

Jan. 2, 1945.

S. W. FORD

2,366,507

RANGE BOILER

Filed June 24, 1942

2 Sheets-Sheet 1

Fig. 1.

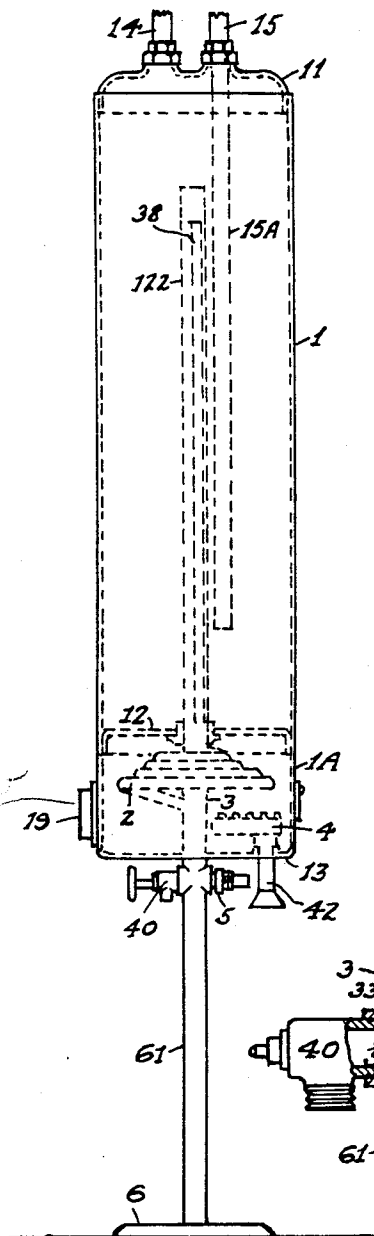


Fig. 3.

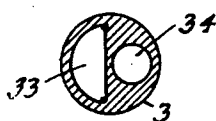
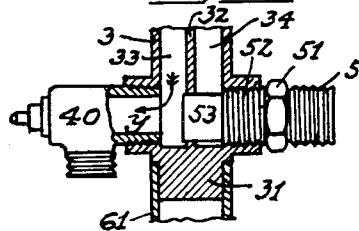


Fig. 4.



Inventor -

Samuel W. Ford

Jan. 2, 1945.

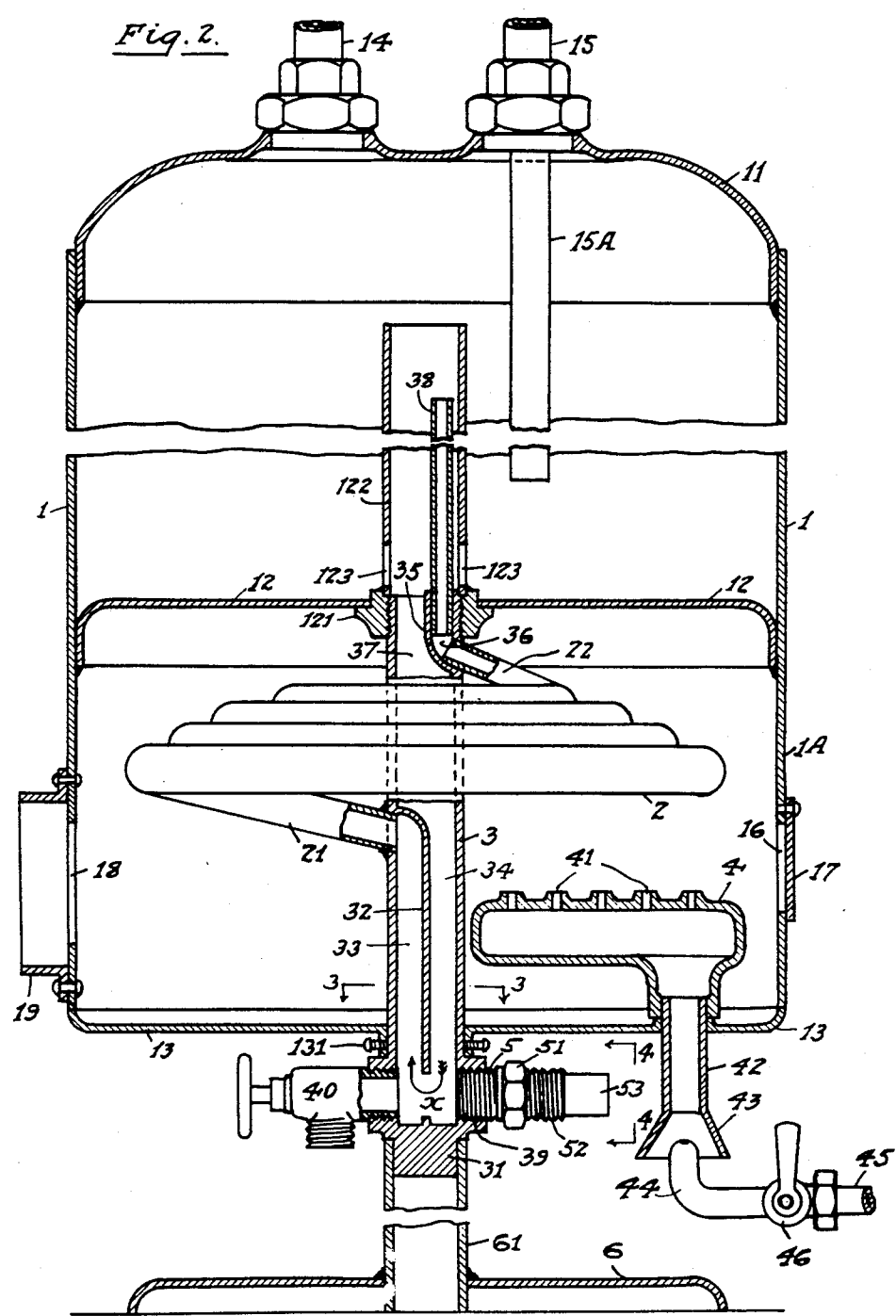
S. W. FORD

2,366,507

RANGE BOILER

Filed June 24, 1942

2 Sheets-Sheet 2



Inventor-
Samuel W. Ford

UNITED STATES PATENT OFFICE

2,366,507

RANGE BOILER

Samuel W. Ford, Detroit, Mich.

Application June 24, 1942, Serial No. 448,322

3 Claims. (Cl. 126—361)

My invention relates to range boilers, and its principal object is to provide a boiler which embodies a new and improved circulating principle, whereby it is capable of producing hot water more quickly and in larger quantities than is possible with boilers of ordinary construction having the same general dimensions.

A further object of my said invention is to provide means for rapidly and effectively cleaning out the coil and other parts of the boiler. This is considered of great importance at the present time, when coils and other parts ordinarily made of copper or brass must be replaced by iron or steel which are much more liable to corrosion and scaling, so that more frequent cleaning of the parts is necessary.

Another object is to provide a simpler and less expensive supporting means for the boiler, whereby it is more easily installed and at the same time the floor space adjacent the boiler is more accessible for cleaning purposes.

With these and other objects in view, I will now describe a preferred embodiment of my invention with reference to the accompanying drawings, in which—

Figure 1 is a diagrammatic elevational view of the range boiler showing the location of the principal parts.

Figure 2 is a fragmentary vertical section of the boiler drawn to an enlarged scale showing the complete details, certain parts being shown in elevation for the sake of clearness.

Figure 3 is a fragmentary horizontal section taken on line 3—3 of Figure 2, and

Figure 4 is a fragmentary vertical section taken on line 4—4 of Figure 2 illustrating the rearrangement of certain parts in order to facilitate cleaning of the coil and adjacent passages.

Like characters designate corresponding parts throughout the several views.

In the drawings, 1 is the main casing having a cover 11 secured thereto by welding and a bottom 12 also welded to the main casing. The casing 1 extends below the bottom as shown at 1A to form a heater chamber, and this chamber is provided with a removable closure 13 as shown. In the cover 11 is an opening connected by a union with the hot water pipe 14 and another union to which is connected a cold water pipe 15, the pipe 15 having a downwardly extending portion 15A of conventional construction reaching to within a short distance of the bottom 12 as shown. In the center of the bottom 12 is welded a socket 121 which is internally threaded to receive the upper end of the coil assembly to

be hereinafter described, and extending upwards from this socket is a pipe 122 which reaches within a short distance of the cover 11. The pipe 122 has two or more openings 123 communicating with the main chamber of the heater.

The heater assembly consists of a coil 2 of metal tubing arranged in spiral form having a central tubular member 3, the upper end of which screws into the socket 121 while the lower end extends downwardly through the lower cover 13 and has a solid end 31 adjacent to which is a drain valve 40, normally closed. Intermediate the drain valve 40 and the coil 2 is arranged a partition 32 by which the tubular member is divided into two separate passages 33, 34, and the outer terminal 21 of the coil is connected by welding or otherwise with the passage 33. Above the coil 2 the tubular member 3 is again divided by a partition 35 into two passages 36 and 37, and the inner terminal 22 of the coil 2 is connected by welding or otherwise to the passage 36, while the passage 37 merely forms a continuation of the passage 34 below it. Within the passage 36 and forming a continuation thereof is a relatively small pipe 38 which extends upwardly within the larger pipe 122 near to or level with the top thereof. Within the heater chamber and below the coil 2 is a gas burner 4 spaced vertically from the coil and having the usual openings 41 in its upper surface, and to the bottom of this burner is connected a mixing tube 42 having a conical bottom 43 into which projects the gas jet 44, the latter being fed from the gas pipe 45 through the usual shut-off cock 46, the complete burner following the conventional construction and having its main portion extending more or less around the underside of the coil. It will be observed that the tubular member 42 is secured within an opening in the cover 13, while the cover itself is secured upon the tubular member 3 as by set screws 131. An opening 16 in the casing having a swinging cover 17 facilitates the lighting of the burner, while on the opposite side of the casing is a flue opening 18 provided with a laterally projecting socket 19 adapted to receive the usual flue pipe carrying away burned gases from the heater chamber. In the lower part of the tubular member 3 and in opposed relation to the drain valve 40 is a threaded opening 39 and into this opening is screwed a plug 5 having a hexagonal portion 51 for manipulation by a wrench, and outwardly of this is a threaded por-

tion 52 and a solid cylindrical portion 53 for a purpose to be hereinafter explained.

In order to support the heater in a simple manner, there is provided a circular base 6 into which is welded a central pipe 61 which extends downwardly to the floor line as shown in Figure 2, and at its upper end receives the solid portion 31 of the tubular member 3, the whole forming a simple and inexpensive pedestal which takes the place of the usual support having three or four legs and renders much easier the cleaning of the floor which surrounds the heater.

In operation, the boiler being filled with cold water through the pipes 15 and 15A and the burner lighted, the water flows downwardly through the passage 37 into the passage 34 and then around the partition 32 as indicated by the arrow *x* in Figure 2, whence it continues onwards through the passage 33 into the outer portion 21 of the coil. The water thus being heated flows upwardly through the passage 36 and the pipe 38 to the upper portion of the boiler. It will be noted that the pipe 38 is, to some extent, isolated from the main body of the cold water by the pipe 122 so that the heated water reaches the upper portion of the boiler with very little loss of heat, by which arrangement hot water is almost immediately available for discharge through the pipe 14. In the meantime, the small amount of water contained in the pipe 122 becomes heated from contact with the smaller pipe 38 and then, by continued circulation, the whole body of water within the boiler comes to the required maximum temperature. The advantage of the preliminary discharge of hot water through the pipe 38 is readily seen since it provides a small quantity of hot water for immediate use, and it is found that the entire body of water becomes heated in a much shorter time than is possible with boilers of ordinary construction.

It has been pointed out in the preamble of this specification that, due to the great demand for copper for war purposes, it is necessary to construct the coil 2 from steel or iron tubing which is much more subject to corrosion and scaling than is the case with copper. In order to facilitate the cleaning out of the coil and the adjacent portions of the heater assembly, the plug 5 is removed from the position in which it is shown in Figure 2 and is reversed, as shown in Figure 4, so that its cylindrical portion 53 projects into the passage 34, thereby closing it. The water supply is then turned on so that the pressure from the water main is applied to the body of water within the boiler, which is thus forced downwards through the coil and through the passage 33 to the open drain valve 40 as indicated by the arrow *y* in Figure 4, which results in quick and thorough cleaning of the coil.

It will be observed from the foregoing description and by reference to the drawings that I have provided a range boiler in which the production of hot water is much more rapid than is the case with existing boilers, and also a method of quickly and easily cleaning out the coil and adjacent parts, as well as an improved supporting means for the boiler as a whole. It will be readily understood by those skilled in the art to which my invention pertains that various changes in detail may be made to suit any particular or pe-

culiar requirement without departing from the spirit of the invention as defined in the appended claims.

Having thus described my said invention, what I claim and desire to secure by Letters Patent of the United States is:

1. A range boiler comprising a casing having inlet and outlet connections in its upper end; a socket in its lower end having an opening therein; a spiral heater coil positioned below said opening; a hollow member connected to said opening and extending downwardly therefrom and through said coil, said member having a transverse partition extending downwardly in said member to provide two vertical passages therein, one of which is closed at one end and is in alignment with and communicates directly with the outer terminal of said coil while the other extends upwardly through said opening; a pipe extending upwardly through said opening having its upper end open and its lower end in alignment with and connected directly to the inner terminal of said coil; the lower end of said partition having an aperture therein to provide a connection between said respective passages.

2. A range boiler comprising a casing having inlet and outlet connections in its upper end; a socket in its lower end having an opening therein; a spiral heater coil positioned below said opening; a hollow member connected to said opening and extending downwardly therefrom and through said coil, said member having a transverse partition extending downwardly in said member to provide two vertical passages therein, one of which is closed at one end and communicates with the outer terminal of said coil while the other extends upwardly through said opening; a pipe extending upwardly through said opening having its upper end open and its lower end connected to the inner terminal of said coil; the lower end of said partition having an aperture therein to provide a connection between said respective passages; and a larger, upwardly-extending pipe surrounding said first-mentioned pipe, having its upper end open and having its lower end communicating with said opening and with the main body of said casing.

3. A range boiler comprising a casing having inlet and outlet connections in its upper end; a socket in its lower end having an opening therein; a spiral heater coil positioned below said opening; a hollow member connected to said opening and extending downwardly therefrom and through said coil, said member having a transverse partition extending downwardly in said member to provide two vertical passages therein, one of which is closed at one end and communicates with the outer terminal of said coil while the other extends upwardly through said opening; a pipe extending upwardly through said opening having its upper end open and its lower end connected to the inner terminal of said coil; the lower end of said partition having an aperture therein to provide a connection between said respective passages; there being a drain valve connected to said first-mentioned passage and means for closing said aperture, whereby water under pressure within said casing is forced outwards through said coil and said drain valve.

SAMUEL W. FORD.