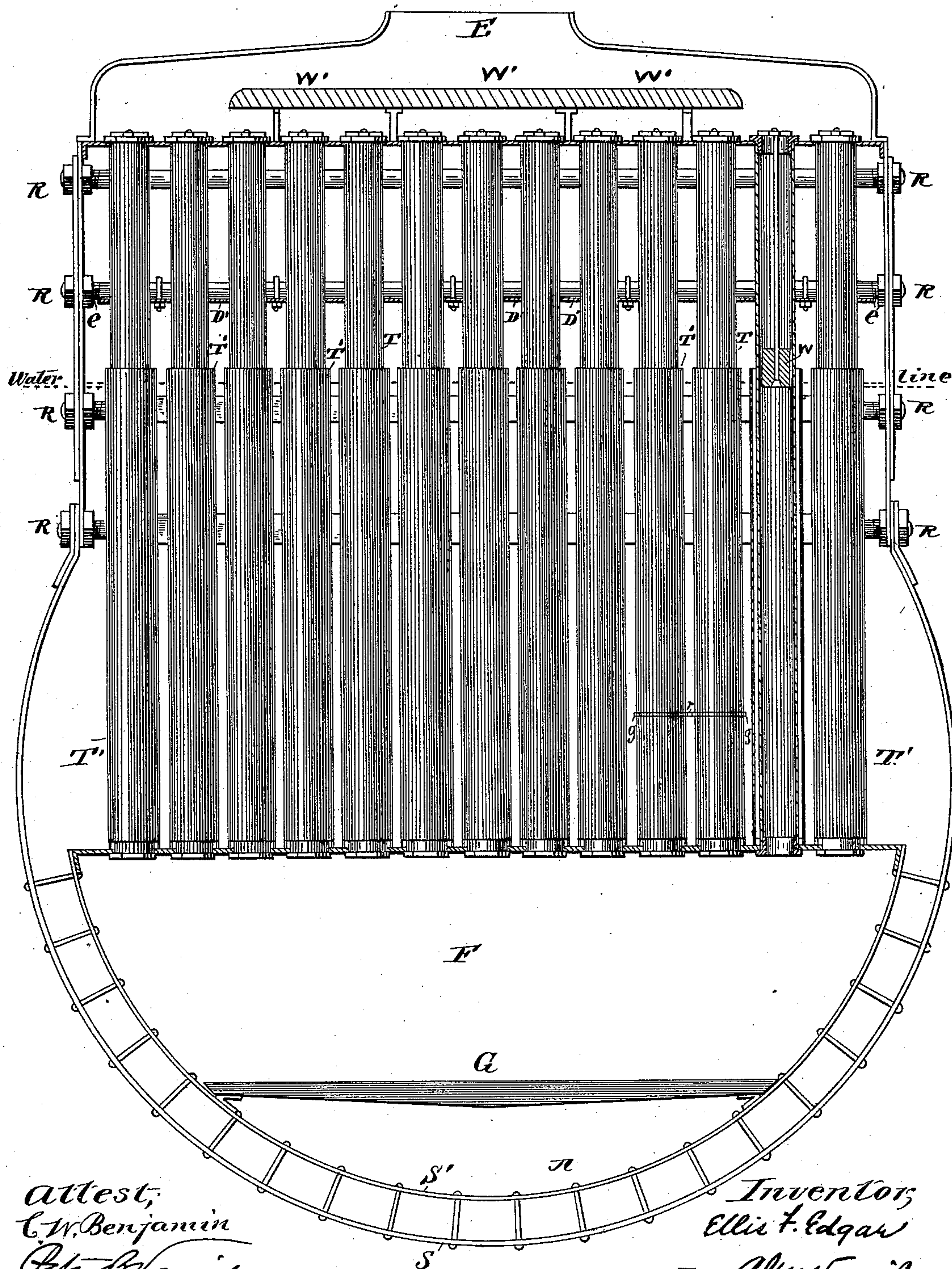


(No Model.)

E. F. EDGAR.
STEAM BOILER.

No. 528,930.

Patented Nov. 13, 1894.



Attest,
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UNITED STATES PATENT OFFICE.

ELLIS F. EDGAR, OF WOODBRIDGE, NEW JERSEY.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 528,930, dated November 13, 1894.

Application filed November 11, 1892. Serial No. 451,639. (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 drawing, forming part of the same, in which the figure is a vertical cross-sectional view of a boiler embodying my invention in one form.

In inventing this boiler, I had in view two objects. One was to provide more heating surface than is found in a plain shell boiler, the other to insure as perfect circulation as can be had in a plain shell boiler, and if possible in attaining both objects to still use, in some form, or an approximate form, the heat accumulator plate described in application, Serial No. 446,399, filed September 21, 1892, and United States Letters Patent No. 436,494, of September 16, 1890.

The boiler shown has an exterior shell S, an interior shell S', ash pit A, grate G, fire box F, priming plate D', shown in section suspended from one or more of the stay bars or rods R, tubes T', and t, walls W, one in each tube T', auxiliary wall W', and draft exit E. The tubes T', as is plainly seen, extend from the crown sheet of the furnace or fire box to the upper part of the shell, being open at both ends and communicating below with the fire box and above with the smoke box, so called. About these tubes I arrange circulator tubes t, supported preferably on legs at the bottom, a short distance above the crown sheet and extending upward to about the level of the water line of the boiler. Within they may be provided with longitudinal fins, preferably three, to hold them concentric with tubes T'. At each side the priming plate is arranged to leave a steam exit e, between it and the shell of the boiler. The walls placed within the tubes are preferably solid and with a draft aperture at the edge, between them and the

walls of the tubes and suspended by rods from the top of the tubes so that they are about at the water level. The location of the walls is one main feature in the success of the boiler but some of its advantages might be secured even though the draft apertures were not located absolutely at the edge of the walls.

The combination of the series of fire tubes having the series of internal walls located as described and surrounded with circulator tubes with the priming plate above gives great heating surface with economy in the use of fuel, and a very dry steam with no danger of burning out the upper ends of the fire tubes.

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

1. In a steam boiler, a series of boiler tubes provided with incombustible walls located within and partially closing the tube at or about the water line, but with draft spaces at the edges of said walls, a series of circulator tubes about the boiler tubes but a short distance therefrom and extending upward to about the level of the water line and a priming plate interposed between the steam space and the upper ends of the circulator tubes, substantially as set forth.

2. In a steam boiler, a series of boiler tubes provided with incombustible walls located within and partially closing the tubes at or about the water line, with draft apertures from one face of said walls to the other, a series of circulator tubes about the boiler tubes, but a short distance therefrom, and extending upward to about the level of the water line and a priming plate interposed between the steam space and the upper end of the circulator tubes, 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 9th day of November, 1892.

E. F. EDGAR.

Witnesses:

E. DEGHNIE,
A. G. N. VERMILYA.