Oct. 31, 1933. E. PARKER 1,932,597

OIL BURNER

Filed April 7, 1931 3 Sheets-Sheet 1

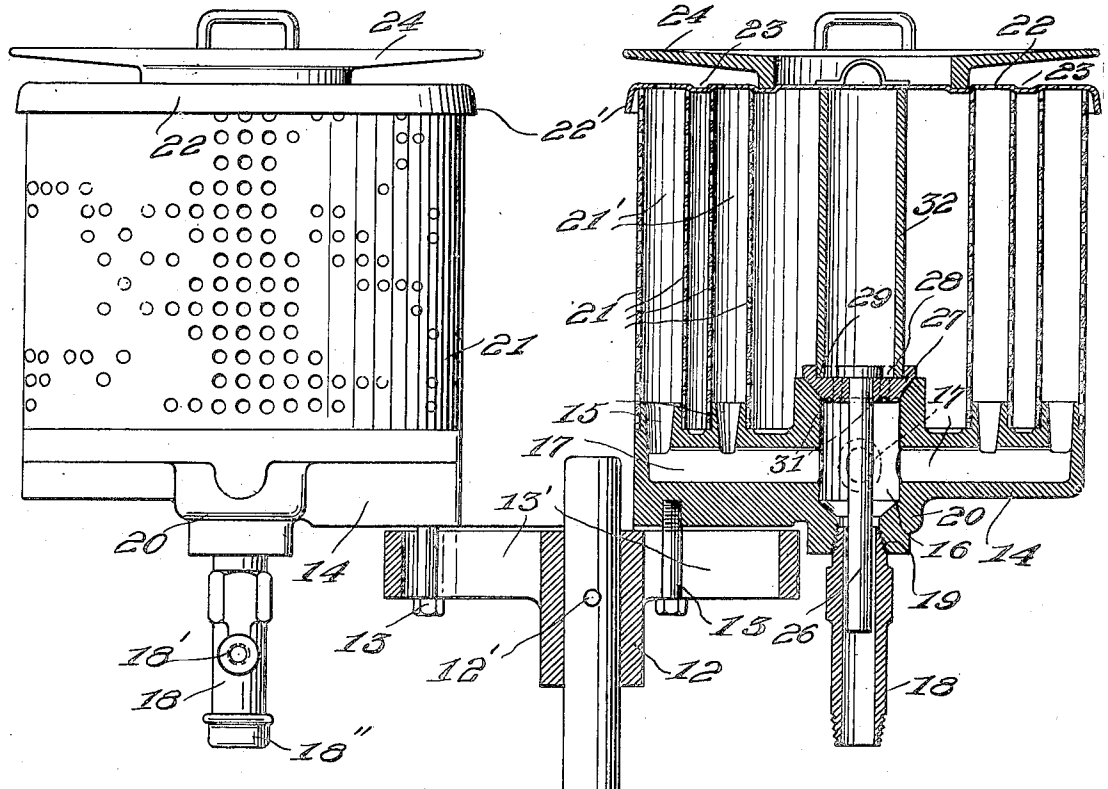


Fig. 1.

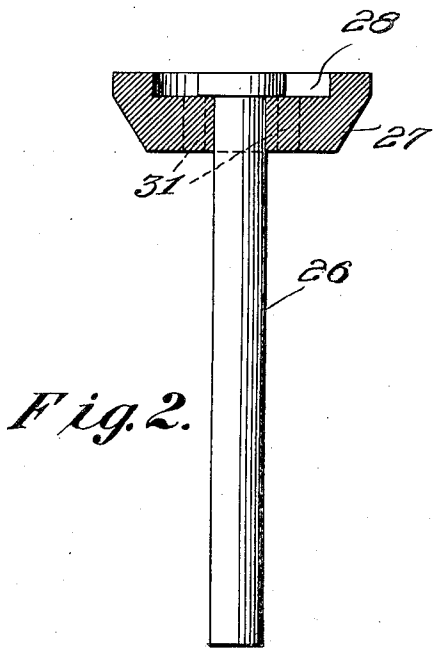


Fig. 2.

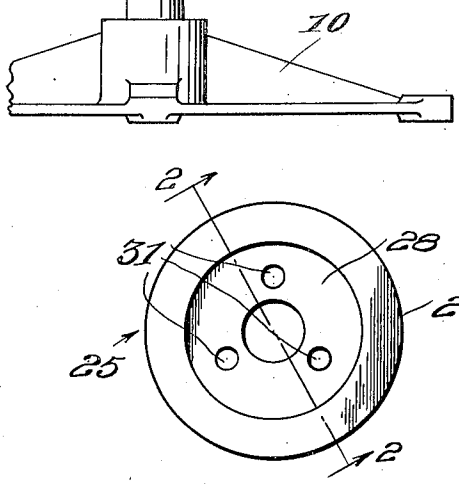


Fig. 3.

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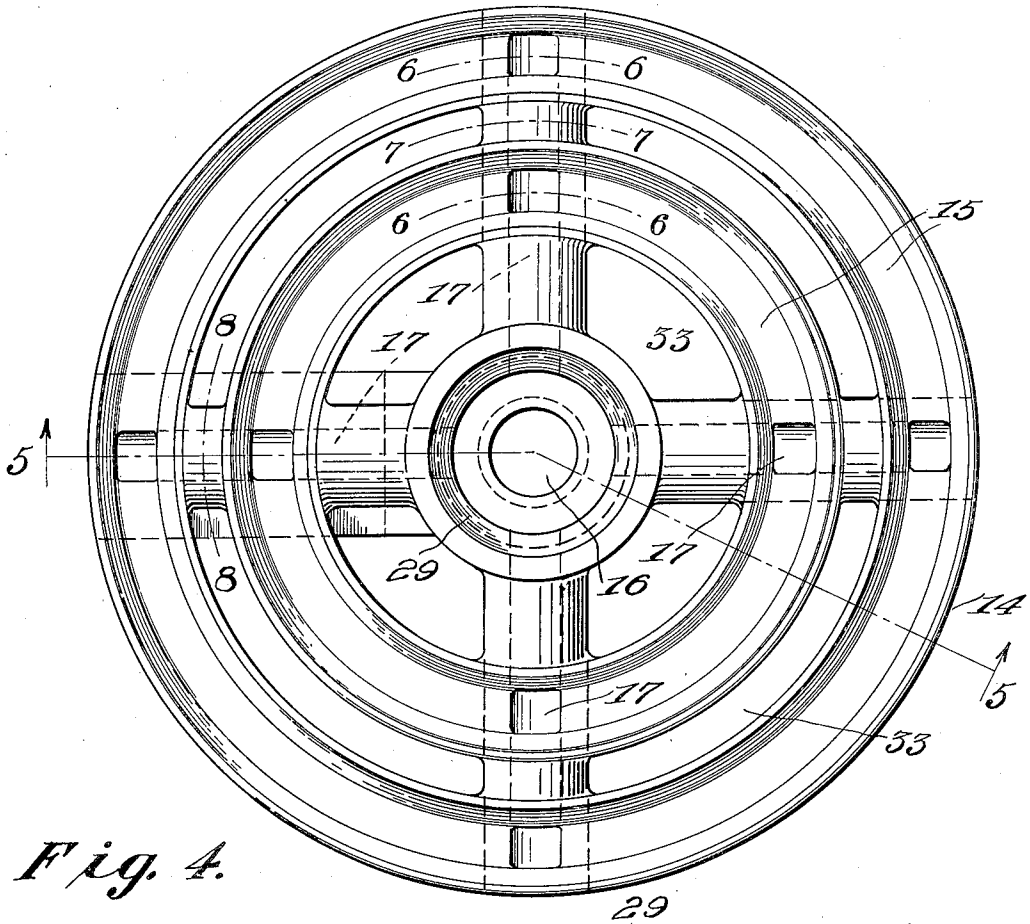


Fig. 4.

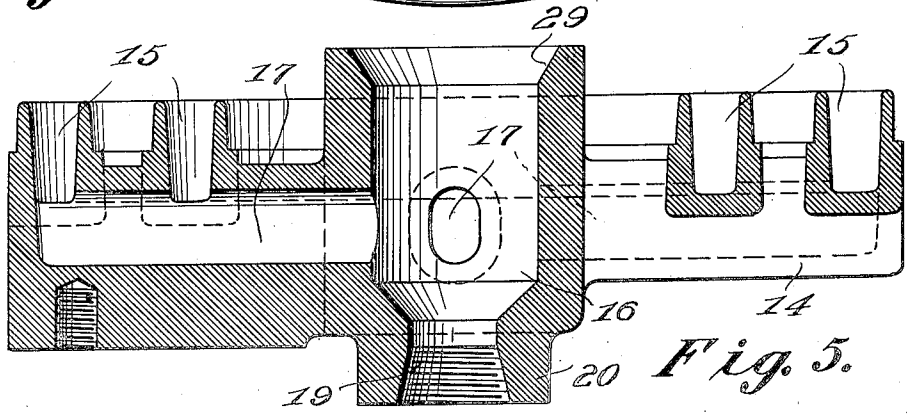


Fig. 5.

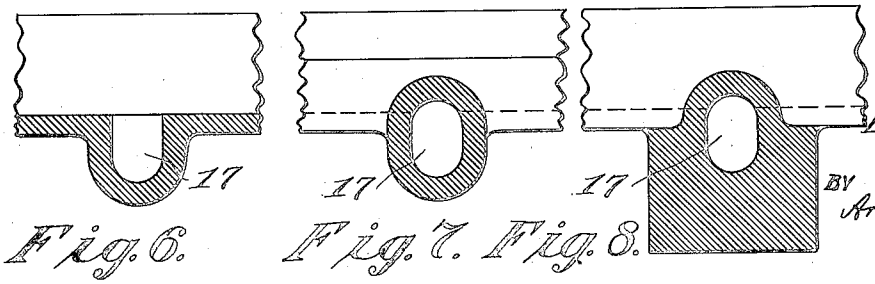


Fig. 6. Fig. 7. Fig. 8.

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OIL BURNER

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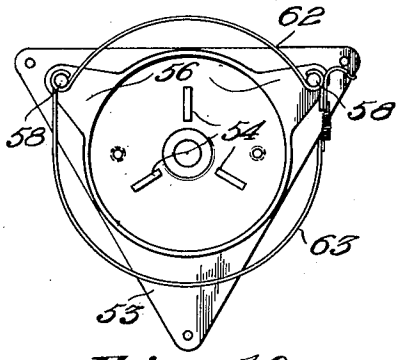


Fig. 10.

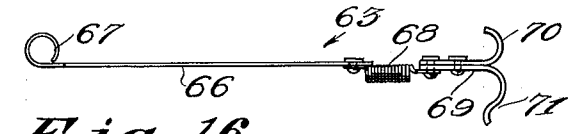


Fig. 16.

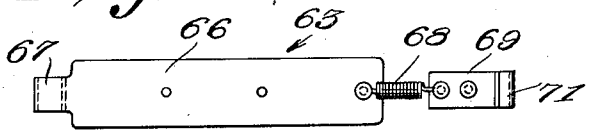


Fig. 15.

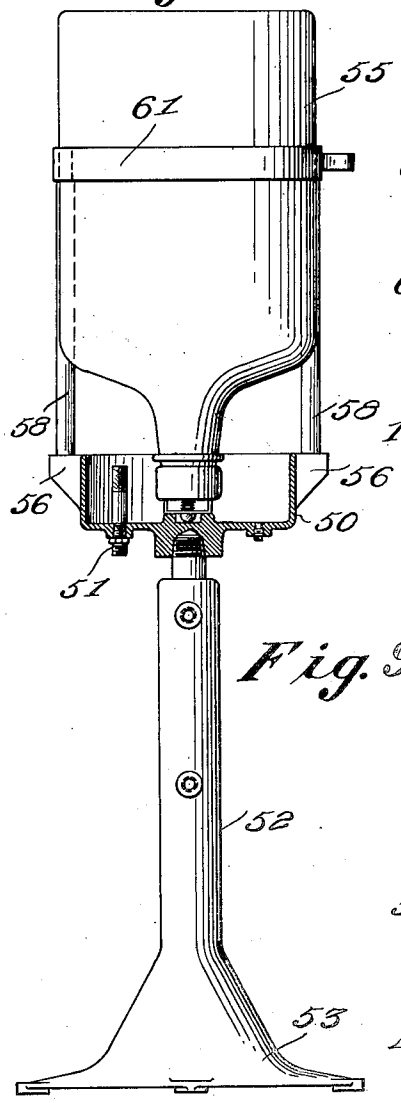


Fig. 9.

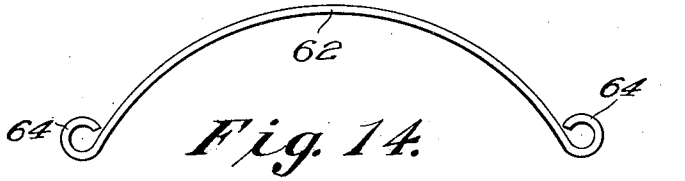


Fig. 14.

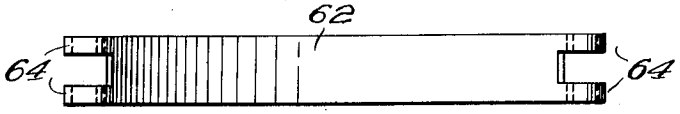


Fig. 13.

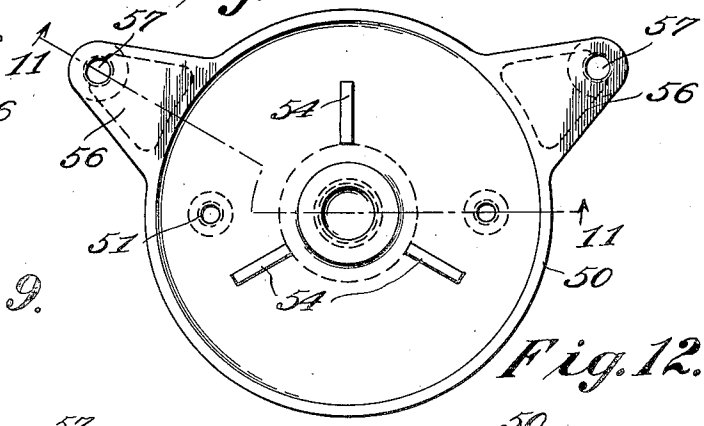


Fig. 12.

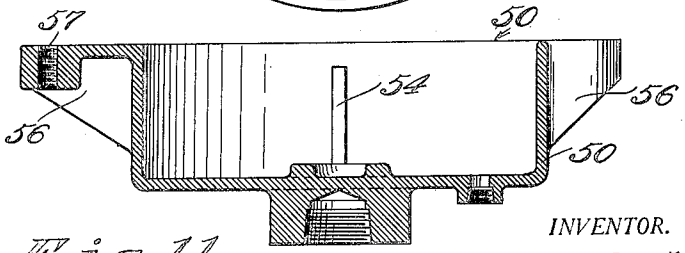


Fig. 11.

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Patented Oct. 31, 1933 1,932,597

UNITED STATES PATENT OFFICE

1,932,597

OIL BURNER

Eugene Parker, Newton Highlands, Mass., assignor to Beacon Burner Mfg. Corp., Boston, Mass., a corporation of Massachusetts

Application April 7, 1931. Serial No. 528,407

4 Claims. (Cl. 158—87)

My invention relates to fuel oil burners for general use, and in particular to fuel oil burners of the type adapted to be employed in connection with heating stoves and cooking ranges to provide heat for cooking, space heating and analogous purposes.

One object of my invention is to provide an oil burner which will operate successfully on a low grade of fuel.

Another object of my invention is to provide for an oil burner a novel vaporizing member adapted to efficiently vaporize the fuel oil and having means to suppress fluctuations in the flow of fuel.

Another object is to provide a vaporizing member which is readily removable and constructed for expansion independently of the burner base.

A further object is to provide improved burner base supporting means.

A still further object is to provide improved means for supporting the fuel supply reservoir for the oil burner.

The various features and objects of my invention will be more fully understood upon reference to the following detailed description taken in connection with the accompanying drawings, while the scope of my invention will be particularly pointed out in the appended claims.

The term "fuel oil" as used herein, denotes oil fuel such as is commonly used for heating purposes.

In the drawings,

Fig. 1 is a view in side elevation of two burners supported on a single base, one of the burners being shown in section.

Fig. 2 is a view partly in side elevation and partly in section, showing my improved vaporizing member.

Fig. 3 is a plan view of the vaporizing member.

Fig. 4 is a top view of the base of one of the burners.

Fig. 5 is a section taken on line 5—5 of Fig. 4.

Fig. 6 is is a fragmentary section taken on line 6—6 of Fig. 4.

Fig. 7 is a fragmentary section taken on line 7—7 of Fig. 4.

Fig. 8 is a fragmentary section taken on line 8—8 of Fig. 4.

Fig. 9 is a side elevational view, partly in section, showing the fuel reservoir and its support.

Fig. 10 is a top plan view of the fuel reservoir and its support.

Fig. 11 is a vertical section through the bottle bowl.

Fig. 12 is a top plan view of the bowl.

Fig. 13 and Fig. 14 are detail views showing the back support for the bottle.

Figs. 15 and 16 are detail views showing the front support for the bottle.

In the accompanying drawings, the numeral 10 designates a base from which rises a solid standard 11. A burner base holder 12 is secured to the standard 11 and is vertically and rotatably adjustable on the standard 11, being fastened thereto by a set screw 12'.

The base holder 12, in this case, supports two burners in the construction herein shown, each burner being mounted on the holder 12 by means of a single bolt 13. The bolt 13 may be moved radially in channel 13', and permits of the base being moved in a radial direction with respect to the support 11, and also permits of the base being rotated about the pivot 13 and being thereby made fast at any position desired.

The burners being of similar construction, the description of one will suffice for both. Formed in the base 14 are two concentric, horizontally-disposed vapor grooves 15 and a centrally disposed vaporizing chamber or well 16. As shown most clearly in Figure 4, a plurality of ducts or passages 17 extend radially from the well 16 for distributing fuel to the vapor grooves 15.

Liquid fuel is fed into the well 16 through a pipe section 18 screwed into a threaded axial bore 19 formed in a boss 20 on the under side of the base 14. Numeral 18' indicates the oil feed inlet for the pipe section 18. The bottom of the section 18 is closed by a cap 18'' thus forming a sediment trap.

Supported on the base 14 are two pairs of perforated cylindrical shells 21 the lower edges of which rest in seats formed in the inner and outer edges of the walls of each vapor groove 15. The shells 21 form two annular combustion chambers 21', one for each vapor groove.

A circular cover 22 is applied to the top of the shells 21, the cover having a peripheral flange 22' for retaining it in position and annular depressions 23 may be provided, if desired. The cover 22 is perforated over the combustion chamber 21' as is well known to those skilled in the art. Removably seated on the cover 22 is a flame spreader 24 which, as is well known in the art, acts to spread the flame rising from the combustion chambers.

Arranged centrally within the burner, is a freely removable and unattached vaporizing member 25 which forms an important part of my invention. This vaporizing member may be made of lava, refractory steel alloy or any other

material which is a good conductor of heat and is durable at elevated temperatures and, as shown in Figures 2 and 3, comprises an elongated cylindrical shank 26 and a head 27 of frusto-conical form and having in its upper surface a short cylindrical recess 28. The base 14 of the burner is provided with a central opening 29 in axial alignment with the vaporizing chamber or well 16 and this opening is frusto-conical in form and suitably dimensioned to receive the frusto-conical head 27 of the vaporizing member.

In prior constructions with which I am familiar the vaporizing member and the corresponding opening in which it rests are made generally cylindrical. With such constructions the vaporizing member and the walls of the well expand to seize each other with the result that difficulty is experienced in attempting to remove the vaporizer for cleaning. In my present invention, I overcome this difficulty by making the central opening 29 in the burner base of frusto-conical shape and the head 27 of the vaporizing member of similar shape. With this construction the vaporizing member may expand and contract freely and independently without binding or seizing the burner base.

Prior burners of this general type have not been hitherto commercially practicable because of uncontrollable fluctuations in the flame, engendered by an uneven flow of fuel. In accordance with my invention, I have overcome this obstacle by providing vents 31 in the vaporizing member 25, these vents, in the embodiment illustrated, extending through the head 27 of the vaporizer in a direction parallel to the longitudinal axis of the vaporizing member. These vents, I have found, will efficiently suppress the undesirable fluctuations mentioned above.

Fluctuations will occur in the burner if the vents are closed, due to the slight gas pressure generated in the vaporizing chamber. When the pressure is thus generated it has a tendency to cause the oil level to be lowered. When the oil level is reduced the supply is diminished in the vaporizing chamber and the burner gives less heat and produces a flutter in the flame which is distinctly audible. Further, when the oil level in the vaporizing chamber is thus reduced, the oil is vaporized lower within the vaporizing medium. The lower portion of the vaporizing medium is cooler than the portions higher up, consequently, less gas for ignition and consumption is provided, causing the overall temperature to drop. The vents 31, however, provide uniform equal exit and distribution for the escape of the gas vapors over the burner thus giving a uniform flame action which can neither increase or decrease, due to any internal action, as here described. Disposed above the well and in axial alignment therewith is a cylindrical open-ended vapor flue 32 for conducting away any vapor which passes through the vents 31 for burning the same adjacent the flame spreader 24. The flue 32 has its lower end seated in the recess 28 of the vaporizing member, as shown in Figure 1.

In operation, liquid fuel is fed by gravity into the well 16 and to the vapor grooves 15 and ignited. Such ignition may be made by means of a wick as is well known in the art, or by an electric ignitor, or any other igniting arrangement known in the art. After a short period of operation the vaporizing member 25 becomes heated by conduction through the base 14 and by radiation from the combustion chambers 21' and heat is conducted through the body of the vaporizing member into the well 16 thereby vaporizing the oil therein. The resulting vapor is conducted through the ducts 17 to the vapor grooves 15 and burns in the combustion chambers, air being supplied through the slots 33 in the base 14.

After starting, the grooves 15 contain vapor only, and consequently the necessity of having the burner base absolutely level is obviated. This enables me to employ the simplified burner support means described above.

It should be noted that the oil level in the well, after starting, is reduced to a point several inches below the level of the oil grooves in the burner base and this prevents flooding if the flow of oil is suddenly increased, either accidentally or otherwise. This is important because children or other inexperienced persons have been known to manipulate the valves and cause damage. Also, vapor only is burned, resulting in odorless combustion after the initial start and consequently, more heat is obtained from a given quantity of oil than is possible with prior constructions. Vapor is emitted at the grooves 15 and immediately burns, thus giving heat from the base up, while in other types, the oil only begins to vaporize in the base and does not burn until half way up the combustion chambers, and combustion is not completed within the device and consequently, much unburned gas escapes and is unaccounted for in heat units. In my device, however, by heating from the very bottom up, I accomplish what has heretofore been impractical, namely, the heating of water backs and water fronts. Because of the large heating area, my new burner is adapted to burn oil at a higher rate, so that much more heat can be produced by a burner of the same size.

Referring to Figure 9, the numeral 50 designates the usual pan-shaped bottle bowl having a supply pipe connection 51 in its bottom at one side, said receptacle being supported on a stand 52 provided with a suitably enlarged base portion 53. As shown in Figure 11, the bowl 50 is provided with a plurality of integral, radial lugs 54 extending upwardly from the bottom of the bowl and arranged radially in a circle around the center of the bowl. The main receptacle, comprising the usual glass bottle 55, is inverted over the bowl, the neck of the bottle being received within the cylindrical enclosure formed by the lugs 54. A suitable valve mechanism, the details of which are not shown, is associated with the mouth of the bottle.

The bowl 50 is provided with a pair of radially extending ears 56 spaced 120° apart. Each ear is provided with a threaded hole 57 extending vertically through the ear for receiving the lower threaded end of the bottle support rod 58 as shown in Figure 9. These rods are of such length that their upper ends reach at least up to the middle of the bottle 55. Surrounding the bottle and secured to the upper ends of the rods 58 is a metal band 61 comprising a back support portion 62 and a front support portion 63, as shown in Figure 10. The back support portion 62 is of arcuate form and subtends an angle of 120° so that its ends, which form sleeves 64, will fit over the upper ends of the support rods 58.

The front portion 63 of the band comprises a thin metal strip 66 one end of which is reduced in width and rolled to form a circular sleeve 67, the other end being connected by means of a helical spring 68 to a terminal member 69 having two hook portions 70 and 71 turned in opposite directions. The end 67 of the strip 66 is en-

gaged over the end of one support rod and the hook 70 of the terminal member is then engaged over the end of the other support rod, the spring 68 being stretched sufficiently to effect this connection of the parts. The hook 71 forms a finger-piece for attachment and detachment purposes.

It will be evident from the foregoing description that the bottle is supported throughout its entire circumference and will therefore be held firmly against lateral bodily displacement. It should be noted that the bottle retaining means is flexible and is hence adapted for application to bottles of varying sizes. Also, attachment and detachment may readily be made, even by inexperienced persons.

Some changes may be made in the construction and arrangement of the parts of my invention without departing from the real spirit and purpose of my invention and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:—

1. In an oil burner, a base having a plurality of annular concentric grooves, perforated shells supported on said base and forming with said grooves annular combustion chambers, a central well in said base, a plurality of ducts in said base extending radially from said well to said grooves, a vaporizing member supported on said base and having a portion extending into said well, said vaporizing member having vents, and a flue supported on said vaporizing member for conducting away any vapor passing through said vents.

2. An oil burner comprising a base provided with a fuel groove, a combustion chamber having perforated walls above said groove, said base including an oil well forming a vaporizing chamber and ducts leading from said well to said groove, and vented heat conducting and vaporizing means seated upon and partially closing said vaporizing chamber, said means including a vapor conducting element extending above said well and adjacent the perforated walls of said combustion chamber for heating thereby.

3. An oil burner comprising a base provided with a fuel groove, a combustion chamber having perforated walls above said groove, said base including an oil well forming a vaporizing chamber and ducts leading from said well to said groove, and heat conducting and vaporizing means seated upon and partially closing said vaporizing chamber, said means comprising a vented cap having a flue supporting portion and an elongated shank projecting from the cap into the vaporizing chamber.

4. An oil burner comprising a base provided with a fuel groove, a combustion chamber having perforated walls above said groove, said base including an oil well forming a vaporizing chamber and ducts leading from said well to said groove, heat conducting and vaporizing means seated upon and partially closing said vaporizing chamber, said means comprising a vented cap portion and an elongated shank projecting from the cap into the vaporizing chamber, and a vapor flue supported on the cap.

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