

(No Model.)

O. CROSBY.
STEAM BOILER.

No. 482,787.

Patented Sept. 20, 1892.

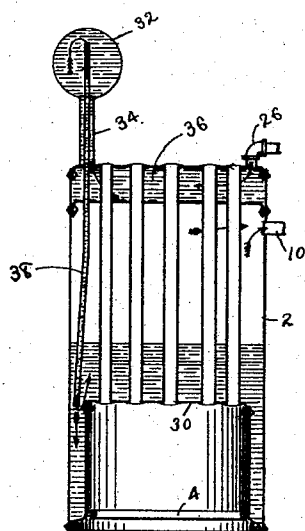


Fig. 2.

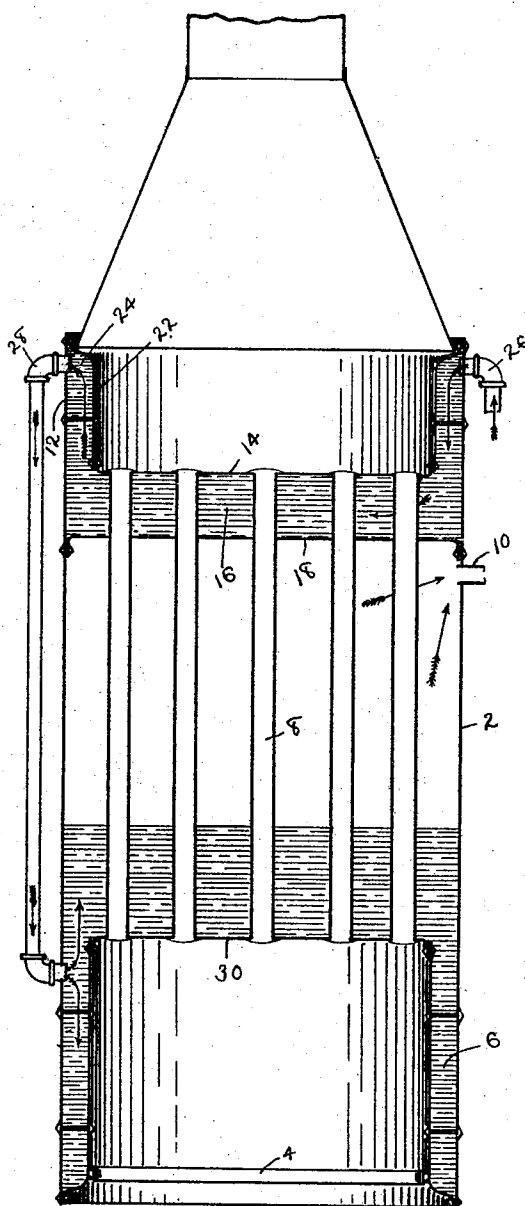


Fig. 1.

Witnesses
George Bunn
A. M. Welch

Inventor
Olivier Crosby
By his Attorneys
Paul & Merwin

UNITED STATES PATENT OFFICE.

OLIVER CROSBY, OF ST. PAUL, MINNESOTA.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 482,787, dated September 20, 1892.

Application filed December 29, 1891. Serial No. 416,407. (No model.)

To all whom it may concern:

Be it known that I, OLIVER CROSBY, of St. Paul, Ramsey county, Minnesota, have invented certain Improvements in Steam-Boilers, of which the following is a specification.

My invention relates to improvements in that class of upright boilers which are provided with a water-chamber surrounding and protecting the upper ends of the flues, its object being to provide means whereby said water-chamber is kept supplied with an ample quantity of water to compensate for evaporation without the use of a continuously-running pump.

To this end my invention consists in extending the outer shell of the boiler a considerable distance above the top of the boiler proper or upper flue-sheet and in arranging in connection with the upper flue-sheet an inner shell above the same, connected to the top of the shell extension, thus forming an annular chamber or reservoir connecting with the water-chamber beneath the flue-sheet. This reservoir or extension of the water-chamber should be of such capacity that it will compensate for the evaporation in the water-chamber and require filling no oftener than the boiler itself is supplied.

I am aware of the patent to Waterous, No. 400,529, issued April 2, 1889, which shows a water-chamber inclosing the upper ends of the flues, and I do not claim this as any part of my invention.

My invention further consists in the construction and combination hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 represents a central vertical section of my improved boiler, and Fig. 2 is a similar section of a modified construction.

In the drawings, 2 represents the shell of the boiler, provided in the usual manner with the grate 4, the water-leg 6, the flues 8, and steam-pipe 10, the shell 2 being provided with an extension 12 above the upper flue-sheet 14. The upper ends of the flues 8 are protected by means of a water-chamber 16, surrounding and inclosing the same, formed by the flue-sheet, and a diaphragm 18, arranged a short distance below it. The flue-sheet is prefer-

ably of smaller diameter than the shell 2, and its edge is connected to an inner shell 22, which is carried upward and outward to connect with the top of the extension 12, thus forming an annular reservoir or extension 24 of the chamber 16. Preferably at the top of this reservoir connects the pipe 26, leading to the pump, and also communicating with the reservoir 24 near its top is an overflow-pipe 28, carried, preferably, downward outside the shell 22 and communicating with the water-leg beneath the crown-sheet 30.

In the modified construction shown in Fig. 2 the shell of the boiler is not carried above the flue-sheet; but a reservoir 32 is constructed above the chamber 36, formed by the flue-sheet 37 and diaphragm 18, communicating therewith by means of a pipe 34, the overflow-pipe 38 being arranged within the pipe 34, extending to the top of the reservoir and downward within the boiler nearly to the crown-sheet 30.

In use, the water-chamber and reservoir being filled with water, the heat from the flues gradually evaporates the water in the chamber, the steam passing off through the overflow or outlet pipe, which also carries off any surplus water when the chamber and reservoir are being filled. The water in the reservoir thus supplies the place of that evaporated from the chamber, so that the water in the chamber is always kept in contact with the flue-sheet 14 and the connections of the flues therewith without necessitating the continuous working of the pump.

I claim—

1. In a steam-boiler, the combination, with the flues thereof and a water-chamber surrounding and inclosing the upper ends of the flues, of a reservoir located above and communicating with said chamber, having suitable outlet at or near its top and adapted to replenish said chamber automatically, substantially as described.

2. In a boiler, the combination, with a water-chamber surrounding the ends of the flues, of a reservoir connected with said chamber, the outer walls of which are formed by an extension of the boiler-shell, adapted to keep said chamber at all times filled, substantially as described.

3. In an upright boiler, the combination,

with the water-chamber surrounding and inclosing the upper ends of its flues, of an annular reservoir or extension to said chamber above the same, adapted to keep said chamber supplied with water, and an outlet-pipe communicating with said reservoir at or near its top, substantially as described.

4. The combination, with the shell of an upright boiler, of an upper extension thereof, the flue-sheet, the inner shell connected at its lower end to the flue-sheet and at its upper end with the top of said extension, the diaphragm arranged beneath said flue-sheet, constituting a water-chamber surrounding the upper ends of the flues, and a storage-reservoir therefor, and an outlet-pipe communicating with the space between the inner shell and the extension at or near their junction, substantially as described.

5. In an upright steam-boiler, the combination, with the flues, of a flue-sheet of less diameter than the boiler, a diaphragm beneath the flue-sheet, inclosing and surrounding the flues and forming a water-chamber, an upper extension of the boiler-shell, a concentric in-

ner shell connected at its lower end to the edge of the flue-sheet and at its upper end to the shell extension, forming a reservoir for said chamber, an inlet-pipe for said chamber, and an outlet-pipe for said reservoir communicating with it near its top, substantially as described.

6. The combination, with the upright boiler-shell having an upper extension, of the flue-sheet of less diameter than the shell, the inner shell 22, connected to the edge of said flue-sheet and to the top of said extension, forming an annular chamber or reservoir 24, a diaphragm 18, arranged beneath said flue-sheet, the inlet water-pipe 26, and the outlet-pipe 28, communicating with the reservoir at or near its top and leading to the boiler beneath, substantially as described.

In testimony whereof I have hereunto set my hand this 24th day of December, 1891.

OLIVER CROSBY.

In presence of—

T. D. MERWIN,
A. M. WALCH.