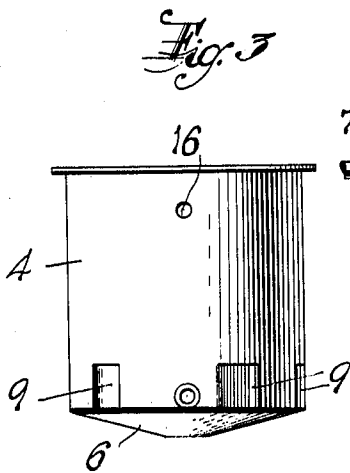
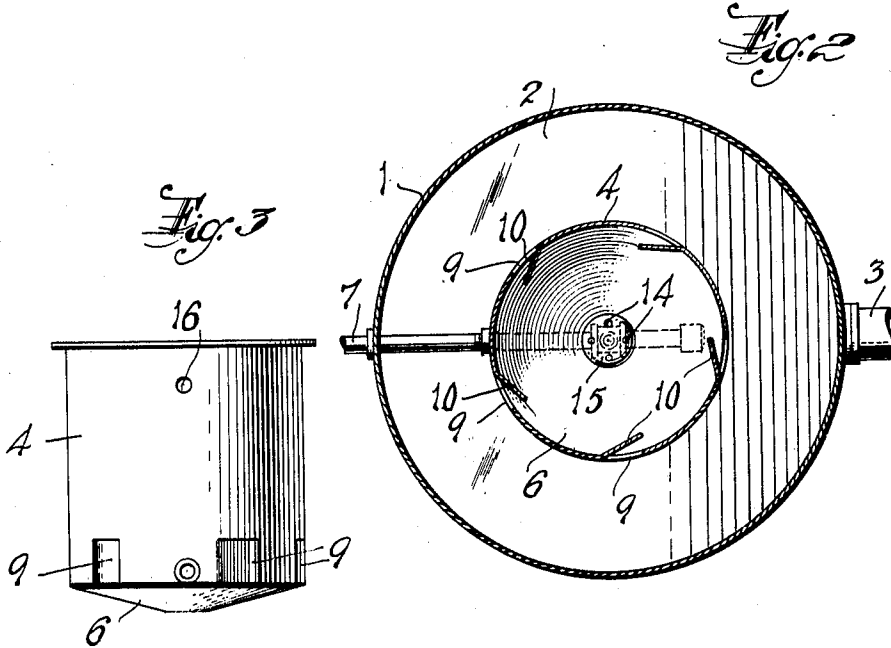
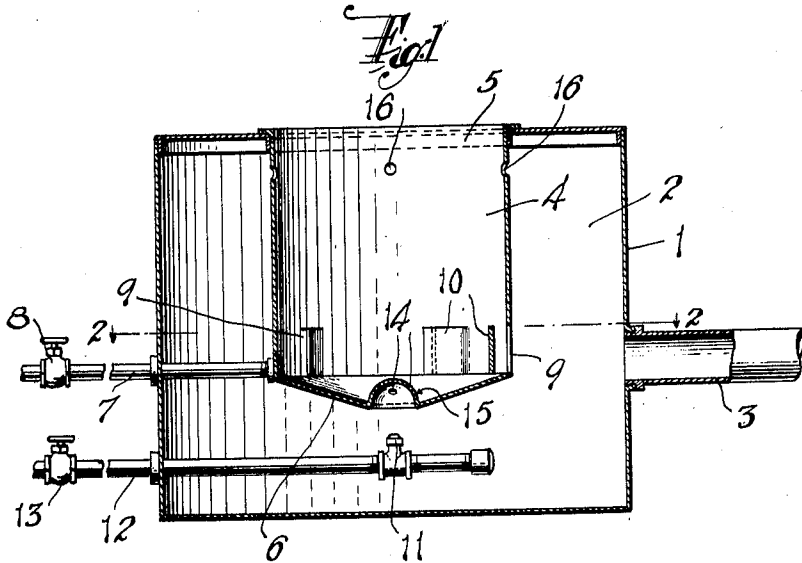


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G. H. MESSER
LIQUID FUEL BURNER
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GEORGE H. MESSER, OF NEWARK, NEW JERSEY.

LIQUID-FUEL BURNER.

Application filed October 24, 1923. Serial No. 670,419.

To all whom it may concern:

Be it known that I, GEORGE H. MESSER, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Liquid-Fuel Burners, of which the following is a specification.

This invention relates in general to liquid fuel burners adapted to burn the cheaper grades of oils or the hydrocarbons commonly known as fuel oils, and more particularly to burners of this character which are constructed to vaporize the fuel and produce a mixture thereof with air whereby more complete combustion of the fuel and the maximum heat therefrom is obtained.

The primary object of the invention is to provide a liquid fuel burner of the character described embodying novel and improved features of construction for producing a complete and rapid vaporization of the fuel and a thorough mixture thereof with air whereby a more complete combustion and maximum heat is obtained with a minimum of carbon deposits, soot, etc.

Another object is to provide a liquid fuel burner of this character in which currents of air under pressure are caused to pass with a swirling or circular motion over a surface which receives the fuel in the form of a film to produce a thorough fuel and air mixture which is directed upwardly in the form of a column whereby complete combustion of the fuel is obtained and the collection of carbon, etc., prevented.

Further objects are to provide such a liquid fuel burner comprising a combustion chamber having a closed bottom and open top or flue and surrounded by a chamber containing compressed air, the walls of said combustion chamber being formed with slots adjacent said bottom to permit flow of compressed air thereover and the liquid fuel being caused to flow over said bottom in the form of a thin film which is quickly vaporized, mixed with said air and ignited; to provide such a burner embodying novel features of construction whereby deposits of carbon, soot, etc., are prevented from forming on the walls of the combustion chamber thereby ensuring the same against becoming clogged or combustion therein restricted; to provide a construction whereby the walls of the chamber are maintained at proper temperature by the air supply and the air

supply maintained at the best operating temperature by said combustion chamber before its mixture with the fuel, and to obtain other results and advantages as may be brought out by the following description.

Referring to the accompanying drawings, in which like numerals of reference indicate the same parts throughout the several views.

Figure 1 is a transverse vertical sectional view through a liquid fuel burner embodying my invention;

Figure 2 is a horizontal sectional view taken on the line 2—2 of Fig. 1, and

Figure 3 is a detached side elevation of the combustion chamber.

In the said drawings I have shown a liquid fuel burner embodying my invention and particularly adapted for use with house heating furnaces or boilers, although it will be understood that it is within the scope of the invention to modify the construction of the burner to adapt it for many other uses.

Referring to the specific embodiment of the invention illustrated the reference character 1 designates a casing forming a chamber 2 to receive compressed air by means of a pipe 3 from any suitable source such as a blower fan (not shown). The casing 1 is preferably cylindrical, although not necessarily so, and arranged substantially coaxially with the casing 1 is a combustion chamber 4 preferably formed of sheet metal and having one end thereof open as at 5 to form a flue. In the present instance the chamber 4 is substantially cylindrical and formed at its lower end, or the end opposite the open end 5 with a burner plate 6. This burner plate may be formed integrally with the chamber 4 or separate therefrom as may be desired, but it is in heat conducting contact with the walls of the chamber 4. The burner plate 6 is preferably formed of sheet metal and of an inverted conical shape. The liquid fuel is supplied to the burner by means of a pipe 7 controlled by an inlet valve 8, said pipe being so arranged as to admit the fuel to the burner plate at the upper edge thereof so that the fuel will flow by action of gravity over the plate in the form of a film.

The walls of the combustion chamber 4 are formed immediately above the burner plate 6 with a plurality of openings 9 to admit currents of air from the compressed air chamber 2, said openings being so arranged that the currents of air are directed

transversely of the burner plate 6, and baffles 10 are arranged adjacent each of the openings 9 to direct the currents of air in paths having a substantial chordal relation with the combustion chamber 4. In this manner the currents of air are caused to enter the combustion chamber 4 with a swirling or circular motion above the burner plate 6 which produces in effect a film or sheet of air above the burner plate.

For initially vaporizing and igniting the liquid fuel on the burner plate 6, I may provide a pilot light 11 supplied from any suitable source of fuel as by means of a pipe 12 controlled by a valve 13, said pilot light being arranged substantially centrally of the burner plate 6 and beneath the same. The center of the burner plate is formed with a plurality of openings 14 to permit the flame from the pilot light to enter the combustion chamber, and to prevent the fuel from flowing through said openings 14, the said openings are formed in an upwardly projecting portion 15 formed at the center of the burner plate 6.

In the operation of the burner the fuel is permitted to flow from the pipe 7 downwardly over the burner plate 6, and when the pilot light 11 has heated the liquid fuel sufficiently to vaporize the same, the vapors are ignited by the pilot light through the openings 14. The currents of compressed air enter the combustion chamber through the openings 9 and thoroughly mix with the fuel vapors, the swirling motion of the currents of air greatly assisting in a thorough mixture of the fuel vapors and the air and at the same time assisting in the vaporization of the fuel. The rising vapors of fuel must pass through the sheet of air above the burner plate 6, and a pressure is constantly maintained in the combustion chamber to ensure complete vaporization of the fuel and mixture thereof with the air so that thorough combustion of the fuel mixture is obtained. The flames from the combustion and the products of the combustion leave the combustion chamber 4 through the open end 5 and after a short time the walls of the combustion chamber become sufficiently heated to continuously and rapidly vaporize the fuel as it flows onto the burner plate 6.

With the particular arrangement of the combustion chamber and compressed air chamber, the compressed air maintains the walls of the combustion chamber at the proper operating temperature, while the heat from the walls of the combustion chamber serve to heat the compressed air to a proper operating temperature before it enters the combustion chamber. The thorough and complete combustion enabled by the construction ensures against deposits of carbon or soot on the inner walls of the com-

bustion chamber, and to further ensure against such carbon deposits, the combustion chamber may be formed adjacent its outer end with a plurality of openings 16 which admit currents of compressed air from the chamber 2 into the combustion chamber at its outer end.

The baffles 10 may be formed in any suitable manner, but a convenient and inexpensive construction is shown in the drawings in which the baffles consist of the metal of the walls of the combustion chamber which is stamped inwardly to form the openings 9. Thus, the openings 9 and baffles 10 may be formed in the same operation.

While I have shown and described the burner as embodying certain details of construction now the best known to me, it will be understood that this is mainly for the purpose of illustrating the principles of the invention and that many modifications and changes can be made in the details of the construction without departing from the spirit or scope of the invention. Therefore, I do not wish to be understood as limiting myself except as required by the following claims when construed in the light of the prior art.

Having thus described the invention, what I claim is:

1. A liquid fuel burner, comprising a substantially vertical combustion chamber having an open upper end and provided at its lower end with a plurality of horizontally spaced openings to admit currents of air transversely of said chamber, a downwardly inclined burner plate arranged beneath said openings, and means for supplying liquid fuel to the upper edge of said plate whereby said fuel flows by action of gravity over said plate in the form of a film.

2. A liquid fuel burner, comprising a substantially vertical combustion chamber having an open upper end and provided at its lower end with a plurality of horizontally spaced openings to admit currents of air transversely of said chamber, an inverted conical burner plate arranged beneath said openings, and means for supplying liquid fuel to the upper edge of said plate whereby said fuel flows by action of gravity over said plate in the form of a film.

3. A liquid fuel burner, comprising a substantially vertical combustion chamber having an open upper end and provided at its lower end with a plurality of horizontally spaced openings to admit currents of air transversely of said chamber, an inverted conical burner plate arranged beneath said openings, means for supplying liquid fuel to the upper edge of said plate whereby said fuel flows by action of gravity over said plate in the form of a film,

and means for supplying air under pressure to all of said openings to produce a pressure in said chamber and on said burner plate thereby causing thorough vaporization of the liquid fuel and complete mixture of the air and fuel vapors.

4. A liquid fuel burner including a substantially cylindrical combustion chamber having an open end and provided at its other end with a plurality of openings to admit currents of air, baffles adjacent said openings to direct said currents of air in paths having chordal relations to said chamber, an inverted conical burner plate arranged beneath said openings, and means for supplying liquid fuel to the upper edge of said plate whereby said fuel flows by action of gravity over said plate.

5. A liquid fuel burner, comprising a chamber to receive compressed air, a combustion chamber arranged within said air chamber open at its outer end and formed in its walls with a plurality of openings to admit air from said air chamber transversely of said combustion chamber, a burner plate at the inner end of said combustion chamber at the side of said openings opposite said open end, and means for supplying liquid fuel to said burner plate

in the form of a film, whereby pressure is maintained in said combustion chamber to cause thorough mixture of said air and the fuel vapors and the air in said air chamber is preheated by contact with the walls of said combustion chamber.

6. A liquid fuel burner, comprising a chamber to receive compressed air, a combustion chamber arranged within said air chamber open at its outer end and formed in its walls with a plurality of openings spaced in the same plane to admit currents of air from said air chamber in paths having chordal relations to said combustion chamber, a burner plate at the inner end of said combustion chamber at the side of said openings opposite said open end, and means for supplying liquid fuel to said burner plate in the form of a film, whereby the air in said air chamber is pre-heated by contact with the walls of said combustion chamber and enters said combustion chamber in the form of a sheet between said burner plate and said open end producing a pressure in said chamber and causing thorough vaporization of the fuel and mixture of the fuel vapors with said air.

GEORGE H. MESSER.