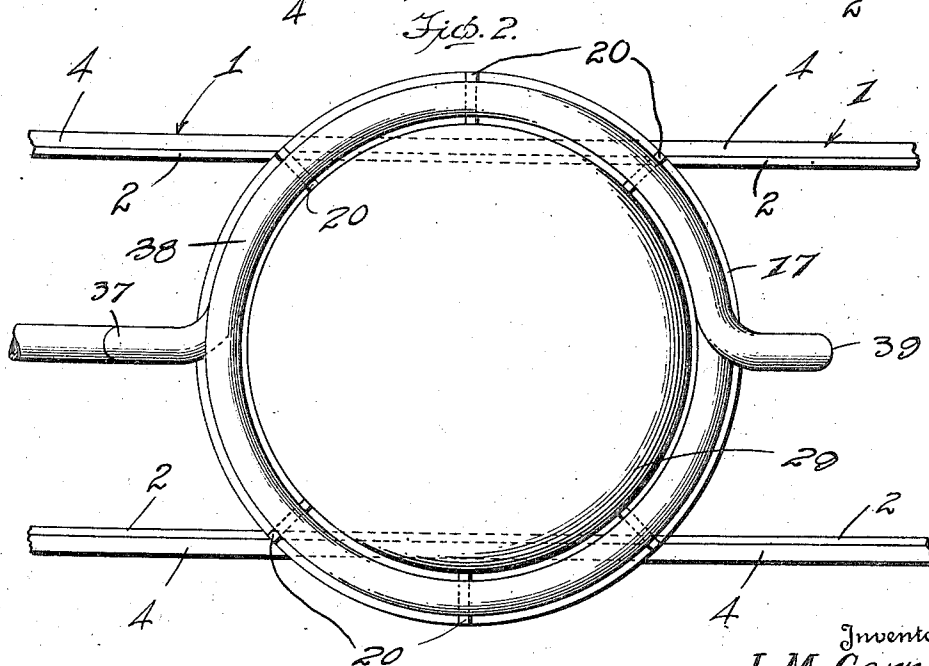


I. M. CARR.
OIL BURNER.
APPLICATION FILED JUNE 17, 1916.



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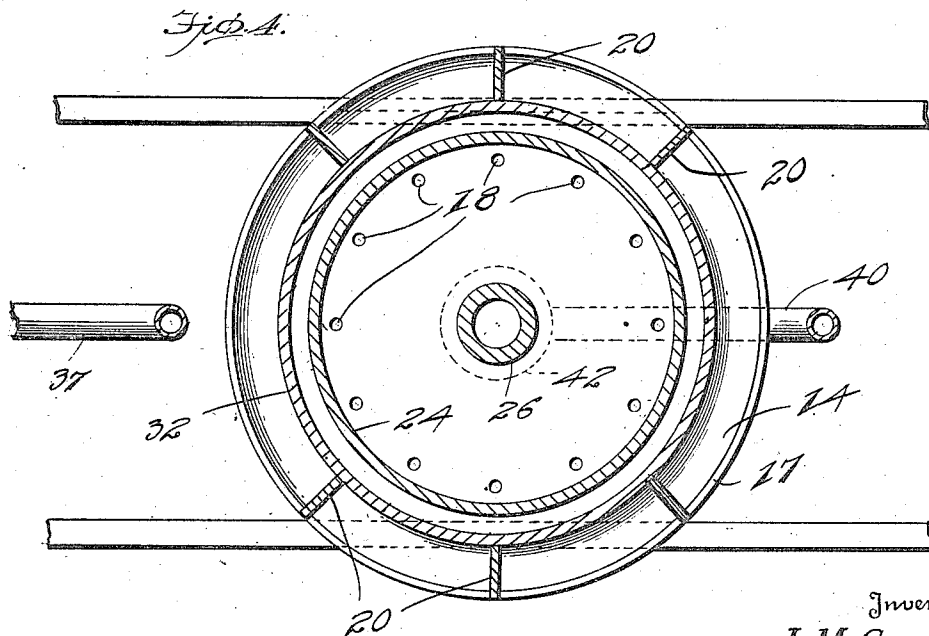
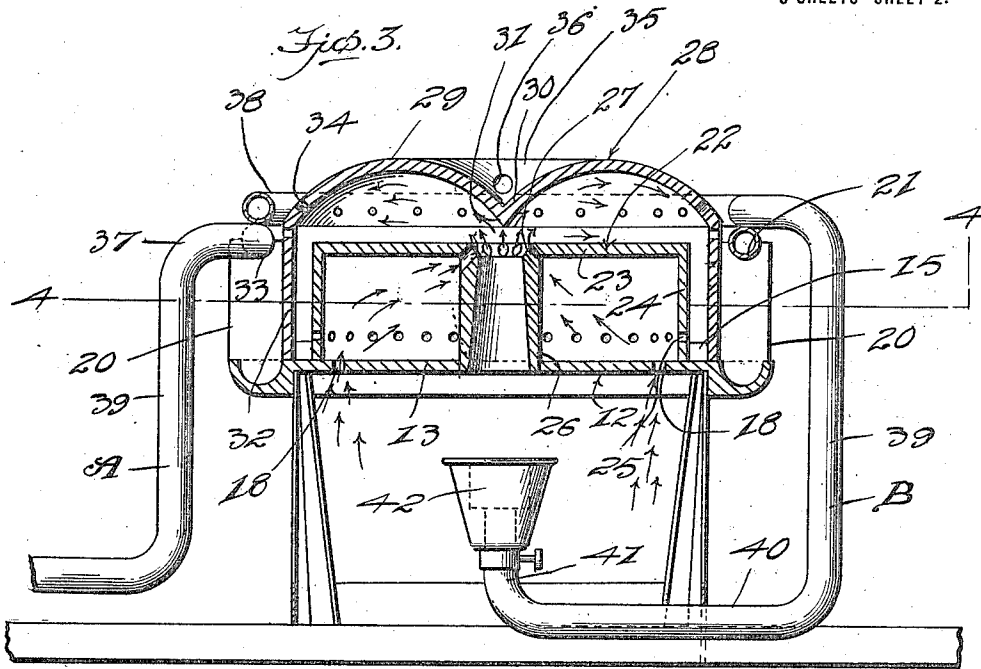
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3 SHEETS—SHEET 2.

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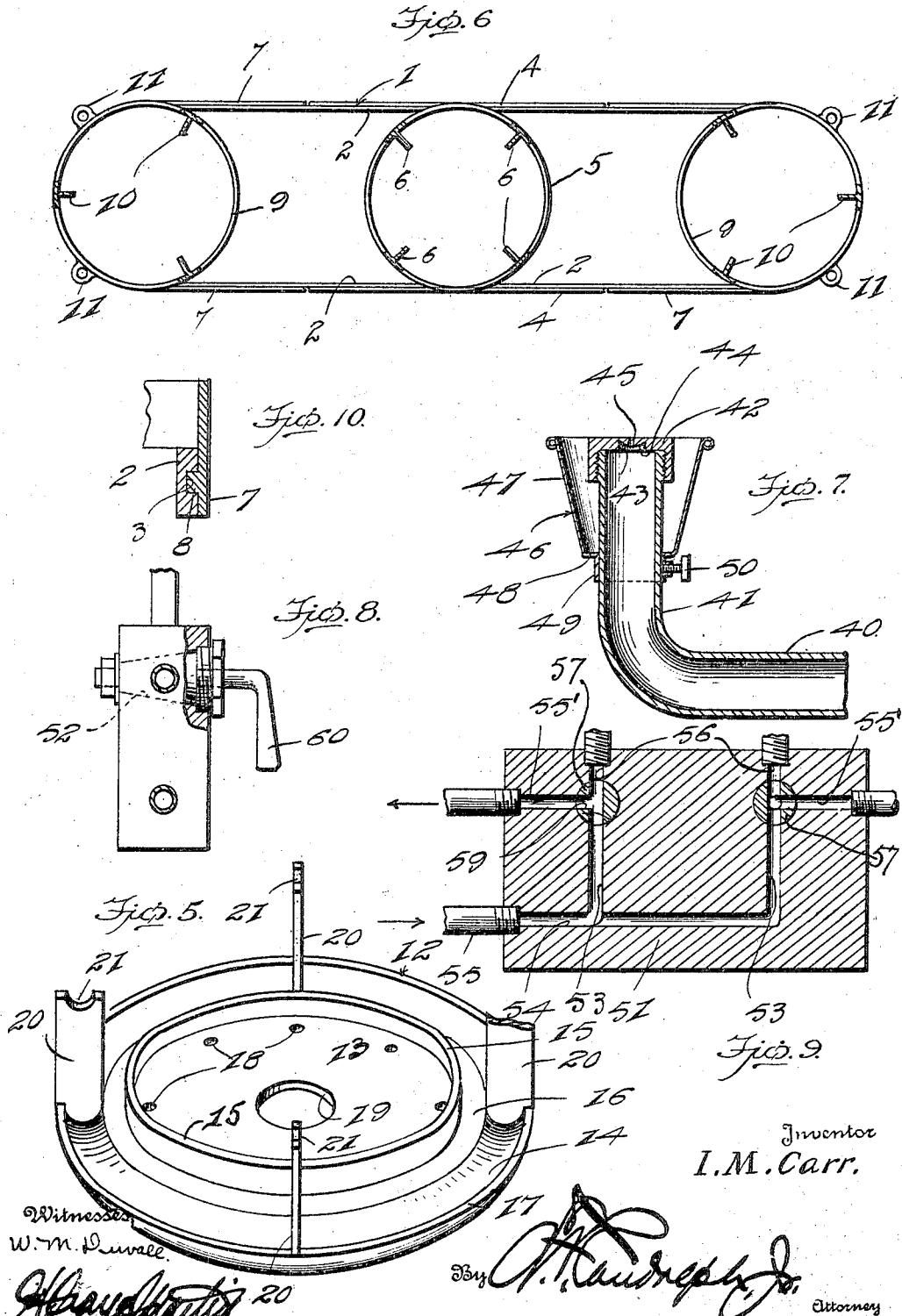
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UNITED STATES PATENT OFFICE.

IRA M. CARR, OF TITUSVILLE, FLORIDA.

OIL-BURNER.

1,234,129.

Specification of Letters Patent.

Patented July 24, 1917.

Application filed June 17, 1916. Serial No. 104,346.

To all whom it may concern:

Be it known that I, IRA M. CARR, a citizen of the United States, residing at Titusville, in the county of Brevard and State of Florida, have invented certain new and useful Improvements in Oil-Burners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in oil burners, and the principal object of the invention is to provide a burner adapted for transforming kerosene oil into a combustible gas and consuming the same for heating purposes.

Another object of the invention is to provide a burner provided with a retort consisting of a coil of pipe through which the oil passes and in which it is vaporized before entering the burner.

A further object of the invention is to provide a burner having its retort located in the path of the flame, thereby insuring the proper vaporization of the oil and the proper operation of the device.

Still another object of the invention is to provide a heating chamber for a part of the air which is adapted to warm the air passing therethrough prior to its mixture with the kerosene gas thereby forming a combustible gas which upon emission from the burner ignites.

A further object of the invention is to provide a burner having a dome shaped cap which is provided with a deflecting tip located centrally thereof and adapted to divide the kerosene gas at the point where it mixes with the air and cause the combustible gas to be deflected outwardly toward the burner openings.

A further object of the invention is to provide a by-pass for allowing the unconsumed combustible gas to enter the air chamber and mix with the air passing therethrough and be returned through the mixing chamber thereby avoiding much of the loss ordinarily accompanying the use of oil burners.

Still another object of the invention is to provide a shield to prevent drafts from interfering with the entrance of the kerosene gas into the mixing chamber.

A further and important object of the invention is the provision of a burner in which alcohol may be used as the pre-heating ele-

ment for the retort and in which the necessity of allowing the alcohol flame to burn out and become extinguished before the burner is set in operation is eliminated.

A still further object of the invention is to provide a novel means for supporting the retort in the path of the alcohol flame and also in the path of the flame emitted from the burner.

With these and other objects in view, the invention consists in the novel combination and arrangement of parts which will be fully set forth in the following specification and accompanying drawings, in which:

Figure 1 is a side view in elevation of a burner constructed in accordance with this invention.

Fig. 2 is a top plan view of Fig. 1.

Fig. 3 is a vertical sectional view through the burner.

Fig. 4 is a horizontal sectional view on line 4-4 of Fig. 3.

Fig. 5 is a detail perspective view of the base plate of the burner.

Fig. 6 is a plan view of the supporting frame of the burner.

Fig. 7 is a detail sectional view on an enlarged scale, through the spray nozzle and shield therefor.

Fig. 8 is an end view partly in section of the valve controlling the operation of the burners.

Fig. 9 is a vertical sectional view through Fig. 8, and

Fig. 10 is a detail sectional view through the supporting frame illustrated in Fig. 6 on an enlarged scale, illustrating the manner of making the same extensible.

Referring to the drawing, the numeral 1 designates as an entirety, a supporting frame or base of the burner comprising a pair of parallel side bars 2, each of which is provided on its outer face with a longitudinal groove 3. Suitable reinforcing bars 4 are secured to the bars 2 on their outer faces and these bars are of a length equal to about one-half of the length of the bars 2 and are secured centrally of the longitudinal terminals thereof to allow extensions at opposite ends on which the adjusting arms which will be more fully hereinafter described are slidable. The bars 4 are connected and held in parallel relation by a centrally located integrally formed ring 5 provided at spaced intervals therearound with the standards 6 which are substantially T-

shaped in cross section and are adapted to support at their upper ends the burner which will be more fully hereinafter described. The extension members of the frame above referred to each comprises a pair of arms 7 provided on their inner faces with the inwardly extending tongues 8 which are slidable in the grooves 3 and these bars or arms like the bars 4, are held in spaced parallel relation by the ring 9 which ring like the ring 5 is provided at spaced intervals with the standards 10. These standards are substantially T-shaped in cross section and the upper ends thereof are adapted to support the burner mounted thereupon. Secured to the ring and extending outwardly therefrom are the ears 11 forming attaching ears for supporting the device in place. From the foregoing it will be seen that an extensible supporting frame for the burner is provided which may be readily adjusted to fit fire boxes of varying lengths, and which is held in place by means of the ears 11 hereinbefore referred to.

Supported at the upper ends of the standards 6 and 10 are the burner units which will be more fully hereinafter described. Each burner unit comprises a base plate designated generally by the numeral 12 comprising the circular central portion or body 13 formed at its periphery with an annular trough 14. A suitable annular rib 15 is formed on the upper surface of the body 13 and projects upwardly therefrom and this rib is spaced inwardly from the outer edge of the body to form a shoulder 16 on which the domed cap of the burner rests. As illustrated in the drawings, it will be seen that the trough 14 is depressed below the upper surface of the body 13 so that the outer side wall 17 thereof lies in the same plane with the shoulder 16. Formed in and extending through the body 13 and spaced inwardly from the annular rib is an annular series of air inlet openings 18 for the admission of fresh air to the air heating chamber.

A central opening 19 is formed in the plate or body 13 and this opening is to accommodate the gas tube through which the gas passes on its way to the mixing chamber. Suitable standards 20 are formed integral with the trough 14 and are provided in their upper edges with the arcuate seat or depression 21 in which the retort coils are retained. These depressions are adapted to hold the retort coils against accidental movement and in the path of the flame emitting from the burner.

A suitable cap designated generally by the numeral 22 is provided and comprises the circular plate or body 23 formed at its periphery with a downwardly extending wall 24. This body or plate 23 is of a diameter equal to the distance between diametri-

cally opposite points of the inner face of the rib 15 and the wall 24 is adapted to rest on the plate or body 13 so that its outer face is engaged by the rib 15 above referred to. An annular series of openings 25 is formed near the lower edge of the wall 24 and these openings form bi-passes through which the unconsumed combustible gas returns to the warming chamber as will be more fully hereinafter described. The plate 23 is formed with a central opening and surrounding the opening and extending downwardly from the under side of the plate is the tube 26 through which the kerosene gas mixed with air passes. The upper end of the tube is slightly restricted as clearly shown and a plurality of openings 27 are formed at the point where the tube joins the body or plate 23 and these openings are arranged so that the warm air within the air heating chamber is directed upwardly and inwardly at the point where it mixes with the gas. The lower edge of the tube 26 is adapted to fit within the opening 19 in the body 13 as clearly shown in Fig. 1 so as to further assist in maintaining the cap 22 in proper position with relation to the body 12.

The burner dome is designated generally by the numeral 28 and comprises a dome-shaped body 29 formed with a central depression 30 providing a deflecting tit 31 against which the jet of kerosene gas is projected after leaving the spray nozzle and passing through the tube 26. This tit 31 is to assist in the vaporizing of the kerosene and it will be seen that the gas emitted from the spray nozzle will be finely separated at the point where it is mixed with the warm air from the chamber formed by the cap 22. A downwardly extending wall 32 is formed at the periphery of the dome-shaped body 29 and extends in parallel relation to the wall 24. This wall 32 is adapted to seat on the shoulder 16 formed on the base plate 12 and it will be seen that when the cap 22 and burner dome 28 are in position the walls 24 and 32 will be spaced in parallel relation to form a passage for the unconsumed combustible gas. Formed at the point where the wall 32 joins the dome body 29 is an annular series of burner openings 33 through which the combustible gas passes and these burner openings coöperate with the burner openings 34, formed in the dome 29 near its periphery which incline upwardly and are adapted to direct the flame in an upward and outward direction. A suitable web 35 extends across the depressed portions 30 of the dome 28 and is formed with a central opening 36 through which a suitable hook may be extended to facilitate the removal of the dome from its position on the burner.

The retort used in connection with the device comprises a pipe 37 arranged in a coil

38 around the lower edge of the dome body 29 which coil rests on the upper ends of the standards 20 and is held against accidental movement by the walls of the notches or recesses 21. The opposite terminals of the pipe are bent downwardly as at 39 to form the conducting pipes by which the liquid kerosene is fed to the burner and the vaporized kerosene is conducted therefrom. The pipe designated A is adapted to conduct the liquid kerosene to the burner while the pipe B is adapted for conducting the vaporized kerosene to the spray nozzle. A suitable angular extension 40 is formed at the lower end of the pipe B and extends inwardly toward the center of the burner and is bent upwardly as at 41 and provided with the spray nozzle 42. The spray nozzle 42 is best illustrated in Fig. 7 and consists of an ordinary cap threaded on the end of the pipe 41 which is provided with a central recess 43 which is formed in the inner face of the said cap. The bottom wall of said recess is convexed as at 44. A restricted central opening 45 is formed in the cap and is adapted to allow a small jet of the gas passing through the pipe to pass outwardly and into the tube 26.

In order to prevent interference with the passage of the gas between the spray nozzle 42 and the tube 26, there is provided the shield 46 comprising a hollow frusto-conical cup 47, the bottom wall 48 of which is provided with a central opening which is surrounded by the collar 49. The collar 49 or opening is of the same diameter and of a size sufficient to readily slip over the upper end of the pipe 41. A suitable set screw 50 holds the shield 46 in its various adjusted positions on the pipe 41 and it will thus be seen that the shield may be moved upwardly or downwardly on said pipe to meet various requirements of the device.

In order to provide a means for controlling the operation of the burner, there is provided the valve illustrated in Figs. 8 and 9, comprising a block or body 51 having extending therethrough the transversely shaped apertures 52. These apertures 52 are in communication with the vertically extending passages 53 which in turn communicate at the lower terminals with the horizontally extending passage 54.

This passage 54 is in communication with the oil supply pipe 55 and it will be seen that the liquid kerosene passes through the passage 54 into the passages 53. Suitable horizontally extending passages 55' are formed in the body and extend between the end walls thereof and the openings 52, while the vertically extending passages 56 extend between the upper wall of the body and the openings 52. The passages 55' and 56 form the outlet passages which lead to their respective burners and the flow of liquid from

the passages 53 into the various outlet passages is controlled by means of the turning plugs 57 each of which is provided with a transverse passage 58 extending diametrically therethrough, and a radial passage 59 which extends in the same plane with the passages 58 but at right angles thereto and communicates at its inner end therewith. It will thus be seen that the turning plugs when moved to their various positions by means of the handle 60 will either stop the flow of liquid through the valve or may be adjusted so as to operate one or all of the burners at the desire of the user.

In operation the liquid fuel is passed through the valve and is led through the pipe 39 into the retort coil 38. The trough 14 is filled with alcohol or a similar readily inflammable liquid and it will be seen that the flame and heat therefrom will be directed upwardly and on the retort, thus causing the same to become heated and vaporize the liquid passing therethrough. As soon as sufficient liquid is vaporized, the same will pass through the pipe B and into the pipe 40, thence up through the pipe 41 and through the spray nozzle 42 into the tube 26. The pressure of the vapor within the retorts will cause the vapor emitted from the spray nozzle 42 to pass into the tube 26 with a relative high velocity, thereby creating a vacuum and drawing the air from around the pipe into the tube. Further the vacuum caused by the passage of the vapor past the openings 27 will cause a draft through the chamber formed by the cap 22 and the base plate 12 thus causing the air to flow into the chamber through the openings 18 and out through the openings 27. It will be seen that the vapor directed against the tit 31, will be caused to separate and travel laterally of the device and further the vapor will be more completely atomized. The inflowing air through the openings 27 will mix with the kerosene vapor in the space between the dome body 29 and the plate 23 and will pass laterally out through the openings 33 and 34 where it will be ignited by the flame from the liquid within the trough 14. It will be seen that after the igniting of the gas passing through the openings 33 and 34 the flame caused thereby will be directed against the retorts and after the liquid within the trough has burned out further replenishing of the supply will be unnecessary as the operation of the burner will be continuous, until manually stopped.

The space between the walls 32 and 24 will form a by-pass which coöperates with the openings 25 in allowing the gas which cannot escape through the openings 34 and 33 to pass into the air heating chamber formed by the cap 22 and plate 12 which gas passes up through the opening 27 and again mixes with the inflowing vapor, thereby en-

riching the mixture and increasing the combustibility of the gases. Due to the fact that the burner may be lighted directly from the flame of the liquid within the trough 14, it will be seen that a considerable saving of time is effected since it is unnecessary for the liquid to be entirely burned out before the burner is set in operation.

While in the foregoing there has been shown and described the preferred embodiment of this invention, it is to be understood that such changes may be made in the combination and arrangement of parts as will fall within the spirit and scope of the appended claims.

What is claimed is:—

1. In an oil burner, a base comprising a pair of side bars, a ring secured centrally of the side bars, arms slidable on the side bars, and rings on the arms.

2. In an oil burner, a base comprising a pair of side bars having grooves in their outer faces, a ring formed integrally with said bars intermediate their ends, arms slidable in the grooves in the side bars, rings formed integral with the outer terminals of the arms and holding said arms in spaced parallel relation, and standards on the rings, said standards being adapted to support burners.

3. In an oil burner, a base plate having a central opening, a trough at the outer edge of the base plate, retort supporting standards extending upwardly from the trough, a retort on said standards, a cap adapted to rest on the base plate, said cap being provided with a central vertical opening adapted to register with the central opening in the base plate, the plate being provided with a series of openings near its edge and communicating with the interior of the cap, the cap being provided with a series of openings at the point where the central opening extends through the top wall, a domed cap adapted to seat on the upper face of the base plate, said domed cap provided with a cen-

tral inwardly extending tit, said cap also having burner openings adapted to direct the flame against the retort, and means directing the vapor formed in the retort through the central opening in the first mentioned cap and against the tit.

4. In an oil burner, a circular body provided with an annular trough at its periphery, retort supporting standards formed integral with said body and extending upwardly therefrom, a retort supported by said standards, an annular rib formed on the body, the said body having a central aperture therein, an annular series of air inlet apertures formed in the body inwardly from the rib, a circular cap provided with a central passage adapted to fit on the body within the rib, the cap being provided at the point where the passage extends through its top wall with an annular series of upwardly and inwardly inclined openings, said cap together with the domed body forming an air warming chamber, a domed burner cap adapted to fit about the body on the exterior of the annular rib, said domed burner cap being provided with an annular series of burner openings adapted to direct the flame against the retort, a central tit formed in the burner cap adapted to deflect the gas passing through the central passage of the first mentioned cap toward the burner openings, the space between the inner cap and the burner cap forming a mixing chamber, a by-pass to allow the unconsumed gas to pass into the air warming chamber, and a pipe connected to the retort provided with a spray nozzle adapted to direct the vapor formed in the retort upwardly through the central passage in the first mentioned cap.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

IRA M. CARR.

Witnesses:

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J. H. MORGAN.