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O. REICH
GASLIGHTER

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Fig. 1.

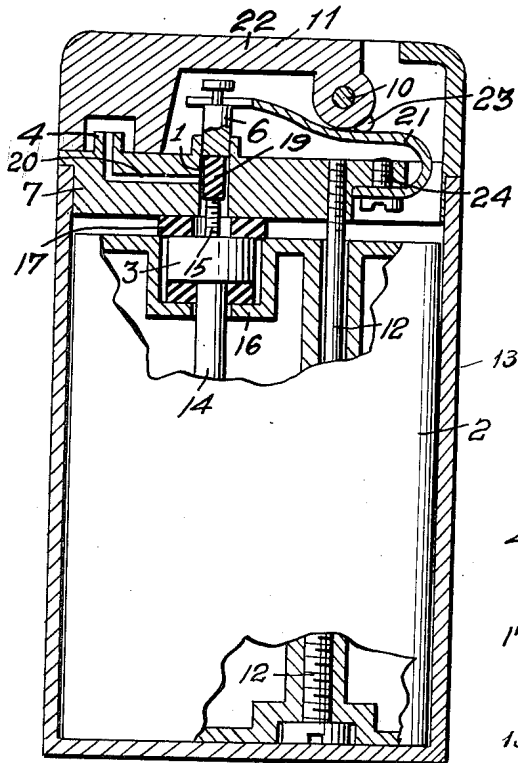
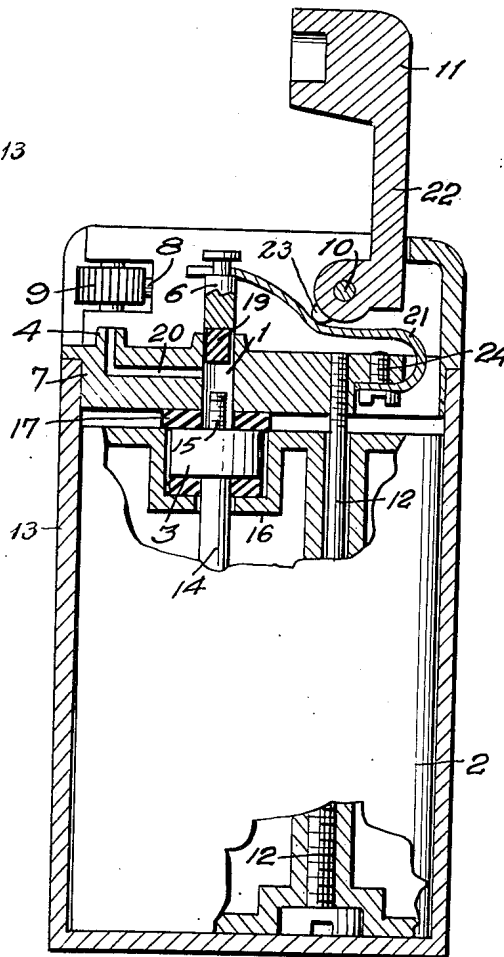


Fig. 2.



INVENTOR.
Otto Reich

BY

Glencoe Dawning & Seibold
Attorneys

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2,697,339

GASLIGHTER

Otto Reich, Vienna, Austria, assignor of one-third to Julius Vignati, Vienna, Austria, and one-third to Erich Wieden, Solingen-Ohligs, Germany

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6 Claims. (Cl. 67—7.1)

The present invention relates to improvements in Portable Lighting Devices.

More particularly the invention relates to lighting devices of the type utilizing gaseous fuel.

Specifically the invention relates to a cigar or cigarette lighter of the pyrophoric type including a detachable and exchangeable fuel container, a lighter body on which is mounted the igniting means and valve means for controlling flow of fuel to the igniting means incorporated with the lighter body.

In prior known portable lighting devices utilizing gaseous fuel, the means for controlling the flow of fuel are either embodied with the fuel container or, if embodied in the lighter portion, are of such character as not to provide for adequate sealing so that gaseous fuel can escape or are so costly to produce and include rather complicated mechanism as to preclude ready refilling of the fuel containers.

Therefore the present invention has for an object to provide a pocket lighting device adapted to utilize a gaseous fuel so as to enable long usage before refilling is required, incorporating a detachable and exchangeable fuel container which includes conduit means through which the gas can flow and throttle means associated with this conduit means to regulate the pressure of the gas and a lighter body portion embodying gas conduit means and igniting means and in which a movable stop valve and adequate sealing means are incorporated respectively within the lighter body portion and between the same and the container to effectively prevent gas leakage.

It is an additional object to provide a pocket lighter of the type in which sealing means is provided between the container and the lighter body, sealing means to be applied against the outlet of the container and an additional seal is effected by a closure cap surrounding the burner tip or nozzle.

It is a more specific object to incorporate a single resilient means operable to simultaneously firmly apply the sealing means against the outlet of the gas container and to seat the cap against the lighter body.

It is an additional specific object to provide the control valve in the lighter body in the form of a slidable plunger having resilient sealing means incorporated in the head thereof which firmly seats against the outlet of the fuel container.

Further and more specific objects will be apparent from the following description taken in connection with the accompanying drawing in which:

Figure 1 illustrates the lighter in partial longitudinal section with the cap and the valve in closed position; while

Figure 2 is a similar view illustrating the lighter when the cap and valve are raised and in open position respectively and in which position gas can flow from the container to the nozzle tip.

As shown in the drawing, the lighter in accordance with the present invention includes a detachable and exchangeable fuel container 2 which embodies a pipe 14 through which gas can pass, gas throttle means 3 which are adjustable to regulate the pressure of the gas that is to flow out of the container so that the lighter flame can be at the proper height and an outlet pipe or nozzle 15 which extends from the throttle means and as shown projects outwardly of the body or top portion of the container 2. This nozzle or pipe 15 terminates in an open outlet when associated with the lighter body proper and is externally threaded so as to receive a screw cap for sealing

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the container when it is charged with liquified or compressed gas and before it is attached to the lighter body portion.

The lighter body portion denoted generally at 7 includes a pyrophoric igniting mechanism comprising a flint 8 and conventional means for applying the same against a friction wheel 9. The body is cut-away to provide space for pivotally mounting a closure cap 11 which is pivotal about the axis 10 and the shoulder or web portion which lies beneath the pivotally mounted cap is provided with a transverse bore 1 into which the outlet pipe 15 is insertable, a branch conduit or lateral duct 20 communicating with the bore 1 and a vertical bore communicating with the conduit 20 which terminates in the burner nozzle or tip 4. Thus conduit means are provided in the body that terminate at one end in a nozzle tip and at the other end receive the open outlet of the fuel container. A control valve in the form of a plunger 6 is slidably mounted within the bore 1. This plunger 6 includes resilient sealing means in the form of a rubber insert 19 in the lower end thereof and the plunger or valve is movably supported by the leaf spring 21 fastened to the web or shoulder of the lighter body by the screw 24. As shown, one end of the spring bears against the under surface of the shoulder on the lighter body, passes through a slot provided through the lighter body and is then bent back upon itself and terminates in a forked end that cooperates with a reduced portion formed on the outer end of the plunger or valve 6. In view of this arrangement the spring 21 tends to normally move the valve 6 to open position. As indicated in the drawings the boss on the closure cap 11 which surrounds the axis or shaft 10 is provided with a control cam 23 cooperable with the spring 21 in a manner set forth hereinafter.

To secure the container to the lighter body portion proper there is provided a bore through the container and through which passes a screw 12 that threadedly engages an aperture in the lighter body proper. To enclose the container 2 there is provided an outer casing 13 that slidably mounts on a reduced portion of the lighter body.

As indicated the upper portion of the fuel container 2 is recessed to accommodate the throttle means 3 which, when the lighter is to be filled, is unscrewed from the seating 16. Suitable packing means is provided between the throttle means and the recessed portion of the container and to insure a gas tight coupling of the container to the lighter body portion an annular packing ring 17 is provided which surrounds the nozzle pipe 15 and is compressed between the container and the under surface of the lighter body portion when the screw 12 is tightened.

There is thus provided a lighter in which sealing means is embodied between the container and the lighter body portion proper. The resilient insert 19 seals against the open outlet of the nozzle or pipe 15 and simultaneously closes communication between the bore 1 and the lateral duct denoted at 20 and an additional seal is effected by the spring 21 cooperating with the cam 23 to hold the pivoted cap 11 in its lower position so that the recessed end of the cap bears against the upper surface of the shoulder on the lighter body surrounding the nozzle tip 4. The relationship of the control cam 23 to the spring 21 is such that when the cap 11 is being swung upwardly toward the position shown in Figure 2 the cam 23 first flexes the spring 21 to more firmly seat the rubber insert against the open end of the pipe 15. As soon as the cam 23 has passed beyond the position in which it is vertical, the force of the spring applied against the side of the cam snaps the cap to its position shown in Figure 2 and simultaneously raises the plunger 6 to permit gas to flow through the conduit means in the lighter body portion to the tip 4 following which the wheel 9 can be rotated and the gas ignited. When the cap is to be closed it is pressed downwardly, the cam surface forcing the plunger 6 downwardly as viewed in the drawings so that it first closes communication between duct 1 and the lateral bore in the body portion and subsequently seats the rubber insert against the open end of the pipe 15. When the cam has again passed its vertical position with the cap moving in its closing direction, the resiliency of the spring applied against the opposite side face of the cam firmly seats the

cap 11 against the upper surface of the shoulder in the position shown in Figure 1.

Therefore the stop valve or plunger 6 has a dual function when the arm 22 of the cap 11 is swung downwardly since it closes communication into the bore 1 and also interrupts communication between the bore 1 and the branch 20 flowing to the burner nozzle or tip 4. In view of the fact that this branch 20 extends laterally of the body of the lighter, the valve is in spaced relation to the burner tip so that the metal portion of the lighter body 7 constituting the walls of the bore 1 which guides the stop valve or plunger is not directly heated, thus providing a lasting, tight, sliding fit of the valve in the bore. Additionally the dual function of the spring is important in that it not only urges the cap and valve to open position but due to the particular disposition of the cam 23 with relation to its bearing point on the spring 21 it urges the cap 11 to closed position to provide an additional gas seal.

In connection with the assembly of the lighter, the screw cap which is not shown is first removed from the threaded portion of the pipe 15 and a finger applied to the open outlet. A small leakage of gas will of course occur. Next the pipe 15 is inserted within the bore 1 and manually pressed against the rubber insert 19 and the packing ring 17 is also pressed manually against the under surface of the lighter body 7. With the parts in this position the screw 12 is then tightened in the threaded aperture provided in the lighter body and the tightening of the screw effectively sealing the joint between the lighter body and the fuel container while the spring holds the cap 11 against the upper surface of the shoulder on the lighter body portion and also firmly seats the rubber insert against the open end of the pipe 15.

It is thus clear that the present invention provides a portable lighter of the type utilizing gaseous fuel which comprises an exchangeable or detachable fuel container and which container includes conduit means through which gas can flow. Throttle means are associated with the conduit means and the conduit means terminate in an open outlet which is disposed in spaced relation to the body of the container. The body portion of the lighter has igniting means incorporated therewith and gas conduit means therein which terminate in openings at opposite ends with the opening at one end being an outlet opening adjacent the igniting means and constituting a burner nozzle and the open outlet of the conduit means extending within an inlet opening at the other end of the conduit means in the body. A movable stop valve is mounted on the lighter body and is movable within the conduit means in an extended open portion thereof that is opposite the inlet opening so as to control the flow of throttled gas from the container to the nozzle.

The invention further comprises multiple sealing means including a sealing ring compressible between the under surface of the lighter body and the fuel container, a resilient sealing means incorporated with the movable valve for seating against the open outlet of the fuel container, the particular disposition of this valve with relation to the conduits within the lighter body which include a branch conduit communicating with the bore in which the valve is slidable so that the valve closes communication through this branch conduit and a recessed lighter cap that is pivotally mounted and resiliently urged into seating relation with the upper surface of the lighter body surrounding the burner tip.

Having now fully described my invention what I claim as new and useful and desire to secure by Letters Patent in the United States is:

1. A lighter of the type utilizing gaseous fuel comprising a lighter body portion, igniting means incorporated within the body portion, said body portion having gas conduit means therein including opposite ends terminating in laterally spaced first and second openings, the first opening being adjacent said igniting means and thereby constituting a burner nozzle, an exchangeable fuel container associated with the body portion subjacent the conduit means therein and including further conduit means terminating in an open outlet through which gas can flow, throttle means associated with the conduit means of the fuel container for reducing the pressure of the gas, the open outlet of the conduit means of the fuel container extending within the second opening of the conduit means of the body portion, a movable stop valve within the said second opening for controlling the flow of throttle

gas from the container to the nozzle, and said open outlet of the container being disposed in spaced relation to the body of the container, the conduit means in the body further comprising a first portion extending through the body and into which said open outlet extends, a branch portion within the body extending from said first portion and terminating in said nozzle, said stop valve being slidable within said first portion and constituting a plunger including one end movable toward and away from said open outlet, said one end having resilient sealing means incorporated therewith, and means for moving said plunger into sealing engagement with the said open outlet so that when the plunger is moved toward engagement with said open outlet it simultaneously closes communication between said first portion and said branch portion and seats said resilient sealing means against said open outlet.

2. A lighter of the type defined in and by claim 1 in which additional sealing means surrounds said open outlet and the terminal end of said first portion of the conduit means in the body with which the outlet projects and means for detachably connecting said container to said body portion, said last mentioned means compressing said additional sealing means between said container and said body portion.

3. A lighter of the type defined in and by claim 2 and in which a cap is pivotally mounted on said body portion for movement between a lower position closing said burner nozzle and an upper position, resilient means mounted on said body portion and connected with said plunger normally biasing the same to movement away from said open outlet, said pivoted cap including cam means cooperable with said resilient means and receiving an application of force from said resilient means when the cap is manually pivoted from its closed position toward its open position prior to reaching said open position whereby said resilient means forces the cap to open position and simultaneously withdraws said plunger from sealing relation with said open outlet and said cam means receiving application of force in the opposite direction when the cap is moved toward its closing position, said force being applied immediately prior to closure to maintain the cap in seating relation around said burner nozzle, said cap further maintaining said plunger in sealing relation with said open outlet from the gas container.

4. In a lighter, a body portion including a laterally extending shoulder having a transverse bore therethrough and branch conduits within the body communicating with the bore at one end and terminating in an opening on the upper surface of said shoulder constituting a burner tip, igniting means incorporated in said body portion adjacent said burner tip, a pivoted cap mounted for pivotation toward and away from said burner tip about an axis remote from said tip, said cap including a recessed portion and an annular seating surface cooperable with the upper surface of said shoulder surrounding said tip, a detachable fuel container for gaseous fuel including a body and gas conduit means embodying gas throttling means to regulate the pressure of fuel flowing through said conduit means and said gas conduit means including a nozzle portion extending from said throttling means and terminating in an open outlet in spaced relation to the body of the fuel container, said nozzle being insertable in the transverse bore in said body lighter portion, sealing means surrounding the nozzle, and means for detachably connecting the container to the body portion, said means constituting a compressor coupling to compress said sealing means between the container and the body portion, a plunger valve slidably mounted within said transverse bore for movement toward and away from said nozzle, said plunger valve including a head having a resilient sealing insert cooperable with said open outlet to seal the same when the same is in closed position and said plunger further controlling communication between said transverse bore and said branch conduit, resilient means carried by said body portion and connected to said plunger for normally urging the same to open position and said cap including cam means adjacent its axis of pivotation cooperable with said resilient means to receive force therefrom during a portion of the opening and closing movement of the cap and to apply force thereto during the major portion of the closing movement of the cap whereby the position of the cap controls the position of said plunger.

5. In a lighter as defined in and by claim 4, in which said resilient means constitutes a leaf spring secured at

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one end to said body portion subjacent and laterally displaced with respect to the axis of pivotation of said cap, the lateral displacement being in the direction away from said nozzle tip and said spring being bent upon itself and extending toward said nozzle tip beneath said axis and terminating in a forked end, said plunger having a portion of reduced diameter adjacent the end opposite that embodying the sealing means, and said forked end being disposed about said reduced portion of the plunger so as to couple the plunger to the spring for movement therewith.

6. A lighter of the type utilizing gaseous fuel comprising a lighter body portion, igniting means incorporated with the body portion, said body portion having gas conduit means therein including an inlet opening, an outlet opening and an extended open portion opposite the inlet opening, the said outlet opening being adjacent said igniting means and thereby constituting a burner nozzle, an exchangeable fuel container associated with the body portion subjacent the conduit means therein and including further conduit means terminating in an open outlet through which gas can flow, throttle means within the conduit means of the fuel container upstream of said

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open outlet for reducing the pressure of the gas issuing from the container, the said open outlet of the conduit means of the fuel container extending within the inlet opening of the conduit means of the body portion, and a movable stop valve within the extended open portion of the conduit means of the body portion and cooperable with the said open outlet for controlling the flow of throttled gas from the container to the nozzle.

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