

No. 639,390.

Patented Dec. 19, 1899.

B. HOLT.
BOILER.

(Application filed June 8, 1899.)

(No Model.)

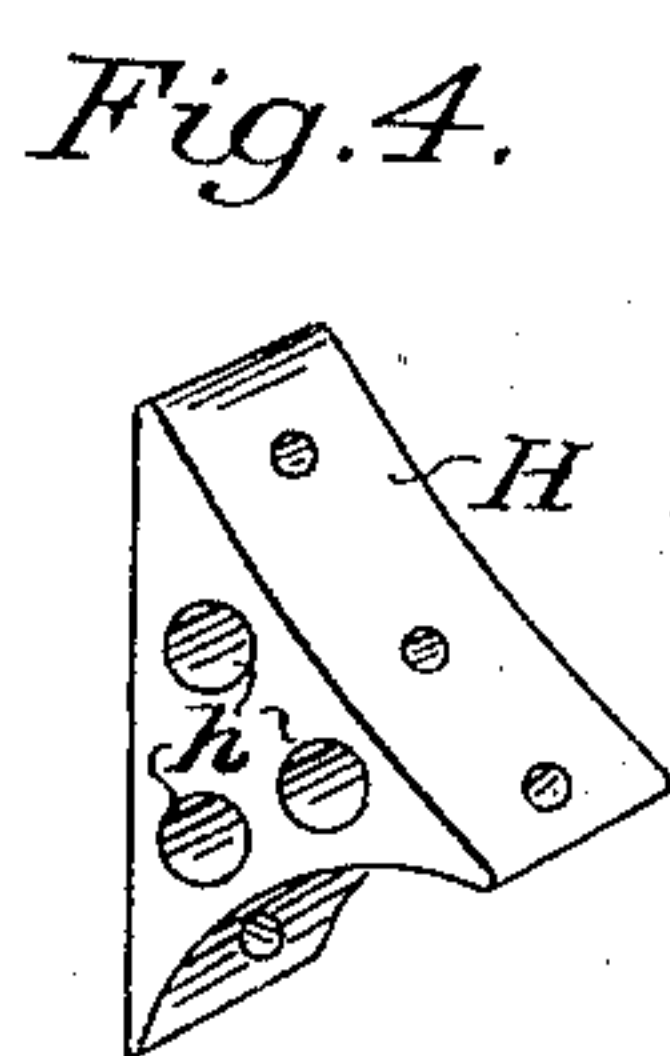
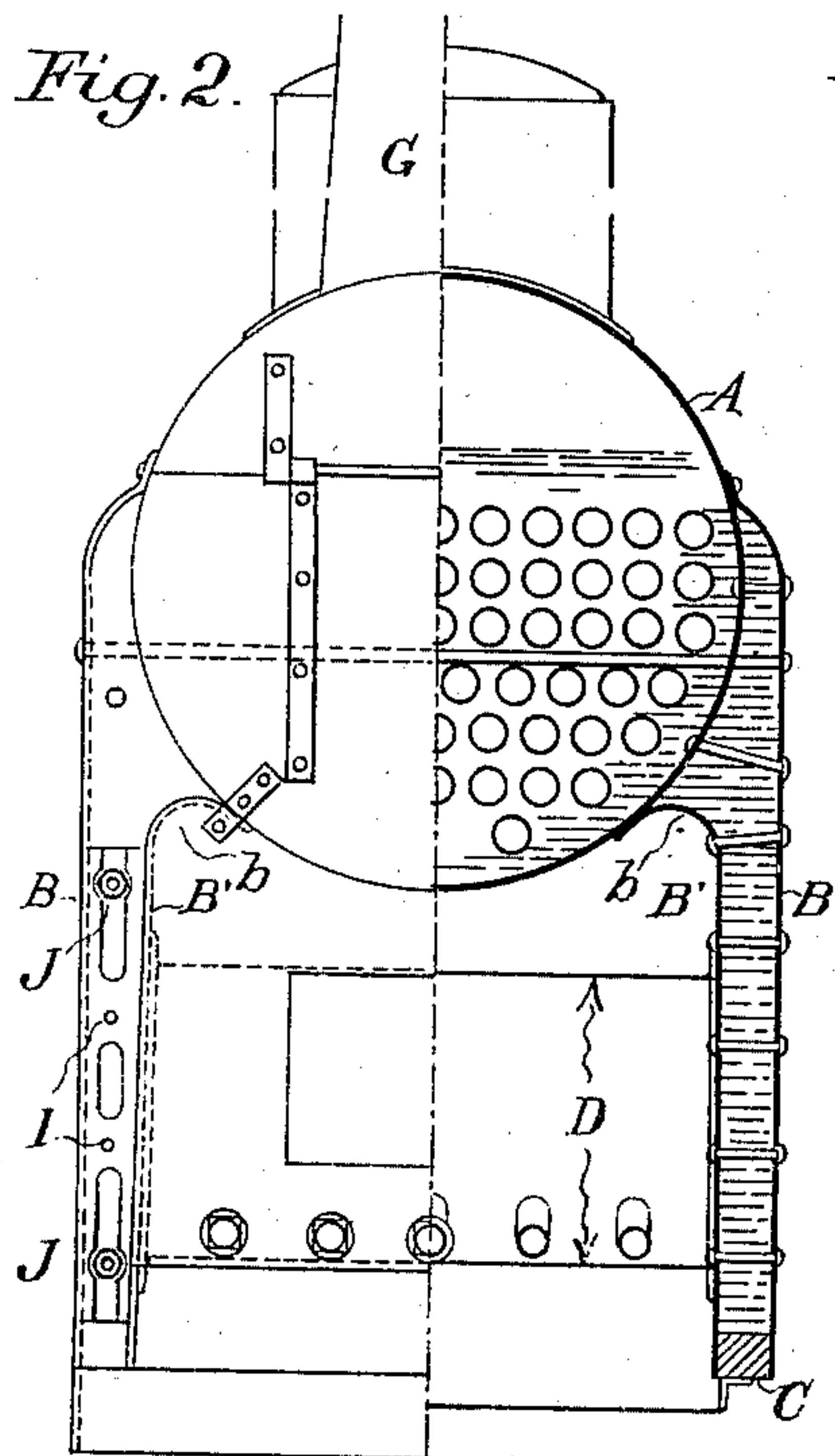
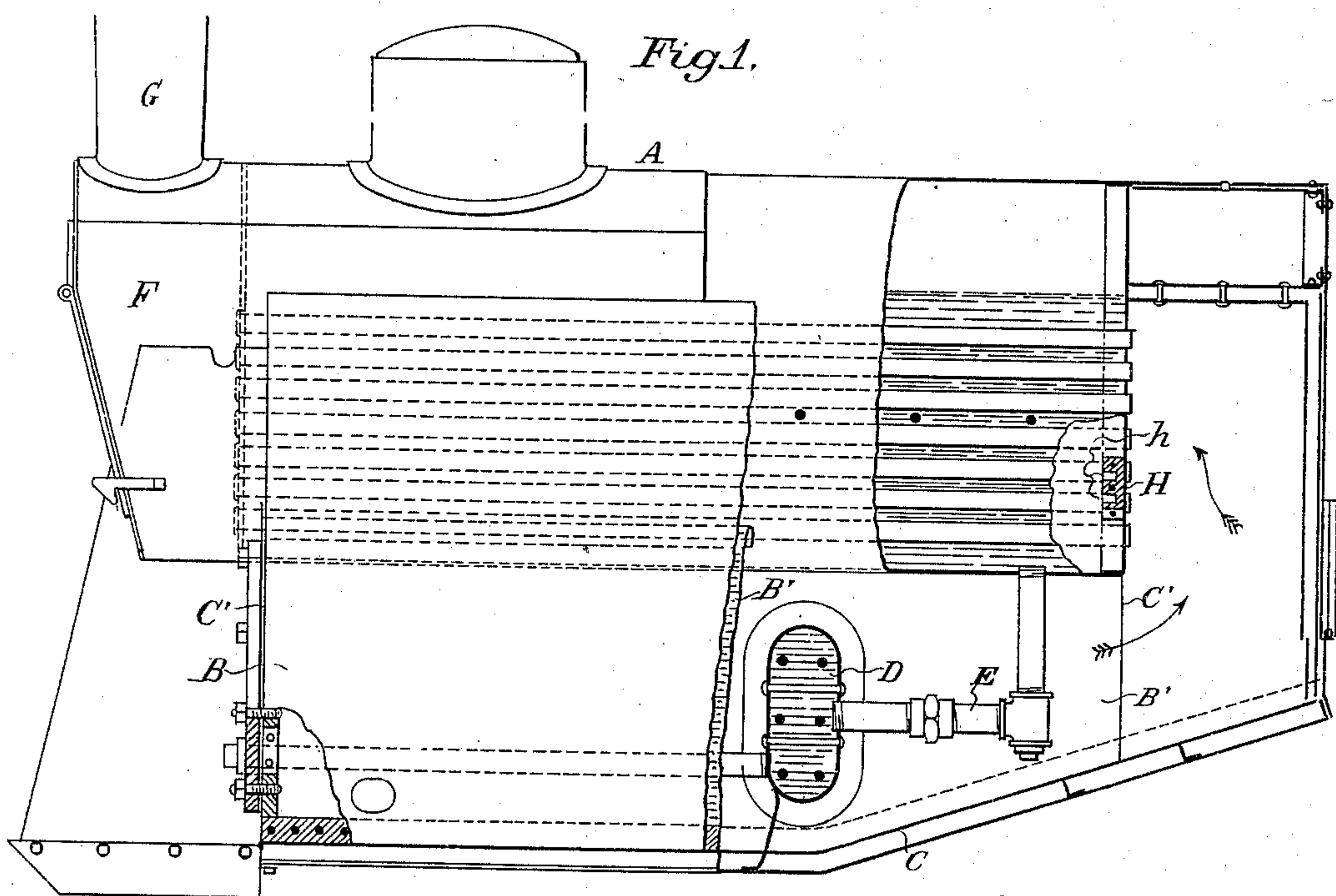
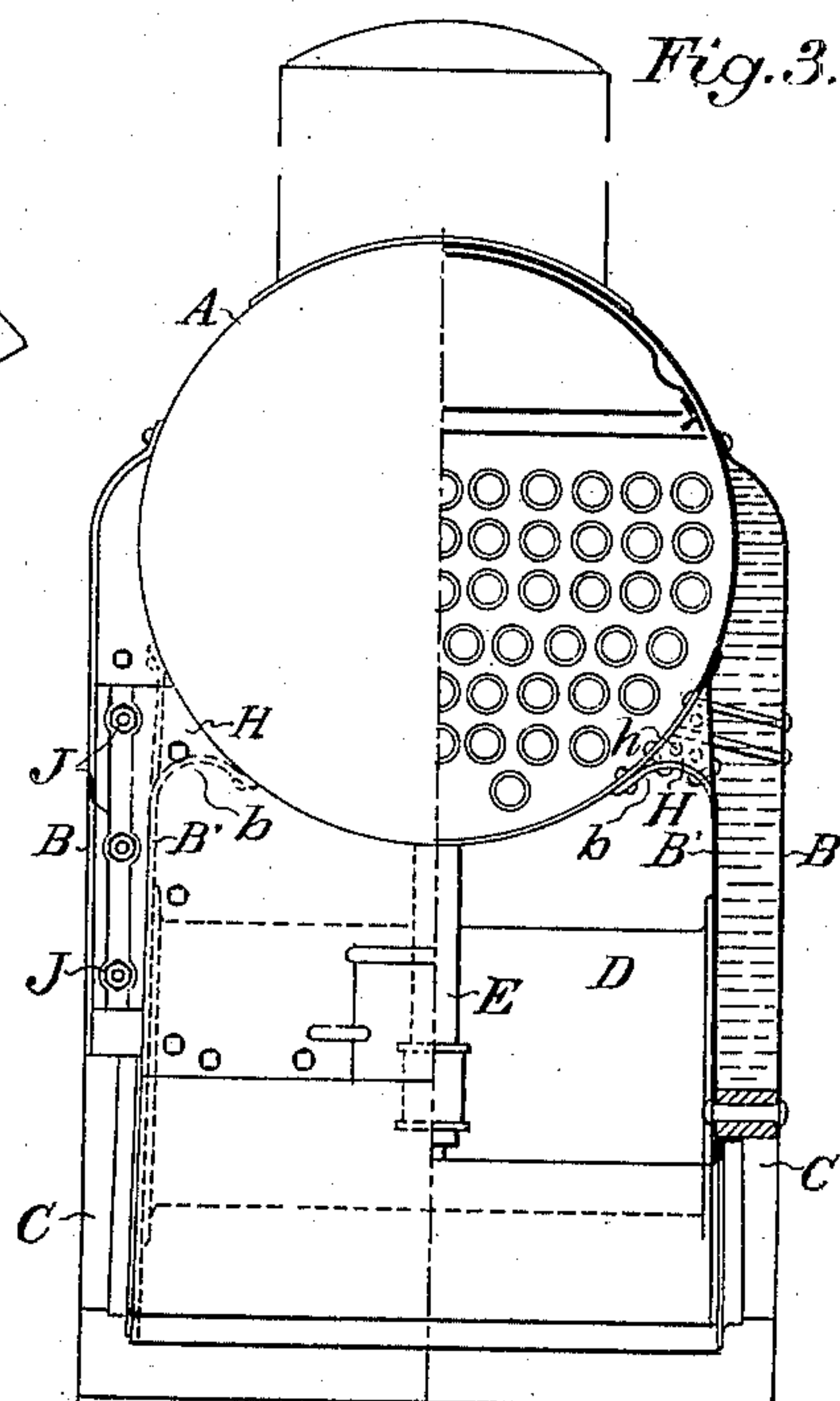
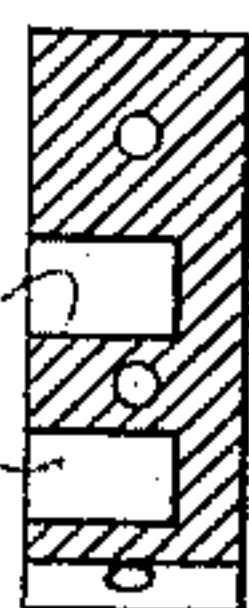


Fig. 5.



Witnesses,
J. H. Amee
E. A. Brandau

Inventor,
Benjamin Holt
By *Dwight Strong & Co.*
Atty.

UNITED STATES PATENT OFFICE.

BENJAMIN HOLT, OF STOCKTON, CALIFORNIA.

BOILER.

SPECIFICATION forming part of Letters Patent No. 639,390, dated December 19, 1899.

Application filed June 8, 1899. Serial No. 719,790. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN HOLT, a citizen of the United States, residing at Stockton, county of San Joaquin, State of California, have invented an Improvement in Boilers; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in boilers, these improvements, as herein shown, being especially designed for what are known as "portable" boilers but they are also applicable to all boilers of that class having water-legs extending down upon each side of the furnace and combustion-chamber below the boiler.

The invention consists, essentially, in an improved means for connecting the sheet forming the water-leg sections with the cylindrical shell of the boiler.

It also comprises details of construction, which will be more fully explained by reference to the accompanying drawings, within which—

Figure 1 is a side elevation. Fig. 2 is a vertical half-section showing the connection of the water-leg sheets with the boiler-shell. Fig. 3 is a vertical half-section and elevation taken at the rear end of the boiler. Figs. 4 and 5 show a perspective view and section, respectively, of the block H.

A is the shell of the boiler, and B B' are walls riveted to the sides of the boiler, forming supplemental water-spaces extending down upon each side and of a length equal to or greater than that of the boiler. The lower edges and ends of these sheets are closed, as shown at C, and they thus form open channels extending upon each side of the boiler and upward along the sides thereof, with openings at intervals connecting the interior of the boiler with the space between these plates, the extensions being known as "water-legs." The outer sheet extends upwardly and is riveted to the shell of the boiler at a point somewhat above the central horizontal line and is connected therewith, as also is the inner sheet B' where it extends below the boiler, by stay-bolts in any suitable or desired manner.

The boiler is here shown as having flues extending through from one end to the other, and the space between the water-legs at the front end of the boiler receives the grate and

forms the furnace for the combustion of fuel. At a point behind the center of the boiler these water-legs are connected by an oval tubular passage D, so that water may circulate freely from one leg to the other through this passage, and this passage is centrally connected by pipes E with the lower part of the rear portion of the boiler.

The rear extension behind the boiler forms a combustion-chamber, into which the products of combustion pass beneath the boiler from the grate and are thence returned through the flues to the smoke-box F at the front, thence passing out through the stack or chimney G.

The general construction of the boiler is not very different from other boilers of this class. My main improvement consists in a means for securing the water-leg plates B' to the boiler-shell, so as to provide for a larger space at the junction of the water-leg with the boiler-shell, to increase the strength of the fastening, and to so place the lines of riveting by which the plates are united to the boiler-shell that they can be easily reached from the outside instead of being riveted within the narrow space between the plates, and the invention also comprises a means for obtaining access to the interior of these water-legs, so as to clean them of scale and other deposits.

As shown in section, Fig. 2, the plates B' are curved at the top, as shown at b, and their edges meet the lower portion of the curve of the cylindrical shell of the boiler in a line essentially coincident therewith. The line of rivets then passes through holes made in the shell of the boiler and through the edges of these plates, the outer head of the rivet being thus made accessible from the space between the water-legs, and in this manner the riveting is better done than where it is necessary to work in the narrow space between the outer sheet of the water-leg and the lower side of the boiler. This curvature also provides for the increased space at the junction of these plates, and a body of water will thus rest upon this curve and will protect the iron from being burned by the fierce heat within the furnace. The front and rear end of the water-legs are closed, as shown at C', and at the rear end the triangular space

formed between the curves *b*, the outer plate B, and the cylindrical shell of the boiler must be closed by a separate block. The block is shown in perspective at H and fits between the meeting portions of the boiler-shell, the plate B', and the curve *b* and is riveted thereto, as shown. This block is made of considerable thickness, and in order to prevent its being burned by the exterior heat I have shown holes *h* bored into it from the interior and extending part way through, so that water from within the water-legs can enter these chambers, and thus keep the block sufficiently cool for the purpose.

In order to obtain access to the space within the water-legs, I have shown holes I made through the ends of the water-legs and closed by screw-plugs J, which screw into these holes and close them. These plugs are removable at any time for the insertion of rods or scrapers, which may be directed through the spaces between the stay-bolts, thus cleaning off scale and deposit from the sides of the water-legs and keeping them measurably clean. These water-legs serve as a sort of heater and purifier for the water, as the majority of the scale or deposit from the water will remain within these legs and will not enter the boiler.

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

1. In a boiler, a complete cylindrical shell, independent water-legs at each side having a length equal to or greater than that of the boiler, the inner walls of said legs being curved throughout the length of the boiler, to meet the lower part of the boiler-shell, and riveted thereto.

2. In a boiler, a complete cylindrical shell, independent water-legs at each side having a length equal to or greater than that of the

boiler, the inner walls of said legs forming concave arches into the space between the water-legs, and having their edges riveted to the boiler-shell.

3. The combination with a cylindrical boiler having a continuous shell, of independent vertical water-legs extending along the sides of the boiler with the outer and inner walls riveted thereto, the inner walls having their upper edges curved to form concave arches into the space beneath the boiler, and form stays therefrom.

4. In a boiler, a cylindrical shell, water-legs composed of outer and inner plates secured to the sides of the boiler, in lines above and below the central horizontal plane thereof, said inner plates having their upper edges curved inwardly and riveted to the boiler-shell within the space between the water-legs, and triangular blocks fitting the open spaces thus formed between the water-legs and the rear end of the boiler substantially as described.

5. In a boiler having the cylindrical shell, the water-legs extending downwardly upon each side below the bottom, and also beyond the rear end of the boiler having inner plates curved inwardly with their edges extending toward the lower and central part of the boiler and riveted to the shell thereof as shown, triangular blocks fitting the angles between the shell of the boiler and the curved inner plate, and forming the closure at the rear of the space, said blocks being chambered from the interior for the admission of water thereinto.

In witness whereof I have hereunto set my hand.

BENJAMIN HOLT.

Witnesses:

JOSEPHINE M. HOGAN,
G. L. DICKENSON.