

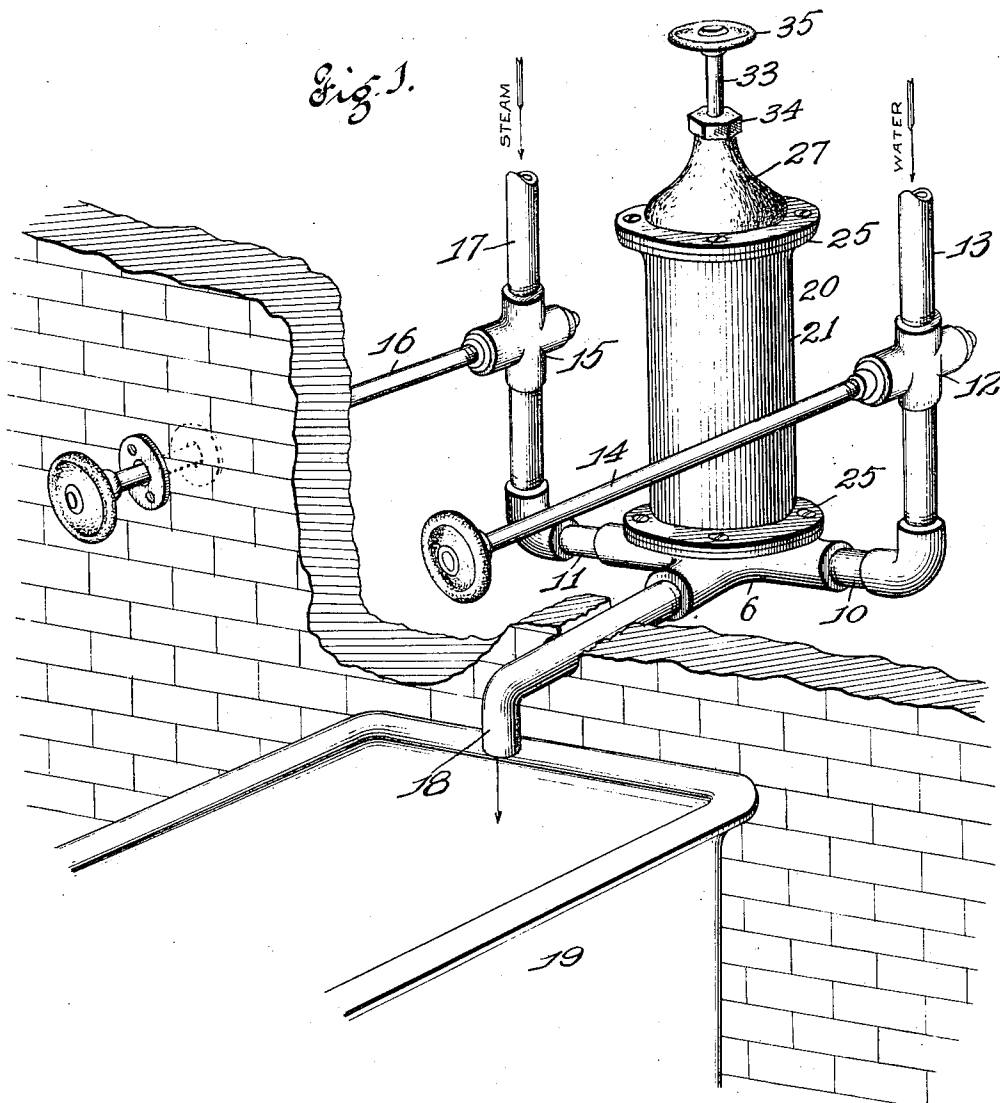
W. J. WARNER & D. A. LICHTY.
WATER HEATER.

APPLICATION FILED OCT. 5, 1909.

Patented Jan. 17, 1911.

2 SHEETS—SHEET 1.

981,725.



Witnesses

W. L. Stein

L. A. M. Dwyer

Inventors.

Walter J. Warner

Daniel A. Lichty

by Hopkins & Eichen Attys.

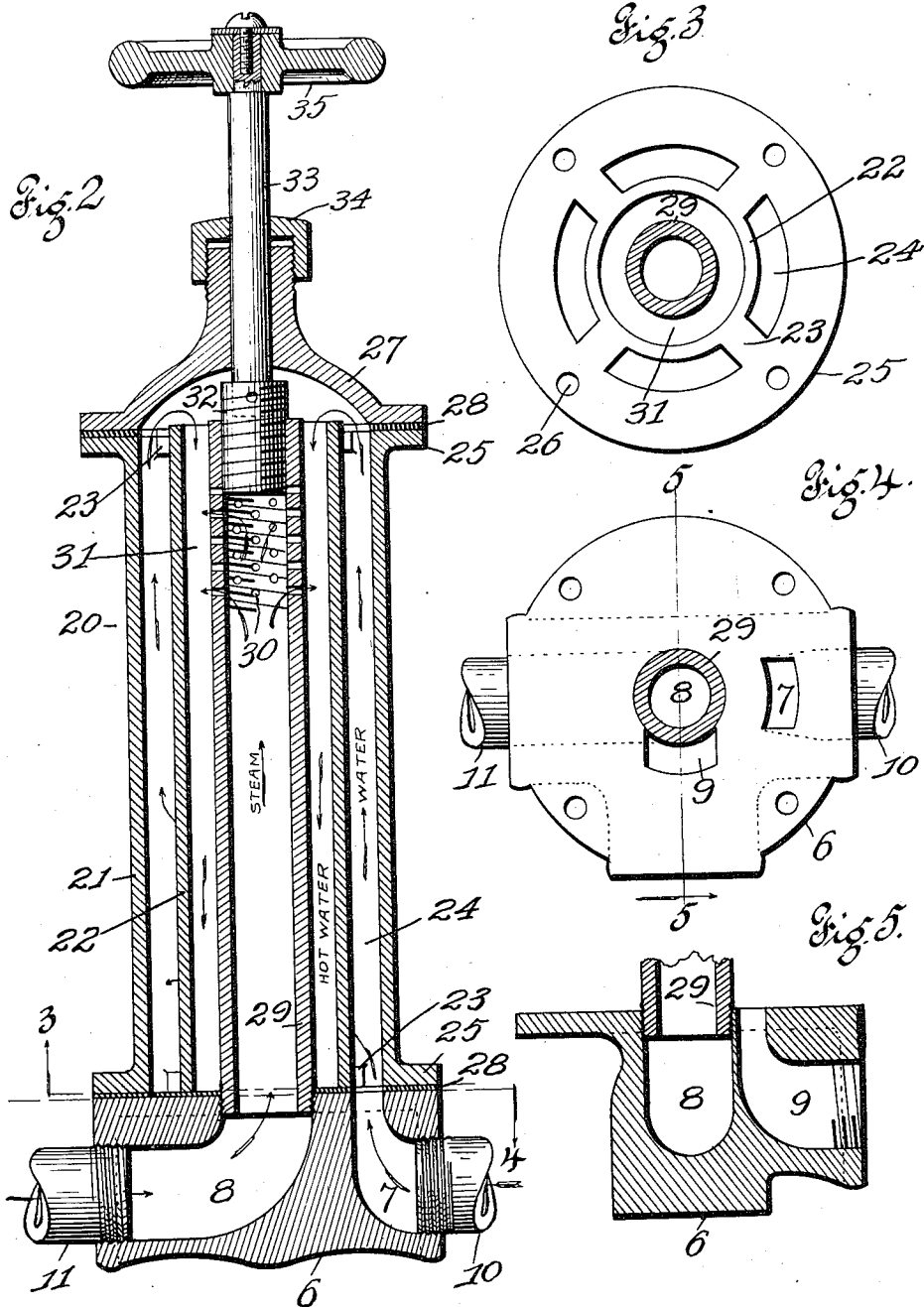
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UNITED STATES PATENT OFFICE.

WALTER J. WARNER AND DANIEL A. LICHTY, OF ST. LOUIS, MISSOURI, ASSIGNORS TO
WARLIC HEATER MANUFACTURING COMPANY, OF ST. LOUIS, MISSOURI, A CORPO-
RATION OF MISSOURI.

WATER-HEATER.

981,725.

Specification of Letters Patent. Patented Jan. 17, 1911.

Application filed October 5, 1909. Serial No. 521,143.

To all whom it may concern:

Be it known that we, WALTER J. WARNER and DANIEL A. LICHTY, citizens of the United States, and residents of St. Louis, Missouri, have invented certain new and useful Improvements in Instantaneous Water-Heaters, of which the following is a specification.

Our invention relates to an improvement in instantaneous water heaters, and has for its object to provide a heater shell in which live steam and water are brought in direct contact and the water discharged in a heated condition.

A further object of our invention is to provide a heater shell having a plurality of compartments mounted upon a base provided with a plurality of ports, each communicating with a designated compartment of the heater shell wherein water and steam are admitted and brought in direct contact during the circulation, and discharged in a heated condition.

In the drawings—Figure 1 is a perspective view of our complete invention, showing the same in operative position. Fig. 2 is a central, vertical sectional view of our invention. Fig. 3 is a bottom plan view of the heater shell with the central steam pipe in section, and viewing the same on the line indicated by the arrow 3. Fig. 4 is a top plan view of the base 6, showing the pipe 29 in section; the view being taken on the plane indicated by the dotted line marked with the arrow and the numeral 4 in Fig. 2. Fig. 5 is a cross-sectional view of the base taken on the line 5—5 of Fig. 4.

In the construction of our invention we provide a base 6 provided with a water inlet port 7, a steam port 8 and a hot water outlet port 9. In the ports 7 and 8 are inserted pipes 10 and 11; the pipe 10 is connected to a valve 12 which is connected to the water main 13 and by said valve and through the operation of the valve stem 14, the supply of water from the water main is regulated. The pipe 11 is connected to a similar valve 15 and is governed by the valve stem 16 which regulates the inflow of live steam admitted through the pipe 17. In the port 9 is placed the hot water supply pipe 18 through which the heated water is permitted to flow into any suitable receptacle 19.

Upon the base 6 is mounted the heater 20 which consists of an outer shell 21, an inner

cylindrical wall 22 which is formed integral with the outer shell 21 by means of the spurs 23, forming between said outer shell and cylindrical wall a water receptacle or passage 24. The outer shell is provided at its top and bottom with a projecting flange 25 having suitable perforations 26 by which the same can be securely bolted to the base 6 and the hood 27. Between the heater and the base and hood is located a strip of packing material 28 arranged to make an absolutely water-tight joint. The water port 7 in the base is so arranged as to communicate with the water receptacle or passage 24 (see Fig. 2), so as to admit the water from the water main to pass upwardly and fill the entire chamber between the outer shell 21 and cylindrical wall 22.

In the port 8 of the base is screw-seated a central steam pipe 29 which is provided near its top with a plurality of perforations 30 through which the live steam passing from the pipe 11 is permitted to jet through into the water passage 31 located between the pipe 29 and the inner surface of the cylindrical wall 22. Water is permitted to pass into this chamber by passing over the top of the cylindrical wall by over-flow, and as this water is passing downwardly the jets of steam passing through the perforations 30 come in direct contact with the sheet of water, heating the same, and this water is permitted to pass out of said chamber through the port 9 which has direct communication with the chamber.

In the pipe 29 is seated the valve 32 which is of sufficient length to cover the entire series of perforations 30 when manipulated by the valve stem 33, the valve 32 is screw-threaded in the pipe 29, and leakage between the valve stem and hood is prevented by the stuffing box 34. Said stem is provided with a valve handle 35 by which the same may be readily operated. By means of the valve 32 the supply of steam can be regulated and this is accomplished by operating the valve so as to open or close any number of the perforations in the pipe. The inflow of the steam can also be regulated by means of the valve 15. This depends upon the degree of heat of the steam and the amount of heat required for heating the water supply.

In operating our invention we deem it best to first turn on the water supply, then

the live steam, and as the steam passes up through the pipe 29, the pipe, together with the port 8, up to the valve 15 is normally filled with water after the steam and water supply has been cut off from a previous operation. The steam being of greater pressure has a tendency to force the water in the pipe 29 out through the perforations 30, the steam then coming in contact with the water and in this manner supplying the receptacle with water of the desired degree of heat.

The circulation of the water and steam is clearly indicated in Fig. 2 by the arrows.

15. Having thus fully described our invention, what we claim as new and desire to have secured to us by the grant of Letters Patent, is:

1. A device of the class described comprising a heater composed of an outer shell provided with a plurality of water circulating passages; a base provided with a plurality of ports; a steam supply pipe located in the heater and communicating with one of the ports in the base, the remaining ports of said base communicating with the respective water passages of the heater; a valve located in the steam pipe for regulating the supply of steam to contact with the water while in circulation, substantially as described.

2. A device of the class described comprising a heater composed of an outer shell; an inner cylindrical wall; a central perforated steam pipe; a base provided with a plurality of ports, each port registering with its respective compartment of the heater; a valve located in the steam pipe for regulating the supply of steam to pass through the perforations to contact with the water while in circulation, substantially as specified.

3. A device of the class described comprising a heater composed of an outer shell; an inner cylindrical wall located therein; a base supporting said shell and wall; a

water inlet formed in said base and communicating with the space between the outer shell and cylindrical wall; a steam port located in said base and terminating centrally in the heater; a perforated steam pipe screw-seated in said port and extending centrally into the cylindrical wall; a discharge port located in the base and communicating with the space between the steam pipe and cylindrical wall; and a valve located in the steam pipe for regulating the passage of steam from the steam pipe into the water compartment, substantially as described.

4. A device of the class described comprising a heater composed of an outer shell; an inner cylinder spaced from the outer shell by spurs forming a water passage between the outer shell and cylinder; a steam pipe located within the cylinder; a base provided with a plurality of ports, the center port communicating with the steam pipe and in which the steam pipe is fastened, the remaining ports communicating with the water passages through one of which the water is admitted between the outer shell and cylinder, the other port permitting the discharge of the heated water from the passage between the inner shell and the steam pipe, said steam pipe being provided near its upper end with a plurality of jets and a valve screw seated in the steam pipe for regulating the discharge of the steam through the ports to contact with the volume of water passing from the outer passage over the top of the cylinder through the passage formed by the inner cylinder and steam pipe, substantially as specified.

In testimony whereof, we have signed our names to this specification, in presence of two subscribing witnesses.

WALTER J. WARNER.
DANIEL A. LICHTY.

Witnesses:

ALBERT L. SCHMIDT,
WALTER C. STEIN.