United States Patent

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[54] PORTABLE LANTERNS
9 Claims, 5 Drawing Figs.

[52] U.S. Cl. 431/109, 240/44.2
[51] Int. Cl. F21h 1/00
[50] Field of Search 431/100, 107, 109; 240/11, 44, 44.2

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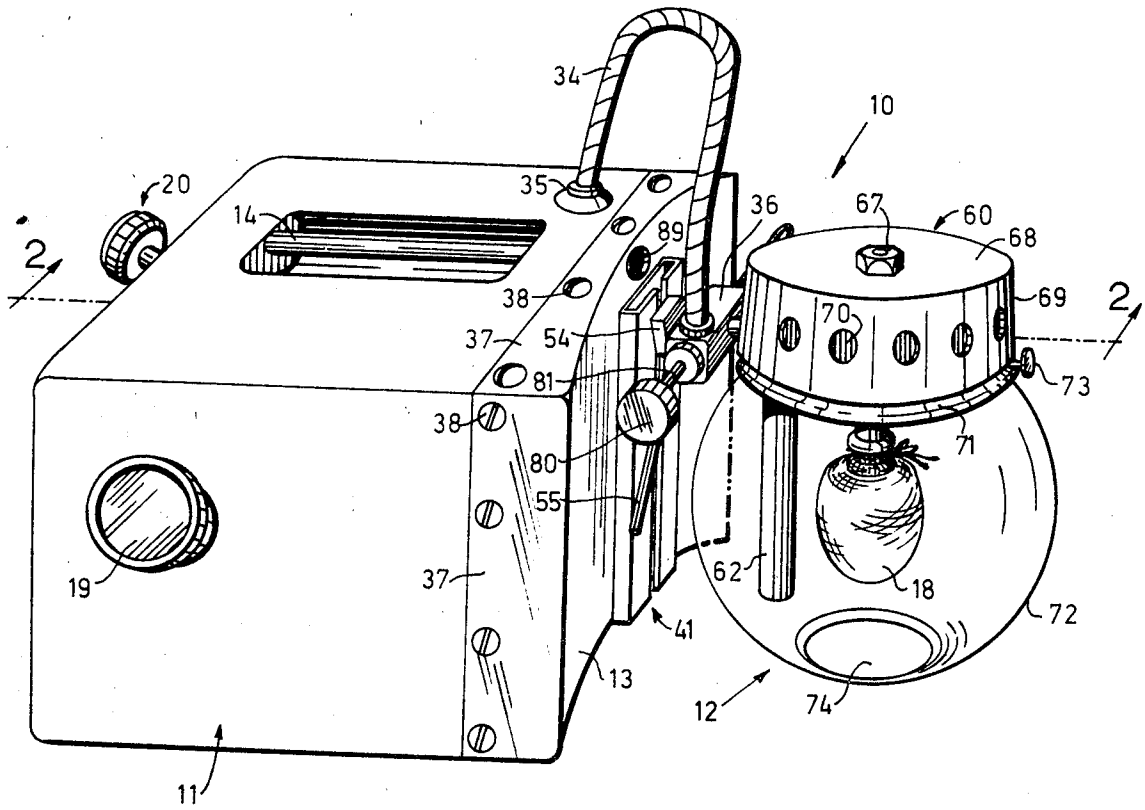
ABSTRACT: A portable lantern which can be used both as a handheld unit and suspended from an overhead support includes a housing with a generally vertical, light-reflecting surface and a light source mounted on the housing opposite the light-reflecting surface and for movement between a raised position and a lowered position. With the light source in the raised position, light is reflected forwardly of the lantern while, with the light source in its lowered position, illumination provided below the lantern is not interrupted by the housing. In a specific structure, the housing also serves as a fuel tank and a mantle and an associated globe are movably mounted on a vertical guideway on a reflective end wall of the fuel tank.



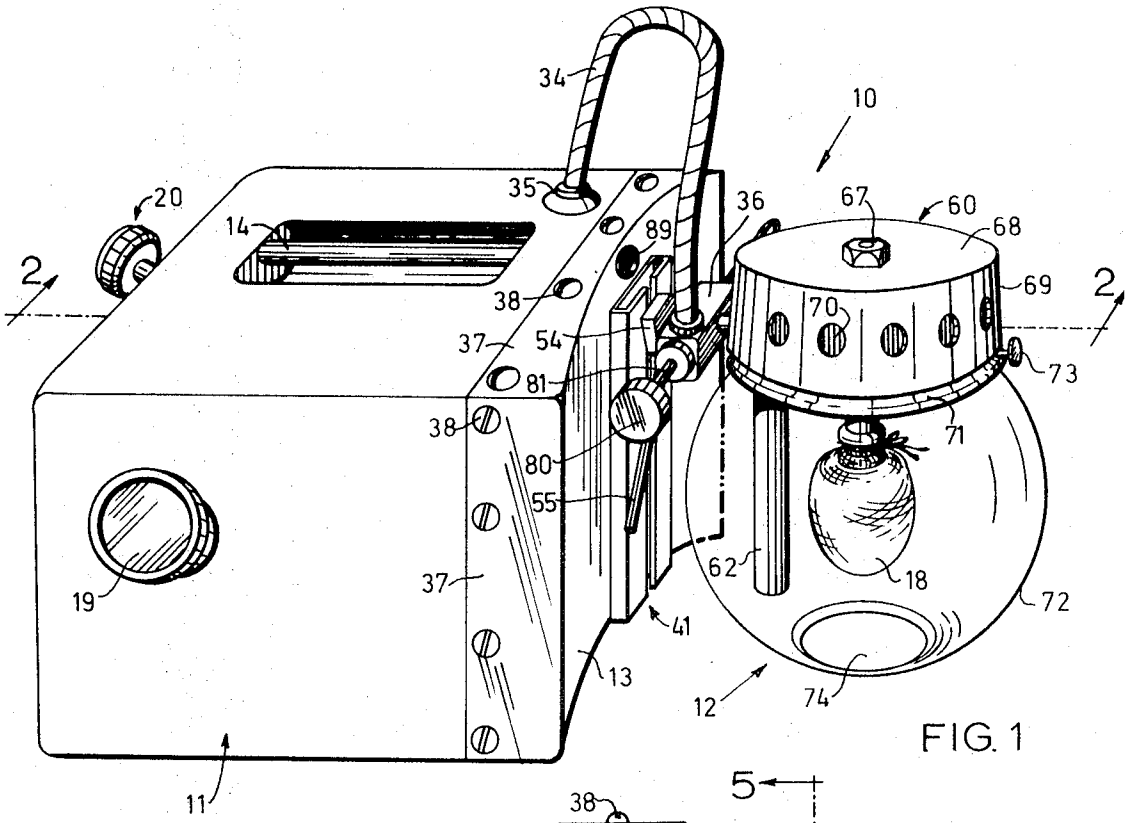


FIG. 1

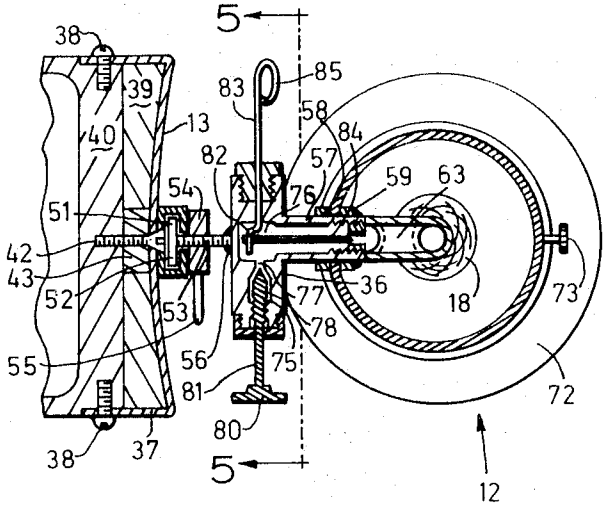


FIG. 4

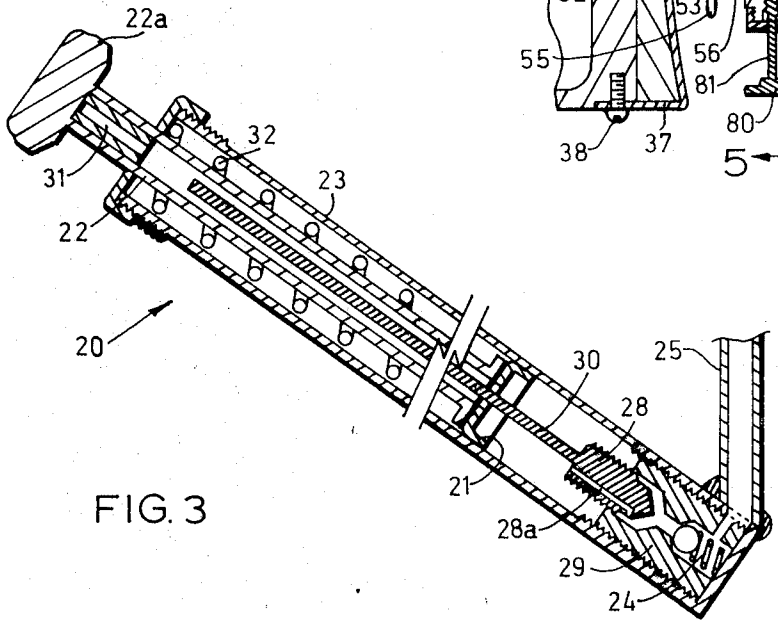


FIG. 3

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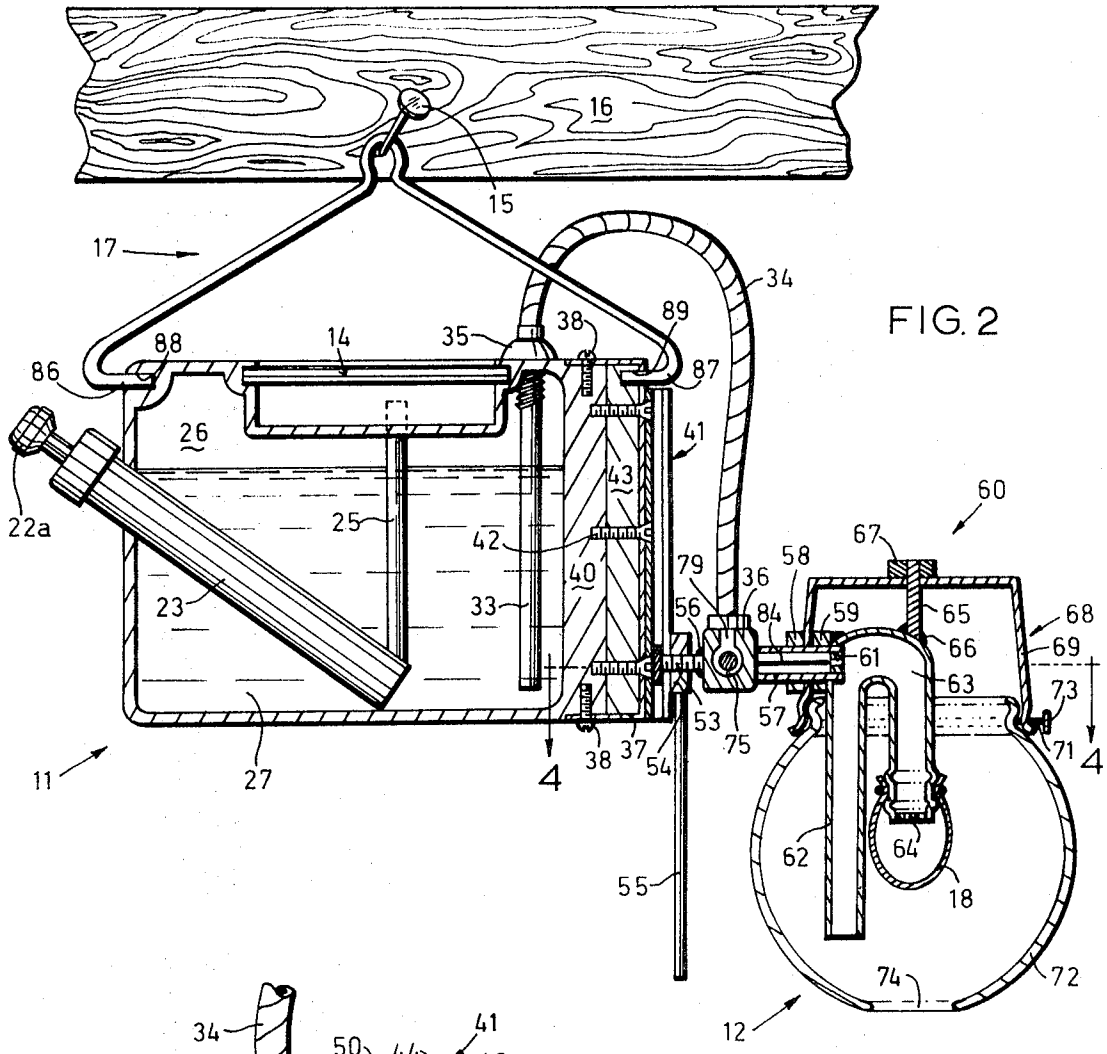

FIG. 2

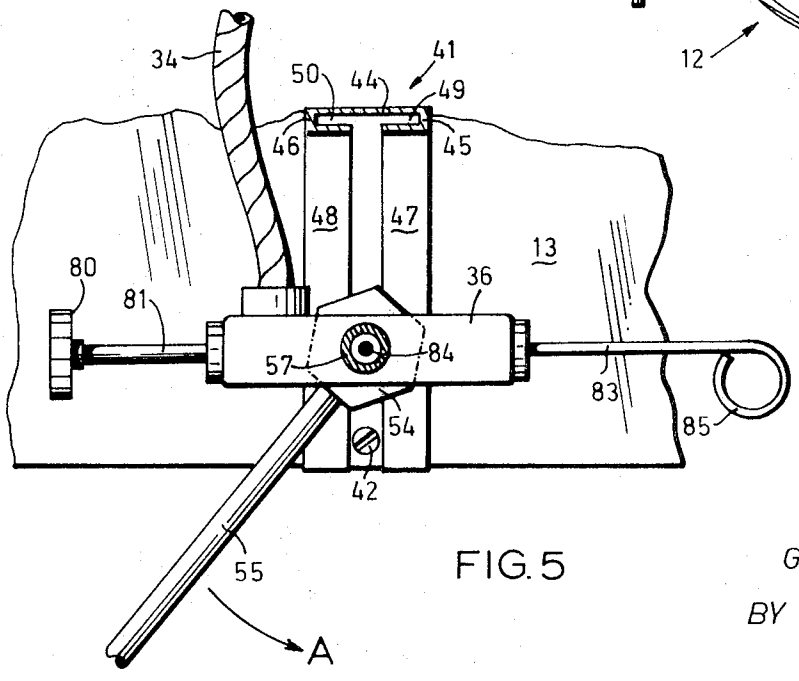

FIG. 5

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PORTABLE LANTERNS

BACKGROUND OF THE INVENTION

The present invention relates to portable lanterns and more particularly to portable lanterns which can be used both as hand-held units for providing forwardly directed illumination and as suspended lanterns for providing downwardly directed, substantially uninterrupted illumination.

Many existing portable lanterns intended for use by campers and the like possess certain disadvantages. For instance, many of the lanterns already known and intended to be carried by hand cannot be suspended to provide overhead illumination in a cottage or the like. Even with those lanterns which are provided with hangers for suspending them from overhead supports, unsatisfactory illumination is frequently obtained below such a lantern due to the interposition of the opaque base of the lantern between the light source and the area to be illuminated.

Furthermore, the previously known lanterns which are intended to be used as overhead lanterns and to provide noninterrupted illumination therebelow are frequently unsuited for use as hand-held lanterns.

It is accordingly a principal object of the present invention to provide a portable lantern which can be used both as a hand-held lantern to provide forwardly directed illumination and as an overhead lantern to provide downwardly directed, substantially uninterrupted illumination.

It is a further object of the present invention to provide a dual purpose lantern of the hereinbefore described character and which is simple and reliable in its operation and construction.

Yet another object of the present invention is to provide a portable lantern of the novel character which is particularly adapted to be powered by a volatile liquid fuel such as white gasoline.

SUMMARY OF THE INVENTION

In its broadest scope, the present invention provides a portable lantern comprising a housing adapted both to be carried by hand and to be suspended from an overhead support, said housing being provided with a generally vertical, light-reflecting surface, and a light source mounted on said housing for movement between a raised position in generally horizontal opposition to said light-reflecting surface and a lowered position below said housing, whereby said lantern may be used as a hand-held lantern to provide forwardly directed illumination and as an overhead lantern to provide downwardly directed, substantially uninterrupted illumination.

Other objects, features and advantages of the invention will become apparent as the description herein proceeds.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described merely by way of illustration with reference to the accompanying drawings in which:

FIG. 1 is a perspective view of a preferred embodiment of a portable lantern in accordance with the invention and showing the light source thereof in its raised position;

FIG. 2 is a vertical sectional view through the lantern of FIG. 1 taken along the line 2–2 of that figure and showing the lantern suspended from an overhead support with the light source in its lowered position;

FIG. 3 is an enlarged axial sectional view through the priming pump provided in the lantern of FIGS. 1 and 2;

FIG. 4 is a partial horizontal sectional view through the lantern of FIGS. 1 and 2 when taken along the line 4–4 of FIG. 2; and

FIG. 5 is an enlarged, fragmentary front elevation when viewed in the direction of the arrows 5–5 of FIG. 4 showing in detail the locking means provided for releasably securing the light source of the lantern in a desired vertical position.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The portable lantern generally indicated at 10 in FIG. 1 comprises a housing generally indicated at 11 and a light source generally indicated at 12. A generally vertical light-reflecting surface 13 is secured in a manner to be explained hereinafter on the forward end surface of the housing 11 and means are provided whereby the light source 12 may be moved between the raised position shown in FIG. 1 and the lowered position shown in FIG. 2. Referring further to FIG. 1, it will be noted that the housing 11 is provided with a handle 14 to enable the lantern 10 to be carried while, from FIG. 2, it will be seen that the lantern 10 may be suspended from an overhead support such as nail 15 in a ceiling rafter 16, by means of a hanger 17 which can be releasably attached to the housing 11 for this purpose.

Before proceeding with a more detailed description of the structure of the lantern 10, it is convenient to note at this time that with the light source 12 in its raised position as shown in FIG. 1, light emitted rearwardly by the light source 12 will be reflected by the reflecting surface 13 to provide increased illumination in front of the person carrying the lantern. On the other hand, when the light source 12 is disposed in its lowered position as shown in FIG. 2, downwardly and sidewardly directed light from the light source 12 is not interrupted by the housing 11. This is particularly advantageous when the lantern 10 is used as an overhead light, for example, in a cottage or other building.

Referring now in greater detail to the particular lantern 10 shown in the accompanying drawings, it will be seen that the lantern is of the type which burns a volatile liquid fuel such as white gasoline to heat a heat-responsive light-emitting means such as a conventional gas mantle 18. In the lantern 10, the housing 11 serves as a fuel reservoir or tank and is provided with a filling cap 19 in a conventional manner.

Fuel is transferred from the tank 11 to the light source 12 by means of a conventional priming pump indicated generally at 20 and shown in greater detail in FIG. 3. This pump 20 is a simple, manually operated piston pump having a pump washer 21 carried on the lower end of a hollow rod 22 for movement in a pump cylinder 23. A handle 22*a* is formed at the upper end of the rod 22. A spring-loaded ball valve 24 at the lower end of the cylinder 23 serves to restrict air flow from the pump 20 to the inward direction and it will readily be understood that air compressed in the conventional manner inside the cylinder 23 below the pump washer 21 will pass through the ball valve 24 and then through an escape tube 25 connected to the lower end of the cylinder 23 and terminating in a space 26 above the liquid fuel 27 within the tank 11.

In accordance with a particularly useful feature, the pump 20 may be provided in a known manner with a threaded plug 28 which is mounted in a valve block 29 in the lower end of the cylinder 23 for the purpose of preventing the escape of air pressure by leakage past the pump washer 21. This plug 28 is provided with an air passage 28*a* to permit the flow of air into the tank 11 when the plug is in its unscrewed position as shown in FIG. 3. The plug 28 is integrally formed with a stem 30 of noncircular cross section which stem is received within a correspondingly shaped socket sleeve 31 provided inside the hollow rod 22 when the latter is fully depressed. A helical compression spring 32 is provided within the cylinder 23 as is conventional.

The fuel is forced by the air pressure in the space 26 to flow up a dip tube 33 and then into a flexible hose 34 threadingly engaged in a boss 35 integrally formed with the top of the tank 11. The liquid fuel passes through the hose 34 to a valve body 36, the structure of which will be described in greater detail hereinafter.

Referring now to the light-reflecting surface 13, it will be seen from FIG. 1 that this surface 13 is suitably formed from a sheet of metal or other suitable reflective material so as to be horizontally concave and vertically planar. The edges of this

sheet are bent back as flanges 37 which are secured to the top, under and side surfaces of the tank 11 by screws 38. Since considerable heat might be radiated from the light source 12, it is desirable to include a thermally insulating material 39 between the light-reflecting surface 13 and the forward end wall 40 of the tank 11.

As hereinbefore indicated, the light source 12 is, in accordance with an important feature of the present invention, mounted on the housing 11 so as to be movable between the positions shown in FIGS. 1 and 2. For this purpose, a vertical guideway generally indicated at 41 is mounted substantially centrally of the reflecting surface 13. It will be seen from FIGS. 2 and 4 that this guideway 41 is held in position by countersunk screws 42 which are threaded into the end wall 40 of the housing 11. A solid spacer member 43 is provided between the light-reflecting surface 13 and the end wall 40 if the insulating material 39 does not provide sufficient rigidity for the mounting of the guideway 41.

It will further be noted from FIG. 5 that the guideway 41 is suitably formed, for example as an extrusion, with a flat rear web 44, sidewalls 45 and 46, and spaced-apart front flanges 47 and 48 so as to define elongated grooves or recesses 49 and 50 within which side flanges 51 and 52 integrally formed at the rearward end of a supporting arm 53 can move. A coarse threaded nut 54 disposed around the arm 53 so as to engage a corresponding thread formed on the arm 53 forwardly of the flanges 51 and 52 has a rod 55 suitably secured thereto and this rod 55 extends downwardly therefrom. Rotation of the nut 54 by manual movement of the rod 55 to the position actually shown in FIG. 5 causes the nut 54 to engage the front flanges 47 and 48 of the guideway 41 to hold the light source 12 in any required vertical position. Movement of the rod 55 a small distance in the opposite direction as indicated by the arrow A in FIG. 5 loosens the nut 54 to permit the vertical position of the light source 12 to be adjusted. It will also be noted that the valve body 36 is secured to the forward end of the supporting arm 53, for example, by a weld as indicated at 56.

Secured to and extending forwardly from the valve body 36, there is a tubular supporting arm 57 which near its forward end is secured by nuts 58 and 59 to a cowl indicated generally at 60 of the light source 12. Disposed within the forward end of the tubular supporting arm 57, there is provided a fuel nozzle 61 through which liquid fuel is injected into a larger diameter air tube 62. From the nozzle 61, the air tube 62 curves forwardly and downwardly as a combustion mixture supply tube 63 to the lower end of which the mantle is secured. To avoid flashback, a suitable wire screen 64 (FIG. 2) is inserted in the tube 63 adjacent the upper end of the mantle 18.

Referring further to FIG. 2, it will be seen that a threaded stub shaft 65 is welded at 66 to the tube 63 generally above the mantle 18 and that a nut 67 threaded onto this shaft 65 serves to hold the cowl cover member 68 in position. FIG. 1 also shows that the cowl cover member 68 is usefully provided in its skirt portion 69 with a plurality of openings 70 through which hot air and combustion gases escape.

In proximity to the lower peripheral edge of the skirt portion 69, the cowl cover member 68 is formed with an inwardly displaced, peripheral groove 71 which engages a corresponding groove in the upper peripheral edge of a transparent globe 72. The globe 72 is held in position by a setscrew 73 and has an opening 74 at its lower end to permit the flow of both primary and secondary air to the air tube 62 and to the mantle 18 respectively.

The internal structure of the valve body 36 will now be described in greater detail. From FIG. 4, it will be seen that this valve body 36 includes a first valve chamber 75 and a second valve chamber 76 interconnected by a passage 77 which can be closed or opened as required by a movable valve member 78. Liquid fuel passes from the hose 34 through a passage 79 (FIG. 2) extending upwardly from the first valve chamber 75. From the second valve chamber 76, the fuel passes through the tubular supporting arm 57 to be injected from the nozzle 61 into the air tube 62. A knurled control knob 80 is provided at the outer end of a shaft 81 integrally formed with the movable valve member 78 for controlling the flow of liquid fuel to the second valve chamber 76.

A crank 82 formed on the inner end of a crank arm 83 is provided in the second valve chamber 76 and a nozzle-cleaning wire 84 is secured to the crank 82 and extends forwardly therefrom through the hollow arm 57 to the nozzle 61. A simple handle 85 is formed on the outer end of the crank arm 83 to permit rotation of the crank 82 and consequently reciprocating movement of the wire 84 for the purpose of cleaning the nozzle 61 of any deposits or plugging particles lodged therein.

Referring again to the hanger 17, it should be noted that this member is usefully formed of a resilient material such as spring steel and has two opposed end portions 86 and 87 which are removably received within openings 88 and 89 provided in the front and rear surfaces of the housing 11 in proximity to the upper edges thereof. As a result of its resiliency, the hanger 17 is easily removed from the housing 11 simply by pulling its ends apart.

Having described the construction of the lantern 10, its manner of use will now be briefly summarized. The supply of fuel from the tank 11 to the mantle 18 is effected in a conventional manner and to cause such transfer a suitable fuel such as white gasoline is first introduced into the tank 11 after the removal of the filler cap 19. After the cap 19 has been replaced, the handle 22*a* of the pump 20 is rotated to unscrew the plug 28 from its associated seating at the bottom end of the pump cylinder 23. The pump 20 is then operated in a conventional manner to force compressed air through the air passage 28*a* in the plug 28, past the ball valve 24 and through the escape tube 25 into the space 26 above the field 27 in the tank 11.

As a result of the elevated pressure in the space 26, the fuel 27 is driven up the dip tube 33, through the flexible hose 34 and passage 79, and into the first valve chamber 75 within the valve body 36.

By turning the knob 80, the liquid fuel flows from the first valve chamber 75 through the passage 77 and the second valve chamber 76 into the interior of the hollow supporting arm 57. The fuel then passes through the nozzle 61 into the air tube 62 for admixture with the primary air flowing therein and subsequent passage through the mixture supply tube 63 to the mantle 18, the handle 85 being used in a known manner when required for cleaning the nozzle 61.

When it is required to use the lantern 10 as a hand-held portable lantern, the light source 12 is disposed in the position shown in FIG. 1. With the light source 12 in such a position, the lantern may be carried by the handle 14 to provide forwardly directed illumination with rearwardly directed light being reflected by the surface 13. With the light source 12 in its raised position as shown in FIG. 1, the lantern 10 may also be used as a table lamp.

When the lantern 10 is to be suspended from an overhead support as shown in FIG. 2, the hanger 17 is attached in the manner already described and the rod 55 is moved in the direction of the arrow A (FIG. 5) to rotate the nut 54 to allow the supporting arm 53 and the associated structure of the light source 12 to be moved along the guideway 41 to the position shown in FIG. 2. The rod 55 is then moved in the opposite direction to lock the light source 12 in its lowered position. It will be understood that with the light source 12 in this lowered position, the mantle 18 is free to direct downward illumination over a substantially complete area, i.e. no unilluminated areas or shadows are caused by the interposition of the housing 11 as would be the case if the light source 12 were left in the raised position of FIG. 1. It should further be understood that the effect on downwardly directed illumination of the interposition of the air tube 62 and the rod 55 are negligible and do not significantly detract from the primary advantage of lowering the light source 12 with respect to the housing 11.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. A portable lantern comprising a housing adapted both to be carried by hand and to be suspended from an overhead support, said housing being provided with a generally vertical, light-reflecting surface and including a reservoir for a pressurized fluid fuel, a light source mounted on said housing for movement between a raised position in generally horizontal opposition to said light-reflecting surface and a lowered position below said housing, which light source is adapted to be powered by such a fluid fuel, and a transfer conduit extending from said reservoir to said light source for conveying such a fluid fuel from said reservoir to said light source irrespective of whether said light source is disposed in its raised position or its lowered position, whereby said lantern may be used both as a hand-held lantern to provide forwardly directed illumination and as an overhead lantern to provide downwardly directed, substantially uninterrupted illumination.

2. A portable lantern as claimed in claim 1 in which said light source is mounted on said housing for movement along a guideway provided on said generally vertical, light-reflecting surface.

3. A portable lantern as claimed in claim 1 in which said transfer conduit comprises a flexible tube extending between said reservoir and said light source.

4. A portable lantern as claimed in claim 3 in which said light-reflecting surface is horizontally concave and vertically planar and is separated from said reservoir by a thermally insulating material.

5. A portable lantern as claimed in claim 4 in which said light source is disposed on a forward end of a supporting arm having a rearward end mounted for sliding movement along a generally vertical guideway secured generally centrally on said light-reflecting surface.

6. A portable lantern as claimed in claim 5 in which a valve body is mounted on said supporting arm, in which one end of said flexible tube is in fluid communication with a first valve chamber within said valve body, in which a fuel supply passage in fluid communication with a second valve chamber within said valve body is provided in said supporting arm forwardly of said valve body for the purpose of conveying fuel to said light source, in which a transfer passage is provided within said valve body to interconnect said first and second valve chambers, and in which there is additionally provided a manually adjustable control means having a movable valve member adapted to be moved between a closed position in which it closes said transfer passage against the flow of fuel therethrough and an open position in which fuel flow through said transfer passage may take place at a required rate.

7. A portable lantern as claimed in claim 6 in which said fuel supply passage terminates forwardly in a fuel discharge nozzle, in which a nozzle-cleaning wire is reciprocally disposed within said fuel supply passage, in which crank means adapted, on rotation thereof, to move said nozzle-cleaning wire reciprocally, is additionally provided within said second valve chamber of said valve body, and in which a manual control means extends outwardly from within said valve body to permit manual rotation of said crank means from without.

8. A portable lantern as claimed in claim 7 in which a manually rotatable locking handle is mounted on said supporting arm and is adapted, on rotation, releasably to secure said supporting arm at any desired vertical position along said guideway.

9. A portable lantern as claimed in claim 1 which lantern is adapted to be suspended from an overhead support by means of a hanger having opposed, resiliently separable end portions adapted to be received removably within recesses provided in generally vertical opposite surfaces of said housing and in which lantern said housing has an upper surface with a handle secured thereto.