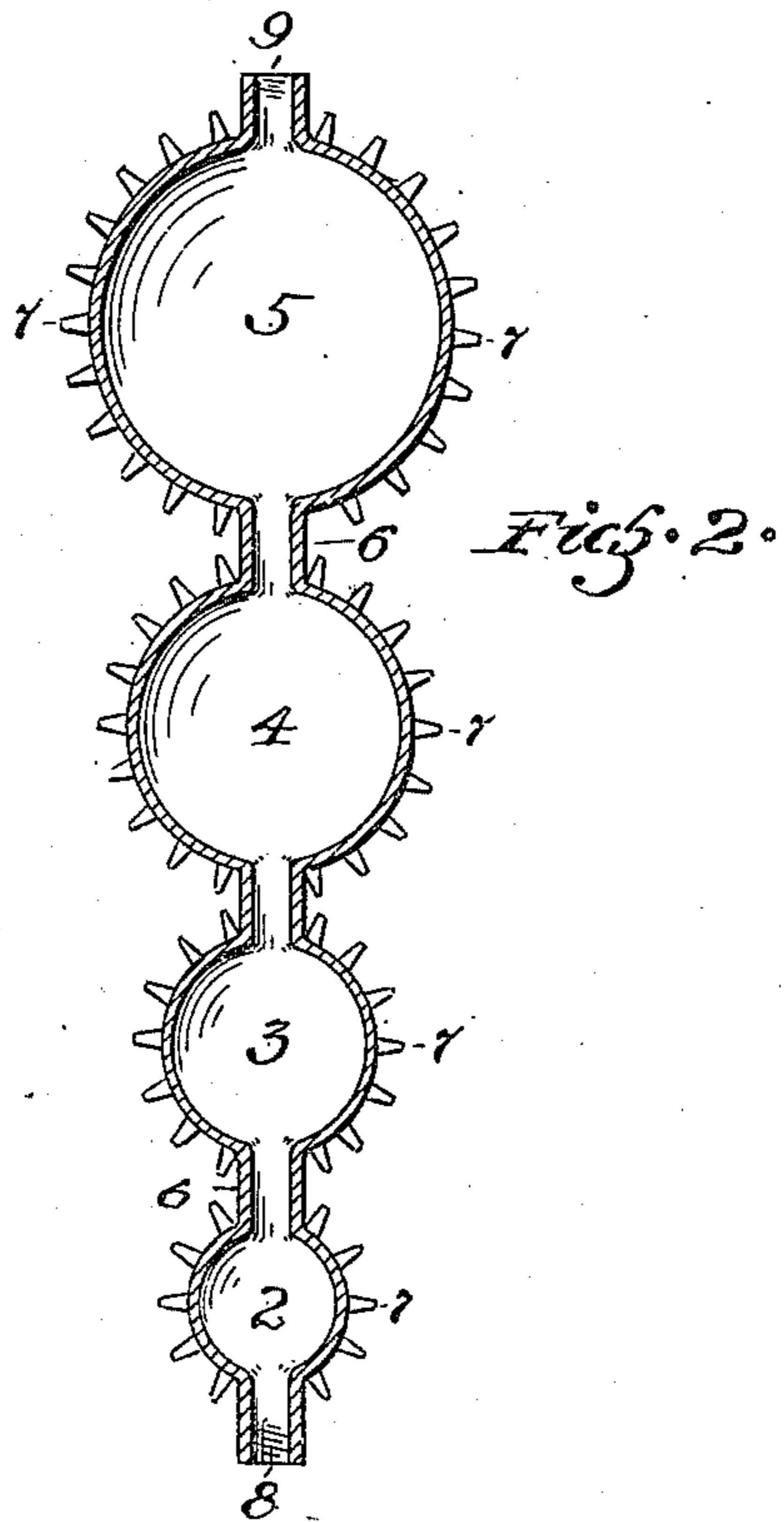
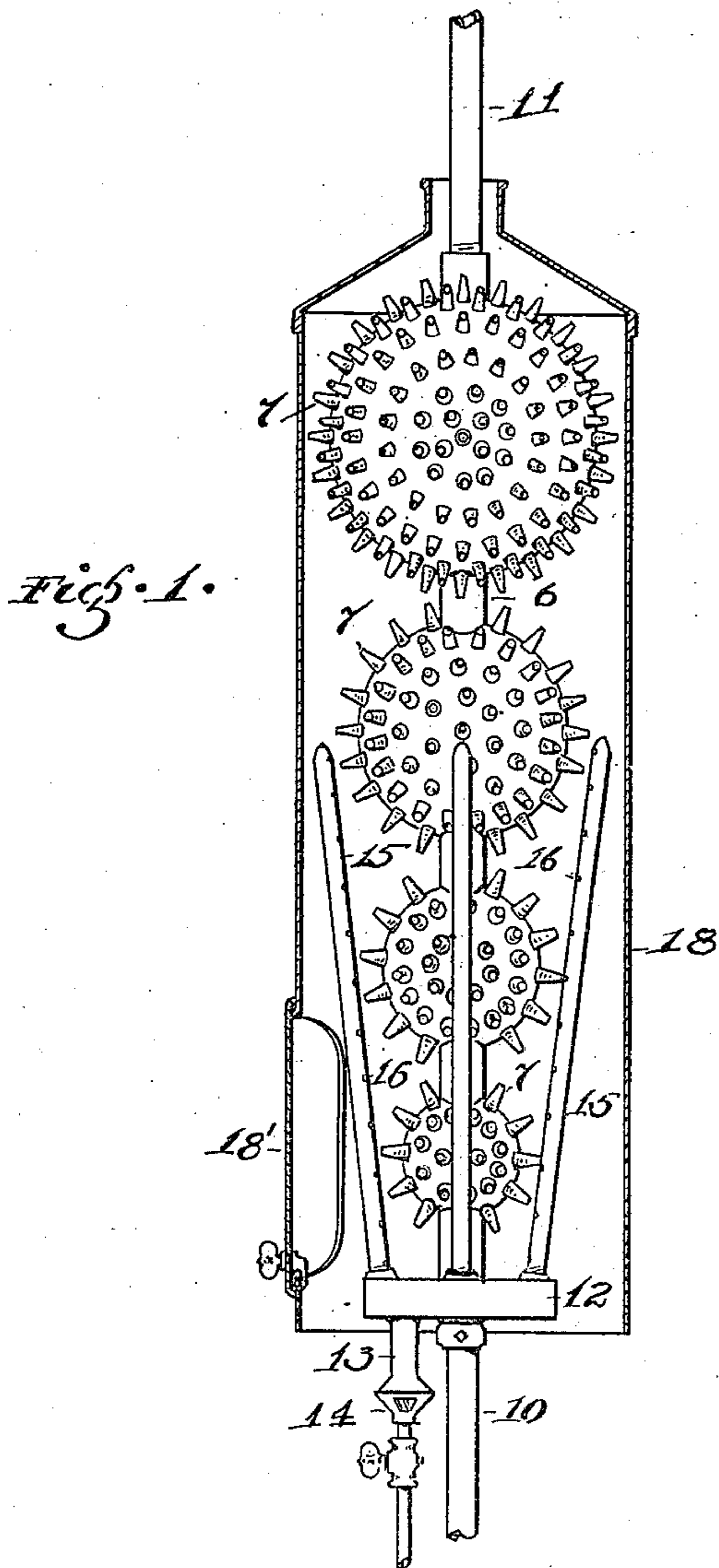


C. A. BOREIN.  
WATER HEATER.

APPLICATION FILED OCT. 16, 1908. RENEWED APR. 28, 1910.

975,824.

Patented Nov. 15, 1910.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

CHARLES A. BOREIN, OF OAKLAND, CALIFORNIA.

WATER-HEATER.

975,824.

Specification of Letters Patent.

Patented Nov. 15, 1910.

Application filed October 16, 1908, Serial No. 458,115. Renewed April 23, 1910. Serial No. 558,286.

*To all whom it may concern:*

Be it known that I, CHARLES A. BOREIN, a citizen of the United States, and residing at 915 Broadway, in the city of Oakland, county of Alameda, and State of California, have invented certain new and useful Improvements in Water-Heaters; and I do hereby declare the following to be a full, clear, and exact description of the said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

This invention relates to improvements in water heaters and consists in the novel construction and arrangement of the parts.

The objects sought to be accomplished, are to simplify this class of heater by reducing the number of parts and eliminating joints within the water containing members, to reduce the liability of leakage, and the cost of assembling; and to construct the burner so that the flame is evenly distributed over the heating surface, proper combustion insured, back firing and popping prevented, and odor eliminated.

Broadly the invention consists of the water heating member comprising a series of globular enlargements cast in an integral piece, having an inlet at the bottom, and an outlet at the top; the outer surface covered with projecting spines or heat absorbing asperities; a gas burner having a mixing chamber and upwardly extending perforated burner tubes inclosing the heating member; the whole inclosed within an ornamental insulating jacket.

In the drawings:—Figure 1 is a side elevation of a water heater constructed in accordance with this invention, the inclosing jacket being shown in cross section. Fig. 2 is a longitudinal cross section of the water heating chamber.

In detail the construction consists of the water heating chamber comprising the globular enlargements 2, 3, 4 and 5, joined by the necks 6, the outer surface being provided with the spines 7. The inlet 8 and the outlet 9 are threaded to receive the water service pipes 10 and 11. The whole water containing chamber, with its globular enlargements, and spinous heating surface is preferably cast in a single integral piece, for the sake of simplicity and strength; but if desirable the globes may be cast separate and joined by screw nipples. This latter is convenient when it is desired to increase the

heating capacity by adding more globes in the series. Annular flanges can be substituted for the spines, but practice has demonstrated the superiority of the latter.

The burner consists of the mixing chamber 12 with the inlet neck 13, and the aspirator 14. The tubular burner tubes 15 extend upward from the mixing chamber and are provided with the perforations 16, which project the flame against the adjacent heating surface of the water chamber. These burner tubes may be multiplied to increase the capacity of the burner in proportion to the heating surface exposed; and they may be of any length in proportion to the height of the heater. These burner tubes are preferably made of lengths of common pipe perforated and threaded into the cast mixing chamber. The burner rests upon the set collar upon the inlet pipe 10.

The inclosing jacket 18 may be of any suitable material, burnished or enameled as taste suggests. The even distribution of heat due to the construction of the burner and the absorbent qualities of the heating surface, prevents the excessive heating of the jacket so common in this class of heater of the ordinary construction. The jacket may be finished in burnt enamel of various colors or ornamentation to harmonize with the surroundings. The jacket is provided with the door 18', of ample size to allow the escape of any gases which may accumulate within the jacket before the match is applied to the burner.

The heater is attached to the kitchen boiler for domestic purposes in the usual manner. The service pipe from the bottom of the tank is connected to pipe 10. The water flowing through the heater absorbs the heat from the burner and passes out to the service pipes or back into the tank; continuing to circulate thus until drawn off. The capacity of the heater can be increased as before stated by adding more heating globes, and increasing the length of the burner tubes proportionately; or the number of heaters may be multiplied in connection with the same tank.

Having thus described this invention what is claimed and desired to secure by Letters Patent is:—

1. A water heater consisting of a series of intercommunicating globular chambers with spinous heating surfaces, and inlet and outlet service connections; and a burner consisting of an inlet neck, a mixing chamber, and

a plurality of perforated burner tubes extending upward from the mixing chamber, and communicating with the latter, said burner tubes being arranged to direct flames  
5 against said series of globular chambers, and a jacket inclosing said globular chambers and said burner.

2. A water heater consisting of a series of intercommunicating globular chambers with  
10 spinous heating surfaces, and inlet and outlet service connections, and a burner with perforated burner tubes communicating therewith and arranged to direct flames against said globular chambers, and a jacket  
15 inclosing said globular chambers and said burner.

3. A water heater comprising a series

of intercommunicating globular chambers placed one above another and successively increasing in diameter, and a burner pro- 20  
vided with a mixing chamber located below said heater and having upwardly extended, diverging burner tubes communicating with said mixing chamber and surrounding the chambers of said heater. 25

4. A water heater formed of a series of intercommunicating globular chambers placed one above another, said chambers successively increasing in diameter and being each provided with exterior spines.

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Witnesses:

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