No. 743,769. PATENTED NOV. 10, 1903.

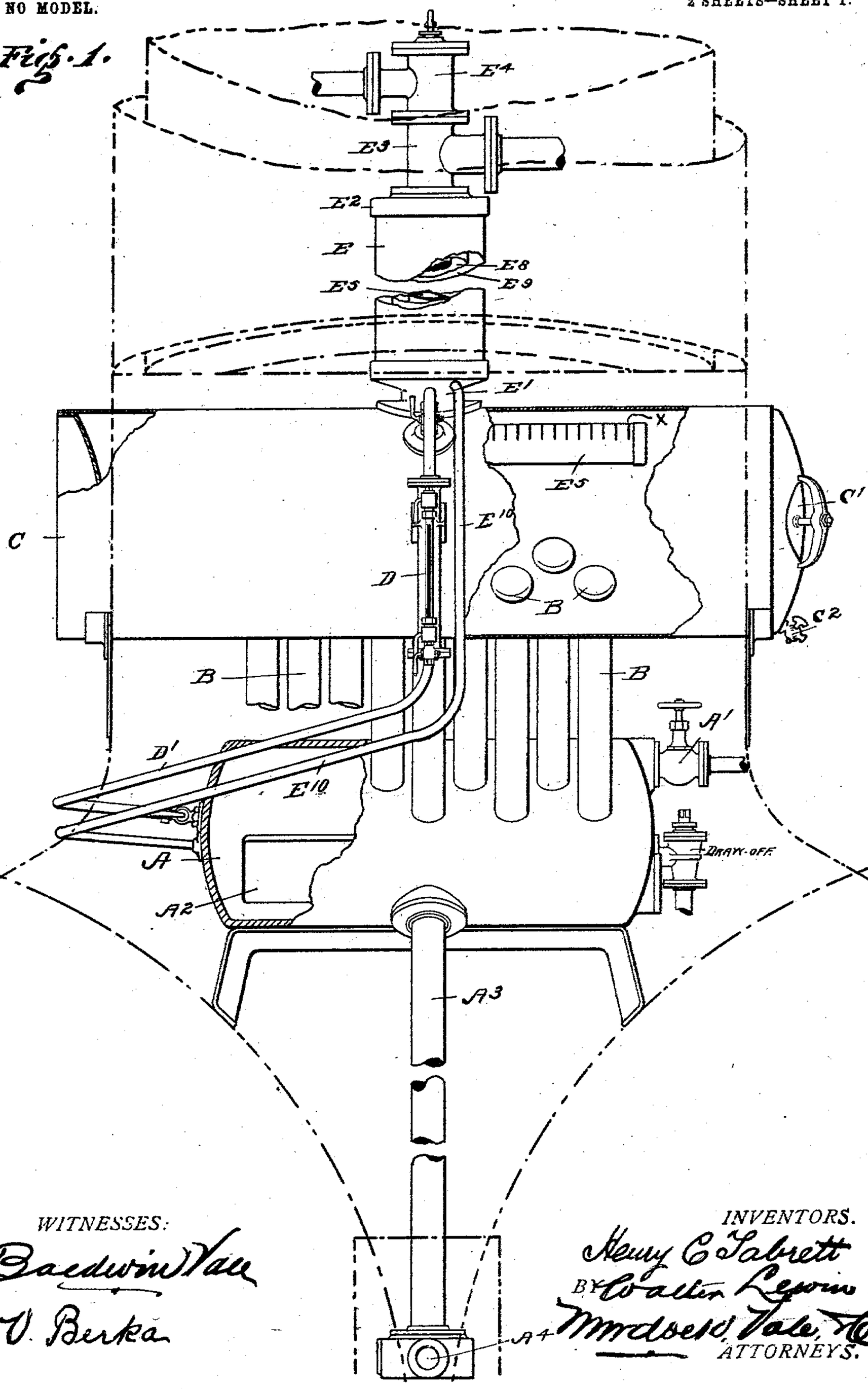
H. C. TABRETT & W. LEWIN.

HEATER.

APPLICATION FILED APR. 8, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

Baldwin Vale

V. Berka

INVENTORS.

Henry C Tabrett

BY Walter Lewin.

Mudd, Vale & Co.

ATTORNEYS.

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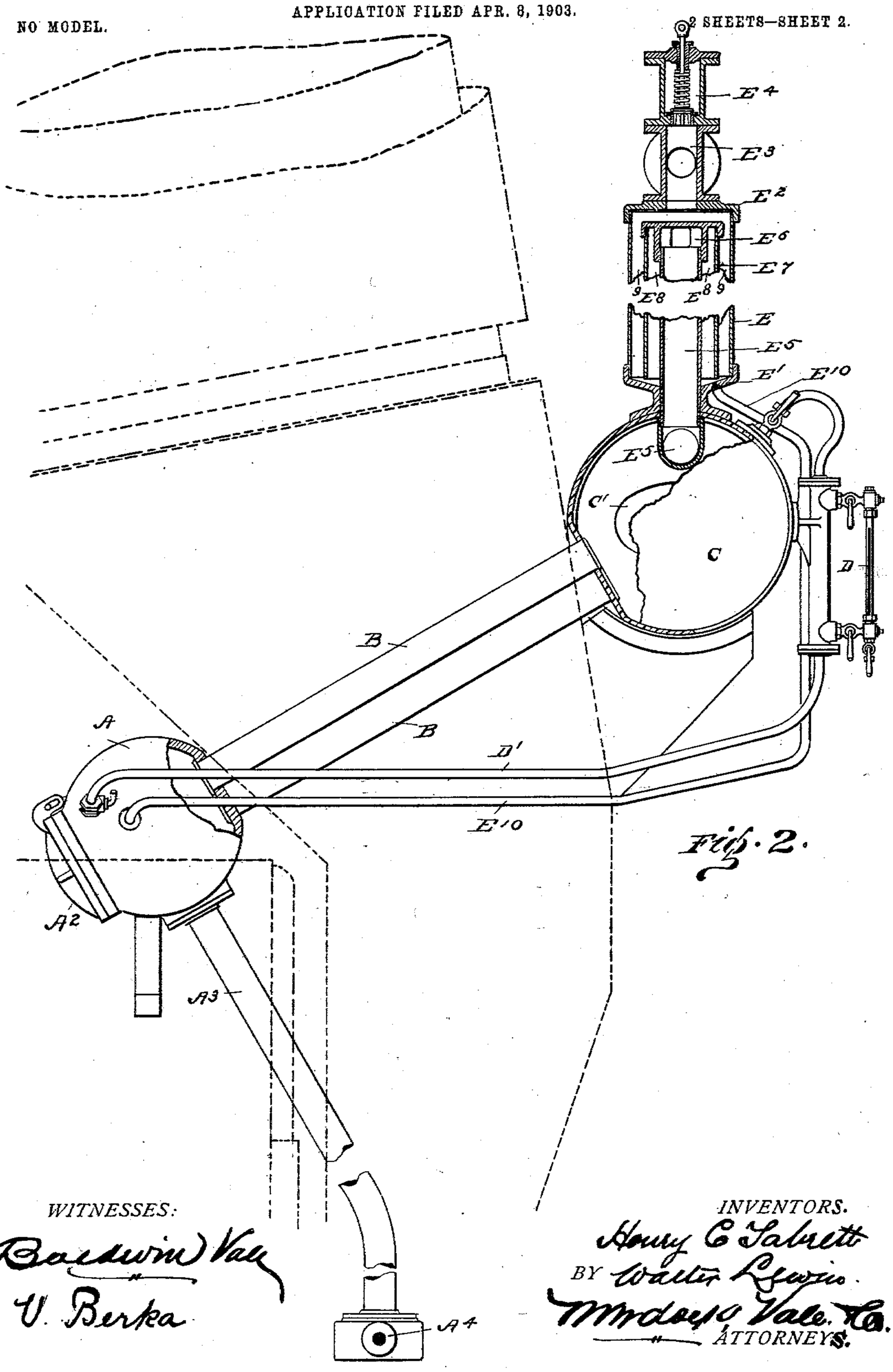

Fig. 2.

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UNITED STATES PATENT OFFICE.

HENRY C. TABRETT AND WALTER LEWIN, OF SAN FRANCISCO, CALIFORNIA.

HEATER.

SPECIFICATION forming part of Letters Patent No. 743,769, dated November 10, 1903.

Application filed April 8, 1903. Serial No. 151,670. (No model.)

To all whom it may concern:

Be it known that we, HENRY C. TABRETT, residing at 3847 Twenty-first street, and WALTER LEWIN, residing at 1227 Page street, in the city of San Francisco, county of San Francisco, and State of California, have invented certain new and useful Improvements in Evaporators or Heaters; and we do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

This invention relates to improvements in evaporators or heaters for utilizing the waste heat in smoke-stacks, breechings, uptakes, or the like; and it consists of the novel construction and arrangement of the parts.

The objects sought to be accomplished are to evaporate salt sea-water or foul water, whereby fresh pure water may be obtained, or to provide an economical means for heating any liquid or fluid, such as steam, air, or other gases.

Broadly, the invention consists of an initial or precipitation drum connected by tubes (exposed to the waste heat) with a larger drum or reservoir provided with a separator and water-gage, pop-valve, draw-off valves, and precipitation-legs suitably combined therewith.

In the drawings, Figure 1 is a front elevation of a heater constructed in accordance with this invention disposed in the uptake of a battery of boilers, which are indicated in dotted outline, the invention being broken away in parts to better disclose its construction. Fig. 2 is a side elevation of the same.

In detail the construction consists of the receiving-drum A, into which the salt sea-water, for instance, is pumped through the inlet-valve A′. The receiving-drum is connected by the heat-absorbing tubes B, disposed across the uptake and terminating in the shell of the second drum C, the ends of the tubes being expanded and beaded over at each end, where they join the respective drums. The quantity of water in the heater is indicated by the gage-glass D, set on the side of the drum C, and provided with the tube D′, leading back to the drum A, to balance the pressure in the glass D. The separator consists of the outer shell E, set in the annular pillar E′, riveted to the upper dome of the drum C. The shell E is capped by the top E^2, to which the flanged T E^3 is attached to lead the dry vapor to a suitable condenser. (Not shown.) The separator is provided with the relief-valve E^4 to blow off excess pressure. The vapors arising from the surface of the water in the drum C escape through the perforations x of pipe E^5 upward into the separator and are released under the cap E^6, having the downwardly-extending wall E^7, which forms the annular spaces E^8 E^9, through which the vapor must circulate before escaping from the separator. The condensation or a "gulp" of water within the separator drains back into the drum A through the pipe E^{10}. The drums and tubes are accessible for replacement, cleaning, &c., through the door A^2 in the drum A and through the manhole C′ in the drum C. In the process of evaporation the specific gravity of the water in the drum A becomes greater, and it sinks into the precipitation-leg A^3, from whence it is led to the bilge or sea.

The drum A can be of cast-iron and is preferably set lower than the drum C to give a free rise to the hot water. It is obvious, however, that the construction could be variously disposed without departing from the spirit of this invention.

In operation the drum A is pumped full until the water rises to a point above the level of the exits of tubes B, as indicated in the gage-glass. Under the influence of the heat absorbed by the tubes the water evaporates, precipitating the heavier impurities into the drum A, the purified vapors rising into the separator and escaping dry to the condenser. After a few hours running, during which the drum C has been relieved of the first filling of salt water through the petcock C^2, the drum C should not prime, which confines all deposits to the drum A, from which they are readily removable. A mean water-level is preserved in the heater by an automatic feed to the drum A and an automatic blow-off on the leg A^3 at A^4.

Having thus described this invention, what is claimed, and desired to be secured by Letters Patent, is—

1. The combination with the smoke-passage

of a boiler of a heater consisting of a receiving-drum having an inlet above and an outlet below the center thereof, and a precipitation-leg connected to the bottom thereof; and tubes leading from the receiving-drum across the smoke-passage to a second drum communicating with a separator, consisting of a series of vertical annular passages, with intercommunication between alternating top and bottom; a suitable outlet-drain and safety-valve on said separator; and a water-gage communicating with both drums; and a door in said receiving-drum in line with the connecting-tubes.

2. The combination with the smoke-passage of a boiler, of a heater consisting of a receiving-drum having suitable inlets and outlets and tubes leading from the receiving-drum across the smoke-passage to a second drum; a separator connected to said second drum, and consisting of a series of vertical annular passages intercommunicating alternately top and bottom; and a suitable outlet from said separator, and a water-gage communicating with both drums.

3. A heater such as described, consisting of a plurality of drums connected by heat-absorbing tubes; and having a suitable vapor-separator; a safety-valve; water-gage communicating with both drums, and precipitation-leg, suitably combined therewith.

4. A heater such as described, comprising a plurality of drums connected by heat-absorbing tubes, a suitable vapor-separator, a perforated pipe communicating with said separator and extending into one of said drums, a safety-valve, a water-gage communicating with both of said drums, and a precipitation-leg leading from one of said drums.

In testimony whereof we have hereunto set our hands this 26th day of March, 1903.

HENRY C. TABRETT.
WALTER LEWIN.

Witnesses:
BALDWIN VALE,
A. J. HENRY.