L. B. RICE.

INDIVIDUAL WATER HEATER.

APPLICATION FILED MAR. 12, 1910.

1,031,376. **Patented July 2, 1912.**

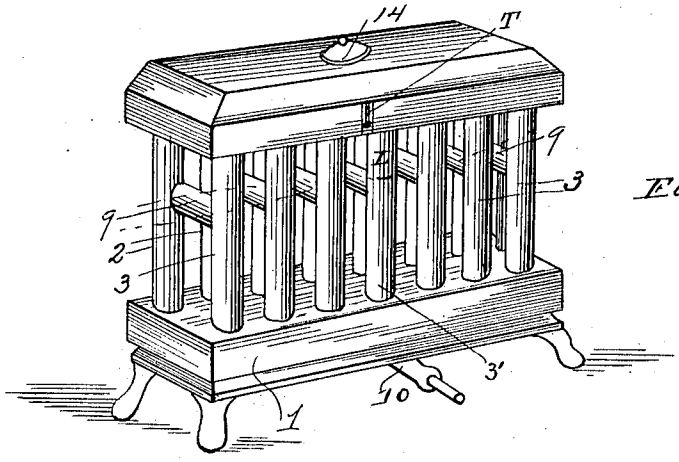

Fig. 1

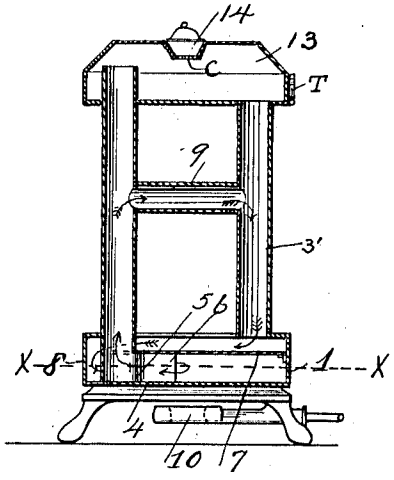

Fig. 2

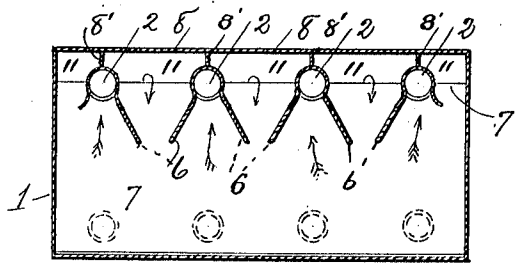

Fig. 3

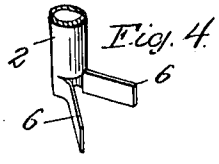

Fig. 4

Witnesses
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UNITED STATES PATENT OFFICE.

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INDIVIDUAL WATER-HEATER.

1,031,376. Specification of Letters Patent. Patented July 2, 1912.

Application filed March 12, 1910. Serial No. 549,054.

To all whom it may concern:

Be it known that I, LOUISA B. RICE, a citizen of the United States, and resident of Collinwood, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Individual Water-Heaters, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The objects of the invention are to provide an individual portable form of water heater such that it will be suitable for cottages or apartments, and which will include a circulating system and a heating means and will provide for the necessary warmth and comfort of the tenant, of one room, without the installation of an entire heating plant or equipment throughout an entire building. To accomplish these results the heater comprises a "unit" or single radiator having provision made for self heating and interior circulation and expansion and consists in the combination and arrangement of parts as hereinafter described, shown in the accompanying drawings and specifically pointed out in the claims.

In the accompanying drawings Figure 1 is a perspective view of the device; Fig. 2 is a vertical section from front to rear; Fig. 3 is a horizontal transverse section of the heating drum at the lower part of the heater on line x—x Fig. 2; Fig. 4 is a perspective view of the lower end of one of the outlet pipes.

In these views 1 is a heating drum or circulating chamber. Inserted in the upper wall of this chamber are two series of vertical circulation pipes 2, 2 and 3, 3 respectively, one series of which 2, 2 are longer than the other series 3, 3. The pipes 2, 2 are preferably in the rear and the pipes 3, 3 preferably in the front of the heater.

The longer pipes 2, 2 extend to the bottom 4 of the chamber 1 and are each provided with a lateral opening 5, 5, the vertical walls of which are preferably flared outwardly and extended at 6 to assist in giving free access thereto for the water in the chamber. The other series of pipes 3, 3 communicate with the upper part of the chamber only, and the hot water is prevented from entering them by means of a horizontal partition 7, which joins the pipes 2, 2 above the lateral openings 5, 5.

The pipes 2, 2 are placed closely adjacent to the rear wall 8 of the chamber 1 since it is not intended that the water shall circulate behind these pipes, or vertical partitions 8′, 8′, can be placed behind them. One 3′ of these series of pipes 3, 3, can be made of glass if desired. The two series of pipes extend upwardly and a normal water level is predetermined and at or about this level substantially horizontal pipes 9, 9 connect the front and rear series of pipes.

A heating device such as a gas or gasolene burner or plate 10 is secured underneath the chamber 1, and the heating means may be connected with any convenient source of gaseous fuel employed in the building or an ordinary coal oil burner may be used, since the water does not need to be heated to the steam generating point.

In operation the water underneath the horizontal partition 7 first becomes heated and expanding rises through the pipes 2, 2 and the cool water in the pipes 3, 3, falls into the upper part of the chamber 1, above the partition 7, and falls between the pipes 2, 2 at 11, 11 so as to become heated to rise again through the pipes 2, 2 to the pipes 3, 3 and a constant circulation is maintained so long as the water in the tubes 2 is hotter than the water in the tubes 3 which will be the case so long as heat is applied to the bottom. Provision is also made for the expansion of the water if it should become too hot, and for this purpose the pipes 2, 2 and 3, 3 are preferably carried up above the normal water line and communicate with an expansion chamber 13 in which a higher water level can be maintained if necessary.

The pipes 2, 2 preferably extend into the chamber 13 to a higher level than the pipes 3, 3 and if the circulation through the horizontal pipes 9, 9 is not sufficient to take care of the water when expanded, the overflow from the upper ends of the pipes 2, 2 will do no harm, but will continue cooling the water since the higher the elevation the cooler the water will become.

One of the pipes 3, 3 is preferably formed of glass and a normal water level line L is marked thereon, so that the heater may not contain too much water for its capacity to

permit expansion. A thermometer T may be attached to prevent overheating and the production of steam.

Fresh water can be introduced at 14 and the opening can be supplied with a closure C which may be perforated to permit air to enter if desired, and to prevent air compression within. An upper cap may be used to cover the openings.

The device described is also useful for heating water for bathing or other domestic purposes.

Having described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a heater, a heating chamber having an upper wall, and a bottom vertical pipes for upward flow extending upwardly through the upper wall and extending downwardly to the bottom and provided with lateral openings at their lower ends, a transverse partition separating said heating chamber into upper and lower portions, and extending rearwardly to said upward flow pipes, the lateral openings in said upward flow pipes communicating with the lower part of said chamber below said partition, vertical pipes for downward flow communicating with the portion of said chamber above said partition and communicating with the said pipes for upward flow at an elevated point above said chamber, the said upper and lower portions of said chamber being in communication with each other around the edge of said partition at points substantially intermediate of the said upward flow pipes.

2. In a hot water heater, a hollow base comprising a heating and circulation chamber, a horizontal partition in said chamber separating said chamber into upper and lower portions, means for applying heat directly to the bottom of said chamber, a series of vertical upward flow pipes extending to the bottom of the said chamber and provided with lateral openings communicating with the lower portion of said chamber, the walls of said openings turned outwardly, the upper and lower portions of said chamber communicating with each other in the rear of said upward flow pipes substantially intermediate of the same, downwardly extending flow pipes communicating with the upper portion of said chamber above said partition, one of said upward flow pipes being formed of transparent material, and means of communication between the upper ends of said upward and downward flow pipes, said transparent pipe provided with means for indicating normal water level.

In testimony whereof, I hereunto set my hand this 17th day of February, 1910.

LOUISA B. RICE.

In presence of—
WM. M. MONROE,
GEO. S. COLE.