Aug. 29, 1939. N. MARCUS 2,171,369

HOT WATER HEATER

Filed Dec. 27, 1937

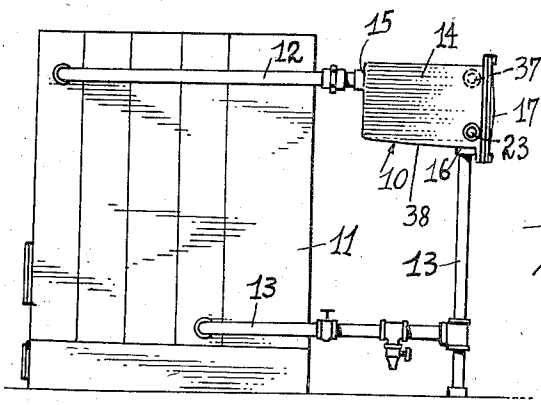


Fig. 1.

Fig. 3.

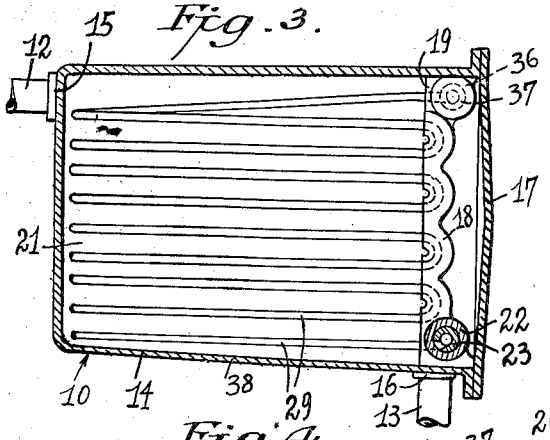


Fig. 4.

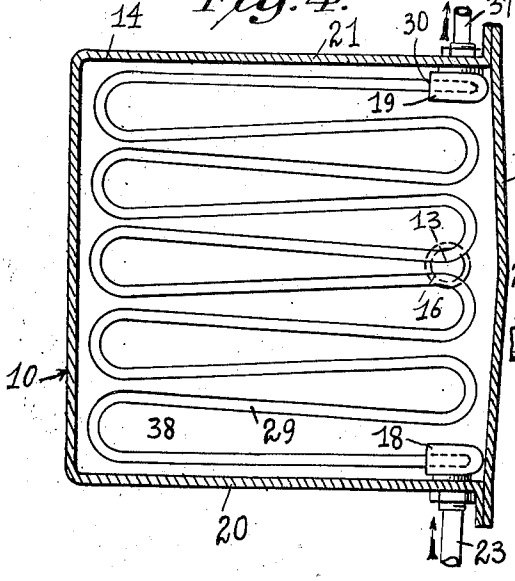
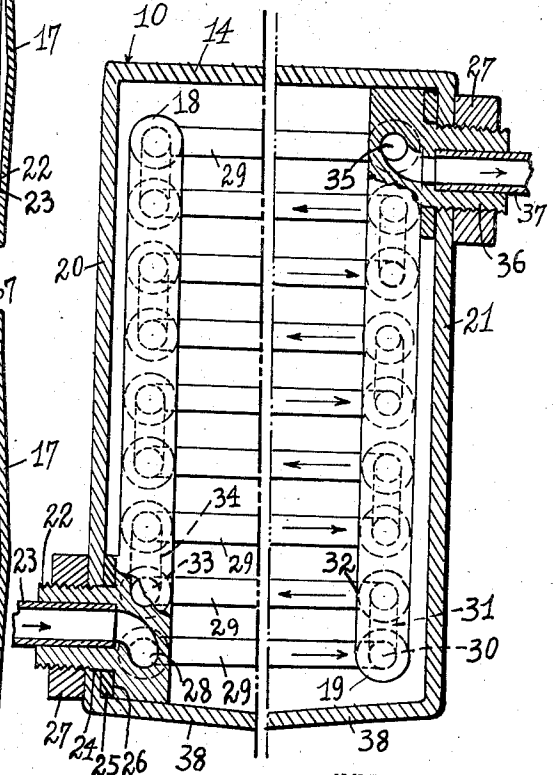


Fig. 2.



INVENTOR,
Nathan Marcus.
BY Julian J. Wittal
his ATTORNEY.

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HOT WATER HEATER

Nathan Marcus, Union City, N. J.

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1 Claim. (Cl. 257—230)

This invention relates to that type of hot water heaters, in which the water to be heated is passed through successive layers of coils, terminating in two headers, and arranged in a casing or box through which the heating medium circulates, and my invention has for its main object to provide a hot water heater of this character which will be simple in construction and more efficient in operation than are the heaters now in use.

Other objects of my invention will be apparent as the specification of the same proceeds, and among others, I may mention: to provide a heater, as characterized hereinbefore, which will be less expensive to manufacture than the similar heaters now in use and still easier to assemble and disassemble, inspect and repair, and will have less portions which need sealing against the escape of liquids or other fluids.

In the drawing, forming a part of this specification and accompanying the same:

Fig. 1 is a diagrammatic elevation of a boiler to which my hot water heater is attached;

Fig. 2 is a vertical sectional elevation of my hot water heater, portions of the same having been broken away for the sake of showing the remaining parts on a larger scale;

Fig. 3 is a sectional elevation taken at a right angle to that of Fig. 2 and on a smaller scale, while

Fig. 4 is a horizontal sectional view of the device shown in Fig. 3.

Referring now to the drawing more in detail, by characters of reference, the numeral 10 indicates my hot water heater, in general, which, as shown in Fig. 1, is attached to an ordinary boiler 11 by an intake hot water pipe line 12 and a return cooled water pipe line 13.

My hot water heater is arranged or housed in a casing or box 14 into which opens the hot water intake line 12, as at 15, and from which exits the cooled water outlet line 13, as at 16. A removable cover 17 is arranged on the front of the box or casing 14. Two reversibly placed headers 18 and 19 are arranged adjacent to the side walls 20 and 21, respectively, the one, indicated by 18, being for introducing the water to be heated, and the other, indicated by 19, being for the exit of the heated water.

The header 18 has a pipe extension 22 adjacent to the bottom of the casing 14 into which is sealingly secured the intake pipe 23 for the cold water to be heated. Extension 22 preferably is passed through the wall 20 in an opening 24 therein, and a resilient sealing washer 25 is placed between the side wall 20 and an appropriate surface 26 on the header 18, so that the header may be placed against said washer and the device secured in this position through the use of a nut 27 on the outside, said nut possibly being provided with any of the usual locking means, well known in this art.

The cold water entering through the pipe 23 will pass through a channel in the bottom of the header 18, as indicated at 28, and then into the lowermost layer of coils 29. A desired number of identical coils 29 is arranged in a superposed relation between the two headers 18 and 19, and their construction and arrangement is best shown in Fig. 4.

After the water to be heated passes the lowermost coil 29, it will arrive at the header 19, as indicated at 30 in Figs. 2 and 4, and then will pass upwardly in a channel in header 19, as indicated at 31, and as it is well known in this art, leaving said header, as at 32, to enter the second layer of coils 29, passing through the same in a reverse direction and entering header 18, as at 33, then rising in header 18, as at 34, and passing from the same into the third layer of coils 29.

In this manner, the water to be heated will pass forwardly and backwardly between the two headers 18 and 19 in the respective layers of coils 29, always rising in the respective header into the next higher layer of such coils until finally it will arrive in header 18 to the topmost layer of coils 29, and passing through the same will enter into the exit channel 35 in header 19, which is in communication with an exit pipe extension 36 on said header, secured into the wall 21 of the casing in the same manner as has been described hereinbefore in connection with the intake header pipe extension 22, a resilient washer being placed between the header and the wall 21, the extension 36 projecting through the wall 21, and being secured by the nut 27, as shown in Fig. 2. Into this pipe extension 36 is secured in a sealed manner, the heated water exit pipe 37.

The general construction of such headers is well known to the art, and it is believed that the description and the various drawings herein offered—showing the same will be amply sufficient to make the operation of my hot water heater clearly understood by those versed in this art.

The bottom 38 of the casing 14 may be made forwardly and centrally inclined towards the cooled water exit pipe 13, as indicated in Figs. 2 and 3.

It will be seen that my invention provides an extremely simple and efficient construction for such hot water heaters, in which the space within the casing is most efficiently utilized by a great number of layers of coils placed in superposed planes, one above the other, and communicating between two headers within the casing, in the manner described, the whole construction being secured in the casing by the intake and exit pipe extensions 22 and 36, of the two headers only.

A clear, unobstructed, simple and unburdened cover plate 17 (preferably somewhat outwardly projecting, as shown) is provided for my heater, which cover may be removed and then the whole inside of the heater inspected, the parts therein cleaned and repaired. My construction also provides for an easy and quick removal of the headers and the coils, as will be understood. Indeed, after disconnecting the intake and outlet extensions 22 and 36 from the cold and heated water lines 23 and 37, and removing their respective nuts 27, the inherent resiliency of the coils 29 will permit a compression of them in a horizontal plane to such a degree that the extensions 22 and 36 may be pushed or pulled inwardly into the casing 14, freed of the walls 20 and 21, and the whole structure of headers and coils entirely removed and cleaned and repaired, and in a similar manner, it may be replaced easily and quickly. This is brought about by the fact that headers and coils, the whole inside structure of my heater, is free of the casing except where secured thereto at two places through the pipe extensions 22 and 36.

Through this construction, I also may take the cold water into my device and take the heated water out of the same without any other outside connections for my heater than the two pipe extensions 22 and 36, which are easily and safely sealed, and therefore, no leaking connections are possible with my device.

Each header, 18 and 19, is in the form of a vertical flat column, their outer flat surfaces being placed adjacent to the respective flat sides 20 and 21 of the housing or shell 14, near to the front edges of said walls, where they are closed by the removable cover 17, and the intake header 18 will rest with a flat bottom surface on the bottom 38 of the shell, while the outgo header 19 will rest with a flat top surface against the top of the shell 14.

It also will be obvious by inspecting the drawing, that my heater has very few and simple parts, and it is inexpensive to manufacture and easy and quick to assemble and disassemble.

Finally, it will be understood that my heater may be made, so to say, double acting, with very little change, that is, headers 18 and 19 may be made with two surfaces to receive two sets of coils 29, oppositely placed at the two sides of said headers, two systems of rising connecting channels being provided in each header for the oppositely placed two sets of coils 29, in the same manner has been described for one of such systems, and one set of coils, hereinbefore. In this manner, with one cold water intake and one heated water exit, and no other outside connections, a hot water heater of very high capacity may be produced.

What I claim is new is:

In a hot water heater, having a shell open in front, as well as intake and outlet connections for a heating medium to pass therethrough, a vertical inlet header and a vertical outlet header placed at the respective two side walls of said shell adjacent to said open end thereof, and a plurality of continuous, series connected serpentine coils between said two headers within said shell, in combination, a flat lower surface on said inlet header arranged against a flat lower portion of the respective side wall, a flat upper surface on said outlet header arranged against a flat upper portion of the respective other side wall, said inlet header also resting on the bottom of said shell, and the top of said outlet header also being placed against the top of said shell, said plurality of serpentine coils being arranged in super-posed horizontal layers between said two headers in a horizontally yielding, resilient manner; an inlet extension pipe projecting from said lower flat surface in said inlet header and passing through the respective side wall, an outlet pipe extension projecting from said upper flat surface in said outlet header and passing through the respective second side wall, a continuous channel being formed from said inlet pipe extension through the coils and headers to said outlet pipe extension; a resilient washer placed around each pipe extension between the respective header and side wall, screw threads on the exposed outer portions of said pipe extensions, and a securing nut on each pipe extension adapted to be tightly drawn against the respective wall of said shell, the fluid to be heated entering through said inlet pipe extension, and leaving through said outlet pipe extension.

NATHAN MARCUS.