C. L. HUDLER.

AUTOMATIC WATER HEATER.

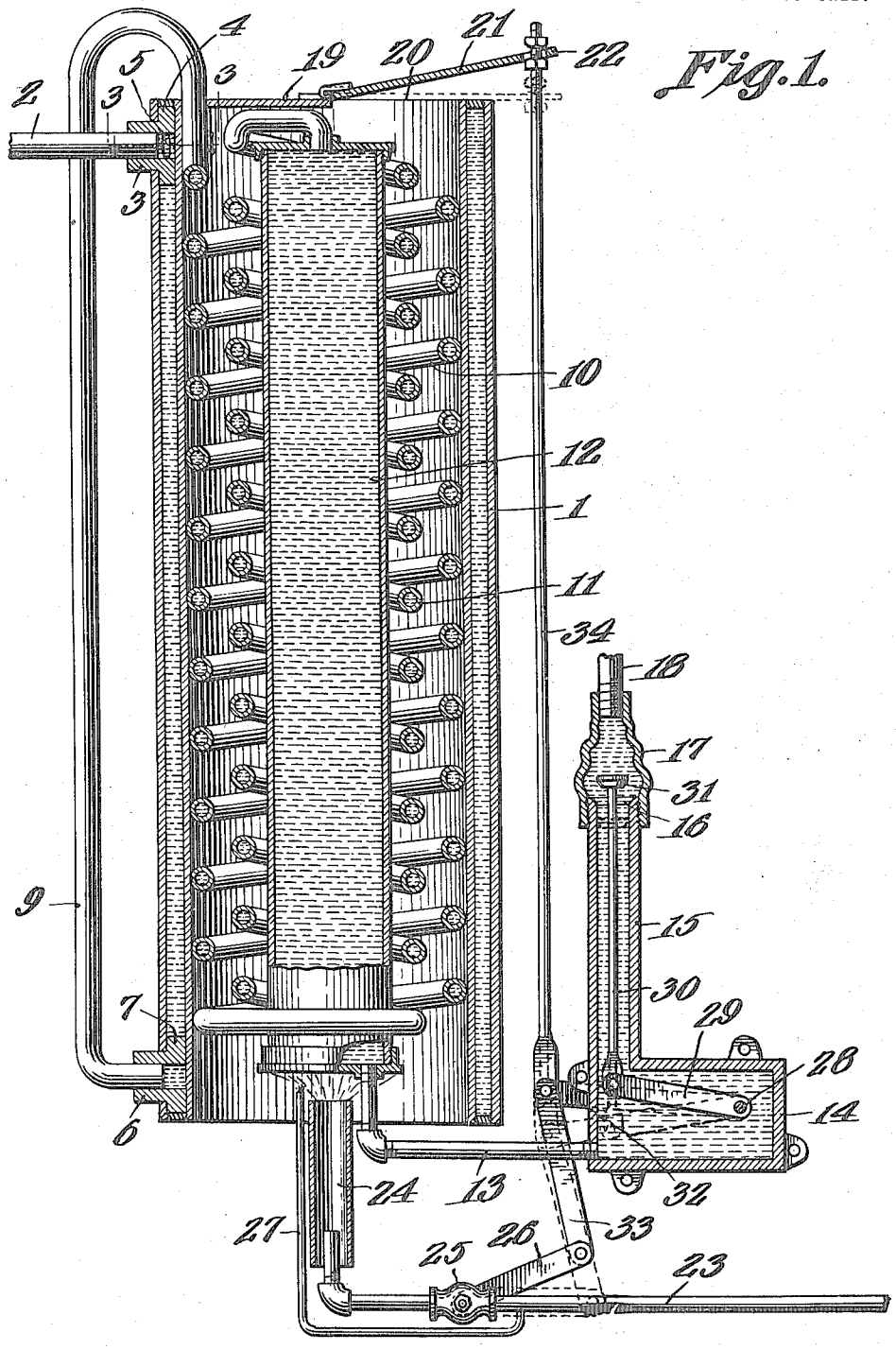
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1,141,247.

Patented June 1, 1915.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

J. Stoner

M. E. McCarthy.

Charles L. Hudler,
Inventor

by C. A. Snow & Co.
Attorneys

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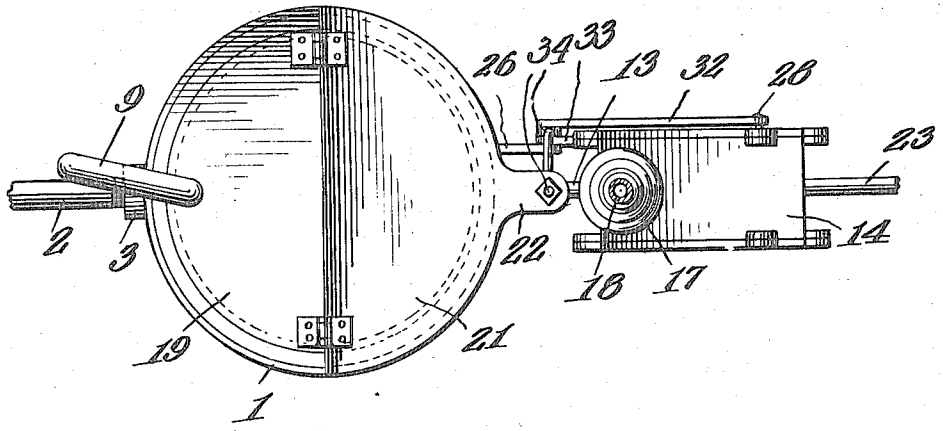
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2 SHEETS—SHEET 2.

Fig. 2.



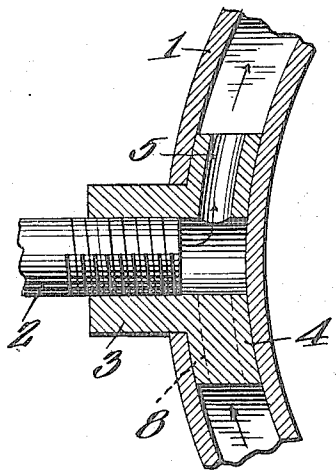


Fig. 3.

Witnesses

J. P. Tonnies

M. E. McCarthy.

Charles L. Hudler,

Inventor

by C. A. Snow & Co.

Attorneys

UNITED STATES PATENT OFFICE.

CHARLES LEMUEL HUDLER, OF ST. LOUIS, MISSOURI.

AUTOMATIC WATER-HEATER.

1,141,247. Specification of Letters Patent. Patented June 1, 1915.

Application filed August 8, 1914. Serial No. 855,801.

To all whom it may concern:

Be it known that I, CHARLES L. HUDLER, a citizen of the United States, residing at St. Louis, State of Missouri, have invented a new and useful Automatic Water-Heater, of which the following is a specification.

The present invention appertains to water heaters, and aims to provide a novel and improved boiler for automatic gas water heaters.

A further object of this invention is to provide a unique water circulating system, whereby the water will be quickly heated when the gas is turned on and the burner lighted by means of the pilot light.

It is also within the scope of the present invention to improve generally, the construction of the water heater, to enhance the utility thereof, and to render the same comparatively simple and inexpensive in construction, as well as practical, serviceable and efficient in its use.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, can be made within the scope of what is claimed, without departing from the spirit of the invention.

The invention has been illustrated in its preferred embodiment in the accompanying drawings, wherein:—

Figure 1 is a vertical section of the improved water heater, parts being shown in full. Fig. 2 is a plan view of the device. Fig. 3 is an enlarged sectional detail taken on the line 3—3 of Fig. 1.

In carrying out the present invention, there is provided a peculiar water circulating system including an upright cylindrical water jacket 1 which has a water chamber or space between its inner and outer walls, and to the upper end of which is connected the cold water supply pipe 2. The supply pipe 2 is attached to the upper end of the water jacket 1 in a peculiar manner, and to this end, a nipple 3 is engaged outwardly through the outer wall of the jacket 1, and is provided at its inner end with a flange or head 4 fitting snugly between the outer and inner walls of the jacket and having a lateral branch or outlet 5, which is so directed within the jacket 1, to create a rotary or whirling motion of the water within the jacket. The flange or head 4 of the nipple 3 fitting snugly within the jacket, will close the inner end of the bore of the nipple, as seen in Figs. 1 and 3, and it being evident that the supply pipe 2 is threaded or otherwise engaged into the outer or free end of the nipple so that the water discharged from the supply pipe 2 will pass into the nipple 3 and laterally out the branch 5 into the water chamber or space within the jacket.

The water jacket 1 is provided with a lower discharge or outlet including a nipple 6, similar to the nipple 3, and engaged outwardly through the outer wall of the jacket 1 adjacent the lower end of the jacket, the nipple 6 having a flange or head 7 fitting snugly within the walls of the jacket, and provided with a lateral or horizontal branch or inlet 8 extending in a direction opposite to the direction in which the branch 5 extends, as indicated in Fig. 3. Into the outer or free end of the nipple 6, is threaded or engaged the lower end of a riser pipe 9, which extends upwardly on the exterior of the jacket, and which has its upper end bent back within the upper end of the jacket 1, and attached to the upper end of a vertical coil 10 disposed within the jacket 1. A second vertical coil 11 is disposed within the coil 10, the lower ends of the coils 10 and 11 being connected, and a vertical elongated chamber 12 is disposed within the inner coil 11, and the upper end of the said inner coil is attached to the upper end of the chamber 12. Thus, when the water flows through the jacket 1 into the riser pipe 9, it will flow downwardly within the outer coil 10, thence upwardly within the inner coil 11, and thence downwardly within the chamber 12, all of which form the water circulating system or conduits adapted to be heated by the burner, as hereinafter set forth.

A discharge pipe 13 for the chamber 12, is attached to the lower end or bottom of the said chamber, and its outer end is attached to one end of a casing 14 having an upstanding tubular discharge extension 15 which is provided at its upper or free end with an annular bevel 16.

A discharge chamber 17 is threadedly or

otherwise engaged over the upper or free end of the extension 15, and is adapted for the connection of the discharge pipe 18 which leads to the faucet or other point of discharge.

The casing 14 is preferably disposed at one side of the lower end of the jacket 1, so that the extension 15 projects upwardly at one side of the jacket, it being understood that the several parts of the present apparatus may be supported upon any suitable stand, or in any other suitable manner.

The upper end of the water jacket 1 is provided with a damper, and to this end, a semi-circular cover 19 is secured upon the upper end of the jacket 1 to partially close the upper end thereof, and providing convenient means for the passage of the upper end of the riser 9 into the upper end of the water jacket, as seen in Fig. 1.

A semi-circular damper 21 is hinged to the cover 19, and is provided at its free portion with an extension or arm 22 for the engagement of the damper controlling rod or link, as will hereinafter appear.

The gas supply pipe 23, which is preferably passed below the case 14, has its nozzle end communicating with the burner 24 which is disposed below the chamber 12 concentrically within the lower end of the water jacket 1. The burner 24 is preferably, although not necessarily, of the Bunsen type, and the nozzle or discharge end of the gas supply pipe 23 projects upwardly within the Bunsen burner or mixing tube 24 whereby the air will be drawn upwardly with the gas to provide the combustible mixture.

A controlling valve 25 is interposed in the gas supply pipe 23 adjacent the burner 24, and is equipped with a controlling lever or arm 26.

A pilot tube 27 is attached to the gas supply pipe 23 beyond the controlling valve 25, and extends to the mouth or discharge portion of the burner 24, to provide a pilot light for igniting the gas discharged from the burner 24, when the valve 25 is opened.

As a means for automatically controlling the gas valve 25 and the damper 21, there is provided a rock shaft 28 journaled through one or both sides of the case 14 at a point remote from the extension 15, and having a lever or arm 29 secured thereto within the case 14 and projecting below the extension 15. A stem or rod 30 which projects through the extension 15, is pivoted to the free end of the lever 29, and is provided with a beveled piston or disk 31 adapted to move snugly within the upper portion of the extension 15 and to rise within the discharge chamber 17. The piston 31 is adapted to fit a little loosely in the extension 15, to thereby enable a slight leakage of the water from the extension 15 into the enlarged discharge chamber 17 even when the piston is depressed, and to thereby avoid the sticking of the piston within the extension 15, which would be objectionable. The piston 31 is adapted to be lifted into the chamber 17 when the water is permitted to discharge through the discharge pipe 18.

A lever or arm 32 is secured to the outer end or extremity of the rock shaft 28, and a link 33 connects the free ends of the levers 32 and 26, whereby when the piston 31 is lifted into the chamber 17, as seen in Fig. 1, the piston stem 30 will raise the lever 29, which will oscillate the rock shaft 28 and lever 32 carried thereby, to thereby raise the link 33 and the lever 26 to open the gas controlling valve 25. Similarly, when there is no flow of water through the apparatus, the piston 31 will settle or gravitate into the extension 15, and the levers 29, 32 and 26 will drop or swing downwardly, to close the valve 25.

An upright rod or link 34 has its lower end pivoted to the free end of the lever 32, and has its upper end loosely engaged through the extension or arm 22 of the damper 21, as seen in Figs. 1 and 2, whereby when the lever 32 is raised and lowered, the damper 21 will be opened and closed, respectively.

In operation, the weight of the damper 21, damper rod 34, levers 29, 32 and 26, links 33, piston 31 and piston stem 30, will cause the said parts to gravitate, when the flow of water through the apparatus is arrested, in order that the piston 31 will gravitate into the extension 15, and in order that the damper 21 and gas controlling valve 25 will both be closed when the apparatus is idle. Thus, the burner 24 will be extinguished and the damper 21 will be seated upon the upper end of the water jacket 1 to close the upper outlet 20 of the water jacket. Now, when the water is turned on so as to flow through the discharge pipe 18, the upward pressure of the water flowing from the extension 15 into the discharge chamber 17 will lift or raise the piston 31 into the chamber 17, and consequently, the lever 32 will be swung upwardly, to raise the lever 26 of the gas valve 25 and to raise the damper rod or link 34 to lift the damper 21. Consequently, the gas will be turned on into the burner 24, and will be ignited by the pilot light, and simultaneously, the damper 21 will be thrown open, to establish a draft through the water jacket 1 and to enable the products of combustion to pass off, after they have circulated through the coils 10 and 11 within the water jacket 1 and around the chamber 12. The products of combustion being confined within the water jacket 1, will thoroughly heat the coils 10 and 11, and will also heat the water jacket 1 and chamber 12, to quickly heat the water as it

passes through the heater. As soon as the flow of water is shut off, the piston 31 will settle back to closed position within the extension 15, and the damper 21 and valve 25 will be automatically closed, whereby the burner 24 will be extinguished, and whereby the damper 21 will be closed, to retain the products of combustion within the water jacket 1 and whereby the subsequent heating of the water circulating system or conduits will be accelerated or rendered more quick, to afford economy in the consumption of gas or fuel.

It is to be observed that the water in passing into the jacket 1 from the supply pipe 2, will be given its initial or primary application of heat, to raise the temperature thereof, and then, the water passing up through the riser 9 and downwardly and upwardly within the respective coils 10 and 11, will be quickly heated to a high temperature by the contact of the products of combustion with the coils as the products of combustion rise within the water jacket 1. The heated water will then pass into the chamber 12, where it will receive its final application of heat, it being noted that the chamber 12 will contain a sufficient quantity of water, for ordinary domestic purposes for use at one time. An important feature resides in the provision of the peculiar nipples 3 and 6 for the inlet and outlet of the jacket 1, whereby the water entering the jacket 1 through the nipple 3, will be given a rotary or whirling motion within the jacket, in connection with the nipple 6 at the lower end of the jacket which forms the discharge therefor. The whirling or rotary motion of the water is of advantage, inasmuch as it will carry the hot water downwardly within the jacket, instead of letting the hot water rise and accumulate at the upper end of the jacket, while the cold water would descend directly from the pipe 2 down one side of the water jacket to the riser 9.

From the foregoing, taken in connection with the drawings, the other advantages and attributes of the present apparatus will be obvious to those versed in the art, without further comment being deemed necessary.

Having thus described the invention, what is claimed as new is:—

1. In a water heater, an upright water jacket having an inlet at its upper end, a coil disposed within the jacket, a riser connecting the lower end of the jacket and upper end of the said coil, a second coil disposed within the first mentioned coil, the lower ends of the coils being connected, and an upright elongated chamber disposed within the said second coil, the upper end of the second coil being connected to the upper end of the chamber, and the chamber having a lower outlet.

2. In a water heater, a cylindrical water jacket, a water supply pipe connected to one end thereof and having a lateral outlet within the jacket, and an outlet connected to the other end of the jacket and having a lateral inlet within the jacket projecting in a direction opposite to the direction in which the said lateral outlet of the supply pipe extends, so as to impart a whirling motion to the water flowing through the jacket.

3. In a water heater, a cylindrical water jacket, and nipples engaged to the jacket at its ends and having lateral branches within the jacket extending in opposite directions, so as to impart a whirling motion to the water flowing through the jacket.

4. In a water heater, a cylindrical water jacket, and inlet and outlet nipples engaged through the outer wall of the jacket adjacent the ends thereof, the nipples having heads fitting snugly within the jacket and provided with lateral branches projecting in opposite directions, so as to impart a whirling motion to the water flowing through the jacket.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CHARLES LEMUEL HUDLER.

Witnesses:
HY. LOWENSTEIN,
MILTON GLASER.