

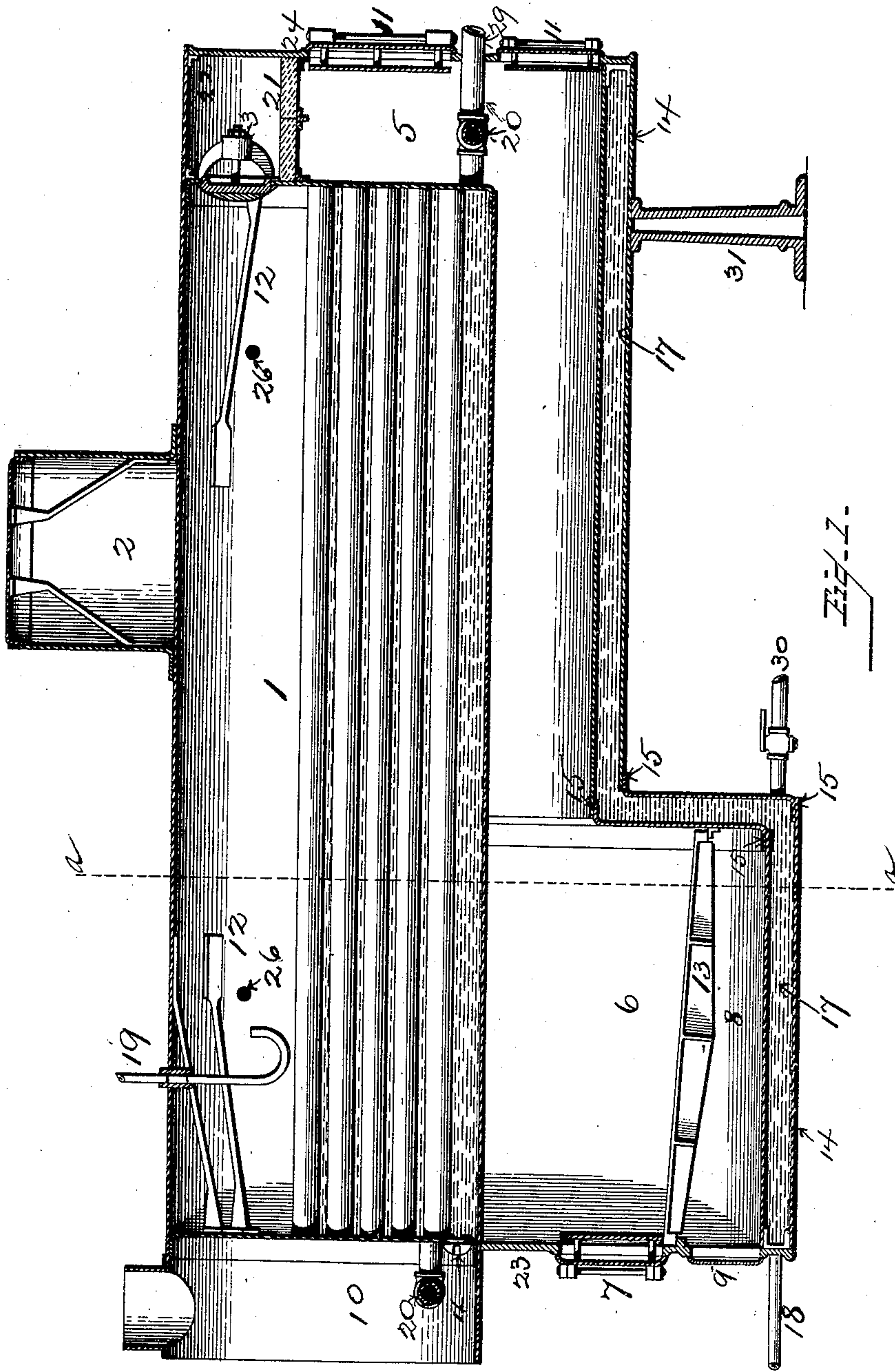
(No Model.)

2 Sheets—Sheet 1.

J. DICK.
STEAM BOILER.

No. 411,094.

Patented Sept. 17, 1889.



Witnesses
W. L. Seider
J. H. Jones

Inventor
John Dick
By his Attorney
Chas. J. Gooch

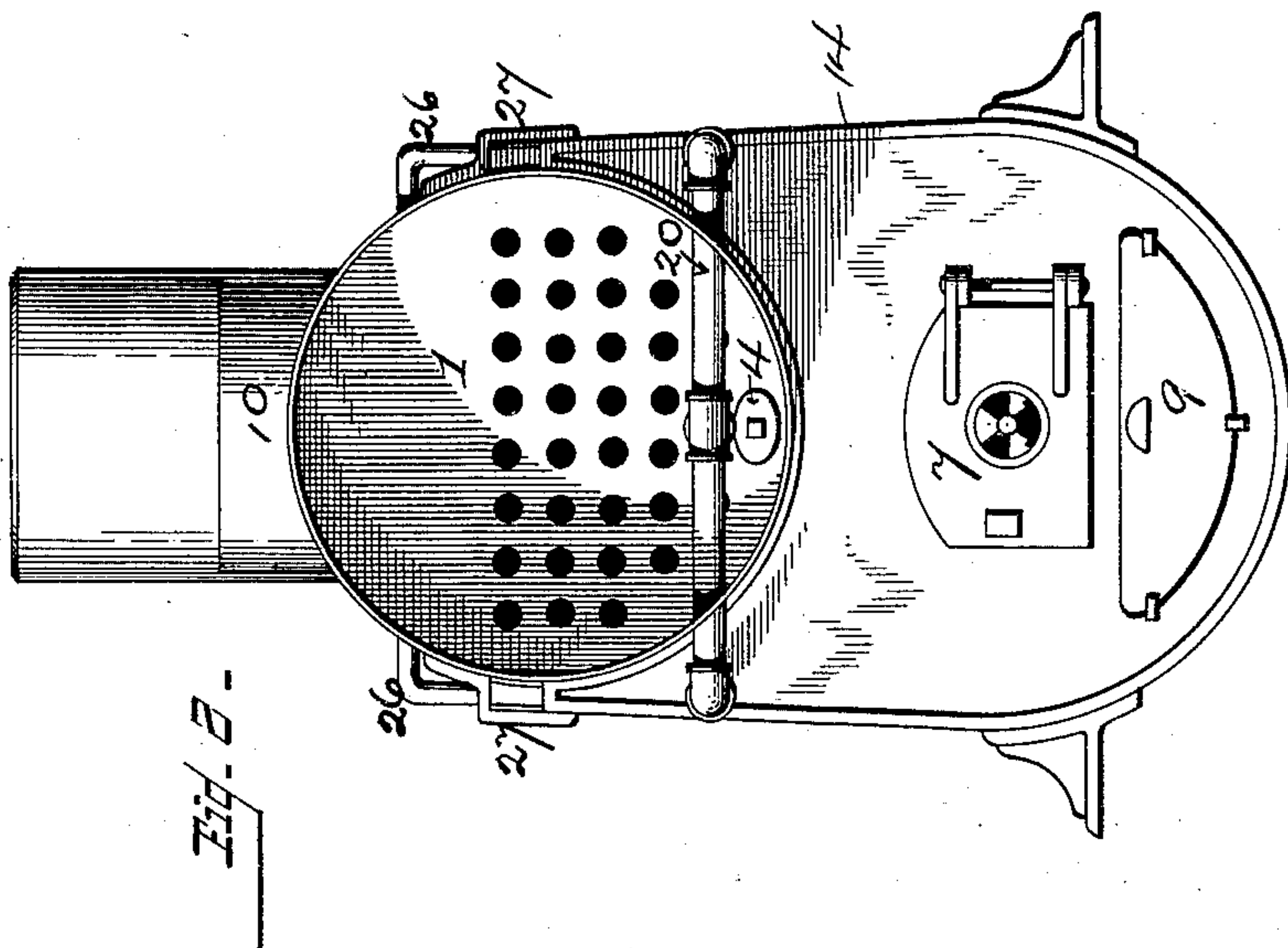
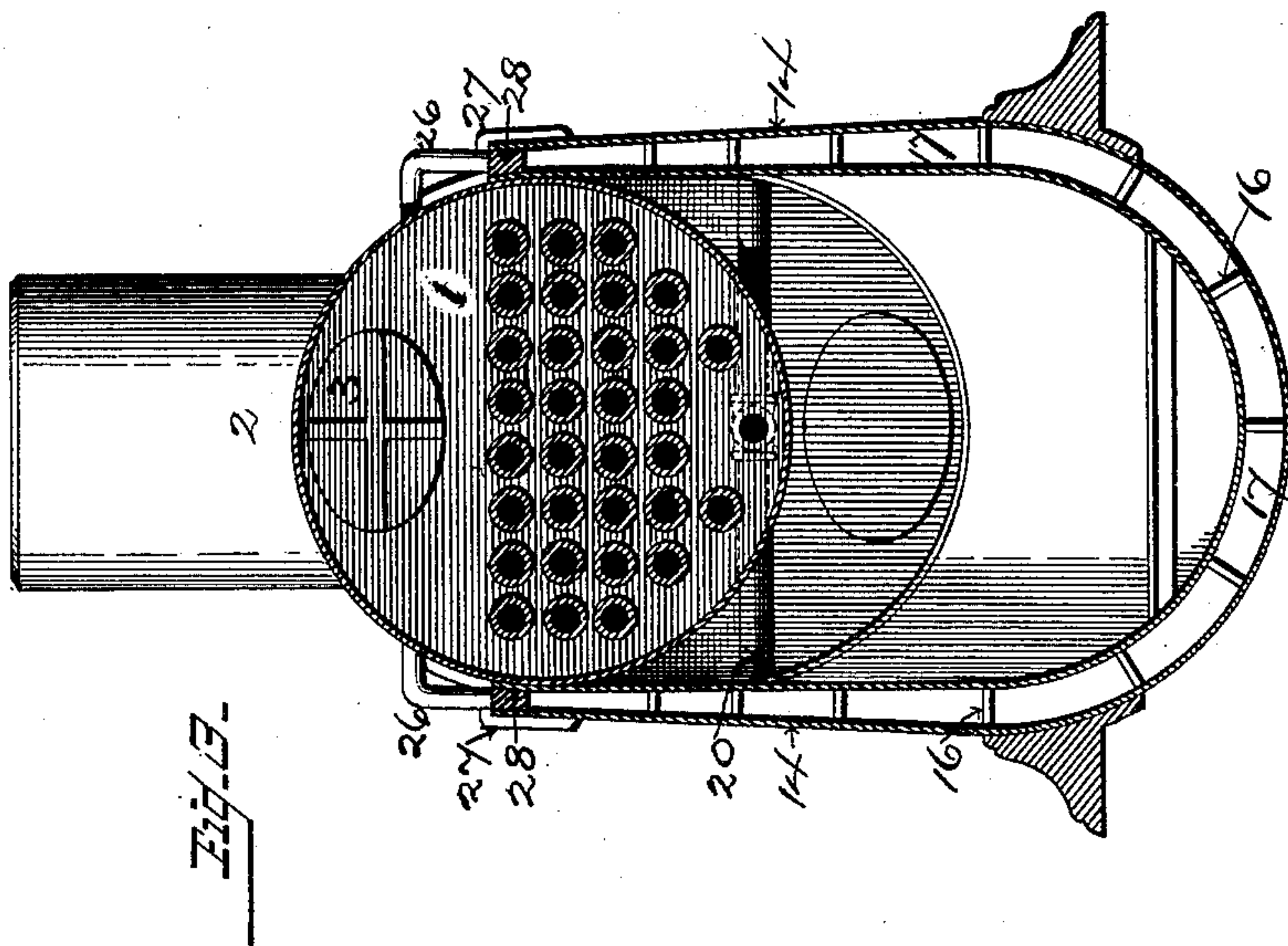
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STEAM BOILER.

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Witnesses
W. H. Steider.
E. J. Dumas.

Inventor
John Dick
By his Attorney *Chas. J. Gooch.*

UNITED STATES PATENT OFFICE.

JOHN DICK, OF MEADVILLE, PENNSYLVANIA.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 411,094, dated September 17, 1889.

Application filed November 1, 1887. Renewed March 9, 1889. Serial No. 302,742. (No model.)

To all whom it may concern:

Be it known that I, JOHN DICK, a citizen of the United States, residing at Meadville, in the county of Crawford and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Boilers; and I do hereby 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.

My improvement in steam-boilers relates to a combined boiler-setting and water jacket, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a longitudinal section, and Fig. 2 represents a front elevation, of a return tubular boiler with my improved casing and parts connected therewith, the smoke-box head being left off to show the hand-hole, circulating-pipes, &c. Fig. 3 represents a transverse section on the line *a a* of Fig. 1.

In the accompanying drawings I have represented my invention as applied to a return tubular boiler of ordinary construction.

By combining my improvements with a return tubular boiler I secure a portable boiler or a double boiler that may be used either as a portable or a stationary boiler.

1 represents a return tubular boiler of ordinary form. 2 is the steam-dome. 3 is the man-hole, 4 a hand-hole, 5 the combustion-chamber, 6 the furnace, 7 the furnace-door, 8 the ash-pit, 9 the ash-pit door, 10 the smoke-box, 11 the doors leading to the combustion-chamber, 12 the braces, and 13 the grate, all of which may be of ordinary or any desired form.

The boiler 1 is set in and braced to a double casing or water-jacket 14, which is composed of a series of strong metal plates lapped and riveted together at their joints, as at 15, and stayed at suitable intervals, as represented at 16, so as to constitute a space or chamber 17, within which the feed-water is received, heated, and evaporated. The water is supplied to the interior of this double casing or jacket by feed-pipes connecting therewith at suitable points—as, for instance, beneath the furnace, as at 18, by a top-feed pipe, as at 19, and a large circulating-pipe 20; but the num-

ber and location of such feed-water supply and circulating pipes may be changed as desired, I not limiting myself to the precise number or arrangement thereof shown in the drawings.

The boiler casing or jacket represented in the drawings is composed of a double wall of boiler or other sheet iron or metal of equal strength to the strength of the boiler. This jacket, as shown, has a curved lower portion and extends horizontally beneath the fire-box, and from thence extends upwardly to form the bridge-wall, and thence across the combustion-chamber and beneath the boiler and forming the bottom of the flue, and thence vertically upward on each side of the boiler.

The top of the combustion-chamber may be closed by a fire-brick tile 21 and covered by an extension-piece 22, bolted onto the shell or casing to form a finish; or this extension-piece may be omitted.

The rear open end of the combustion-chamber and the forward open end thereof and the open ends of the water-jacket are closed by cast-iron heads 23 24, which are bolted to the casing or jacket, as represented in the drawings. These heads are provided with suitable doors 7 11, by means of which access may readily be had to the fire-box and also to the combustion-chamber and boiler-flues for the purpose of either cleaning or repairing either the combustion-chamber, flues, or other parts of the device. This double-walled casing 14, as clearly represented in the drawings, Fig. 3, is of U form in cross-section and extends up a sufficient distance on either side of the boiler, which is set therein, said setting or casing and boiler being connected together in any suitable manner—as, for instance, by flanged plates 27. The water-space between the walls of the casing is closed at the top by a bar or flanged joint 28, properly riveted to prevent the escape therethrough of steam or hot water. The circulating-pipe 20 connects the two sides of the casing and the boiler, as shown in Figs. 2 and 3, and is provided at its rear end with a suitable blow-off 29.

Water from any suitable source is supplied to the casing or boiler through either or both the top and end feed-pipes 18 19, and from

thence passes across and around the fire-box and combustion-chamber and up the sides of the casing, from whence it passes, by means of suitable connecting-pipes 26, to the interior of the boiler. In its passage through the casing to the boiler the water becomes highly heated and is brought to a temperature equal to the temperature of the boiler. In effect, therefore, this casing constitutes a secondary boiler, and I have practically a double boiler. Not only does my casing constitute a feed-water heater and boiler, but it also operates as a water-purifier and sediment-collector, the impurities in the water settling in the bottom thereof and being readily removed therefrom through blow-off pipes 30.

31 represents suitable standards for supporting the casing.

The casing or jacket being constructed separately from the boiler may be readily entirely or partially replaced at a moderate cost whenever occasion may require, although it is designed to so construct the casing that it shall be as strong and durable as the boiler itself.

Having thus described my invention, what I claim is—

1. The combination, with a return tubular boiler, of a double casing or water-jacket having open ends, a curved lower portion extending the full length of the boiler and combustion-chamber and horizontally across and beneath the fire-box, combustion-chamber, and boiler, and vertically on each side thereof and constituting, respectively, the bottom of the ash-pit, the bridge-wall, and the bottom of the flue, head-plates closing the open-ended water-jacket and open-ended combustion-chamber and provided with doors to permit of ready access being had to said combustion-chamber and boiler-flues and one or more feed-pipes, and a circulating-pipe connecting the jacket and boiler, substantially as set forth.

2. The combination, with a return tubular boiler, of the double-walled casing or water-jacket herein described, of U form in cross-section, extending from the front of the fire-box to the rear thereof upwardly to form the bridge-wall and thence horizontally to the rear of the combustion-chamber and extending across the bottom and up the sides there-

of and constituting the bottom of the furnace-flue, the water-space between the walls of said casing or jacket being closed at the top by a bar or flanged joint, and said casing being removably attached to the boiler by suitable means, as by flanged plates, and suitable supply and circulation pipes connecting said jacket and boiler, substantially as and for the purpose set forth.

3. The combination, with a return tubular boiler, of an open-ended water-jacket of U form in cross-section, within which the boiler is removably set, said jacket extending horizontally across the bottom of the fire-box and vertically upward at the rear thereof to constitute the bridge-wall and thence along the combustion-chamber to the end thereof and forming the bottom of the flue and thence vertically up the sides thereof and also of the boiler, an open-ended combustion-chamber, and cast-iron heads closing the open ends, respectively, of said jacket and of the combustion-chamber and provided with suitable doors to permit of ready access to said combustion-chamber and boiler-tubes, and suitable water supply and circulation pipes connected with the boiler and jacket respectively, substantially as set forth.

4. The combination, with a return tubular boiler, of an open-ended combustion-chamber and an open-ended water-jacket of U form in cross-section, within which the boiler is removably set and braced, said jacket surrounding the entire bottom and sides of the fire-box and combustion-chamber, and the sides of the boiler extending the entire length thereof and also constituting the bridge-wall and the flue-bottom, head-plates secured to the respective ends of the jacket to close the water-space therein and also the respective ends of the combustion-chamber, water-supply pipes, and a water-circulating pipe connecting the respective sides of the jacket and the boiler and having a suitable blow-off, substantially as set forth.

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

JOHN DICK.

Witnesses:

PERCY T. M. BECKETT,
EMMETT S. KNAPP.