

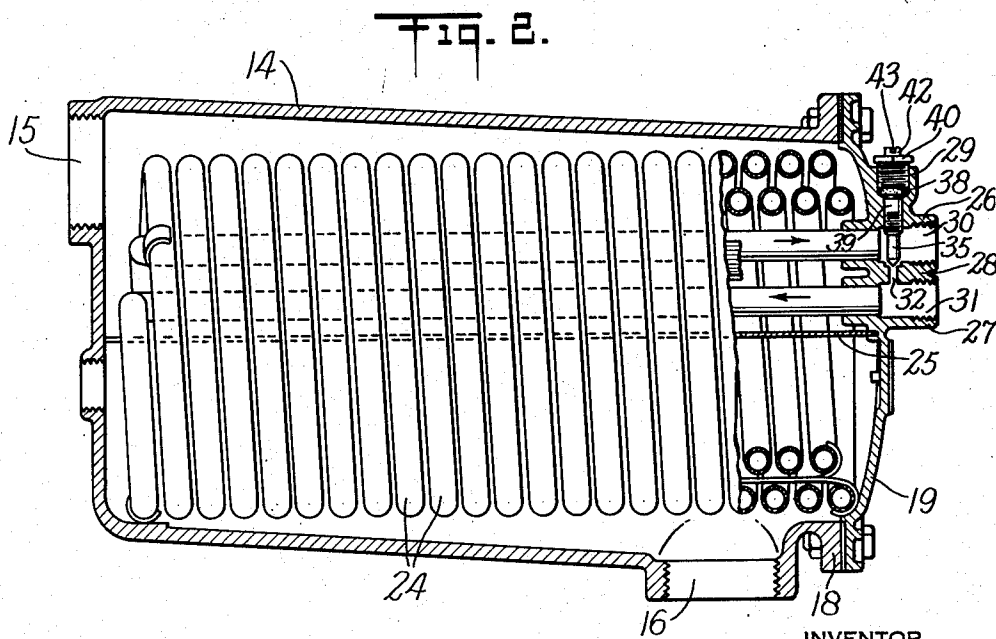
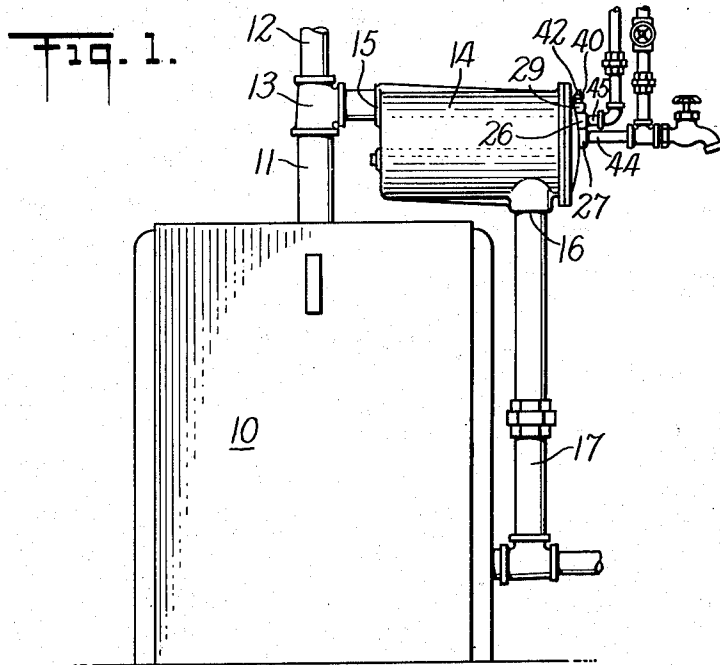
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TANKLESS HEATER AND BY-PASSING VALVE  
CONSTRUCTION THEREFOR

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2 Sheets-Sheet 1



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# UNITED STATES PATENT OFFICE

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## TANKLESS HEATER AND BY-PASSING VALVE CONSTRUCTION THEREFOR

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2 Claims. (Cl. 257—248)

1

This invention relates to domestic hot water heating installations, more particularly to a tankless heater, and still more particularly to a tempering valve for a tankless heater.

My invention is concerned with a domestic hot water heating system in which a heating medium is circulated in heat exchange relationship to a heat exchanger, to supply domestic hot water without storage. Systems so installed employ under thermostatic responsive valves control an addition of tempering water to the outlet end of the heat exchanger, to supply hot water by an evenly controlled temperature. Such systems are expensive both in the installation involved as well as in the labor necessary for making the installation.

I have found that considerable economy can be effected and a highly efficient installation procured in a domestic hot water heating system wherein hot water is circulated in heat exchange relationship to a coil and tempering the hot water so secured from the heat exchanger by a manual setting of a by-pass valve to temper the hot water supply.

Specifically, I have combined in a domestic hot water heating system a tankless heat exchanger serving as the means for supplying domestic hot water with a tempering valve of compact and low cost construction whereby manual control of the tempering water is effected in the hot water line emerging from the heat exchanger, to provide an installation effecting considerable economy in cost of material and labor for installation.

To attain these objects and such further objects as may appear herein or be hereinafter pointed out I make reference to the accompanying drawing, forming a part hereof, in which—

Figure 1 is a schematic view showing my installation;

Figure 2 is a magnified sectional view of the tankless heat exchange unit employing my invention;

Figure 3 is an end elevation of Figure 2, looking in the direction of the arrows 2—2;

Figure 4 is a magnified section taken on the line 4—4 of Figure 3.

Summarizing my invention, it is an object thereof to provide in the circulating system of a hot water heating system a domestic hot water supply of exceedingly low cost, which eliminates the necessity for using a storage tank and employs the circulating liquid of the heating system to heat water in a heat exchanger at temperatures in excess of that useable for domestic hot

2

water supply, and to include a low cost and compact valve installation for the heat exchanger in the nature of a cover-flange wherein the outlet water has bled or by-passed into it tempering unheated water which is manually controlled.

Making reference to the drawing, I show a hot water boiler 10 which has a riser 11, leading to a pipe-line 12 in advance of a flow valve (not shown). A T-joint 13 is connected to a casing 14 by the inlet boss 15. The casing 14 has an outlet boss 16 for the line 17 for the return flow to the boiler 10. Hot water from the boiler is circulated through the casing by convection or otherwise, by positive circulation. The casing 14 has a flange 18, to which may be bolted the cover 19. The casing has internal bosses 20 and 21 for the inlet end 22 and outlet end 23, respectively, of the coils 24 which are convoluted within the casing 14 about the baffle plate 25.

Hot water comprising the heating medium illustrated from the heating system 10 may thereby be brought in heat exchange relationship with the coils 24, the axial line through the casing being angularly positioned to the normal vertical plane for purposes which will be readily understood.

The cover 19, at its front end, is provided with bosses 26 and 27 contiguous to each other and preferably connected by a solid web 28. One of the bosses, preferably the upper, has integrally formed therewith the angle boss 29, whose axial line is at right angles to the axial line through the bosses 26 and 27. The bosses 26 and 27 are bored and tapped at 30 and 31, respectively, for screw-threaded connection, for purposes which will appear as this description proceeds.

Rearwardly of the tapped portion the web 28 is formed with a by-pass or bleeding port 32, joining the borings 30 and 31. A seat 33 receives the needle portion 34 of a needle valve 35, which is mounted for screw feed in the neck 36 of the boss 29. A counterboring 37 holds a packing 38 about the shank 39 of the needle valve. A packing gland 40, screw-threadedly holds the packing in sealing position about the shank 39 of the needle valve and also has a restricted aperture adjacent the neck 41 for the head 42. A keying slot 43 for a screw driver or the like instrumentality is formed at the end of the needle valve shank for manually seating or unseating the needle valve on the seat 33.

With this installation, the inlet line 44 from the cold water supply is connected to the boss 27. The hot water outlet line 45 is connected to the boss 26. By the installation provided, it will

3

be observed that the inlet cold water may enter the coils through the end 22 of the coils and leave for domestic consumption through the outlet 23. The heat exchange relationship of the coil to the casing 14 may heat the water unduly high for consumption and for this purpose cold water coming into the coil may be by-passed through the port 32, past the seat 33, to flow outwardly through the line 45, to temper the excessively hot water to the desired extent.

Manual adjustment of the needle valve shank 39 to move the conical portion 34 from the seat will increase the flow of cold tempering fluid. Adjustment tending to seat the conical section of the needle valve 34 on its seat will shut off the tempering valve, by-passing cold water to give the maximum flow of hot water.

The provision of a casing flange cover having the connecting bosses contiguous to each other, with a connecting web, serves as a means for providing a low cost by-passing and tempering valve which may be manually controlled to require the minimum amount of steam-fitter's labor for installation.

Accessibility is afforded for making the adjustment, with no possible disruptive effect. Efficient operation is assured in the relationship of flow of the hot water to the shank of the needle valve and its position in relation to the bleed or by-passing port.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:

1. In combination with a heating coil having inlet and outlet terminals contiguously positioned for a tankless heat casing having a flange, a supporting cover member for connection to the flange of said casing, said cover having a contiguously positioned set of bosses thereon on one face thereof arranged to be on the inside of said casing and integral therewith, and in which said terminals of said coil are arranged to be mounted, a second set of bosses in parallelism with each other extending on the outer opposite face of said

4

cover having a common connecting web, said second set of bosses being in communication respectively with said first set of bosses, a by-pass port transversely extended between said second set of bosses through said web and a manually controlled valve for adjusting the opening of said port diametrically extended through one of said second set of bosses.

2. In combination with a heating coil having inlet and outlet terminals contiguously positioned for a tankless heat casing having a flange, a supporting cover member for said coil for connection to the flange of said casing, said cover having a contiguously positioned set of bosses thereon on one face thereof arranged to be on the inside of said casing and integral therewith in which said terminals of said coil are arranged to be mounted, a second set of bosses on the outer face of the cover in parallelism with each other, a connecting web between said latter bosses forming a common wall between said bosses, a by-pass port in said web extending through said common wall, said second set of bosses being in communication respectively with said first set of bosses, a valve seat for said port on one side of said wall within one of said bosses and a manually controlled valve for said valve seat having a guide adjacent one of said bosses and extending diametrically through the same to the wall common to the other boss.

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