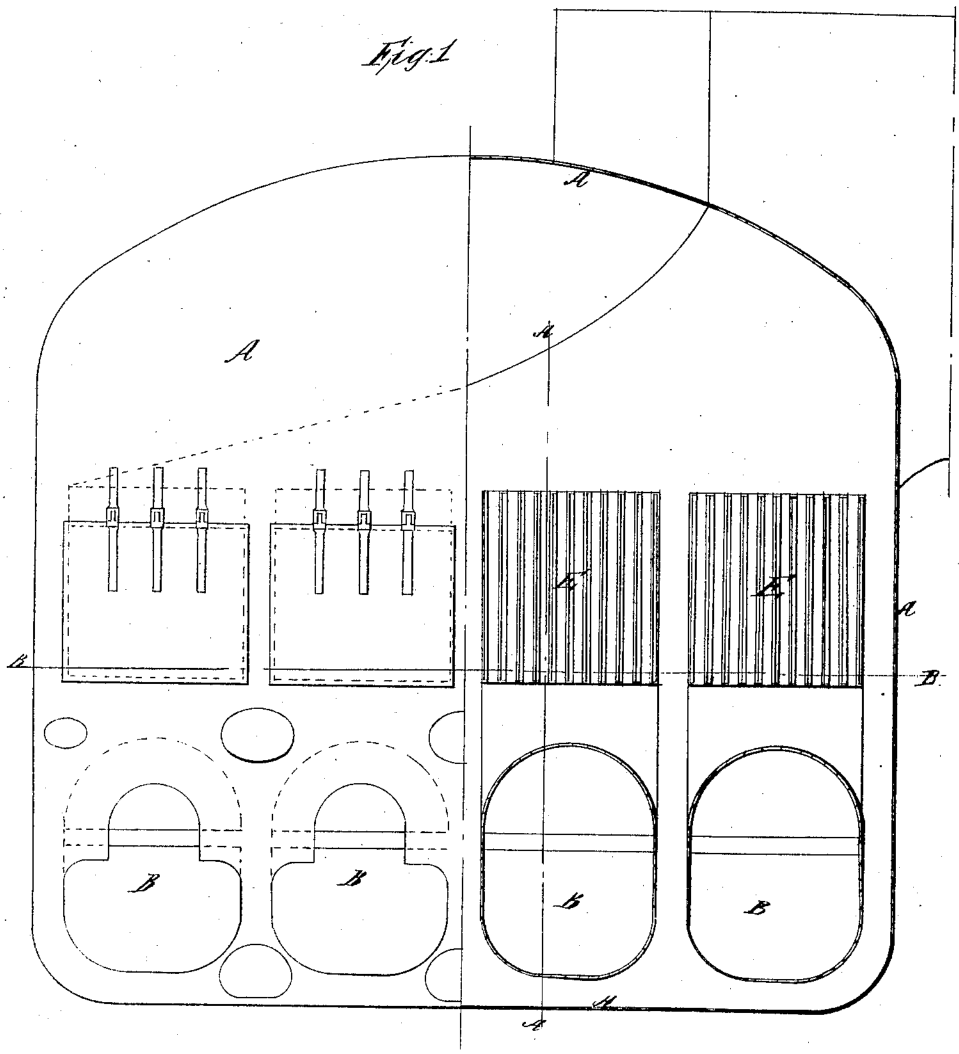
3 Sheets, Sheet 1.

D. B. Martin,

Steam-Boiler Water-Tube.

№ 11,997. Patented Nov. 28, 1854.

Fig. 1



3 Sheets. Sheet 2.

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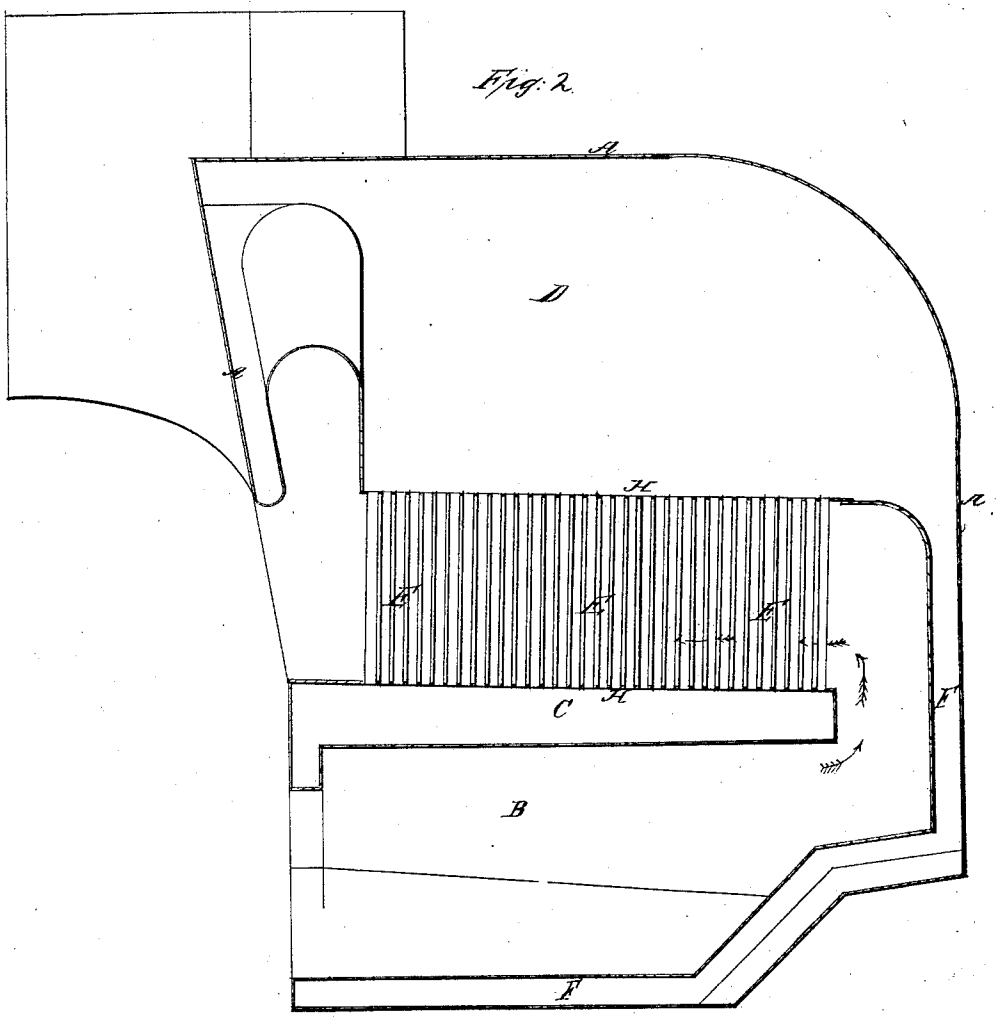
Fig. 2.



3 Sheets-Sheet 3.

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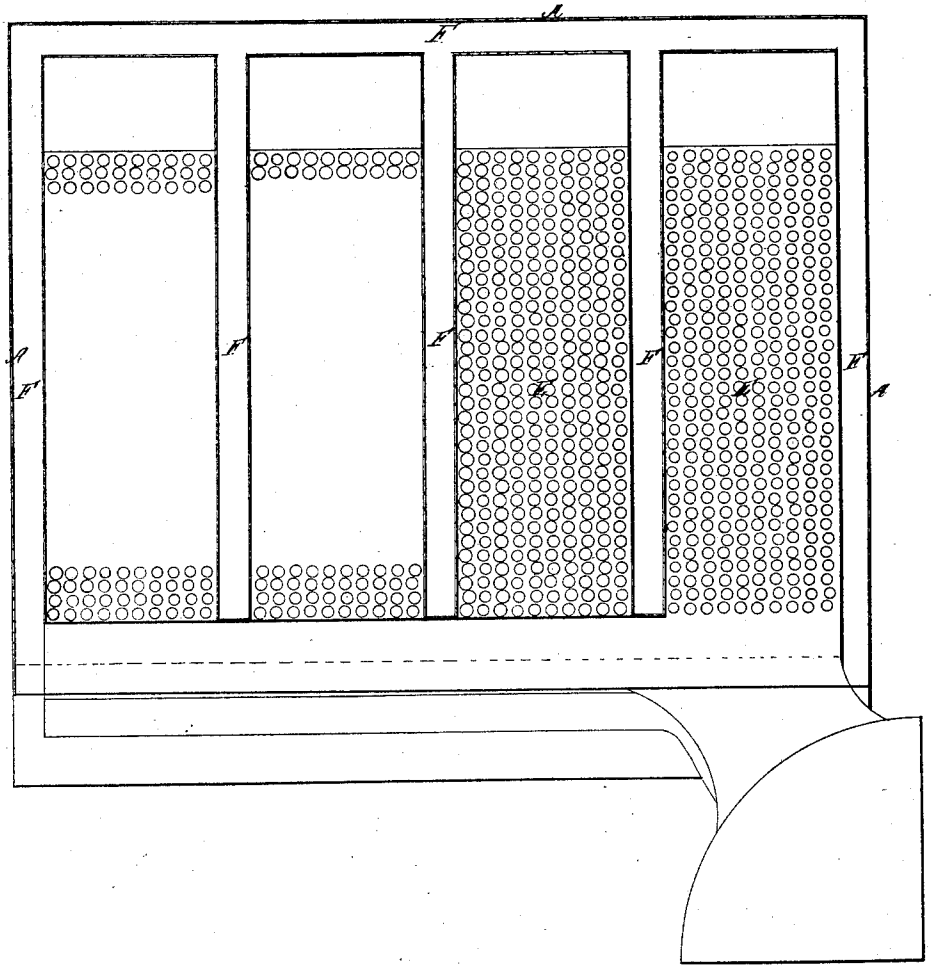
Fig. 3.



UNITED STATES PATENT OFFICE.

DANIEL B. MARTIN, OF WASHINGTON, NEW JERSEY.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **11,997**, dated November 28, 1854.

To all whom it may concern:

Be it known that I, DANIEL B. MARTIN, of Washington, Middlesex county, New Jersey, have invented an Improvement in Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known, and of the usual manner of making, modifying, and using the same, reference being had to the accompanying drawings, of which—

Figure 1 is a front view of the boiler with one-half of front removed to show the tubes. Fig. 2 is a vertical section from front to rear through the line A A of Fig. 1. Fig. 3 is a horizontal section through line B B of Fig. 1.

My invention consists in a certain arrangement of parts in vertical tubular boilers hereinafter described, whereby I economize heat, obtain a larger fire-surface for size of shell, preserve the lower parts of the tubes from rust, and in addition to these advantages my arrangement admits of easy access to every part of the boiler, a feature not common to tubular boilers.

A is the outer shell of the boiler, within which the parts are arranged as follows:

B is the fire-chamber, and the course of the draft is indicated by the arrows. The water-space C is directly over the fire-chamber, and this water-space is connected with the chamber D of the boiler by means of the series of vertical tubes E and the vertical water-spaces F F. The tubes are not exactly vertical, but are set slightly inclined, the inclination being backward, so that the side of the tubes most exposed to heat shall be more in contact with the water while steam is making. The tube-plates H H are also inclined, so that water from leaks (if any should occur) from the joints of tubes or other parts shall not remain about their bases.

A serious difficulty has been experienced in vertical tubular boilers from the rusting out of the tubes at the lower joints. The water, ashes, and corrosive matters usually standing about these points cause the tubes to rust out rapidly; but the inclination of the tube-sheet at the lower end of the tubes drains off the water and preserves the tubes. The height of the chamber D above the top of the tubes is such that the tubes may be drawn up and out of their places for repairs. The water-spaces F F are also continued down around and under the fire-chamber and then upward in the rear of the same into the upper chamber D, so that the most ample provision is made for circulation. It will be readily seen that this arrangement admits of very extensive fire-surface, and from the interposition of the water-space between the crown of the furnace and the tubes and the return of the flue among and around the tubes they are not exposed to the most intense heat, and are thereby in a great measure saved from its destructive effects.

I do not claim vertical tubes in boilers connected with water-spaces above and below, except under an arrangement like that set forth—viz., where the lower water-space is immediately over the fire and the draft of the furnace returns over said space and among the tubes, as set forth—that is to say,

I claim—

The arrangement of the series of tubes placed vertically, or nearly so, between an upper and a lower and connecting vertical water-spaces, when said lower water-space is made directly over the fire-chamber and the draft is returned over said lower space and among the vertical tubes, in the manner set forth.

DANL. B. MARTIN.

Witnesses:

W. W. WOOD,

T. CAMPBELL.