June 14, 1932. O. HOFFERBERT 1,863,273

WATER HEATER

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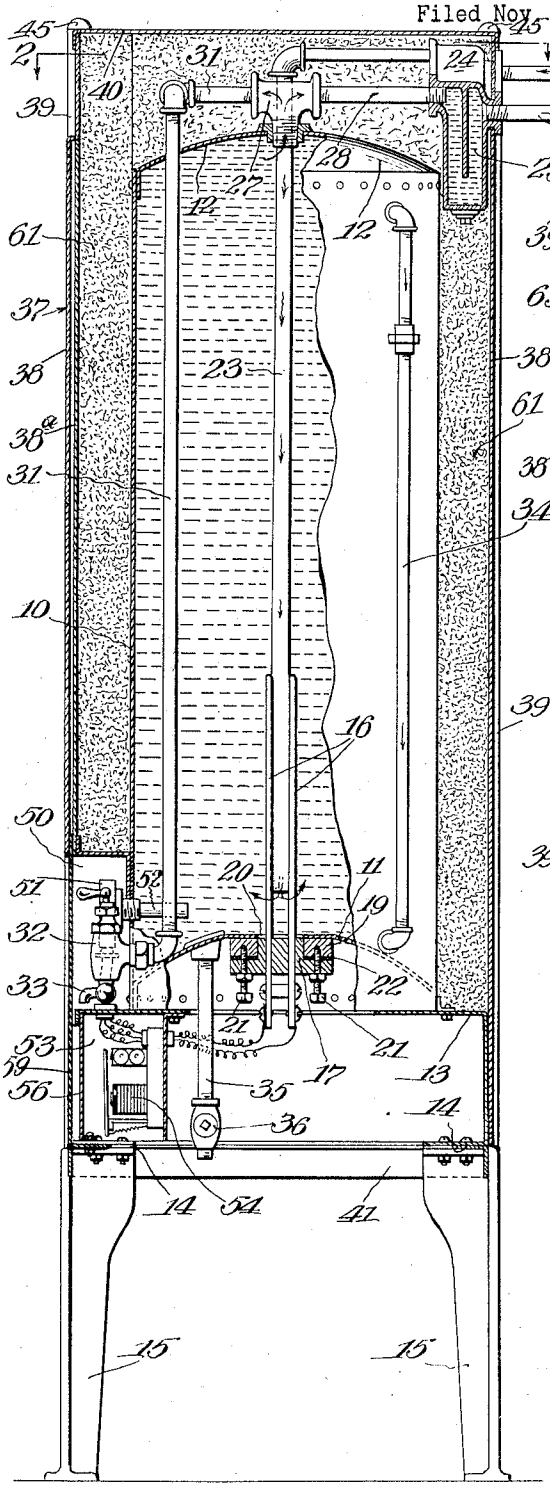

Fig. 1.

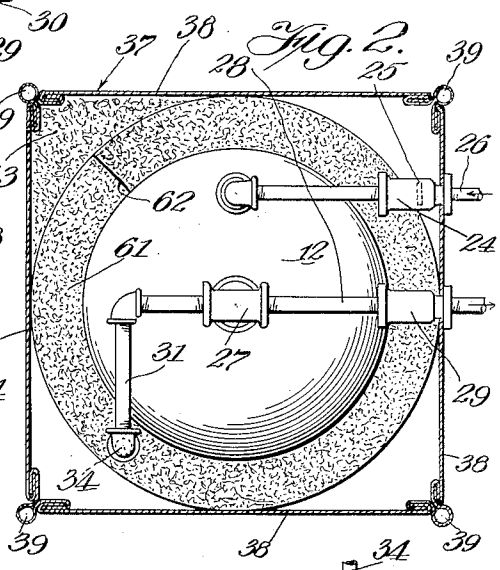

Fig. 2.

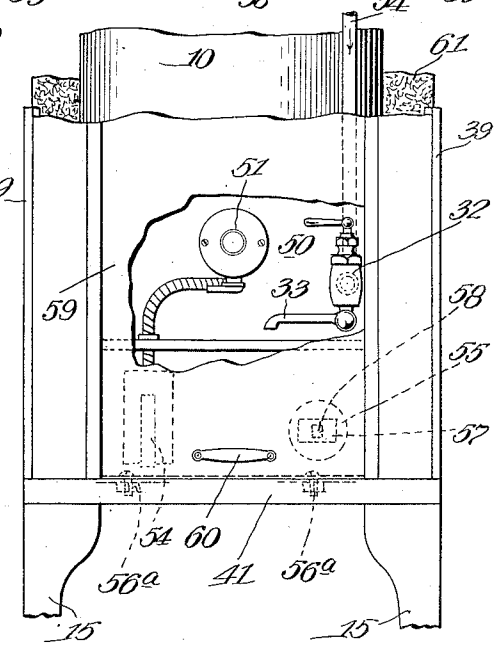

Fig. 3.

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Fig. 5.

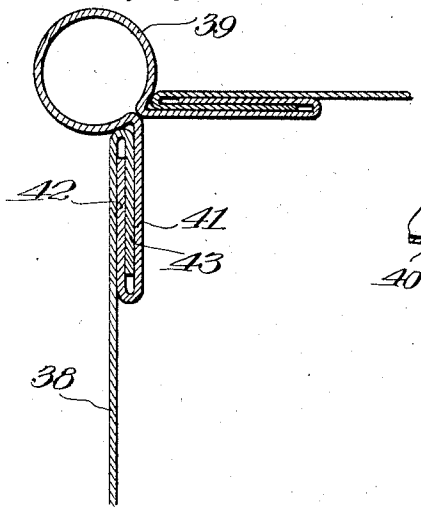

Fig. 6.

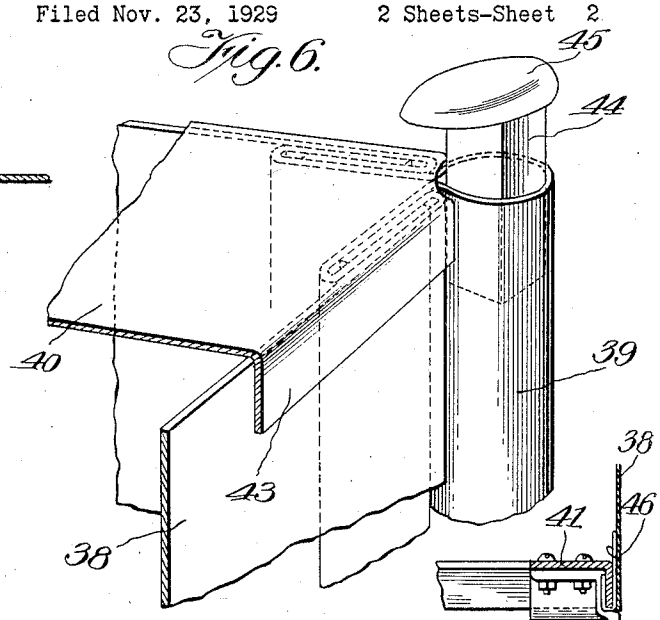

Fig. 7.

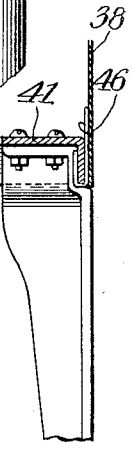

Fig. 4.

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UNITED STATES PATENT OFFICE

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WATER HEATER

Application filed November 23, 1929. Serial No. 409,339.

This invention relates to improvements in water heaters.

One object of the invention is to provide a water heater of improved construction which is of neat, compact arrangement and adapted to be installed in a kitchen, for instance, to provide a ready supply of hot water for domestic use.

Another object relates to the provision of a water heater comprising an insulated tank housed within a casing which encloses various tank accessories, thereby presenting a cabinet-like appearance, but which casing renders such accessories readily accessible, in use, for adjustment, repair or removal.

A further object of the invention relates to the provision of a hot water tank having a water circulating conduit which maintains the temperature of the water substantially uniform throughout the tank, thus preventing the accumulation of a relatively small quantity of excessively hot water at the top of the tank.

An additional object relates to the provision of a heating element for the water which can be removed from the tank when desired and which is secured in position by means on the exterior of the tank, thereby avoiding the rusting or encrustations of the securing means by water deposited material.

Another object of the invention relates to the provision of traps on the inlet and outlet pipes of the tank to retard the escape of heat by conduction through the water in the pipes.

A further object relates to certain features of the casing construction which avoids the use of visible rivets or bolts.

Further objects relate to various features of construction and arrangement of parts which will be apparent from a consideration of the following specification and accompanying drawings, wherein:

Fig. 1 is a broken vertical sectional view of a water heater embodying the present improvements;

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

Fig. 3 is a broken front elevation of a heater;

Fig. 4 is a broken perspective view of the tank casing and certain related parts;

Fig. 5 is an enlarged broken sectional view illustrating a portion of the casing construction;

Fig. 6 is a broken perspective view of an upper portion of the casing; and

Fig. 7 is a broken vertical sectional view taken on line 7—7 of Fig. 4.

In the drawings 10 indicates a water tank, which, in the embodiment shown, is provided with a concave bottom 11 and a convex top 12. The tank is supported by a transverse centrally apertured partition 13 which rests upon an angle iron frame structure 14 to which the legs 15 are secured whereby the tank is supported at a convenient distance above the floor. The means for supplying heat to the water in the tank 10, in the embodiment shown, comprises a pair of metal blades 16 having resistance wire enclosed in the same, the particular construction of which forms no part of the present improvements. The elements 16 pass through suitable apertures in the bottom closing plate 17 having a central boss 18 which extends into the ring 19 which is preferably welded to the outside of the bottom 11 in registration with an aperture 20 in the tank bottom. The plate 17 is secured to the ring 19 by means of screws 21 interposed between which plate and ring is a gasket 22. A water tight connection is thus effected but without the screws coming in contact with the water whereby the same are made free from deposits of lime or other material and are always in condition for convenient removal.

Water is supplied to the tank through a pipe 23 which is provided with a trap 24 comprising a hollow member having a depending baffle 25. This trap retards the conduction of heat through the water of the pipe 23 back into the supply line 26. The outlet of the tank in the particular construction shown is through a T coupling 27 and short pipe 28 through a second trap 29 similar to trap 24 and exterior pipe 30 to the place of use.

Where the tank is employed in the kitchen, for instance, it is desirable to have an addi-

tional outlet for hot water comprising the conduit 31 which extends downwardly along the side of the tank 10 and is provided with a faucet 32 at its lower end, the faucet having a swinging nozzle 33 whereby it can be swung outwardly from the position shown in Fig. 1 to clear the casing hereinafter described.

To prevent the accumulation of excessively hot water at the top of the tank 10, a circulating pipe 34 is provided which extends from adjacent the top of the tank to a point near the bottom thereof. It has been found that this pipe 34 effects the substantial equalization of the temperature throughout the tank, the hot water passing downwardly through the pipe 34 to effect a mixture of the hot and cold water, there being but a few degrees variation in the temperature of the water throughout the tank.

A drain pipe 35 having a shut off valve 36 at its lower end is provided for draining the water from the tank when desired. The tank is preferably provided with an outer casing indicated generally by the numeral 37 comprising walls 38, corner posts 39 and top 40. The corner posts are formed of sheet metal and as shown in Fig. 5, have laterally extended flanges 41, the free edges 42 of which are bent backwardly toward the post between which portions 41 and 42 a flange 43 of the side wall 38 telescopes. This provides a sturdy construction which obviates the use of visible bolts, rivets or other fastening means. The top 40 of the casing may be of sheet metal and has depending flanges 43 which extend downwardly a short distance along the exterior of the walls 38. The top is held in position by means of spikes each having a rectangular shaped body portion 44 and a head 45. Each spike is pressed down into the interior of a post 39 and is held therein by friction, the heads 45 overlying the corners of the top 40 and holding the latter in position. The bottom of the casing 37 rests upon the frame 14 and has clips 46 welded thereto which are bent under the vertical flange of the frame as shown in Fig. 7.

In the forward portion of the casing 37 a compartment 50 is provided in the space available between the outer surface of the tank 10 and the front wall 38. Within this compartment the faucet 32 is housed as well as the thermostat casing 51, the thermostat having a heat responsive member 52 which extends into the tank. Beneath the compartment 50 and separated therefrom by the forward portion of the partition 13 is a second compartment 53 within which is positioned the electrical relay 54 and the main switch 55.

A closure member 56 is provided in the compartment 53 having an aperture 57 therein through which extends the switch lever 58 for manually closing the circuit to the heating element 16. The closure member 56 may be removably secured by means of bolts 56^a whereby inspection of the accessories within compartment 53 may be made. The member 56, however, excludes dust, water, etc., from the switch and relay and their connections and also shields the electrical equipment against children.

A door 59, which slides vertically within the casing 37, between the front wall 38 and the inner panel 38^a, is provided which, when down, closes both compartments 50 and 53. When it is desired to obtain hot water the door is lifted by means of a convenient handle 60 and the faucet nozzle 33 swung outwardly.

Surrounding the tank 10 is insulating material 61, which, in the form shown (see Fig. 2) is in the form of a blanket. The vertical seam 62 of the blanket is preferably disposed adjacent one of the corners of the casing 37 which corner is packed with additional insulating material 63 to prevent the escape of heat through the seam 62. The traps 24 and 29, outlet pipe 31 and circulating pipe 34 are all enclosed within the casing 37 and are surrounded by insulating material whereby loss of heat through radiation is reduced to a minimum and the tank as a whole presents a neat unencumbered cabinet-like appearance.

Although I have shown certain features of my improvements for the purpose of illustration, it will be apparent that various changes may be made therein without departing from the spirit of the invention as defined by the appended claims.

What I claim is:

1. A water heater comprising a tank, water heating means therefor, water inlet and outlet conduits communicating with said tank and a hot water trap in each of said conduits, said traps each comprising a receptacle having inlet and outlet ports, an off-set body portion and a baffle interposed between said ports and extending toward and terminating short of the inner wall of said body most remote from said ports.

2. A water heater comprising a casing, a water tank supported therein, heating means for the water, said casing having a chamber beneath said tank providing access to said heating means, said casing having a compartment in one side wall thereof, means for regulating said heating means positioned in said compartment and a door for said second compartment, said door being slidable vertically within said casing.

3. A water heater comprising a tank, an electric heating element for said tank, current controlling means for said element, a casing enclosing and supporting said tank, said casing being spaced from said tank, heat insulating material in said space, a compartment in said casing extending inwardly thereof to said tank, a hot water faucet in

said compartment having a nozzle adapted to be swung outwardly of said compartment, the wall of said casing above said compartment having an inwardly spaced panel, and a door for said compartment slidable between said wall and panel.

4. A water heater comprising a tank, an electric heating element for said tank, current controlling means for said element, a casing enclosing and supporting said tank, said casing being spaced from said tank, heat insulating material in said space, a compartment in said casing extending from a wall thereof inwardly to said tank, a hot water faucet in said compartment having a nozzle adapted to be swung outwardly of said compartment, and a door for said compartment adapted to be closed when said faucet is in inner position for concealing said compartment.

5. A water heater comprising a water tank, an electric heating element for said tank, a casing enclosing and supporting said tank, said casing being spaced from said tank, a compartment in the lower portion of said casing extending from said wall inwardly toward said tank, a hot water outlet for said tank positioned in said compartment, a vertical panel in said casing supporting electrical apparatus comprising a switch for controlling current to said heating element, a horizontal partition between said outlet and apparatus for protecting the latter from water from said outlet, and a door for said compartment for concealing said compartment and apparatus.

6. A water heater comprising a tank, a casing supporting and enclosing said tank and having a chamber providing access to said tank at the bottom thereof, a heating element for said tank accessible from said chamber, a vertical panel at one side of said chamber for supporting electric apparatus comprising a switch for controlling current to said element, a second panel constituting a shield for said apparatus positioned inwardly of a wall of said casing and in front of said switch, said second panel being removable to provide accesss to said apparatus, said second panel having an opening therein, said switch having an operating portion projecting through said opening whereby said switch can be operated while said second panel is in normal position, and a door adapted to be moved over said panel to cover the same.

In testimony whereof, I have subscribed my name.

ORRIN HOFFERBERT.