Nov. 7, 1933. S. FUCHS 1,933,726

COMBINATION HOT WATER BOILER AND HEATER

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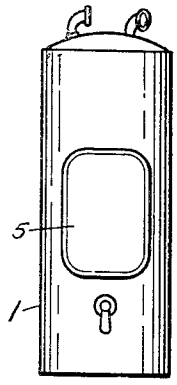


Fig. 1

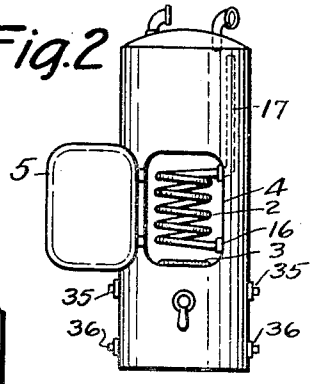


Fig. 2

Fig. 3

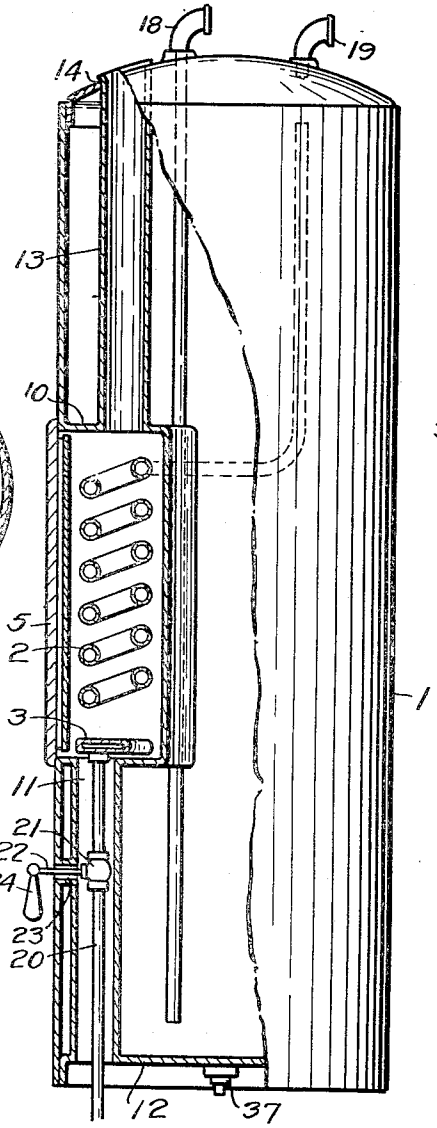


Fig. 4

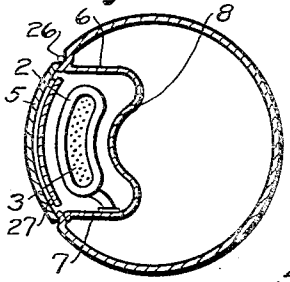


Fig. 5

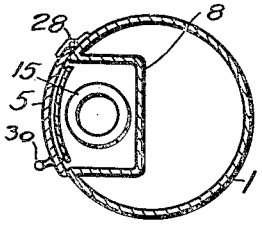


Fig. 6

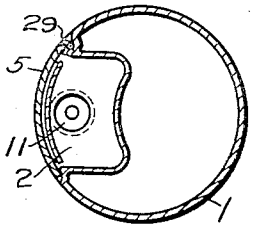


Fig. 7

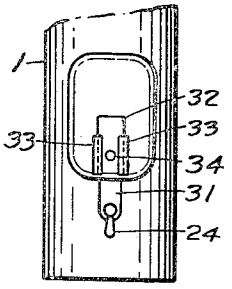
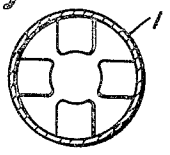


Fig. 8



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UNITED STATES PATENT OFFICE

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COMBINATION HOT WATER BOILER AND HEATER

Siegfried Fuchs, Brooklyn, N. Y.

Application August 15, 1932. Serial No. 628,873

1 Claim. (Cl. 122—16)

The invention is a boiler for domestic hot water in which a heater therefor is built into the boiler casing.

The object of the invention is to provide a hot water boiler having a heater made integral therewith in which the heater is partially surrounded by the water of the boiler so that all of the heat units therefrom may be imparted to the water in the boiler.

Another object of the invention is to provide a hot water boiler having a heater built into and made integral therewith.

Another object of the invention is to provide a hot water boiler having a chamber therein in which a heater may be inserted which has connecting flues to the bottom and top thereof.

Another object of the invention is to provide a heater for hot water boilers that may be installed in a boiler of any type.

Another object of the invention is to provide a heater that may be installed in domestic hot water boilers which is so arranged that gas may be used as the heating medium.

A further object of the invention is to provide a domestic hot water boiler with a heater built therein in which a burner and hot water coils are installed in the heater.

And a still further object of the invention is to provide a domestic hot water boiler having a heater built therein which is of a simple and economical construction.

With these ends in view the invention embodies a cylindrical tank of the type adapted for hot water boilers, a compartment inserted in one side of said tank, a burner in said compartment, a water coil also in said compartment, a flue connecting the lower end of the compartment to the bottom of the boiler, another flue connecting the upper end of the compartment to the top of the boiler, and a door on the front of said compartment.

Other features and advantages of the invention will appear from the following description taken in connection with the drawing, wherein:

Figure 1 is a view showing a front elevation of a boiler having a coil built therein.

Figure 2 is a similar view showing the door of the heating compartment in the open position.

Figure 3 is a view showing a side elevation of the boiler with part broken away showing a cross section thru the heater compartment.

Figure 4 is a cross section thru the boiler and heater compartment.

Figure 5 is a similar section showing a compartment, coil and door of an alternate design.

Figure 6 is a similar section with the coil omitted showing another alternate design and also the location of the lower flue.

Figure 7 is a view similar to that shown in Figure 1 showing an alternate design in which an air opening is provided below the door and a damper is shown on the door that may be used to close the opening.

Figure 8 is a view showing another alternate design in which a plurality of compartments may be used in one boiler.

In the drawing the boiler is shown as it may be made wherein numeral 1 indicates the boiler, numeral 2 the coil, and numeral 3 the burner.

In the drawing the boiler 1 is shown of a cylindrical shape, however, it will be understood that the boiler may be of any shape or design and arranged in any manner. It is preferred to use a common hot water boiler known as a range boiler and it will be noted that an opening 4 is cut in the side of the boiler and a door 5 provided to close the opening. The heater compartment is in the form of a box which extends into the boiler and the edges are welded to the edges of the opening 4 so that a complete enclosed unit will be formed thereby. The box is formed by side plates 6 and 7, a back plate 8, a bottom 9 and a top 10, and a tubular flue 11 extends downward from the plate 9 forming the bottom of the heater to the bottom 12 of the boiler, and a similar tubular flue 13 extends from the top plate 10 to the top 14 of the boiler. It will be noted that the flue 11 is comparatively close to the edge of the boiler whereas the flue 13 sets inward so that it is surrounded by more water as it will be understood that cool air passes thru the tube 11 whereas the hot gases from the burner pass outward thru the tube 13 and it is desired to utilize as many of the heat units as possible from these gases. It will be noted that the back 8 may be curved, as shown in Figure 4, or straight, as shown in Figure 5, or made of any other shape or design. It is preferred, however, to have it curved or corrugated so that a greater area from the heating surface will be obtained. It is also preferred to have it curved, as shown in Figure 4, so that a plurality of units may be used in one boiler with a circular water column between the units, as shown in Figure 8. It will be understood that any number of units may be used in one boiler and they may be arranged in any manner. It will also be understood that the edges of the unit may be welded or attached to the edges of the boiler opening in any manner, however, it is preferred to form a completely welded or sealed joint as it is appre-

ciated that it must be water tight, and subject to expansion and contraction.

The coil 2 may be shaped, as shown in Figure 4, so that the sides thereof will conform to the surfaces of the heater compartment, however, it will be understood that this coil may be round, as shown in Figure 5, and indicated by the numeral 15, or made of any design or shape. It will be noted that the lower end of the coil is attached directly to the side of the heater compartment, as shown at the point 16, and opens into the water of the boiler whereas the upper end is connected thru the wall of the heater compartment to a pipe 17 and extends upward to the upper end of the boiler so that hot water heated therein will pass directly upward to the top of the boiler. The boiler may be provided with the usual cold water connection 18 that extends downward to the lower end of the boiler and also a hot water connection 19 at the upper end of the boiler. It will be understood that the coil may also be arranged in any other position and connected to the boiler in any other manner.

The burner 3 is positioned in the lower end of the heater compartment and it is connected to a supply pipe 20 that extends downward thru the flue 11 and has a valve 21 therein with the stem 22 thereof extending thru an opening 23 to the exterior of the boiler so that a handle 24 on the outer end thereof, may open or close the valve as it is turned by hand from the outside of the boiler. It will be understood that this burner may be of any shape, type, or design and may be made to burn gas or any other fuel and it will also be understood that an electric heating element may be used and arranged in any manner to supply heat to the compartment.

At the front of the compartment is the door 5 which may be hinged at one side by hinges 26, as shown in Figure 4, and the inner surface lined with asbestos or a suitable insulating or fireproofing material as indicated by the numeral 27. The edges of the door may be mounted within the periphery of the boiler, as shown in Figure 4, or the door may be mounted on the outside of the boiler, as shown in Figure 5, and the hinges may be provided in the recesses in the boiler in which the door is mounted, as shown in Figure 4, or on the outside of the boiler and door, as shown in Figure 5 and indicated by the numeral 28, or provided between the door and in the surface of the recess, as shown in Figure 6 and indicated by the numeral 29. It will be understood that the door may be hinged and mounted in any other manner. The door may also be provided with a handle 30, as shown in Figure 5, or the handle may be omitted so that the outer surface will be smooth, as shown in Figure 4.

In the design shown in Figure 7 an opening 31 is provided above the valve stem so that air may be admitted directly to the burner and a damper formed of a sliding plate 32 may be mounted between clips 33 on the door and provided with a handle 34 so that it may be moved downward when the door is in the closed position to close or partially close the opening 31. It will be understood that a damper of any other type or description may be provided on the door and also that air may be provided to the burner in any other manner.

Water connections 35 and 36 may be provided in the lower part of the boiler and it will be noted that the upper connection 35 may be used as the connection for hot water to a stove water-back and the connection 36 used for the cold connection to the water-back. Similar connections may be provided in both sides of the boiler, as shown in Figure 2, if desired. The bottom of the boiler may also be provided with a connection 37 which may be used as a drain for the boiler or for any other purpose.

It will be understood that other changes may be made in the construction without departing from the spirit of the invention. One of which changes may be in the location or position of the heating unit in the boiler, another may be in the arrangement of the admission of air from the draft to the burner, another may be in the use of walls of any other shape or arranged in any other manner to facilitate the imparting of heat units from the burner to the water of the boiler, and another may be in the omission of the coil as it will be understood that the walls may be shaped to come directly into contact with the heat of the burner.

The construction will be readily understood from the foregoing description. It will be understood that the heating compartment may be installed in boilers now in use or may be built in new boilers and the new boilers supplied with the device therein. It will be understood that when it is desired to provide hot water in the boiler the door may be opened and the burner lighted and it will be appreciated that all of the heat from the burner will be imparted to water in the boiler and by using the combination of the boiler and coil in a domestic hot water boiler of this type it will be possible to obtain a small amount of hot water at the top of the boiler as is possible with a detached heater and at the same time utilize all of the heat of the burner thereby providing a combination boiler and heater of the highest possible efficiency.

Having thus fully described the invention what I claim as new and desire to secure by Letters Patent, is:

A range boiler of the cylindrical type having an opening in one side positioned about midway of the height thereof, a compartment extending into said boiler from the edges of said opening with the edges of the compartment welded to the edges of the boiler at the opening, a flue extending downward from the lower end of the compartment to the bottom of the boiler and positioned substantially close to the outer wall of the boiler and separated therefrom, another flue slightly smaller in area than the former flue extending upward from the upper end of the compartment to the top of the boiler, a water coil in said compartment with a connection to the interior of the boiler at the lower end, another connection extending from said coil thru the wall in the compartment and thru the boiler to the upper end thereof, a burner in said compartment positioned below said coil, a fuel connection extending from said burner downward thru the lower flue, a cock in said connection, and a door hingedly attached to said boiler at one side of said opening and adapted to form a closure for said compartment.

SIEGFRIED FUCHS.