Nov. 8, 1927. 1,648,043

T. W. DAHLQUIST

BOILER

Filed Sept. 4, 1924

Fig. 1

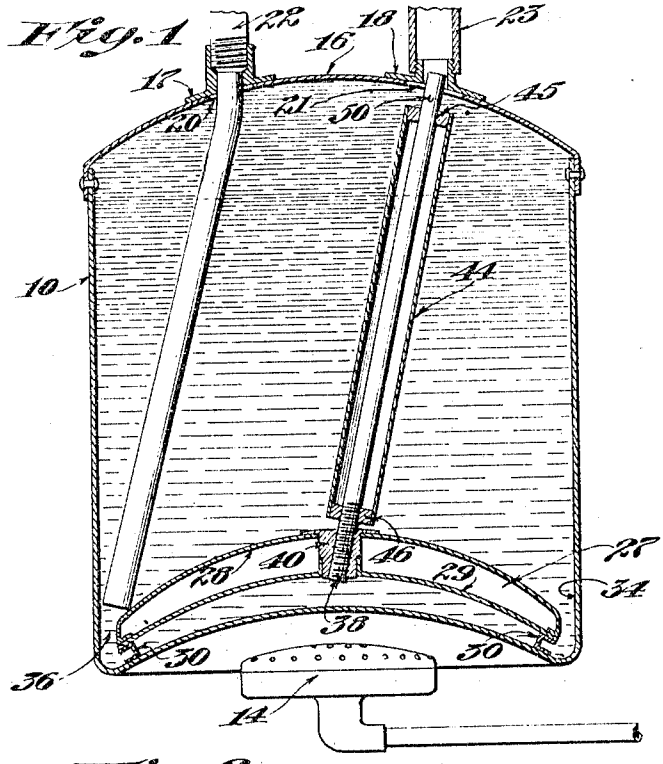
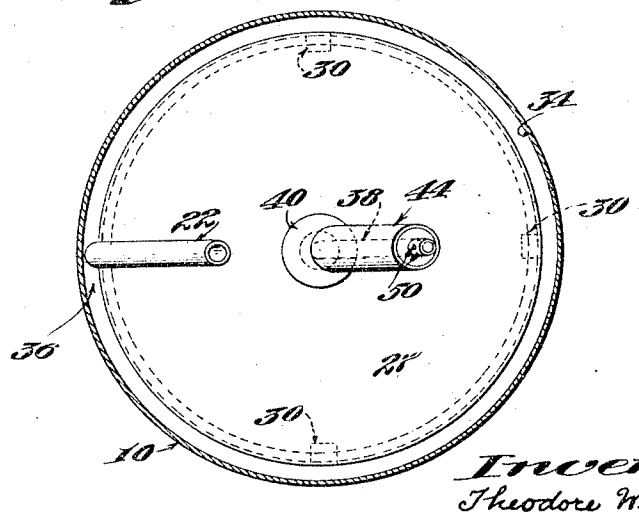


Fig. 2



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UNITED STATES PATENT OFFICE.

THEODORE W. DAHLQUIST, OF DEDHAM, MASSACHUSETTS.

BOILER.

Application filed September 4, 1924. Serial No. 735,886.

This invention relates to a hot water boiler and more particularly to a hot water boiler of the character commonly used in barber shops and in which the heat is applied directly to the bottom of the boiler for heating the water therein.

The invention has for its object to provide a boiler of the character specified, with means whereby hot water may be obtained within a minimum time after the heat has been applied to the bottom of the boiler.

In the usual construction of hot water boiler employed in barber shops, considerable time elapses between the lighting of the gas burner for heating the bottom of the boiler and the flow of hot water of the desired temperature from the tap or hot water faucet, because of the fact that as these boilers are now constructed it is necessary to heat the entire body of water within the boiler.

In accordance with the present invention, provision is made for confining the heat applied to the bottom of the boiler to action upon a relatively small portion of the water within the boiler, and for preventing the heat in this water from being dissipated by convection upwardly throughout the main body of water within the boiler, so as thereby to cause such relatively small body of water to become rapidly heated to a high temperature, and provision is made for conducting the water thus heated directly to the hot water outlet pipe from the boiler leading to the hot water tap or faucet. Provision is also preferably made for automatically effecting discharge of the hot water into the boiler when the hot water faucet or tap is closed to thereby establish circulation within the boiler and permit the entire body of water within the boiler to be gradually heated.

These and other features of the invention will be hereinafter described and particularly pointed out in the claims at the end of this specification.

In the drawing illustrating the preferred embodiment of the invention, Fig. 1 is a vertical section of the improved boiler, and Fig. 2 is a plan of the boiler shown in Fig. 1 with the cover or upper part thereof removed.

Referring to the drawing, the body portion 10 of the boiler illustrated therein may and preferably will be constructed of copper in the usual manner and of the usual size at present employed in barber shops, and may and preferably will be heated in the usual manner by a gas burner 14 located below the boiler so that the gas flame may be directed against the bottom of the boiler. The body portion of the boiler may and preferably will be provided with a head or upper portion 16 riveted or otherwise secured to the body portion of the boiler 10 and which is provided with nipples 17, 18, brazed or otherwise secured to the exterior thereof to register with enlarged holes 20, 21 in the top or head portion of the boiler, and with which the usual connection is made to the cold water supply pipe 22 and to the hot water outlet pipe 23 leading from the boiler to the hot water tap or faucet.

In order that hot water may be obtained at the hot water tap or faucet in a minimum time after the gas burner 14 is lighted, provision is made for confining the action of the gas burner in heating the water to the small body of water in the immediate vicinity of the bottom of the boiler, and also for preventing the dissipation of the heat in such body of water upwardly into the main body of the cold water within the boiler, both by conduction and by convection currents. Provision is also made for directly connecting this relatively small body of water in the immediate vicinity of the bottom of the boiler, with the hot water outlet pipe 23 leading from the boiler, as herein shown, by a partition member 27 preferably in the form of a metal dome of double wall construction and having the upper and lower walls 28, 29, thereof separated and confining a body of air to render the dome heat insulating. The partition member or dome 27 is supported within the boiler near the bottom thereof and as herein shown is supported upon a plurality of U-shaped supporting members 30 resting directly upon the bottom of the boiler, and which are of such height as to form between the lower wall 29 of the dome 27 and the bottom of the boiler, a chamber for containing a relatively small proportion of the water contents of the boiler. The metal dome 27 is preferably arranged to substantially cover the bottom of the boiler and to extend to near the side wall 34 thereof and to form with the side wall 34 a narrow annular opening 36 through which cold water may flow into the space or chamber below the dome when the heated water from such space is

drawn from the boiler. The heated water in the space or chamber below the dome is conducted directly to the hot water outlet pipe 23 leading from the boiler, preferably through a conduit or pipe 38 which is preferably screwed into a threaded hole tapped at the proper angle in a central block 40 in and forming a part of the metal dome as illustrated in Fig. 1, and the upper end of the conduit or pipe 38 is arranged to terminate within the nipple 18 so that the pipe is operatively supported by the dome 27 and confined at its upper end from movement by the nipple 18. The pipe 38 is preferably provided with an insulated jacket member herein shown as comprising an enlarged secondary pipe 44 having the ends thereof closed by plugs 45, 46, to form a confined air space around the main body of the pipe 38 to insulate the hot water passing through the pipe from the cold water within the main body of the boiler. The cold water supply pipe 22 is preferably bent as illustrated in Fig. 1, and arranged to extend downwardly to near the bottom of the boiler and to terminate in close proximity to the annular inlet opening 36 surrounding the marginal portion of the metal dome 27. With this construction it will be observed that the metal dome 27, substantially covering the entire bottom of the boiler, serves as a partition, to not only insulate the body of water beneath it which is rapidly heated by conduction from the gas flame through the bottom of the boiler, but also serves to prevent convection currents being established, which otherwise would dissipate the heat from the relatively small body of water beneath the dome, to the main body of cold water within the boiler and as a result of this construction, within an exceedingly short time after the gas of the burner is lighted, hot water may be drawn directly from the hot water tap or faucet. This construction, therefore, is of particular advantage in the type of boilers used in barber shops in which the demands for hot water are more or less intermittent.

The openings 20, 21 in the top or cover member 16 of the boiler are constructed of a sufficient size to enable the bent portion of the cold water supply pipe 22 to be readily inserted therethrough and also to permit the jacketed pipe 38 to be removed if occasion requires.

In order to establish circulation from the chamber or space below the dome or partition member 27, in the event that the gas burner remains lighted and the hot water faucet or tap closed, the upper end of the conduit or pipe 38 is provided with a plurality of openings 50 through which the heated water may pass outwardly into the main body of the boiler and in this manner establish a definite circulation from the main body of cold water downwardly through the annular inlet opening 36 around the metal dome 27 and thence from the heated body of water beneath the metal dome upwardly through the pipe 38 and outwardly through the openings 50 into the main body of the boiler, thus serving to gradually heat up the main body of water within the boiler.

While the preferred form of the invention has been illustrated and described, it is to be understood that the invention may be embodied in other forms within the scope of the following claims.

Having thus described the invention what is claimed is:

1. The combination with a hot water boiler having a head provided with a cold water inlet and a hot water outlet, a partition within the boiler located near the bottom thereof to form therewith a hot water chamber within the boiler and to form with the sides of the boiler a water inlet for said chamber, a hot water outlet pipe for said chamber attached to said partition and having its upper end extended into the hot water outlet in the head of the boiler, a pipe surrounding the portion of the hot water outlet pipe above said partition, and closed at its ends to form a closed insulating chamber about said hot water outlet pipe for substantially the length of the same above said partition, and a cold water inlet pipe for said boiler extended from the cold water inlet in the head of the boiler to near the water inlet for said hot water chamber.

2. The combination with a hot water boiler having a head provided with a cold water inlet and a hot water outlet, a partition within the boiler provided with a closed air chamber located near the bottom of the boiler to form therewith a hot water chamber within the boiler, a hot water outlet pipe for said hot water chamber attached to said partition and having its upper end extended into the hot water outlet in the head of the boiler and provided with a water outlet near said head, a pipe surrounding the hot water outlet pipe for said chamber between the water outlet in said hot water outlet and said partition and closed at its ends to form an air chamber about the hot water outlet pipe for said chamber, and a cold water inlet pipe for the boiler extended from the cold water inlet in the head of the boiler to near the water inlet for said hot water chamber.

3. In a hot water boiler having a head provided with a cold water inlet and a hot water outlet, a unit construction insertable into the boiler and comprising a partition of smaller diameter than said boiler, a pipe attached to said partition, and a pipe of larger diameter surrounding the portion of the first-mentioned pipe above the partition and closed at its ends, the said unit when

located within the boiler co-operating therewith to form a hot water-chamber at the bottom of the boiler and to form within the boiler a passage for cold water to said hot water chamber, a direct passage from said chamber into the hot water outlet for the boiler and a heat insulating air chamber between the said direct passage and the water in the boiler for substantially the length of the said direct passage.

4. A unit capable of being inserted into and removed from a hot water boiler comprising a partition of smaller diameter than the boiler into which the unit is to be inserted and constructed to form with the bottom of the boiler a hot water chamber and to also form within the boiler a passage for cold water to said hot water chamber attached to said partition to communicate with said chamber and a second pipe of larger diameter mounted upon the first-mentioned pipe above the partition and closed at its opposite ends to form a closed air chamber about said first-mentioned pipe between the upper end thereof and said partition.

In testimony whereof, I have signed my name to this specification.

THEODORE W. DAHLQUIST.

CERTIFICATE OF CORRECTION.

Patent No. 1,648,043. Granted November 8, 1927, to

THEODORE W. DAHLQUIST.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, line 18, claim 4, after the word "chamber" insert a comma and the words ", a pipe"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 29th day of October, A. D. 1929.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)