

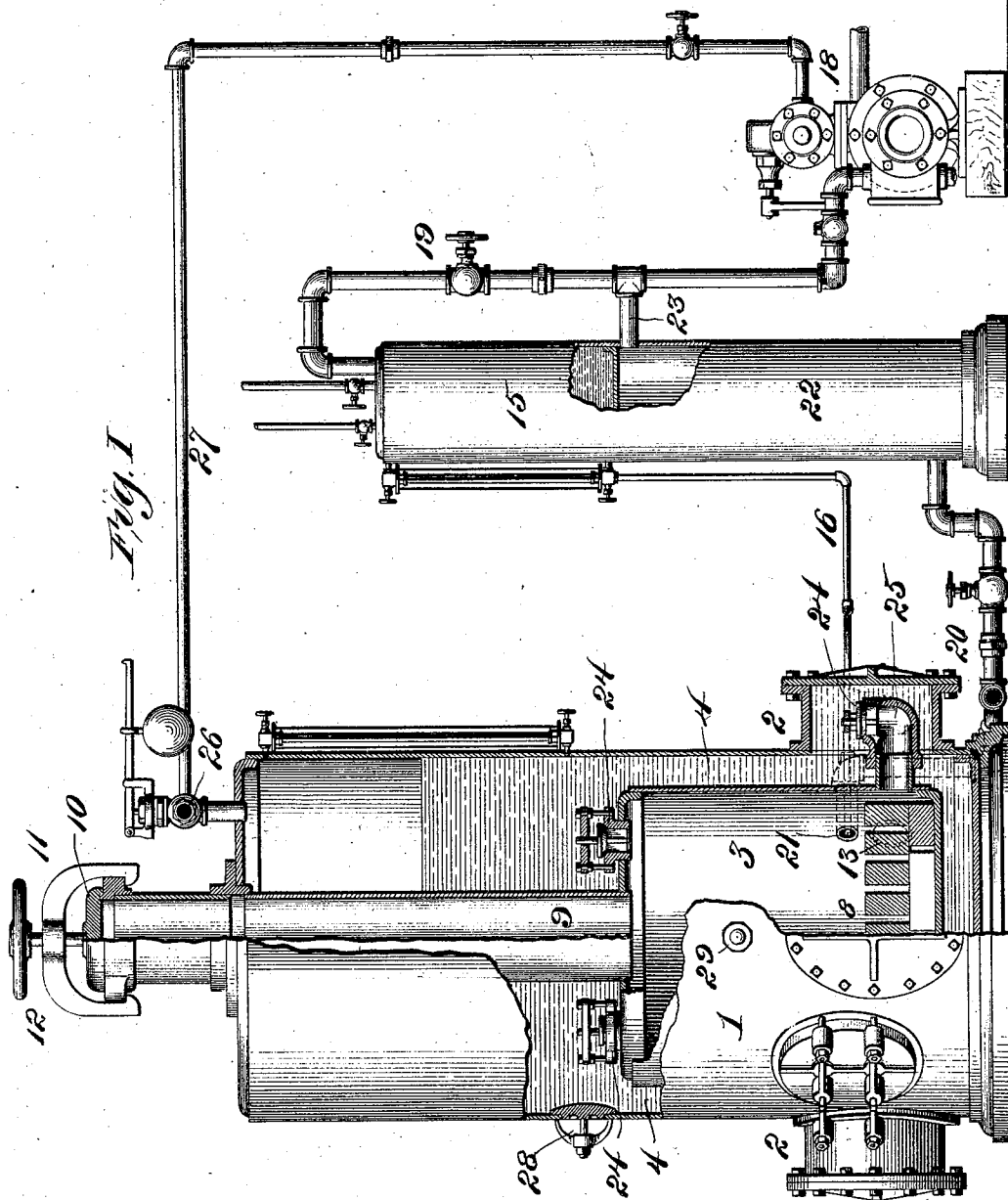
(No Model.)

2 Sheets—Sheet 1.

A. DWELLE.
BOILER FURNACE.

No. 542,187.

Patented July 2, 1895.



Attest:
C. G. Edwards.
E. Knight

Inventor:
Albert Dwelle.
By *Wm. H. Prosser*
Attys

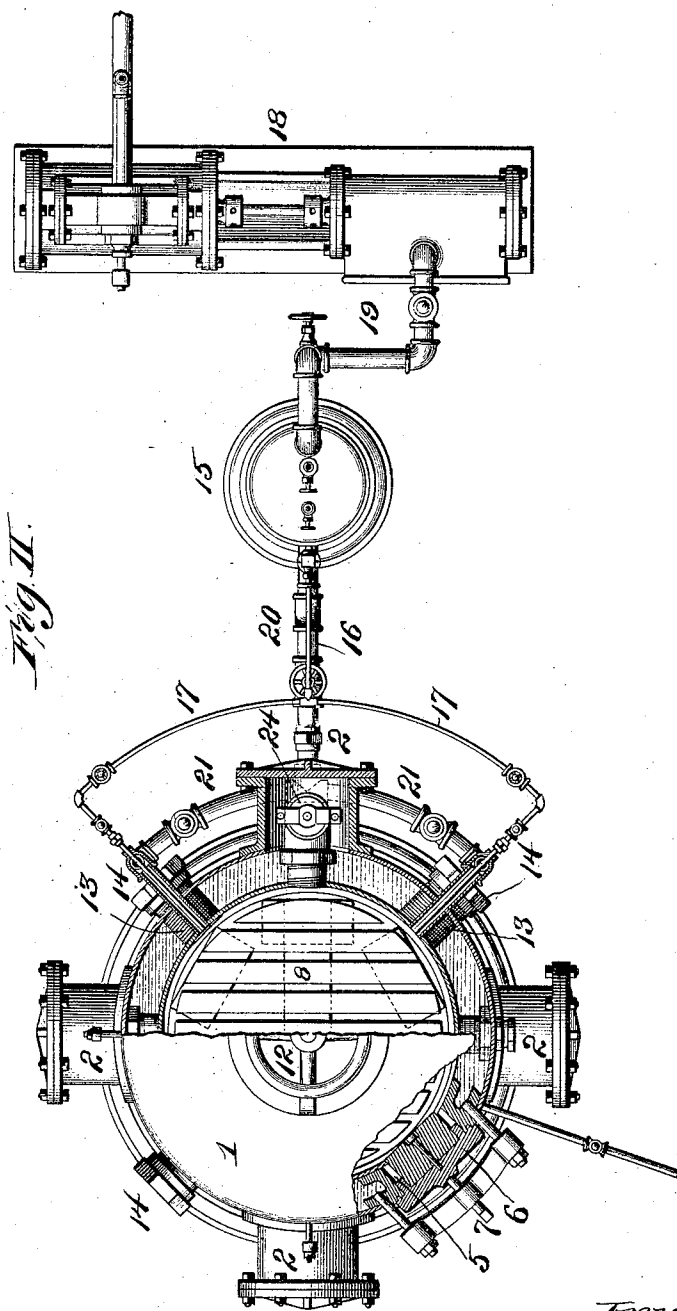
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Inventor:
Albert Dwell.
By Knight & Bro. Attys

UNITED STATES PATENT OFFICE.

ALBERT DWELLE, OF ST. LOUIS, MISSOURI, ASSIGNOR TO ZACH W. TINKER AND EMILY C. DWELLE, OF SAME PLACE, AND CHARLES W. DWELLE AND CHARLES W. DWELLE, TRUSTEE, OF DENVER, COLORADO.

BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 542,187, dated July 2, 1895.

Application filed July 23, 1894. Serial No. 518,316. (No model.)

To all whom it may concern:

Be it known that I, ALBERT DWELLE, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Boiler-Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to that class of boiler-furnaces in which fluid fuel is used; and my invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I illustrates my invention, part in side view and part in vertical section. Fig. II is a top or plan view, part in horizontal section.

Referring to the drawings, 1 represents the boiler containing the water to be heated. It is provided with suitable man-holes 2.

3 represents the combustion-chamber, located within the boiler, and which is smaller in diameter than the boiler, so that a water-space 4 is left between them. The combustion-chamber is formed with a manhole 5, (see Fig. II,) and which is closed by a head 6 and a suitable bridge 7. At the bottom of the chamber 3 is a suitable fire-brick or other grate 8. Ascending from the top of the chamber 3 is a flue 9, extending out through the top of the boiler and provided with a cap 10 at its upper end, and a bridge 11, and screws 12 for holding the cap in place.

13 represents pipes or tubes leading from the combustion-chamber 3 through the wall of the boiler, and which are provided with removable caps 14 on their outer ends, the caps being preferably screwed in place on the tubes, as shown.

15 represents an oil-tank communicating with the combustion-chamber 3 through means of a pipe 16, having branches 17, which deliver the oil to the chamber 3.

In starting the furnace the caps 14 are removed from the tubes 13 and the cap 10 is removed from the flue 9, the oxygen to supply combustion entering through the tubes 13 and the products of combustion passing off through the flue 9. After the furnace

has been in operation for a short time the cap 10 is applied to the flue 9 and the caps 14 are applied to the tubes 13. The oil continues to pass from the tank 15 to the combustion-chamber through the pipe 16 and branches 17, but it is introduced under pressure from a pump 18, connected with the tank 15 through means of a pipe 19, and air or oxygen is now introduced into the combustion-chamber through means of a pipe 20, having branches 21, forming a communication between the combustion-chamber and an air-receiver 22, which is connected with the pump 18 through means of a branch pipe 23, leading off from the pipe 19. I have shown the oil-pipe branches 17 passing through the upper ends of the branches 21 of the air-pipe. The oil and air are now introduced under pressure, and the heat and products of combustion instead of passing out through the flue 9, escape through valves 24 into the boiler 1 in direct contact with the water. The valves, as will be observed, open outwardly, and they are forced open by the pressure of the gases within the chamber 3; this pressure being that naturally due to combustion, augmented by the pressure of the pump, which introduces the air and oil.

I have shown two of the valves 24 located on the top of the chamber 3, and I have shown one located in each of the short pipes 25, extending out from the lower end of the combustion-chamber into the manholes 2. Any desired number of these valves may be used, and they may be of any suitable form or construction. By thus admitting the gases and products of combustion from the chamber 3 directly into the water, or into the boiler containing the water, the full effect of the heat is obtained to generate steam, and no part of the heat passes off to the open air, as in the ordinary construction.

26 represents a steam-pipe leading off from the boiler and which I have shown provided with a branch 27, leading to the pump 18 for operating the latter. The steam is conducted through the pipe 26 to any desired place of use.

28 represents a hand-hold in the boiler 1. The different pipes, it will be understood,

are provided with valves wherever they are needed.

29 represents a peep-hole for examining the interior of the combustion-chamber.

5 I claim as my invention—

1. In a boiler furnace, the combination of a combustion chamber, provided with valves, a boiler surrounding the combustion chamber, and into which said valves open, an oil chamber, an air chamber, a pump for forcing oil and air from their chambers into the combustion chamber; and an escape flue for said combustion chamber; substantially as set forth.

15 2. In a boiler furnace, the combination of a combustion chamber, provided with valves, a boiler inclosing the combustion chamber, tubes for admitting air to the combustion chamber, and which are provided with suitable caps or doors, a tube for permitting the escape of the products of combustion from the combustion chamber, and which is provided with a suitable cap or valve, and means for forcing oil and air into the combustion chamber; substantially as set forth.

3. In a boiler furnace, the combination of a boiler, a combustion chamber inclosed wholly within the boiler, valves opening from the top of said combustion chamber into the boiler, short pipes extending out from the side of the combustion chamber and also provided with valves opening into the boiler, a valved outlet for the escape of products of combustion, and means for forcing fuel and air into the combustion chamber, substantially as and for the purpose set forth.

4. In a boiler furnace, the combination of a combustion chamber, provided with valves, a boiler inclosing the combustion chamber, a flue communicating with the combustion chamber, and extending through the boiler,

and provided with a cap or valve on its outer end, air flues communicating with the combustion chamber, and extending through the boiler, and provided with caps or valves on their outer ends, an oil tank, a pipe connecting the oil tank with the combustion chamber, a pump, a pipe forming a communication between the pump, and the combustion chamber, and a pipe forming a communication between the pump and said oil tank; substantially as set forth.

5. In a boiler furnace, the combination of a combustion chamber provided with valves, a boiler inclosing the combustion chamber, an oil tank, a pipe forming a communication between the oil tank and the combustion chamber, a pump, a pipe forming a communication between the pump and the combustion chamber, and a pipe forming a communication between the pump and said oil tank; substantially as set forth.

6. In a boiler furnace, the combination of a combustion chamber, provided with valves, a boiler inclosing the combustion chamber, an oil tank, an air reservoir, a pipe forming a communication between the air reservoir and said combustion chamber, an oil tank, a pipe forming a communication between the oil tank and the combustion chamber, and which passes through the inner end of said air pipe, a pump, a pipe forming a communication between the pump and said air reservoir, and a pipe forming a communication between the pump and said oil tank; substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand this 13th day of July, A. D. 1894.

ALBERT DWELLE.

In presence of—

FANNIE GART,
BEDE MILES.