

(No Model.)

H. WOJAN.
STEAM BOILER.

No. 477,880.

Patented June 28, 1892.

Fig. 1.

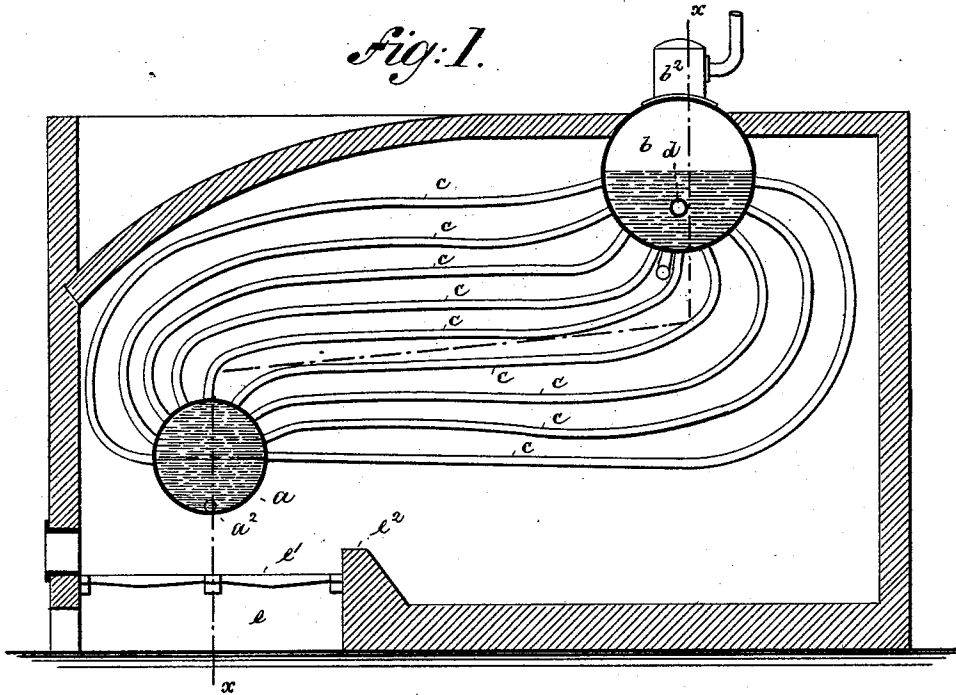
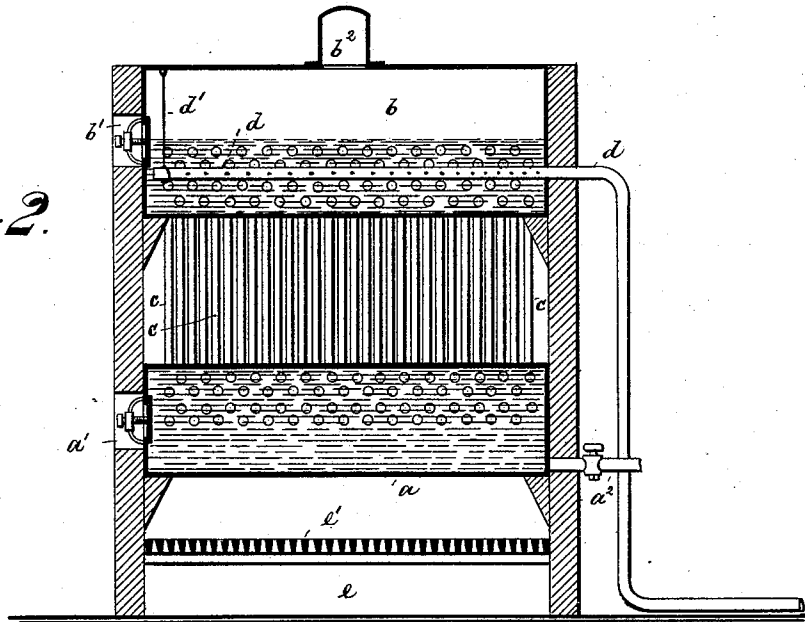


Fig. 2.



WITNESSES:

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HERMANN WOJAN, OF BROOKLYN, NEW YORK.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 477,880, dated June 28, 1892.

Application filed February 13, 1892. Serial No. 421,382. (No model.)

To all whom it may concern:

Be it known that I, HERMANN WOJAN, of Brooklyn, Kings county, New York, have invented an Improved Steam-Boiler, of which the following is a specification.

This invention relates to a tubular steam-boiler of novel construction; and it consists in the various features of improvement more fully pointed out in the claim.

In the accompanying drawings, Figure 1 is a longitudinal section of the boiler; and Fig. 2, a transverse section on the line $x x$, Fig. 1.

The letter a represents a lower cylinder, and b an upper parallel cylinder placed above and in the rear of cylinder a . The cylinders a and b are connected by a series of horizontal tubes c , of which the upper tubes are bent down at the front and the lower tubes are bent up at the rear. The curvature diminishes from one tube to the other, so that the tubes are placed equidistant at their ends and that the upper and lowermost tubes enter the cylinders on opposite ends of the same diameter.

e represents the fireplace of the boiler-furnace, e' being the grate and e'' the bridge. The cylinder a is placed parallel to the bridge and in front of the same, directly over the grate, as shown, so as to be exposed for its full length to the action of the direct heat. The cylinder b has a somewhat larger diameter than the cylinder a , and it is placed back of the bridge-wall, while the horizontal tubes c extend over the combustion-chamber from front to rear and are exposed to the full action of the products of combustion on their way to the chimney.

d is the water-inlet pipe traversing the up-

per cylinder and connected to the feed-pump at one end, while it is secured in place by a hanger d' at the other end. This pipe is provided with a number of perforations within the cylinder b , so as to properly distribute the water. The cylinder b is, moreover, provided with the manhole b' and the steam-dome b'' , while the cylinder a is provided with the manhole a' and the blow-off a'' .

The operation of the boiler will be readily understood. The water entering through the tube d flows into the lower part of cylinder b and circulates through tubes c and cylinder a to be converted into steam. The steam accumulates in the upper part of cylinder b to be discharged by the dome b'' .

The advantages connected with my boiler are that it can be readily cleaned, that the tubes are free to expand, that the circulation is perfect, and that a large fire-surface is offered. The latter feature adapts the boiler for furnaces in which rubbish, bagasse, &c., is consumed.

What I claim is—

The combination of a pair of cylinders placed at different elevations with a grate, over which the lower cylinder and in the rear of which the upper cylinder is placed, and with a series of horizontal connecting-tubes, of which the upper tubes are bent down at the front and the lower tubes are bent up at the rear, the curvature diminishing from tube to tube, substantially as and for the purpose specified.

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Witnesses:

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