

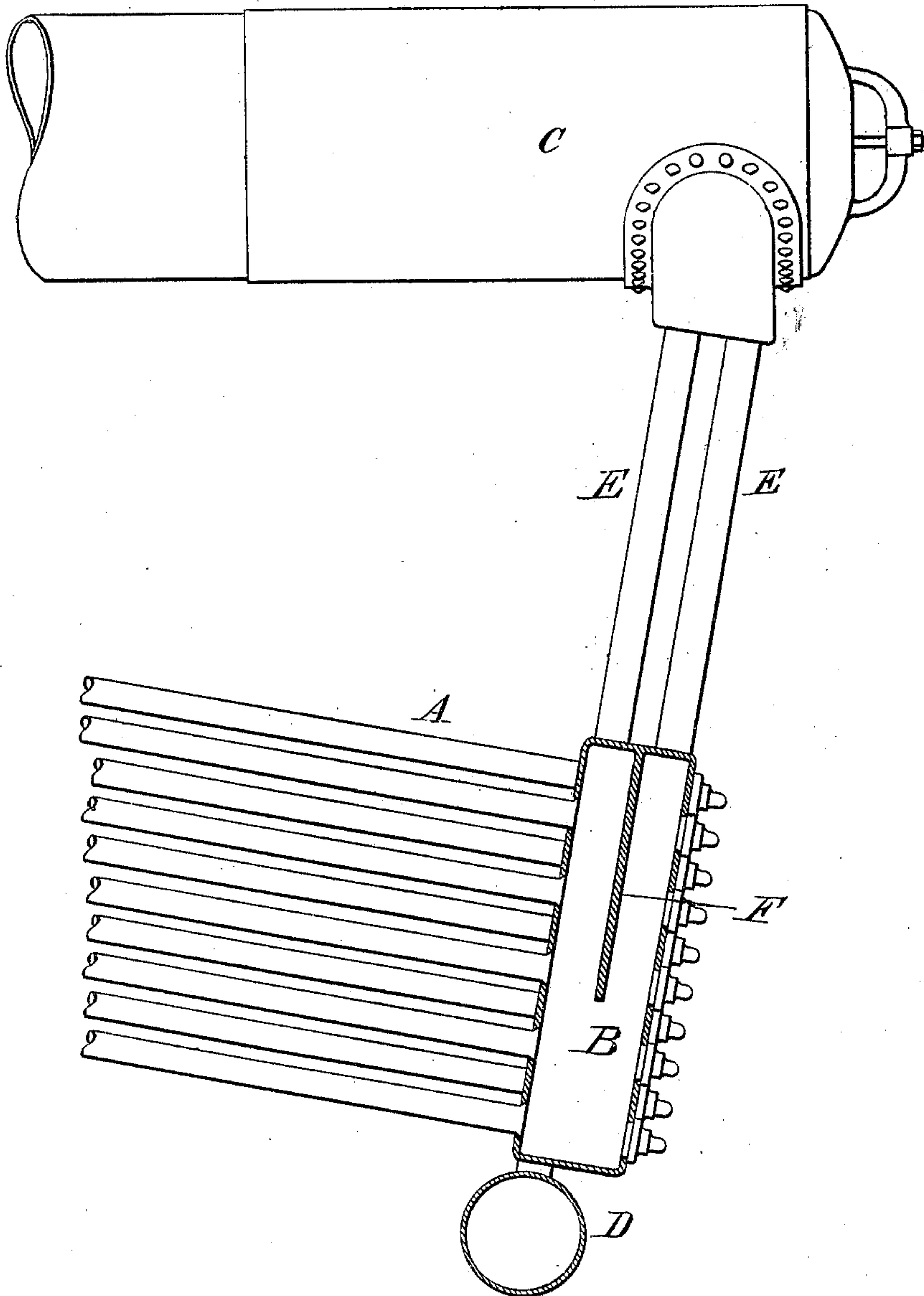
No. 692,223.

Patented Feb. 4, 1902.

J. A. ANDERSON.
WATER TUBE BOILER.

(Application filed Dec. 10, 1900.)

(No Model.)



Witnesses:

Gas. F. Coleman
Geo. R. Taylor

Inventor

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Att'ys.

UNITED STATES PATENT OFFICE.

JAMES A. ANDERSON, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF
TO WILLIAM A. PRICE, OF NEW YORK, N. Y.

WATER-TUBE BOILER.

SPECIFICATION forming part of Letters Patent No. 692,223, dated February 4, 1902.

Application filed December 10, 1900. Serial No. 39,315. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. ANDERSON, a citizen of the United States, residing in the borough of Brooklyn, city of New York, State of New York, have invented a certain new and useful Improvement in Water-Tube Boilers, of which the following is a description.

My invention relates to various new and useful improvements in water-tube boilers; and the improvements relate particularly to boilers of the so-called "Babcock and Wilcox" type, wherein a series of inclined tubes are expanded into headers at their ends, which headers are connected to one or more steam-drums by a riser extending between each header and the drum. By assembling a greater or smaller number of headers side by side the capacity of the boiler can be correspondingly increased or diminished. The tendency of modern boiler practice is to increase the number of tubes in each vertical series in order that boilers of greater capacity can be obtained without increasing the floor-space. I have observed that with boilers of this type when a considerable increase in the number of tubes in each vertical series is made the lower tubes, for sometimes as much as their entire upper half, become filled with scale, due to the fact that the water circulation through such tubes is insufficient to accommodate their steam-generating capacity. In other words, with such boilers the water descending through the back risers circulates immediately through the upper tubes, so that the lower tubes become "starved" instead of receiving the larger proportionate amount of water, as they should, owing to their closer proximity to the source of heat.

The object of my invention is to provide a water-tube boiler wherein these practical defects are overcome.

In carrying my invention into effect I make the back headers of the standard width to accommodate the standard diameter of tube, so that the width of the boiler is not increased; but I make these headers of greater dimension from front to back, and I connect each back header with the steam-drum by means of two or more risers arranged one in front of the other, whereby a very much greater quantity of water will be permitted to circu-

late from the steam-drum to the rear headers than is now possible. I also preferably employ one or more deflecting-diaphragms located within each of the back headers and whereby the circulating water will be caused to more evenly distribute itself through the several tubes than is now possible.

In order that my invention may be better understood, attention is directed to the accompanying drawing, showing, partly in section and partly in elevation, the rear portion of a standard Babcock and Wilcox boiler equipped with my present improvements.

A represents the tubes, which are expanded at their rear ends into the back headers B and are arranged, as heretofore, in a vertical series of the desired number. The headers B, as will be understood, are arranged side by side, so that the boiler amounts practically to a series of steam-generating units connected to one or more common steam-drums.

C represents the steam-drum, and D the ordinary mud-drum connected to the lower ends of the headers.

The headers B are made of the standard width to accommodate the standard dimension of the tubes A, whereby the width of the boiler will not be increased. These headers are, however, made longer from front to back than is common, and extending up from each header and connecting the same with the steam-drum are the risers E E, two or more of which connect each header with the steam-drum. These risers are of the usual diameter as may be accommodated by the standard width of the headers; but their increased number provides for an increased circulation, whereby all the tubes will be properly supplied with circulating water. I arrange within each header a diaphragm F, located between the two risers, whereby the circulating water from the risers will descend past the upper tubes, so as to be directed into the lower tubes. The length of the diaphragm F will be determined by experiment and will be so proportioned as to result in the proper quantity of circulating water reaching the lower tubes to accommodate their steam-generating capacity. When more than two risers extend up from each header, an additional

diaphragm may be interposed between the second and third risers, as will be understood.

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

10 In a water-tube boiler, the combination with the tubes and the steam-drum, of a rear header with which said tubes connect, a plurality of risers connecting the header with said steam-drum, and a diaphragm in the

header between two of said risers for deflecting the circulating water from one riser past the upper tubes, substantially as set forth.

15 This specification signed and witnessed this 6th day of December, 1900.

JAMES A. ANDERSON.

Witnesses:

JNO. R. TAYLOR,
ARCHIBALD G. REESE.