

(No Model.)

N. W. PRATT.

STEAM BOILER.

No. 249,670.

Patented Nov. 15, 1881.

Fig. 2.

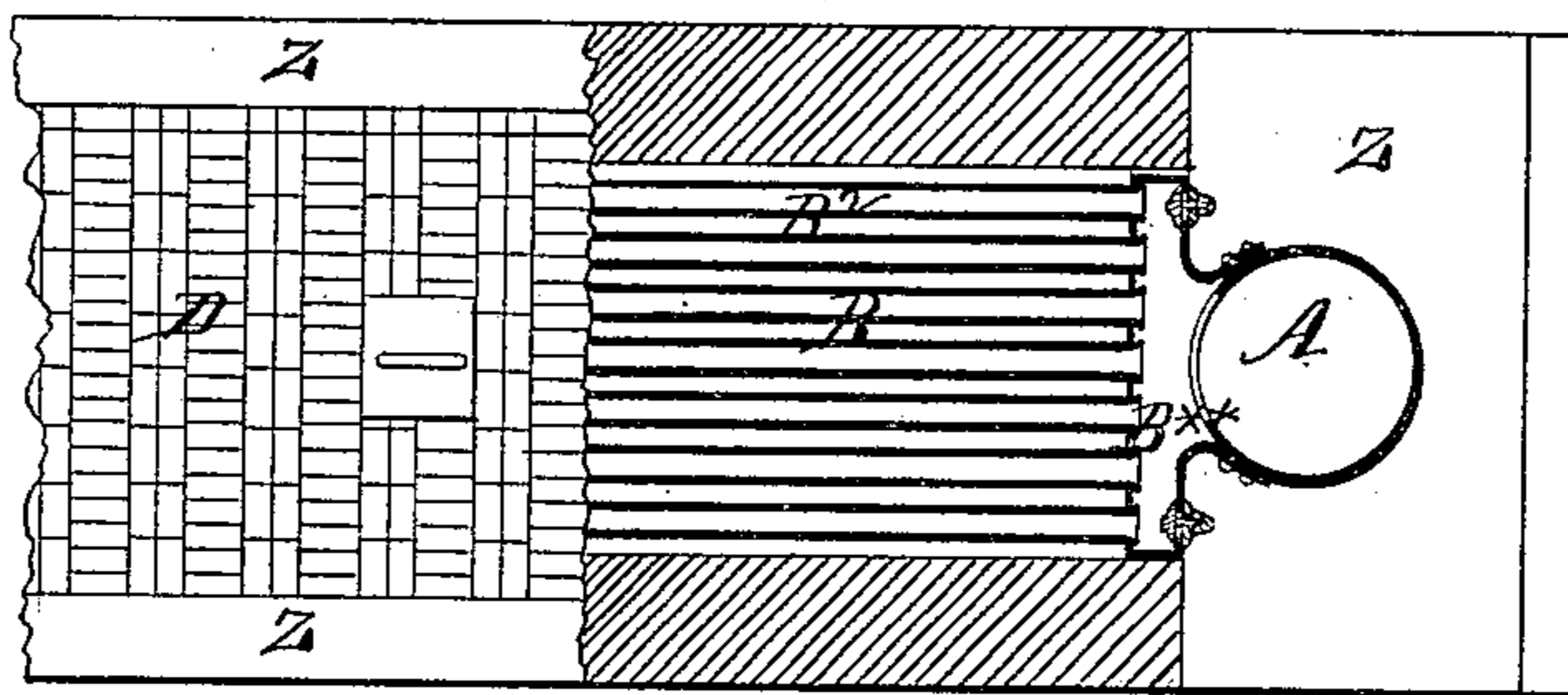
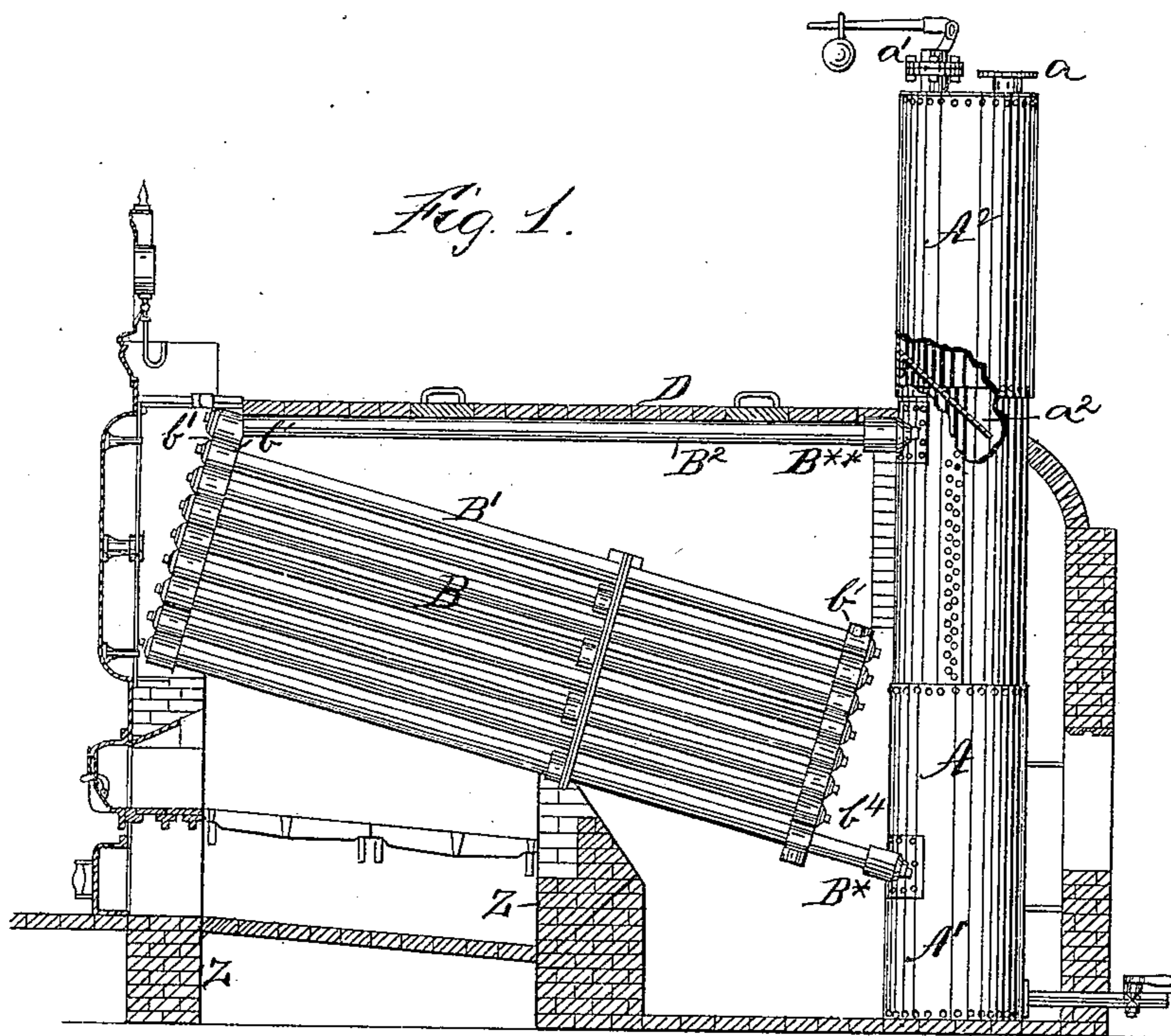


Fig. 1.



Witnesses.

W. Colborne Brooks

Charles C. Stetson

Inventor

Nathaniel W. Pratt

by his attorney

Thomas S. Stetson

UNITED STATES PATENT OFFICE.

NATHANIEL W. PRATT, OF BROOKLYN, NEW YORK, ASSIGNOR TO GEORGE H. BABCOCK, OF PLAINFIELD, NEW JERSEY, AND STEPHEN WILCOX, OF BROOKLYN, NEW YORK.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 249,670, dated November 15, 1881.

Application filed December 22, 1880. (No model.)

To all whom it may concern:

Be it known that I, NATHANIEL W. PRATT, a citizen of the United States, residing at the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

My invention relates to improvements in that class of steam-boilers known in the trade as "Babcock & Wilcox" boilers.

According to my present invention, in place of employing a horizontal steam-drum arranged over the tubes, as is the practice in constructing boilers of this class, I employ a vertical steam-drum at the rear. This drum at its lower end is provided with a mud-chamber below the header connected with the lower-end casting, and at its upper end is provided with an extension serving as a steam-dome. The uppermost tier of sectional pipes are arranged in a horizontal plane to form the top of the furnace and flue space. These pipes are covered by a layer of fire brick or other suitable material in sections adapted to be readily removed for the purpose of blowing off any dirt or products of combustion which may be deposited from time to time on the sectional tubes.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a side view, mainly in section, of a boiler constructed according to my invention. Fig. 2 is a plan view of the same, also partly in section.

Similar letters of reference indicate like parts in both the figures.

A is the vertical steam-drum, having a top-extension, A^2 , which forms a steam-chamber provided with a steam-pipe, a , and safety-valve, a' .

The back-end castings, b , of the inclined portion B' of the stacks of tubes B are connected at their lower ends by means of tubes b^4 and headers B^* with the steam-drum A, the lower end of which constitutes a mud-chamber, A' .

The drum may be provided with a suitable blow-off cock, and with hand-holes, man-hole, connections for gage-cocks, &c., as desired.

The boiler has a series of tubes, B^2 , arranged in a horizontal plane, connected to the front-end castings, b' , at their upper end, and to a header, B^* , at the back end, the latter connecting with the steam-drum A.

The sections B are inclosed in suitable brick-work, Z, in a similar manner to that now adopted in putting up Babcock & Wilcox boilers.

D is a layer of fire-brick or other suitable material, formed with sections or covers capable of separate removal for the purpose of inserting the nozzle of a hose or a brush for cleaning the exterior of the tubes B.

a^2 is an inclined deflector extending about half-way across the drum A, and arranged to receive the current of steam and water from the upper header, B^{**} , and deflect it downward. In the active circulation through the tubes the water is largely changed into steam in the inclined tubes B' , and in traversing through the cooler tubes B^2 at the top some further steam is generated; but the agitation due to the production of further steam in these latter tubes is so slight that the water and steam become practically separated, the steam alone being in the top and the water alone at the bottom. Thus conditioned, the current flows out against the under side of the deflector a^2 and is directed downward, the watery particles continue to descend with the mass of water circulating in the drum, while the steam readily disengages and rises in a dry condition to be taken from the top of the extension A^2 .

Modifications may be made in many of the details. I have shown one division-plate or partition extending across the mass of tubes and compelling the hot products of combustion to circulate once up and once down in their traverse through the flue-space. This partition can be wholly or in part omitted; or instead of one I can use two or more. I can employ two or more upright drums, A A' A^2 , in one boiler, or I can unite two or more sets of sections to one upright drum. I prefer, for obvious reasons, to make one complete boiler, with fire-doors, steam-pipe, feed-pipe, &c., for each upright drum.

My boilers can, of course, be employed in any number side by side, or otherwise conveniently arranged, to supply steam from moder-

ate-sized boilers for a large manufactory or a large steam-vessel.

The water-level in the entire apparatus may vary within wide limits. I propose, under ordinary conditions, to commence with the water low, so that the small quantity of water will allow steam to be raised rapidly. After the apparatus is working the water is pumped in preferably to a level a little below that of the upper tubes, B².

I claim as my invention—

1. In a steam-boiler having inclined tubes B' and horizontal tubes B² and suitable connections to an upright drum at the back, the arrangement of the latter extending below the

lowermost connection and above the uppermost, to serve, respectively, as mud-drum and steam-drum, as herein specified.

2. The stationary masonry Z and removable cover D, in combination with the inclosed tubes B' B² and upright drum A A' A², as herein specified.

In testimony whereof I have hereunto set my hand, at the city of New York, this 30th day of November, 1880, in the presence of two subscribing witnesses.

NAT. W. PRATT.

Witnesses:

W. COLBORNE BROOKES,
R. H. PECK.