

(No Model.)

O. C. BARBER.
WATER TUBE BOILER.

No. 473,443.

Patented Apr. 26, 1892.

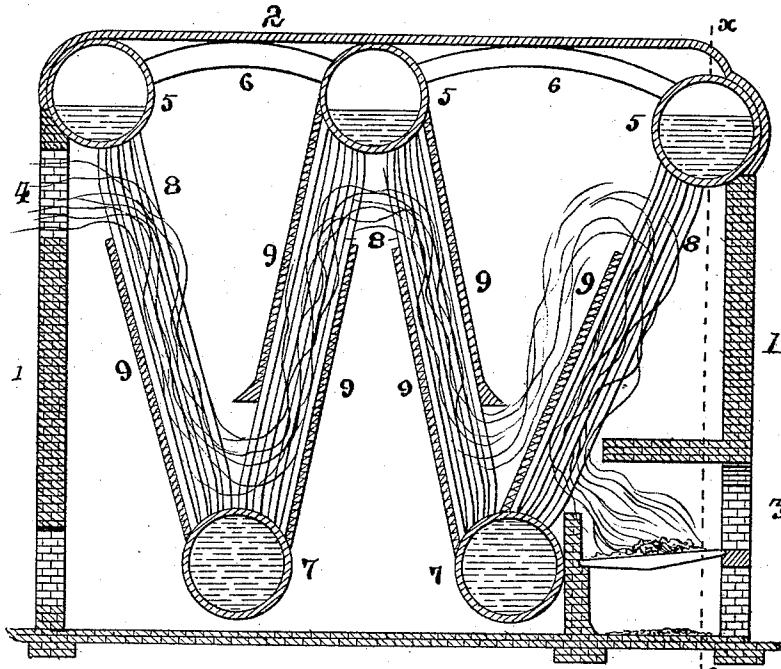


Fig. 1.

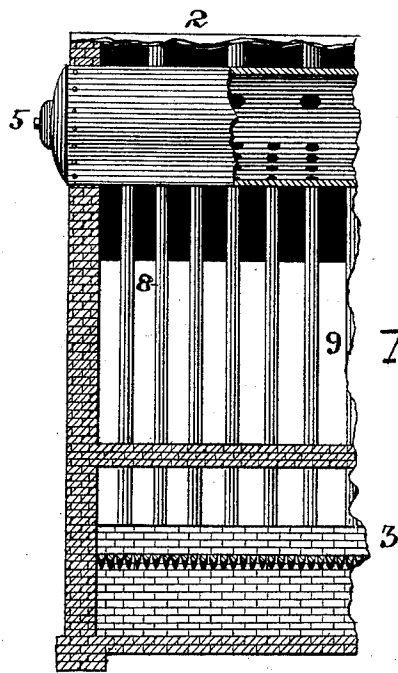


Fig. 2.

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WATER-TUBE BOILER.

SPECIFICATION forming part of Letters Patent No. 473,443, dated April 26, 1892.

Application filed January 25, 1892. Serial No. 419,151. (No model.)

To all whom it may concern:

Be it known that I, OHIO C. BARBER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Water-Tube Boilers, of which the following is a specification.

My invention has relation to improvements in that class of steam-boilers in which series or ranks of water-tubes are connected with upper and lower cylinders or drums and successively subjected to heat from a furnace, the courses of heated air being deflected by baffle-plates or equivalent devices.

The objects of my invention are to provide an improved circulation through the boiler, to increase its capacity for depositing impurities from the water, to secure a maximum of the furnace heat in generating steam, and generally to simplify the construction and increase its efficiency.

My invention consists in the peculiar and novel construction, arrangement, and combination of parts hereinafter described, and then specifically pointed out in the claims, reference being had to the accompanying drawings, forming a part of this specification.

In the accompanying drawings, in which similar reference-numerals indicate like parts, Figure 1 is a sectional view of my improved boiler and furnace transverse to the axial line of the drums hereinafter described, and Fig. 2 a partial section of the same at the line *x x* of Fig. 1.

Referring to the drawings, 1 indicates the inclosing walls in which the boiler is placed, closed by a crowning or cover 2, of brick or other suitable material, and provided with a firing-grate 3 and an exhaust or uptake flue 4. Inside these walls is located the boiler, which consists of three parallel cylinders or drums 5, having their upper portions above the water-line internally connected by a series of steam-pipes 6, and below them two mud-drums or deposit-cylinders 7, the several upper and lower drums 5 and 7 being connected with ranks or series of tubes 8.

Opposite each set of tubes 8 are baffle-plates 9, by which the heat from the furnace 3 is compelled to pass alternately and successively along each set or rank of tubes 8 until it escapes at the outlet-flue 4. The water enters the rear drum in its coolest state, where it comes in contact with the steam-pressure of the boiler. It is then gradually forced down the rear rank of tubes and forward from one rank to another, gradually approaching the hottest parts of the furnace, where the steam is most rapidly generated, the gradual process of heating the water by forcing it through the successive banks of tubes and drums causing a minimum strain on the several parts of the boiler by expansion and contraction. By this arrangement and construction the steam-pressure is the same in each cylinder 5, and hence the incoming water in the left-hand drum 5 is immediately subjected to its pressure and absorbs a part of its heat. Thence it passes successively through the series of pipes 8, drums 7, and intermediate drum 5 to the right-hand drum 5, constantly approaching the furnace, and thereby being subjected to its heat, and in this passage releases any organic matter held in mechanical or chemical suspension and deposits it in one of the drums 7. By thus continually forcing the water through the pipes and drums it is continuously heated by contact with the heat at the successive ranks of tubes and is effectively cleansed from impurities and the foreign matter deposited in the mud-drums 7, which may be provided with a blow-off cock or other suitable device for removing the same. I also secure the most effective action of the fuel in the furnace, as its heat is successively applied to the ranks of the boiler-tubes, commencing with the rank nearest to the furnace and thence to the other ranks in their order.

I claim as my invention—

1. The combination, with an inclosing furnace having a firing-place and uptake-flue, of a boiler consisting of two series of horizontal drums, one set being located above the other,

the several series being connected by alternate ranks of tubes, and baffle-plates arranged adjacent to said ranks of tubes, substantially as shown and described, and for the purpose
5 specified.

2. The herein-described boiler, consisting of the cylinders 5 and 7, the intermediate connecting-tubes 8, and the steam-connecting pipes 6, all constructed and arranged substan-

tially as shown and described, and for the purpose specified.

In testimony that I claim the above I hereunto set my hand.

OHIO C. BARBER.

In presence of—

C. P. HUMPHREY,
C. E. HUMPHREY.