

E. F. EDGAR.
STEAM BOILER.

No. 498,384.

Patented May 30, 1893.

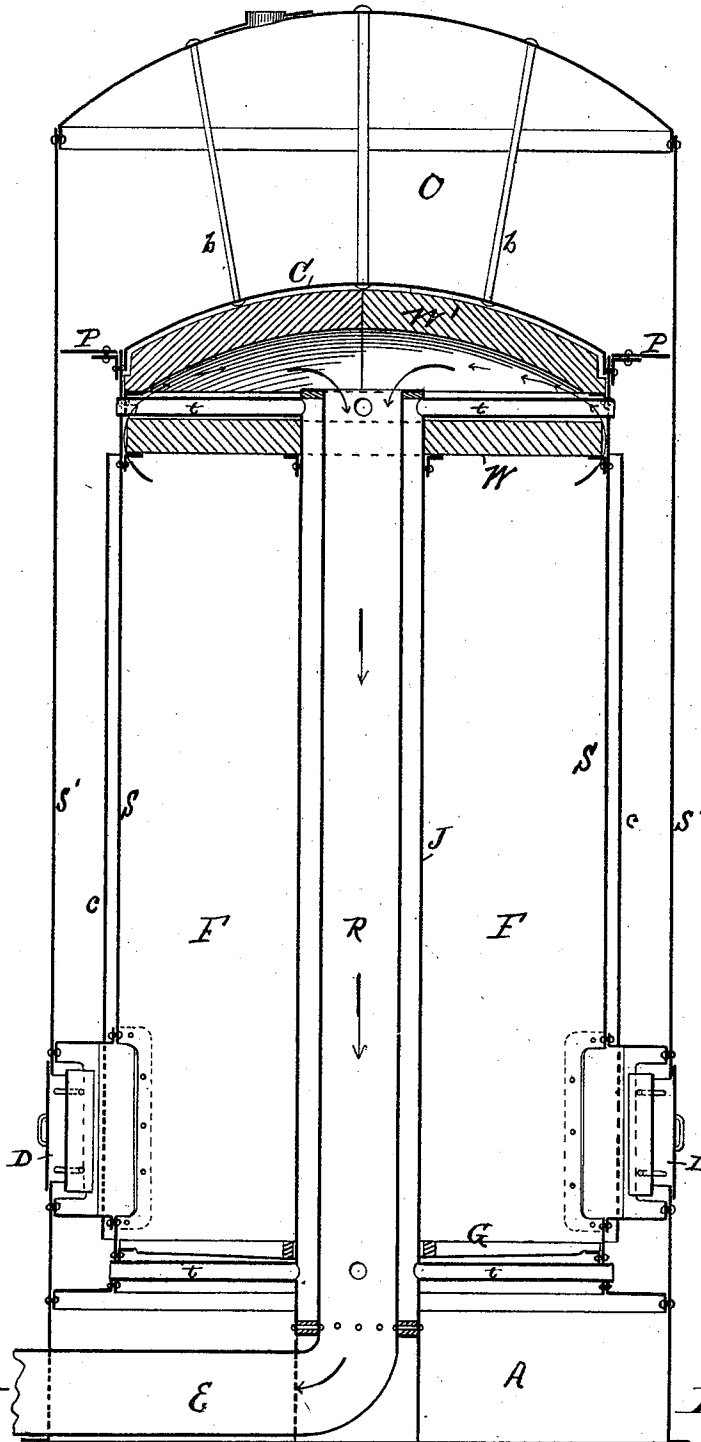


Fig. 1.

Attest
C. W. Benjamin
Peter B. Vermilyea.

Inventor,
Ellis F. Edgar
by H. Vermilyea
his atty

(No Model.)

2 Sheets—Sheet 2.

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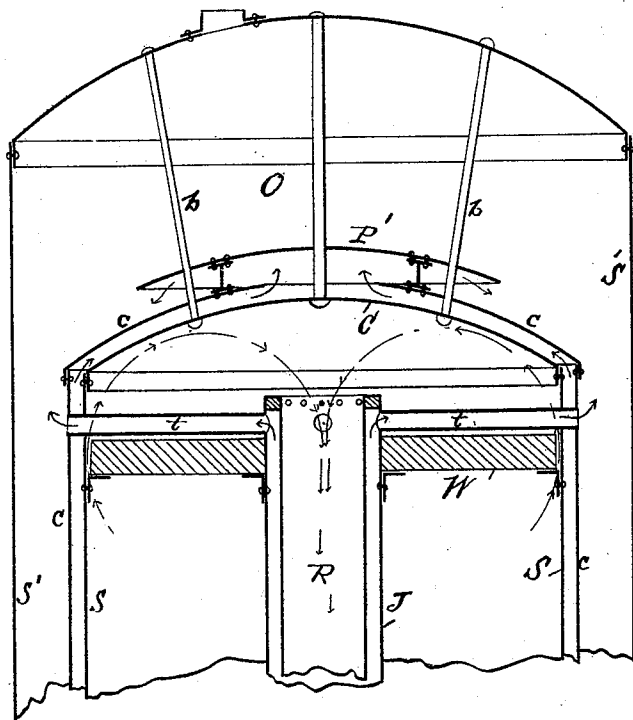


Fig. 2.

Attest;
C. W. Benjamin
Peter B. Vermilyea

Inventor
Ellis F. Edgar
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UNITED STATES PATENT OFFICE.

ELLIS F. EDGAR, OF WOODBRIDGE, NEW JERSEY.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 498,384, dated May 30, 1893.

Application filed July 16, 1892. Serial No. 440,227. (No model.)

To all whom it may concern:

Be it known that I, ELLIS F. EDGAR, a citizen of the United States of America, and a resident of Woodbridge, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a vertical cross sectional view of an upright boiler containing certain features of my invention; and, Fig. 2, is a similar view of the upper part of an upright boiler especially illustrating a further feature of said invention.

S, is the interior shell of the boiler, S', the exterior shell, P, the priming and c, the circulation plate, F, the fire box, A, the ash pit, G, the grate, D the door, C, the crown sheet, E, the draft exit, R, the return tube, W, the heat accumulator wall, W', the protecting wall, J, the tube jacket, t, the connecting tubes, b, the bolts, and O, the steam space.

In Fig. 2, the wall W', is omitted, c, is extended up to the level of and partially across the crown sheet and instead of a priming plate P, a modified one P', is employed. Its office and arrangement however are substantially the same, that is, it prevents the water which rises up between the interior shell and the circulation plate from being ejected upward into the steam space, but deflects it downward into the space between said plate and the exterior shell whereby the circulation is assisted.

The operation is as follows: The boiler being filled in the case of Fig. 1, to a little below the upper edge of plate c, and in the case of Fig. 2, to about the level of the upper end of tube R, fire is kindled upon the grate. The draft is first upward and outward toward the edges of wall W, which is usually made of fire brick, and between said edges and the interior shell of the boiler, as plainly shown by the arrows, the space being usually in area about equal to the area of the draft exit. On passing this wall the flame (though but little does pass) and the gases would impinge upon the crown sheet and unduly heat it were it not protected in some manner. In

Fig. 1, this is accomplished by the wall W', also usually of fire brick, which fully accomplishes the desired object.

In Fig. 2, I extend the circulation plate up and partially over the crown sheet and thereby cause the rising water to cover the crown sheet and thus prevent its heating to an undesirable temperature. The gases then in their course pass back through tube R, and out at exit E. They were to a great degree exhausted of heat by the time they passed wall W, but what little was left would be fully utilized before the gases reached exit E, and the final result is economy of fuel. Not only this, but the water in the jacket about R, of itself becomes heated as highly as that within plate c, and also rises, rapidly passing out at the top through the upper tubes t, into the space beyond plate c, and a more free and rapid circulation is insured while the jacket prevents the burning out of the walls of tube R.

The boiler is free from the objections attendant upon the use of a multitude of small tubes, and having a large free fire box, is a rapid and easy steamer which nevertheless exhausts the heat from the fuel before the gases pass beyond their working period.

I prefer to always use the plate W, as it and the tube R, are mutually supporting, and it is of great value in increasing the power of the boiler, but the tube R, could be supported in other ways, and furthermore the arrangement shown could readily be adapted for use in a horizontal boiler.

What I claim, and desire to secure by Letters Patent, is—

1. A steam boiler having an interior shell, an exterior shell, a crown sheet, a circulation plate intermediate the interior and exterior shell, extending up to the level of and partially over the crown sheet but having an opening in it above the crown sheet and a priming plate located above and extending beyond said opening in the circulation plate, the space between the circulation and priming plates being as wide or wider than the space between the interior shell and the circulation plate, all substantially as set forth.

2. A steam boiler provided with a return tube leading from the farther end of the fire

box back through said fire box and into the draft exit and a wall of incombustible material capable of being highly heated located at or near the farther end of the return tube
5 with a space at its edges, between said edges and the interior shell of the boiler, but otherwise substantially closing the space between the return tube and the wall of the fire box, all substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 11th day of July, 1892.

E. F. EDGAR.

Witnesses:

A. G. N. VERMILYA,
F. ROWLAND.