

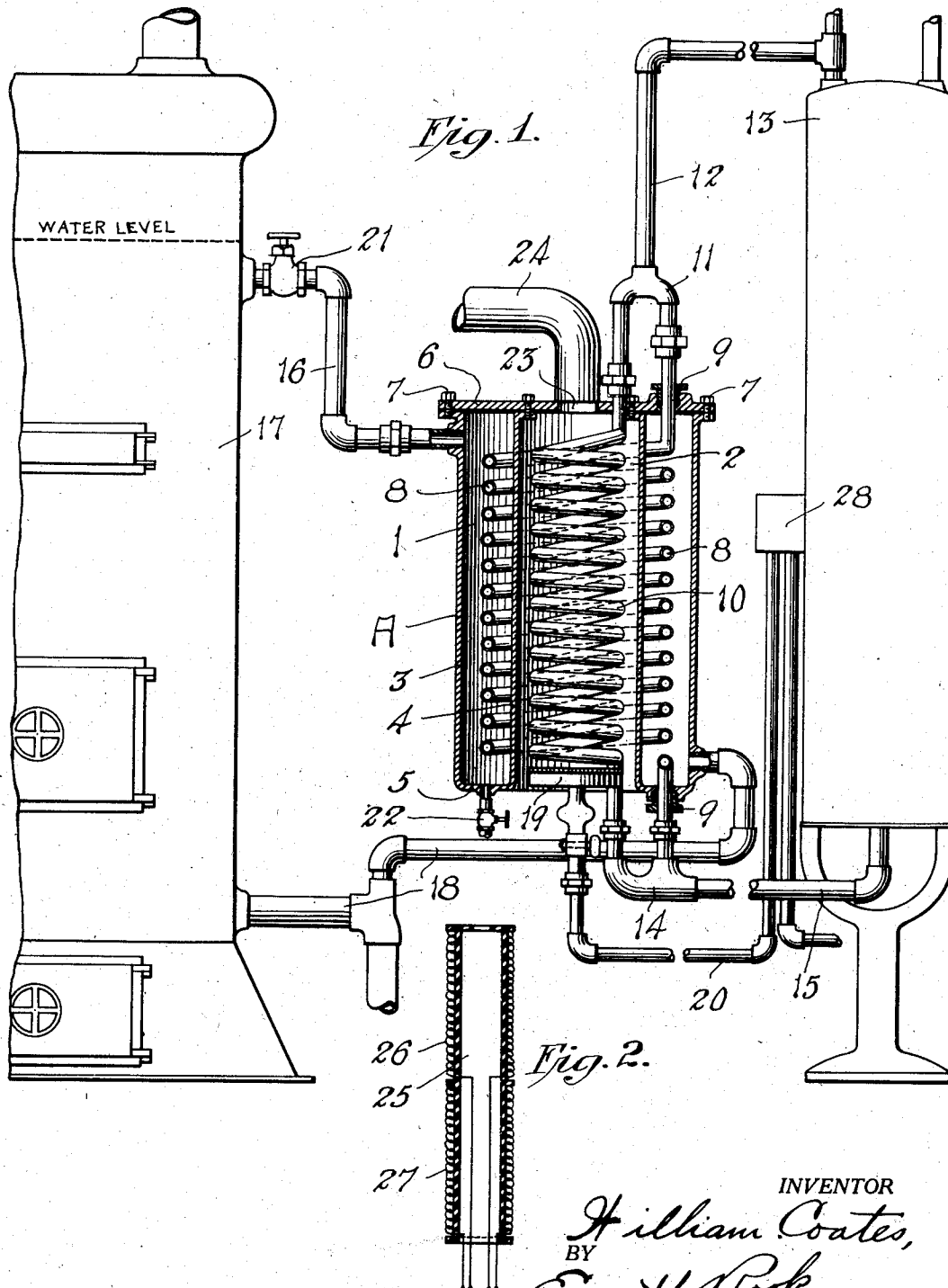
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WATER HEATER

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WATER HEATER.

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The primary object of the invention is to provide a novel and improved device which is adapted to utilize the hot water of a building heating system for heating service water during the winter and including an auxiliary heater, such as a gas, electric or liquid fuel heater for heating the service water when the building heating system is out of commission, for instance, during the summer.

Another object of the invention is to provide a water heater of the character described including a flow circuit for the water to be heated embodying novel and improved features of construction, whereby a plurality of independent water heating elements may be used selectively for heating water from a common supply and discharging it from a common outlet so that a thermal circulation of the water takes place only through the heating element to which heat is applied.

Further objects are to provide a water heater of this character embodying novel features and including a chamber adapted to be connected to the boiler of a heating system to receive water therefrom, a service water conduit connected to a reservoir or tank and passing through said chamber, a second service water conduit independent of said first-mentioned conduit connected to said reservoir or tank, and an auxiliary heater for heating the water in said second conduit; to provide a water heater of this character including a casing formed with two substantially concentric chambers one of which is adapted to be connected to a boiler of a heating system to receive water and has a service water conduit connected to a reservoir or tank passing therethrough, a second service water conduit independent of said first-mentioned conduit connected to said tank and arranged in the other of said chambers, and an auxiliary heater for said second conduit; to provide a substantially cylindrical vertical casing having two substantially concentric chambers, the outer one of which is adapted to receive water from the boiler of a heating system, a service water coil connected to a reservoir or tank and arranged in said outer chamber and surrounding the inner chamber, a second service water coil independent of said first-mentioned coil arranged within the said inner chamber, and an auxiliary heater arranged at the lower end of said inner chamber to heat said second coil, and to obtain other results and

advantages as may be brought out by the following description.

Referring to the accompanying drawing, in which like numerals of reference indicate the same parts throughout the several views;

Figure 1 is a central vertical sectional view through a water heater embodying my invention, showing the same connected to the boiler of a building heating system and a tank or reservoir for service water, and

Figure 2 is a diagrammatic central vertical sectional view through an electric heater adapted to be used in connection with the water heater.

In the embodiment of my invention shown in the drawings, the reference character A designates a substantially cylindrical casing adapted to be arranged in a vertical position and formed with two concentric chambers 1 and 2. The casing may be of any suitable construction, but in the present instance I have shown the same as comprising two concentric annular walls 3 and 4, the latter of which forms the inner chamber and the outer chamber 1 being formed between the said walls 3 and 4. The walls are integrally connected at one end as at 5 and the other ends of the chambers 1 and 2 are closed by a cover plate 6 secured to flanges on the walls 3 and 4 by means of bolts 7.

A coil of pipe 8 is arranged within the chamber 1 and surrounds the inner chamber 2, the ends of said coil passing outwardly through the bottom 5 of the casing and the cover plate 6, packing glands 9 being provided to maintain a water tight connection of the coil with the casing.

A second coil of pipe 10 is arranged within the inner chamber 2 and has one end thereof passing through the cover plate 6 and the other end passing outwardly through the lower open end of said chamber. The upper ends of the coils 8 and 10 are connected by a Y-connection 11 to a hot water pipe 12 connected to the top of the tank or reservoir 13 for the service water. The lower ends of the said coils are connected in a similar manner by a connection 14 to a cold water pipe 15 connected to the lower end of the said tank 13. The coils 8 and 10 are thereby connected in parallel between the cold water supply pipe 15 and the hot water pipe 12, and a thermal circulation of water may take place through either of the coils 8 or 10 dependent upon the heating medium

in operation, or through both of the coils 8 and 10 when both the hot water from the boiler and the burner 19 are being utilized. Accordingly, it is possible to utilize each of the coils 8 and 10 independently of the other for heating service water, and the cold water in the coil not being heated does not mix with or cool the water in the coil being heated.

The outer chamber 1 is connected at its upper end by a pipe 16 to the boiler 17 of a building heating system below the water level thereof, and the lower end of said chamber is connected by a pipe 18 to the said boiler adjacent the bottom of the water chamber. Thus, when the boiler 17 is in operation the hot water therefrom may circulate from the water chamber of the boiler through the pipe 16, the chamber 1 and the pipe 18, and the heat from the said boiler water is transferred to the service water in the coil 8 which passes into the tank 13.

An auxiliary heater is arranged at the bottom of the inner chamber 2 for heating the second coil 10, and in Figure 1 of the drawings the said heater is shown as comprising a gas burner 19, fuel for which is supplied by a pipe 20. Thus, when the burner 19 is lighted, the water in the coil 10 will be heated and circulate into the tank 13. It will thus be seen that a water heater constructed in accordance with my invention may utilize the hot water from the boiler of a building heating system for heating service water when the heating system is in operation, for instance during the winter, and that when the heating system is out of commission, for instance during the summer, the service water can be heated by the auxiliary heater 19. For the purpose of preventing the water in the chamber 1 from circulating through the boiler 17 when the boiler is out of commission, I may provide a valve 21 in the pipe 16. For the purpose of draining the chamber 1 I may provide a drain pipe 22 at the bottom of the chamber.

The chamber 2 serves to retain the heat from the burner 19 so that substantially all of the heat is utilized for heating the coil 10, and any waste heat from the burner 19 not absorbed by the coil 10 will be taken up by the water in the chamber 1 and by that transferred to the service water in the coil 8. Similarly, the waste heat from the water in the chamber 1 when the boiler 17 is in operation will be taken up by the coil 8 and by that transferred to the service water. To provide a vent for the chamber 2 I may form the cover plate 6 with an opening 23, and when a gas burner is utilized, a flue pipe 24 may be connected to the opening 23 to carry off the gases of combustion.

When it is necessary or desirable to utilize electricity instead of gas or liquid fuel for heating the coil 10, I may utilize an electric

heater such as illustrated in Figure 2. Such a heater comprises a cylindrical body of insulation 25 on which are wound two coils of wire 26 and 27, the terminals of which may be connected to a four-pole switch in the well-known manner. This heater is adapted to be co-axially arranged within the coil 10, and when maximum heat is desired both coils 26 and 27 are utilized. When less heat is desired only one of the said coils would be used, the four-pole switch connecting either one or both of said coils to the source of electricity.

It may be desirable in some instances to provide automatic means for shutting off the fuel supply or the electric current of the auxiliary heater when the water in the tank 13 reaches a predetermined temperature. For this purpose I may utilize a thermostat 28 of any suitable construction adapted to close a supply valve for a gas or liquid fuel burner or an electric switch for an electric heater when the water in the tank 13 reaches a certain temperature. Such a thermostat may be mounted on the side of the tank 13, as illustrated in the drawings.

My improved heater can be employed with both steam heating apparatus, where the water from the boiler is hot enough to raise the service water to the desired temperature, and with a hot water system of house heating, since, although the hot water from the boiler may not be of a temperature high enough to raise the service water to the desired degree, it is always possible to utilize the auxiliary heater in conjunction with the water from the boiler, said auxiliary heater acting automatically to supplement the heat from the boiler water and so raise the service water to the desired temperature.

While I have shown and described a water heater embodying certain details of construction, it will be understood that this is only for the purpose of illustrating the principles of the invention and that many modifications and changes can be made in the detail construction of the heater without departing from the spirit or scope of the invention. Therefore, I do not desire to be understood as limiting myself, except as required by the following claims when construed in the light of the prior art.

Having thus described the invention, what I claim is:

1. In a water heater, the combination with a boiler of a heating system, a coil to receive service water to be heated and a heater therefor, of a casing formed with two chambers one of which surrounds the other and is connected to said boiler of the heating system to permit hot water from said boiler to circulate therethrough, the other of said chambers receiving said coil

and said heater, and a second coil independent of said first-mentioned coil mounted in said first-mentioned chamber and surrounding said second-mentioned chamber to receive service water, the water in said coils being directly heated by the heating medium in the corresponding one of said chambers and also indirectly heated by the other of said heating mediums when the latter is in operation, the outlet ends of said coils being connected to a common hot service water supply pipe.

2. The combination with a boiler of a heating system having a water chamber, of a water heater including a substantially vertical casing formed with two substan-

tially concentric chambers, the outer one of which is connected to said water chamber of the boiler to receive water therefrom, a helical pipe coil for service water arranged in each of said chambers, said coils being independent of each other and the coil in the outer of said chambers surrounding the other of said coils, and a heater in the inner one of said chambers, whereby the water in each of said coils is directly heated by the heating medium in the corresponding one of said chambers and also indirectly heated by the other of said heating mediums when the latter is in operation.

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