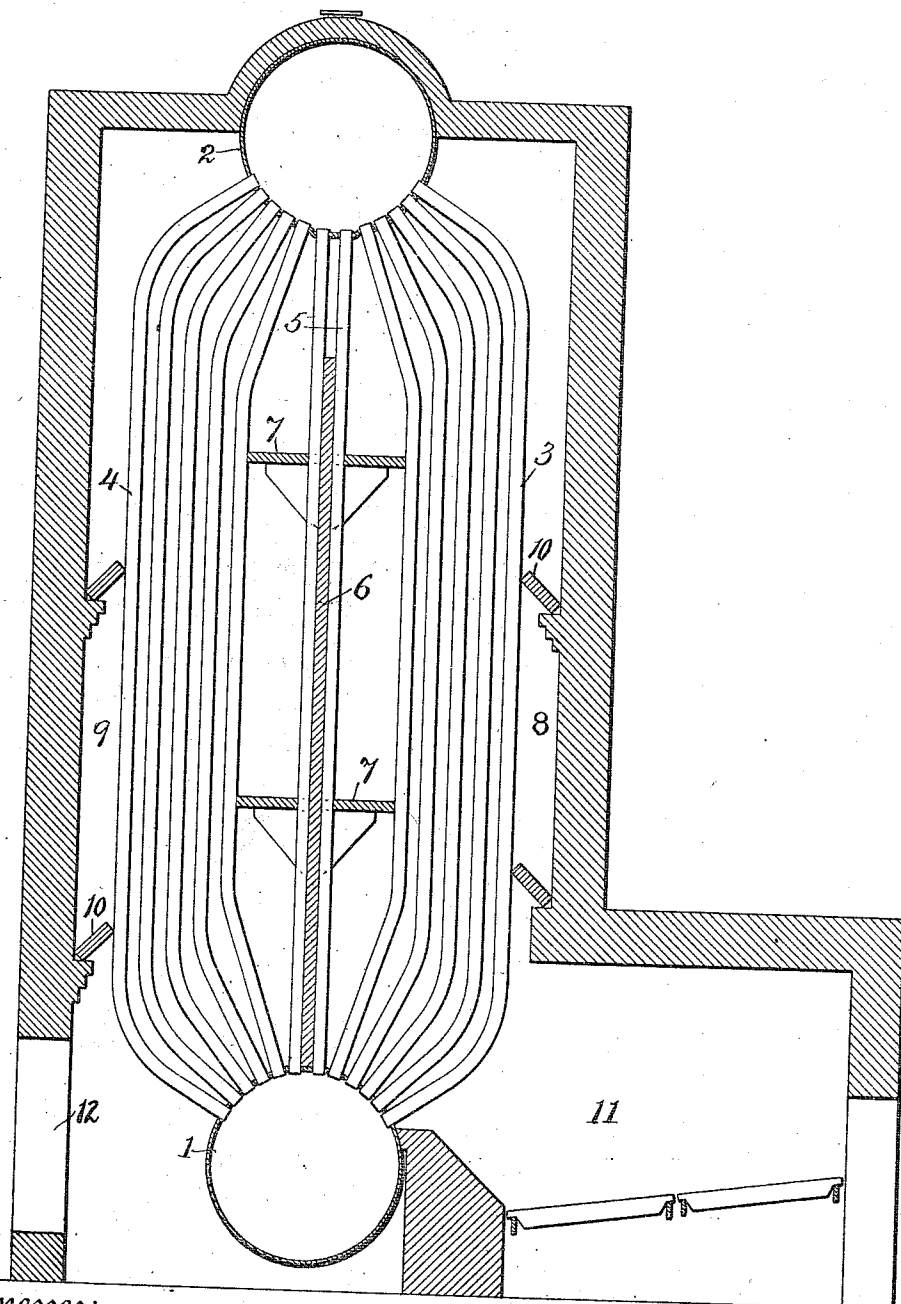


W. D. CHESTER & H. B. RUST.
 WATER TUBE BOILER.
 APPLICATION FILED MAR. 10, 1910.

995,523.

Patented June 20, 1911.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILFRED D. CHESTER AND HENRY B. RUST, OF PITTSBURG, PENNSYLVANIA, ASSIGNORS TO THE BABCOCK & WILCOX COMPANY, OF BAYONNE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

WATER-TUBE BOILER.

995,523.

Specification of Letters Patent. Patented June 20, 1911.

Application filed March 10, 1910. Serial No. 548,464.

To all whom it may concern:

Be it known that we, WILFRED D. CHESTER and HENRY B. RUST, citizens of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Water-Tube Boilers, of which the following is a specification.

10 The object of this invention is to increase the efficiency of a water-tube boiler of the form described by bringing the products of combustion into a more intimate contact with the heating surface by forcing the
15 gases to cross and recross the tubes a number of times as well as passing them in a longitudinal direction, without throttling at any point except when specially desirable, and will be understood by reference to
20 the accompanying drawing which is a vertical section through a boiler setting showing our improved method of baffling.

In the drawing, 1 is a water drum extending laterally of the furnace; 2 a steam and
25 water drum placed above 1 in a position parallel to it and connected with it by a plurality of groups of bent tubes 3 and 4, and by a group 5 of two or more lines of straight tubes in an intermediate position
30 between the groups of bent tubes, the spaces between each of the groups 3 and 4 and the group 5 being sufficient for the entrance of a man when repairs to the baffle may be necessary. Between the lines of tubes of
35 group 5 there is placed a wall 6 of fire brick, said wall being held in position by the lines of tubes forming the group and extending from side wall to side wall of the boiler and upwardly from the bottom drum, and terminating short of the upper or steam and
40 water drum to permit the gases to cross from the group of tubes 3 to the group 4. At intervals in the height of this wall or diaphragm there are placed horizontal baffles or shelves 7 extending from the middle

group 5 toward groups 3 and 4 to the extent that spaces between groups 3 and 4 and group 5 are divided into several chambers in a vertical direction. Spaces 8 and 9 exist respectively between groups or tubes 3 and 4 and the front and rear walls of the boiler setting. At intervals in these spaces baffles or shelves of the form like that shown at 10 are introduced at intervals along the height of the tubes. These intervals are
55 such as to cause a crossing and recrossing of the tubes by the gases as they proceed from the furnace 11 to the smoke outlet 12 of the setting, the gases coming into contact first with the group of tubes 3, then passing over
60 the top of wall 6 and downwardly in contact with the group 4.

What we claim and desire to secure by Letters Patent of the United States is:—

1. In a water-tube boiler having horizontal water and steam and water drums, a group of straight tubes adjacent to a vertical plane passing through the center line of the two drums, groups of bent tubes on either side of said group of straight tubes
70 placed at a distance from the said group of straight tubes a sufficient distance to allow a man to enter the said space, a wall between the straight tubes and supported by them, said wall resting on the water drum and extending from side wall to side wall, and
75 horizontal baffles supported by said vertical wall and the straight tubes and extending from the group of straight tubes toward the group of bent tubes, and inclined baffles extending from the front and rear walls to the bent tubes.

2. In a water-tube boiler having horizontal water and steam and water drums, a group of straight tubes adjacent to a vertical plane passing through the center line of the two drums, groups of bent tubes on either side of said group of straight tubes placed at a distance to allow a man to enter the said space, a wall between the straight
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tubes and supported by them, said wall resting on the water drum and extending from side wall to side wall, spaces intervening between the groups of bent tubes and the front and rear boiler walls having within them projecting ledges extending from the walls toward the groups of bent tubes.

In testimony whereof we have hereunto

signed our names in the presence of two subscribing witnesses.

WILFRED D. CHESTER.
HENRY B. RUST.

Witnesses:

M. L. SCANLON,
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