

No. 666,336.

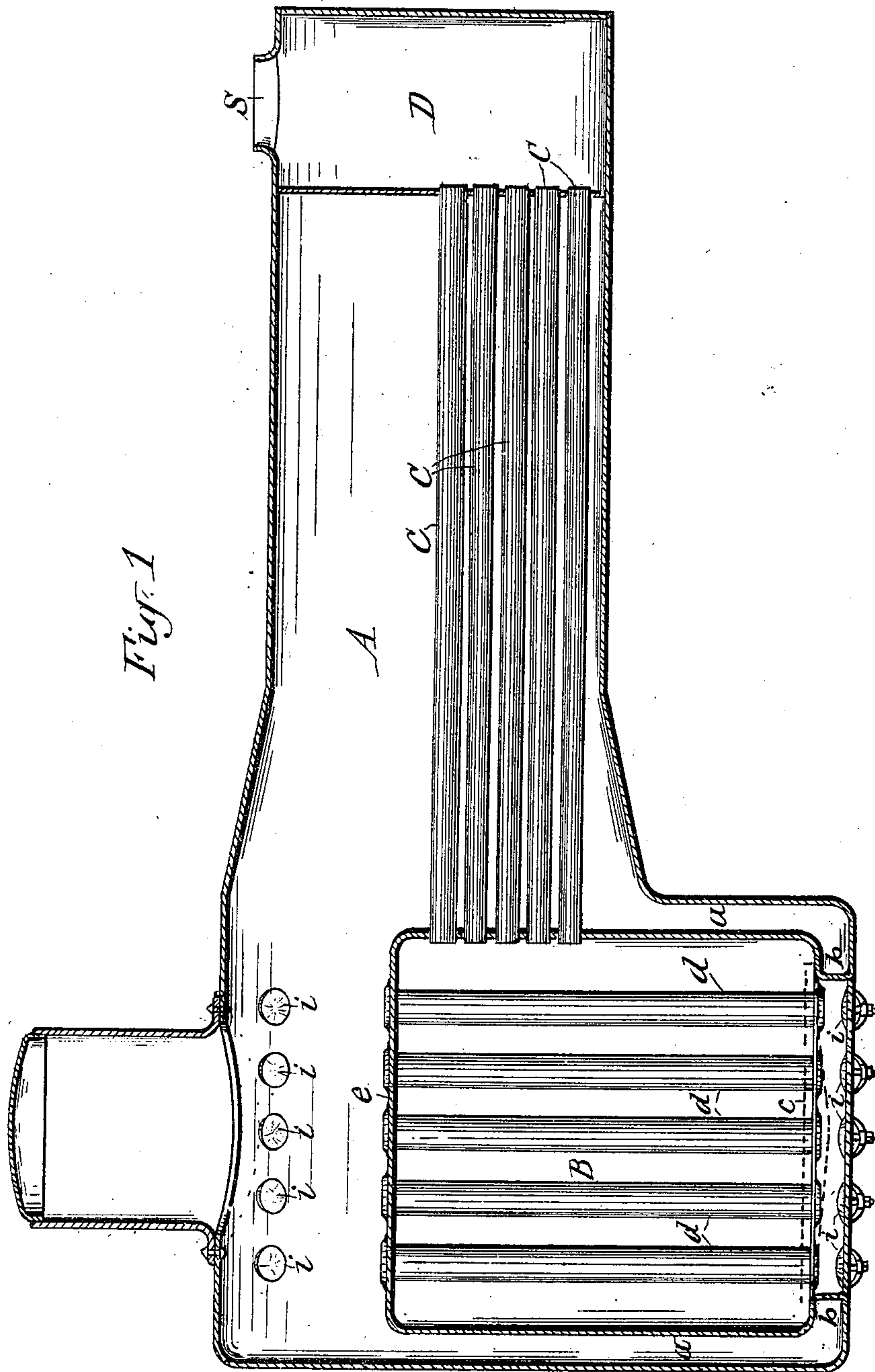
Patented Jan. 22, 1901.

J. J. TONKIN.
STEAM BOILER.

(Application filed May 26, 1900.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

H. B. Smith

J. J. Laess

INVENTOR

John J. Tonkin

By E. Laess

ATTORNEY

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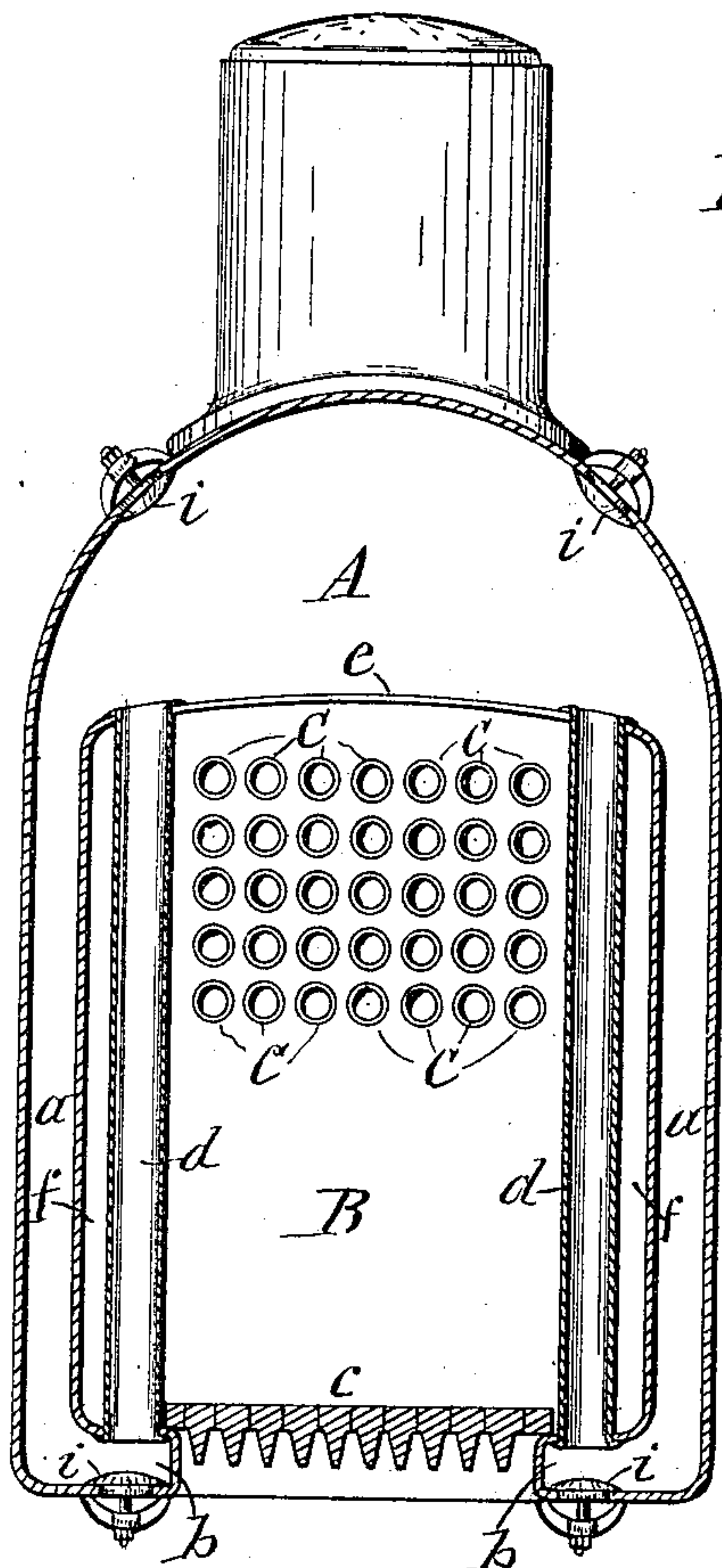
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2 Sheets—Sheet 2.

Fig. 2



WITNESSES:

H. B. Smith,

J. J. Laase

INVENTOR

John J. Tonkin

By E. Laase

ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN J. TONKIN, OF OSWEGO, NEW YORK.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 666,336, dated January 22, 1901.

Application filed May 26, 1900. Serial No. 18,087. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. TONKIN, a citizen of the United States, and a resident 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.

10 This invention relates to the class of steam-boilers which are formed with a subjacent water-jacketed furnace or fire-box and with water-tubes extending through said furnace.

15 The object of the invention is to simplify and reduce the cost of the construction of such boilers and at the same time increase their efficiency and stability; and to that end the invention consists in the improved construction and combination of parts hereinafter described and set forth in the claims.

20 In the annexed drawings, Figure 1 is a vertical longitudinal section of a steam-boiler embodying my invention, and Fig. 2 is a transverse section on line X X in Fig. 1.

25 A represents the boiler proper, consisting of a horizontal cylindrical shell, which is formed at its front end with the water-jacketed furnace B, extending some distance below the shell A.

30 C C denote fire-flues extending from the furnace longitudinally through the boiler and into a smoke-box D, built on the rear end of the boiler, and S is the smoke-exit, which leads to the smoke-stack mounted on the smoke-box in the usual manner.

35 The furnace B is surrounded by the water-leg *a*, which is formed of plain vertical plates, the inner plate extending from the base of the water-leg directly to the crown-sheet, while the outer plate is a continuation of a portion of the boiler-shell. The vertical walls of the water-leg are thus of the ordinary simple construction. The base of the water-leg terminates with an inwardly-extending continuous water-ledge *b*, which is formed of horizontal extensions of the inner and outer plates of the water-leg and surrounds the space in which is arranged the grate *c*, which is thus located in the plane of the aforesaid ledge, as shown. *d d* represent vertical water-tubes, which extend from the ledge *b* di-

rectly to the crown-sheet *e*, and the protruding ends of said tubes are expanded and beaded in said parts to form ties between them. These tubes are disposed sufficiently remote from the inner sides of the water-leg to form between them passages *f f* for the products of combustion, which thus completely surround each tube throughout the entire length thereof. The grate *c* being located at the base of the water-leg causes the products of combustion to impinge the lower ends of the tubes *d d* as effectually as any other portions of the lengths of said tubes, and thereby accelerates the circulation of the water from the ledge *b* to the water-space over the crown-sheet, and thus obviates accumulation of sediment in the ledge *b*, this ledge forming a continuous water-space around the base of the furnace and affording direct communication between the tubes at the bases thereof. To permit the ends of said water-tubes to be properly and conveniently expanded and beaded, so as to effectually tie them to the ledge *b* and crown-sheet *e*, the top portion of the boiler-shell A and the bottom of the ledge *b* are provided with hand-holes *h h*, which are in range with the tubes and provided with water-tight removable cover-plates *i i*. Said hand-holes are of proper sizes to permit the introduction of the tool by which to expand and bead the ends of the tubes, as aforesaid.

What I claim as my invention is—

1. In a steam-boiler the combination of the furnace having a water-leg terminated with a continuous water-ledge extending around the base of the furnace and formed of inward extensions of the inner and outer plates of the water-leg, and water-tubes extending vertically from said ledge directly to the crown-sheet substantially as described and shown.

2. The combination of a steam-boiler formed with its furnace underneath and with a water-leg around said furnace, the inner walls of said water-leg consisting of vertical plates extending from the base of said leg direct to the crown-sheet, and said base formed with inwardly-extending feet, the grate located at said feet, water-tubes extending vertically from said feet to the crown-sheet and having the protruding ends expanded and beaded in

said parts to form ties between them, said
tubes being disposed remote from the inner
walls of the water-leg and forming passages
for the products of combustion completely
5 around the tubes throughout the lengths
thereof, and hand-holes in the bottom of the
aforesaid feet and in the top of the boiler-

shell and in range with the aforesaid water-
tubes all constructed and combined as set
forth.

JOHN J. TONKIN. [L. s.]

Witnesses:

J. J. LAASS,

H. B. SMITH.