J. T. FANNING.
Steam-Boiler.

No. 201,232. Patented March 12, 1878.

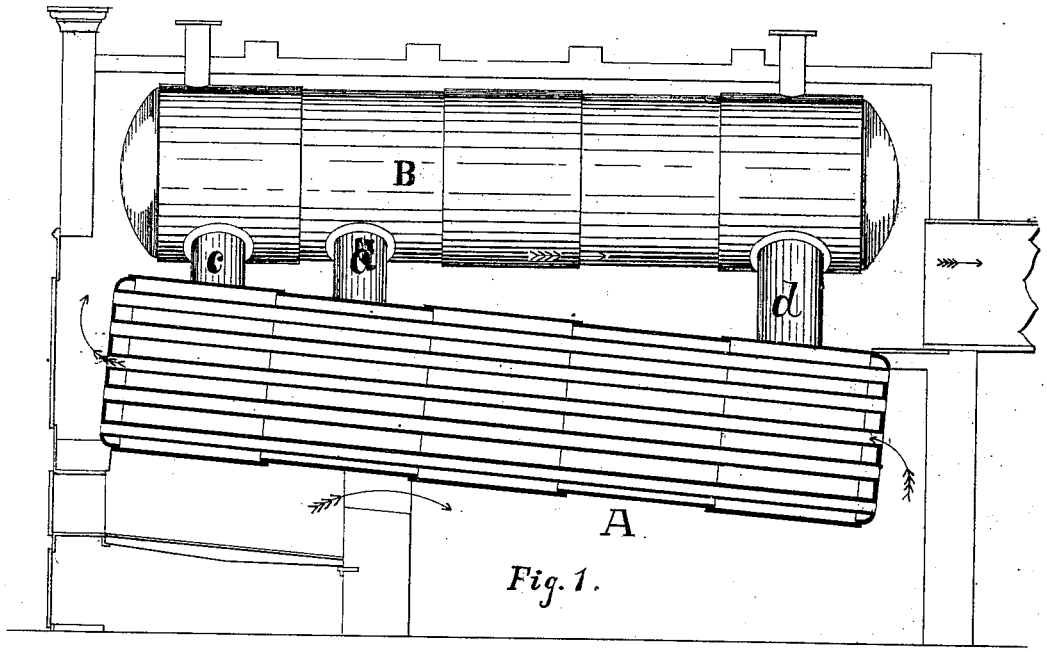

Fig. 1.

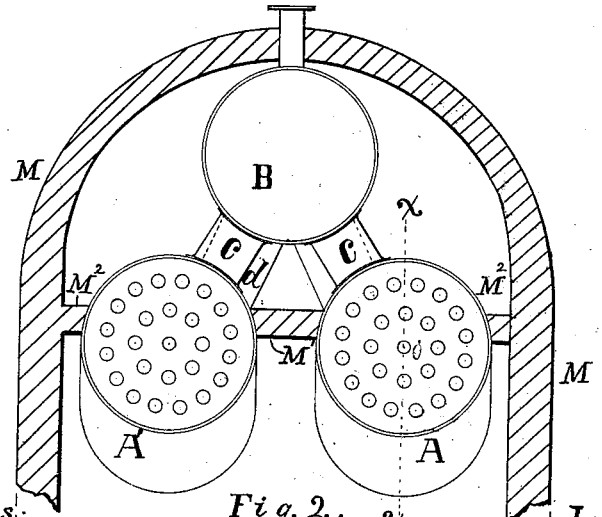

Fig. 2.

Witnesses;
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JOHN T. FANNING, OF MANCHESTER, NEW HAMPSHIRE.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **201,232**, dated March 12, 1878; application filed August 1, 1877.

To all whom it may concern:

Be it known that I, JOHN T. FANNING, of the city of Manchester, county of Hillsborough, and State of New Hampshire, have invented a new and useful Improvement in Steam-Boilers, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

My invention gives an active circulation, with ample steam-room and separating-surface. It is adapted for pumping water in cities, and for like purposes, where durability, safety, and great uniformity of action, as well as economy and efficiency, are requisite.

A British patent to Hopkins, in 1852, shows a horizontal cylinder adapted to serve as a separating-vessel, and also partially as a steam-generator, connected to two lower cylinders, which latter are also horizontal, and are tubular and adapted to generate steam efficiently.

I employ a nearly similar arrangement with the exception that my tubular cylinders are inclined instead of horizontal. The difference is important, because I thereby secure an efficient circulation, the water moving upward in the inclined tubular cylinders, and horizontally in the separating-cylinder, with a constant and active circulation.

The accompanying drawing represents what I consider the best means of carrying out my invention.

Figure 1 is a section through one of the tubular generators A and side elevation of the generator B, the section through A, Fig. 1, being on the line *x y*, Fig. 2. Fig. 2 is an end elevation.

The two tubular cylinders A are inclined, as shown, and are joined to the upper cylinder B by means of ample connections *c*, *c'*, and *d* near their front and rear ends.

The upper half of the upper cylinder B constitutes the steam-reservoir, the water-line being preferably carried at about the mid-height of the shell.

The furnace is beneath the front ends of the inclined generators A. Horizontal partitions M^1 M^2 tightly close the spaces between the two inclined generators, and also between them and the external masonry M. They serve to prevent the hot products of combustion from rising directly. The course of the gases is first along the under sides of the inclined shells to the rear, then through the tubes to the front, and then returning along the lower side of (or surrounding) the upper shell to the flue in the rear.

Inclination is given to the lower or tubular generator, in part to promote draft through the tubes, but more especially in connection with end positions of the connections or circulation-legs *c* and *d*, to insure a positive and rapid circulation of the hot water from end to end of the tubular generators A, and through the upper cylinder B, so as to provide for an easy and prompt release of the steam globules from the hot water, and to deliver the steam free from wetness.

I am aware that two upper boilers have heretofore been employed in connection with a lower boiler, as shown in Letters Patent granted to C. T. Boardman, No. 47,790, dated May 23, 1865; and I therefore lay no claim to such invention.

In my construction the parts are reversed, and I employ but one main boiler or separating chamber, and two lower ones. This structural difference is obvious; but there are other differences.

In the construction referred to the tubular boiler is a mud-drum. The single tubular case is short, extending less than half the length of the main boilers, and is nowhere presented to the direct heat of the fire, and the inclination of the tubular vessel is against the movement of the gases through it, the gases moving downward through the inclined tubes.

In my construction the inclination is favorable to the motion of the gases as they move upward through it, and differs in its construction and operation from the arrangement of boilers described.

I claim as my invention—

In a steam-generating apparatus, the combination of the single main boiler or separating-chamber B with two inclined tubular boilers, A A, mounted near together, and extending the whole length of the main boiler, with liberal connections *c d* at the ends, adapted to serve with a horizontal partition, M^1, between and with a grate at a lower level, as and for the the purposes herein specified.

JOHN T. FANNING.

Witnesses:
A. J. LANE,
GEO. F. MOOAR.