

(No Model.)

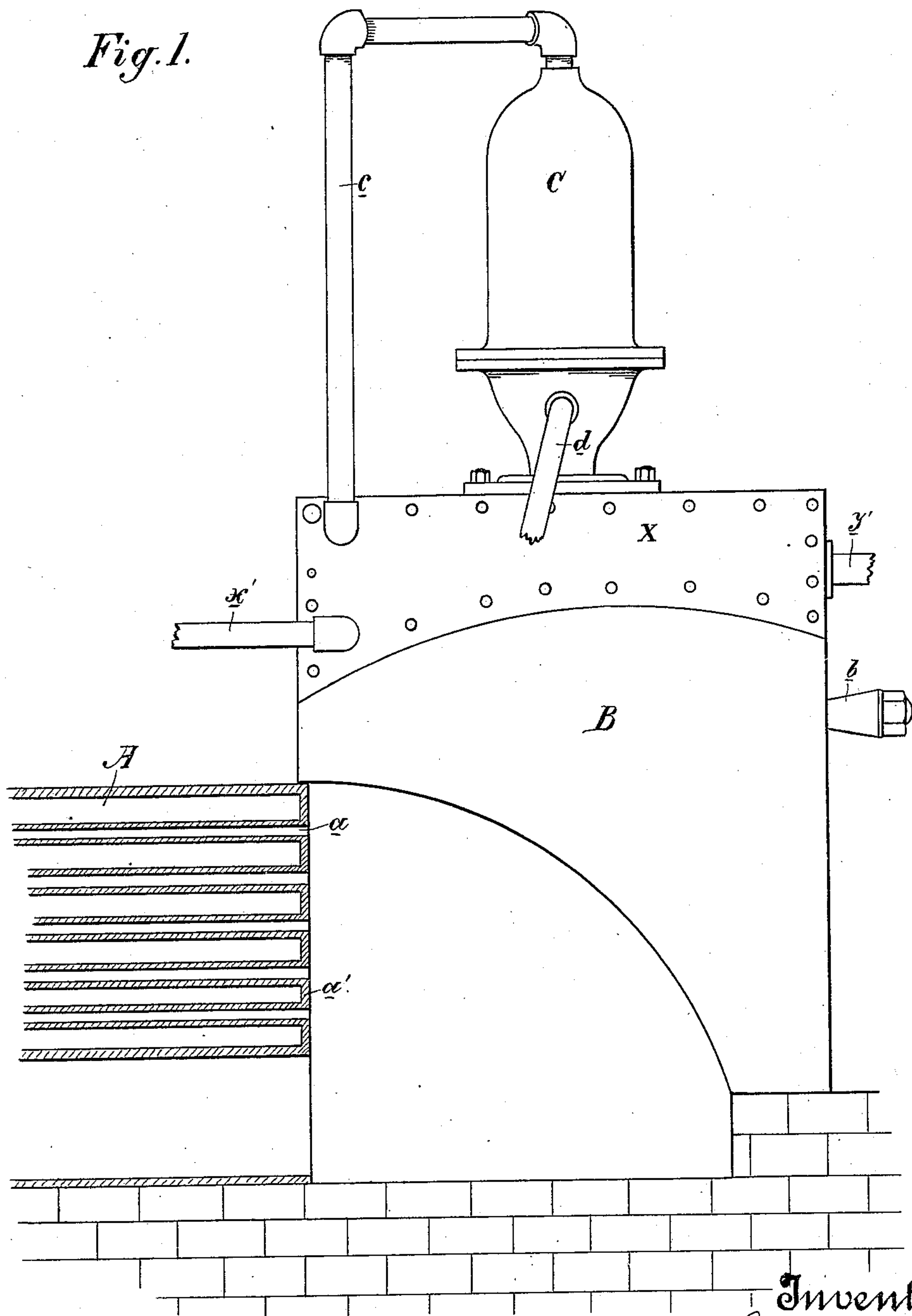
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L. A. OLSEN.
FEED WATER HEATER.

No. 332,824.

Patented Dec. 22, 1885.

Fig. 1.



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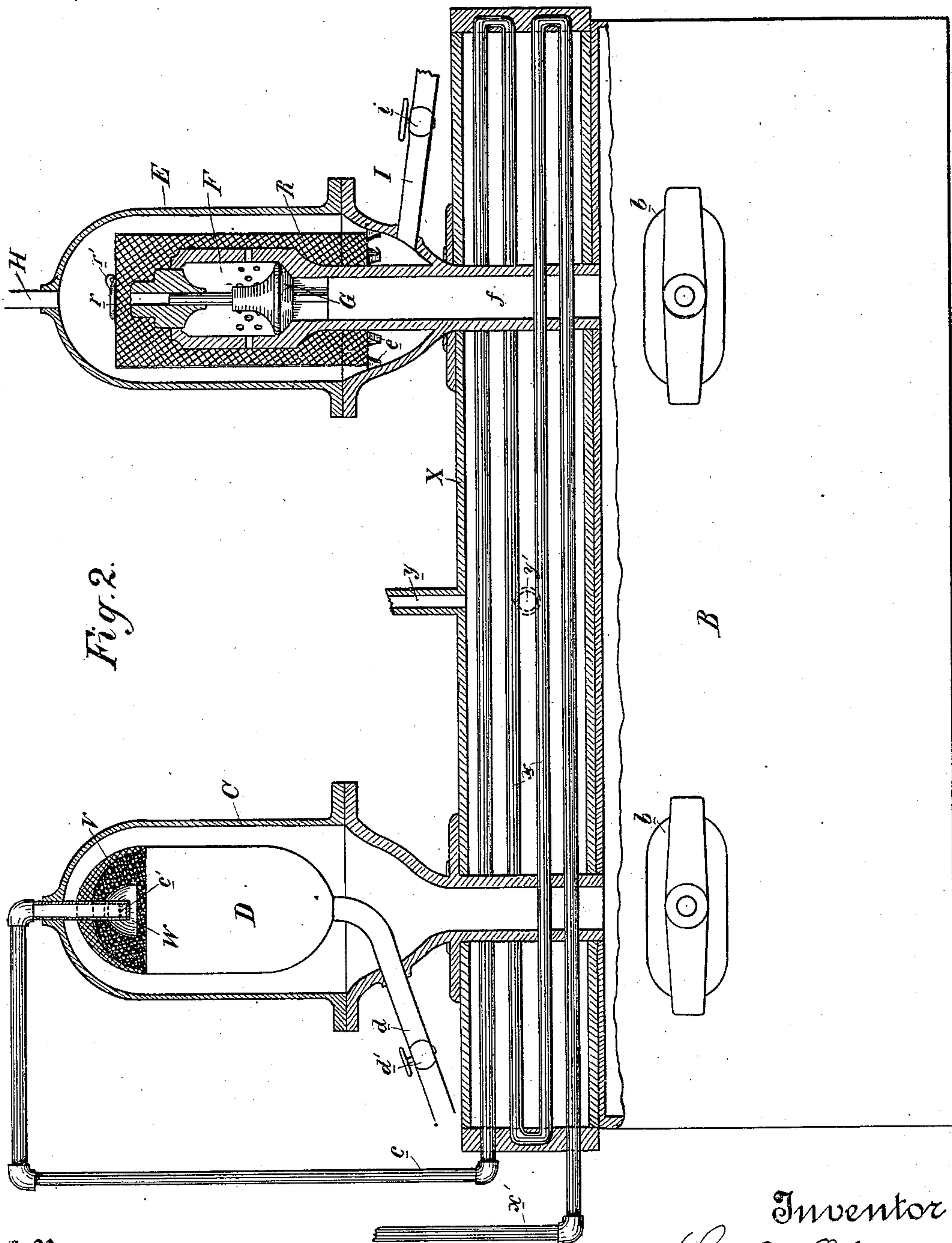
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UNITED STATES PATENT OFFICE.

LARS. A. OLSEN, OF SAN FRANCISCO, CALIFORNIA.

FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 332,824, dated December 22, 1885.

Application filed October 1, 1885. Serial No. 178,765. (No model.)

To all whom it may concern:

Be it known that I, LARS. A. OLSEN, of the city and county of San Francisco, and State of California, have invented an Improvement in Feed-Water Heaters and Purifiers; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the class of devices for heating and purifying feed-water to boilers; and my invention consists of a boiler-iron box at the rear of the boiler, a second box or casing upon the first box and containing return-flues communicating with the pipe from the pump, said box or casing receiving the exhaust-steam, a globe connected with one end of the first box and with a pipe from the flues of the second box, a globe connected with the other end of the first box and with the pipe to the boiler, a cup or disk in the first globe to receive the feed-water, and a valved outlet-pipe from said cup, a check-valve in the second globe, a perforated casing around said valve, and a screen-cylinder around the casing, a discharge-pipe from the globe, and other details of construction, all of which I shall hereinafter fully describe.

The object of my invention is to provide a simple and effective device which is adapted not only to heat the feed-water, but at the same time to purify it, and which can be easily cleansed.

Referring to the accompanying drawings, Figure 1 is an end elevation of my device. Fig. 2 is a longitudinal vertical section.

A is a portion of a boiler, of which a are the tubes, and a' the rear tube-sheet. Instead of the rear plate of the boiler, I have the boiler-iron box B, resting on the brick-work, and adapted to be heated directly by the flames as they return through the tubes. In the rear of the boiler-iron box are man-holes b . On top of the box B is a second box or casing, X, containing return-pipes x , communicating with a pipe, x' , from the pump and with the pipe c , as shown. In the top center of box X is the inlet-port y , through which the exhaust-steam is to be admitted, and in its side is the exhaust-port y' , through which it escapes. On one end of the box X, and communicating with box B, is a globe, C, in the top of which is let the pipe c from the pipes x . Within the globe is

a cup or dish, D, from the bottom of which a pipe, d , extends and passes out through the globe to the ash-pan, a valve, d' , being let into said pipe. The pipe c projects downwardly into the globe, and has screwed upon its end, just above the cup or dish D, a conical sleeve or thimble, W. The lower end of the pipe c is closed, but perforations c' are made in its sides, through which the water escapes. A conical screen or sieve, V, is slipped over the rim of the cup D, and embraces with its top the pipe c . On the other end of box X is a globe, E, within which is a perforated casing, F, the stem f of which communicates with the box B. In this casing is seated an upwardly-moving check-valve, G. Supported on small lugs e within the globe E is a cylindrical screen or sieve, R, which may be made of wire-cloth or perforated metal, such as zinc. In the top of the wire-cloth cylinder is an upwardly-opening check or safety valve, r , held to its seat by a spring, r' .

H is a pipe which leads from the top of the globe to the boiler.

I is a pipe leading out of the globe near its base, and provided with a valve or cock, i .

The operation of my device is as follows: The feed-water is forced by the pump through pipe x' and through the flues x of box X, in which its temperature is raised by the exhaust-steam. Thence it passes through the pipe c , escaping through the perforations at its lower end, and striking against the conical thimble or sleeve W, from which it drops down into the cup or dish D. The valve d' of the outlet-pipe d of said cup or dish being closed, the water overflows through the screen V. A great portion of the impurities are left in the sides of the cup and in its outlet-pipe. The presence of the sleeve or thimble W, which receives the first impact of the water, prevents undue agitation of the water in the cup, and thus induces the water to part with its impurities, a result which is further assisted by the screen V. The water thus purified passes down through the globe into the boiler-iron box B, in which it is fully heated. It is thence forced up through the stem f , past the valve G, into the casing F, through the perforations of which it passes outwardly through the screen R into the globe E. In thus pass-

ing through the parts described whatever impurities may be still in the water are separated and deposited as sediment in the base of the globe. The pure water passes through pipe

5 H to the boiler. The object of the valve *r* in the top of the screen R is to relieve said screen if it should become clogged. When a sufficient quantity of sediment has collected in the cup D of the globe C, the cock *d'* of its discharge-pipe *d* is opened, and the impurities
10 are blown out into the ash-pan by the incoming water; and when the impurities have accumulated in the globe E the pump is stopped, the cock *i* of the discharge-pipe I is opened,
15 and the whole pressure of the water in the boiler is thrown back into the globe, whereby its impurities are washed out. The box B is cleansed through the man-holes *b*.

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

1. In a feed-water heater and purifier, the box B at the back of the boiler, in combination with the globe C, communicating with
25 the pump and with the box at one end, and the globe E, communicating with the boiler and with the box B at the other end, substantially as herein described.

2. In a feed-water heater and purifier, the
30 box B at the back of the boiler, having a communication at one end with the boiler, in combination with the box X, having inlet and exhaust ports for the exhaust-steam, and the flues or pipes *x* within the box X, communicating with the pump and with the box B,
35 substantially as herein described.

3. In a feed-water heater and purifier, the box B at the back of the boiler, having a communication at one end with the boiler, in combination with the globe C, communicating with
40 the other end of the box and with the pump, and the cup or dish D in the globe, adapted to receive the water, having an exit-pipe with a valve, substantially as herein described.

4. In a feed-water heater and purifier, the
45 box B at the back of the boiler, communicating at one end with the boiler, in combination with the globe C, the inlet water-pipe *c*, having perforations in its lower end, the conical sleeve or thimble W on the end of pipe *c*,
50 and the cup or dish D, having pipe *d* and valve *d'*, substantially as herein described.

5. In a feed-water heater and purifier, the globe C, communicating with the feed-water-heating chamber, and having a cup or dish,
55 D, within it provided with a valved outlet, in combination with the feed-pipe *c*, projecting into the globe above the cup or dish and having a perforated lower end, and the conical sleeve or thimble W on the pipe *c*, substantially
60 as herein described.

6. In a feed-water heater and purifier, the globe C, communicating with the feed-water-heating chamber, the cup or dish D within
65 the globe and provided with a valved outlet, and the screen or sieve V over the top of the cup, in combination with the feed-pipe *c*, projecting

into the globe and through the top of the screen and having a perforated lower end, and the conical sleeve or thimble W on the
70 pipe *c*, substantially as herein described.

7. In a feed-water heater and purifier, the globe E, communicating with the boiler, in combination with the perforated valved casing F within the globe and communicating with
75 the feed-water-heating chamber, substantially as described.

8. In a feed-water heater and purifier, the globe E, communicating with the boiler, and having a valved outlet-pipe at or near its base,
80 in combination with the perforated valved casing F within the globe and communicating with the feed-water-heating chamber, substantially as described.

9. In a feed-water heater and purifier, the
85 globe E, communicating with the boiler and having a valved outlet-pipe at or near its base, in combination with the perforated valved casing F within the globe and communicating with the feed-water-heating chamber, and the
90 cylindrical screen R around said casing, substantially as herein described,

10. In a feed-water heater and purifier, the box B at the back of the boiler, in combination with the globe C, communicating with
95 one end of the box and with the pump, the cup or dish D within said globe adapted to receive the feed-water and having a valved outlet, the globe E at the other end of the box, communicating with the boiler and having a
100 valved outlet, and the perforated valved casing F within globe E and communicating with the box, substantially as herein described.

11. In a feed-water heater and purifier, the box B at the back of the boiler and communicating at one end with said boiler, the box
105 X on top of said box heated by exhaust-steam, and the flues or pipes *x* in said box X, communicating with the pump, in combination with the globe C on the box X and communicating with the box B, the pipe *c*, connecting the flues or pipes *x* with said globe,
110 said pipe having a perforated end within the globe, the thimble or sleeve W on the pipe, the cup or dish D, having a valved outlet, and
115 the top screen, V, for said cup or dish, substantially as herein described.

12. In a feed-water heater and purifier, the box B at the back of the boiler, and the box
120 X, heated by exhaust-steam and having flues or pipes *x*, connected with the pump and communicating with the box B at one end, in combination with the globe E, having a valved outlet and communicating with the boiler, and the perforated valved casing F within the
125 globe and communicating with the box B, substantially as described.

13. A feed-water heater and purifier comprising the box B at the back of the boiler, the box X on top of box B, and having ports
130 adapting it to be heated by exhaust-steam, the flues or pipes *x* in box X, the pipe *x'*, connecting said flues with the pump, the globe C, communicating with the box B, the pipe

5 c, connecting the flues or pipes x with said globe, said pipe projecting into the globe and having a perforated end, the thimble or sleeve on the end of pipe c, the cup or dish D, having a valved outlet and a screened top, the globe E, connected with the boiler and having a valved outlet, the perforated valved casing F in said globe communicating with box B, and the screen R around said casing, all arranged

and adapted to operate substantially as herein described.

In witness whereof I have hereunto set my hand.

LARS. A. OLSEN.

Witnesses:

C. D. COLE,

J. H. BLOOD.