2 Sheets—Sheet 1.

D. RENSHAW & G. B. N. TOWER.

Steam-Generator.

No. 196,825. Patented Nov. 6, 1877.

Fig. 1.

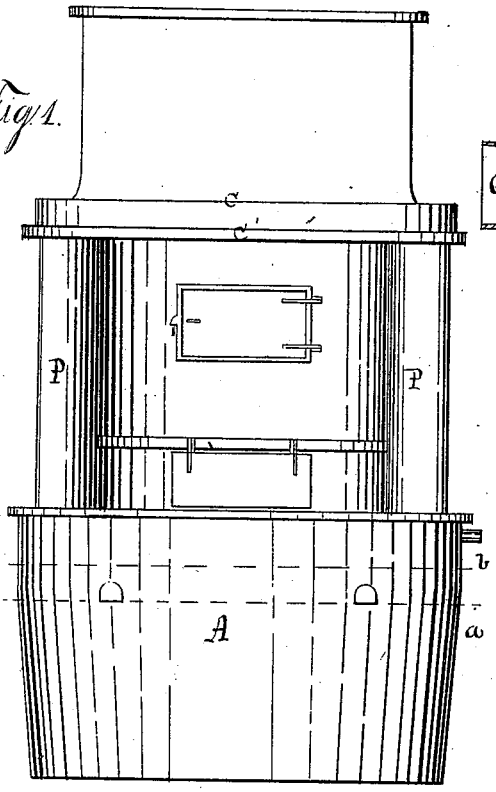


Fig. 2.

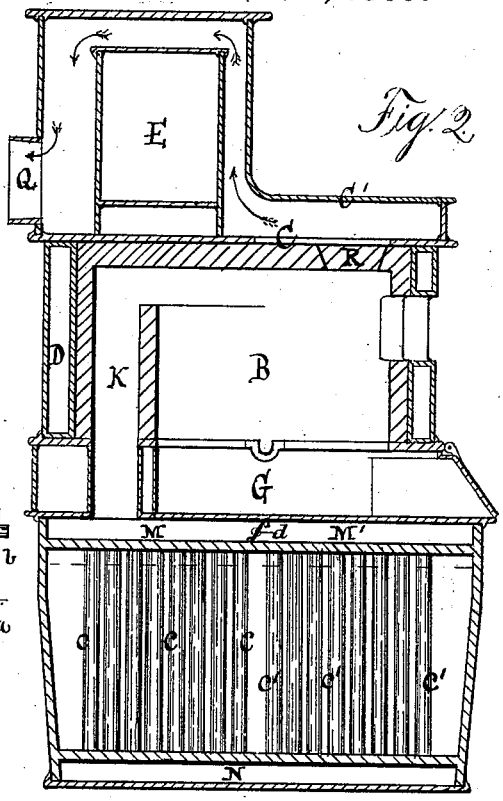


Fig. 3.

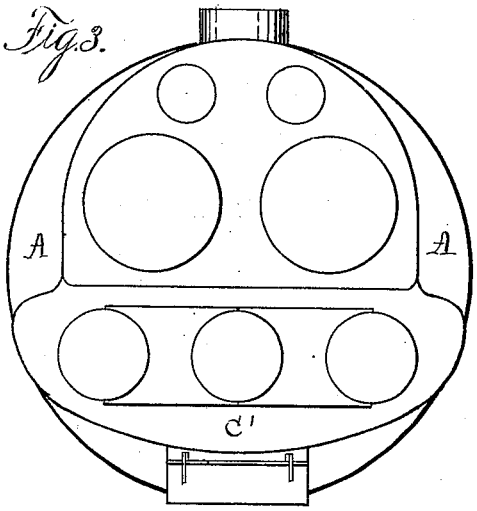
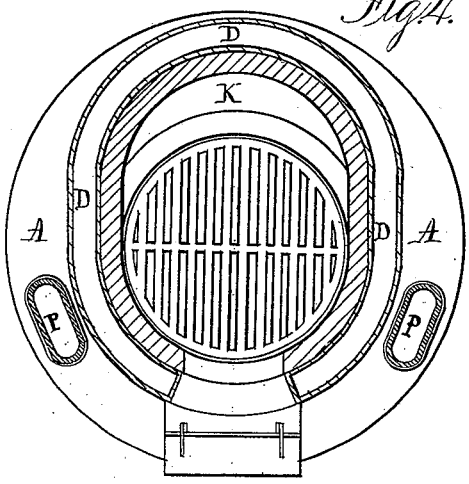


Fig. 4.



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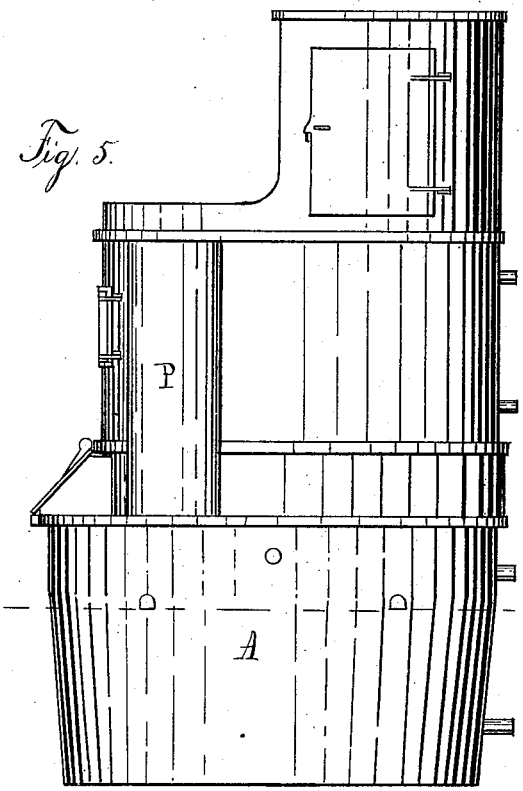
2 Sheets—Sheet 2.

D. RENSHAW & G. B. N. TOWER.

Steam-Generator.

No. 196,825. Patented Nov. 6, 1877.

Fig. 5.



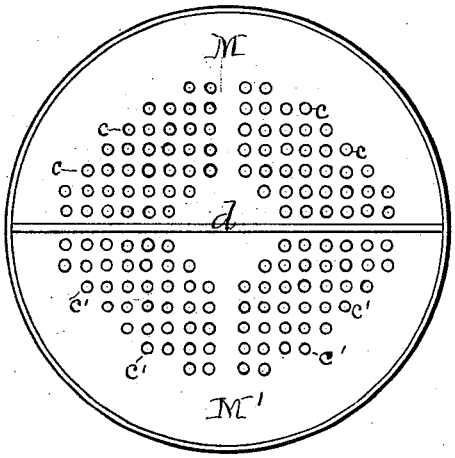


Fig. 6.

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UNITED STATES PATENT OFFICE.

DAVID RENSHAW, OF COHASSET, AND GEORGE B. N. TOWER, OF CAMBRIDGE, MASSACHUSETTS.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. **196,825**, dated November 6, 1877; application filed March 16, 1877.

To all whom it may concern:

Be it known that we, DAVID RENSHAW, of the town of Cohasset, in the county of Norfolk and State of Massachusetts, and GEORGE B. N. TOWER, of the city of Cambridge, in the county of Middlesex, in said State, have jointly invented new and useful Improvements in Steam-Generators, which improvements are fully set forth in the following specification and accompanying drawings, in which—

Figure 1 shows a front elevation of a generator embodying our invention. Fig. 2 shows a vertical section of the same. Fig. 3 shows a plan view. Fig. 4 shows a horizontal section through the fire-box. Fig. 5 shows a side elevation. Fig. 6 shows a plan of the top of the boiler.

The object of our invention is to improve on the methods of generating steam, and combining our improvements with devices for heating, cooking, &c.

The principal feature of our invention consists in placing the boiler or steam-generator lower than the fire, in such a manner that the gases from the fire will pass downward, and through a series of flues in the boiler, and rise on the opposite side of the boiler, thus retaining the heat, and bringing it into the best relation with the tubes for converting the water in the boiler into steam.

Another feature of our invention consists in combining with boilers so constructed the ordinary arrangements for cooking, and for heating water for domestic purposes.

And another feature of our invention consists in combining such boilers with stoves for heating purposes, so that the radiant heat may be used in conjunction with steam—as, for instance, in a railway-car, our stove would furnish radiant heat to the car, while the boiler could be connected with radiating pipes traversing the whole length of the car; or the stove could be used in a building as a furnace, while the boiler was furnishing steam for power.

And still another important feature of our invention consists in the fact that we can at any moment, without drawing the fires, by the peculiar construction of our generator, shut off from the boiler all the steam-generating heat, and reduce our apparatus to a simple furnace or stove, not acting on the water in the boiler.

In the drawings we have shown our invention as applied to a boiler for power or steam heating, and with apparatus for cooking and for heating water attached to it.

We have shown our boiler A as resting on the floor *a*, part being below the floor and part above, and the water-line *b* as above the floor. By this construction we keep our boiler in a position where it occupies little room, comparatively with other boilers, and are enabled to place the fire-box B in a position where it can readily be attended to, and where it will serve the purpose of communicating its surplus heat to the top of the range C C′, to the water-heater D, and, by means of the return-flues, to the oven E. G represents the ash-pit.

The gases from fire built in the combustion-chamber B pass down through the upright flue K to a chamber, M, over the boiler; thence through a series of flues, *c c*, to a chamber, N, beneath the boiler; thence through the flues *c′ c′* to the chamber M′, from which they are conducted, by means of the flues P, over the heated surface C of the top of the range, and around the oven E, in the direction shown by the arrows, emerging and entering the outer flue through a pipe, Q. The top of the range, and the top of the oven as well, can be arranged in the usual manner of ranges, as shown in Fig. 2, and direct heat, if required, can be obtained at the front of the range by removing the piece R over the front of the fire.

Between the two chambers M and M′ we place a damper, *d*, which, being closed, forces the gases to pass freely from one chamber to the other, thus at once cutting off the supply of heat to the boiler.

The range may be fitted with a water-jacket, as shown at D, or with a water-back or coil of pipe, as is common in ranges; but in many cases nothing of the kind would be required.

In a railway-stove or a furnace the same arrangement is best—that is, setting the boiler partially within the floor—as it gives better

facilities for taking care of the fire, and the flues would generally be joined together above the stove, or entered into a chamber from which a discharge-pipe would lead.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination of the furnace B with the boiler A, having pipes *c* and *c'*, arranged and adapted to operate in the manner described.

2. In combination with the boiler A, constructed as described, beneath the furnace B, the cooking apparatus C, C', and E, as and for the purpose specified.

3. In combination with the furnace B and boiler A, the damper *d*, for regulating the supply of heat to the boiler, as described.

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