

W. M. HOFFMAN.
OIL BURNER.
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1,335,166.

Patented Mar. 30, 1920.

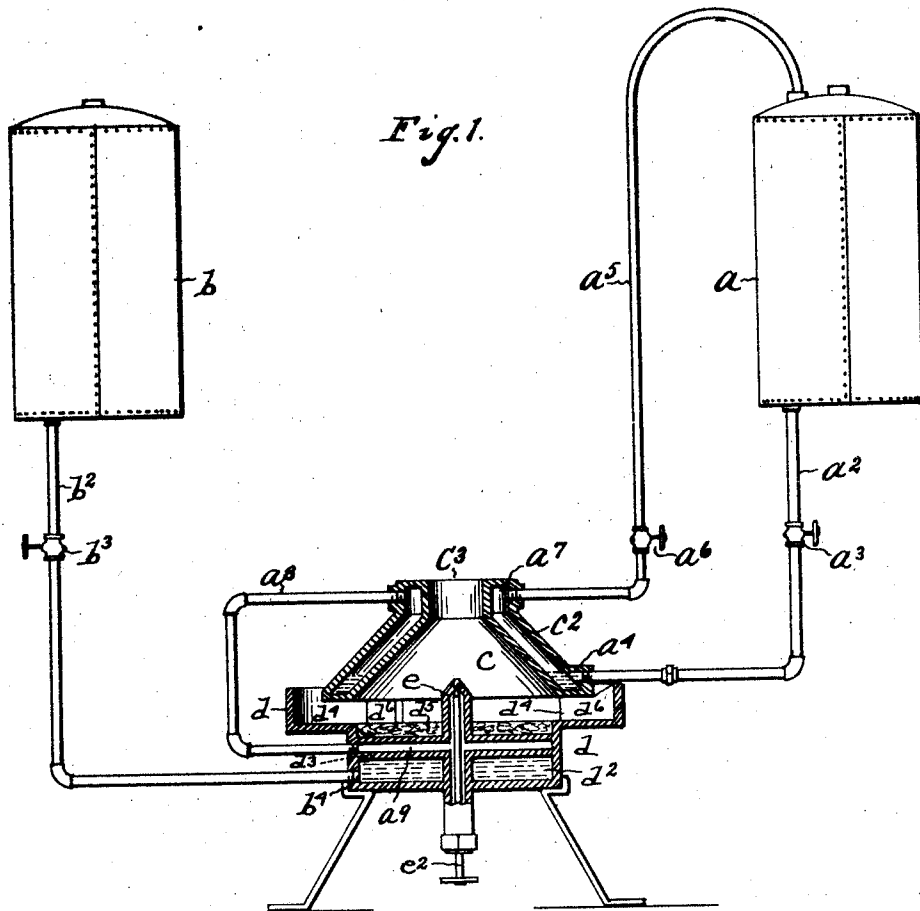


Fig. 1.

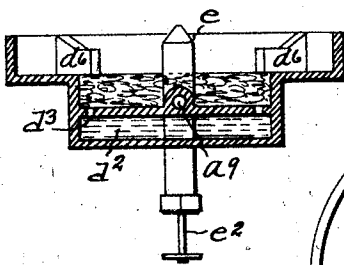


Fig. 3.

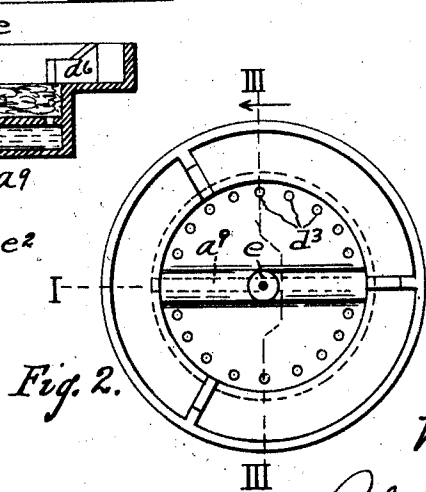


Fig. 2.

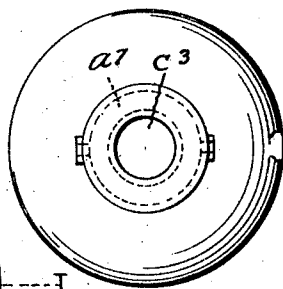


Fig. 4.

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OIL-BURNER.

1,335,166.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM M. HOFFMAN, a citizen of the United States, residing at Buffalo, county of Erie, State of New York, have invented a certain new and useful Improvement in Oil-Burners, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to oil burners and an object of my improvement is to provide an improved burner, producing smokeless combustion and intense heat.

I secure this object in the device illustrated in the accompanying drawing in which;

Figure 1 is an elevation partly in section on the line I—I Fig. 2 of an apparatus embodying my invention.

Fig. 2 is a detail plan view of the oil cup or receptacle, the mixing cone being removed.

Fig. 3 is a section on the line III—III Fig. 2.

Fig. 4 is a plan view of a mixing cone.

a is an elevated reservoir forming a receptacle for water. b is a similar reservoir forming a receptacle for fuel oil. c is a hollow cone having an inclosed space c^2 within its wall and constituting a mixer for air and fuel. The cone c is open at its top in a coaxial opening a^3 .

a^2 is a pipe extending from the bottom of the reservoir a to the lower portion a^4 of the chamber c^2 in the wall of the cone c . The pipe a^2 is provided with an adjustable cock a^3 by which the flow of water there-through may be regulated. a^5 is a pipe leading from the upper end of the reservoir a to the chamber c^2 at its upper end, at a^7 , and provided with an adjustable cock a^6 .

d is an oil cup, or receptacle, having an enlarged open upper portion d^4 and a concentric, upwardly open portion of smaller diameter in which is placed at d^5 a refractory absorbent material, such as asbestos. d^2 is an inclosed chamber at the lower part of the cup d opening through its wall to the portion d^5 in a series of small apertures d^3 arranged in a peripheral circle. d^6 are radially extending fins, or ribs, in the cup d

and upon these ribs rest the mixing cone c with its large opened end downward and concentric with said cup so as to leave a space for the passage of air under the lower edge of the wall of the cone.

a^9 is a diametrically extending passage in the bottom of the open portion d^5 of the cup d . From the passage a^9 a delivery nozzle e rises vertically concentric with the nozzle d and cone c , its upper end extending part way into the hollow of said cone. e^2 is a needle valve controlling the area of passage from the delivery nozzle e . a^8 is a pipe leading from the upper part of the chamber c^2 to the passage a^9 .

The operation of the above described device is as follows;

Water is placed in the receptacle a and fuel oil in the receptacle b . The oil flows by gravity through the pipe b^2 into the inclosure d^2 and rises through the apertures d^3 into the absorbent material in the part d^5 of the open portion of the cup d . The oil is ignited on the surface of the material d^5 , the air for its combustion is supplied under the lower edge of the cone c . Water is admitted from the receptacle a through the pipe a^2 into the chamber c^2 and is vaporized by the heat of the combustion in the cup d . The steam passing from the chamber c^2 through the pipe a^8 into the passage a^9 and is discharged through the delivery opening of the nozzle e into the mixing chamber c where it passes with the burning oil through the opening c^3 producing a flame with very concentrated heat and perfect combustion.

The pressure upon the surface of the water in the receptacle a is always the same as that in the chamber c^2 because the upper portion of said receptacle communicates with said chamber through the pipe a^5 .

The apparatus is supplied with water at the required rate by regulating the cock a^3 and with oil by regulating the cock b^3 . The discharge of steam is adjusted by the needle valve e^3 controlling the discharge orifice of the nozzle e .

What I claim is:

1. In an apparatus of the kind described, a mixer having an inclosed chamber in its wall, means for supplying water to said chamber, an oil burner located below said mixer so that the flame of said burner shall rise into said mixer, a delivery nozzle open-

ing into said mixer from below, vapor communicating means between said chamber and said nozzle, a reserve vapor chest, vapor communicating means between said chest
5 and said mixer.

2. In an apparatus of the kind described, an oil burner cup, means for supplying oil thereto, a conical mixer, having a hollow wall, superimposed over said burner in such
10 a manner as to provide a circumferential air passageway between the lower edge of the wall of said mixer and the side of said burner cup, water communicating means with the hollow wall of said mixer, a deliv-
15 lery nozzle disposed in said burner to project vapor into said mixing chamber, means for regulating the flow of vapor through said nozzle, vapor communicating
20 means between the hollow wall of said mixer and said nozzle, a reserve vapor tank, vapor communicating means between said tank and the hollow wall of said mixer.

3. In an apparatus of the kind described, an oil burner, means for supplying oil there-
25 to, a vapor generating chamber provided with a hollow wall and a central opening superimposed thereover to act as a mixing chamber, water communicating means with
30 said generator, vapor communicating means to project a jet of vapor into said mixing chamber coaxially with the products of combustion, means for regulating the flow of vapor through said vapor communicating
35 means, a reserve vapor chest, vapor communicating means between said vapor chest and the vapor generating chamber.

4. In an apparatus of the kind described, an oil burner, means for supplying oil there-
40 to, a mixer provided with a hollow wall and a central upward opening located above said burner, an exterior water tank, water com-

municating means between said tank and the hollow wall of said mixing chamber, vapor communicating means between the hollow wall of said mixer and terminating
45 in said mixing chamber so as to project a jet of vapor therein coaxially with the products of combustion, vapor communicating means between the hollow wall of said mixer and the upper portion of said water tank so
50 as to provide a reserve vapor supply therein.

5. In an apparatus of the kind described, a combustion chamber, a water vapor generator disposed so as to be heated by the
55 combustion in said chamber, means for projecting vapor into said combustion chamber, vapor communicating means from said generator to said vapor projecting means, a water reservoir, water communicating means between said reservoir and said vapor generator, vapor communicating means between
60 said reservoir and said vapor generator, said vapor communicating means leading to said generator disposed on the opposite side of said generator from the communicating
65 means leading to said vapor projecting means.

6. In an apparatus of the kind described, a combustion chamber, a water vapor gener-
70 ating chamber disposed so as to be heated thereby, vapor communicating means leading from said vapor generator so adapted as to project a jet of vapor into said combustion chamber, a water vapor reservoir supplied with vapor from said generator, vapor
75 communicating means leading from said reservoir through said generator to said vapor projecting means.

In testimony whereof I sign this specification.

WILLIAM M. HOFFMAN.