

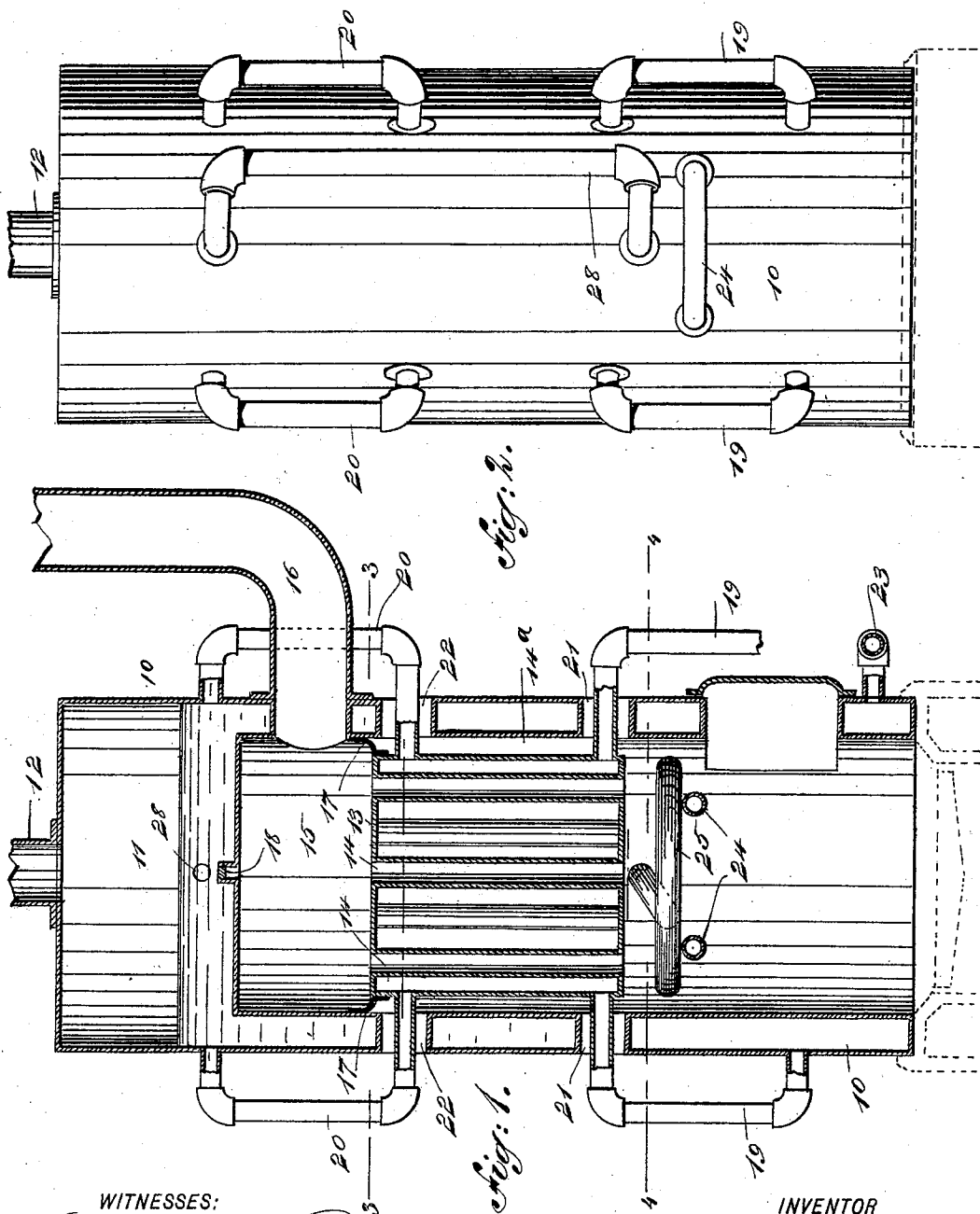
(No Model.)

2 Sheets—Sheet 1.

A. JAEGER.
BOILER.

No. 521,655.

Patented June 19, 1894.



WITNESSES:
Chas. Nier
C. Sedgwick

INVENTOR
A. Jaeger
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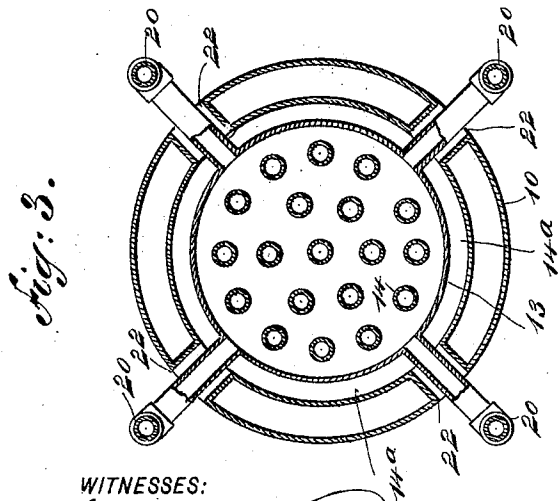
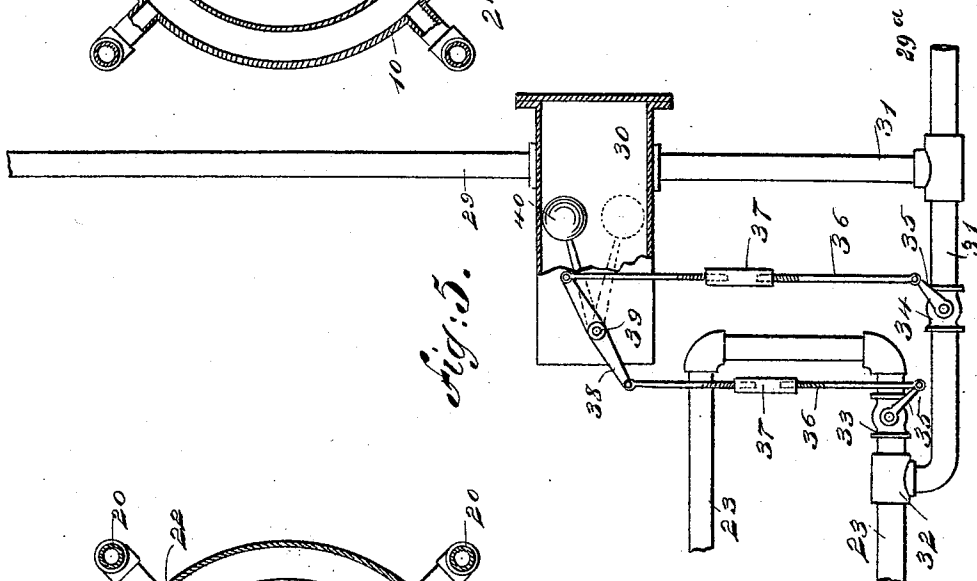
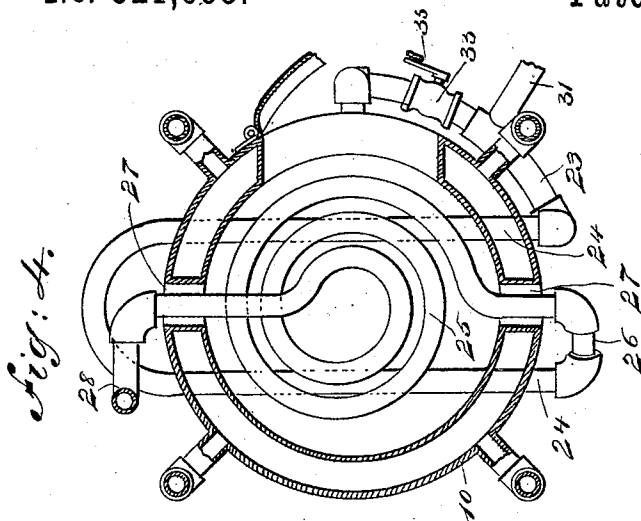
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UNITED STATES PATENT OFFICE.

ALBERT JAEGER, OF JERSEY CITY, NEW JERSEY.

BOILER.

SPECIFICATION forming part of Letters Patent No. 521,655, dated June 19, 1894.

Application filed March 6, 1894. Serial No. 502,505. (No model.)

To all whom it may concern:

Be it known that I, ALBERT JAEGER, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and Improved Boiler, of which the following is a full, clear, and exact description.

My invention relates to improvements in boilers; and the object of my invention is to produce a boiler which may be used as a hot water circulating boiler or steam generator, which combines to a certain extent the features of a tubular and coil boiler, which has a very large heating surface so that the water in it may be heated with a great economy of fuel, which has its shell, flues, coil and circulating tubes arranged in such a way as to promote rapid circulation and consequent efficient heating, and which has an arrangement to enable the return water, or the water of condensation, to enter the boiler at a low level.

To these ends my invention consists of certain features of construction and combinations of parts, which will be hereinafter described and claimed.

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

Figure 1 is a central vertical section of the boiler embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a sectional plan on the line 3—3 of Fig. 1. Fig. 4 is a sectional plan on the line 4—4 of Fig. 1; and Fig. 5 is a broken detail elevation, partly in section, of the mechanism controlling the return.

The boiler is preferably a vertical boiler and has a hollow shell 10, in which the water is held and heated, this shell having a space 11 to be utilized for generating steam, if the boiler is used as a steam boiler, and leading from this upper portion is a steam pipe 12. Within the shell is located the fire box in the ordinary way, and in the central portion of the boiler is a water-containing compartment 13 which is in connection with the shell and through which pass vertical flues 14, the heat and smoke passing up through these so as to heat the water in this section of the boiler. This tubular portion of the boiler is encircled by a flue 14^a, see Fig. 3, and just above it is the smoke box 15 from which leads the

stack 16. The flue 14^a is shut off from the smoke box by a diaphragm 17.

In the upper part of the boiler, just above the smoke box, is a fusible plug 18, which in case the water line gets too low, melts and thus gives an alarm, and puts out the fire.

The lower portion of the shell 10 connects with the lower portion of the tubular section 13 by means of pipes 19, while the upper portion of the tubular section connects with the upper portion of the shell by pipes 20, the pipes 19 and 20 projecting through holes 21 and 22 in the shell so as to make connection with the section 13. The heating and circulating of the water is also provided for by the following system of pipes: A pipe 23 leads from the lower portion of the shell 10 and merges in cross pipes 24, which extend transversely across the fire box beneath the section 13, and thus form a support for the coil 25 into which they merge, this coil being connected with the cross pipes by a pipe 26, see Fig. 4, and the coil connects by means of a pipe 28 with the upper part of the shell 10, the pipes 26 and 28 extending through holes 27 in the shell to make connection with the coil. It will be seen that the coil is arranged in the very hottest part of the fire box, so that the water, which is in it, is quickly heated and, rising, gives place to other water so that heating and circulation are both promoted. The return of the circulation pipe is through a pipe 29^a which delivers into a pipe 31, and this connects, as shown at 32, with the pipe 23. The pipe 31 also connects with a tank 30, and this connects, by means of the pipe 29, with the main steam pipe 12, and the object of this connection is to enable the steam from the boiler to balance the water pressure flowing back through the pipe 31.

The tank 30 is set at the desired height and is in connection with the boiler, as specified. Back of the connection 32 is a valve 33 in the pipe 23, and the pipe 31 is also controlled by a valve 34, each of these valves having its stem or handle 35 connected by a rod 36, which is longitudinally adjustable by means of the ordinary coupling 37, with a tilting lever 38, which is secured to a shaft 39 extending transversely through the tank 30 and the connections between the valves and the rod

are such that when one valve is open the other is closed. The shaft 39 is oscillated and the valves operated by a float 40, which is connected with the shaft, as shown in Fig. 5.

5 When the level of the water is above the coil 25, the water fills the tank 30 which is arranged at the desired level, and this raises the float 40 which, acting on the lever 38 and rod 36, opens the valve 34 and closes the
10 valve 33, so that the return water of condensation passes through the pipe 29^a, the pipe 31, and the pipe 23 to the coil 25, where it is quickly heated and circulated. The extreme heat of the coil draws the water out of the
15 tank 30 which permits the float 40 to drop, and this shifts the position of the valves, closing the valve 34 and opening the valve 33, so that the water is then taken from the lowest and
20 leg of the pipe 23 and carried directly to the coil 25, so that an active circulation is kept up and water enough is drawn into the coil to prevent it from being burned up.

It will be noticed from the above description and by reference to the drawings that
25 there is at no part of the boiler a great bulk of water, but that the water is distributed so as to be exposed so a great heating surface, and, consequently, is very quickly and economi-
30 cally heated.

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

35 1. A boiler composed of a vertical, hollow or double-walled shell, having a water and steam space at the top, and an annular-water

containing space communicating with such steam space and extending thence to the bottom of the shell, a smoke-box and fire-box, a tubular section intermediate of and connect- 40 ing such boxes, and circulation pipes connecting said tubular section with the water space of the shell, as shown and described.

2. A boiler, comprising a hollow walled shell, a tubular central section arranged with- 45 in the shell, circulation pipes connecting the tubular section with the shell, a coil arranged beneath the tubular section, and pipes connecting the coil with the lower and upper portions of the shell, substantially as described. 50

3. The combination, with the boiler, of the circulation pipe connecting with it at different levels, the return pipe of the boiler, the tank connected with it, a second pipe leading from the tank to the circulation pipe, valves 55 in the second pipe and in the circulation pipe, a float in the tank, and mechanism for opening and closing the valves by the movement of the float, substantially as described.

4. The combination, with the boiler and its 60 heating coil, of the circulation pipe connecting the lower portion of the boiler with the coil, a return pipe connected with the circulation pipe, valves controlling the return and circulation pipes, and a float actuated mech- 65 anism operated by the water in the return pipe to move the valves, substantially as described.

ALBERT JAEGER.

Witnesses:

JAMES H. KNIFFIN,
RICHARD V. TAFT.