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2,675,689

JET LIGHTER

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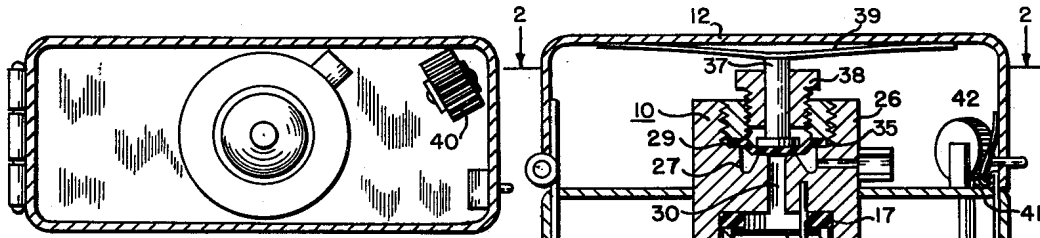


FIG. 2

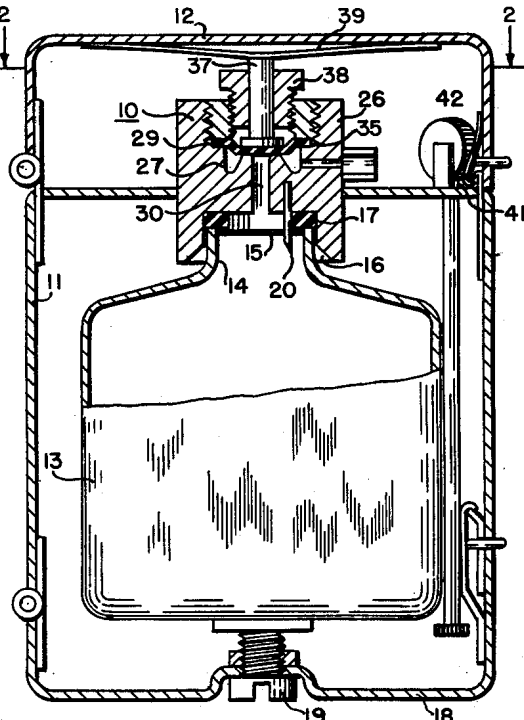


FIG. 1

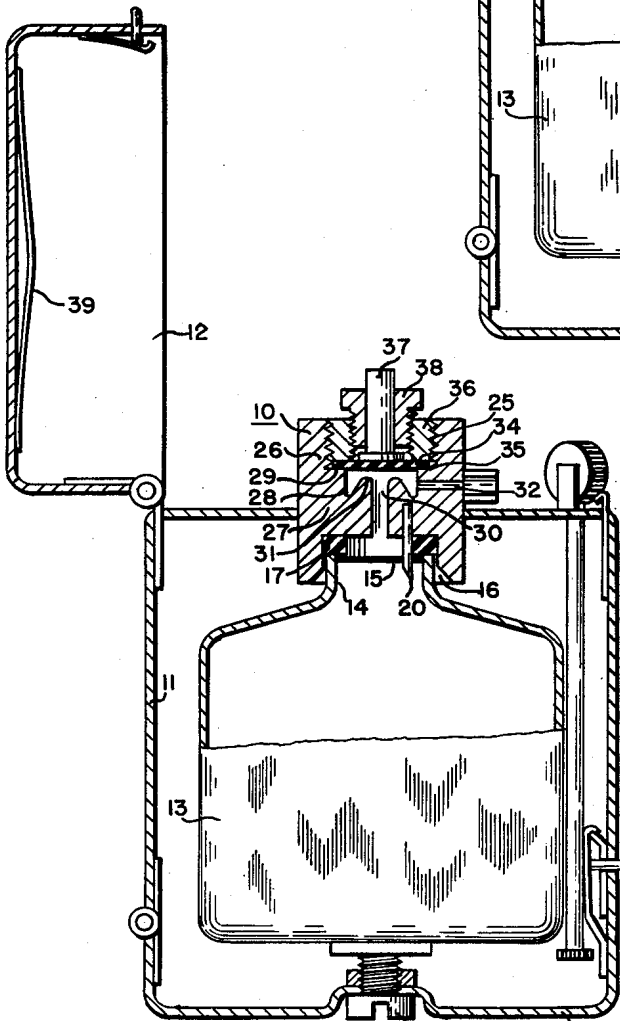


FIG. 3

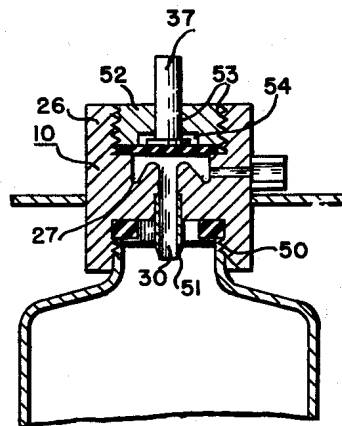


FIG. 4

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UNITED STATES PATENT OFFICE

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1 Claim. (Cl. 67-7.1)

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Our invention relates to portable lighting devices and in particular to small jet lighters which can be carried in a pocket.

One of the objects of our invention is to provide a jet lighter which has a replaceable pressurized fuel container.

Another object of our invention is to provide a jet lighter with an adjustable valve operable to release fuel at a desired rate to provide a flame of desired size.

Another object of our invention is to provide a wickless jet lighter having a pressurized fuel container with an automatic valve operable by the cap of the lighter casing to release fuel when the cap is opened.

Another object of our invention is to provide an improved jet lighter which is simple in construction and economical to manufacture.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawing, in which:

Figure 1 is a view in vertical cross-section of the preferred form of our lighter as constructed in accordance with our invention;

Figure 2 is a view taken along the lines 2-2 of Figure 1, showing the top of our lighter;

Figure 3 is the lighter as illustrated in Figure 1 with the cap of the casing open for lighting; and

Figure 4 is a cross-sectional view of a modified valve head which may be used in our lighter.

The preferred embodiment of our jet lighter is illustrated herein as comprising generally a valve head 10 which supports a casing 11. A cap 12 is hinged or otherwise attached to this casing 11 and cooperates therewith to completely enclose the valve head 10. We have provided a pressurized fuel container 13 for supplying fuel for our jet lighter. This pressurized fuel container 13 is preferably of a replaceable type and has a neck 14 with a puncturable closure member 15 therein.

The valve head 10 has a socket 16 therein for receiving the neck 14 of the fuel container 13. In the bottom of this socket 16 is a gasket 17 which engages the neck 14 to form a seal between the neck 14 of the pressurized fuel container 13 and the valve head 10. This gasket 17 extends about the peripheral edge of the neck and about the puncturable closure member 15, which is punctured to form an opening for releasing fuel from the pressurized fuel container 13. The casing 11 has a door 18 on the bottom end thereof

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to provide means for inserting the fuel container and the casing with the neck 14 entering the socket 16. A small screw 19 is threaded through the door 18 and abuts against the container 13 to force the neck of the container into the socket 16 and to hold the container 13 securely against the valve head 10. We have provided a small puncture pin 20 carried by the valve head 10 and extending into the socket 16 to puncture the closure member 15 as the neck 14 of the fuel container 13 is inserted in the socket 16 and against the gasket 17.

The valve head 10 is also provided with a hole 25 in one side thereof. This hole 25 defines a side wall 26 and a bottom wall 27. In the preferred embodiment of our invention, we have found it most economical to construct the valve head from cylindrical bar stock with the socket 16 in one end thereof and the hole 25 in the other end thereof. However, it is understood that other shapes and designs may be used without departing from the spirit and scope of our invention. The bottom wall 27 is provided with an annular recess 28 with the outside diameter of the annular recess 28 being less than the diameter of the hole 25. This difference in diameters provides a peripheral surface portion of the bottom wall extending about the annular recess 28 and defining a shoulder 29.

A duct 30 extends through the bottom wall 27 and opens into the hole 25 and within the annular recess 28. This duct 30 and the annular recess 28 are designed to provide an annular valve seat 31 on the bottom wall 27 and between the annular recess 28 and the duct 30. The duct 30 extends into communication with the socket 16 to conduct fuel from the pressurized fuel container 13, past the annular valve seat 31 and into the annular recess 28. A jet opening 32 extends from this annular recess 28 to the outside of the valve head 10 to conduct fuel to atmosphere. The socket 16 of the valve head is disposed within the casing 11, whereas the side wall 26 and the bottom wall 27 with the valve seat 31 and the jet opening 32 are all disposed externally of the casing 11.

A valve wafer 34 having a peripheral support portion 35 is held in the hole 25 with the peripheral support portion 35 abutting the shoulder 29. A threaded sleeve 36 is threaded into the hole 25 and against the peripheral support portion 35 of the valve wafer 34 to hold the wafer against the shoulder 29. A plunger 37 is abutable against the wafer 34 and is movable axially to urge the wafer 34 against the valve seat 31

to close the duct 30 and thereby prevent fuel escaping from the fuel container 13 and also to hold the wafer 34 a predetermined distance from the valve seat 31 to permit metering of the fuel to obtain the flame desired. This plunger 37 extends through an adjustment nut 33, which is adjustably threadable into the sleeve 36 to control the axial movement of the plunger 37 and thereby provide the jet lighter with an adjustable valve operable to release fuel at a desired rate to provide a flame of a desired size or length.

In Figure 1 of our drawing, we illustrate the plunger 37 holding the valve wafer 34 against the valve seat 31. A spring member 39 carried by the cap 12 abuts the plunger 37 and urges it against the wafer. In Figure 3 of our drawing, we illustrate the lighter with the cap 12 hingedly open from the casing 11. In this open position, the pressure of the spring member 29 against the plunger 37 has been released and the valve wafer 34 has moved away from the valve seat 31. Thus, in Figure 3 with the valve open, fuel from the pressurized fuel container 13 travels through the duct 30 between the valve seat and valve wafer and into the annular recess 28 and through the jet opening 32 to atmosphere.

An ordinary conventional sparking device 40, comprising a flint 41 and striking wheel 42, is supported by the casing 11 and positioned to project sparks into the path of fuel jetting into atmosphere. In Figure 2 of our drawing, we best illustrate that the sparks engage the fuel after it has been jetted from the valve head 10 through the jet opening 32. By providing a short distance between the end of the jet opening 32 and the position at which the sparks engage the fuel, air has a chance to mix with the fuel.

We have found fuel of the butane nature and characteristics to be best suited for our jet lighter. This type of fuel may be liquefied and inserted in the fuel container 13 in liquid state. When the fuel container 13 having a liquid butane therein is inserted in the lighter and punctured, the liquid butane will slowly turn to a gaseous butane which will jet from the lighter under its own pressure.

In Figure 4 of our drawing, we illustrate a modification of the valve head 10, wherein the socket 16 is provided with threads 50 to permit the neck 14 of the container 13 to be threaded into the valve head 10. In this instance, we have also used a tubular puncture pin 51 for piercing the closure member 15 of the fuel container 13. This tubular puncture pin 51 is aligned with the duct 30 whereby the duct 30 may be said to extend through the puncture pin 51 and directly into the fluid container 13. We have also omitted the nut 33 in this modified valve head. A member 52 having an opening 53 extending there-through and a recess 54 in the bottom side thereof is threaded into the hole 25 in the valve head 10. The plunger 37 extends through this opening 53. The member 52 thus serves the dual purpose of holding the valve wafer 34 against the shoulder 29, as well as holding the plunger 37 in position for operating the wafer 34. Operation of the structure illustrated in Figure 4 is substantially the same as that of the structure illustrated in the preferred embodiment of our invention as illustrated in Figures 1, 2 and 3. Although our invention has been described in

its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

What is claimed is:

A portable lighting device comprising, an enclosure case for holding a pressurized fuel container, said case having a top wall, a valve head carried by said top wall and extending therethrough, said valve head having a socket therein residing within said case for receiving the neck of a fuel container and having seal means for cooperating with the neck of a fuel container to form a seal about said opening, means within said case to hold the neck of a fuel container forced into gas tight sealing relationship with said socket and seal means, said valve head having a recess defined by a peripherally closed side wall and a bottom wall, said valve head having a first opening extending from the bottom wall to said socket and communicating with said fuel container, a valve seat about said first opening, said valve head having a second opening extending from said recess to the outside thereof and defining a jet opening, said valve seat separating the first opening from the second opening, a valve wafer-like member seatable against said valve seat and controlling the flow of fuel from said first opening to said second opening, a sleeve fitted in said side wall and peripherally holding said wafer-like member against the bottom wall, a plunger abutable against the wafer-like member to move the wafer-like member against the valve seat, an adjustment member slidably supporting said plunger, said adjustment member adjustably fitted in said sleeve and adjustably movable relative to the valve seat to regulate the distance of movement of the plunger and the wafer-like member from the valve seat and thereby meter the flow of fuel through the valve, a lid cap for said case fitted to cover over said top wall and valve head, and contact means carried by said lid positioned to contact said plunger upon closing the lid upon the case and thereby force the plunger to close off said valve seat.

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