Dec. 8, 1936. M. A. S. LAVIGNE 2,063,847

OIL BURNER

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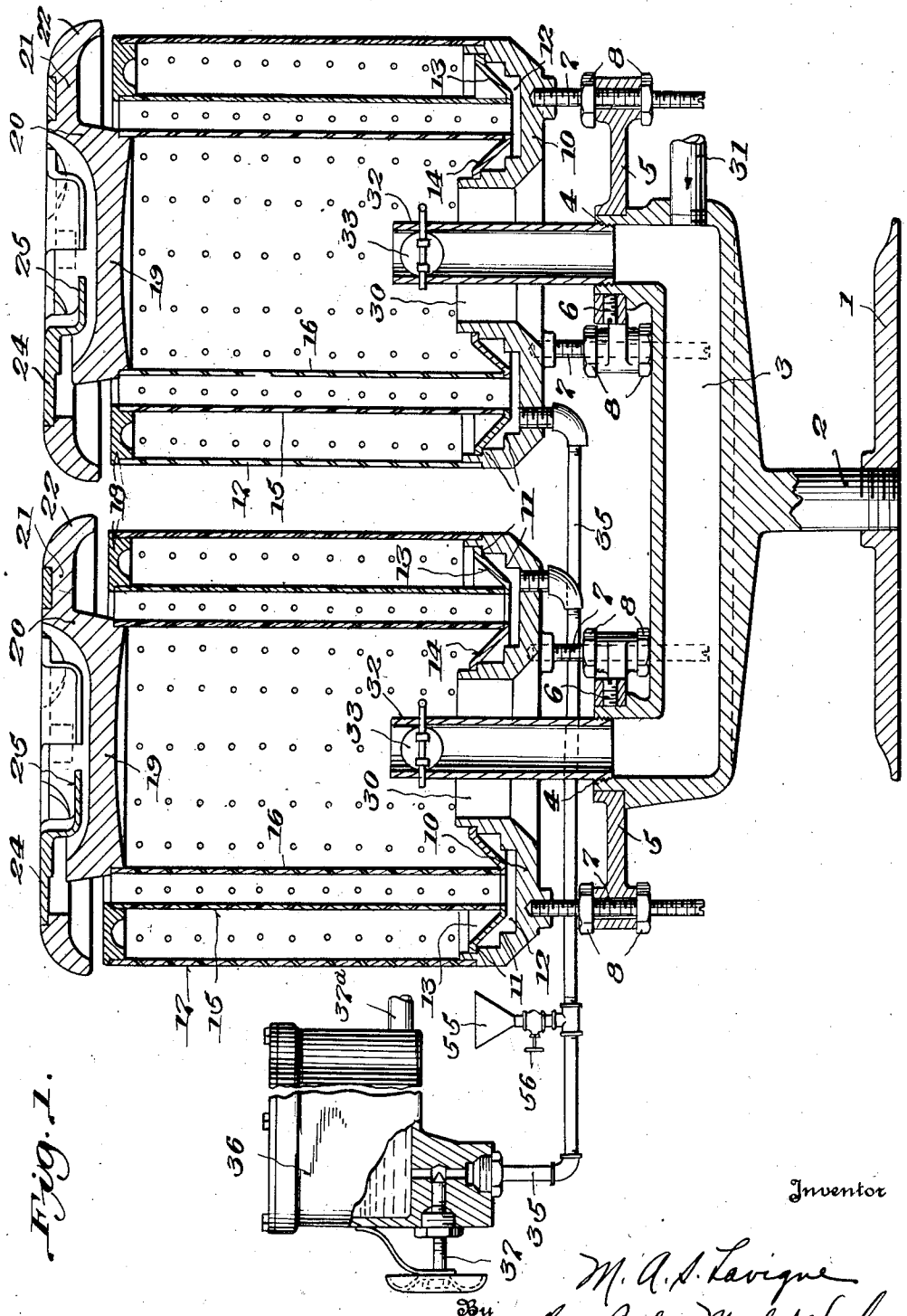


Fig. 1.

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Fig. 2.

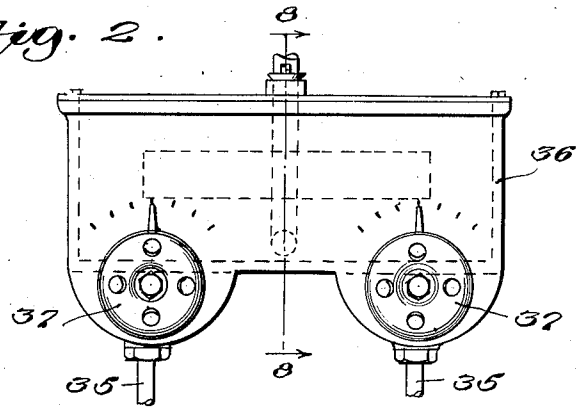


Fig. 3.

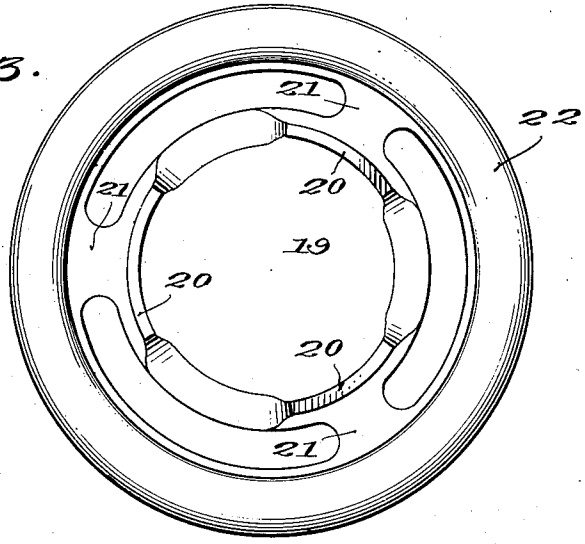
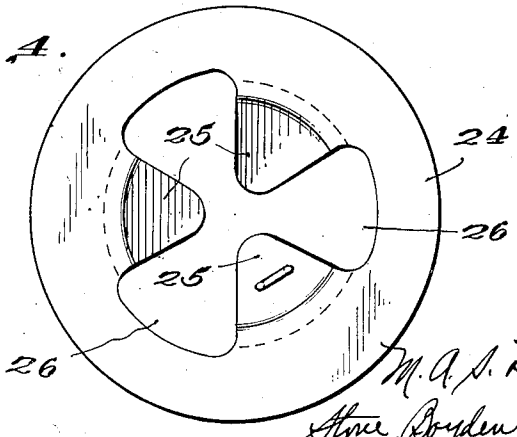


Fig. 4.



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Fig. 5.

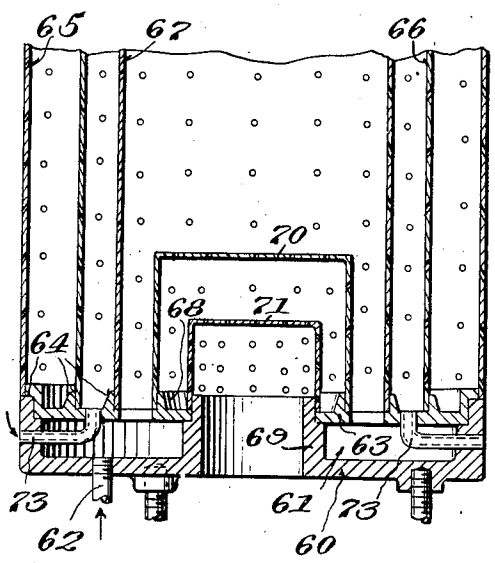


Fig. 6.

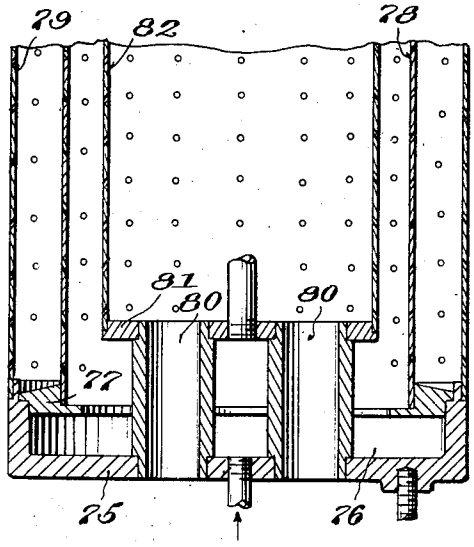
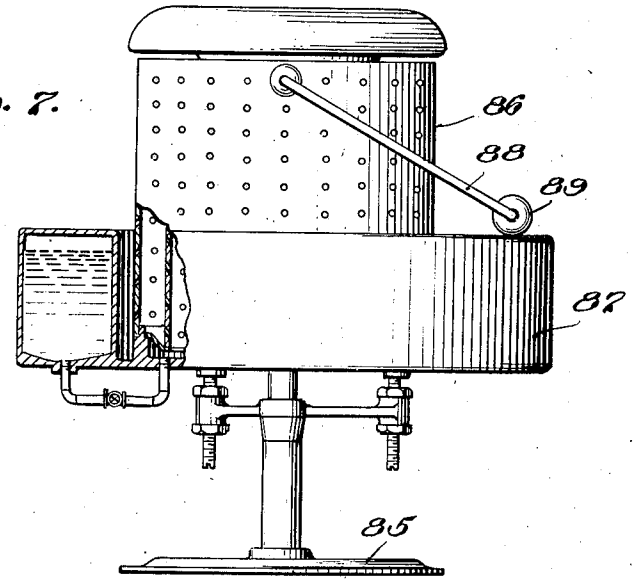


Fig. 7.



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Fig. 8.

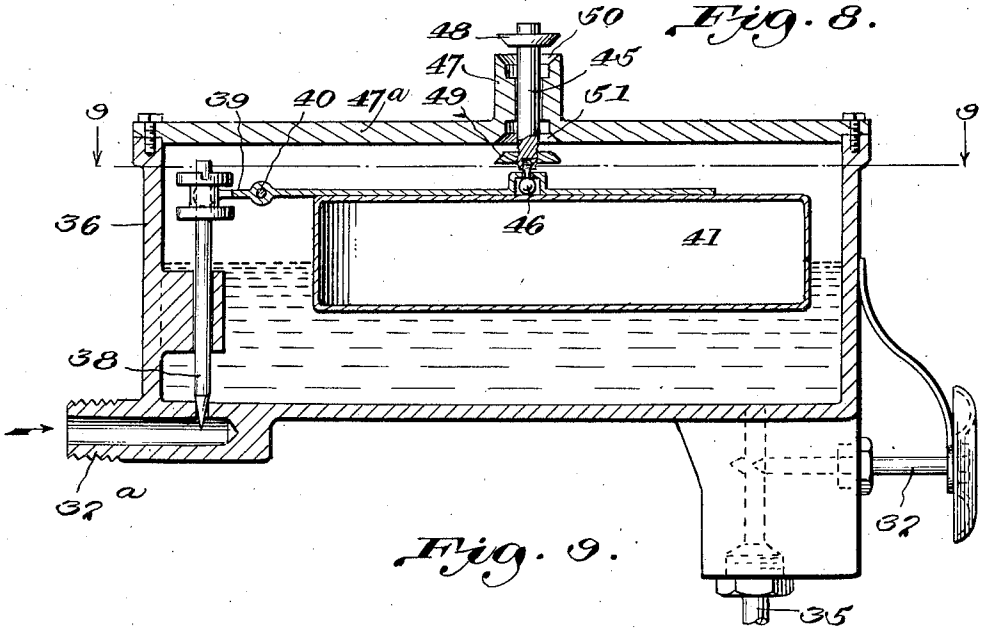


Fig. 9.

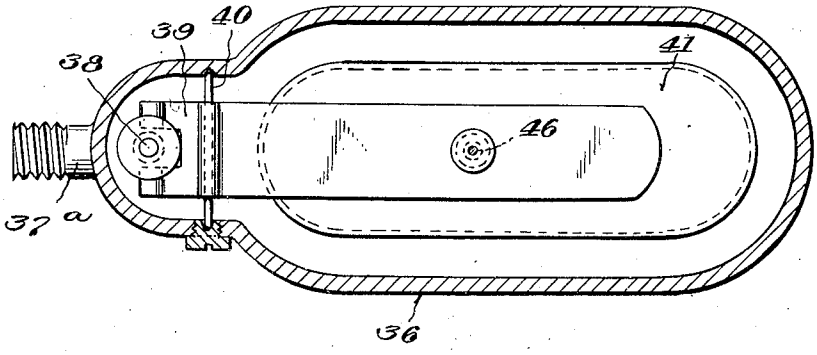
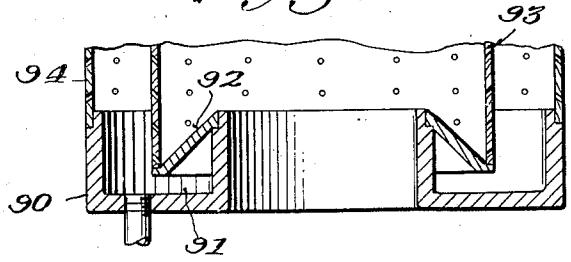


Fig. 10.



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Patented Dec. 8, 1936 2,063,847

UNITED STATES PATENT OFFICE

2,063,847

OIL BURNER

Michael A. S. Lavigne, Worcester, Mass., assignor of fifteen per cent to Marvin M. Taylor, Worcester, Mass., and eighty-five per cent to Marvin M. Taylor as trustee for Isobel R. Lavigne

Application February 2, 1931, Serial No. 513,029

6 Claims. (Cl. 158—87)

This invention relates to oil burners and has particular reference to oil burners of the wickless type similar to that described in my Patent No. 1,763,164 dated June 10, 1930.

The primary object of the present invention is to provide an improved type of oil burner which shall include novel flame baffling means which will enable the device to burn heavy, light or any intermediate grade of fuel efficiently.

Another object is to provide a burner which shall be capable of universal use, such as heating kitchen ranges, water heaters, furnaces and other cooking and heating appliances.

A further object is to provide an oil burner of the aforesaid character which shall be simple in construction, inexpensive to manufacture and which shall be highly efficient in operation.

With the foregoing and other objects in view, the invention may be stated to consist in the various novel features of construction and arrangement or combination, all of which will be fully described hereinafter and pointed out in the appended claims.

In the drawings accompanying and forming part of this application,

Figure 1 is a vertical sectional view through a twin burner constructed in accordance with my invention;

Figure 2 is a front elevation of the control valves for the twin burner;

Figures 3 and 4 are top plan views of the burner hood elements;

Figure 5 is a fragmentary vertical sectional view of a modified form of burner;

Figure 6 is a similar view of a still further modification;

Figure 7 is a side elevation partly in section of a portable type burner;

Figure 8 is a transverse sectional view taken on the line 8—8 of Figure 2;

Figure 9 is a longitudinal sectional view taken on the line 9—9 of Figure 8; and

Figure 10 is a fragmentary vertical sectional view of a further modified form of burner.

Describing the various parts by reference characters and referring particularly to Figure 1, 1 denotes a base from which rises a standard 2 having a horizontal disposed conduit 3 at its upper end. The ends of conduit 3 are directed upwardly as indicated at 4 and each receives a spider 5 which is retained in position by a set screw 6. Each spider is provided with a plurality of vertically adjustable rods 7 and these rods support the burner structure to be described hereinafter. It will be understood that rods 7 are each vertically adjustable and may be locked in position by nuts 8 to maintain the burner structure level.

Each burner unit consists of a base in the form of an annulus 10 which is substantially U shape in cross section. As shown in Figure 1, the annulus is formed with a plurality of shoulders 11 which define annular grooves 12, the lowermost of which serves as a fuel well. Supported on the uppermost of these shoulders are a pair of downwardly directed annular baffle rings 13 and 14 which extend to within close proximity of the bottom of the fuel well, and each ring is formed at its lower edge with a horizontal portion which receives and supports the perforated sleeves 15 and 16. It will be noted that the space between the sleeves 15 and 16 is disposed substantially midway of the fuel well 12 and defines a combustion chamber for the vaporized oil. Supported on the base 10 adjacent its outer edge and extending upwardly is a third perforated sleeve 17 which encloses sleeves 15 and 16.

At the upper end the space between sleeves 15 and 17 is closed by a ring 18. The top of sleeve 16 is closed by a casting 19 as shown in Figures 1 and 3, which seats on said sleeve and is formed with a plurality of upwardly extending projections 20, from which radiate horizontal extensions 21 that support an annular ring 22 which forms a hood over the upper ends of sleeves 15 and 17. Detachably supported on casting 19 is a circular plate 24 (Figs. 1 and 4) having a depressed central portion 25 and a substantially clover leaf shaped cut out portion 26. This cut out portion is adapted to receive the projections 20 when the plate 24 is seated on the ring 22 of casting 19 as shown in Figure 1, thereby providing spaced flame and heat baffles at the top of the burner.

Air is supplied to the burner through the perforations in the sleeves 15, 16 and 17 and also through a central aperture 30 defined by the base annulus 10. In some instances where the burner is enclosed in a confined space, as for instance in the bottom of a furnace, it may be desirable to supply additional air and for this purpose, I connect a pipe 31 with conduit 3 and extend the same outside the furnace walls. The upper ends of conduit 3 each have threaded therein a conduit 32 which projects up into the sleeve 16 and each conduit is provided with a butterfly control valve 33.

Fuel is supplied to the burners through pipes 35 which connect at one end to the fuel groove 12 in the base rings 10, and at the other ends, said

pipes connect with a fuel supply and control chamber **36**, through control valves **37**.

The fuel supply and control mechanism is shown in Figs. 1, 2, 8 and 9 and is interposed between the burner and main source of fuel supply. This mechanism serves to maintain a small and substantially constant head of fuel for gravity feed to the burner. As shown in detail in Figures 8 and 9, the fuel chamber **36** is provided with an inlet **37***a* which is adapted to be connected with the main source of fuel supply. A needle valve **38** is movable vertically to control the fuel inlet to chamber **36** and the valve is connected to one end of a lever **39** which is pivoted at **40** to the walls of chamber **36**. The opposite end of lever **39** has a float **41** secured thereto and this mechanism serves to maintain a substantially constant fuel level in chamber **36** in a well known manner. In order to provide against sticking of the needle valve **38** and flooding of the chamber **36** and burners, I provide an automatic cut-off mechanism which consists of a valve stem **45** which is connected at one end through a universal joint **46** to the top of the float. This valve stem projects upwardly and fits loosely through a boss **47** in the cover **47***a* and said stem is fitted with two oppositely facing valves **48** and **49** which are arranged in spaced relation on the stem. These valves are adapted to cooperate with suitable valve seats **50** and **51** respectively that are formed in boss **47**. From the foregoing, it will be apparent that if the valve stem becomes stuck in the open position, the float will be down and valve **48** will engage seat **50** and shut off the air vent past valve stem **45** to the atmosphere and hence seal chamber **36**, and thereby prevent fuel from flowing into the chamber. In a similar manner, if the needle valve is stuck in the closed position, the float will be in the up position and valve **49** will engage seat **51** to cut off the air vent to the chamber and prevent flow of oil from the chamber to the burner.

As shown in Figure 1, I provide a priming funnel **55** which is connected through a valve **56** to the feed line of each burner. In use, a light grade of fuel is poured into funnel **55** and valve **56** is opened to allow the priming charge to flow to the burners. The valve **56** is then closed and the priming charge is ignited in the fuel groove **12**. This charge burns and heats baffle rings **13** and **14**, whereupon the heavy grade of fuel is fed through the pipes **35** and **36** to the burners and is gasified by contact with the hot baffle rings. The gasified fuel is mixed with air and burns with a blue flame between the sleeves **15** and **16**.

In Figures 5 and 6 I have shown modified forms of burners. In Figure 5 I have shown a base ring **60** having a relatively wide fuel groove **61** which is connected with a source of fuel supply by a pipe **62**. A baffle plate **63** is supported on the outer periphery of ring **60** and extends radially inwardly. This baffle plate is formed with a plurality of upstanding ridges **64** which serve to position and support perforated sleeves **65**, **66** and **67**. A similar baffle ring **68** is fitted to the upstanding central portion **69** of the base ring **60** and extends radially outwardly. This baffle supports perforated sleeves **70** and **71** in spaced relation. The fuel in groove **61** burns between the sleeves **67** and **70**. Air to support combustion is supplied through conduits **73** which extend from the side walls of ring **60** through the baffle **73** to points between sleeves **66** and **67**. The burner is supported in a manner similar to that previously described.

In Figure 6 I have shown a further modification wherein the base ring **75** is formed with a fuel groove **76**. A baffle **77** extends from the peripheral edge of the base ring radially inwardly and supports a perforated sleeve **78** and a second perforated sleeve **79** is supported on the peripheral edge of ring **75** and encloses sleeve **78**. Air conduits **80** extend upwardly from ring **75** and support at their upper ends a plate **81** which in turn supports an inner sleeve **82**.

In Figure 7 I have shown a portable type burner consisting of a base **85**, a single burner unit **86** such as those previously described, and a fuel tank **87** surrounding the burner unit. A bail **88** having a handle **89** affords a convenient means for carrying the structure.

In Figure 10 I have shown a still further modified form of burner which employs only two sleeves. In this form the base ring **90** is formed with a fuel groove **91** and a radially outwardly and downwardly directed baffle **92** is supported from the inner peripheral edge of the base ring. A perforated sleeve **93** rises from the outer edge of the baffle, and a similar sleeve **94** rises from the outer peripheral edge of the base ring and is disposed concentric with sleeve **93**. The combustion of the fuel takes place between the sleeves **93** and **94**.

What I claim is:

1. A burner of the character set forth comprising a base, a standard rising from said base, a horizontally disposed conduit carried by said standard, a burner unit carried by each end of said conduit, and means for supplying air through said conduit to each burner unit.

2. A burner of the character set forth comprising a base ring having a fuel groove therein, a plurality of separate, removable and downwardly inclined baffle rings normally overlying a portion of said fuel groove, the lower edges of said rings being spaced apart and defining an upwardly facing opening from said groove, and perforated tubes rising from said baffle rings at the edges of said opening.

3. A burner of the character set forth comprising a base ring having a fuel groove therein, a removable baffle ring extending radially inwardly and downwardly from an edge of said groove and a second removable baffle ring extending radially outwardly and downwardly from the opposite edge of said groove, the inner edge of the first mentioned ring being spaced from the outer edge of the second ring, and perforated tubes supported by and rising from the spaced edges of said baffle rings, said tubes being arranged in spaced relation to define a combustion space, and said combustion space being in free communication with said groove through the space between the edges of the rings.

4. A burner of the character set forth comprising a base ring having a fuel groove therein, a removable baffle ring extending radially inwardly and downwardly from the outer edge of said groove, and a second removable baffle ring extending radially outwardly and downwardly from the inner edge of said groove, the adjacent edges of said baffle rings being disposed in spaced relation below the upper edges of the fuel groove, and perforated tubes rising from the adjacent edges of said rings and defining a combustion space.

5. A burner of the character set forth comprising a base ring having a fuel groove therein, a baffle ring extending radially inwardly and downwardly from the outer edge of said groove

and a second baffle ring extending radially outwardly and downwardly from the inner edge of said groove, the adjacent edges of said baffle rings being disposed in spaced relation below the upper edge of the fuel groove, perforated tubes rising in concentric and spaced relation from and supported by the adjacent edges of said baffle rings, and a perforated tube enclosing the first mentioned tubes and spaced therefrom.

6. A combustion tube burner having a base provided with upstanding walls presenting between them a broad fuel chamber, means for supplying liquid fuel to the bottom of said chamber, separate removable covers extending part way over opposite sides of said chamber but leaving between them an annular exit opening adapted to receive a wick, the bottom of said chamber presenting flow surfaces for the liquid fuel directly beneath said covers, and spaced combustion tubes forming a combustion chamber in upstanding relation to the fuel chamber and communicating therewith through said opening but of narrower width than the said fuel chamber, said tubes being supported one by each of said covers, whereby on removal of the latter said fuel chamber is opened and exposed to view.

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