

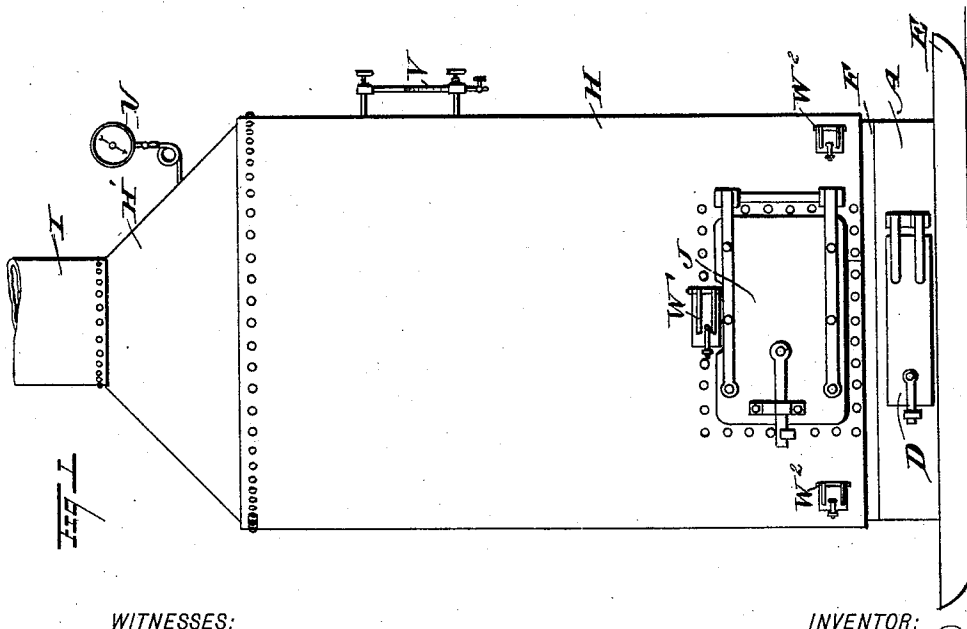
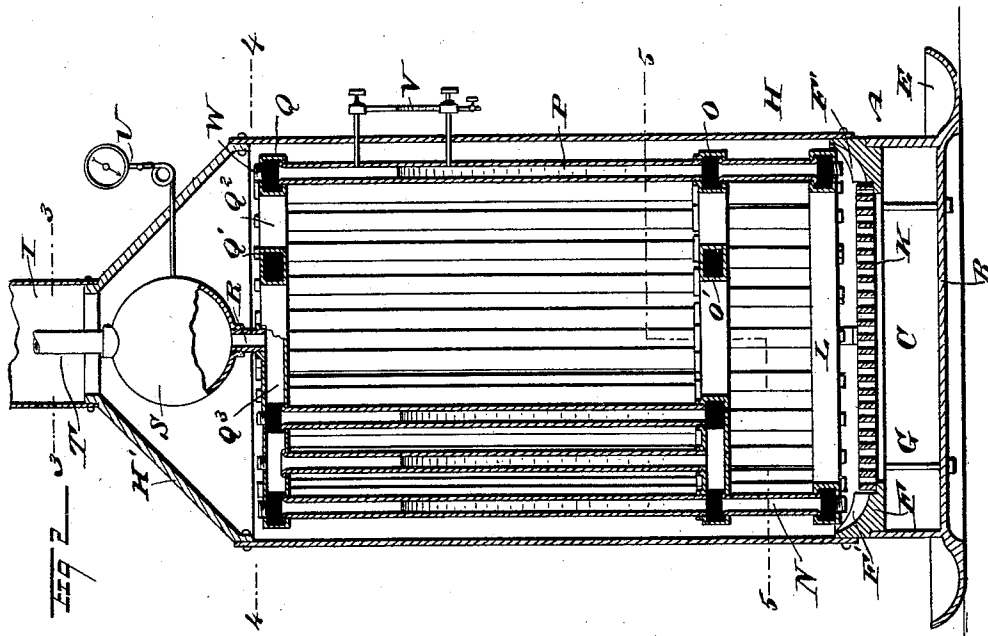
(No Model.)

2 Sheets—Sheet 1.

J. R. LUTGEN.
BOILER.

No. 479,288.

Patented July 19, 1892.



WITNESSES:

H. Walker
to Sedgwick

INVENTOR:

BY *J. R. Lutgen*
Munn & Co
ATTORNEYS.

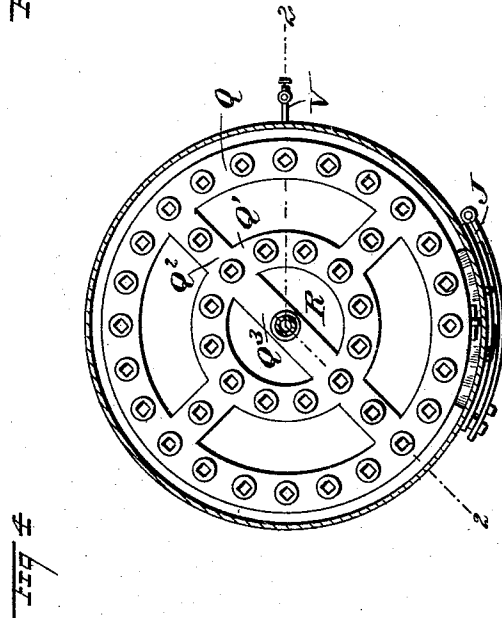
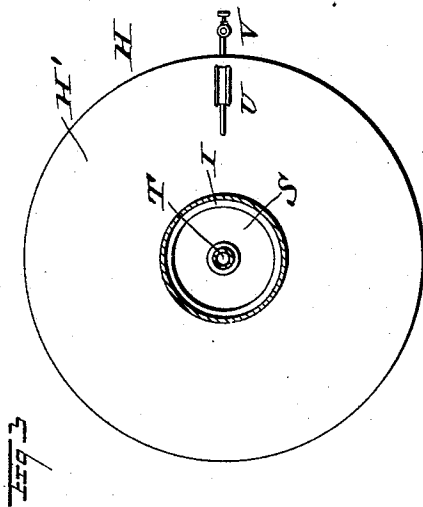
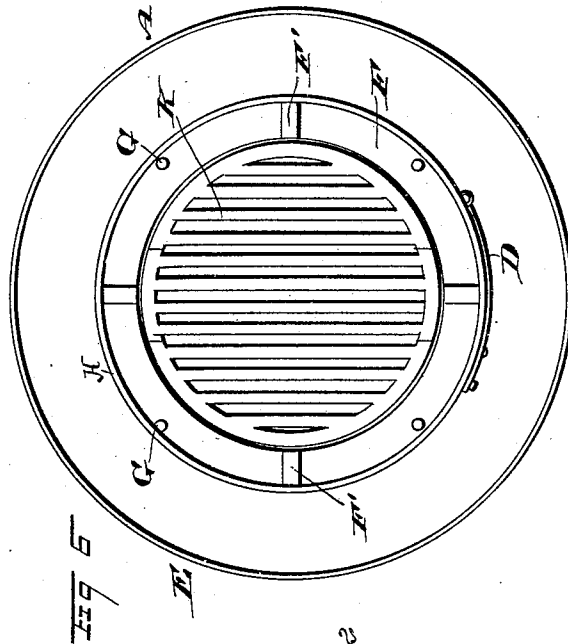
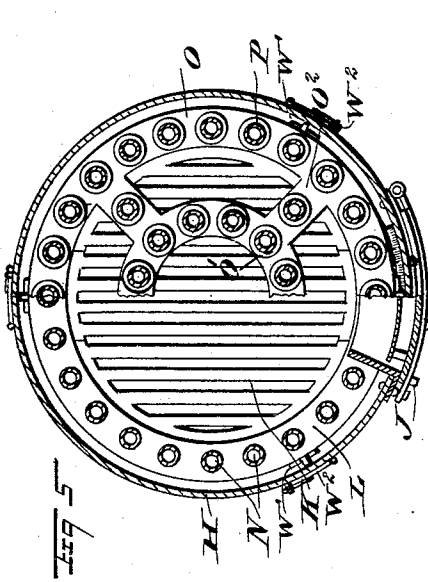
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2 Sheets—Sheet 2.

J. R. LUTGEN.
BOILER.

No. 479,288.

Patented July 19, 1892.



WITNESSES:

H. Walker
C. Sedgwick

INVENTOR:

J. R. Lutgen
BY *Munn & Co*

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JAMES R. LUTGEN, OF WINLOCK, ASSIGNOR OF ONE-HALF TO CHARLES A. STURM, OF CASTLE ROCK, WASHINGTON.

BOILER.

SPECIFICATION forming part of Letters Patent No. 479,288, dated July 19, 1892.

Application filed February 9, 1892. Serial No. 420,897. (No model.)

To all whom it may concern:

Be it known that I, JAMES R. LUTGEN, of Winlock, in the county of Lewis and State of Washington, have invented a new and Improved Boiler, of which the following is a full, clear, and exact description.

The invention relates to sectional boilers, such as shown and described in the Letters Patent of the United States No. 416,412, granted to me on the date of December 3, 1889.

The object of the present invention is to provide a new and improved boiler which is simple and durable in construction, not liable to get out of order, and arranged to quickly and safely generate steam without waste of fuel.

The invention consists of certain combinations of the parts, as will be hereinafter described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation of the improved boiler. Fig. 2 is a sectional front view of the same on the line 2 2 of Fig. 4. Fig. 3 is a sectional plan view of the same on the line 3 3 of Fig. 2. Fig. 4 is a similar view of the same on the line 4 4 of Fig. 2. Fig. 5 is a like view of the same on the line 5 5 of Fig. 2, and Fig. 6 is a plan view of the base with the grate in place.

The improved boiler is provided with a circular base A, having a bottom B, forming an ash-pit C, access to which is had by means of a door D, arranged on one side of the base A. The latter is formed with an outwardly-extending curved flange E, forming a trough to catch any dripping water, oil, &c., from the upper parts of the boiler.

On the top of the base A is set a ring F, fastened by bolts G to the bottom B, and on the outside of this ring F is riveted or otherwise fastened the exterior circular shell H, provided at its upper end with a cone-shaped cap H', supporting the smoke-stack I. On the lower part of the exterior shell H, directly above the ash-pit door D, is arranged a door J, through which the fuel is introduced into the fire-box of the boiler. The ring F supports a circular grate K of any approved construction,

and on the upper surface of the ring are formed lugs F', supporting the circular pipe L, connected by a series of vertically-arranged pipes N with a second circular pipe O, formed with a concentric pipe O', connected with the outer pipe O by radially-extending pipe-arms O², as plainly shown in Fig. 5. The space between the grate K and the pipes O, O', and O² forms the fire-box, into which leads the door J. A sufficient number of pipes N are omitted to allow space for the casing of the door J, as plainly shown in the said Fig. 5.

From the pipes O, O', and O² extend upwardly the pipes P, supporting at their upper ends and connected with the pipes Q, Q', and Q², of which the pipe Q is circular. The pipe Q', concentric to the same, and the pipes Q² are in the shape of radial arms, as plainly shown in Fig. 4. The concentric pipe Q' is formed with a diametrically-arranged pipe Q³, from the center of which extends a short branch pipe R, connecting with a spherical-shaped steam-dome S, located in the cap H' of the exterior shell H. A steam-pipe T leads from the top of the dome S to carry the generated steam to the machine to be driven. The steam-dome S also carries a gage U of any approved construction for indicating the pressure of the steam within the said dome. A water-gage V is connected with one of the vertical pipes P to indicate the level of the water within the said pipes.

It will be seen by reference to the drawings that the pipes P, connecting the circular pipes O and Q with each other, are really continuations of the pipes N, extending between the circular pipes O and L. The other pipes P, connecting the concentric circular pipes O' and Q' and the arms O² and Q² with each other, do not extend between the circular pipes O and L, so that the fire-box is unobstructed and sufficient space is given for burning the fuel on the grate K.

In order to have ready access to the several vertical pipes, plugs W are screwed in the top of the pipes Q, Q', and Q² opposite the entrance of the pipes P, and similar plugs W also screw in the under side of the circular pipe L, opposite the entrance of the pipes N. Thus by removing the several plugs W the various vertical pipes P and N can be readily

cleaned whenever necessary. Hand-holes W' are arranged in the circular pipes O and L and corresponding doors W² are formed in the shell H to conveniently clean said pipes.

5 It is understood that the circular pipes L and O, the concentric pipes O', the arms O², the vertical pipes N, and part of the vertical pipes P are filled with water, while the top pipes Q, Q', and Q² and the upper part of the vertical
10 pipes P fill with steam generated from the water in the pipes mentioned, the steam finally passing from the concentric pipe Q' to the arm Q³ and from the latter to the branch pipe R to the steam-dome S. The level of the
15 water in the vertical pipes P is always indicated on the gage V.

It will be seen that the fuel burning on the grate K heats the water in the circular pipes L, O, and O', as well as in the lower pipes N
20 and the branch pipes O², and then the heat in rising from the fire-box above the circular pipes O and O' passes among the large number of pipes P, thus heating the water therein. It will thus be seen that the lower pipes O, N,
25 and L are subjected to the greatest heat emanating from the burning of the fuel on the grate K, so that the water in these pipes will be heated to a higher degree, and will con-

sequently readily circulate in the entire system of pipes except the top pipes.

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

1. In a boiler, a sectional water-pipe comprising a circular base-pipe, vertical pipes extending from the said base-pipe, a second circular pipe arranged above the base-pipe and connected with the said vertical pipes, and a concentric circular pipe arranged within the said second circular pipe, and a series of hollow radial arms which connect with two circular pipes, substantially as shown and described.

2. In a boiler, a sectional water-pipe comprising a circular base-pipe, concentric pipes arranged above the said base-pipe and connected with each other, upright pipes set in the said concentric pipes, top concentric pipes connected with the said upright pipes, and short vertical pipes connecting the said base-pipe with the first set of concentric pipes, substantially as shown and described.

JAMES R. LUTGEN.

Witnesses:

J. R. BUXTON,

W. H. KENOYER.