

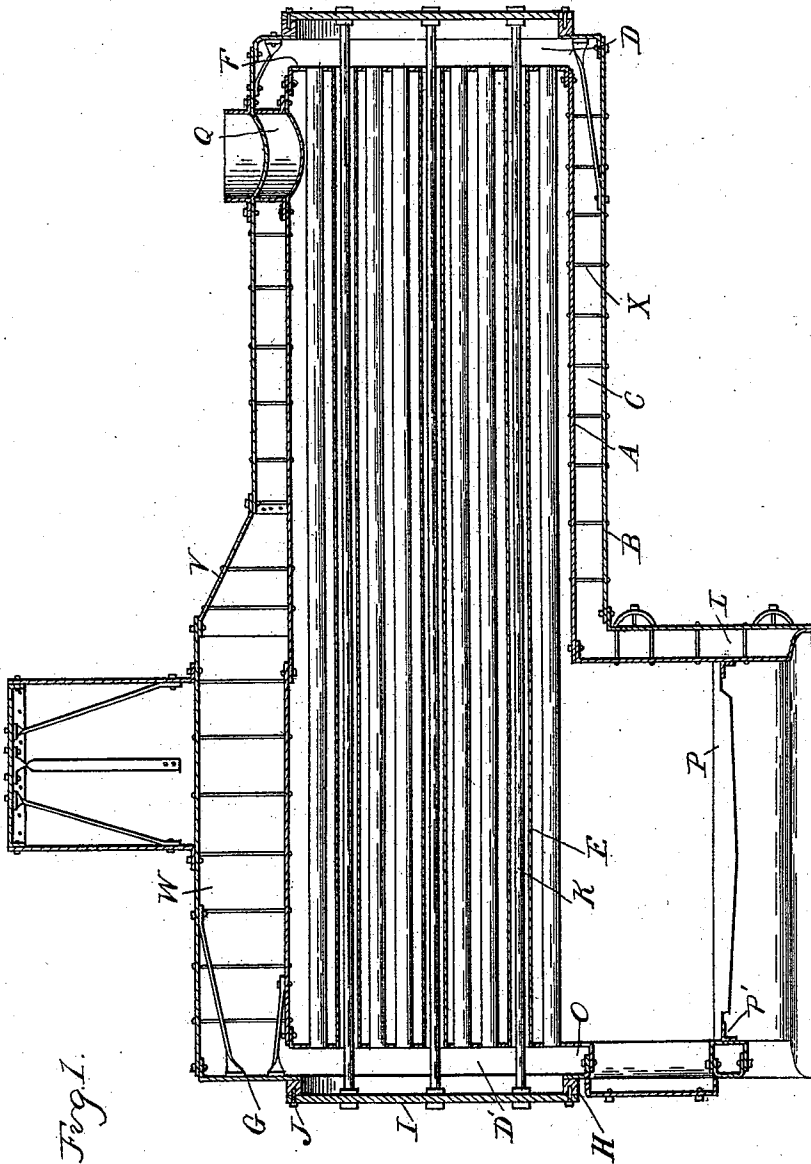
(No Model.)

2 Sheets—Sheet 1.

R. WILDMAN.
BOILER.

No. 528,352.

Patented Oct. 30, 1894.



Witnesses
L. J. Whittemore
C. F. Barthol.

Inventor
Robert Wildman
By Wm. S. Spaquet Esq.
Att'y.

(No Model.)

2 Sheets—Sheet 2.

R. WILDMAN.
BOILER.

No. 528,352.

Patented Oct. 30, 1894.

Fig. 1

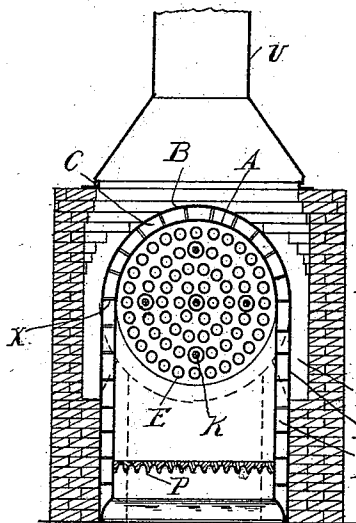


Fig. 3.

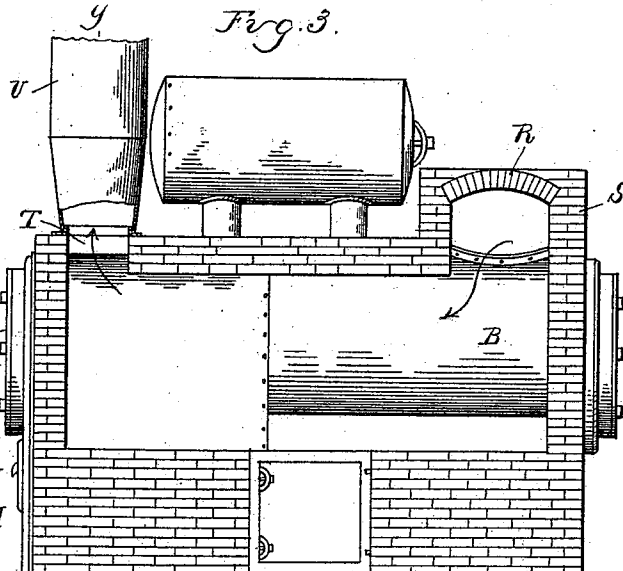


Fig. 2.

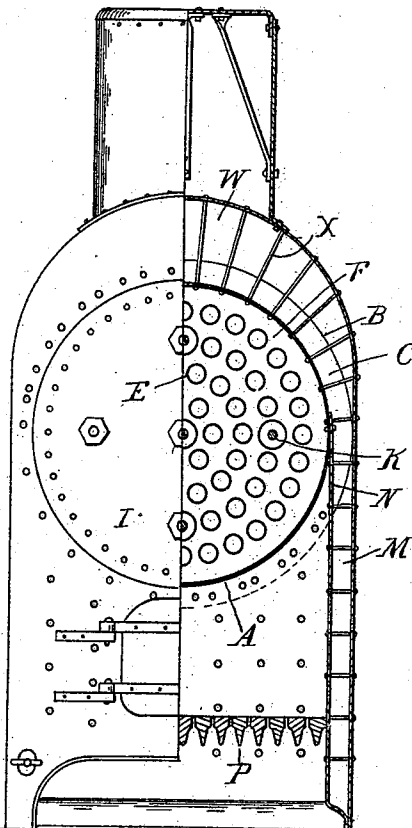
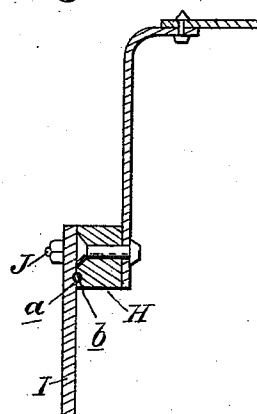


Fig. 5.



Witnesses
S. J. Whittemore.

O. F. Barthel.

Inventor
Robert Wildman
By Wm. L. Spangler
Attys.

UNITED STATES PATENT OFFICE.

ROBERT WILDMAN, OF BAY CITY, MICHIGAN, ASSIGNOR OF ONE-HALF TO
HENRY S. JOHNSON, OF SAME PLACE.

BOILER.

SPECIFICATION forming part of Letters Patent No. 528,352, dated October 30, 1894.

Application filed June 29, 1894. Serial No. 516,115. (No model.)

To all whom it may concern:

Be it known that I, ROBERT WILDMAN, a citizen of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Boilers, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the peculiar construction of a water tube boiler comprising an inner and an outer shell concentrically arranged, forming between them a water jacket or chamber, the inner shell being shorter than the outer shell, whereby water chambers are formed at the ends of the shell, tubes connecting these end chambers and water legs depending from this water chamber forming a combustion chamber at one end which communicates with the interior of the inner shell. The invention further consists in the peculiar construction, arrangement and combination of the various parts.

In the drawings, Figure 1 is a vertical, central, longitudinal section through my improved boiler without the setting or brick work. Fig. 2 is a sectional elevation thereof centrally through the steam dome. Fig. 3 is a central, sectional elevation showing the brick work, and a modified form of steam dome. Fig. 4 is a cross section on line *y y* Fig. 3. Fig. 5 is a detail section illustrating the construction of the boiler front.

A is a cylindrical casing forming the inner shell, and B is a shell of larger diameter and of greater length than the shell A, inclosing the same to form an annular water chamber C around the same and the water chambers D D' at the ends thereof. These end water chambers are connected through the inner shell by means of the tubes E which are secured at their ends in the heads F of the inner shell. The heads of the outer shell are formed of the section G of sheet metal apertured opposite the heads of the inner shell. Upon the inner edge of this aperture is secured the wrought iron ring H, extending outwardly from the face of the section G. This ring is provided on its exterior face with a

groove *a* adapted to receive a copper wire *b*, which forms the packing ring for the head I, which is secured to the ring H by means of suitable bolts J.

K are tie rods which pass through the tubes E and secured at their ends to the heads I of the outer casing or shell. The inner shell near the forward end on the under side is cut away and around this cut away portion at the rear is the water leg L. At the sides, the water legs M are formed by a continuation of the outer casing and the plate N riveted at its upper end to the outer side of the inner shell and at its lower end to the outer casing, as plainly shown at the right hand in Fig. 2. The two heads at the front are extended downward to form the water leg O, thus entirely inclosing the fire chamber by the water legs. P are grates supported on lugs P' on the end water legs of the fire chamber.

Q is a flue which extends through the water chamber between the two shells at the top and the rear thereof, as shown in Fig. 1, and communicates at its outer end into a smoke chamber R formed within the brick setting S. This smoke chamber connects into the flues T arranged between the brick casing and the outer shell of the boiler, which flues at their forward end connect into the smokestack U.

The steam dome may be of the construction shown in Fig. 1 or Fig. 3.

The fire being lighted on the grates, the products of combustion will pass up into the inner shell around the tubes the entire length of the tubes out through the flue Q into the smoke chamber and thence down around the outside of the outer casing the entire length of the boiler and finally out through the smoke stack.

The advantage of this construction is that at no point in the boiler is there any steam space in the tubes subjected to the fire which is not protected by water, so that the danger of burning out is very greatly lessened.

I preferably enlarge the forward section of the outer casing, as shown at V, Fig. 1, to form in the upper portion of that section, the steam chamber W, so that plenty of steam

space may be provided and still maintain the flues submerged or filled with water at all times.

The two shells are connected together and stayed by suitable connecting bolts and stays X. The usual feed doors, ash doors, man holes, &c., are provided where necessary.

What I claim as my invention is—

1. In a steam generator, the combination
10 with an outer and an inner shell of lesser diameter and length than the outer shell and arranged within the same to form a water jacket between, of tubes connecting the heads
15 of the inner shell, a combustion chamber located beneath the front ends of the tubes, an outer casing surrounding the shells, a smoke chamber R located above the rear ends of the shells, a flue Q located at the rear end of the water jacket and extending into the smoke
20 chamber, a smoke opening at the front of the outer casing, and flues on the outside of the shells connecting the smoke chamber and opening, substantially as described.

2. The combination of an outer shell and
25 an inner shell of lesser diameter and length than the outer shell and arranged within the same to form a water jacket between tubes connecting the heads of the inner shell, a fire chamber at the forward end, depending water
30 legs from the water chamber around the fire chamber, an outer casing surrounding the shells a flue through the water chamber at the rear end of the inner shell, return flues located between the outer shell and casing

and a smoke stack at the forward end with
35 which said return flues communicate, substantially as described.

3. In a steam generator, the combination with the shell having centrally apertured
40 heads, of rings H surrounding the apertures and secured to the head, an annular groove in the outer faces of the rings, packing rings within the grooves, plates I detachably secured to the rings, tubes secured within the
45 shell, and rods K passing through the tubes and secured to the plates I, substantially as described.

4. In a steam generator of the kind described, the combination of the inner and
50 outer shells arranged substantially as set forth, the inner shell having a cut away portion on its under forward face, the fire chamber beneath such cut-away portion, the front and rear water legs L at front and rear of said
55 fire chamber and the side water legs M formed by an extension of the outer casing and the wall N secured at its upper end to the side of the inner shell and at its lower end to the extension, the tubes E connecting the heads of
60 the inner shell and a flue Q through the water chamber at the rear end of the inner shell, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT WILDMAN.

Witnesses:

M. B. O'DOHERTY,
L. J. WHITEMORE.