

No. 747,072.

PATENTED DEC. 15, 1903.

S. H. HUMAN.
APPARATUS FOR HEATING WATER.

APPLICATION FILED AUG. 25, 1903.

NO MODEL.

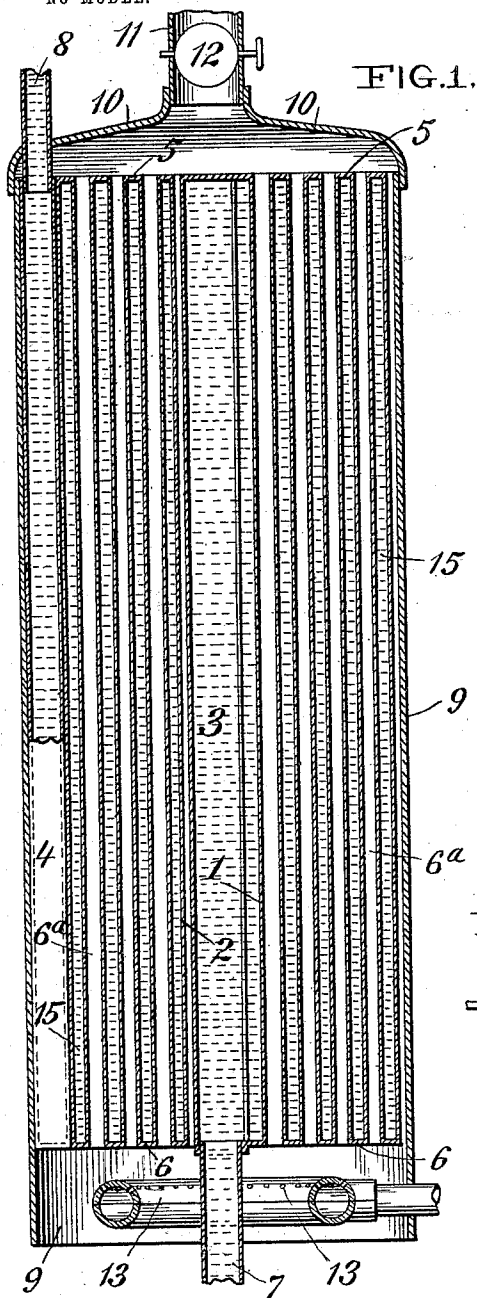


FIG. 1.

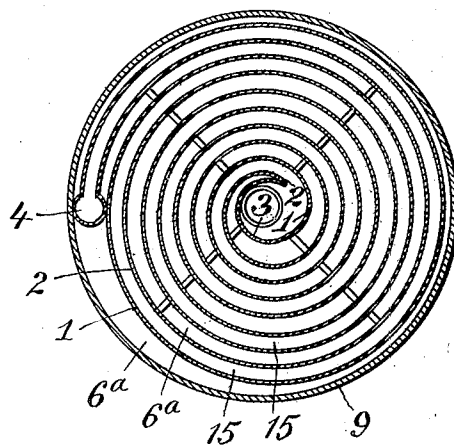


FIG. 2.

FIG. 3.

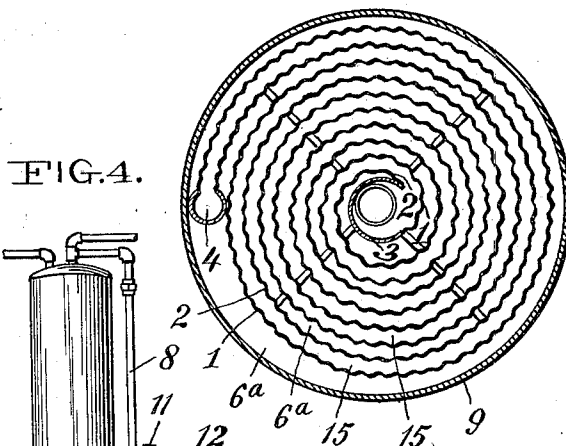
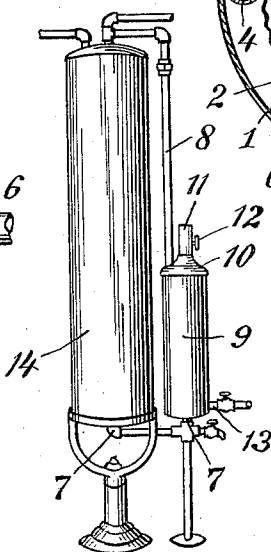


FIG. 4.



WITNESSES:

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APPARATUS FOR HEATING WATER.

SPECIFICATION forming part of Letters Patent No. 747,072, dated December 15, 1903.

Application filed August 25, 1903. Serial No. 170,677. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL HUNTER HUMAN, a citizen of the United States, residing at New York city, county and State of New York, have invented certain new and useful Improvements in Apparatus for Heating Water, of which the following is a specification.

My invention relates in general to apparatus for heating fluids; and it more specifically consists of an improved device for heating water operated by a gas-flame for household use.

The preferred form of apparatus embodying my invention is illustrated in the accompanying sheet of drawings, in which—

Figure 1 is a vertical central section of the apparatus. Fig. 2 is a horizontal section thereof. Fig. 3 is a similar view of a modification; and Fig. 4 is a view, on a reduced scale, showing my apparatus in its relation to the ordinary form of hot-water tank or reservoir.

Throughout the drawings like reference-numbers indicate like parts.

1 and 2 represent sheets of some flexible material, as steel, which are preferably of rectangular shape when developed. These sheets of metal are connected together along one vertical edge in any convenient manner, but preferably by taking a tube 3 and cutting the same away longitudinally and brazing or otherwise fastening the edges of the metal strips 1 and 2 to the edges of this cut-away portion. The metal strips 1 and 2 are then coiled and bent about the tube 3 in the manner shown in Fig. 2, being properly spaced at an even distance apart by means of connections 5 along their upper edges and connections 6 along their lower edges. The outer edges of the sheets 1 and 2 are connected together in any suitable way, as by attaching them to the edges of the cut-away portion of a second vertical tube 4. The spiral chamber thus formed is given an inlet connection 7, preferably at the lower end of the inner tube 3, and an outlet 8, preferably at the upper end of the outer tube 4, and the whole may conveniently be placed in a cylindrical casing 9, which has a dome 10 surmounting it, said dome being provided with an outlet-pipe 11 and said pipe being provided with a damper 12 or other means for controlling the flow of gas therethrough.

Any convenient form of gas-burner 13 is placed in the lower part of the casing under the spiral chamber formed as above. In use I preferably mount my heater beside an ordinary hot-water tank or cylindrical reservoir 14 with the usual connections, as shown in Fig. 4.

The method of operation of my invention is as follows: The gas being lighted at the burner 13, the hot gases impinge upon the lower end 6 of the spiral chamber and pass up around the same, through the air-spaces 6^a 6^a, to the dome 10, and thence out through the pipe 11. In this way all the heat of the flame and hot gases is transmitted to the water which fills the spiral chamber in the water-spaces 15 15. The hot water passes around the spiral from the center to the circumference and escapes by the outlet 8, the cold water coming in through the inlets 7 to supply its place. In this manner all the water in the reservoir 14 will gradually be heated, and any fresh water added thereto will be similarly heated in turn.

The advantages of my invention comprise the simplicity of the construction and cheapness of manufacture with efficiency of heating, the water being subjected to the action of the hot gases along a very large area of chamber-wall in a heater occupying a very small space, and the water being compelled to pass through a long series of passages heated in this manner is thoroughly heated before it reaches the outlet connection.

If desired, the heating-surface and the flexibility of the plates can be increased by corrugating them, as shown in Fig. 3. It is evident also that other changes could be made in the details of construction without departing from the spirit and scope of my invention. If desired, the sheets 1 and 2 could be coiled about in other than a perfect spiral shape, and the shape of the sheets 1 and 2 could be varied, as well as that of the surrounding casing, the location of the inlet and outlet connections, and the means for controlling the flow of the hot gases. These and similar modifications I should consider matters of mere mechanical skill and should regard the resulting structures as still within the boundaries of my invention.

Having therefore described my invention,

what I claim as new, and desire to protect by Letters Patent, is—

1. In a device for heating fluids, the combination of a chamber of spiral horizontal cross-section and a heating device located under the lower end thereof.
2. In a device for heating fluids, a chamber through which the fluid to be heated is moved, formed of two sheets of metal connected at their edges and coiled about one edge, in combination with an inlet connection at one end of the inner edge of the coil, and an outlet connection at the other end of the outer edge.
3. In a device for heating fluids, the combination of a chamber formed by two sheets of metal of rectangular shape, connected at their edges, spaced an even distance apart and folded about one vertical edge, an inlet connection at the lower end of the inner edge, an outlet connection at the upper end of the outer edge, a containing-casing, and a burner in the lower part of said casing under the chamber so formed.
4. In a device for heating fluids, the combination of a chamber formed by two sheets of metal of rectangular shape, connected at their edges, spaced an even distance apart and folded about one vertical edge, an inlet connection at the lower end of the inner edge, an outlet connection at the upper end of the outer edge, a containing-casing, and a burner in the lower part of said casing under the chamber so formed, together with a dome surmounting the casing, and an outlet for the hot gases from said dome.
5. In a device for heating fluids, the combination of a chamber formed by two sheets of metal of rectangular shape, connected at their edges, spaced an even distance apart and folded about one vertical edge, an inlet connection at the lower end of the inner edge, an outlet connection at the upper end of the

outer edge, a containing-casing, and a burner in the lower part of said casing under the chamber so formed, together with a dome surmounting the casing, and an outlet for the hot gases from said dome, said outlet being provided with means for controlling the escape of gases.

6. In a device for heating liquids, the combination of a vertical tube cut away longitudinally, two flexible sheets of metal fastened to the edges of said cut-away portion of the tube, connected along their top and bottom edges and coiled around said tube, a second tube cut away longitudinally and having the outer edges of said metal sheets fastened to the edges of said cut-away portion, the inner tube being closed at its upper end, but open at its bottom end, and the outer tube being closed at its bottom end and open at its top end.

7. In a device for heating fluids, a chamber through which the fluid to be heated is moved, formed of two sheets of metal connected at their edges and coiled about one edge, an inlet-pipe arranged to feed into the center of said chamber, and an outlet-pipe leading from the periphery of said chamber.

8. In a device for heating fluids, a chamber through which the fluid to be heated is moved, formed of two sheets of metal connected at the top and bottom, an inlet-pipe connected to the vertical edges of said sheets at one side, an outlet-pipe connected to the vertical edges of said sheets at the other side, a heater located under said chamber and pipes, and an inclosing casing for said parts.

In testimony whereof I affix my signature in the presence of two witnesses.

SAMUEL HUNTER HUMAN.

Witnesses:

L. E. PEARSON,
FRANK O'CONNOR.