E. T. WELLS.

WATER HEATER.

APPLICATION FILED MAY 3, 1919.

1,338,760.

Patented May 4, 1920.

Fig. 1.

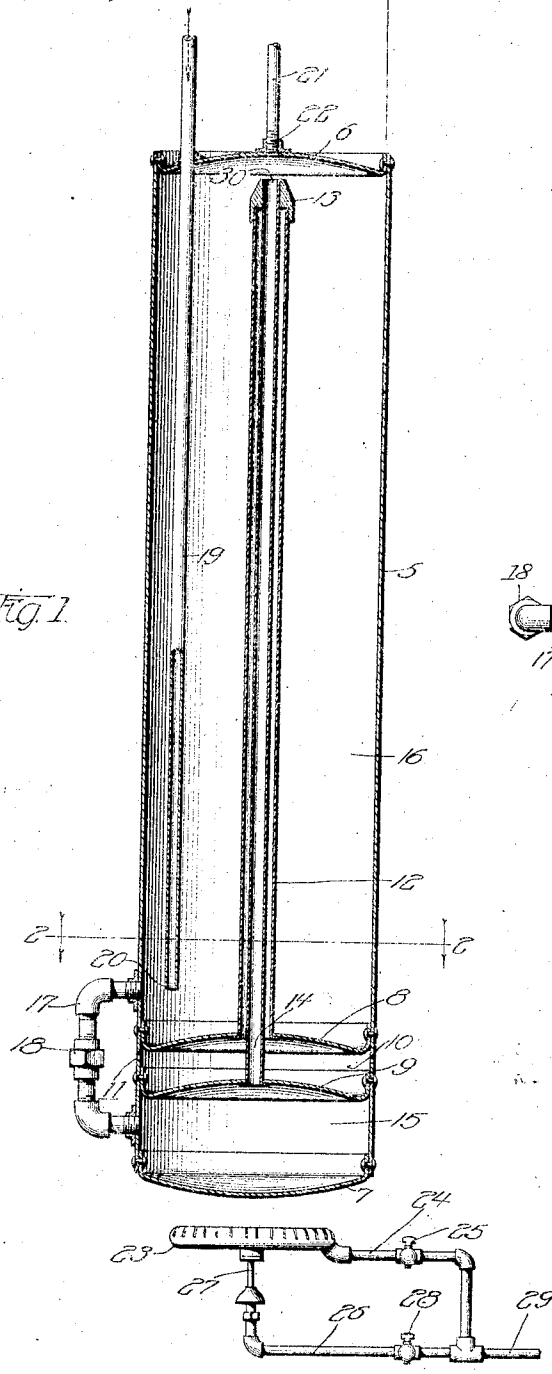
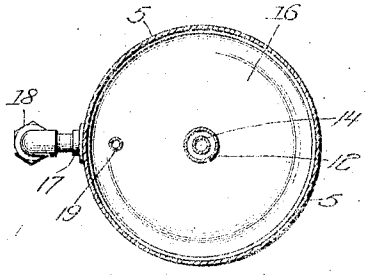


Fig. 2.



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UNITED STATES PATENT OFFICE.

EZRA T. WELLS, OF CHICAGO, ILLINOIS.

WATER-HEATER.

1,338,760. Specification of Letters Patent. Patented May 4, 1920.

Application filed May 3, 1919. Serial No. 294,619.

To all whom it may concern:

Be it known that I, EZRA T. WELLS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Water-Heaters, of which the following is a specification.

The invention relates to water heaters and has especial reference to means for heating water in kitchen boilers, or the like.

One of the objects of the invention is to increase the efficiency of devices of this character.

Another object is to provide, in coöperation with a suitable burner, a wall of the boiler of such contour, or configuration, that it will not hinder complete combustion of the gases and therefore the incombustible products of combustion, being so limited in quantity and character are not offensive to the occupants of the room, rendering piping to the chimney unnecessary.

Another object is to provide a boiler and heater as a unitary structure.

Another object is to surround the hot water pipe, carry the water to the top of the boiler with a dead air space open to the atmosphere.

Other and more specific objects of the invention will become readily apparent, to persons skilled in the art, from a consideration of the following description when taken in conjunction with the drawings, wherein:—

Figure 1 is a central vertical section of a boiler showing my improved preferred form of water heating arrangement.

Fig. 2 is a section taken on line 2—2 of Fig. 1.

In all the views the same reference characters are employed to indicate similar parts.

5 is a kitchen boiler in inverted position with the end 6, which is usually at the bottom of the boiler, located at the top, and the convex end 7 located at the bottom, for a purpose to be hereinafter more fully explained.

Near the lower end of the boiler and part of the unitary structure are two diaphragms 8 and 9, spaced apart to provide an air space 10 therebetween. This air space may be vented to the outside atmosphere by a vent hole 11, if desired. The upper diaphragm 8 is connected to an air containing pipe 12, which is closed at its upper end as by a reducer 13. A smaller water conducting pipe 14, is connected to the lower diaphragm 9 and communicates with a water compartment 15. The compartment or chamber 15 is connected with the main compartment 16 by suitable means, as by means of proper fittings 17 and the union 18. The water intake pipe 19 passes through the upper head 6 to a point 20 near the bottom of the boiler.

The air space between the pipes 12 and 14 serves as an insulator to prevent the heated water passing up through the pipe 14 from the compartment 15 being cooled by the relatively cool water within the larger compartment 16 of the tank. A hot water delivery pipe 21 is located in the upper head 6 of the boiler, as at 22, through which hot water from the tank passes to any suitable point of delivery.

A fuel burner 23 is fed by a suitable pipe 24 controlled by a cock 25. Another pipe 26 supplies the pilot burner 27 and this burner is controlled by the cock 28. Both burners are connected to a supply pipe 29 through which the gas or other fluid fuel passes to the respective burners.

The lower head of the structure is convexed or flat, so that when the gases from the burner 23 impinge upon this surface they are not held long enough in contact with the relatively cold head to set free the carbon, and thus prevent complete combustion of the gases, as would be the case if the head were concaved, as usual where burners are applied to tanks of this character and when the concave head of the tank is at its bottom end in which position they are usually installed.

The burner 23 heats the water in the compartment 15, which rises rapidly through the pipe 14, and discharges at its upper end, as at 30, immediately in the neighborhood of the lower end of the pipe 21. The air space, between the pipes 12 and 14, insulates the ascending column of relatively hot water and prevents it from being chilled by the colder water that intervenes between the diaphragm 8 in the upper end of the composite pipes 12 and 14. The colder water passes through the bypass fittings 17 and the union 18, into the lower chamber 15.

When heat is applied to the bottom of the structures illustrated the water immediately over the burner will rise in a most direct

line and therefore it will necessarily pass up through the pipe 14 and be discharged through the upper end, as at 30, into the tank. There is an air space between the pipes 12 and 14, which insulates the pipe 14 carrying the heated water so that the water is delivered at the end 30 into the main tank at substantially the same temperature that it attains in the chamber 15 immediately over the burner.

While I have herein shown a single embodiment of my invention, for the purpose of clear disclosure, it will be manifest, to persons skilled in the art that considerable change in the arrangement and configuration of the parts may be made within the scope of the appended claims.

Having described my invention, what I claim is:—

1. A heater of the character described providing a tank having a lower and an upper water chamber and an intermediate air chamber, the latter having air inlet passage ways through the walls of the tank out of the path of the products of combustion from the heating burner; a water pipe connected to the water chamber, passing through the air chamber and opening into the upper chamber near the top thereof; an air pipe surrounding the water pipe and spaced away therefrom, closed at its upper end and having its lower end connected to said intermediate air chamber to provide an air jacket for said water pipe and for the lower end of said upper chamber; means for connecting the two water chambers together and a burner applied to the lower end of said tank.

2. A unitary structure of the character described having in combinative association an elongated tank providing a lower convex smooth end wall, a pair of spaced apart diaphragms near the lower end of said tank providing two water chambers and an air space therebetween; a water pipe connected to the substantial center of the lower diaphragm extending through the substantial center of the tank and opening at its upper end near the upper end of the tank; a larger concentrically disposed pipe connected to the upper diaphragm surrounding the water pipe, to provide a dead air space between the pipes extending substantially the full length of the water pipe and closed at its upper end; a bypass around said diaphragms and a fuel burner under the lower end of the tank.

3. An article of manufacture comprising an elongated boiler, having two spaced apart diaphragms, near one end, dividing the boiler into two water chambers and an intermediate air chamber, said boiler having openings in its walls into said air chamber; a water pipe connected to one water chamber and extending to the remote end of the other water chamber and an air pipe connected to the air chamber, surrounding the water pipe and closed at its upper end, to provide a dead air space.

In testimony whereof I hereunto subscribed my name.

EZRA T. WELLS.