

No. 757,263.

PATENTED APR. 12, 1904.

J. T. BURR.

WATER HEATING AND STEAM GENERATING DEVICE.

APPLICATION FILED JUNE 4, 1903.

NO MODEL.

FIG. 1.

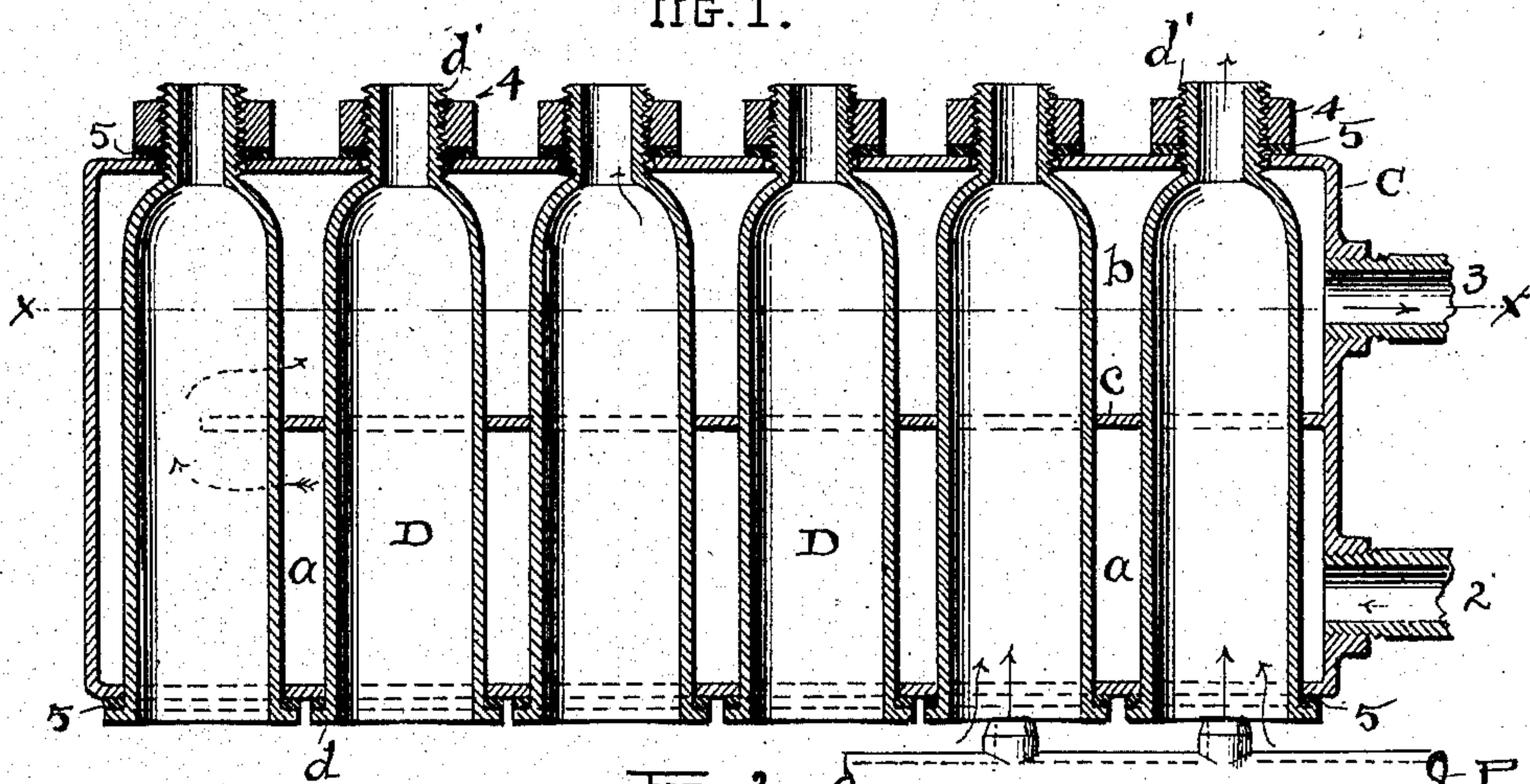


FIG. 2.

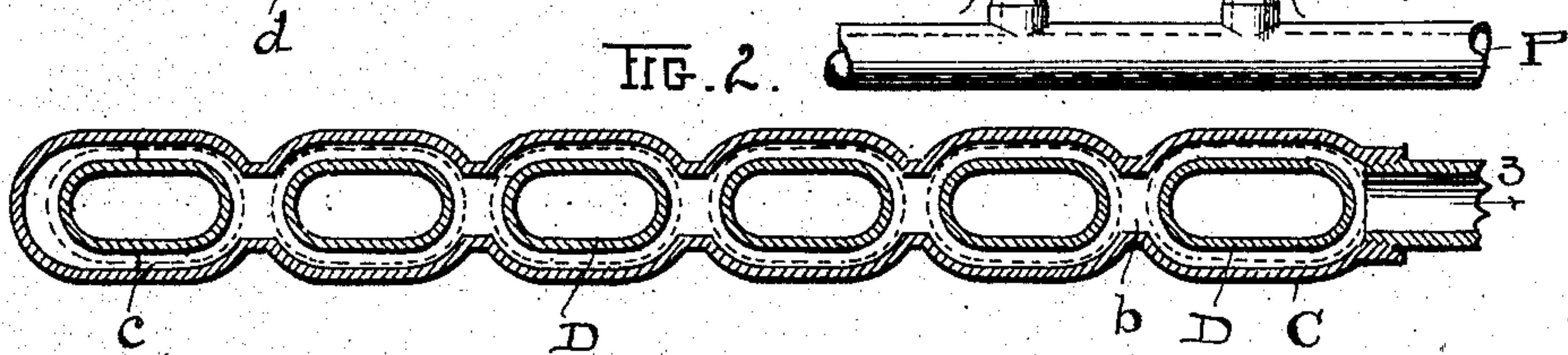


FIG. 3.

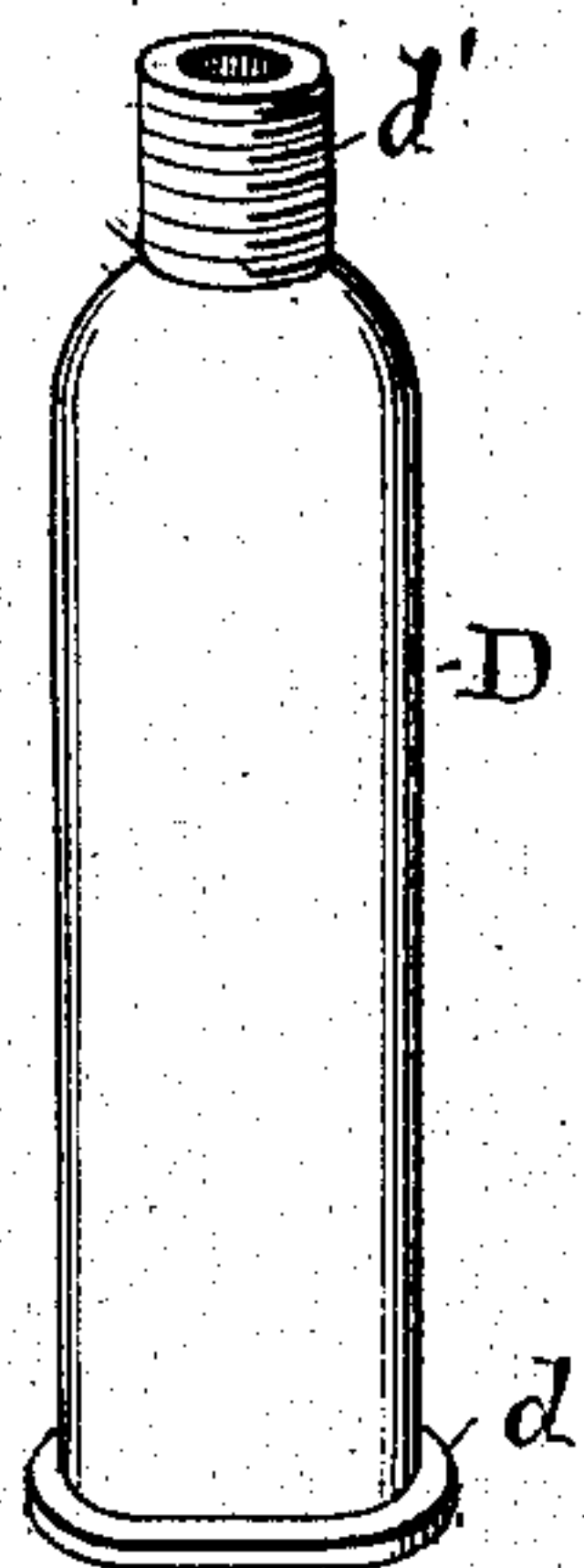
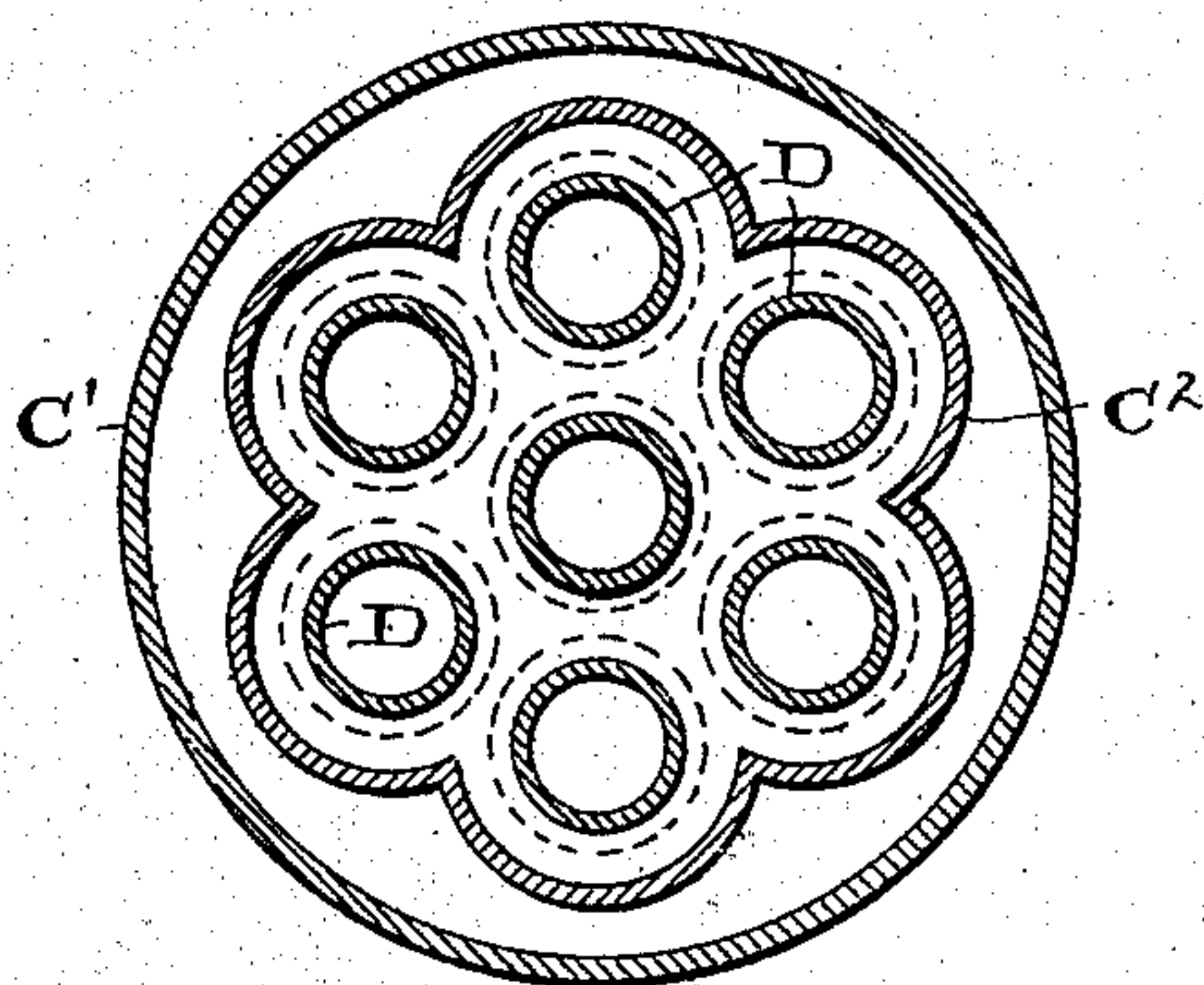


FIG. 4.



ATTEST.

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## WATER-HEATING AND STEAM-GENERATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 757,263, dated April 12, 1904.

Application filed June 4, 1903. Serial No. 159,987. (No model.)

*To all whom it may concern:*

Be it known that I, JESSE T. BURR, a citizen of the United States, residing at Glenville, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Water-Heating and Steam-Generating Devices; and I do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to water-heating and steam-generating devices, all substantially as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical sectional elevation of a device constructed to one form of my invention. Fig. 2 is a plan view thereof on line *x x*, Fig. 1. Fig. 3 is a detail of one of the burner-mantles shown in Figs. 1 and 2. Fig. 4 is a sectional plan view of a modification of the invention.

The form of heater herein shown is designed more especially for use as a water-front in a cooking stove or range, and for this reason it has been built narrow in cross-section or depth front to rear, but has elevation to give a large heating-surface. In this use as well as in others, as where the device is employed separately for heating water or providing steam or as an instantaneous water-heater, the device necessarily is embodied in a suitable casing C, and the form of the casing may be as shown in Figs. 1 and 2 or circular, as shown in Fig. 4. Other forms also may be used without departing from the spirit of the invention. In Fig. 1 I also show a chambered or divided casing, in which there is shown a single central horizontal partition *c*, extending across the casing and from end to end and constructed to allow the water to flow from the lower chamber or space *a* to the upper chamber or space *b* around or through the end of said partition opposite the water inlets and outlets 2 and 3, respectively. Thus water entering chamber *a* flows about the burner tubes or mantles D from inlet 2 to the other end of the heater, whence it passes up into the upper chamber *b* and onward and outward through outlet-pipe 3. One or more partitions *c* can be used, but in reverse order.

It is intended in any event that the space between said tubes D or between the tubes and the wall of the casing be comparatively slight and as nearly uniform as possible, and all my arrangements contemplate the maximum exposure of the water to the heating-surface which any given form or style of heater affords. Hence in Fig. 1 the entire heating-surface of each and all the burner-tubes is exposed to water, and the said tubes are so constructed and arranged that they will impart their heat directly to the water rather than lose it largely in the draft. To these ends the casing C is provided with openings in its bottom of a size to introduce the said tubes D bodily up to their bottom flanges *d*, while the threaded necks *d'* of the said tubes extend through correspondingly smaller holes in the top of the casing. Nuts 4 engage necks *d'*, and gaskets 5 at the ends of the tubes D serve to make said tubes water-tight in the casing. Partition or diaphragm *c* is provided with holes also for tubes D, but no packing is required at this point. Each tube is independent of all the others, and any unskilled person with a wrench can remove and replace a tube, if occasion occurs.

In Fig. 4 the casing comprises the vertical inner and outer walls C' and C'', but with tubes D, as in Fig. 1. Wall C' is really a drum to prevent excessive radiation, and any suitable water connections and means to cause the water to travel back and forth may be used.

The part D is referred to herein as a "burner-tube;" but in Fig. 2 the said part is shown as oblong in cross-section, and it is contracted at its top somewhat like a jug, leaving an opening large enough, however, to afford draft for the products of combustion. The body of said tube is preferably of the same cross-section from end to end, and it is distinguished, further, by its flange *d* below and threaded neck *d'* above.

I do not confine myself to any particular kind of fuel for heating tubes D, but show a gas-pipe P with burner-jets. I might, however, use a kerosene or other burner which will deliver heat into tubes D.

I do not wish to be understood as limiting myself to one partition or diaphragm nor to a



horizontal arrangement thereof, as I might use two or more partitions and arrange them vertically instead of horizontally.

What I claim is—

- 5 1. A water-heater comprising a fluid-tight casing having water inlet and outlet openings relatively at the same side of the casing, in combination with a series of burner-tubes extending through said casing and open to  
10 the outside air at both ends, said burner-tubes contracted at their upper ends, and locked fluid-tight with said casing at both ends, and means dividing said casing into two communicating compartments open respectively to  
15 said inlet and outlet openings, substantially as described.

2. The casing having water inlet and outlet

openings at substantially the same side, a partition between said openings dividing the casing into two communicating compartments, 20 burner-tubes extending through the top and bottom of said casing and through said partition, said tubes having reduced upper portions and means thereon securing said tubes at the top, and flanges on said tubes bearing against 25 the bottom of the casing, substantially as described.

Witness my hand to the foregoing specification this 21st day of May, 1903.

JESSE T. BURR.

Witnesses:

R. B. MOSER,  
R. ZBORINK.