

Nov. 12, 1963

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WATER HEATERS

3,110,302

Filed March 7, 1961

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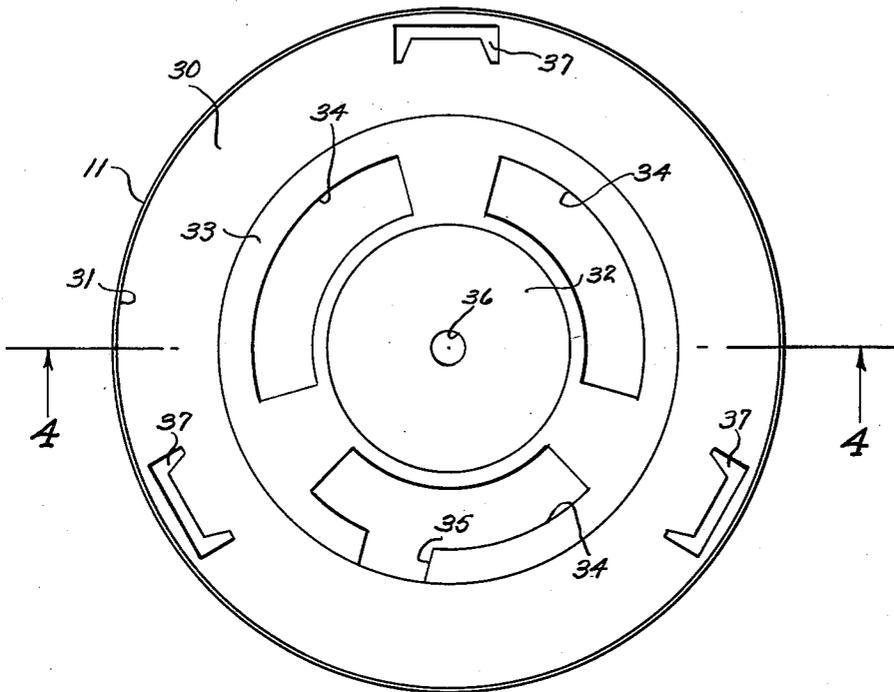


Fig. 3

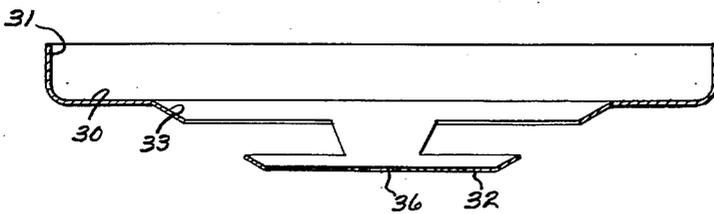


Fig. 4

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3,110,302

WATER HEATERS

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 Filed Mar. 7, 1961, Ser. No. 94,054
 1 Claim. (Cl. 126—363)

This invention relates to water heaters and more particularly to an improved base for supporting a water heater tank and casing and for mounting a combustion type heater burner thereto.

An important objective of this invention is to provide a water heater base which comprises mounting means for the heater burner and so directs and influences the incoming air to the burner as to produce a uniform, concentric flame pattern.

It is also an object of this invention to provide such a base the design of which is readily adaptable to various size water heaters.

A still further object of this invention is to provide a base having the above characteristics which is formed from a single piece of sheet metal thereby effecting considerable savings in time, material, and general cost of manufacture.

Yet another object of this invention is to provide a base of the above type which is extremely strong and durable and highly efficient in use.

Other objects and advantages of the heater base of this invention will be readily appreciated from the following specification and the accompanying drawings, in which said drawings:

FIG. 1 is a vertical section of a water heater having a base of a type embodying the subject of the present application;

FIG. 2 is an enlarged detail of the lower portion of the water heater of FIG. 1;

FIG. 3 is a top plan view of the heater base of FIGS. 1 and 2; and

FIG. 4 is a section taken along the line 4—4 of FIG. 3.

Referring now to the drawings in all of which like parts are designated by like reference characters, and referring more particularly to FIG. 1, at 10 there is generally shown a water heater of a type commonly used in the modern home. The water heater 10 comprises a circular base 11 having a plurality of legs 12 and adapted to support an insulated, underfired water tank 13 which is seated upon a drumlike supporting member 13a.

The tank 13 is cylindrical in section and is provided with a central flue 14 having a flue baffle 14a therein, said flue extending coaxially through said tank from the bottom 15 through the top 16 thereof. The tank 13 is encased with a sheet metal drum or casing 17 which projects upwardly above the top 16 of said tank and is spaced radially outwardly from the tank thereby providing a circumferentially continuous uniform space between said tank and said drum. This space is preferably filled with suitable heat insulating material 9 such as fiber glass or the like. The drum 17 is provided with a top closure plate 18 having a circumferentially continuous downwardly directed flange 18a which telescopically fits over the uppermost end of said drum. The closure plate 18 is centrally apertured at 18b, said aperture having an upwardly directed peripheral collar 18c. The flue 14 projects upwardly through said aperture and extends within said collar. A draft hood 19 is mounted upon the closure plate 18 above the uppermost end of the collar 18c.

The base 11 provides mounting means for a centrally disposed, combustion type burner 20 and a pilot light burner 21 which are respectively connected at the lowermost ends thereof to incoming gas lines 22 and 23. The gas lines 22—23 are connected to a supply source (not shown) whereby gas is directed to the burners 20—21

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through thermostatically controlled valve means 24 which is mounted to the side of the water heater. The pilot light burner 21 has a thermocouple 26 unitarily mounted therewith which is connected to the valve means 24 by a line 27. Said thermocouple operates in a conventional manner to shut off the gas supply to said pilot burner if it stops burning for any reason. It will be understood that the valve means 24 also operates in a well known manner to normally deliver a continuous flow of gas to the pilot light burner 21 and to intermittently supply a larger amount of gas to the main burner 20 in response to a reduction in the temperature of the water within the tank 13.

Referring now to FIGS. 3 and 4, the base 11 is formed from a single piece of relatively heavy gauge sheet metal and comprises a disk 30 having a circumferentially continuous, upwardly directed peripheral flange 31 and a centrally disposed, circular recessed portion 32. The recess portion 32 is integrally connected with the disk 30 by means of a frusto-conical wall 33. As best seen in FIG. 3, the wall 33 is provided with a plurality of uniform, circumferentially evenly spaced, arcuate apertures 34. One of the apertures 34 is intersected by a slot 35 which extends outwardly to the inner periphery of the disk 30. The base 11 is also centrally apertured as indicated at 36 and is provided with a plurality of channel-shaped openings 37 in the disk portion 30 adjacent the flange 31.

Referring now to FIG. 2, it will be noted that the tank 13 and the drum 17 are supported by the disk 30 of the base 11 with said drum closely telescopically interfitted the flange 31. The base 11 is in turn supported by the legs 12 which are generally U-shape in section and interfit the U-shape openings 37 of said base.

It will also be noted that by means of the legs 12 the recessed portion 32 of the base 11 is disposed a substantial distance above the floor or surface upon which the water heater 10 is resting. The central aperture 36 of said base provides means for mounting an elongated, combustion type burner such as the main burner indicated at 20. The gas line 22 terminates in an elbow 28 having an upwardly projecting threaded portion 28a which projects through the central aperture 36. The main burner 20 has an internally threaded portion 20a which is thread fitted upon the threaded portion 28a of the elbow 28 and fastened down tightly against the upper surface of the recessed portion 32. A lock nut 29 is positioned upon the threaded portion 28a below the recessed portion 32 whereby the burner is secured firmly in place.

The burner 20 is of conventional design having a shutter 41 adjacent the lower end thereof which adjustably covers a plurality of orifices 42. The orifices 42 are elongated in shape with the longest dimensions thereof being parallel with the axis of the burner, and the shutter 41 is slidably telescoped over said burner whereby it is adjustable to cover said orifices any desired amount.

The uppermost end or jet 43 of the burner is provided with an upwardly spaced, concentrically located canopy 44 which causes the flame F of the jet 43 to spread or radiate outwardly in a preferably uniform manner.

The pilot light burner 21 and the thermocouple 26 are mounted adjacent the jet 43, at the optimum point for igniting said jet, by means of an elongated bracket means 45 which is secured to the lower surface of the disk 30 by any suitable means, such as a bolt 46 and a wing nut 47, and projects radially inwardly therefrom through the slot 35.

A floor shield 50 is concentrically disposed in upwardly spaced relation to the disk 30 by means of a plurality of angled support members 51 which are welded or otherwise suitably secured to the lower surface of said floor shield and which have radially outwardly projecting tabs

52 which extend beneath the lower edge of the supporting member 13a of the tank 13. Said floor shield is circular in form and is spaced radially inwardly from the walls of the supporting member 13a of the tank 13. Said floor shield is also provided with a relatively large central aperture 53 through which the upwardly projecting burner 20 extends. The aperture 53 is of such dimension as to allow an unrestricted flow of air upwardly around the burner 20.

The water heater 10 is also provided with suitable access means for lighting the pilot burner 21 or adjusting the main burner 20, said access means comprising openings 17a and 13b in the drum 17 and supporting portion 13a of the tank respectively. The opening 17a has a suitable door or closure member 25 whereby the heating chamber or area beneath the tank may be closed.

In water heaters of the type herein described and illustrated, it is important that the flame pattern which emanates from the jet 43 around the canopy 44 to be uniform and as nearly concentric in relation to the tank 13 as possible. The base of the present invention is so designed as to provide a consistent and uniform pattern of air flow up to and around the burner 20 which will result in a correspondingly uniform flame pattern. As well shown in FIG. 2, air enters upwardly through the uniformly spaced apertures 34 and, as indicated by the arrows, is directed to the orifices 42 of the burner and also passes upwardly through the aperture 53 of the floor shield 50 as well as upwardly around the outer periphery of said floor shield. It will be noted that the shutter 41 and the orifices 42 are located generally within the recess of the base whereas the jet 43 projects substantially above said base and above the floor shield 50. By placing the shutter 41 in the area of the recess, the incoming air flows in an unrestricted manner directly to the orifices 42 to provide the primary air to be mixed with the incoming gas of the burner. Air which is not used as primary air then passes upwardly above the base into the chamber beneath the tank 13 and provides secondary air at the jet 43. The result of so directing and influencing the incoming air produces an optimum uniform and concentric flame pattern which results in highly efficient heating. The baffle 14a, herein shown as an elongated strip of helically twisted sheet metal or the like, serves to retard the exit of flue gases from the combustion chamber thereby obtaining the maximum efficiency from them. The floor shield 50 serves as a baffle against a sudden in-rush of air and also reflects heat from the flame F upwardly in the direction of the tank thereby protecting the floor upon which the heat-

er is resting and preventing the lower portion of the base and the parts associated therewith from becoming overheated.

The base and burner arrangement as herein set forth has proved to be substantially more efficient and economical than conventional devices commonly used. The design of the base is readily adaptable for water heaters having differing capacities or diametric dimensions merely by increasing or decreasing the diameter of the flange 31. The fact that the base is formed from a single sheet of material effects great savings in labor and materials, and the result is an integral unit of great strength.

It will be understood that many changes in the invention as herein illustrated and described may be made without, however, departing from the spirit thereof or the scope of the appended claim.

What is claimed is:

A base for a water heater comprising a disk having a concentric recess therein; said recess having upwardly divergent, frusto-conical walls; said disk having a circumferentially continuous, upwardly turned flange; a heater casing mounted upon said base and nested within said flange; a centrally apertured floor shield disposed in spaced relation above said disk; said floor shield being of such diameter as to be spaced inwardly from said heater casing at its outer periphery; said walls having a plurality of circumferentially spaced apertures therein for admitting air from below said disk into said recess; a burner mounted within said recess; said burner having an air shutter adjacent to the lower end thereof and a jet adjacent to the upper end thereof; said burner being mounted in said recess with said air shutter disposed generally within said recess and said jet disposed above the level of said floor shield whereby air enters through said apertures and provides primary air for said burner at said air shutter and passes upwardly through and around said floor shield and provides secondary air for said jet.

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