

(No Model.)

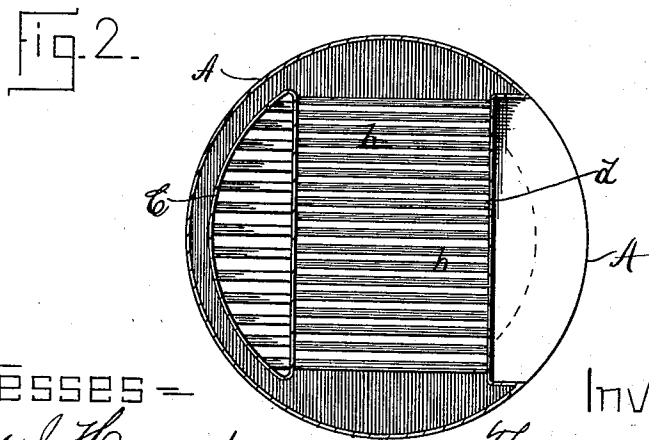
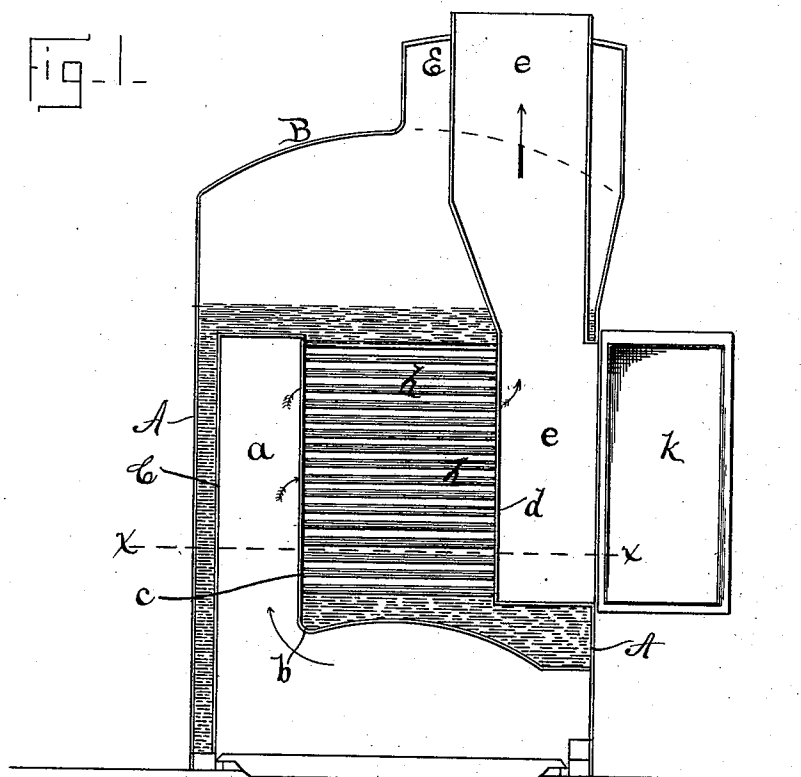
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T. DRUMMOND.

STEAM BOILER.

No. 322,701.

Patented July 21, 1885.



Witnesses =  
Tyler J. Howard  
Henry H. Burdham.

Inventor =  
Thomas Drummond  
By his Attorney  
Frank H. Allen.

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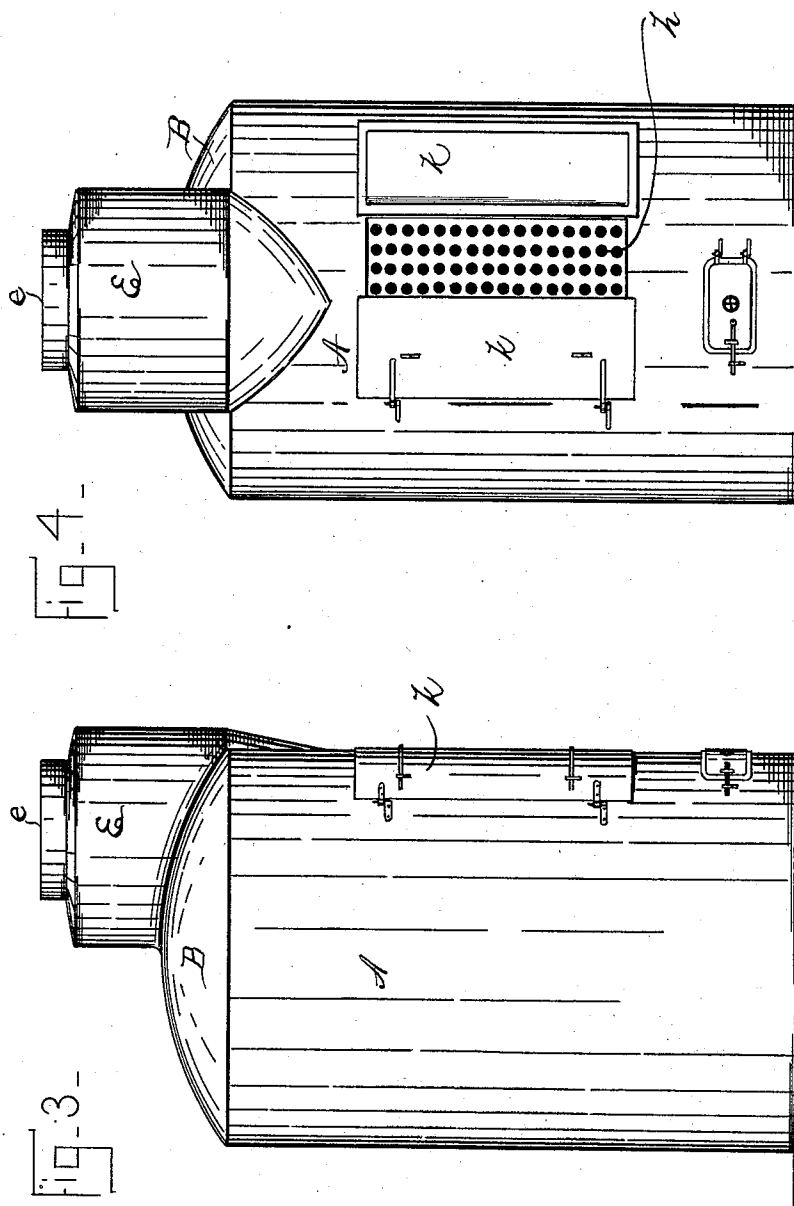
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# UNITED STATES PATENT OFFICE.

THOMAS DRUMMOND, OF NORWICH, CONNECTICUT.

## STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 322,701, dated July 21, 1885.

Application filed April 2, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS DRUMMOND, a citizen of the United States, residing at Norwich, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Steam-Boilers, which improvements are fully set forth and described in the following specification, reference being had to the accompanying drawings.

My improvements relate particularly to vertical cylindrical steam-boilers, my immediate object being to produce in compact form and at a reasonable cost a boiler having, first, an increased amount of heating-surface; second, increased facilities for cleaning the tubes, and, third, perfect draft and combustion. In the annexed drawings, Figure 1 is a vertical sectional view through the center of my newly-improved steam-boiler, and Fig. 2 is a cross-section on line *xx* of Fig. 1. Fig. 3 is a side view of said boiler complete, and Fig. 4 a front view of the same, one of the doors being opened to expose the tubes.

The letter A represents the outer shell or case, having the usual dome, B. Within the outer case, A, is an inner shell, C, concentric with said outer case on the back side of the boiler and extending upward to or slightly above the upper line of draft-tubes, forming a thin water-space around the fire-box and in the rear of the lower main flue, *a*. The crown-sheet of the fire-box is concaved and is rounded at its rear side, as shown at *b* in Fig. 1, to provide a free and unobstructed exit from said fire-box into the lower main flue, *a*.

Extending upward from the rounded portion *b* is a partition, *c*, (dividing the water and fire spaces,) which meets and is secured to the upper wall of the flue *a*, said flue being shaped in cross-section as a segment of a circle. (See Fig. 1.) Near the front side of the boiler and opposite to the partition *c* is a corresponding partition, *d*, whose lower end rests on a base-plate, *f*, whose outer circular edge is secured to the shell A, thus forming the base of the upper main flue, *e*, leading to the chimney. The partitions *c* *d* are perforated to receive and support a series of horizontal tubes *h*, which, passing through the water-space, form connecting draft-passages between the lower and upper flues, *a* *e*.

The crown-sheet or head of the boiler C has a circular extension, E, which surrounds the draft-flue *e*, thus furnishing a suitable steam-dome.

It will thus be seen that the water-space is disposed immediately over and around the fire-box; that the flue *a* is entirely surrounded by the water-space; that the horizontal tubes *h* conduct the heat through the center of said water-space, and that the upper flue, *e*, then carries said heat upward through the steam-chamber and dome, utilizing said heat to the fullest extent up to the instant it passes into the chimney. By thus cutting up the water-space I am able to generate a given pressure of steam much quicker than if the water was in a single sheet or body, and also to hold said pressure with greater economy of fuel than in any of the boilers of this class with which I am familiar.

For convenience in cleaning out the draft-tubes *h*, I have arranged one or more doors, *k* *k*, which confront the partition *d*, and when opened expose the tubes, which may then be readily cleaned by brushing, scraping, or by any of the methods in common use.

As the various necessary connections, such as feed-water pipe, pressure-gages, safety-valve, &c., are made in my improved boiler precisely the same as in boilers now in common use, I have thought it unnecessary to show and describe them here.

The compact form into which my complete boiler is brought renders it especially valuable for use in small steamboats and other similar places where economy of floor-space is to be considered.

Having thus described my invention, I claim—

The combination, in a steam-boiler, of the fire-box having a curved crown-sheet, the vertical flue at the rear, the smoke box and its escape-flues at the front, and the intermediate horizontal flues connecting the vertical flues and smoke-box, substantially as and for the purposes specified.

THOMAS DRUMMOND.

Witnesses:

FRANK H. ALLEN,  
TYLER J. HOWARD.