No. 666,886. Patented Jan. 29, 1901.

M. READY.

HEATER.

(Application filed Mar. 3, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

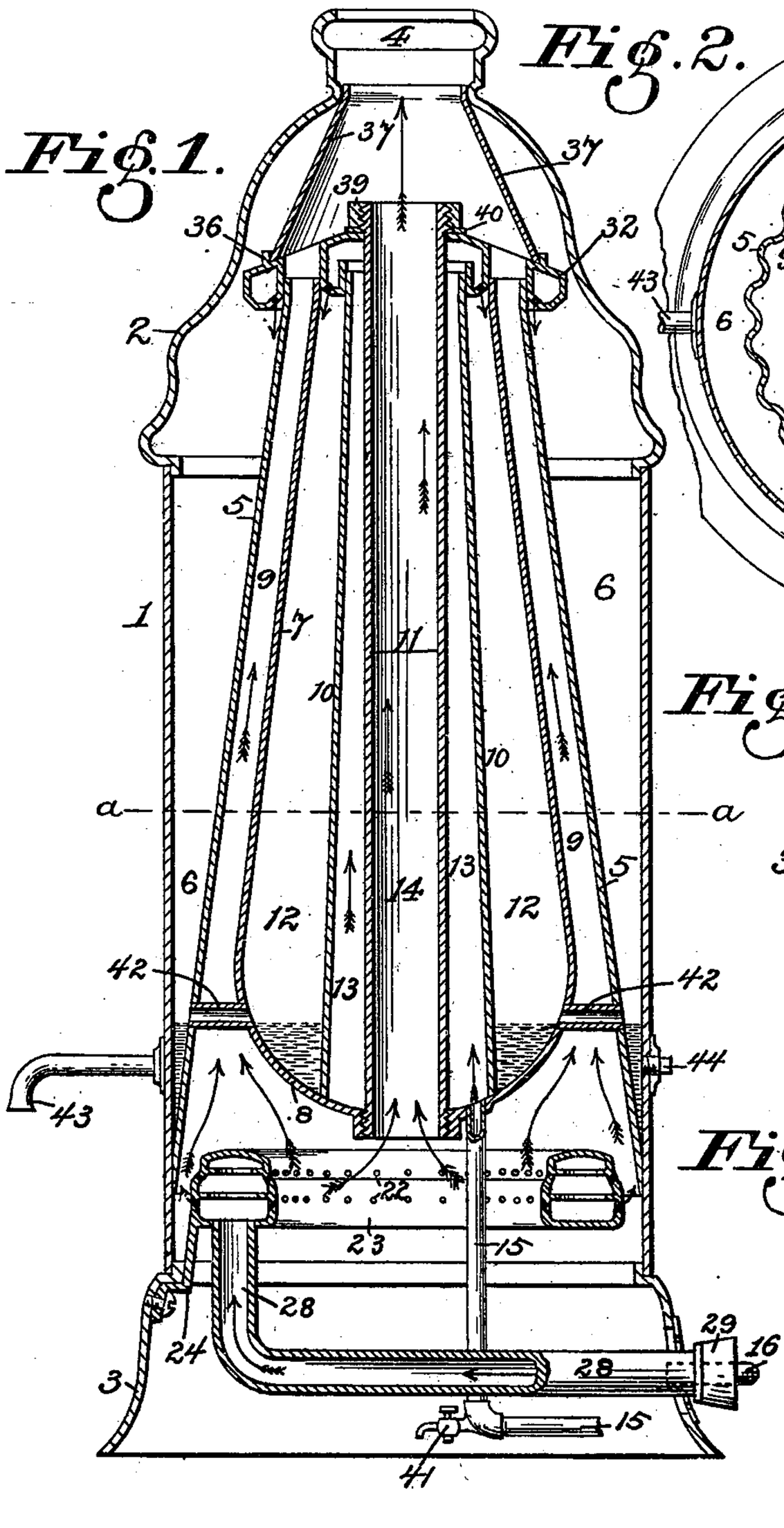


Fig. 2.

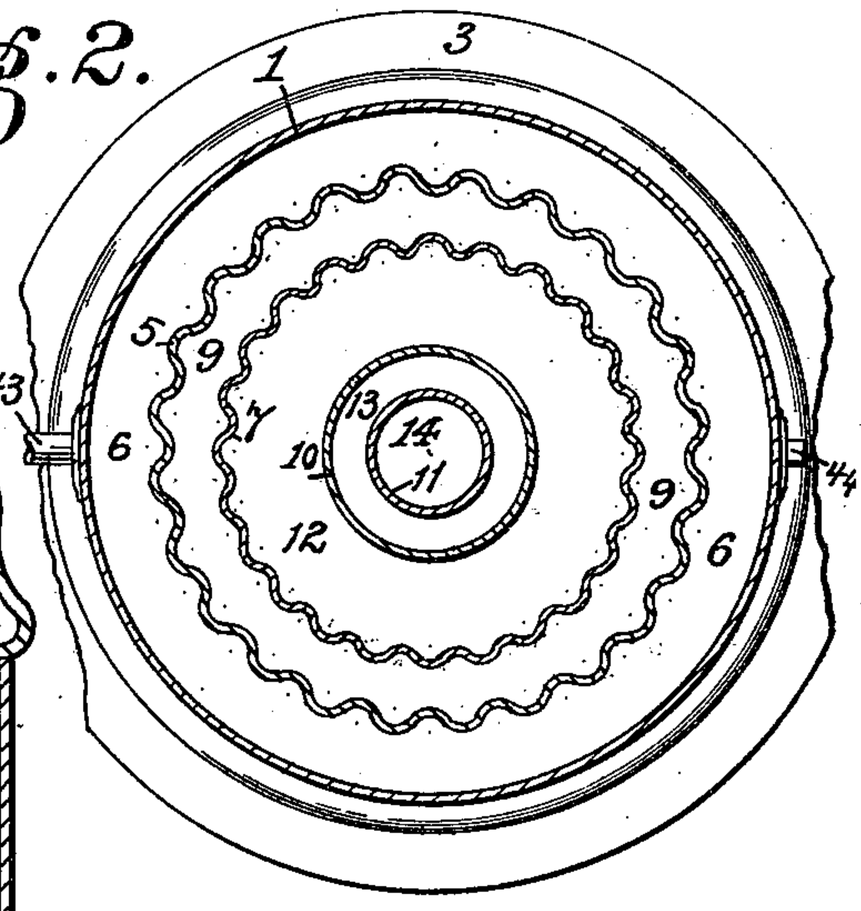


Fig. 3.

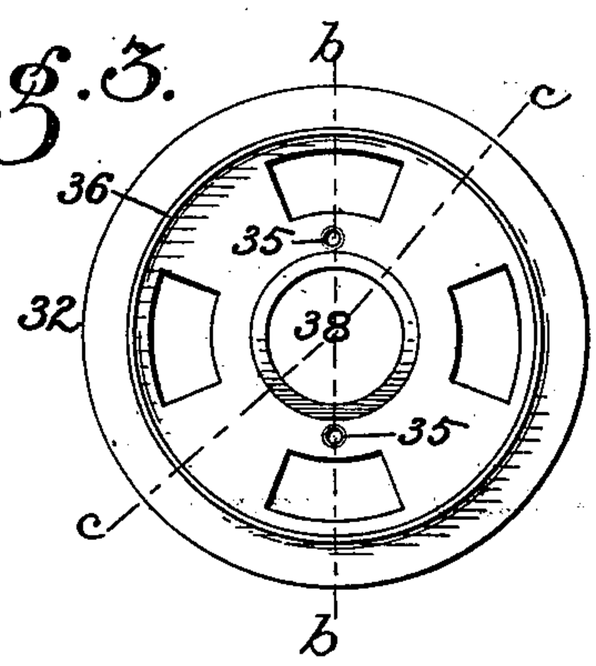
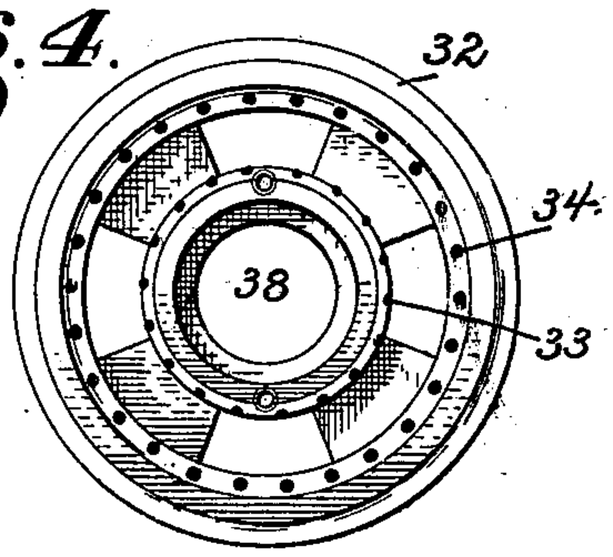


Fig. 4.



WITNESSES:

Walter E. Haas

Robt. S. McMaster.

INVENTOR:

Maurice Ready,

BY

Frank M. Burnham.

his ATTORNEY.

No. 666,886.

Patented Jan. 29, 1901.

M. READY.

HEATER.

(Application filed Mar. 3, 1900.)

(No Model.)

2 Sheets—Sheet 2.

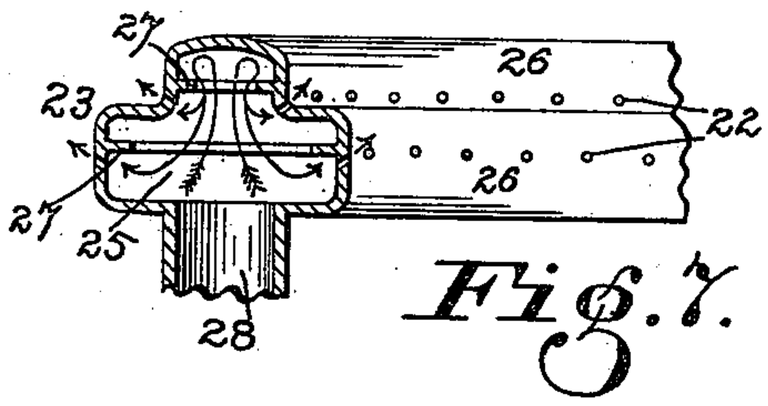


Fig. 7.

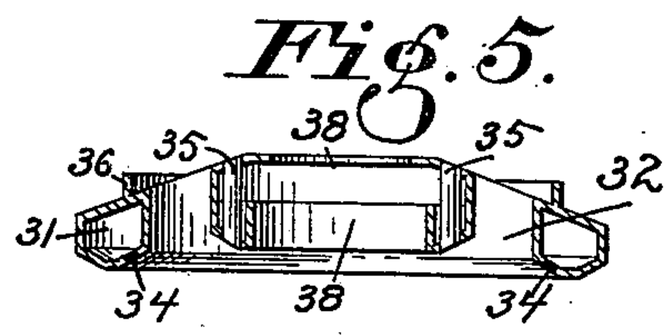


Fig. 5.

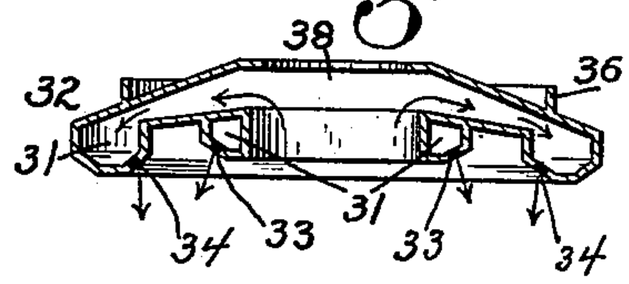


Fig. 6.

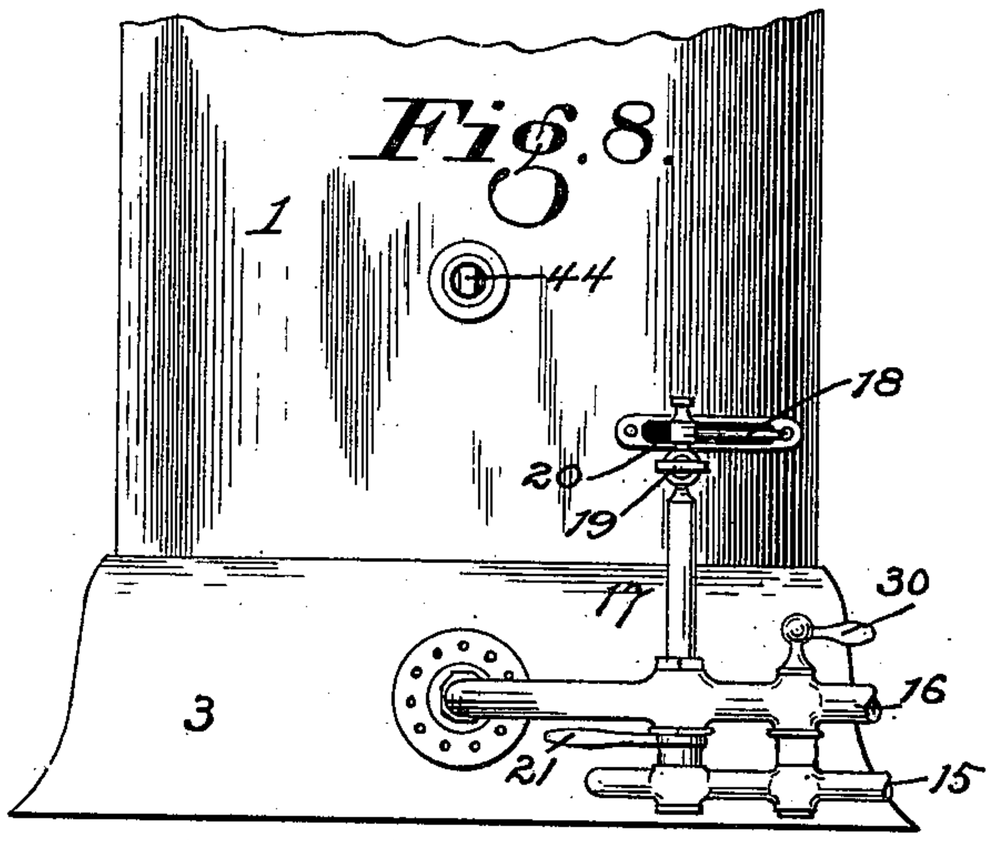


Fig. 8.

WITNESSES:

Walter E. Haas

Robt. S. McMaster.

INVENTOR:

Maurice Ready,

BY

Frank M. Burnham,

his ATTORNEY.

UNITED STATES PATENT OFFICE.

MAURICE READY, OF DAYTON, OHIO.

HEATER.

SPECIFICATION forming part of Letters Patent No. 666,886, dated January 29, 1901.

Application filed March 3, 1900. Serial No. 7,198. (No model.)

To all whom it may concern:

Be it known that I, MAURICE READY, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Heaters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in heaters, and is a separate and distinct improvement over Letters Patent No. 524,399, granted to me under date of August 14, 1894.

The object of my present invention is to provide a device of simple and inexpensive construction by which water may be quickly and readily heated at a small cost for any purpose desired, being especially applicable where temporary heating is desirable, and although of great service in restaurants, saloons, cafés, and other similar public places, as well as private houses, is particularly adapted for bath-room purposes; and it consists in certain peculiar and novel features of construction, arrangement, and combination of the several parts, as will be more fully described hereinafter, and pointed out in the subjoined claims, in accordance with the statutes in such cases made and provided therefor.

Referring to the accompanying drawings, illustrating my invention, and in which like numerals of reference refer to corresponding parts throughout the several views, Figure 1 is a vertical sectional view of my improved heater, and Fig. 2 is a transverse section of same on line *a a* of Fig. 1. Fig. 3 is a top plan view of the water-distributing head, and Fig. 4 is a bottom plan view of same. Figs. 5 and 6 are sectional views of the water-distributing head, taken on lines *b b* and *c c*, respectively, of Fig. 3. Fig. 7 is a detail view showing a portion of the burner as broken away and in section. Fig. 8 is a side elevation of the lower portion and base of the heater, the upper portion being broken away, and showing the pipes which connect with the gas and water supply pipes of the building, thereby furnishing the heater with gas and water, and the duplex valve for regulating the flow of the same, also the pilot-light and the slotted opening in the heater through which it swings when igniting the gas in the burner.

In describing my invention in detail and having reference to the various parts thereof by means of the aforesaid numerals of reference as employed throughout the several views of the accompanying drawings, 1 indicates an outer casing or jacket, preferably of sheet metal, and provided with a removable top or hood 2, all of any preferred contour or design, and a base 3 of suitable form to support the heater when resting in operative position on a bracket or other suitable support, as desired. Top or hood 2 is formed at its base with a shoulder by which it is held or rests firmly but removably on the top of outer casing or jacket 1, while at its top it is formed with a vent or opening 4, adapted to connect with a discharge-pipe (not here shown) for the escape of all superfluous heated air and waste products of combustion, which are thus carried off up the flue or into any store or garret room, as desired.

5 is an inner casing or cylinder of corrugated sheet metal, (see Figs. 1 and 2,) connected at its base with outer casing 1, from which it rises in a conical form to its top, the space between said casings or cylinders 1 and 5 forming a chamber or reservoir 6 for the reception of the water.

7 is conical-shaped cylindrical body of corrugated sheet metal, (see Figs. 1 and 2,) having a bottom portion 8, the space between casing 5 and cylindrical body 7 forming the outer heating or combustion chamber 9, while the interior of said cylindrical body is divided by means of a sheet-metal cylinder 10, preferably slightly conical in form, and a pipe or tube 11 into a large and small water-chamber 12 and 13, respectively. The interior of pipe or tube 11 forms the inner heating or combustion chamber 14. The top of said pipe or tube comes a short distance below in a direct line and has a direct communication with vent 4. Chamber 14 acts as a flue or passageway, and thus conveys the heated air and waste products of combustion as they arise

in their upward course through and are carried off at their final outlet, as heretofore described.

Water-pipe 15 and gas-pipe 16 are shown broken off in Figs. 1 and 8, but in practice are intended to be properly connected to the water and gas supply pipes of the building, and short vertical pipe 17 being provided with an ordinary passage-way the gas when turned on is let into pilot-light 18 by means of small cock 19, and the gas being lighted said pilot-light is adapted to be turned or swung through slotted opening 20 in said outer casing or jacket of the heater by moving handle 21 outward. The flame from the pilot will thus ignite the gas as it escapes through the numerous openings or perforations 22 in gas-burner 23. Gas-burner 23 is supported in position by means of one or more short legs 24, formed with a foot which is screwed to base 3, or said burner may be otherwise supported as desired, and as shown more especially in Fig. 7 said burner is intended to be constructed of any number of sections 26, each one of which forms on its interior a compartment, each of said compartments communicating one with the other, forming one large gas-chamber 25, and in the instance shown in the drawings and more especially in Fig. 7, where I have shown a burner constructed with the top and bottom sections only, each section being provided with a series of perforations or small passages 22 for the escape of the gas to be ignited, each compartment being formed just at the top of each of said series of perforations with a flange 27, around which the gas is forced to pass in escaping through said perforations, and by constructing the burner, as here shown, with a number of compartments as desired, uniting in one larger chamber 25, I have found that the gas as fed to the burner through the pipe 28 will become more thoroughly mixed with the air, thus causing a more perfect combustion, (see arrows in Fig. 7,) although any form of burner desired may be used, and an ordinary form of atmospheric mixer 29, located at end of pipe 28, receives gas-pipe 16.

A handle 30 operates a duplex valve of any ordinary and well-known form of construction, which thus regulates simultaneously the pressure of the flow of both gas and water in pipes 16 and 15, respectively, and when handle 21 is moved outward to swing pilot-light when lighting the burner a valve of any ordinary construction, located within water-pipe 15 and not necessary to be shown here, permits the water to rise by its pressure in pipe 15, from whence it passes and rises in chamber or reservoir 13 and from thence into water ways or channels 31 in water-distributing head 32, and thence through the two series of openings or perforations 33 and 34 in water-distributing head, (see Figs. 1, 4, and 6,) and descends down the corrugated channels in cylinders 5 and 7 in two full thin even streams into water chambers or reservoirs 6 and 12, and thus being evenly spread over the surface of conical cylinders 5 and 7 is quickly heated by the hot air which arises in heating or combustion chambers 9 and 14, ascending from the flame of burner 23, the course of the water and gas being indicated by arrows in Figs. 1, 6, and 7. Water-distributing head 32 is supported by reason of the tops of cylinders 5, 7, and 10 bearing against the sides of or being seated in its waterways or annular channels 31, said water-distributing head being provided with small tubes which form vent-openings 35 for the escape of superfluous hot air and steam and to prevent water chamber or reservoir 12 from becoming air-bound, said water-distributing head being provided on its top surface with a small vertical flange 36, which forms a seat or bearing for flue 37, said cap being opened at its top where it meets vent 4, and this forms a guide for the superfluous heated air and waste products of combustion as they pass from the heater and are carried off through a discharge-pipe up the flue.

Pipe or tube 11 is held in position at its base by a screw-threaded connection with bottom 8, while it is held in position at its top, where it passes through a central opening 38 in said water-distributing head, by a screw-threaded connection with nut 39 and washer 40, which rests on top of the water-distributing head, thus holding said head in position.

When it is desired to clean the interior of the heater, all that is necessary is to turn off the supply of water and gas, and by opening small cock 41, located at the elbow which connects the vertical and horizontal arms of water-pipe 15, the heater may be drained of all water. Then remove top or hood 2, which is formed with the annular shoulder at its base, by which it rests tightly but detachably on the top of the outer casing or jacket. Then remove flue 37, nut 39, and washer 40, when pipe 11 may be quickly disconnected from bottom 8, leaving the interior of the heater accessible.

Short pipes 42 connect inner water chamber or reservoir 12 with outer water chamber or reservoir 6 and form conduits which convey the hot water from said inner to said outer chamber, the said water having its final discharge through spout 43 into the bath-tub or other receptacle, according to the purpose for which the hot water is to be used. Any number of screw-threaded openings provided with plugs 44, as desired, may be arranged in and around casing or jacket 1, adapted to be provided each with a spout 43 for stationary washbowls or other purposes, as desired, or only one spout 43, as in the instance shown in the drawings, may be used, which may be shifted to any position around the heater desired by reason of plugs 44. By employing short pipes 42 and spout 43 there will never be but a small amount of water at any time

in chambers 6 and 12, as shown in Fig. 1, and by constructing the cylinders which form the heating and combustion chambers as here shown, also by constructing the cylinders which form the water-chambers of corrugated sheet metal, conical in form, a greater amount of heating-surface is presented, over which the water has to pass and is distributed in thin even stream in its course, and water can thus be quickly, easily, and economically heated.

It is of course understood that I do not limit myself to precise and exact construction of the several parts of my improved heater as in the instance herein shown and described, as they may be somewhat modified and varied without departing from the spirit or principles of my invention—as, for example, if desired, gasolene may be used instead of gas by simply placing in a convenient and elevated position a tank containing gasolene, said tank having a supply-pipe leading therefrom with a generator at its end where it meets the burner. Also a water-gage may, if desired, be connected at a convenient point to the heater for the purpose of showing the line of water carried, thus obviating any danger of an overflow.

Having now described my improved heater, what I claim as my invention is—

1. In an instantaneous water-heater, the combination with a water-distributing head, formed of a casing having a central opening and provided with vent-tubes, annular water ways or channels, and discharge openings or perforations 33 and 34, of two concentric water-chambers 6 and 12, the chamber 12 being closed at its top by said water-distributing head, and said vent-tubes extending through said water-distributing head and communicating with said chamber 12, all substantially as and for the purposes described.

2. The combination in a heater for water or other liquids, of an outer casing or jacket, a removable top, provided with a vent to said jacket, a suitable supporting-base to said jacket, an inner casing corrugated substantially its entire length, a reservoir formed by and between said outer and inner casings, a conical body corrugated substantially its entire length and provided with a bottom portion, a water reservoir or chamber within said conical body, a heating and combustion chamber between said inner casing and said conical body, a tube or pipe passing through said conical body and forming a heating-chamber as well as a flue or passage for the escape of waste products of combustion, a water-distributing head formed with water courses or ways having perforations therein, so arranged and adapted as to discharge the water or liquid onto the corrugations in said inner casing and said conical body, a flue located on said water-distributing head, a discharge-pipe, a burner and gas-supply pipe, and a water-supply pipe, all substantially as described.

3. In an instantaneous heater for liquids, the combination with the water and gas pipes for supplying said heater with water and gas, of a burner, means for igniting the gas from said burner, an outer casing or jacket, of the corrugated and conical-shaped casings or jackets, of a water chamber or reservoir between the outer and one of the inner conical casings, of a water chamber or reservoir within the other of said conical-shaped casings or jackets, of a heating and combustion chamber, of a smaller or inner water reservoir or chamber, of a water-distributing head formed with ways or channels for carrying the water, and provided with discharge-openings, of a flue resting on said water-distributing head and formed with a vent, of means for controlling and regulating the supply of gas and water, of means so arranged as to keep only a certain amount of water in one of said water-reservoirs, by maintaining the water at a constant level, of means for drawing the water from said heater, of an outlet or discharge for the water from said smaller or inner reservoir or chamber, of a main passage or flue for the escape of heated air and waste products of combustion, which also acts as a heating-passage, of a top provided with a vent and a supporting-base to said heater, substantially as described.

4. In a water-heater, the combination of an outer casing provided with an outlet-opening, an inner corrugated casing forming with said outer casing a water-receptacle, a second inner corrugated casing having a water-receptacle therein, a water-distributing head provided with vent-tubes and with openings adapted to discharge water upon the corrugated casings, and a flue supported on said head and extending to the outlet-opening of the outer casing.

5. In a water-heater, the combination of an outer casing provided with an outlet-opening, an inner corrugated casing forming with said outer casing a water-receptacle, a second inner corrugated casing having a water-receptacle therein, a third or innermost water-receiving receptacle or chamber, a water-distributing head in communication with said third water-receiving receptacle, and provided with vent-tubes, and openings adapted to discharge water upon the corrugated casings, and a flue supported on said water-distributing head and extending to the outlet-opening of the outer casing.

In testimony whereof I have affixed my signature in presence of two witnesses.

MAURICE READY.

Witnesses:
JOHN L. H. FRANK,
LEWIS CLINGER.