

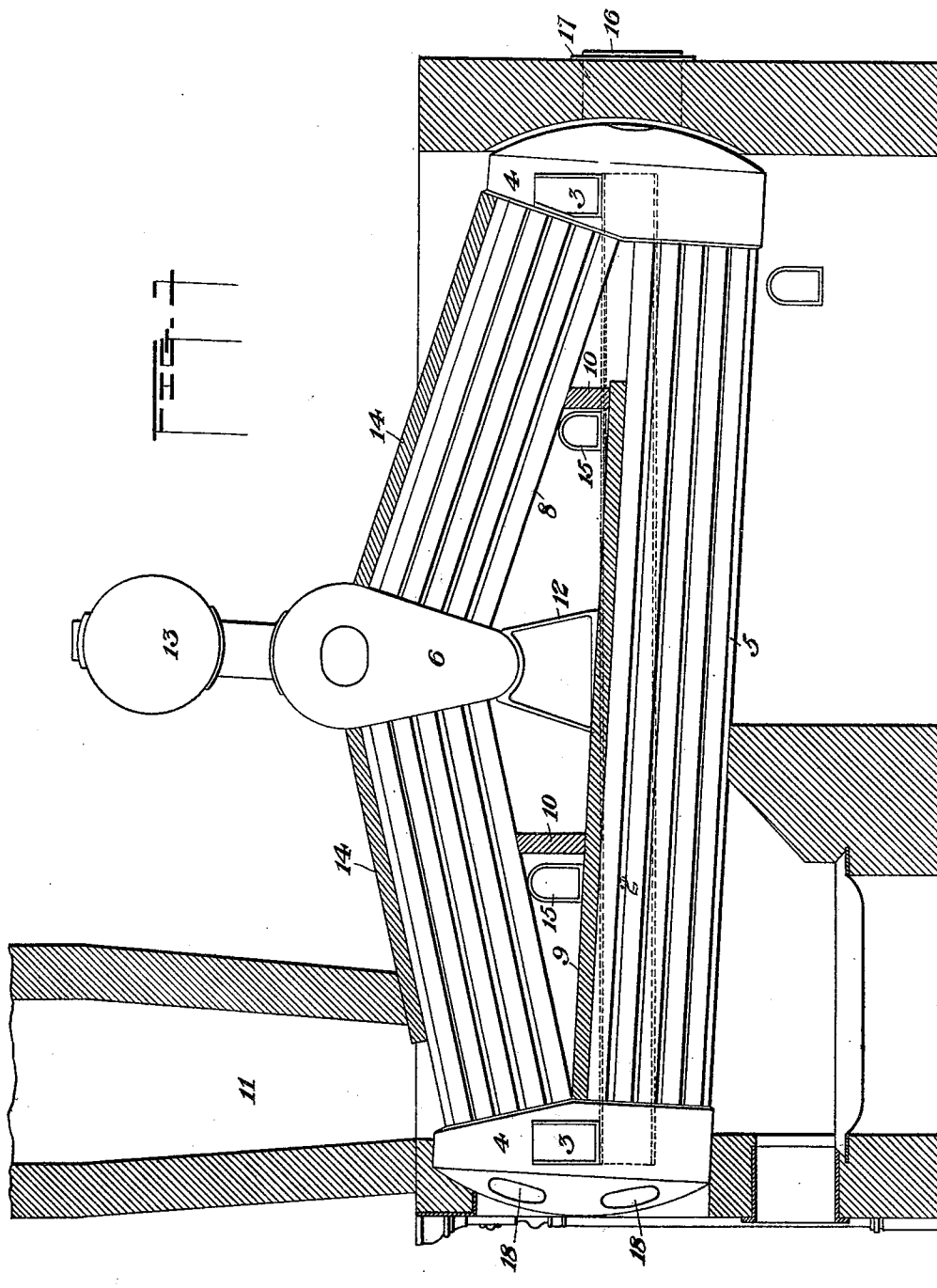
(No Model.)

2 Sheets—Sheet 1.

J. MCGREGOR & J. L. JACKSON.
WATER TUBE BOILER.

No. 544,414.

Patented Aug. 13, 1895.



WITNESSES

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INVENTORS

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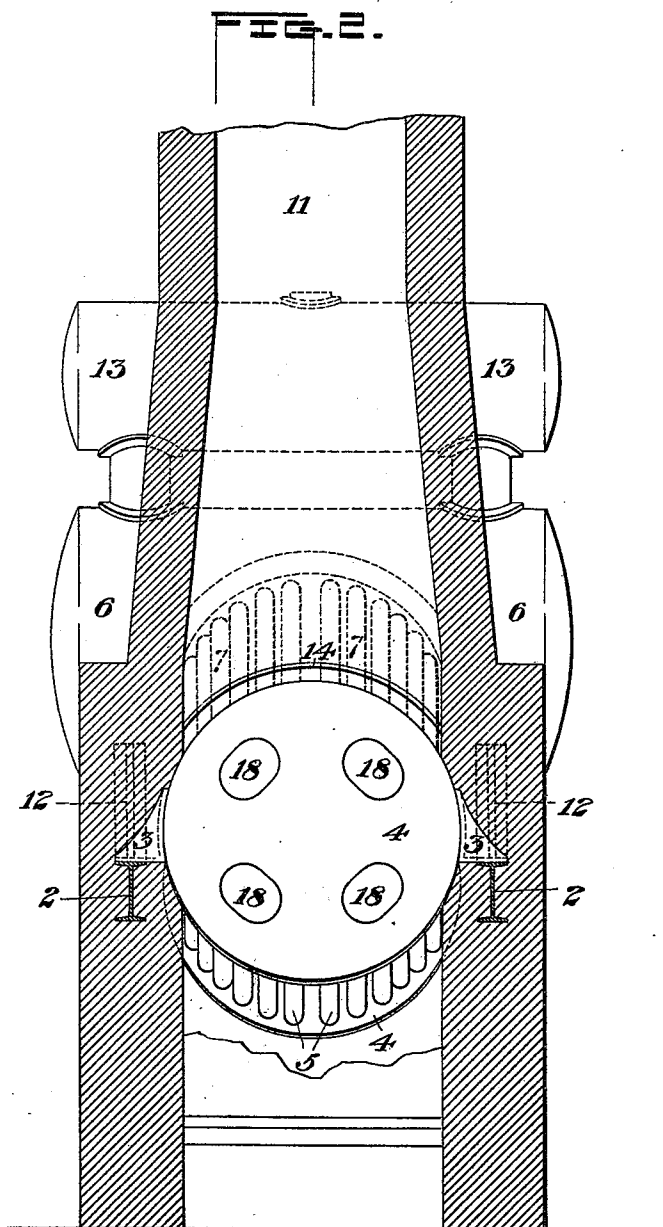
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UNITED STATES PATENT OFFICE.

JAMES MCGREGOR AND JOHN L. JACKSON, OF SAGINAW, MICHIGAN.

WATER-TUBE BOILER.

SPECIFICATION forming part of Letters Patent No. 544,414, dated August 13, 1895.

Application filed May 3, 1895. Serial No. 548,016. (No model.)

To all whom it may concern:

Be it known that we, JAMES MCGREGOR and JOHN L. JACKSON, of the city of Saginaw, in the county of Saginaw and State of Michigan, have invented a new and useful Improvement in Water-Tube Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of our improved boiler in position, the side wall being broken away to show the arrangement of the parts; and Fig. 2 is an end elevation with the end wall of the setting correspondingly broken away.

Our invention relates to the class of water-tube boilers, and is designed to afford a cheap, strong, and efficient boiler of this character in which the use of curved tubes is avoided, and the gases are compelled to travel over all parts of the tubes.

In the drawings, 2 2 are longitudinal I-beams supported in the side walls of the setting and arranged to carry the boiler, which is supported thereon by ears or lugs 3, secured to the end headers or shells of the boiler. These cylindrical headers 4 are provided with outer convex or concave heads, while the inner heads are flat, the upper portion or half of these inner heads being at an angle to the lower portion or half, as shown. A series of water-tubes 5 connect the lower portions of the headers to each other, these water-tubes being inclined backwardly to a slight degree, so that all water will drain into the rear header. Between and above these headers is supported a transverse steam and water drum 6, this drum being preferably of sufficient length to extend into and through the side walls of the setting, but not necessarily of such length. This steam and water drum is of peculiar shape, as shown, its flat sides being inclined at an angle corresponding to the upper part of the inner heads of the end shells, and it is connected to the end shells by two series of water-tubes 7 and 8, the angle of the faces of the shells being at right angles to the tubes.

A tile baffle-wall 9 is provided upon the upper row of water-tubes 5, this baffle-wall ex-

tending from the front header rearwardly to a point near the rear header. Two vertical partitions or transverse projections 10 rest upon this tile wall and extend up to or near to the upper series of water-tubes, thus compelling the gases, after the first horizontal pass among the lower tubes, to pass in contact with the upper series before reaching the uptake 11. A central rest or support 12 is provided for the steam and water drum, this rest having a concaved seat to fit the lower end of the drum and allow a slight movement therein when the parts expand under the action of the heat. A steam-drum 13 is preferably connected to the upper face of the steam and water drum to serve as a receptacle for dry-steam. A covering of tile or other suitable refractory material 14 is provided upon the upper rows of the inclined water-tubes, connecting the end headers with the steam and water drum.

15 15 are cleaning-doors leading through the side walls into the space above the horizontal baffle-wall, and 16 is a door in the rear wall of the setting for access to the back end of the boiler in taking out the plate of man-hole 17 and for cleaning and repairing tubes.

18 are manhole-plates in the front head of the shell for cleaning and repairing the tubes.

In operating the boiler the water is fed into the rear or top drum, as desired, and passes thence into the other parts of the boiler, while the gases rising from the grate intermingle with the lower water-tubes, and, passing to the rear, rise in front of the rear header or drum and are directed into the spaces between the upper series of water-tubes, and, impinging upon these tubes and the central steam and water drum, pass out through the front uptake. In cases where the water used in the boiler contains considerable proportions of impurities a mud-drum may be added as an adjunct to the boiler.

The advantages of our invention will be appreciated by those skilled in the art, since the use of curved tubes is entirely done away with and a strong and cheap boiler is obtained, which is so arranged as to give a strong circulation to the water and a thorough cooling to the gases before they leave the same.

Many changes may be made in the form

and arrangement of the parts by the skilled mechanic without departure from our invention, since

What we claim is—

- 5 1. A water-tube boiler comprising end shells having inner heads whose lower portions are substantially parallel and are connected by water tubes, while their upper portions extend at opposite angles, an upper drum, and
10 tubes connecting the angled portion of each head therewith; substantially as described.

- 15 2. A water-tube boiler having end shells provided with inner heads, the upper parts of which are inclined at an angle, while the lower substantially parallel portions are connected by water tubes, a horizontal baffle-wall above these water tubes, a steam and water drum having its sides substantially parallel with the angled portions of the heads, and

tubes connecting the said angled portions of the heads therewith; substantially as described.

3. A water tube boiler having end shells supported upon longitudinal I-beams extending along the sides of the boiler, said shells having their inner heads connected with each other by water tubes, an intermediate steam and water drum, and tubes connecting the same with the end shells, substantially as described.

In testimony whereof we have hereunto set our hands.

JAMES MCGREGOR.
JOHN L. JACKSON.

Witnesses:

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H. R. WITT.