

No. 754,907.

PATENTED MAR. 15, 1904.

J. M. SMITH.
FEED WATER PURIFIER.
APPLICATION FILED JUNE 29, 1903.

NO MODEL.

Fig. 1.

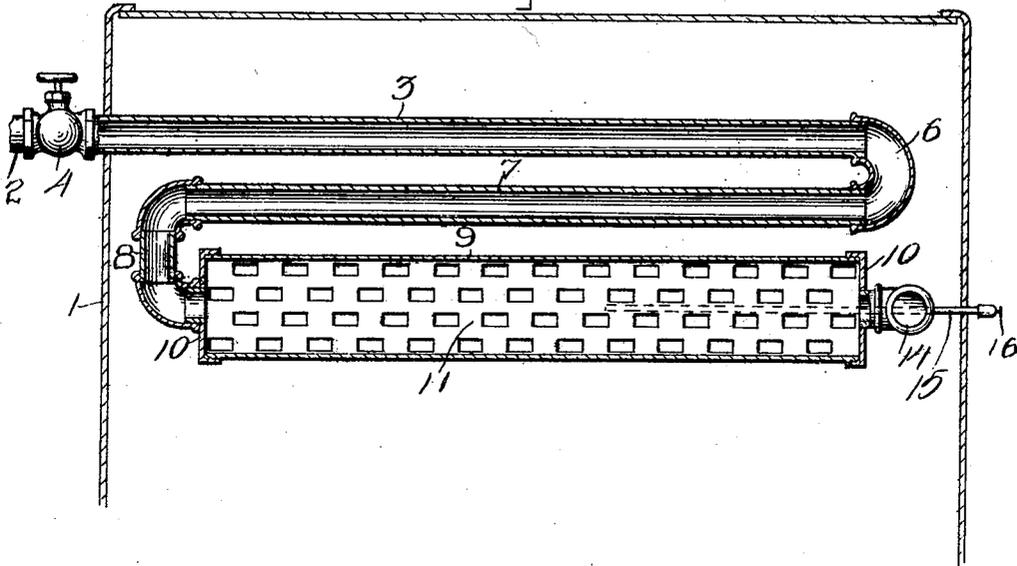
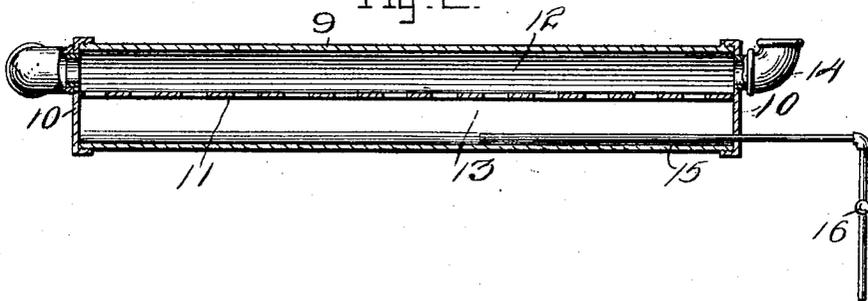


Fig. 2.



Witnesses

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JAMES M. SMITH, OF SHARON, PENNSYLVANIA.

FEED-WATER PURIFIER.

SPECIFICATION forming part of Letters Patent No. 754,907, dated March 15, 1904.

Application filed June 29, 1903. Serial No. 163,594. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. SMITH, a citizen of the United States, residing at Sharon, in the county of Mercer and State of Pennsylvania, have invented certain new and useful Improvements in Feed-Water Purifiers; 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.

This invention relates to improvements in boiler and feed water purifiers.

The object of the invention is to provide a simple and effective feed-water conductor in which provision is made for separating the scale-forming impurities from the water and discharging the same upon the exterior.

With these and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, as will be hereinafter more fully described, and particularly pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a fragmentary horizontal section through the device and shell of a boiler, and Fig. 2 is a vertical longitudinal section through the separator.

Referring now more particularly to the drawings, the numeral 1 represents a boiler shell or casing, and 2 a feed-water-supply pipe. The pipe 2 is connected with the outer end of a conducting-pipe 3, and a regulating-valve 4 is disposed at the point of junction of these pipes to enable the feed of water to the boiler to be controlled. The pipe 3 extends longitudinally from one end to near the opposite end of the boiler and is connected by a union or coupling 6 with an oppositely-extending pipe 7, forming practically a continuation of pipe 3. At its end opposite the coupling 6 the pipe 7 is connected by a coupling 8 with the inner end of a separator 9, disposed longitudinally within the casing or shell 1. The separator 9 comprises a tubular casing closed at each end by a head 10 and provided with a central partition in the form of a diaphragm 11, separating it to form upper and lower chambers 12 and 13. The diaphragm 11 is of a foraminous or mesh mate-

rial, and its apertures or meshes form ports or passages connecting the said two chambers 12 and 13. The coupling or inlet pipe 8 enters the inlet end of the chamber 12; and a discharge-pipe 14 is in communication with the opposite or outlet end of said chamber 12. The chamber 13 is in communication with the inlet 8 only through the chamber 12, but is provided with a discharge-pipe 15, having a controlling-valve 16. This discharge-pipe 15 is designed for the blowing out of the sediment from the chamber 13 to the exterior of the boiler, the valve 16 being opened at intervals to discharge accumulated sediment.

In operation the water flows from the pipe 2 through the pipe 3 and thence through the pipes 7 and 8 into the chamber 12 of the separator 9. In its passage through the pipes 3 and 7 the water absorbs enough heat from the surrounding water and steam to raise its temperature to that of the water in the boiler. As this temperature is much above 212°, the sediment and scale-forming constituents in the water separate in the chamber 12 and while flowing through said chamber settle into the chamber 13 through the screen-diaphragm 11 and under the pressure accumulating from the conversion of a portion of the water into steam are blown out through the pipe 15 when valve 16 is opened. The purified water flows from the chamber 12 through the discharge-pipe into the boiler 1, as will be readily understood.

In the present instance I have shown the separator disposed inside the boiler; but it may be disposed outside the boiler, if desired, or occasion necessitates such disposition.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

1. A feed-water purifier, comprising a casing adapted to be horizontally disposed, a longitudinal horizontal perforated diaphragm separating the interior of said casing to form
 5 superposed separating and sediment chambers, said chambers being in communication only through the perforations of said diaphragm, water inlet and discharge connections at the ends of the upper or separating
 10 chamber, and a sediment-discharge at the end of the sediment-chamber below the said water-discharge, substantially as described.

2. A feed-water purifier, comprising a casing adapted to be horizontally disposed, a longitudinal horizontal perforated diaphragm separating the interior of said casing to form
 15 superposed separating and sediment chambers, said chambers being in communication only through the perforations of said diaphragm, water inlet and discharge connections at the ends of the upper or separating
 20 chamber, and a valved blow-off pipe entering the end of the sediment-chamber below the water-discharge connection and extending some distance into said chamber, substantially
 25 as described.

3. A feed-water purifier comprising a casing adapted to be horizontally disposed, a longitudinal horizontal perforated diaphragm separating the interior of said casing to form
 30 superposed separating and sediment chambers, said chambers being in communication only through the perforations of said dia-

phragm, caps closing the ends of said chamber, water inlet and discharge connections upon said caps at the ends of the upper or separating chamber, and a valved blow-off pipe entering the outlet end of the sediment-chamber through the cap carrying the water-discharge connection, substantially as described. 35 40

4. In a feed-water heater and purifier, the combination of a water-supply pipe, reversely-extending conducting-pipes connected thereto, and pipes extending back and forth in
 45 parallel relation, and a separator disposed parallel with the pipes and comprising a casing, a longitudinal horizontal perforated diaphragm separating the interior of said casing to form superposed separating and sediment
 50 chambers, said chambers being in communication only through the perforations of said diaphragm, a water-inlet connection between said conducting-pipes and one end of the separating-chamber, a water-discharge connection
 55 at the opposite end of said chamber, and a sediment-discharge at the end of the sediment-chamber below the said water-discharge, substantially as described.

In testimony whereof I have hereunto set
 60 my hand in presence of two subscribing witnesses.

JAMES M. SMITH.

Witnesses:

A. W. WILLIAMS,
 F. J. WHARTON.