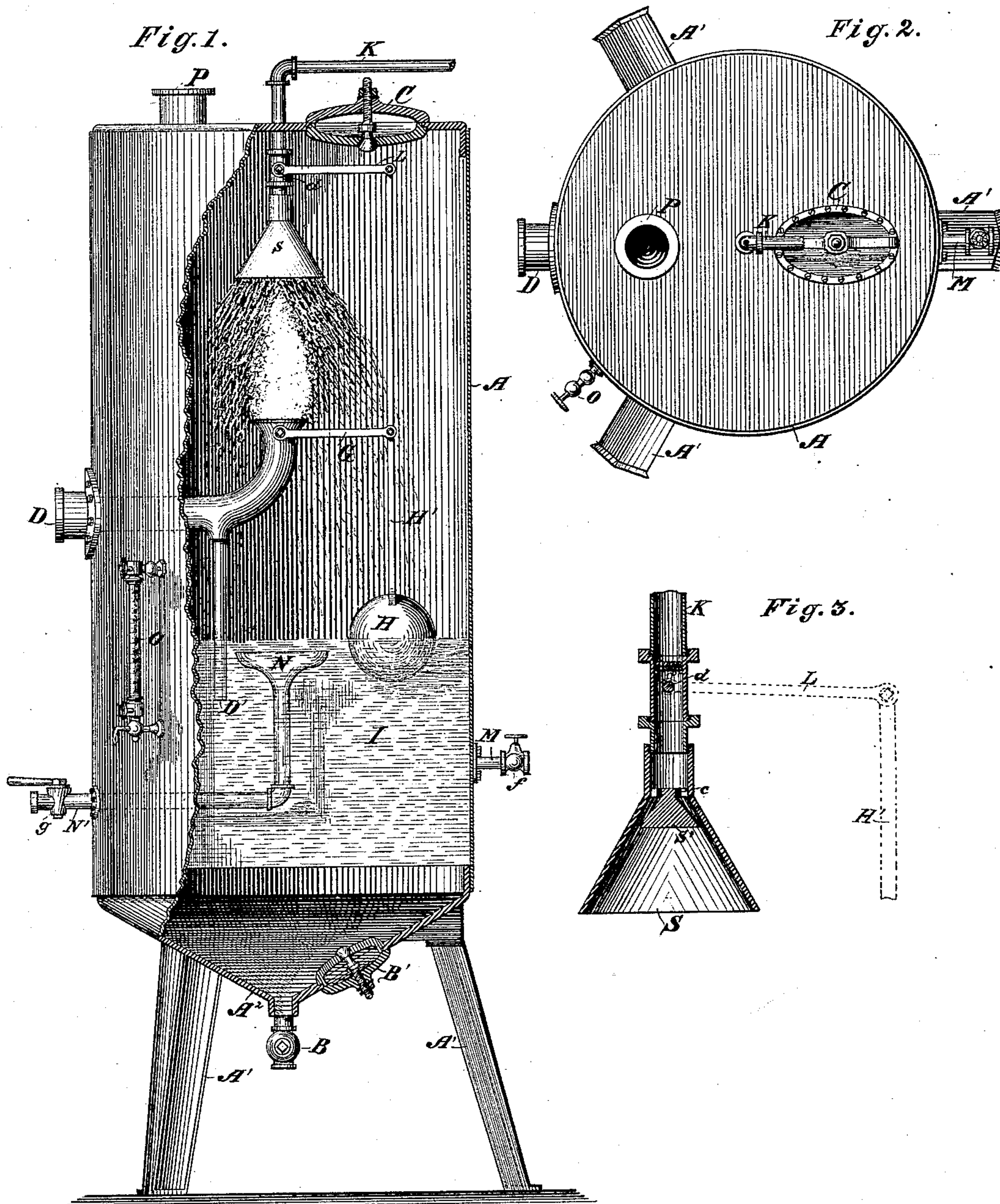


(No Model.)

R. G. EWER.  
FEED WATER HEATER.

No. 297,246.

Patented Apr. 22, 1884.



Witnesses:

Chas. J. [Signature]  
Henry L. Folger,

BY

Inventor:  
Roland G. Ewer.  
Jacob J. Storer.  
Attorney.



# UNITED STATES PATENT OFFICE.

ROLAND G. EWER, OF BROOKLYN, NEW YORK, ASSIGNOR TO ELLA  
L. EWER, OF SAME PLACE.

## FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 297,246, dated April 22, 1884.

Application filed September 27, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, ROLAND G. EWER, a citizen of the United States of North America, and a resident of Brooklyn, county of Kings, State of New York, have invented a new and useful Improvement in Feed-Water Heaters and Purifiers, of which the following is a specification.

The object of this invention is to provide a device for the better purification of feed-water for boilers, whereby calcareous or other sedimentary deposits from impure water on the boiler shell or tubes may be almost or entirely prevented, and a consequent economy of fuel and an increased durability of the boiler be assured.

The invention consists of a "feed-water heater and purifier" of novel design and construction, wherein the steam and water are brought together in most intimate contact, and the supply of water is automatically regulated, and from whence the feed-water for the boiler may be drawn freed from all impurities of greater or less gravity than the water itself, all of which will be hereinafter fully set forth.

Reference is to be had to the accompanying drawings, forming part of the specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a partly sectional vertical elevation of my improved device. Fig. 2 is a plan of the same. Fig. 3 is an enlarged sectional elevation of a portion of the water-supply pipe and attachments.

In the drawings, A represents the cylindrical shell of the feed-water heater and purifier, supported on legs A' A', and provided with a cone-shaped bottom, A<sup>2</sup>, in which is a blow-off cock, B, for drawing off the sediment whenever desired, and a man-hole and cover, B', by which access may be had to the interior of the shell for the purpose of cleaning it. On the top also of the shell A is a covered man-hole, C, through which the upper interior portion of the shell may be reached for cleaning. The pipe D, designed for conveying exhaust-steam from the engine, (not shown,) enters a side of the shell A, and, curving upward in the vertical axis of the shell, has its discharge end

preferably flared or enlarged, as shown at a, in order that the issuing steam may be ejected in a more expanded column, and at the bend or elbow of the pipe D is connected a drop-pipe, D', for discharging into the bottom of the heater what water may enter said pipe D.

The water-supply pipe K, entered axially through the top of the shell A, has on its end, within said shell and directly over the mouth of the pipe D, a conical nozzle, S, within which is held, by braces c, just below the extremity of the pipe K, a cone or distributor, S', over which the entering volume of water is forced to descend in the form of a hollow cone, which envelops the uprising steam from the pipe D, as indicated in Fig. 1, whereby a most intimate contact of the two is assured, and thereby a more complete condensation of the steam and a corresponding heating of the water to the required temperature for purging itself of impurities. This supply-pipe K is provided with a valve, d, which is connected with the rod H' of the ball-float H, that rests on the surface of the water I by a rod, L, so that the variation of the water-level within the heater and purifier will, by raising and lowering the float H, and thereby closing and opening the valve d, affect the supply of water in the same degree. A rod, G, pivoted at one end to the pipe D, and at the other end to the rod H', serves to guide or steady the latter as the float H rises and falls. It is evident, then, that the supply of water is regulated by the removal of heated water by the feed-pump or otherwise, which is done through the pipe M, furnished with a cock, f, that is placed so as to take the heated water from about midway between the surface and bottom thereof, at a point where it will be free from scum or sediment.

The skimming-pan N and its attached pipe N', which latter projects through a side of the shell A, and is supplied with a cock, g, are designed for the removal of any particles of solid matter, scum, &c., that may float on the water surface. Then, as the impurities, which are of greater specific gravity than the water, may be removed through the blow-off cock B, and the impurities of less specific gravity than the water may be removed by means of the pan



and pipe N N', it is obvious that feed-water of exceptional purity may be furnished through the pipe M.

5 The water-gage represented at O is designed to indicate the level of the water within the heater.

In the top of the device is placed an outlet-pipe, P, for the escape of any exhaust-steam that may be uncondensed within the heater  
10 by the feed-water. A pipe may be connected with this pipe P to convey the surplus steam in any desired direction.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

15 1. A feed-water heater and purifier constructed substantially as herein shown and described, consisting of shell A, provided with blow-off cock and man-holes, upward-curving bell-mouthed steam-pipe D, water-supply pipe  
20 K, provided with conical nozzle and water-distributor, water-pipe valve adapted to be adjusted by connection with a ball-float, float H, and valve-connecting rods, skimming-pan and pipe, and hot-water-delivery pipe, all arranged and operating substantially as set forth.

2. In a feed-water heater and purifier, the combination, with the steam-pipe D, having a bell-mouth opening upward in the vertical axis of the heater, of the water-pipe K, having a conical nozzle opening downward over the mouth  
30 of the said steam-pipe, substantially as herein shown and described, whereby the steam and the supply-water may be brought into more intimate contact, as set forth.

3. In a feed-water heater and purifier, the  
35 combination, with the steam-pipe D and water-pipe K, opening opposite each other, of the drop-pipe D', substantially as and for the purpose described.

In testimony that I claim the foregoing as  
40 my invention, I have signed my name, in presence of two witnesses, this 31st day of August, 1883.

ROLAND G. EWER.

Witnesses:

HENRY N. WEST,

THOMAS H. BRENNAN.