

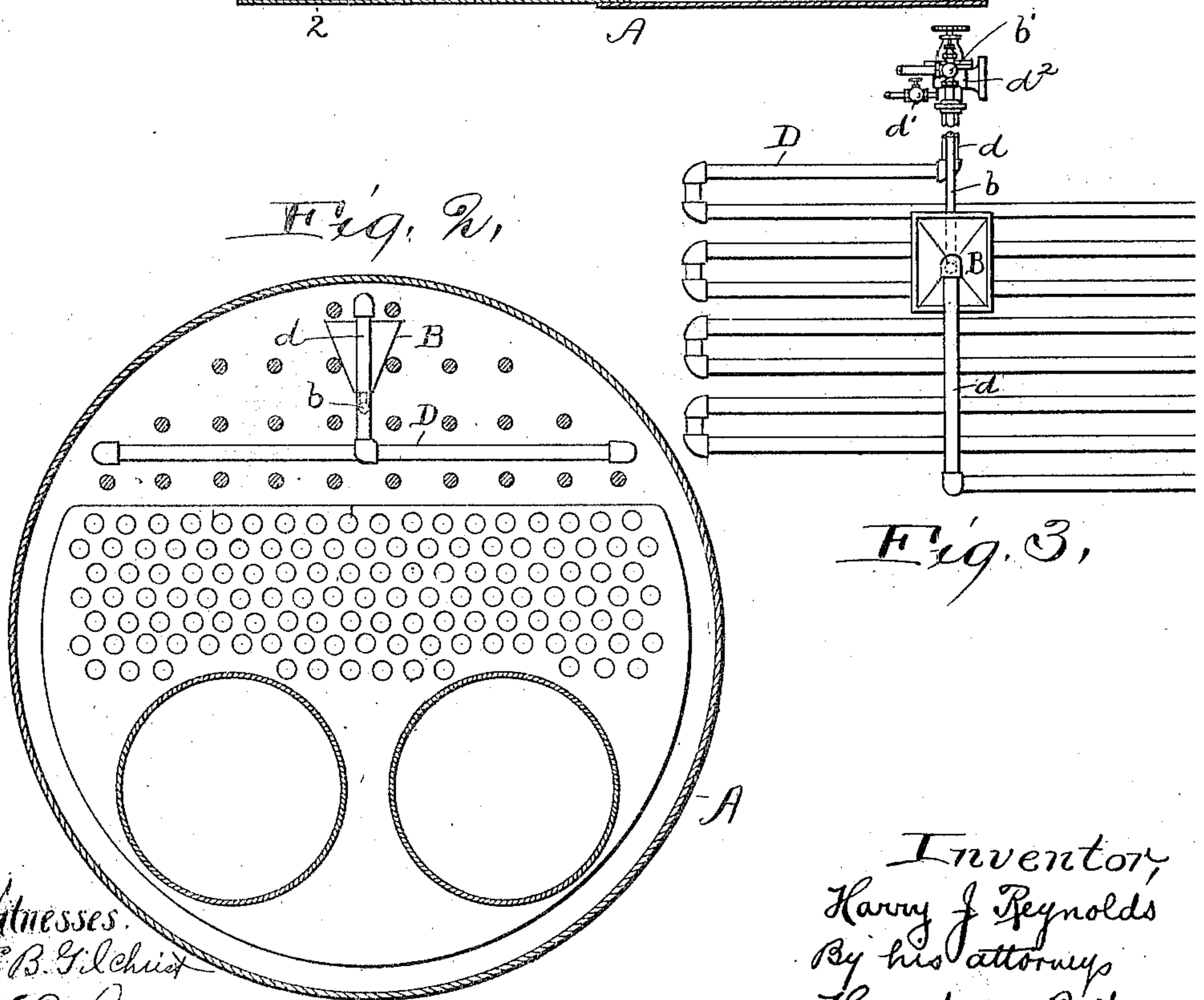
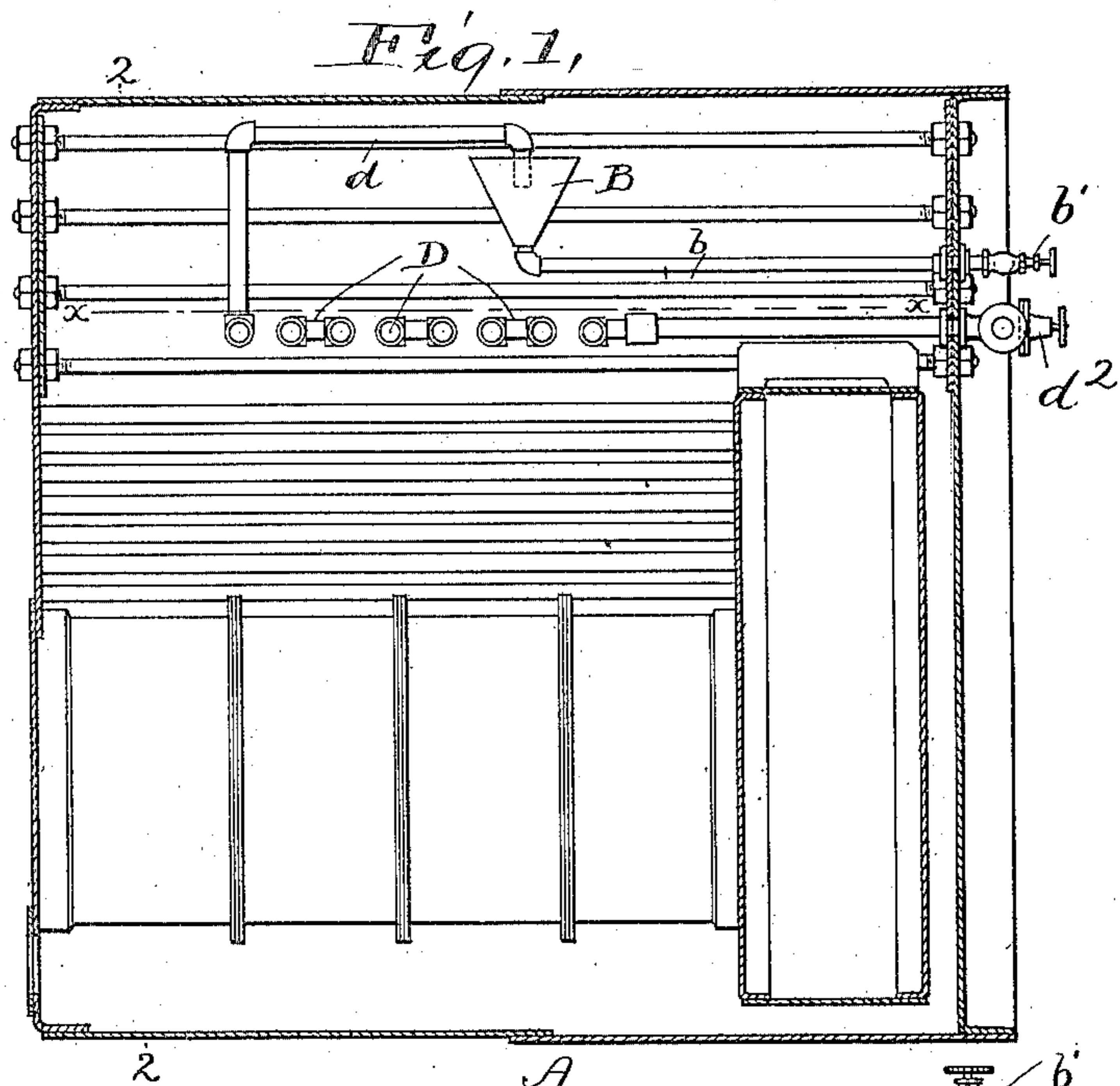
No. 706,782.

Patented Aug. 12, 1902.

H. J. REYNOLDS.
FEED WATER HEATER AND PURIFIER.

(Application filed Feb. 23, 1901.)

(No Model.)



Witnesses.
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UNITED STATES PATENT OFFICE.

HARRY J. REYNOLDS, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO
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FEED-WATER HEATER AND PURIFIER.

SPECIFICATION forming part of Letters Patent No. 706,782, dated August 12, 1902.

Application filed February 23, 1901. Serial No. 48,419. (No model.)

To all whom it may concern:

Be it known that I, HARRY J. REYNOLDS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Feed-Water Heaters and Purifiers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The invention has for its object the heating of the feed-water for a boiler and the removal of the greater part of the impurities contained therein before said heated water is discharged into the boiler.

The invention consists of the combination of an open-top receiver supported in the steam-space in the boiler and having a valve-controlled discharge-pipe connected with its lower end and extending outside of the boiler, a heating-pipe in the boiler located, preferably, below the normal water-line and having its outlet above and in position to discharge into said receiver and having in its inlet end outside of the boiler a blow-off cock.

In the drawings, Figure 1 is a longitudinal sectional elevation of the boiler equipped with the present invention. Fig. 2 is a transverse sectional elevation on line 2 2 of Fig. 1, and Fig. 3 is a plan view of the heating-pipe.

Referring by letters to parts shown, A indicates a boiler, which may be of any suitable construction. B represents the feed-water receiver, which in the best construction is in the form of an open-mouthed funnel. It is located in the steam-space in the boiler above the water-line $x x$, with its open top as near the top of the boiler as convenient. A discharge-pipe b , connected with its lower tapered end, is extended out through the boiler-wall and is provided outside the boiler with a blow-off cock b' .

The heating-pipe D, which consists of a plurality of coils or convolutions, is located in the boiler and preferably below the water-line, wherefore it is submerged in the hot boiler-water. The discharge end d of this heater-pipe is extended up and over the receiver B, wherefore the water which is forced through the heater-pipe is delivered into this receiver. The inlet end of this heater-pipe outside the boiler contains a check-valve d'' , and between this check-valve and the boiler-wall a blow-off cock d' is connected with said pipe D.

In the operation of the described device the water forced through the pipe D is heated, so that when delivered in the receiver B it is at nearly the temperature of the boiler-water. The feed-water used in boilers ordinarily contains impurities held in suspension and a very considerable quantity of impurities which do not separate therefrom until the water is heated. These impurities last referred to, together with the impurities which the water when cold holds in suspension, or rather such part of such impurities as are heavy enough, will settle to the bottom of the receiver B, and the purified water will flow over the edges of said receiver and mingle with the boiler-water. At suitable intervals the impurities which have settled to the bottom of the receiver B may be blown out by opening the blow-off cock b' . In like manner such impurities as may have settled in the heater-pipe D may be blown out by opening the blow-off cock d' .

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

In a feed-water heater and purifier for steam-boilers, the combination of a feed-pipe leading into the boiler, a horizontal heating-coil connected therewith and located in the boiler in a plane parallel with but just below the normal water-line of the boiler and a pipe leading up from the inner end of the coil and having its discharge end curved over and downwardly, with an open-topped funnel-shaped receiving vessel located in the boiler below said discharge-outlet of the heating-coil but above the normal water-line of the boiler and a discharge-pipe connected with the lower end of said receiving vessel and extending out through the shell of the boiler, together with suitable valves in the feed and discharge pipes, outside of the boiler, to control them, substantially as specified.

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

HARRY J. REYNOLDS.

Witnesses:

E. L. THURSTON,
E. B. GILCHRIST.