

No. 714,784.

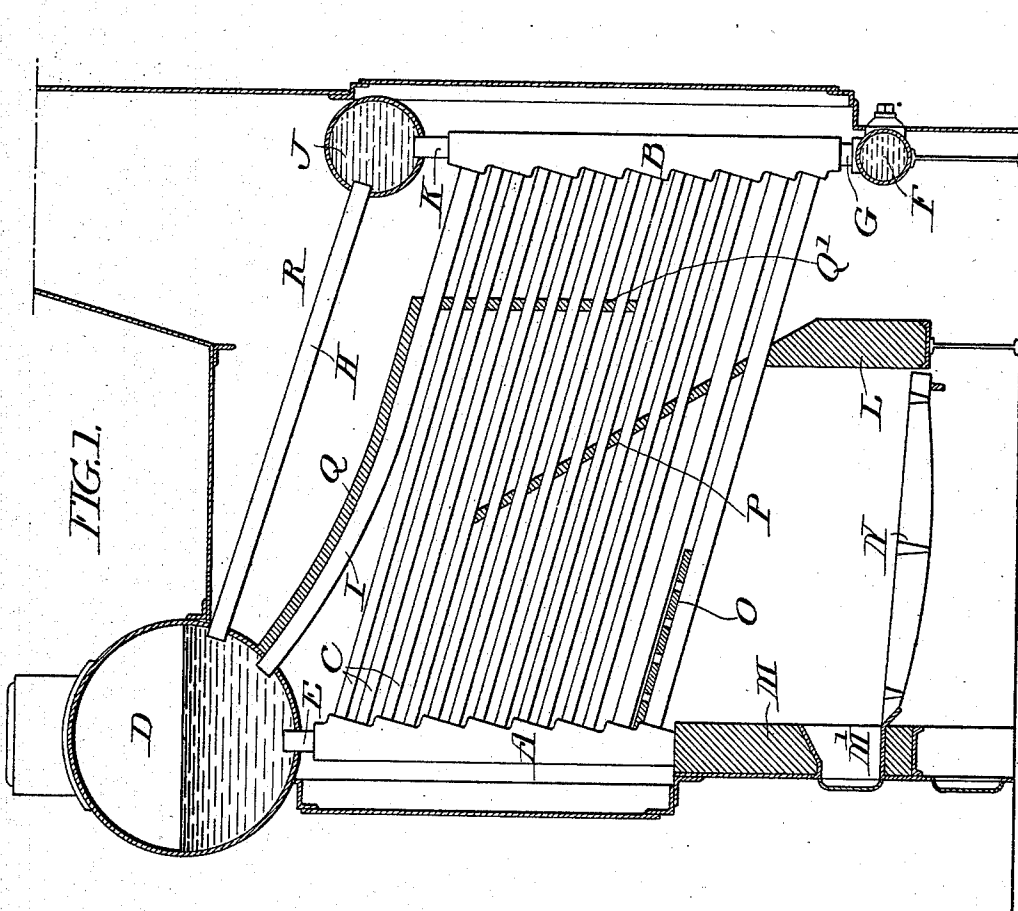
Patented Dec. 2, 1902.

J. C. COOKE.  
BOILER.

(Application filed Oct. 4, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

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*W. Williams*

Inventor:

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*by his atty.*  
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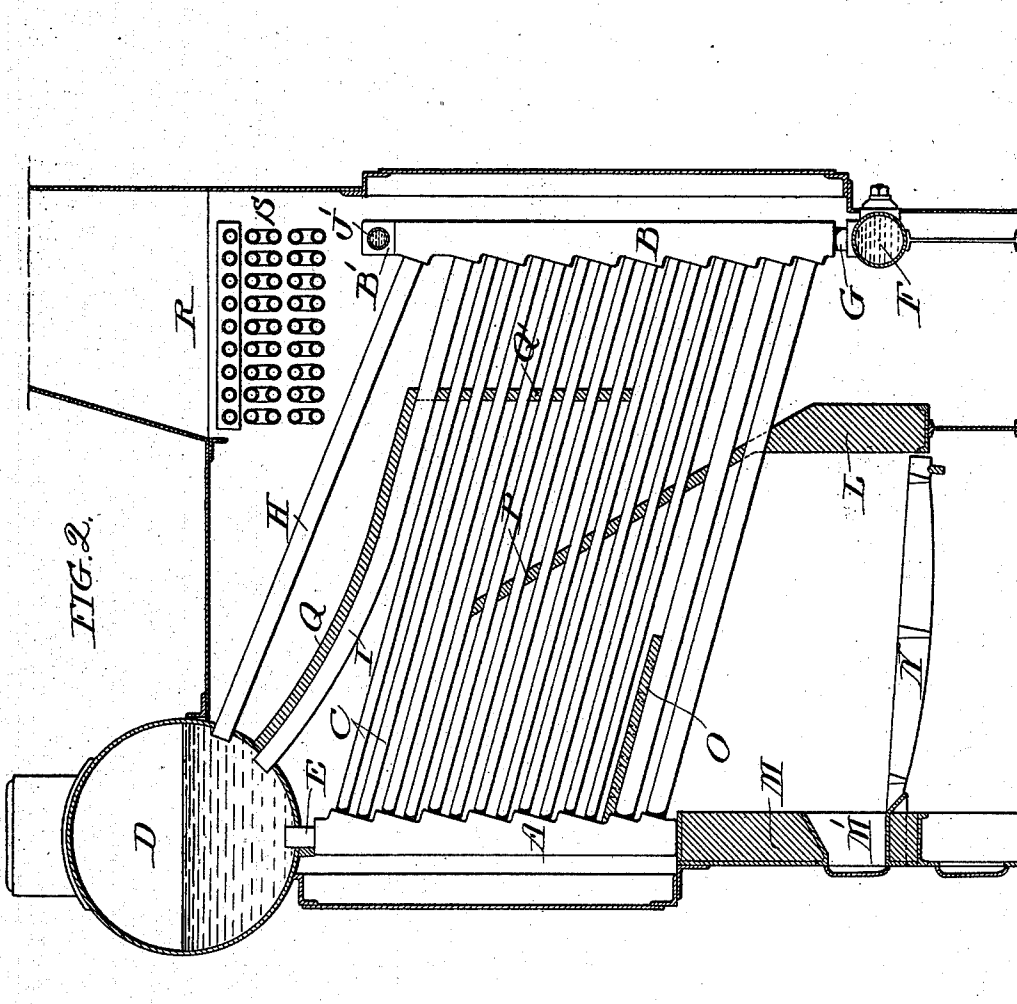
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Witnesses:

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# UNITED STATES PATENT OFFICE.

JOHN C. COOKE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO NEW YORK SHIPBUILDING COMPANY, OF CAMDEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## BOILER.

SPECIFICATION forming part of Letters Patent No. 714,784, dated December 2, 1902.

Application filed October 4, 1901. Serial No. 77,518. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN C. COOKE, a citizen of the United States of America, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Tubular Boilers, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to the construction of tubular boilers, having for its object to include the arrangement of baffles regulating the passage of gases from the furnace around the tubes of the boiler and also to improve the circulation of water in the boiler.

The nature of my improvements will be best understood as described in connection with the drawings in which they are illustrated, and in which—

Figure 1 is a sectional side elevation of a boiler with my improvements, and Fig. 2 a similar view of a slight modification.

A indicates the front headers, of which there are generally a series set side by side; B, the similarly-arranged rear headers; C, the inclined tubes connecting the said headers.

D is a steam and water drum set above the front end of the boiler and connected with the front headers through nozzles E.

F is a mud-drum set beneath the rear headers and connected therewith through nozzles G.

H indicates a series of circulating-pipes connecting the steam and water drum D with the upper ends of the rear headers B, either directly, as shown in Fig. 2, or, preferably, through a water-drum, (indicated at J in Fig. 1,) and connected with the tops of the rear headers through nozzles K.

I is a second series of circulating-pipes connecting the steam and water drum D with the upper ends of the rear headers at a lower level than the connection with the pipes H.

In the modification shown in Fig. 2, where the water-drum J is omitted, I have indicated at B' an upward extension of the side rear headers, said upwardly-extending portions

being connected from side to side of the boiler by a water-tube, (shown at J'.) This construction is simply to serve the purpose of securing the rear headers compactly together.

L indicates the bridge-wall of the furnace, formed between it and the front wall M, M' indicating the furnace-door, and N the grate.

O is a perforated baffle-plate extending rearwardly from the front wall of the boiler above the furnace.

P is an upwardly and preferably forwardly inclined baffle-plate extending from the top of the bridge-wall L.

Q is a partition separating the flue-chamber, containing the tubes, from the outlet-flue, (indicated at R,) this wall being situated between the pipe group indicated at I and the pipe group indicated at H, and preferably supported on the pipes I, as shown.

Q' is a baffle-plate extending downward from the rear of the partition Q.

In operation the circulation of the boiler is from the steam and water drum D rearwardly and downwardly through the pipes H and I to the rear headers, thence upwardly through the pipes C to the front headers, and thence back to the drum D. The fact that the group of circulating-pipes situated beneath the partition Q is exposed to much higher temperature than the group situated above said partition materially improves the effective circulation of the boiler, and while it is not essential for good results I find the circulation is further improved by connecting the upper group of pipes H indirectly with the rear headers through the water-drum J, as shown in Fig. 1. The products of combustion from the furnace pass upward, partly through the perforated partition O, but mainly between its end and the baffle P, and passing over the baffle P they pass downward between it and the baffle Q' and under the baffle Q' upward to the flue R. I have found that in this arrangement of baffles the use of the perforated baffle O increases the general effectiveness of the heating sufficient of the gases passing through it to insure the heating of the upper

ends of the lower tubes C, while the general heating effect is increased by restricting the passage of the products of combustion from the furnace into the flues formed between the baffle-plates, as described.

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

1. In a tubular boiler having front and rear headers and inclined tubes connecting them, the combination of a steam and water drum D situated above the higher end of the boiler, two sets of circulating-tubes extending at different levels rearwardly from the steam and water drum and connecting with the upper ends of the rear headers, a partition-wall situated above one set of circulating-tubes and below the other set, and a furnace situated below said wall so that the lower set of said

tubes is exposed to the direct heat of the furnace and the upper set shielded therefrom.

2. In a tubular boiler having front and rear headers and inclined tubes connecting them, the combination of a steam and water drum D situated above the higher end of the boiler, a water-drum J situated above and connected to the rear headers, a series of circulating-pipes H connecting the drum D with the drum J, a second series of circulating-pipes I situated at a lower level and connecting the drum D with the upper ends of the rear headers, a furnace situated beneath the higher end of the boiler and a baffle-wall Q situated above the pipes I and below the pipes H.

J. C. COOKE.

Witnesses:

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