

D. BURROUGHS.
COMBINATION BOILER AND BURNER.
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1,016,398.

Patented Feb. 6, 1912.

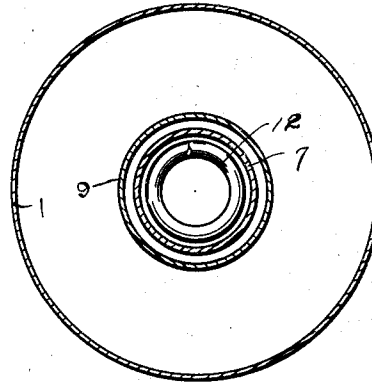
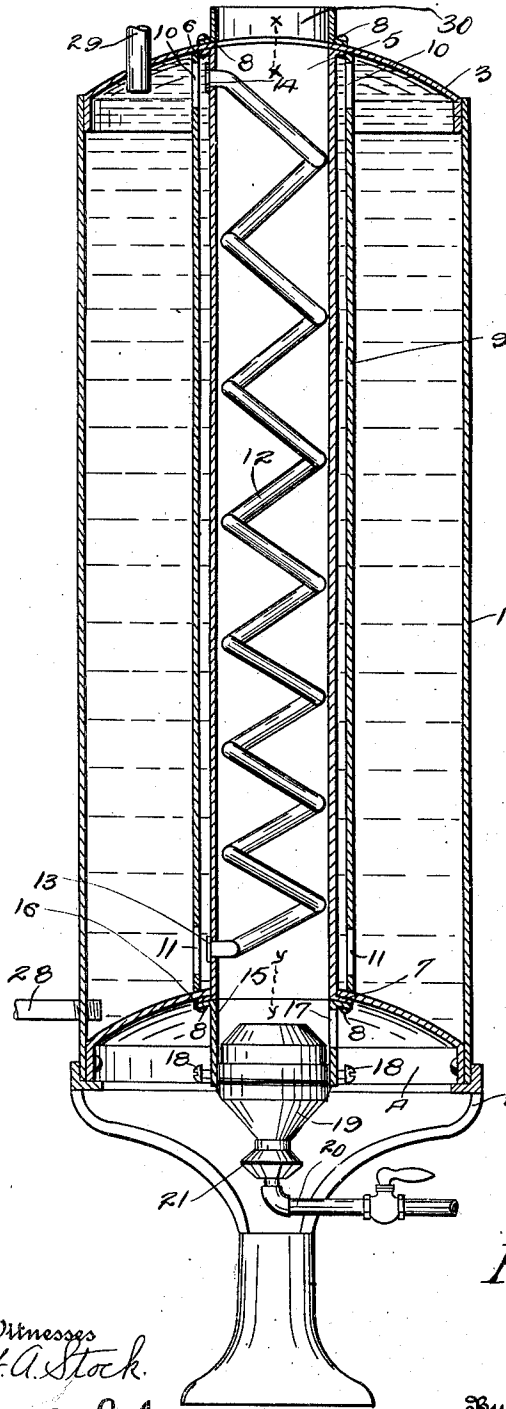


Fig. 2.

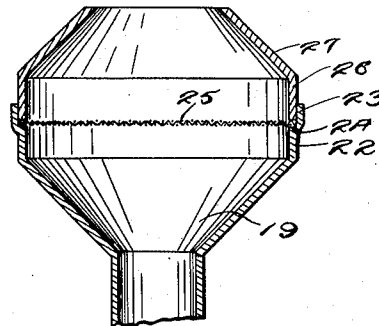


Fig. 3.

Fig. 4.

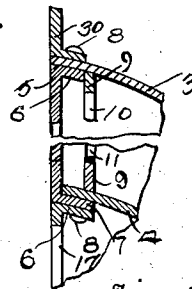


Fig. 1.

DAVID BURROUGHS
Inventor

By *E. O. Crooman*

Attorney.

Witnesses
H. A. Stock
H. C. Schroeder

UNITED STATES PATENT OFFICE.

DAVID BURROUGHS, OF OAKLAND, CALIFORNIA.

COMBINATION BOILER AND BURNER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, DAVID BURROUGHS, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Combination Boilers and Burners, of which the following is a specification.

This invention relates to water heaters and the principal object of the same is to construct the boiler so that an inclosed water space is left around the heating chamber.

This invention is illustrated in the accompanying drawings.

Figure 1 is a vertical sectional view through the improved boiler. Fig. 2 is a transverse sectional view through the boiler. Fig. 3 is an enlarged sectional view through the burner which is used in connection with this boiler. Fig. 4 is an enlarged fragmentary section taken along the lines X—X and Y—Y in Fig. 1.

Referring to the accompanying drawings by numerals it will be seen that this boiler comprises a water chamber 1 which is supported by the stand 2 and is provided with an upper cap 3 and a bottom 4. The cap 3 and bottom 4 are provided with centrally located openings which are connected by means of a heating chamber 5. The heating chamber has an upper flange 6 which is positioned within the boiler and a lower flange 7 which is positioned beneath the bottom 4. Any suitable securing means such for instance as the rivets 8 are used to secure the heating chamber in place. A cylinder 9 surrounds the heating chamber 5 and is provided near its upper end with openings 10 and near its lower end with openings 11 which permit water to pass from the water chamber 1 into the space between the cylinder 9 and the heating chamber 5. A water coil 12 is positioned in the heating chamber and has its inlet end 13 passed through the wall of the heating chamber and in alignment with one of the openings 11. The outlet end 14 passes through the upper portion of the heating chamber and is in alignment with one of the openings 10. A pendant annular piece 15 is provided with a flange 16 at its upper edge by means of which it is secured to the flange 7 of the heating chamber and is provided with an opening 17 located near the upper edge. A burner is secured within the piece 15 by

means of the set screws 18 and has its upper edge on a level with the opening 17 so that a match can be inserted through the opening 17 to light the burner.

The burner comprises a tapered base 19 which fits upon a supply pipe 20 and is provided with air inlet means 21. The upper portion 22 of the base is vertical and has a flared upper end portion 23 to form a seat 24 upon which is placed a wire screen 25. A cap 26 rests upon the wire screen above the shoulder 24 and is provided with a tapered upper portion 27 which concentrates the gas.

The gas passes through the pipe 20 into the base 19 of the burner where it is mixed with air which is fed through the inlet 21. The air and gas are prevented from passing from the burner too quickly by the screen 25 so that the gas is thoroughly mixed with the air. After the air and gas pass the wire and pass out through the opening in the cap 26, it can be lighted by a match inserted through an opening 17. A water inlet pipe 28 enters the water chamber 1 near the base of the water chamber, and a draw off pipe 29 enters the water chamber through the top 3. A collar 30 is secured to the top 3 and surrounds the opening which communicates with the heating chamber so that a pipe leading to a chimney can be connected with the heating chamber.

In the operation of this device the water is fed through the pipe 28 into the chamber 1. As the chamber 1 is filled, the water passes through the opening 11 into the water coil 12 and also into the space between the heating chamber and the cylinder 9. After the chamber 1 is filled the burner is lighted and the water coil becomes heated. As the water is heated in the coil it moves upwardly and out through the upper end 14, and through the opening 10 into the upper portion of the water chamber. More water from the water chamber passes into the water coil and also moves through the coil until it reaches the upper portion of the chamber. As the heating chamber becomes hot, the water in the space between the chamber and the cylinder 9 will become heated thus providing a layer of heated water surrounding the heating chamber. This layer of warm water will hold the heat in the heating chamber and will thus cause the water in the coils to be heated faster as the heat is held almost entirely in the heat-

ing chamber and does not pass out to the water in the water chamber. When water is drawn off through the pipe 29, more water enters through the pipe 28 to take its place.

5 It should be noted that the casing 9 is provided with beveled upper and lower ends which fit the contour of the top and bottom of the boiler, and that the upper portion of the casing surrounds the flange 6 so that it
10 is held in spaced relation to the heating chamber.

It should also be noted that the beveled lower edge keeps the lower portion of the casing in place and prevents it having any
15 movement whatsoever.

What I claim is:—

1. A boiler comprising a water chamber, a heating chamber positioned within said water chamber, a casing surrounding said
20 heating chamber and provided with openings in its upper and lower portions, a heating coil positioned in said heating chamber

and having its inlet and outlet ends positioned in alinement with said openings, and means for heating said heating chamber. 25

2. A boiler comprising a water chamber, a heating chamber, a casing surrounding said heating chamber and positioned in spaced relation thereto to provide a space
30 between said chamber and casing, said casing being provided with means for admitting the passage of water from said water chamber into the space between said heating chamber and said casing, a coil within said heating chamber having its inlet and outlet
35 positioned adjacent said water passage means, and means for heating said heating chamber.

In testimony whereof I affix my signature in presence of two witnesses.

DAVID BURROUGHS.

Witnesses:

H. C. SCHROEDER,
HATTIE C. BURROUGHS.