates are riv- 85 eted to the under side of the cylindrical portion —A— which forms the crown sheet of the fire-box. Said inner side plates are also disposed with the water space —a— between them and the outer side-plates —C—C—. 90 The bottom edges of the described inner plates of the fire-box are all flanged outward and riveted to the bottom edges of the outer plates —P—P'— and —C—C.

The efficiency of the boiler may be aug- 95 mented by the pipe —I— which is located in the smoke-box —L— and taps the boiler head preferably between the direct flues —c— and return flues —d— to avoid the entrance of 100 sediments into said pipe. The pipe is extended in a tortuous course through the interior of the smoke-box and thence into the

upper part of the boiler shell as shown in Fig. 1 of the drawings. The pipe forms an additional water space which is heated by the products of combustion entering the smoke-box and impinging the pipe.

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

In a return flue boiler of the class described, the combination with the cylindrical shell —A— formed with the semi cylindrical rearward top-extension —A'—, the inverted semi-cylindrical bottom plate —B— formed with the vertical extensions —B'— riveted to the bottom edges of the extension —A'—, and the plates —P—P'— attached to said parts as shown, of the side-plates —C—C— attached directly tangentially to the sides of the cy-

lindrical shell —A—, and the fire box-shell formed of the front-plate —D— attached to the cylindrical shell —A— with the water space —a— between it and the plate —P—, the fluesheet —E— also attached to the aforesaid cylindrical shell with the water space between said sheet and plate —P'—, and the side-plates —F—F— attached to said cylindrical shell with the water space between said plates and outer plates —C—C—, all combined substantially as described and shown.

In testimony whereof I have hereunto signed my name this 28th day of January, 1893.

ROBERT JOY. [L. s.]

Witnesses:

EPHRAIM M. WILKINSON,
B. W. BURLEIGH.