

(No Model.)

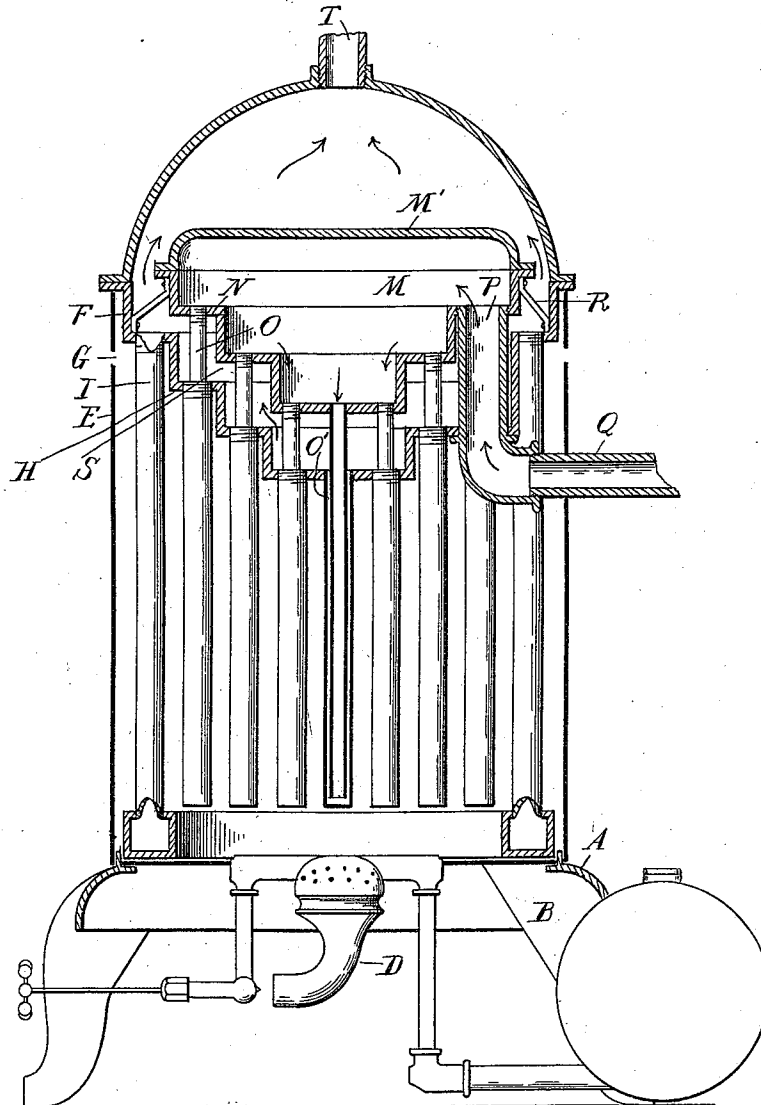
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B. REIN.
HOT WATER HEATER.

No. 550,457.

Patented Nov. 26, 1895.

Fig. 1.



Witnesses
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By *Thos. J. Maguire* Attys.

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Fig. 3.

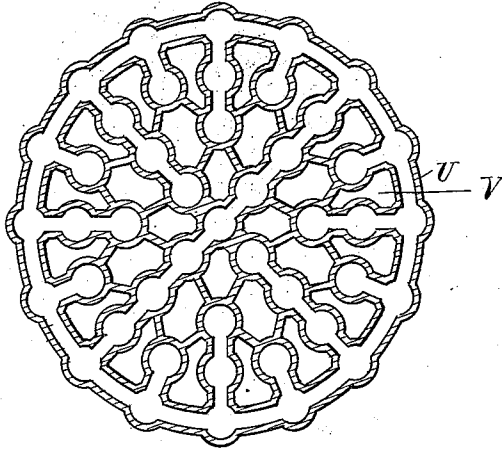
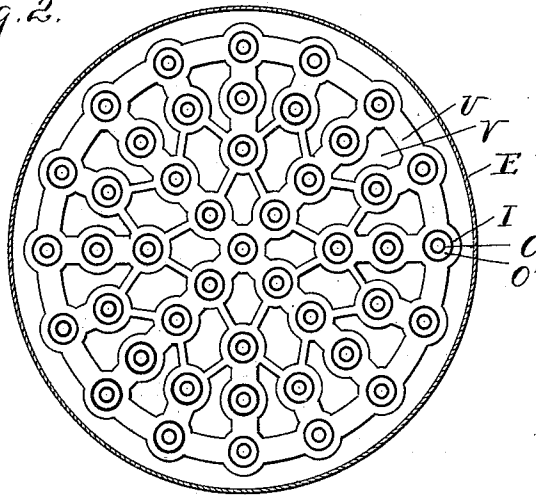


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

BERNARD REIN, OF DETROIT, MICHIGAN, ASSIGNOR TO THE UNION HEATER
SUPPLY COMPANY, OF SAME PLACE.

HOT-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 550,457, dated November 26, 1895.

Application filed April 22, 1895. Serial No. 546,685. (No model.)

To all whom it may concern:

Be it known that I, BERNARD REIN, a citizen of the United States, residing in Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful improvements in Hot-Water Heaters, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the construction of a hot-water heater especially intended for heating purposes, such as house-heating, but which may be used for so-called "instantaneous" heaters or other purposes, if desired.

The invention particularly consists in the construction, arrangement, and combination of the various parts whereby I obtain an unimpeded circulation of the water and whereby the incoming cold or cool water is delivered at the hottest point of the heating-tubes without previously commingling with the heated water, all as more fully hereinafter described.

In the drawings I have shown in Figure 1 my improved construction embodied in a gasoline water-heater in vertical central longitudinal section. Fig. 2 is a horizontal section showing a modified construction. Fig. 3 is a horizontal section through the water-chamber shown in Fig. 2.

A is the base-ring, supported on the legs B. C is the gasoline-tank, and D the gasoline-burner.

E is the casing, which at the top supports the water dome or head F, below which within the casing is the combustion-chamber.

G are apertures near the top of the casing for the escape of the products of combustion.

The bottom of the dome or head F is provided with a series of circular ledges or steps H on different planes, each provided with a series of apertures from which depend a series of drop-tubes I, closed at the lower end.

Within the dome or head F is a vessel or drum M, having a cap M' detachably secured in position thereon. This vessel on its under face is provided with a series of ledges or steps N, corresponding to the ledges or steps H of the dome or head F. Through these ledges N are a series of apertures in which are secured the tubes O, at their upper ends communicating into the vessel M, depending

through the tubes I centrally therein to leave an annular water-space O' between the two tubes, the lower end of the inner tube discharging at or near the lower end of the outer tube, as plainly shown in the drawings.

P is an inlet-nipple passing through the bottom of the dome or drum and communicating with the interior of the drum M, as plainly shown in the drawings, and this nipple connects with the supply-pipe or return-pipe Q. The drum M is supported from the sides of the drum F in any suitable manner—as, for instance, by the brackets R, forming between the two drums the inclined water-channels S.

At the top of the dome or drum F is the outlet-pipe T.

The parts being thus constructed, their operation is as follows: The fire within the casing will impinge directly upon the lower end of the drop-tubes, and the water being heated therein will rise through the annular passage O' and be delivered at the top into the water-channel S and finally find exit through the exit-pipe T. The incoming water will enter the drum M and pass down through the tubes O, entering the tubes I at the lower end thereof, which is the hottest point in the tubes.

In Fig. 2 I have shown the drop-tubes I connected into a circular head or manifold U, having suitable apertures V between the pipes for the discharge of the products of combustion from the fire. The object of this lower head or manifold is to enable me to drain all the water away from the heater when it is desired to empty it, which does not in any wise affect the essence of the invention, which in other parts may remain unchanged.

It will be seen from this description that the incoming cold water is entirely surrounded by the hot water, but does not commingle therewith until it reaches the hottest point in the circulation at the lower end of the drop-tube, from which it rises directly, being heated in the small annular passage O', and finally finds exit through the exit-pipe T. I find with a circulation of this kind that I get a positive circulation of the water starting from the hottest point in the furnace and gradually rising, so that the cold water gets the benefit of the greatest heat, and by distrib-

uting the water in the various drop-tubes in a thin film or body, as in the passage O', the heat the whole length of that passage is applied in the best manner possible to raise the temperature of the water to a high degree.

This device is not only satisfactory in its heating qualities and its circulating qualities, but it can readily be repaired and can be used for a number of different uses, as before set forth.

While I have shown a specific construction of water-dome and return-water drum within the same, I do not desire to be limited to such precise construction, as I believe that my invention includes all constructions in which the return water or feed-water is delivered into such drum or header within the water-drum and carried through the drip-tubes to the lower end thereof, so that the coldest water is delivered at the hottest point in the heater without commingling with the water to cool it until it reaches this point.

What I claim as my invention is—

1. In a water heater, the combination of a water dome or head, a series of drop tubes depending therefrom closed at their lower ends, a head or chamber concentrically within the dome, a series of feed tubes depending therefrom, concentrically arranged in the drop tubes, and open at the bottom, the inlet pipe connecting into the inner chamber, and the discharge pipe from the dome, substantially as described.

2. In a water heater, the combination of a water heating dome, and pipes depending

therefrom, an interior water chamber concentrically within the dome, feed pipes, open at their lower ends depending concentrically in the water heating pipes, water supply or return connecting into the inner chamber, and a water exit from the outer chamber, substantially as described.

3. In a water heater, the combination of a water dome or head, a series of ledges or steps in the lower face of said dome, a series of drop tubes depending therefrom, closed at their lower ends, a correspondingly stepped feed chamber within the dome, having feed pipes depending concentrically within the heating pipes, an inclined water channel between the bottoms of the dome and water chamber, an inlet pipe connecting into the inner chamber and a water exit from the dome.

4. In a water heater, the combination of a water dome or head, a series of water tubes depending therefrom, a manifold or header at the bottom into which these tubes connect, an interior water chamber having depending feed pipes open at their lower ends and arranged concentrically in the drop tubes, a water supply or return connected into the inner chamber and a water exit from the outer chamber, substantially as described.

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

BERNARD REIN.

Witnesses:

M. B. O'DOGHERTY,
OTTO F. BARTHEL.