

No. 639,907.

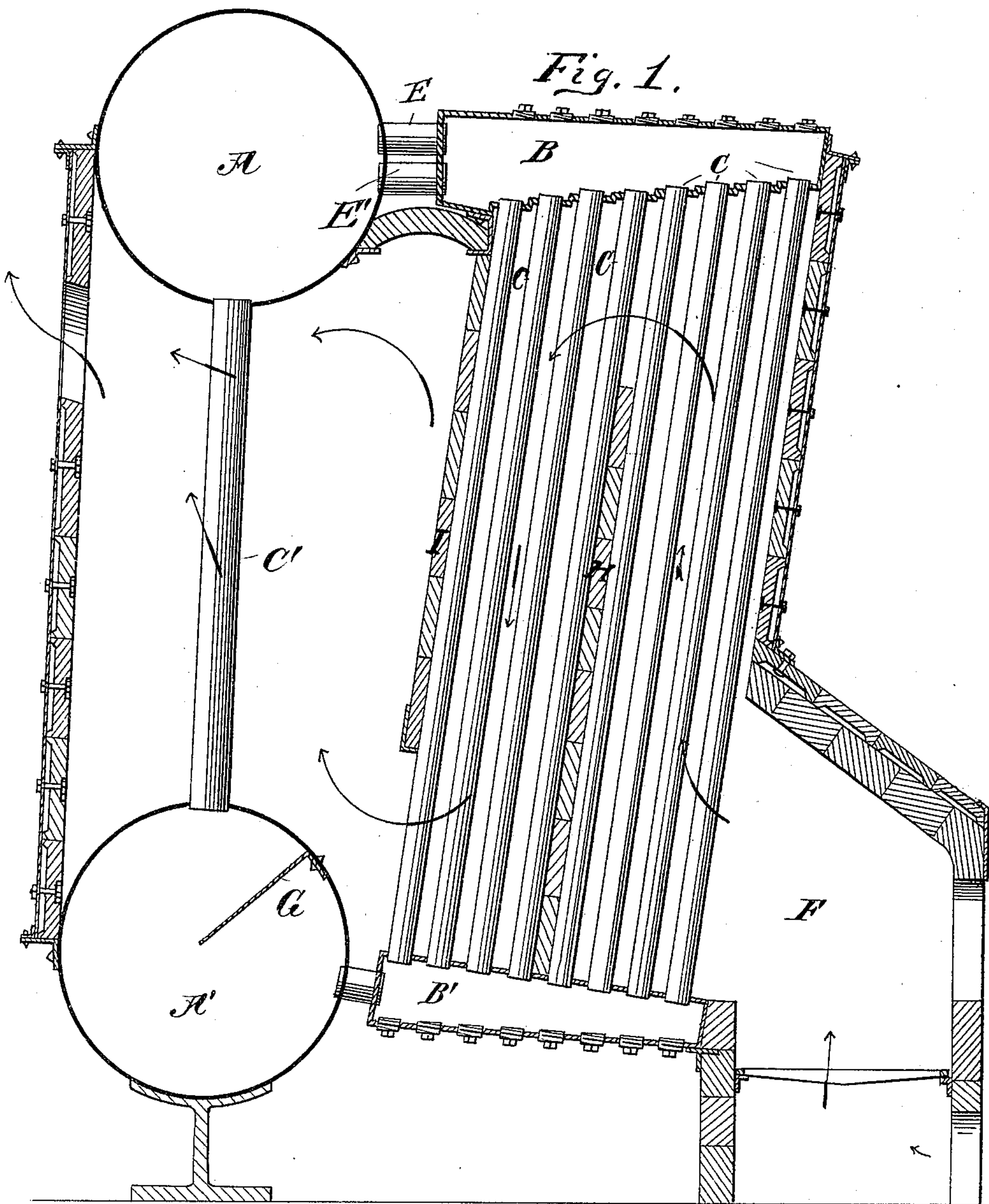
Patented Dec. 26, 1899.

C. B. REARICK.  
STEAM BOILER.

(Application filed Dec. 4, 1897.)

(No Model.)

2 Sheets—Sheet 1.



WITNESS

*C. W. Benjamin*  
*Theo. F. Scheffler, Jr.*

INVENTOR

*Chas. B. Rearick*

No. 639,907.

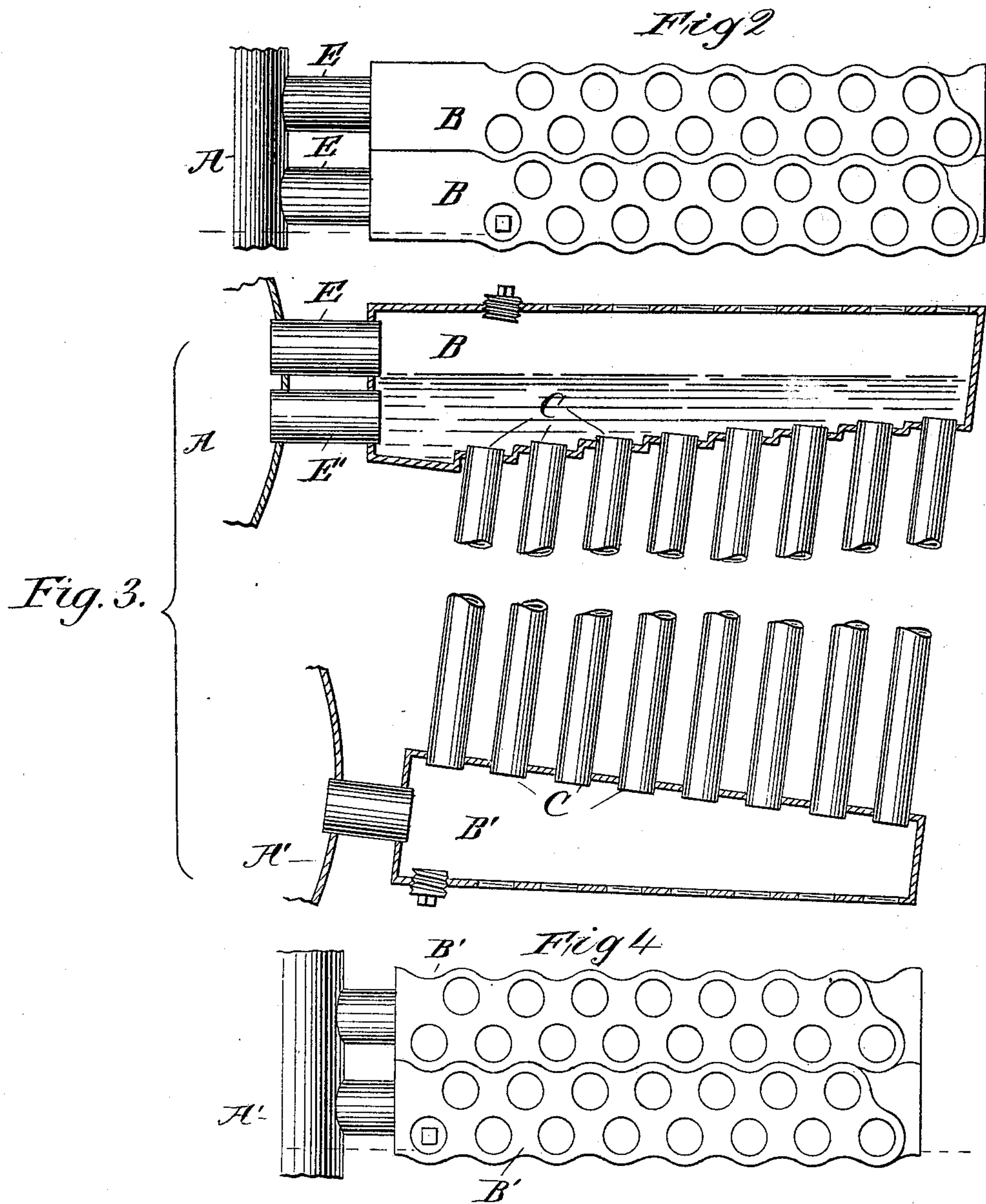
Patented Dec. 26, 1899.

C. B. REARICK.  
STEAM BOILER.

(Application filed Dec. 4, 1897.)

(No Model.)

2 Sheets—Sheet 2.



WITNESSES

C. W. Benjamin  
H. B. Smith

INVENTOR

Chas. B. Rearick



# UNITED STATES PATENT OFFICE.

CHARLES B. REARICK, OF WARREN, PENNSYLVANIA.

## STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 639,907, dated December 26, 1899.

Application filed December 4, 1897. Serial No. 660,785. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES B. REARICK, a citizen of the United States, and a resident of Warren, county of Warren, State of Pennsylvania, have invented certain new and useful Improvements in Steam-Boilers; and I do hereby declare that the following specification, with the drawings thereto annexed, is a full and complete description of the same.

10 I had in view in inventing this boiler, first, compactness to cover little ground-space; second, a vertical action to secure rapid circulation and to free the steam from the heating-surface as rapidly as possible and with the  
15 least obstruction possible on its way to the steam and water drum after leaving the effective heating-surface; third, a furnace as closely located to the heating-surface as possible without the bad effects of preventing the gases  
20 from rising to a high temperature, which would result if the heating-surface was placed directly over the fire-bed; fourth, a boiler in which the solid impurities in the water would not interfere with the economic working or  
25 natural life of the boiler; fifth, an arrangement of flame-deflecting walls for holding the gases on the heating-surface as long as possible without checking the draft sufficiently to cause combustion to be too slow.

30 In the drawings, Figure 1 represents a vertical cross-section through furnace and boiler. Fig. 2 represents a top view of upper headers. Fig. 3 represents a vertical cross-section of headers and connections, showing water-line.  
35 Fig. 4 represents a bottom view of lower header.

Like letters of reference represent same parts in the different figures.

40 The boiler consists of one or more top headers or manifolds B, extending in a horizontal direction, (or they may be placed in a direction somewhat inclined to the horizontal,) a cylindrical steam and water drum A, having its axis horizontal and parallel to the front  
45 of the boiler and connected to the header or headers B, so that the water-line passes through said steam and water drum and connections and into said headers, a cylindrical water and mud drum A', having its axis parallel with that of the water and steam drum,  
50 but below it and connected to it by a series of vertical or vertically-inclined tubes or pipes

C. The water and mud drum is connected to bottom header or a series of bottom headers or manifolds B', this bottom header or headers being connected to top header or headers B by means of a series of vertical or vertically-inclined tubes C. In the water and mud drum A' is placed a deflecting-plate G, which extends from the upper portion of shell downward, same being placed between the inlet-openings from large tubes connecting steam and water drum with water and mud drum and outlet-openings into bottom header or headers.

The following is a description of the operation of the same: The boiler being filled with water and the fire started in furnace F, the heat passing in among tubes C causes the circulation in the water to rise to header B. From there to steam and water drum A, down tubes C' to water-drum A' into header B', and so on up again through tubes C. In this manner I get a rapid and free circulation. By this construction, if sufficient draft is applied to increase the circulation beyond the capacity of tubes C', the water will flow down from header B to header B' through tubes C, between walls H and I, which will prevent a rapid fluctuation of water-line, that is caused in some forms of boilers, and also give drier steam at the steam-supply pipe.

I show the header B with an irregular surface where the tubes enter, owing to placing the tubes on an angle and wishing to maintain header B in a horizontal line, while header B' is slightly pitched downward at the far end from water-drum A'. While I prefer this construction, I may have both headers in a horizontal position and tube C perfectly straight in a vertical line. In that case there would not be any irregular surface where the tubes enter header B. I may construct this boiler of one header at the top and one at the bottom, or there may be a series of them both top and bottom. In this manner of construction with a series I would avoid the expense of staying the upper and lower sides of the said headers, which would have to be done if they were in one header of any size.

Deflecting-plate G in lower water-drum A', I place there for the object of preventing the water taking too short a course from tubes C' to header or headers B', which would pre-



vent to some extent the opportunity of sediment settling in the lower part of water-drum A'.

I connect header or headers B to water and steam drum A by short tubes E and E'. I might use only one, similar to the lower connection; but I prefer to use two, as in case I should run my water-line below or part way up in tube E, this would give me a free exit of steam from header B into steam and water drum A.

By feeding water in at drum A the new water added will be heated to such a temperature by the time it reaches drum A' that the solid matter will be precipitated and collected in said drum A' and by means of blow-off at bottom of this drum can be removed.

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

1. Combination in a water-tube boiler of a furnace, water and steam drum A, connected to a substantially horizontal header or headers B so that water-line passes through said header or headers, connections and water and steam drum A; downflow-pipes C' connecting steam and water drum A to water and mud drum A', said drum A' being connected to header or headers B', header or headers B' connected by upflow-pipes C to header or headers B, all substantially as shown and described and for the purpose set forth.

2. Combination in a water-tube boiler of a furnace, water and steam drum A, substantially horizontal header or headers B connected to water and steam drum A by two or more pipes E and E' one above another as described and for the purpose set forth, downflow-pipes C' connecting drum A to lower header or headers B', header or headers B' connected to header or headers B by water-tubes C.

3. Combination in a water-tube boiler of a furnace, water and steam drum A, header or headers B connected to water and steam drum A by one or more tubes E and one or more tubes E', as described and for the purpose set forth, header or headers B connected to header or headers B' by water-tubes C, header or headers B' being also connected to water and mud drum A', water-tubes C' connecting water and mud drum A' to water and steam drum A, all substantially as shown and described.

4. Combination in a water-tube boiler of a furnace F, water and steam drum A, substantially horizontal header or headers B, with connections to drum A as shown and described; said header or headers B connected to lower header or headers B' by water-tubes C, said lower header or headers B' connected to water and mud drum A', separating-plate G in drum A', water-tubes C' connecting water and mud drum A' to water and steam drum A as shown and described and for the purpose set forth.

5. The combination of a steam and water drum, header or headers and passages between the same, said steam and water drum being placed with its axis in a horizontal plane which enters the interior or interiors of said header or headers, with main downflow-pipes leaving the steam and water drum from the lower side thereof at intervals along its length, all substantially as described and for the purpose set forth.

Signed at Warren, in the county of Warren and State of Pennsylvania, this 1st day of December, A. D. 1897.

CHAS. B. REARICK.

Witnesses:

CHAS. DINSMORE,  
E. H. BESH LIN.

It is hereby certified that in Letters Patent No. 639,907, granted December 26, 1899, upon the application of Charles B. Rearick, of Warren, Pennsylvania, for an improvement in "Steam-Boilers," an error appears in the printed specification requiring correction, as follows: On page 1, line 53, the reference letter "C" should read *C'*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 23d day of January, A. D., 1900.

[SEAL.]

THOS. RYAN,  
*First Assistant Secretary of the Interior.*

Countersigned:

C. H. DUELL,  
*Commissioner of Patents.*