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Sell

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[54] **LANTERN IGNITER**

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[52] **U.S. Cl.** **431/104,** 431/277, 222/3, 431/344

[51] **Int. Cl.** **F21h 7/00**

[58] **Field of Search** ..... 431/104–107, 431/127, 276, 277, 285, 344; 126/25 B; 222/5

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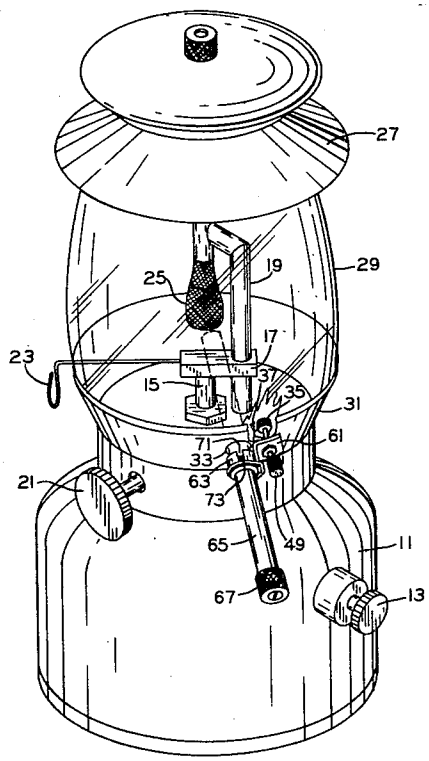
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[57] **ABSTRACT**

An igniter for igniting pressurized liquid fuel lanterns and the like is disclosed wherein a spark source is secured to the lantern and actuable from outside the lantern to provide a spark internal to the lantern. A gas charged propane or butane lighter is positioned close to the spark source and energized and then moved to a position in close proximity to the lantern mantle and generator or the generator of a similar pressurized liquid fuel device such, for example, as a camp stove, to heat the mantle and generator and vaporize the fuel and finally ignite that vaporized fuel.

7 Claims, 4 Drawing Figures



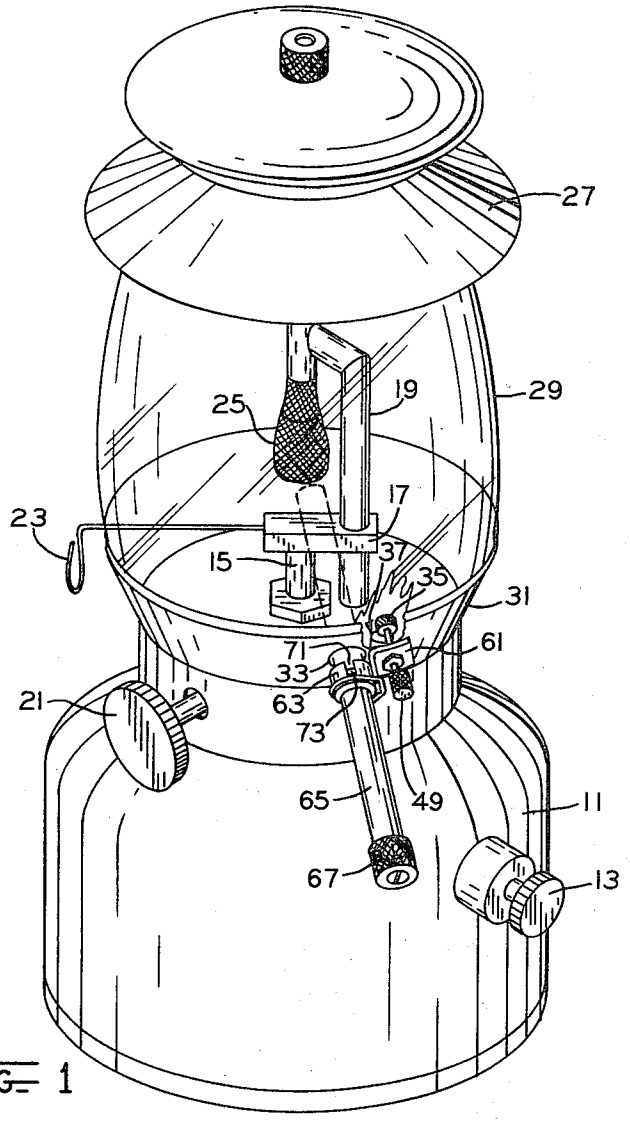

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FIG 1

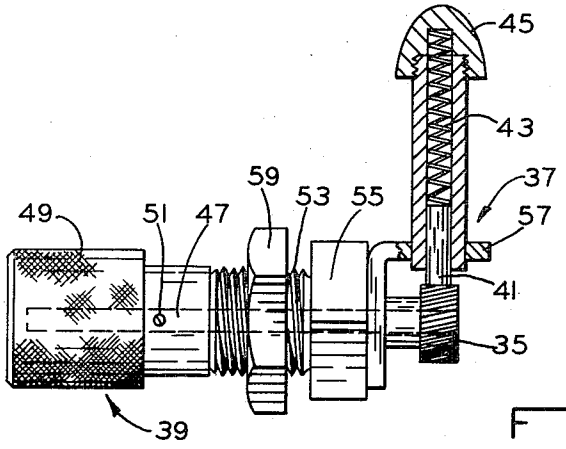

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FIG 2

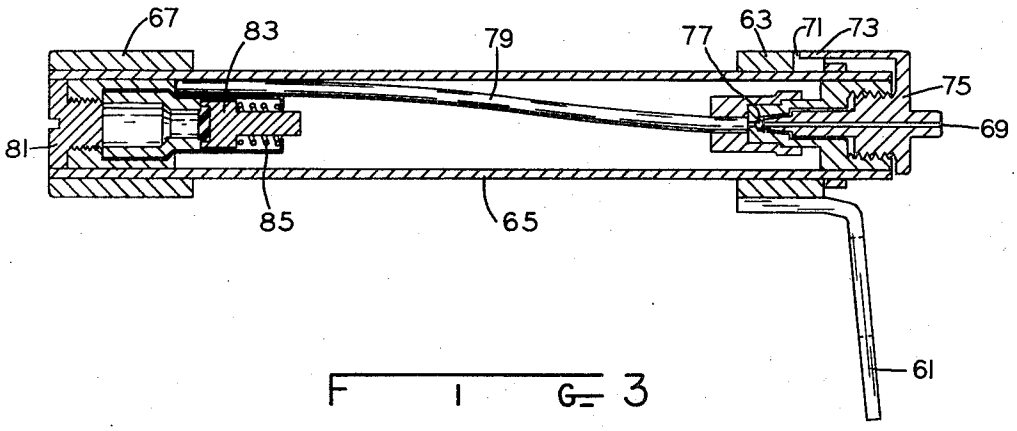

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FIG 3

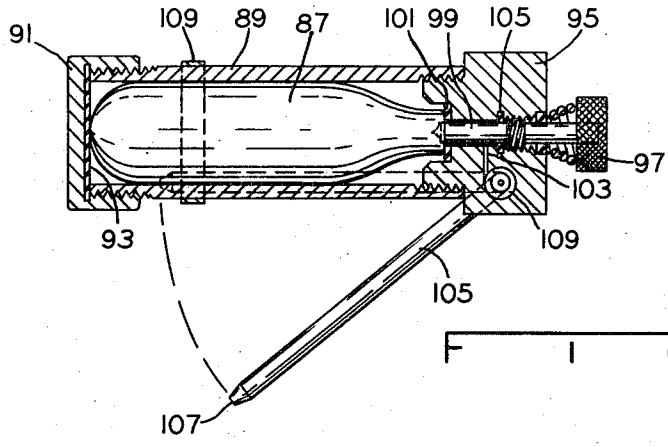

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FIG 4

LANTERN IGNITER

BACKGROUND OF THE INVENTION

This invention relates to an igniter for a pressurized fuel device and more specifically to a gas charged lighter for a pressurized lantern of the heated mantle type. Such lanterns are typically used in fishing, camping and other outdoor activities, and while the present invention could be employed in conjunction with any type lantern or similar equipment it finds particular utility in conjunction with kerosene or gasoline pressurized lanterns where the fuel is normally in a liquid phase and requires vaporization to properly ignite. The prior art procedures for lighting such a lantern include the well-known match as well as several attempts to place a flint and steel structure in close proximity to the mantle so as to ignite the fuel by creating a spark in its vicinity. It is also known to provide a tray beneath the mantle to be filled with alcohol or gasoline which is first ignited and which in turn ignites the gasoline or kerosene within the mantle. Of all of these approaches the old-fashioned large kitchen match is generally the most successful, however, even it will fail in cold, windy conditions at just the time its user most needs the heat and warmth of the lantern.

Such lanterns normally employ gasoline or kerosene as fuel and supply this fuel under pressure in its liquid phase to a generator which should convert the fuel to a vapor and then present that vapor to the mantle. Under cold temperature conditions the fuel will not be vaporized in the generator and accordingly will be presented to the area of the mantle in its liquid phase and be correspondingly more difficult to ignite. The best system for igniting such a lantern is to heat both the mantle and the generator so as to provide a vapor to the mantle which is readily combustible.

Accordingly, it is one object of the present invention to provide a lantern igniter which simultaneously heats the mantle and generator of a pressurized liquid fuel lantern.

It is another object of the present invention to provide a lantern igniter which will function under adverse weather conditions.

It is a further object of the present invention to provide an improved igniter for pressurized fuel devices.

SUMMARY OF THE INVENTION

The foregoing as well as numerous other objects and advantages of the present invention are achieved by providing a spark source mounted on the lantern and actuable external of the lantern to provide a spark within the lantern. A source of combustible material such as a gas charged propane or butane lighter is movable between a first position where it is ignited by the spark source and a second position in close proximity to the mantle and generator of a lantern where it may heat both, thus vaporizing and igniting the fuel. The gas charged lighter then may be moved back to its first position or removed from the lantern for storage or other use.

Accordingly, it is a still further object of the present invention to provide a gas charged lighter for igniting a pressurized fuel device.

Yet another object of the present invention is to provide a gas charged lighter for igniting a pressurized fuel device which may also be used to ignite other pressurized fuel devices or as a lighter for other purposes.

These and other objects and advantages of the present invention will appear more fully from the following detailed disclosure read in conjunction with the accompanying drawings wherein like parts bear like reference numerals.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is a perspective view of a pressurized liquid fuel lantern of known construction incorporating the igniter of the present invention;

FIG. **2** is a partial cross sectional view of the spark source of FIG. **1**;

FIG. **3** is a sectional view of the gas charged lighter of FIG. **1**; and

FIG. **4** is a sectional view of an alternate embodiment for the gas charged lighter of FIG. **3**.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Considering first FIG. **1**, a lantern according to well-known prior art techniques has a base comprising a pressurizable reservoir **11** which may contain as the liquid lantern fuel kerosene or gasoline. A plunger pump assembly **13** allows the user to pump additional air into the reservoir and thus place the fuel under substantially increased pressure to force it through the rest of the system. Fuel flows up a pipe **15** which extends down to near the bottom of the reservoir through a lateral connecting piece **17** and upwardly through a generator **19.** The generator **19** is generally a fiber filled tube having an extremely small aperture at the upper end thereof and is employed to vaporize the fuel passing upwardly through the system. A control valve **21,** of course, shuts off the fuel supply prior to the generator, and a small needle is actuable to clean the orifice at the top of the generator by revolving the lever **23.** Under operating conditions then the fuel as it leaves the small orifice at the top of the generator is in a gaseous phase and is supplied to a mantle **25** where it burns heating this mantle to an incandescent level thus giving off the characteristic bright white light of such lanterns. Such lanterns also include a shade **27,** a glass globe **29,** a side wall **31** which supports the globe, and a filler cap (not shown).

The side wall **31** may be provided with one or more apertures through which air may pass and through which a long match may be inserted to light the lantern. If such apertures of adequate size and location are not present, the present invention requires the drilling of an aperture **33** and a similar adjacent aperture in the side wall **31** for mounting the spark source and passing the gas charged lighter of the present invention. As illustrated in FIG. **1** the gas charged lighter of the present invention is slidable between the position illustrated in solid lines and that illustrated in dotted lines. In the solid line position the orifice of the gas charged lighter is in close proximity to a spark wheel **35,** which in conjunction with the flint which lies below the wheel and is illustrated in FIG. **2,** provides a spark to ignite the gas charged lighter. Once lit this gas charged lighter is slid toward the mantle **25** and generator **19** to heat those parts and ignite the lantern.

Considering first the details of the spark source as illustrated in FIG. **2,** this source is seen to consist generally of a flint holder **37** and a flint actuator **39.** A flint

41 is forced against a spark wheel 35 by a spring 43. The spark wheel 35, sometimes known as a flint wheel, is a serrated hardened steel cylinder which in conjunction with the flint 41 provides the "flint and steel" spark so well-known in cigarette lighters. Flint removal and replacement is, of course, accomplished by removing the threaded cap 45 and the spring 43.

The spark wheel 35 is fixed to an actuating shaft 47, the other end of which is affixed to a knurled knob 49, for example, by a set screw 51. This actuating shaft 47 passes rotatably through a threaded sleeve 53 and collar 55. The flint holder is also attached to the collar 55, for example, by spot welding an angled bracket 57 to the collar 55. Rotation of the knurled knob 49 will thus cause a spark from the flint and steel to be generated in a direction perpendicular to the structure as depicted in FIG. 2.

The spark source is mounted in an aperture in the side wall of the lantern by removing set screw 51 so that the knurled knob 49 may be slid off of the actuating shaft 47. Nut 59 is, of course, also removed and the actuating shaft and threaded sleeve passed through the aperture in the side wall 31 from the inside of the lantern. At this time, if desired, a bracket 61 may be placed over the threaded sleeve and the nut 59 screwed down tightly on that bracket to thus securely hold in place the spark source and the bracket 61.

One end of the bracket 61 is attached to the lantern side wall 31 by the spark source, and the other end of this bracket is provided with a sliding collar 63 in which the cylindrical shell 65 of the gas charged lighter of FIG. 3 may slide. The position of the gas charged lighter illustrated in FIG. 1 in solid lines corresponds to that illustrated in FIG. 3 and represents one extreme of the motion of the lighter relative to the collar 63. When slid to its other extreme the knurled cap 67 abuts the collar 63, and the orifice 69 (now lit) is in position to ignite the lantern. Being cylindrical, the cylindrical shell 65 may also be rotated within the collar 63 to allow alignment of the notch 71 in the collar 63 with a tab 73 which is rotatably attached to the gas charged lighter to form one portion of its valving structure.

The details of the rechargeable embodiment of the gas charged lighter illustrated in FIG. 1 are better seen in the cross sectional view of FIG. 3. The orifice 69 from which the gas emerges to be ignited is an axial hole in an externally threaded plug 75 which is integral with the tab 73. This plug 75 meshes with internal threads within the cylindrical shell and thus may be moved axially relative to the cylindrical shell 65 by engaging the tab 73 in the slot 71 and rotating the cylindrical shell, for example, by twirling the knurled cap 67. Rotation in one direction forces a seal 77 against the gas passing hole thus shutting off the flow of gas through the orifice 69 while rotation in the other direction frees this seal allowing gas to pass.

The gas charged lighter is charged with propane or butane under pressure which, as is known, may be maintained as a liquid under pressure at normal room temperatures, and this liquid passes through a wick 79 which is a fiber filled tube to allow the gas to vaporize prior to passing through the orifice 69. To recharge the gas charged lighter of FIG. 3 a commercially available butane cigarette lighter refill tank is employed. The plug 81 is removed by unscrewing it and the refill tank inserted so as to depress the refill plunger 83 against the force of refill spring 85 and allow the butane primarily in its liquid form to enter the cylindrical shell. Several possible modifications of the gas charged lighter of FIG. 3 are illustrated in a throwaway embodiment of FIG. 4.

The embodiment of FIG. 4 illustrates a gas charged lighter employing a throwaway butane or propane cartridge 87 within a cylindrical case 89. One end of the cylindrical case is enclosed by a cap screw 91 having a resilient packing material 93 against which one end of the throwaway cartridge or cylinder rests. The other end of the cylindrical case is enclosed by a plug or cap 95 which is provided with threads for accepting a corresponding threaded portion of a valve actuating knob or control knob 97. This control knob 97 has a piercing and valve shaft 99 which passes completely through the plug 95 to the cartridge or cylinder 87. The control knob 97 may be screwed inwardly to pierce the soft metallic end of the butane cartridge 87, and thereafter this control knob will function as a valve for the lighter. A resilient sealing material 101 prevents the leakage of gas between the cartridge 87 and the plug 95 so that when the control knob 97 is withdrawn from the pierced cartridge 87 gas will escape and flow in a conduit along the shaft 99 to a passageway 103. An "O" ring or other seal 105 may also be employed to prevent gas leakage along the threaded portion of the control knob. From the passageway 103 the gas continues into a pivotable nozzle 105 and escapes from an orifice 107 in the end of that pivotable nozzle. The nozzle 105 may be provided with "O" ring seals 109 above and below the point at which it connects to the passageway 103. The pivotable nozzle may be held in a closed position by a nozzle spring clip 109 and dislodged from that clip when it is desired to use the lighter. In use the pivotable nozzle 105 is rotated counterclockwise as viewed in FIG. 4 so as to extend outwardly to the right and this nozzle inserted into the aperture 33 of FIG. 1 and placed in close proximity to the spark source which may be manually actuated to ignite the gas escaping from the orifice 107 after which the lighter of FIG. 4 is held in close proximity to the mantle 25 to ignite the lantern. The lighter of FIG. 4 may, of course, also be used to ignite a pressurized liquid fuel camp stove as well as many other items.

While the present invention has been described with respect to a specific embodiment, numerous modifications are possible. Thus, for example, the rechargeable embodiment of FIG. 3 may be provided with a removable spring clip arrangement for attaching the sliding collar 63 to the bracket 61 so that this rechargeable embodiment may be removed from the lantern to light other items. Similarly, the lantern may be provided with a spring clip for removably holding the throwaway embodiment of FIG. 4 either in an operative position or in a storage position. These and other modifications will readily suggest themselves to one of ordinary skill in this art, and accordingly the scope of the present invention is to be measured only by that of the appended claims.

I claim:

1. In a pressurized lantern of the heated mantle type having a generator for vaporizing the lantern fuel prior to supplying that vaporized fuel to the mantle and having a side wall provided with at least two adjacent apertures, an improved device for lighting the lantern comprising:

a spark source attachedly passing through a first of said apertures and having manually actuable means accessible external to the lantern and a spark generator internal to the lantern for providing a spark therein upon actuation;

a source of combustible material comprising a gas charged lighter having a gas outlet and a manually actuable valve for selectively allowing gas to escape through said outlet, passing through a second of said apertures and movable between a first position in close proximity to the spark source in which the combustible material may be ignited by sparks from the spark source and a second position in close proximity to the mantle and to the generator in which position the lantern may be ignited and the generator may be heated by the previously ignited combustile material; and

a bracket attached to the side wall by said spark source and extending to said second aperture, said gas charged lighter being of a generally cylindrical configuration and slidable in the bracket between said first and second positions.

2. The improvement of claim **1** wherein said bracket is provided with a notch, said gas charged lighter comprising:

a cylindrical shell having an internal threaded portion near one end thereof;

valve actuating means having an external threaded portion mating with said internal threaded portion and rotatable relative to the cylindrical shell to open and close the valve, said valve actuating means being provided with a tab which engages said bracket notch when the gas charged lighter is in its first position whereby rotation of the cylindrical shell actuates the valve.

3. The improvement of claim **1** further comprising means associated with said bracket and operative when the gas charged lighter is in said first position to cause rotation of the gas charged lighter to effect actuation of said valve.

4. In a pressurized lantern of the heated mantle type, an improved device for lighting the lantern comprising:

a spark source secured to the lantern having manually actuable means accessible external to the lantern and a spark generator internal to the lantern for providing a spark therein upon actuation;

a cylindrical gas containing shell having first end closing means with a refill valve therein; and

second end closing means at the end of the shell opposite said refill valve and comprising rotary valve means a first portion of which is secured to the shell and a second portion of which is secured to the lantern whereby rotation of the shell relative to the device to be ignited may effect opening and closing of the valve, means mounting said cylindrical shell so that said shell is slidable in the direction of the axis of the cylinder between a first position where the second end closing means is in close proximity to the spark generator and the first and second portions of the rotary valve means are engaged, and a second position where the second end closing means is in close proximity to the lantern mantle and the first and second portions of the rotary valve means are disengaged whereby the rotary valve means may be opened or closed only when the cylindrical shell is in the first position.

5. In a pressurized lantern of the heated mantle type having a generator for vaporizing the lantern fuel prior to supplying that vaporized fuel to the mantle and having a side wall provided with at least two adjacent apertures, an improved device for lighting the lantern comprising:

a spark source attachedly passing through a first of said apertures and having manually actuable means accessible external to the lantern and a spark generator internal to the lantern for providing a spark therein upon actuation;

a source of combustible material comprising a gas charged lighter having a gas outlet and a manually actuable valve for selectively allowing gas to escape through said outlet, passing through a second of said apertures and movable between a first position in close proximity to the spark source in which the combustible material may be ignited by sparks from the spark source and a second position in close proximity to the mantle and to the generator in which the position the lantern may be ignited and the generator may be heated by the previously ignited combustible material;

said gas charged lighter comprising a disposable gas containing cartridge, a cylindrical case having a removable end closing portion for containing the disposable cartridge, manually actuable means for piercing the cartridge and thereafter for selectively allowing gas to escape from the cartridge, a nozzle rotatably mounted on the cylindrical case, and conduit means connecting said nozzle and said cartridge pierced end to thereby allow gas to flow from said cartridge to said nozzle when the manually actuable means is in its gas passing position.

6. In a pressurized lantern of the heated mantle type having a generator for vaporizing the lantern fuel prior to supplying that vaporized fuel to the mantle, an improved device for lighting the lantern comprising:

a spark source secured to the lantern having manually actuable means accessible external to the lantern and a spark generator internal to the lantern for providing a spark therein upon actuation;

a source of combustible material comprising a gas charged lighter having a gas outlet and a manually actuable valve for selectively allowing gas to escape through said outlet and movable between a first position in close proximity to the spark source in which the combustible material may be ignited by sparks from the spark source and a second position in close proximity to the mantle and to the generator in which position the lantern may be ignited and the generator may be heated by the previously ignited combustible material, the manually actuable valve comprising an at least two portion rotary valve one portion of which is secured to the gas charged lighter and another portion of which is securable to the lantern whereby rotation of the gas charged lighter relative to the lantern effects actuation of the valve.

7. The improvement of claim **1** wherein the gas charged lighter has the gas outlet and manually actuable valve at one end thereof and having gas refill means at the other end thereof for periodically recharging the gas charged lighter.

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