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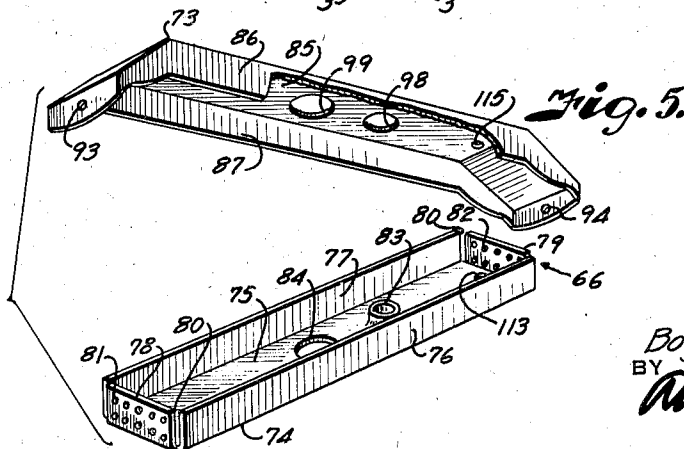
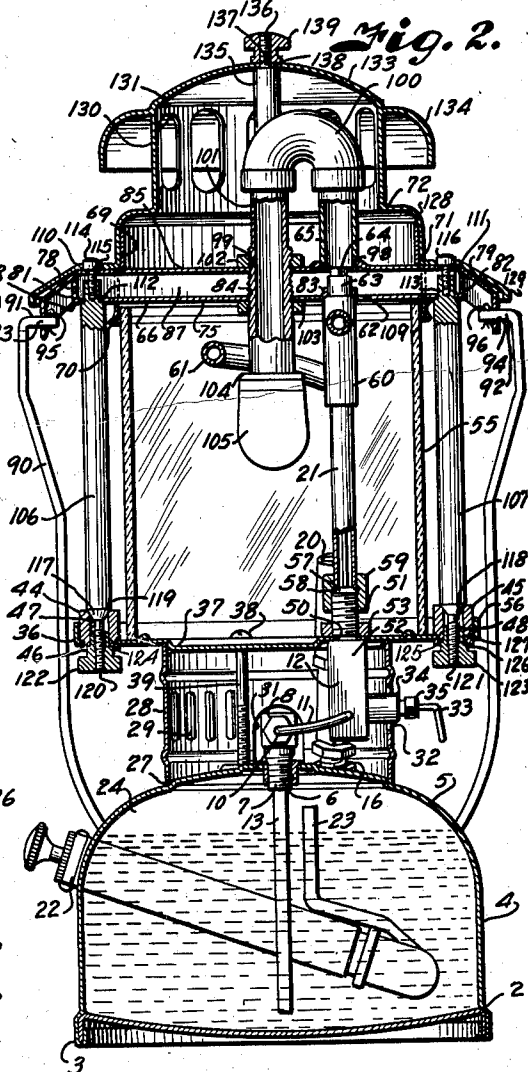
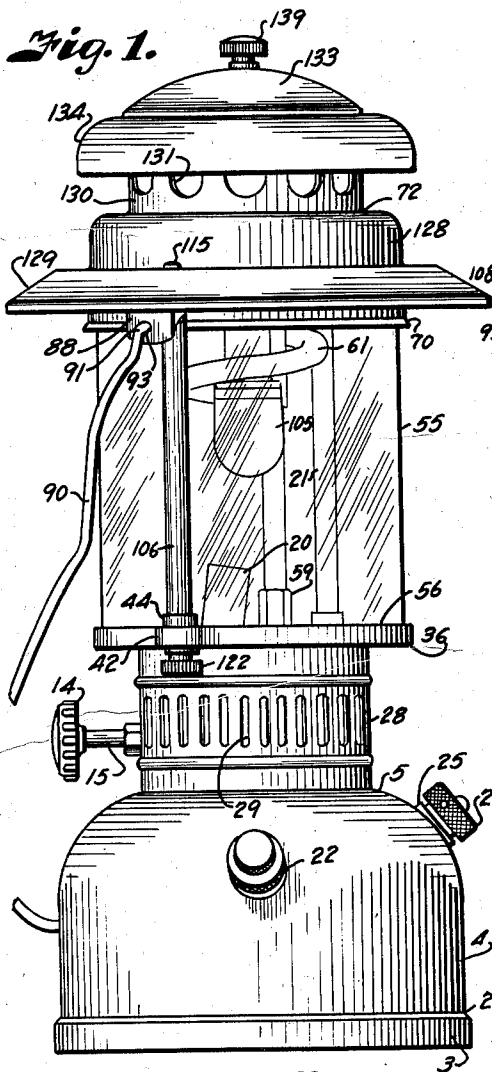
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LANTERN

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## LANTERN

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Application January 12, 1940, Serial No. 313,561

5 Claims. (Cl. 240—27)

This invention relates to lanterns, particularly those designed for burning liquid hydrocarbons such as kerosene and which require a generator for supplying fuel vapor to a Bunsen.

The principal object of the invention is to provide a lantern construction of this character which is simple and inexpensive to manufacture, and wherein the parts are quickly and accurately assembled.

Other objects of the invention are to provide a lantern of this character with an improved suspension and distribution of the weight of the fount from the bail; to provide a lantern construction wherein the interior parts are readily accessible and the globe is adapted for ready removal; to provide a lantern which is not affected by gusts of wind or is likely to clog by insects; to provide an ample air supply regardless of wind direction relatively to the air inlet of the Bunsen; and to provide the lantern with a composite bar through which air is supplied to the Bunsen and which forms an attachment for the bail as well as support for the Bunsen and burner tubes.

In accomplishing these and other objects of the invention, as hereinafter pointed out, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a side elevational view of a lantern constructed in accordance with the present invention.

Fig. 2 is a vertical section through the lantern particularly showing adaptability of the parts to ready and accurate assembly.

Fig. 3 is a detail perspective view of the fount, spacing collar, and the mounting plate shown in disassembled spaced relation.

Fig. 4 is a perspective view of the lantern globe, top assembly and ventilation top shown in disassembled spaced relation.

Fig. 5 is a detail perspective view of the parts of the carrying bar shown in disassembled spaced relation.

Referring more in detail to the drawings:

1 designates a lantern constructed in accordance with the present invention and which includes a fount 2 having a rim-like base 3, and a cylindrical wall 4 terminating in a dome-shaped top 5. The center of the top has a preferably tapered opening 6 threaded to receive the threads of a tapered nipple 7 of a fuel control valve 8. The valve 8 has a transversely arranged body 9 provided with an outlet connection 10 connected by a flexible tube 11 with a generator base member 12. The valve also includes a tube 13 de-

pending within the fount and having an inlet located adjacent the bottom thereof. Flow from the fount through the valve is manually adjusted by a hand-wheel 14 carried on a stem 15 of the valve. The tapered threaded connection of the valve body provides a leak-tight joint without the use of gaskets, but the difficulty is that the extent of takeup of the threads is variable and therefore must be taken care of in makeup of the lantern parts, later described.

Also formed in the dome-shaped top of the fount, and offset laterally of the fuel control valve, is a threaded opening 16 threadedly mounting a generator preheating device 18 which is preferably of the type illustrated in my application for United States Letters Patent on "Atomizer," filed January 12, 1940, Serial No. 313,562.

Briefly, the preheater includes a valve 18 controlled by a hand-wheel 19 to regulate discharge of an atomized mixture into the burner tube 20 which is directed toward a generator tube 21 that is carried on the member 12. The fount also carries an air pump 22 by which air is discharged through a tube 23 into the vapor space 24 at the top of the fount for displacing fuel through the tube 13 and to supply fuel and air to the preheater as later described.

The fount also includes a fill opening 25 through which fuel is inserted into the fount and which is normally closed by a cap 26. The top of the fount is shaped to form an annular shoulder 27 to center a spacing collar 28 thereon. The collar 28 has air inlet openings 29, openings 30, 31 and 32 for respectively passing the actuating stems of the valves 8 and 18, and a generating tip cleaning lever 33 that is carried by the part 12. The lever 33 is rotatably mounted in a lateral extension 34 of the part 12 and passes through a packing nut 35 to prevent leakage of fuel and air therearound.

Seated upon the upper edge of the spacing collar 28 is a base plate 36 having a central, circular, depressed portion 37 engaged within the collar to maintain the base plate in axial alignment with the fount. The plate is attached to the fount by fastening devices such as screws 38 having their shanks 39 extending through openings 40 in the plate and into threaded sockets 41 carried by the top of the fount (Figs. 2 and 3). The base plate 36 has diametrically opposed arm portions 42 and 43 provided with rod anchoring collars 44 and 45. The collars 44 and 45 are secured in openings 46 of the plate as best shown in Fig. 2 and have vertical bores

47 and 48 extending therethrough. The base plate also has an opening 49 to pass the tube 20 of the preheater and an opening 50 to pass the threaded neck 51 which projects from the shouldered upper end 52 of the generator supporting member 12.

The member 12 is rigidly secured to the plate by a nut 53 threaded onto the neck 51 to draw the shoulder 52 against the bottom of the plate, thereby forming a fixed support of the generator tube 21 independently of the valve 8. Any variation in takeup between the valve and the part 12 is compensated for by the flexible connection 11. In order to stiffen the plate and provide a retaining seat 54 for the lantern globe 55, the base plate is provided with an upwardly directed flange 56, which also preferably extends about the collars 44 and 45 as best shown in Fig. 3.

The lower end of the generator tube 21 has a flaring flange 57 engaging the bevelled end 58 of the threaded neck 51 and which is sealingly retained thereon by a nut union 59. The upper end of the tube has a slightly enlarged portion 60 connected at its upper and lower ends with the ends of a generating loop 61 extending about the burner tip or mantle support, later described. The portion 60 terminates in a shoulder 62 encircling a neck 63 carrying a removable orifice tip 64 discharging into a mixing chamber or Bunsen tube 65.

The mixing chamber 65 is carried by a cross-bar 66 extending diametrically through rectangular openings 67 and 68 in a ring 69. The ring 69 has an outwardly flaring skirt portion 70 arranged to engage the upper edge of the globe 55 and retain the globe on its seat. The ring 69 has an annularly shouldered belt 71 substantially registering with the upper face of the cross-bar to seat the ventilator top 72 later described. The bar 66 is formed of sheet metal and includes upper and lower parts 73 and 74. The lower part 74 includes an elongated, rectangular bottom 75 having upwardly turned sides 76-77 and ends 78-79, the ends thereof being cut to form slots 80 at the corners. The ends 78 and 79 are provided with perforations 81 and 82 for the admission of combustion supporting air to the Bunsen.

The bottom 75 has a collar 83 to pass the neck 63 and seat on the shoulder 62. The central portion of the bottom also has an opening 84 which, when the parts are assembled, is located in the vertical axis of the lantern. The upper member 73 includes a top 85 having depending side walls 86 and 87 arranged to telescope between the sides 76 and 77 of the bottom member with the ends thereof passing through the slots 80. The ends of the upper member terminate in downwardly and outwardly inclined ears 88 and 89 forming canopies for the protection of the air inlets and attachments for the lantern bail 90.

The bail 90 has laterally bent ends 91 and 92 that extend through openings 93 and 94 in the ears 88 and 89 and are retained therein by cotter pins 95 and 96 which extend through suitable openings 97 in the ends of the bail. The top 85 has openings 98 and 99 registering respectively with the openings 83 and 84. Fixed over the opening 98 is the Bunsen tube or mixing chamber 65. Connected with the upper end of the tube 65 is a return bend 100 connected with the swedged upper end of a tube 101. The tube 101 has a threaded portion extended through the openings 98 and 84 and is rigidly anchored therein by nuts 102 and 103 respectively engag-

ing the top and bottom portions of the bar. The tube 101 depends through the generating loop 61 and carries a burner head 104 for mounting a mantle 105 as in conventional practice.

The top assembly thus described is removably connected with the base plate by rods 106 and 107. The rods have shouldered upper ends 108 and 109 forming pilots 110 and 111 projecting into the interior of the assembled bar, through openings 112 and 113 so that the shoulders are drawn rigidly against the bottom of the bar by cap-screws 114 extending through openings 115 in the top and into threaded sockets 116 in the ends of the pilots. The lower ends of the rods 106 and 107 have tapered shoulders 117 and 118 engaging tapered seats 119 in the anchoring collars 44 and 45, which cooperate with the shoulders at the upper ends of the rods to accurately space the bar from the base plate, thereby maintaining the orifice tip 64 of the generator tube in definite location relatively to entrance of the mixing chamber or Bunsen 65. The lower ends of the rods are also provided with reduced threaded stems 120 and 121 that extend loosely through the bores in the collars and mount nuts 122 and 123 provided with shrouds 124 and 125 rotatable within the lower ends of the bores of the collars and having shoulders 126 engaging counterbores 127 of the anchoring collars. With this arrangement the rods are rigidly and quickly removed for cleaning the globe and giving access to the burner tube generator and associated parts.

The ventilator top includes a cap portion 128 of suitable inner diameter to sleeve snugly over the shouldered portion of the ring 69 and which terminates in an outwardly and downwardly flaring eave portion 129. The top of the cap terminates in a reduced cylindrical crown portion 130 having ventilating openings 131 cooperating with vent openings 132 in the base plate 36 for the circulation of air and the removal of excess heat generated at the mantle. The top of the cylindrical crown is closed by a dome-shaped portion 133, having a downwardly curved annular eave 134 extending in protecting position over the vent openings 131.

The cap thus described is anchored rigidly to the lantern structure by a stud 135 fixed to the return bend 100 and having a reduced threaded upper end 136 which projects through an opening 137 of the cap 128. The under side of the crown portion of the cap engages a shoulder 138 and is rigidly clamped thereagainst by a retaining nut 139.

The lantern constructed as described is assembled as follows:

The tapered threaded nipple 7 of the valve 8 is drawn up tight in the tapered threaded opening 6 of the fount 2, no attention being paid to the variable makeup between the valve and the fount, the important operation being that the valve is drawn up tight so as to avoid any leakage about the connection. The generator base member 12, including the tip cleaning mechanism, is connected with the valve by the flexible tube 11. The preheater 17 is then screwed into position on the fount and the spacing collar 28 is applied so that the lower end engages about the shoulder 27. The base plate 36 is then applied on the upper edge of the collar 28 and centered thereon with the depressed portion 37 fitting within the collar as shown in Fig. 3. The shoulder 52 of the generator base member 12 is drawn tightly against the base plate by application of the nut 53 so

that the bevelled end 58 is fixedly spaced with respect to the base plate 36. The generator tube 21 is then applied by screwing the union 59 on the threaded neck of the generator base member 12. The orifice tip 64 is then a definite distance above the base plate. The assembled cross-bar 56, carrying the Bunsen and burner tubes 65 and 101, is inserted through the openings 67 and 68 in the ring 69. This is readily effected by first placing the end of the bar having the ear 83 through the opening 67 until the other ear 89 passes into the ring and registers with the opening 68. The bar 66 may then be slid retractively through the openings so that it centers within the ring 69. The pilot ends 110 and 111 of the rods 106 and 107 are then inserted through the openings 112 and 113 of the cross-bar and the shoulders 108 and 109 of the rods are drawn tightly thereagainst upon application of the cap-screws 114. The ventilator top is then applied over the ring 69 and anchored to the top assembly upon application of the nut 139, the heads of the cap-screws 114 passing through suitable openings 140 in the ventilator cap as shown in Fig. 2. After application of the mantle 105, followed by the globe 55, the top assembly is applied over the globe so that the reduced threaded stems 120 and 121 of the rods pass through the bores 47 and 48 of the anchoring collars 44 and 45 with the tapered shoulders 117 and 118 thereof engaging the seats 119 of the collars, thereby accurately spacing the inlet of the Bunsen tube with respect to the orifice tip 64 of the generator. The shroud nuts 124 and 125 are then applied to the threaded stems 120 and 121 of the rods so that the shrouds thereof enter the bores 47 and 48 as the nuts are tightened to securely anchor the rods including the entire top assembly on the base plate.

It is thus obvious that all the parts are spaced relatively to the base plate so that variable make-up of the threads for the valve 8 does not affect predetermined spacing of the generator tip 64 with respect to the inlet of the Bunsen tube. It is also obvious that all the parts are lined up relatively to the plate and that the weight of the lantern is carried by the plate when it is carried by the bail.

Most of the parts of the lantern are constructed so that they may be formed with dies thereby providing an inexpensive construction and yet provide a very effective and rigid structure when the parts are assembled.

After filling the fount with fuel, for example kerosene, the pump 22 is actuated to build up pressure on the liquid in the fount. Upon opening the valve 18 of the preheater 17, an atomized mixture of air and liquid fuel is discharged through the tube 20, which, when lighted, burns with an intensely hot flame directed against the generator tube 21. After the generator tube has been sufficiently heated to cause vaporization of the fuel passed therethrough the hand-wheel 14 is actuated to open the valve 8, whereupon fuel is displaced from the fount 2 through the tube 13, into the generator tube 21, where the fuel is vaporized and the vapor discharged through the orifice tip 64, into the Bunsen tube, so that the vapor discharged into the mantle 105 is ignited by the flame of the preheater. When the fuel is vaporized to give the required brightness of the mantle 105, the preheater valve 18 is closed. The lantern continues to operate, primary air being drawn through the perforations 81 and 82 in the ends of the cross-bar 66, for discharge with the fuel from the jet into the Bunsen tube. During

operation, the interior of the lantern is ventilated through the openings in the base plate 132, and the slot-like openings 131 in the ventilator top. The ears 88 and 89 at the ends of the cross-bar 66, which form attachment for the bail, provide shields so that gusts of wind do not interfere with operation of the lantern. The perforations 81 and 82 not only form screens for the exclusion of bugs, but they break up the air currents passing to the Bunsen. By providing air inlet openings at both ends of the bar, at least one of the ends is always effective in supplying adequate air regardless of the direction which the wind blows.

From the foregoing it is obvious that I have provided a relatively inexpensive and rigid lantern construction which is readily assembled with accuracy so that the fuel mixture effected in the Bunsen is constantly uniform. The construction of the rods and their attachment to the base plate also provide quick and easy removal of the top assembly for giving access to the globe and interior parts of the lantern.

What I claim and desire to secure by Letters Patent is:

1. In a lantern, a top assembly including, a ring member having openings in opposite diametrical sides thereof, a hollow cross-bar extending through said openings and provided with air inlets at the ends thereof, interconnected Bunsen and burner tubes carried by the cross-bar, said Bunsen tube having connection with said air inlets by way of the hollow cross bar for supplying combustion supporting air to the burner tube, a ventilator top on said ring member, means anchoring the ventilator top in fixed position relatively to the cross-bar, and lantern carrying means fixed to said cross bar independently of the ring member and said ventilator top.

2. In a lantern, a top assembly including, a ring member having openings in opposite diametrical sides thereof, a hollow cross-bar extending through said openings and provided with air inlets at the ends thereof, interconnected Bunsen and burner tubes carried by the cross-bar, said Bunsen tube having connection with said air inlets by way of the hollow cross bar for supplying combustion supporting air to the burner tube, a ventilator top on said ring member, means anchoring the ventilator top in fixed position relatively to the cross-bar, canopy-like ears extending in protective relation over the air inlets, and a bail connected with said ears.

3. In a lantern, a top assembly including, a cross member including upper and lower channel-like parts having interfitting sides to form an air duct therethrough, perforated ends on one of said channel-like parts for closing said duct at the ends thereof and forming screen-like guards through which air is admitted to the duct, and canopy-like ears on the ends of one of the channel-like parts and projecting over the perforated ends to prevent external drafts from interfering with flow of air through said perforated ends into the ducts, said ears forming attachments for a bail of the lantern.

4. In a lantern, a fount, a base member fixed upon the fount, a ring member having openings in opposite diametrical sides thereof, a hollow cross bar having ends projecting outwardly from said openings and provided with air inlets, a burner unit carried by the cross bar and having connection through said hollow cross bar with the air inlets, canopy-like ears on the ends of the cross bar and extending over the air inlets, and a bail connected with said ears whereby the entire

weight of said lantern is carried by the bail through the cross bar.

5. A lantern including, a fount, a base plate having fixed support on the fount, anchoring collars on the base plate provided with through bores, a top assembly including a ring member having openings in opposite diametrical sides thereof, a hollow cross bar having ends projecting outwardly from said openings and provided with air inlets, a burner unit carried by the cross bar and having connection through said cross bar with the air inlets, a generator fixed to the base plate and having a tip extending through said cross bar and discharging into the burner unit, rods having fixed connection with the projecting

ends of the cross bar and shouldered lower ends seating against the anchoring collars, threaded terminals of the ends of the rods extending loosely through said bores of the anchoring collars, nuts on the threaded terminals and having shrouds rotatably engaged in said bores to center the rods with respect to the anchoring collar to secure said top assembly to the base plate and maintain a definitely fixed relationship of the orifice tip to the burner unit, and means for attaching a bail to the ends of the hollow cross bar whereby the entire weight of the lantern is transmitted through the cross bar to said bail.

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