Feb. 13, 1951 J. S. HALMASY, SR 2,541,245

COIL TYPE WATER TUBE HEATER

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Fig. 1.

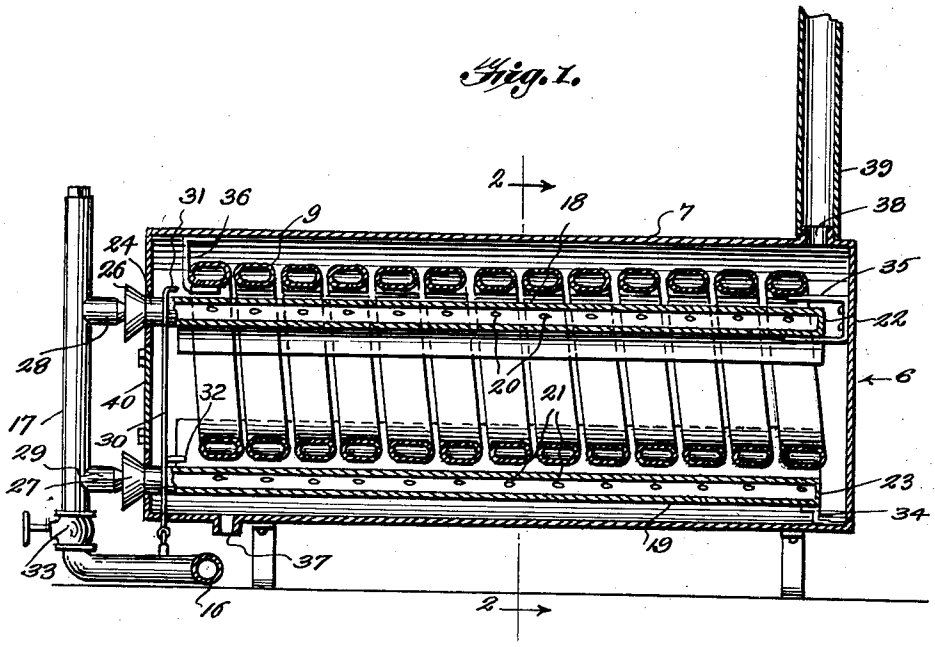
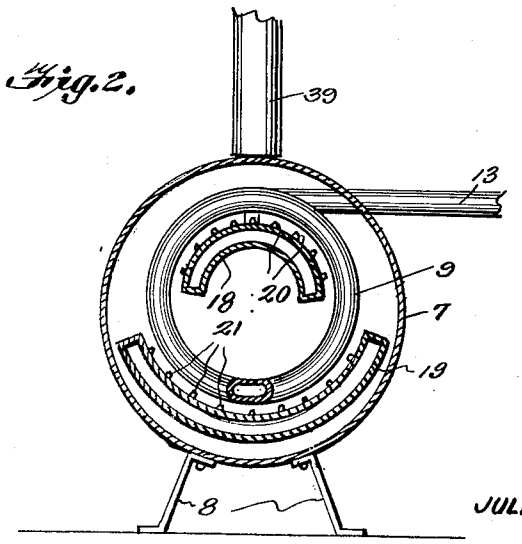


Fig. 2.



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COIL TYPE WATER TUBE HEATER

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2 Claims. (Cl. 122—248)

1

This invention relates to a novel construction of water heater and more particularly to a water heater of the horizontal type which is so constructed and arranged that a given quantity of water may be heated more rapidly and with the use of less fuel than is required with conventional water heaters of the vertical type.

More particularly, it is an object of the invention to provide a horizontal water heater wherein the water to be heated is contained within a helical or spiral coil which is so constructed and arranged that a maximum amount of the water will be located adjacent to the heating unit of the heater for insuring a rapid heating of the water and with the minimum expenditure of the heating fuel.

Still a further object of the invention is to provide a hot water heater having an especially constructed burner unit disposed in close proximity to the water to be heated for utilizing to a maximum the heat generated by the burner unit.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, illustrating a preferred embodiment thereof, and wherein:

Figure 1 is a longitudinal, substantially central sectional view, partly in side elevation, of a heater constructed in accordance with the preferred embodiment of the invention, and

Figure 2 is a transverse sectional view thereof, taken substantially along a plane as indicated by the line 2—2 of Figure 1.

Referring more specifically to the drawings, the improved hot water heater in its entirety is designated generally 6 and includes a jacket 7 which is preferably cylindrical in cross-section and which is adapted to be disposed with its axis in a horizontal plane and thus supported by a plurality of legs 8 which are secured to and depend from the under side thereof. The jacket 7 may be formed of any suitable heat resistant material and may be provided with any suitable heat insulation, not shown.

A spirally coiled pipe 9, preferably formed of copper, is disposed within the jacket 7, substantially concentric therewith, and extends substantially from end to end of said jacket. The individual convolutions of the coiled pipe 9 are oval in cross-section, as best seen in Figure 1, and with the widest portion thereof disposed longitudinally of the jacket 7, for purposes which will hereinafter become apparent. One end (not shown) of the coiled pipe 9 projects substantially tangentially from the lower part of the coil and

2

at one end thereof and extends outwardly through the jacket 7 and is adapted to be connected to an end of a pipe or conduit (not shown) which in turn is connected to a suitable source of supply of water. The opposite end of the coiled pipe 9 terminates in an end portion 13 which projects tangentially from the upper part of the coil and adjacent the opposite end of the jacket 7, through the side wall of the jacket, and is coupled at 14 to an end of a conduit 15, which is adapted to be connected to one or a plurality of hot water outlets, not shown, such as hot water spigots or faucets.

A gas conduit or pipe 16 is provided with a closed end portion 17 which is disposed in substantially upright position beyond one closed end of the jacket 7 and adjacent the inlet end of the coil 9. The opposite end of the conduit 16, not shown, is adapted to be connected to a suitable source of gas supply.

The jacket 7 contains two elongated gas burners 18 and 19, each of substantially the same length as the coil 9. The burners 18 and 19 are each arcuate in cross-section, as seen in Figure 2, and the burner 18 is substantially smaller in cross-section than the burner 19 and is disposed within the coil 9 and adjacent the upper part thereof and its transverse curvature conforms substantially to the curvature of the coil. The upper, convex side of the burner 18 is provided with a plurality of orifices or jets 20 located within and adjacent the upper part of the coil 9. The burner 19 is likewise curved transversely to conform substantially to the curvature of the coil 9 and is disposed between the lower part thereof and the lower part of the jacket 7 and substantially concentric to each and is of a width substantially greater than the width of the burner 18. The upper, concave side of the burner 19 is provided with a plurality of orifices or jets 21, opening toward the outer and lower portion of the coil 9. The burners 18 and 19 are provided with closed ends 22 and 23 respectively, as seen in Figure 1, and restricted tubular opposite ends 24 and 25, respectively, which project through openings in an end wall of the jacket 7 and adjacent to the pipe portion 17. Said tubular ends 24 and 25 terminate in flared mouths 26 and 27, respectively, on the outer side of the jacket 7 and which form the inlet ends of the burners 18 and 19 and into which project nozzles 28 and 29 which form integral lateral extensions of the conduit portion 17 and by means of which gas from the pipe line 16 is admitted to the burners 18 and 19.

The gas line 16 is provided with a portion disposed beneath the end of the jacket 7 through which the tubes 24 and 25 extend, and said portion 16 is provided with a pilot pipe 30 which extends upwardly therefrom through the bottom of the jacket 7 and adjacent said aforementioned end wall. The pilot tube 30 is provided with jets 31 and 32 which are disposed to open above the perforations 20 and 21, respectively, and from which a flame constantly projects for igniting the gas ejected from the perforations 20 and 21 when a valve 33, located in the pipe line 16 and between the pilot tube 30 and nozzle 29, is in an open position to admit gas to the burners 18 and 19.

The jacket 7 includes brackets 34, 35 and 36 which are secured to the interior thereof and by which the coil 9, and burners 18 and 19 are supported within the jacket 7 in properly spaced relationship thereto and to one another. The cylindrical wall of the jacket 7 is provided with a drainage outlet 37, located in the bottom thereof and adjacent the end wall through which the tubes 24 and 25 project. The drainage outlet 37 is provided to permit the drainage from the jacket 7 of any condensation which may accumulate therein. The upper part of the cylindrical wall of the jacket 7 is provided with a flanged outlet 38 which is located adjacent the opposite end thereof and which is connected to an end of a flue pipe 39, by means of which the products of combustion may be carried off from the jacket 7.

From the foregoing it will be readily apparent, that when the valve 33 is in an open position, gas will be supplied to the burners 18 and 19 and will be ignited by the pilot jets 31 and 32 as the gas is emitted from the perforations 20 and 21 thereof. As the burners 18 and 19 and their perforations 20 and 21 extend substantially the length of the coiled pipe 9, the gas flames thus produced will heat the water or liquid passing through the coil 9, both in the upper and lower parts thereof and both adjacent the inner and outer walls of each convolution of the coil to insure maximum utilization of the gas consumed for heating the water passing through the coiled conduit 9. The heated products of combustion will move toward the top and toward one end of the jacket 7 to be released through the flue 39 and in their movement will pass longitudinally through or around and between the individual convolutions of the coil 9 to obtain the maximum benefit from the heat carried by said products of combustion before release thereof to the flue outlet. The flat or oval shape of the individual convolutions in

the coil 9 will insure that a maximum amount of the contents thereof is maintained at all times in close proximity to the sources of heat so that the maximum heating effect will be obtained from the fuel consumed.

The end wall of the jacket 7 through which the tubes 24 and 25 project is preferably provided with a door or closure 40, affording access to the interior of the jacket 7 and to facilitate the igniting of the jets 31 and 32.

Various modifications and changes are contemplated and may obviously be resorted to, without departing from the spirit and scope of the invention as hereinafter defined by the appended claims.

I claim:

1. In a hot water heater, a helical water conduit adapted to be connected at its opposite ends to a source of water supply and to an outlet for hot water, respectively, said conduit being disposed with its longitudinal axis in substantially a horizontal plane, and a plurality of elongated heater units, each of arcuate cross-section and substantially conforming to the curvature of said helical conduit, one of said heater units being disposed within the helical conduit and adjacent the upper part thereof and having upwardly opening orifices in its upper convex side, and the other burner unit being disposed beneath and adjacent the helical conduit and having upwardly opening orifices in its upper, concave side, the first named heater unit being disposed in superposed relation to the second unit whereby it serves to baffle flames and gases of the latter around the coils of the helical conduit.

2. A hot water heater as in claim 1, the individual convolutions of said helical conduit being oval shaped in cross-section and being widened in a direction longitudinally of the coiled conduit and spaced from one another.

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