

E. T. TURNER.  
FEED WATER HEATER.  
APPLICATION FILED NOV. 26, 1910.

Patented Jan. 17, 1911.

2 SHEETS—SHEET 1.

981,901.

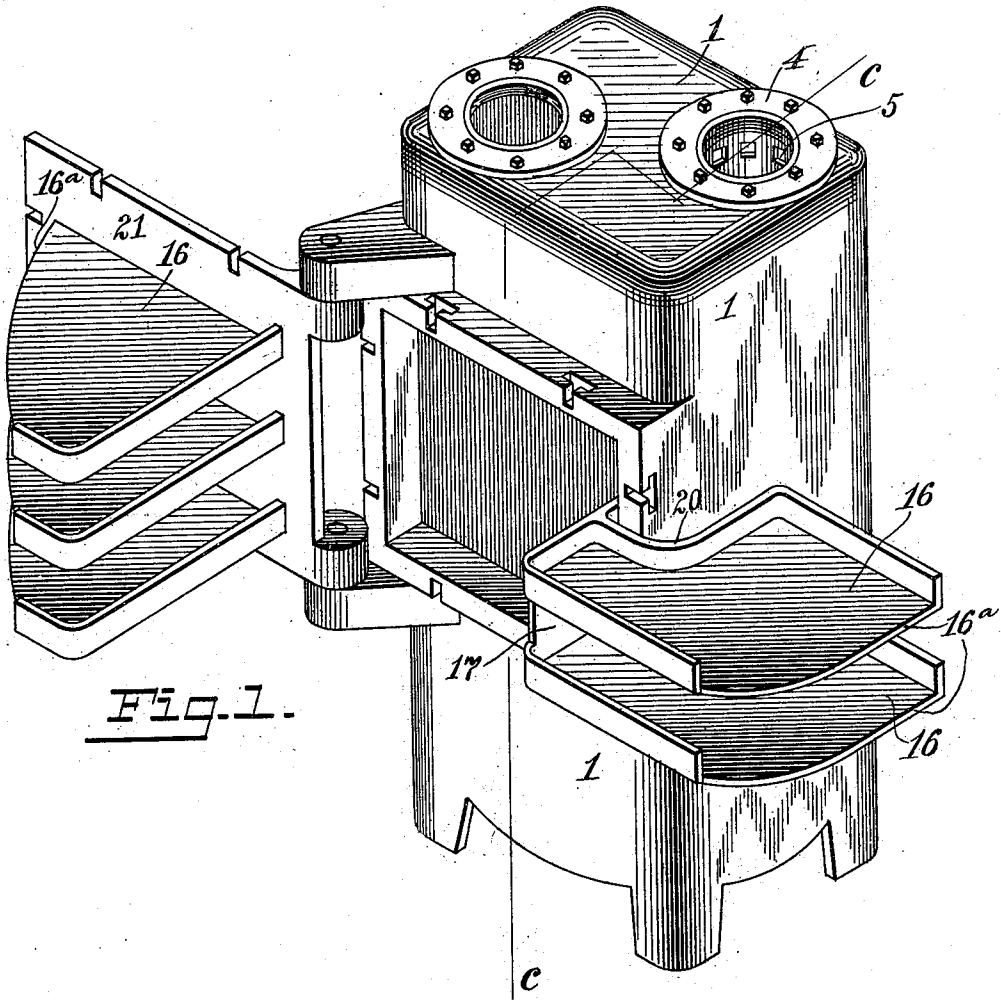


Fig. 1.

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Inventor

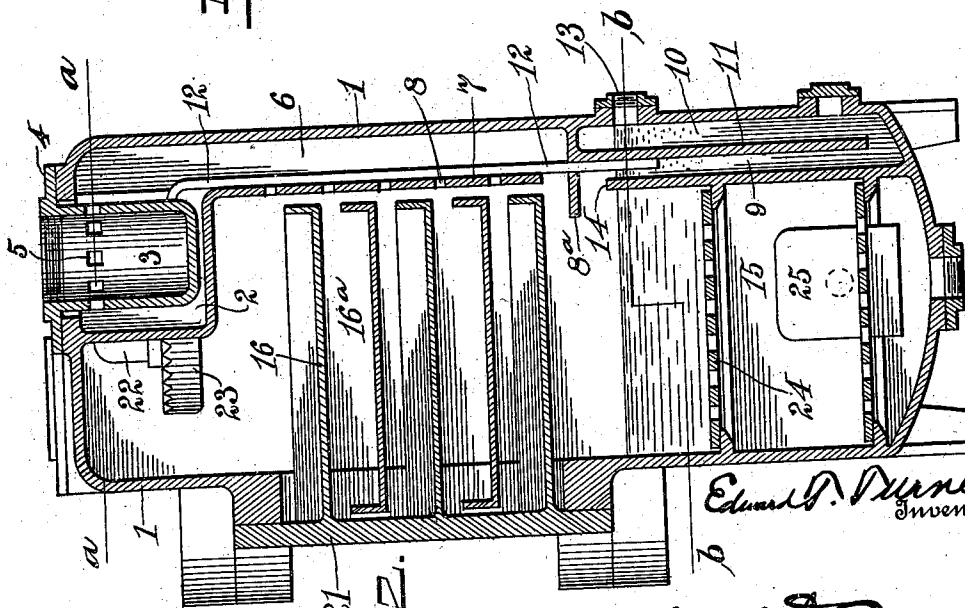
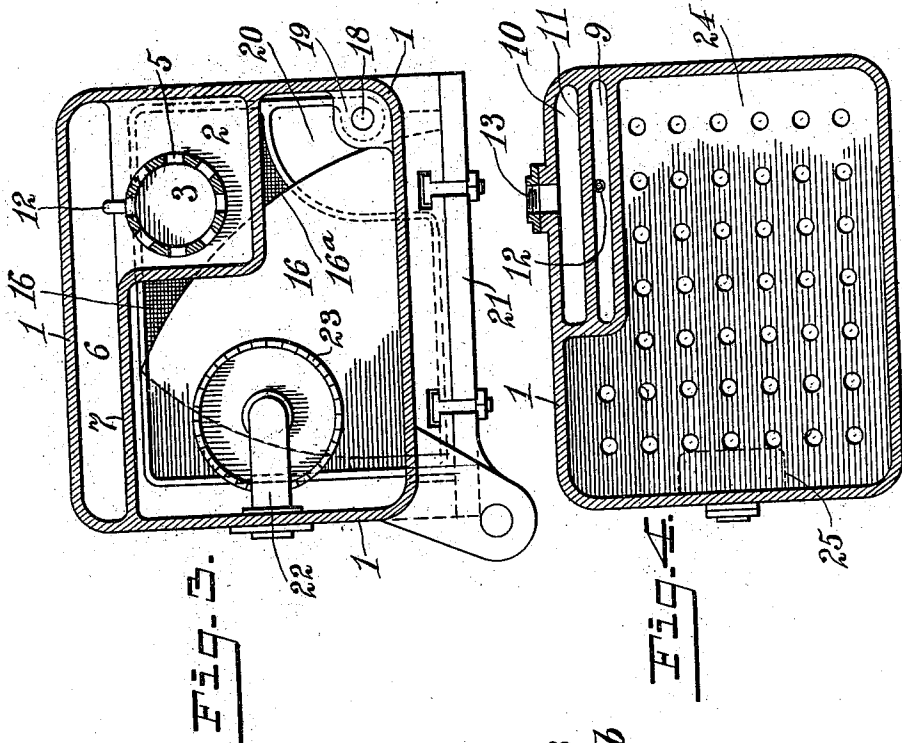
Witnesses  
M. Silber  
H. S. Smith

By J. M. Carty  
his Attorney

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Witnesses  
*W. Sibley*  
*H. P. Smith*

FIG. 2.

*Edward T. Turner*  
 Inventor

*R. J. McCarty*  
 His Attorney

# UNITED STATES PATENT OFFICE.

EDWARD T. TURNER, OF DAYTON, OHIO.

FEED-WATER HEATER.

981,901.

Specification of Letters Patent.

Patented Jan. 17, 1911.

Application filed November 25, 1910. Serial No. 593,989.

*To all whom it may concern:*

Be it known that I, EDWARD T. TURNER, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Feed-Water Heaters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in feed water heaters, and possesses the new and useful features hereinafter described in connection with the accompanying drawings and pointed out in the claims.

The objects of the invention are several, principally among which is the provision of a more economical compact and efficient feed water heater.

With this end in view, the improvements relate specifically to an interior construction of the device by means of which the oil is separated from the steam in a separator, and is retained in a separated condition and caused to pass from the apparatus with the overflow water in the bottom of said apparatus.

The improvements further consist in the provision of a water seal-overflow which is cast with the heater shell and is contained on the inside of the heater.

The improvements further consist in the provision of means whereby easy access may be had to the precipitating pans or trays for cleaning, and easy access may be had to the filter in the lower portion of the apparatus.

Other advantages are attendant in my improved feed water heater, such as cheapness in construction and a reduction in weight due to there being fewer castings and less machine work necessary in completing the same ready for installation, as will more fully appear from the following description taken in connection with the accompanying drawings.

In said drawings Figure 1 is a perspective view of the apparatus showing the precipitating pans or trays swung outwardly. Fig. 2 is a vertical, longitudinal, mid-sectional view on the line *c-c* of Fig. 2. Fig. 3 is a section on the line *a-a* of Fig. 2. And Fig.

4 is a sectional view on the line *b-b* of Fig. 2.

Similar reference characters denote the same parts in the specification and drawings.

Cast on the interior of the heater 1 is a chamber 2 in which an oil separator 3 is placed, said separator being suspended in said chamber by means of a flange 4. The steam conducted from the boiler (not shown) is introduced into this separator more or less commingled with oil. To separate this oil and get it out of the apparatus so that it may not be carried by the steam, in any objectionable amount, to the water entering the apparatus, it will be understood, is desirable. The steam inlet may be so arranged that the steam will enter at the top or side of the apparatus. In the drawings the entrance is shown at the top. Around the upper portion of the separator 3 is a series of steam ports 5 which communicate with the surrounding chamber 2 and with a down chamber or steam leg 6 in the back and on the interior of the apparatus. This chamber 6 is inclosed between the back of the apparatus and an interior wall 7, which is provided with suitable ports or openings 8 constituting outlets for the steam to the precipitating pans to be presently described. The lower end of the steam chamber 6 is inclosed by a horizontal baffle wall 8<sup>a</sup>, and below this wall are two chambers 9 and 10 formed by extending downwardly a wall 11 from the wall 8<sup>a</sup>. The wall 11 terminates at a suitable point above the bottom of the chambers 9 and 10, so as to allow free communication from the first of these chambers to the other. These chambers form a water seal to prevent the heater from blowing up, due to an excess of steam pressure which may occur in the heater, and also serves as an overflow for the excess water contained in the bottom of the heater. The oil and water are also trapped in these chambers, first entering chamber 9 through a down pipe 12 and filling up both chambers until it rises to the outlet 13 through which it passes from the apparatus. The pipe 12 extends from the bottom of the oil separator 3 into the initial chamber 9. The inner wall 14 of the chamber 9 separates said chamber from the filtering chamber 15 by extending it a substantial distance above said filtering chamber.

The precipitating pans or trays 16 are lo-

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cated within the apparatus, each individual pan being arranged below a respective steam port 8. Each of these pans has a portion of its marginal rim removed as at 16<sup>a</sup>, in order that the water may flow from one pan to the other. The portion of each upper pan where the rim is removed, lies above the rim portion of the adjacent lower pan, so that the water flows from one pan to the other across the face of each pan. The precipitating pans are hinged in two series so that they may be swung out of the apparatus as in Fig. 1. One series of pans may be joined by a wall 17 in which case they are made a single casting. This series of pans are hinged to a rod 18, which projects through a suitable number of ears 19 extending from the walls at one of the front corners, see Fig. 3. This series of pans are recessed as at 20, so that they may be swung out of the apparatus and around the corner, as in Fig. 1. The other series of pans may be cast integral with the door 21, or they may be supported on the door by attaching them in any suitable manner. Each series of pans are so spaced or arranged relative to each other, that when they are swung into the apparatus they nest one below the other as in Fig. 1. It is possible to hinge both series of pans in a similar manner, in which case neither series would be mounted on the door. The inlet water pipe 22 enters the upper portion of the apparatus and delivers the water to a receptacle 23, which overflows at its margin and delivers the water to the uppermost precipitating pan from which it traverses throughout the series. From the lowermost precipitating pan the water flows to the apertured plate 24 just above the filtering chamber. From the filtering chamber the water, free from mineral matter, flows to the chamber 25 in the extreme lower end of the apparatus from whence it is conducted to the place of consumption.

45 Having described my invention, I claim:

1. In a feed water heater, a casing having a steam chamber in the upper portion thereof, a down steam passage extending therefrom inclosed on its inner side by an apertured wall, and water seal-overflow chambers in the lower portion thereof, an oil separator located in the steam chamber in the upper portion of the casing, said separator having orifices in its upper portion through which the steam enters said steam chamber and passes therefrom into the down steam passage and thence through the apertured wall to the interior of the apparatus,

and an oil pipe extending from the oil separator into one of the water seal-overflow chambers, substantially as specified. 60

2. In a feed water heater, a casing provided with a steam chamber in the upper portion thereof from which extends a down passage in the rear portion of the casing, said down passage being inclosed on its inner side by a wall having openings therein, a baffle wall inclosing the lower end of said down passage, a space below said baffle wall divided into two communicating water seal-overflow chambers by a lower wall projecting from said baffle wall, an oil separator located within the steam chamber in the upper portion of the casing, a pipe extending from said separator to one of the water seal-overflow chambers, and a series of precipitating pans mounted relatively to the openings in the wall forming the inner inclosure of the down passage, substantially as specified. 75 80

3. In a feed water heater, a casing having a steam chamber in the upper portion thereof, and a down passage leading therefrom, said down passage being inclosed on its inner side by a perforated wall, and two series of precipitating pans having hinged connections adapting them to be swung in and out of said casing, the pans of one series being adapted to lie between the pans of the other series when in position, said pans occupying positions relatively below the openings in the wall forming the inner inclosure of the down passage, substantially as described. 85 90

4. In a feed water heater, the combination of a casing having a steam chamber in the upper portion thereof, and a down passage leading therefrom inclosed by an inner perforated wall, two series of swinging precipitating pans adapted to occupy positions relatively below the openings in said perforated wall when in their inner positions, two communicating water seal-overflow chambers in the lower portion of said casing, separated from the down passage by a horizontal wall, an oil separator within the steam chamber in the upper portion of the casing, and a down pipe extending from said oil separator to one of the water seal-overflow chambers, substantially as described. 95 100 105 110

In testimony whereof I affix my signature, in presence of two witnesses.

EDWARD T. TURNER.

Witnesses:

R. J. McCARTY,  
MATTHEW SIEBLER.