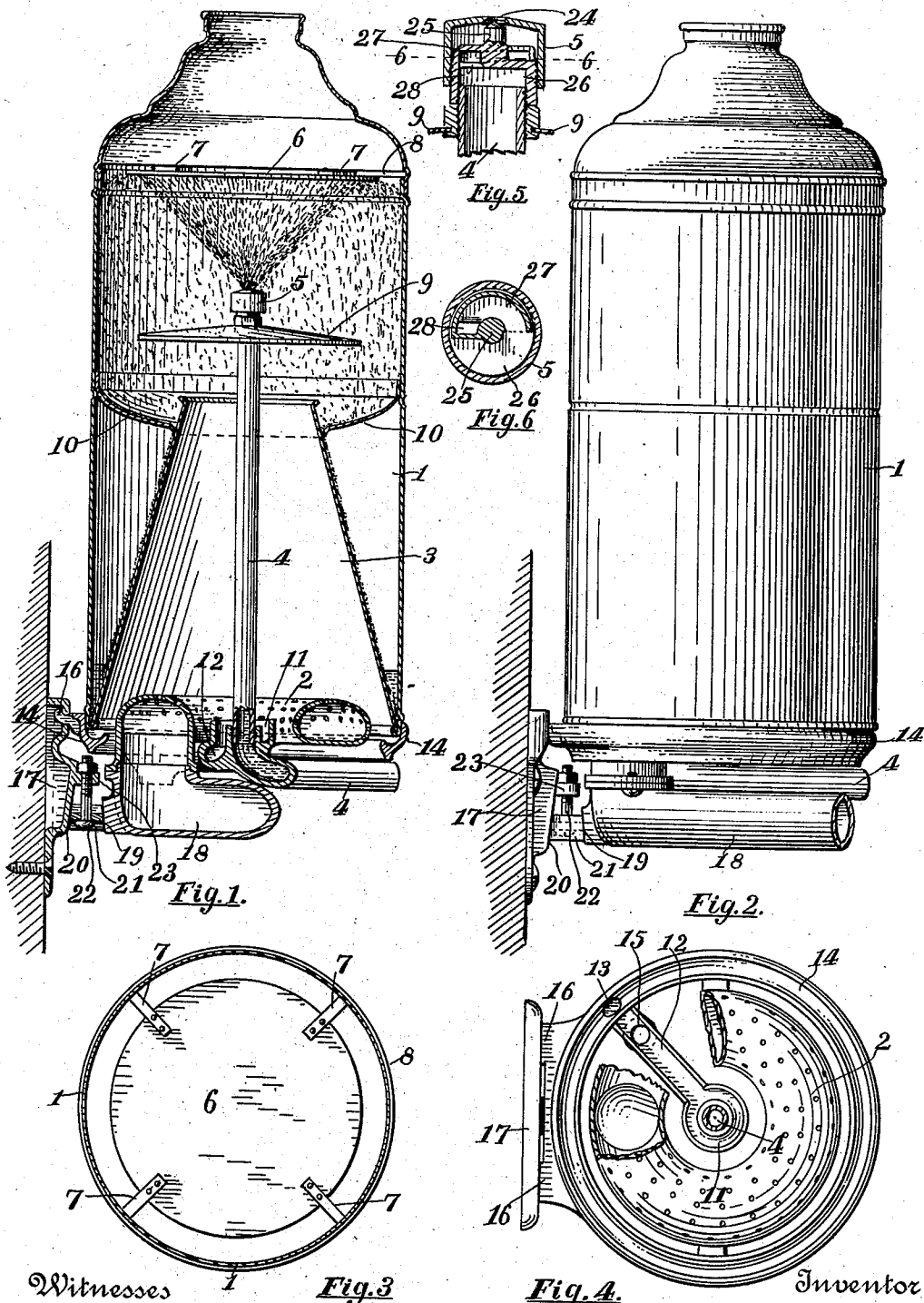


No. 893,084.

PATENTED JULY 14, 1908.

W. J. LOOMIS.
INSTANTANEOUS WATER HEATER.

APPLICATION FILED MAY 3, 1907.



Witnesses
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Fig. 4. Inventor
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UNITED STATES PATENT OFFICE.

WILL J. LOOMIS, OF GRAND RAPIDS, MICHIGAN.

INSTANTANEOUS WATER-HEATER.

No. 893,084.

Specification of Letters Patent.

Patented July 14, 1908.

Application filed May 3, 1907. Serial No. 371,694.

To all whom it may concern:

Be it known that I, WILL J. LOOMIS, a citizen of the United States of America, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Instantaneous Water-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.

My invention relates to improvements in instantaneous water heaters, and its object is to provide a simple and effective device; to provide improved means for leveling the device; to provide means for collecting and carrying away the water of condensation arising from the burner, and to provide the device with various new and useful features hereinafter more fully described and particularly pointed out in the claims.

My invention consists essentially of the combination and arrangement of a case, a centrifugal sprayer, a baffle plate, a burner, a conical flue, and a hood above the flue, so constructed that a fine spray of water is given a rotary or spiral motion and projected transversely through an upwardly moving current of hot gases arising from the burner and then passes downward through the said current, and in various features of construction and arrangement, as will more fully appear by reference to the accompanying drawings, in which:

Figure 1. is a vertical section, through the axis, of a device embodying my invention; Fig. 2. a side elevation of the same; Fig. 3. a plan view of the baffle plate and supports for the same; Fig. 4. a plan view of the drainage mechanism and burner, with a portion of the burner broken away; Fig. 5. an enlarged detail of the sprayer shown in vertical section through its axis; and, Fig. 6. a horizontal section of the same on the line 6—6 of Fig. 5. Like numbers refer to like parts in all of the figures.

1 represents a cylindrical case; 2 the burner; 3 a truncated conical flue above the burner, the smaller upper end being open and the lower end being attached to the bottom of the case. In the axis of the flue and burner is a stand-pipe 4 to supply water to the device. This pipe extends above the flue and supports a hood 9 to prevent water from entering the flue, and to direct the same out-

ward and upon the inwardly inclined diaphragm 10 located between the upper part of the flue and the case. This hood also directs the hot gases outward against the interior of the case. The diaphragm 10 directs the water upon the outer surface of the flue 3, down which it flows and collects at the bottom between the flue and the case.

5 is a centrifugal sprayer constructed substantially as in Figs. 5 and 6, hereafter described, whereby the water is given a rotary or spiral motion and discharged in a hollow cone of spray with the base of the cone impinging upon the under side of the baffle plate 6 near the periphery thereof, and at an angle of about forty-five degrees. Said plate is of less diameter than the interior of the case to provide an annular space therebetween for the free upward passage of the hot gases from the burner, and the plate is supported by radial bars 7 attached thereto and having their outer ends inserted in a groove 8 in the case. The hot gases are thus by the hood 9 and plate 6 caused to flow close to the inner surface of the case down which surface the most of the water flows.

To collect the water condensed on the inner surface of the flue 3 and on the outer surface of the pipe 4, a channel 11 is formed in the boss around the base of the pipe 4 to receive the water, and a lateral conduit 12 extends from this channel to the ring 14, which ring receives the base of the flue and case. This ring is also provided with a channel to collect the water coming from the inner surface of the flue, in the bottom of which channel is an opening 13 communicating with the conduit 12, which conduit is provided with a bottom opening 15 in which is inserted a pipe (not shown) to convey the water away.

To support and level the device, a bracket 17 adapted to be secured to the wall of a room, or other support, is provided, in the upper part of which bracket are openings to receive hooks 16 on the ring 14. On the lower part of the bracket is an inclined surface 20 slidably engaged by one side of a wedge 21, which wedge at the opposite side engages an opposing inclined surface 19 on the burner. This wedge is held and vertically adjusted between these opposing inclined surfaces by a screw or bolt 22 whereby the device may be leveled by turning this screw.

The centrifugal sprayer consists of a cap 5

having a central opening 24 at the top, beneath which opening is a projection 25 having a conical apex opposite the axis of said opening. The bottom of this cap is closed to form a chamber therein by means of a hollow plug 26 on which is the projection 25 and in which plug the end of the pipe 4 is inserted. On the top of this plug and within this chamber is a spiral conduit 27 communicating at one end with the interior of the plug to receive the water, and at the other end opening into the interior of the cap, to discharge the water. This conduit imparts a rapid rotary motion to the water and thus as the water is discharged through the opening 24, the spray assumes the form of a hollow cone, as indicated in Fig. 1. moving in a spiral path whereby the distance traversed is greater than if moving radially. The spray impinging at an angle upon the plate 6 near the periphery is broken up into a fine mist and discharged horizontally and spirally across the path of the upward current of hot gases and against the interior of the case, down which the most of the water flows, exposed to the rising hot gases, the balance of the water falling in a fine shower through the rising gases upon the diaphragm 10 and flows over the conical flue 3, being heated in its passage, and finally accumulates between the bottom of the flue and shell, to be drawn off through a pipe (not shown).

It will be noted that the spray as it strikes the plate 6 is minutely divided into a fine mist by the impact, and that it all passes downward on and near the case where the upward current of hot gases is strongest, also that the upward conical spray between the sprayer and plate is not met and retarded by any falling spray. The movement of the water is thus without collision, and also does not interfere with the draft and choke the burner. It will also be noted that the described sprayer is not easily clogged by any small solid particles passing therethrough. I also provide convenient means for leveling the device, whereby the flow of water over the hood 9, diaphragm 10 and flue 3 may be made uniform all around the same. I also provide suitable drainage to carry off the water which condenses on the pipe 4 and flue 3, or any leakage that may accidentally occur in the same.

The supporting and leveling means herein described is not herein claimed, but is reserved for a separate application in accordance with an action of the office requiring division.

What I claim is:

1. In a water heater, the combination of a case, a sprayer adapted to discharge a hollow cone of spray, means for deflecting the spray radially toward the case, and means for producing an upward current of hot gases close to the inner surface of the case and vertically through the radially projected mist.

2. In a water heater, the combination of a case, a sprayer adapted to discharge a hollow cone of spray, a baffle plate of less diameter than the case and supported above the sprayer and also spaced apart from the case at its periphery, and means for producing an upward current of hot gases close to the inner surface of the case.

3. In a water heater, a case, a truncated conical flue in the case, a burner in the bottom of the flue, a stand pipe in the axis of the flue, a hood on the pipe and above the flue, a sprayer on the upper end of the pipe and adapted to form a hollow cone of spray, a baffle plate of less diameter than the case supported above the sprayer and spaced apart from the case at its periphery to deflect the spray outward in a fine mist across the space between the plate and case, and a diaphragm surrounding the top of the flue to collect the water and direct the same upon the outer surface of the flue.

4. In a water heater having a stand pipe, and a flue, means for collecting the water condensed thereon, said means having a channel surrounding the base of the pipe, and a channel beneath the base of the flue, a conduit communicating with said channels, and means for connecting a pipe to said conduit.

5. In a water heater having a stand pipe and a flue, a ring beneath the lower end of the flue and having a channel to collect water, a boss supporting the stand pipe and having a channel to collect water, a conduit communicating with said channels, and means for connecting a pipe to said conduit.

6. In a water heater the combination of a burner; a stand pipe to supply cold water to the heater and exposed to the products of combustion from the burner, a boss surrounding the lower end of the stand pipe and having a channel to collect water, and means for removing water from said channel.

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

WILL J. LOOMIS.

Witnesses:

LUTHER V. MOULTON,
GEORGIANA CHACE.