No. 895,280. PATENTED AUG. 4, 1908.

J. H. MACKLEY.

WALL WATER HEATER.

APPLICATION FILED JUNE 4, 1907.

2 SHEETS—SHEET 1.

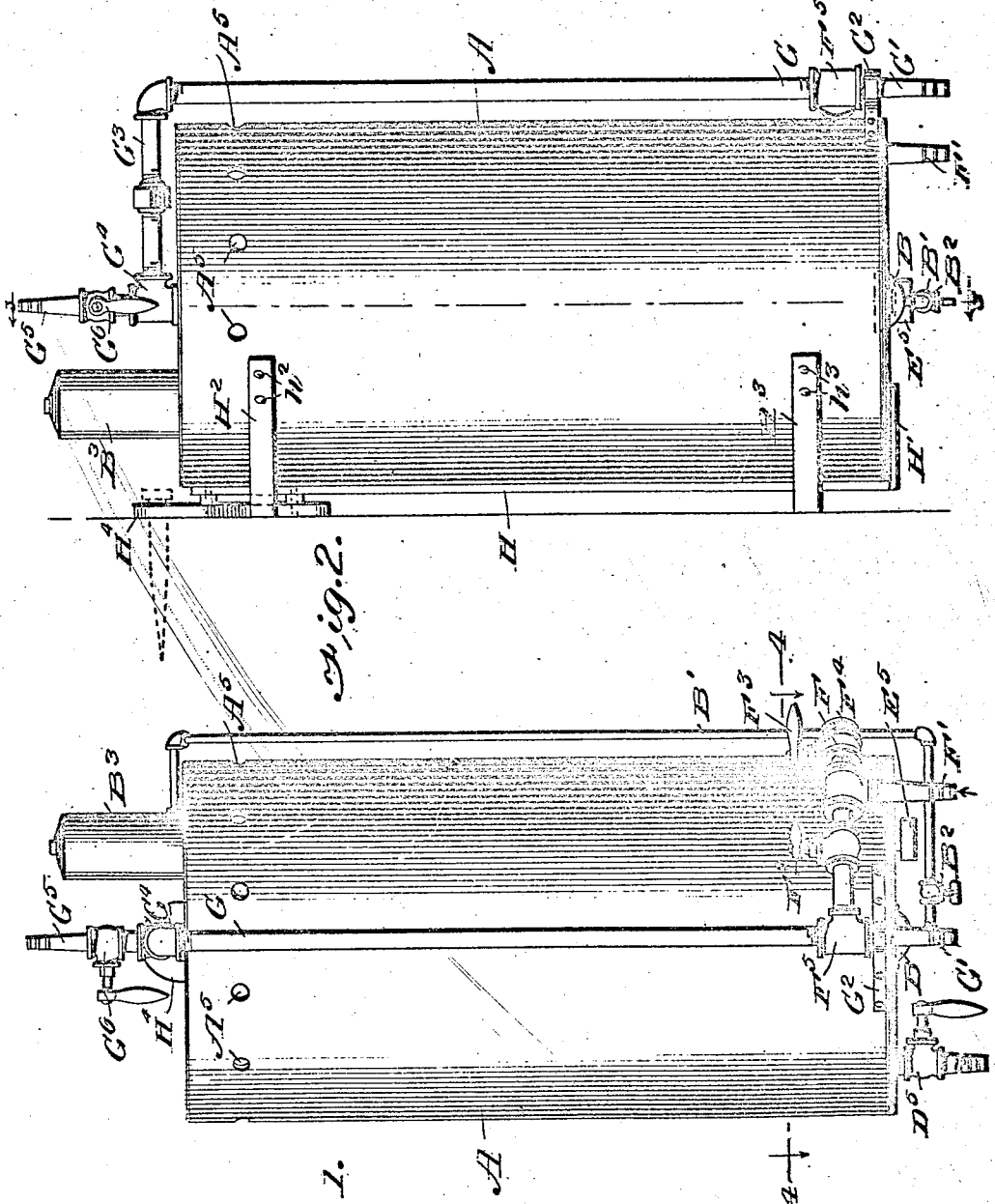


Fig. 2.

Fig. 1.

WITNESSES

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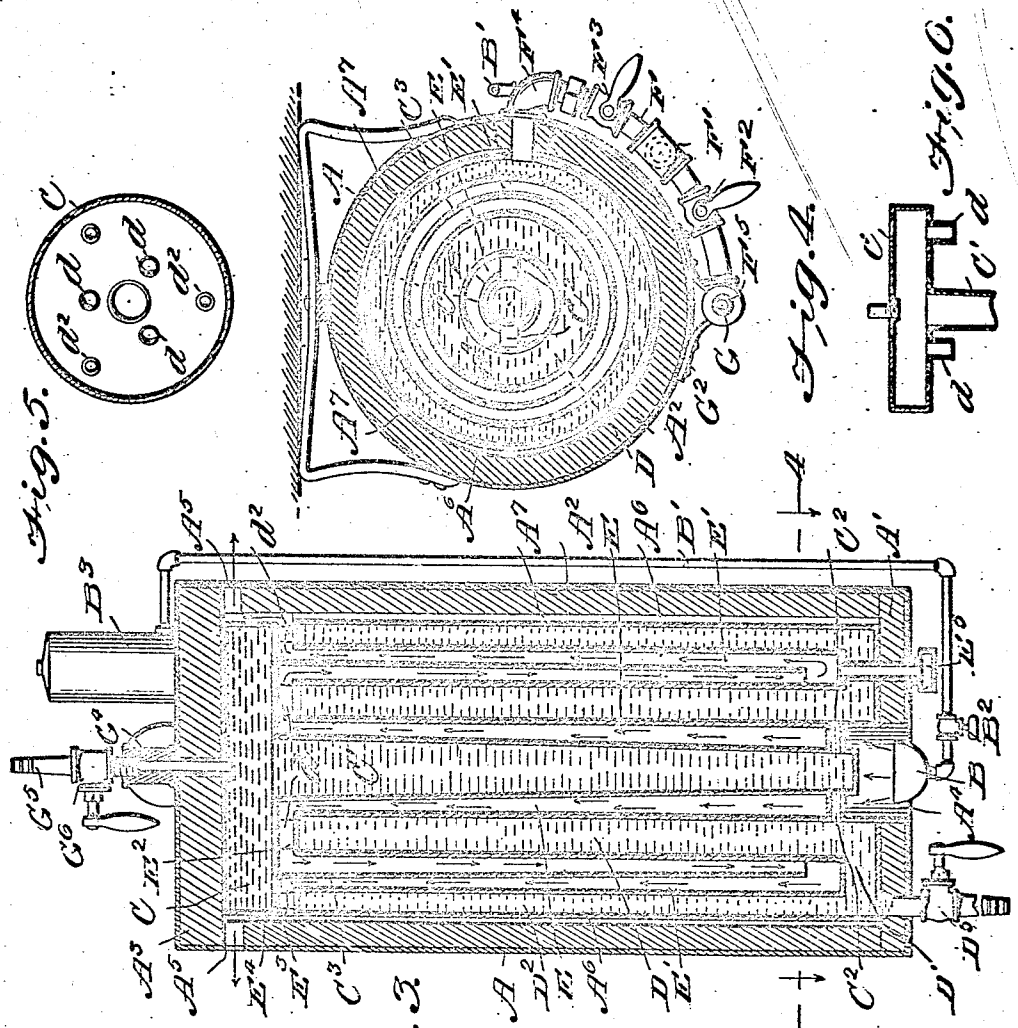


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

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JAMES H. MACKLEY, OF DENVER, COLORADO.

WALL WATER-HEATER.

No. 895,280. Specification of Letters Patent. Patented Aug. 4, 1908.

Application filed June 4, 1907. Serial No. 377,186.

To all whom it may concern:

Be it known that I, JAMES H. MACKLEY, a citizen of the United States, and resident of Denver, in the county of Denver and State of Colorado, have invented an Improvement in Wall Water-Heaters, of which the following is a specification.

My invention is an improvement in water heaters, and especially in wall water heaters, and consists in certain novel constructions and combinations of parts as will be hereinafter described and claimed.

In the drawings, Figure 1 is a front elevation of a heater embodying my invention. Fig. 2 is a side view thereof. Fig. 3 is a vertical longitudinal section on about line 3—3 of Fig. 2. Fig. 4 is a cross section on about line 4—4 of Fig. 3. Fig. 5 is a detail cross section drawn through the water tank. Fig. 6 is a detail vertical section illustrating the tubes for connecting the water tank with the annular water spaces below the same.

In carrying out my invention, I employ a suitable casing A, which may be of any suitable metal, and may be nickeled, japanned, enameled, or otherwise finished and ornamented to suit the trade. This casing A has a bottom lining A′, a side lining A^2, and a top lining A^3 of asbestos or other suitable non-conducting material, in order to insulate the contents of the casing, and prevent waste of heat.

At its bottom, the casing has a central fire hole A^4, and at its top it has outlets A^5 and it is also provided with suitable openings for the passage of the pipes leading to and from the interior of the case, as more fully described hereinafter.

A burner B operating in the fire hole A^4 may be supplied with any suitable fuel through a pipe B′ having a valve B^2 and shown as leading from a tank B^3, mounted on the casing A for the reception of gasolene or other suitable fuel. Within the case at the top thereof, and preferably immediately below the lining A^3, I provide a water pan C, having a central depending, preferably tapered, tubular extension C′ which extends down to a point near the bottom of the casing and rests immediately above the fire hole A^4 and communicates at its lower end by lateral tubes C^2 with an inner annular water chamber D which communicates at its lower end through a cross passage D′ with an outer annular water space D^2, an annular fire space E being interposed between the water chamber D and the central flue, and an annular pipe space E′ being interposed between the inner and outer annular water chambers, as will be understood from Figs. 3 and 4 of the drawings. The inner fire space E communicates at its lower end with the fire hole A^4, and at its upper end through a passage E^2 with the outer fire space E′, and a cylindrical plate or flange C^3 depends from the water pan in the outer fire space E′ to a point near the lower end of said fire space E′, and operates as a baffle to divide the said space E′ so that the heat delivered to said space through the cross space E^5 will be caused to pass down at the inner side of the space E′ and then up at the outer side thereof, where it delivers through a cross space E^3 to a side space E^4 extending alongside the tank C and discharging through the openings A^5, as will be understood from Fig. 3 of the drawing.

The inner annular water chamber D connects at its upper end with the pan C, by means of short tubes *d*, as shown in Figs. 5 and 6, and short tubes d^2 connect the upper end of the outer annular water chamber D^2 with the said water pan, the pan being thus supported on the tubes *d*, d^2, and on its central depending tube C′ before described.

In the operation of the described construction, the heat from the burner B will circulate up through the inner heating space E surrounding the tube C′, thence across at E^2, and down along the inner side of the depending baffle plate C^3, and then up along the outer side of said plate, and thence along the bottom and sides of the pan C, and out at A^5, so that nearly all the heat units will be extracted before the products from the burner are discharged at A^5, as will be understood from the drawings, referring especially to Figs. 3 and 4.

A soot valve E^5 connects with the hot air space to permit the removal of accumulated soot whenever necessary, and a drain valve D^5 connects with the water chamber for emptying the heater whenever desired.

By the described construction, it will be noticed I provide the heater with a central longitudinal heating flue E, and a pair of concentric annular water chambers D and D^2 surrounding said flue, and spaced apart by an intermediate flue, the said water chambers being connected at their lower ends at D′, and a water pan C being arranged over the water

chambers and provided with a central depending extension or tube projecting down within the central flue and with a central plate or flange depending from the said water pan in the hot air space between the inner and outer water chambers and forming a partition or deflector for causing the heat to circulate from the central flue down and then up between the inner and outer water chambers as before described.

A dead air space A^6 is provided between the outer water chamber D^2 and the insulating lining, and longitudinal ribs A^7 on the outer side of the water chamber—see Fig. 4—divide the said dead air space and operate to space the inner parts of the heater properly away from the insulating lining in such manner as to secure the dead air space at all sides.

In supplying water to the heater, I provide a supply pipe F having an inlet at F′ in a suitable T coupling and adapted to receive any suitable water connection, and on opposite sides of the inlet I provide valves F^2 and F^3, the latter controlling the supply connection at F^4 with the lower end of the tank, and the former valve F^2 controlling the connection at F^5 with a discharge pipe G which extends down from the top of the heater and has a lower discharge end G′ braced in connection with the heater by a strap brace G^2, the said pipe G having at its upper end a cross pipe G^3, connecting through a suitable T coupling G^4, with the top of the hot water pan, and having an upwardly extending connection G^5 controlled by a valve G^6 and adapted to operate as a vent, or for top transmission of hot water as may be desired. By this construction it will be noticed that by closing the valve F^2, hot water may be delivered from the pipe G, or if the water is too hot, the valve F^2 may be partially opened in order to secure the desired temperature. It will also be noticed that the valve F^3 may be manipulated to secure the discharge of water from the pipe G when the inlet is suitably coupled up with any desired water surface.

The hanger shown in Figs. 2 and 4, is employed in securing the heater to the wall. This hanger has a main bar or upright H whose lower end is bent forwardly at H′ to underlie the heater. To this main bar are secured upper and lower cross bars forming laterally extending arms H^2 and H^3 which extend alongside of and are riveted at h^2, h^3 to the heater. A back plate H^4 is securely held to the upper end of the main bar and to the cross bar H^2 and has an opening to fit over a nail. This hanger when arranged as shown in Figs. 2 and 4 will operate to securely support the heater.

I claim:

1. A hot water heater comprising a casing, a central hot air flue therein, a water pan within the casing, and having a tube depending within the central hot air flue, inner and outer annular water chambers surrounding the hot air flue, and spaced apart forming a hot air space in communication at its upper end with the upper end of the central hot air flue, a cylindrical plate or flange depending from the water pan in the hot air space between the inner and outer water chambers, and forming a baffle partition in said space, connections between the lower end of the central depending tube and the inner annular water chamber, connections between the upper ends of the annular water chambers and the water pan, and means for circulating water through the heater and comprising a supply pipe, having connection at one end with the water space within the heater, an inlet between its ends, valves on opposite sides of said inlet, and an outlet pipe leading from the water space of the heater, and having a connection with the water supply pipe at the opposite end thereof from that which delivers to the heater, substantially as set forth.

2. A hot water heater, comprising a casing, a central hot air flue therein, and inner and outer annular water chambers surrounding said flue and spaced apart, forming an intermediate hot air space and communicating at their lower ends, a water pan overlying the water chambers, and having a central tube depending within the hot air flue, and communicating at its lower end with the inner water chamber, tubes connecting the said water pan with the inner and outer water chambers, and a partition plate depending from the water pan within the hot air space between the inner and outer water chambers, substantially as set forth.

3. A water heater, comprising a casing, a water pan having a central depending tubular portion in open communication at its upper end with the water pan, and a water chamber surrounding and spaced apart therefrom, forming a hot air space between the said chamber and the central depending tube, connections between the lower end of said water chamber and the depending tube, and connections between the upper end of said chamber and the water pan, substantially as set forth.

4. A water heater having a central heating flue, a pair of concentric annular water chambers surrounding said flue and spaced apart by an intermediate hot air space in communication with the central flue, said water chambers being connected at their lower ends, a water pan overlying the said water chamber, and having a central depending tubular extension projecting down within the central flue, a cylindrical plate or flange depending from the water pan in the hot air space between the inner and outer water chambers, and forming a partition for deflecting the heat received from the central flue down and then up between the said inner and outer water chambers, connections between the

water chamber and the tubular extension of the pan, and connections between said chambers and the pan, substantially as set forth.

5. A water heater having a casing, annular concentric water chambers therein, and connected at their lower ends and spaced apart to form a hot air passage, a water pan overlying and connected with said annular concentric water chambers, an annular partition depending from said water pan in the hot air space between the inner and outer annular water chambers, and a central hot air flue communicating at its upper end with the hot air space between the annular water chambers, substantially as set forth.

6. The combination with a hot water heater, of a supply pipe connected at one end with the lower portion of the heater, and having an inlet between its ends and valved on opposite sides of said inlet, and an outlet pipe connected with the upper portion of the heater and having a depending pipe connected with the opposite end of the supply pipe from that which connects with the heater, substantially as set forth.

7. A hot water heater comprising a central hot air flue, a water pan above said flue and having a tube depending within the flue, inner and outer annular water chambers surrounding the hot air flue and spaced apart forming an intermediate air space, means connecting said inner and outer water chambers at their lower ends, means connecting the lower end of the inner water chamber with the central tube depending from the water pan, and tubes connecting the upper ends of the inner and outer water chambers with the water pan and a partition plate within the hot air space between the inner and outer water chambers, all substantially as and for the purpose set forth.

JAMES H. MACKLEY.

Witnesses:
W. W. SULLIVAN,
JACOB HASBROUCK.