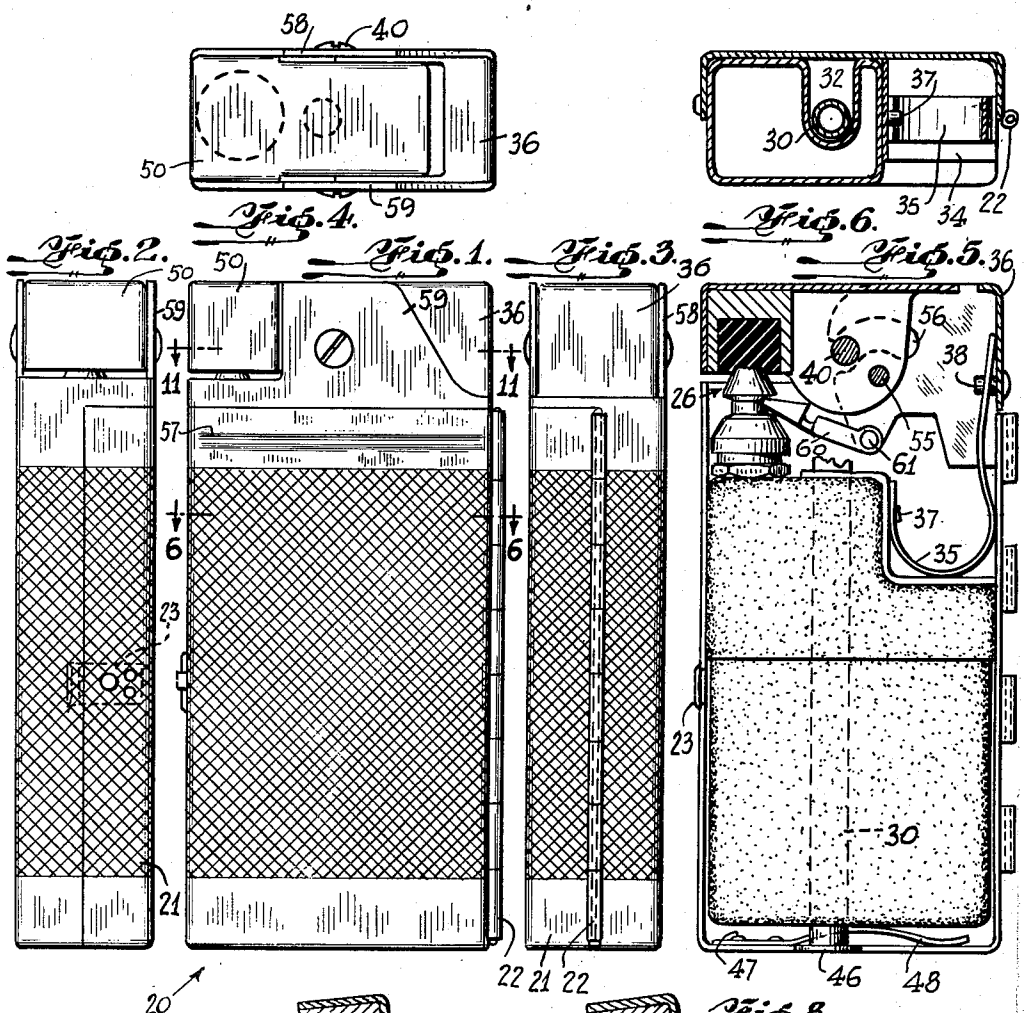
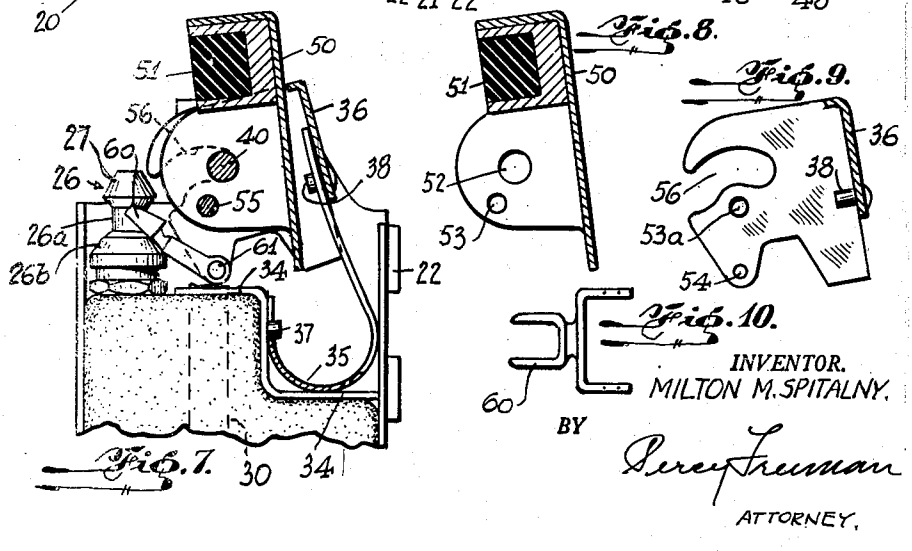
Jan. 12, 1954 M. M. SPITALNY 2,665,573

LIGHTER USING GASEOUS FUEL

Filed Nov. 6, 1950 2 Sheets-Sheet 1





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LIGHTER USING GASEOUS FUEL

Filed Nov. 6, 1950 2 Sheets-Sheet 2

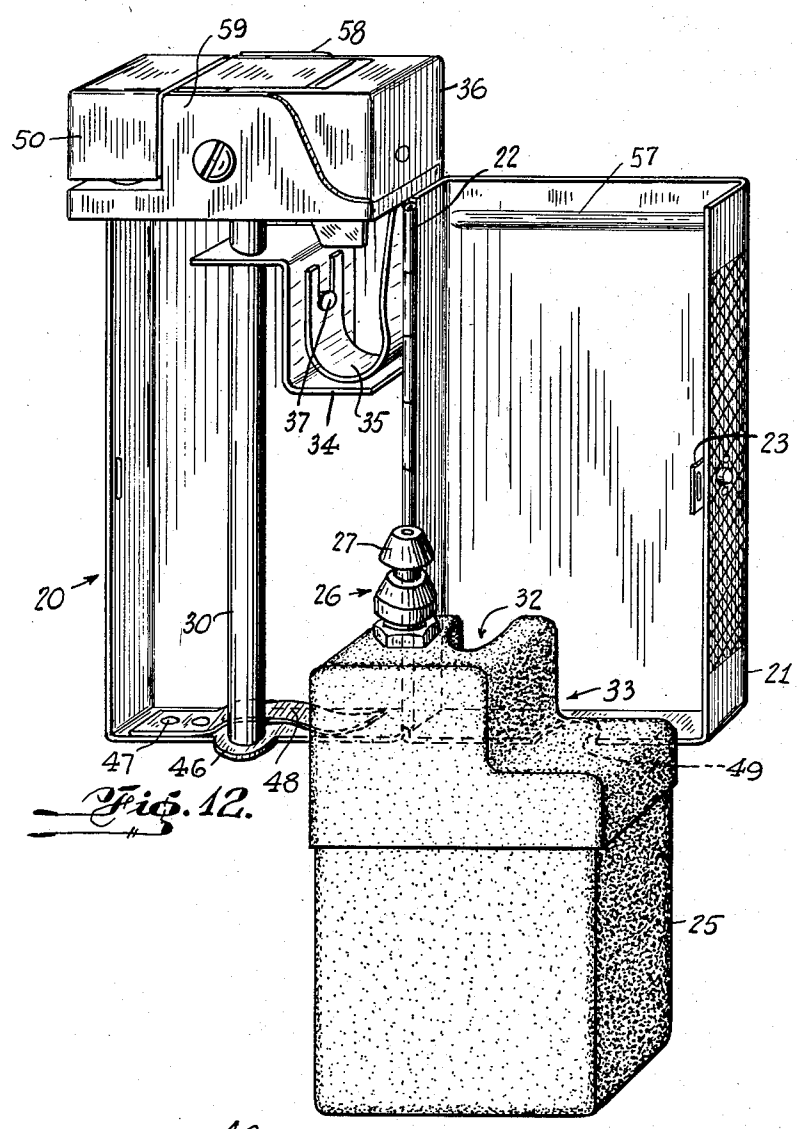


Fig. 12.

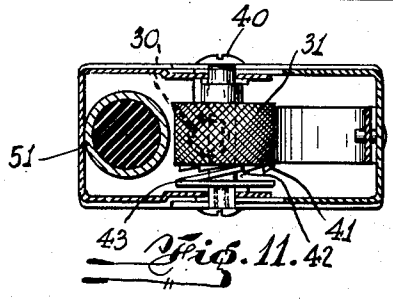


Fig. 11.

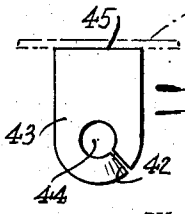


Fig. 13.

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LIGHTER USING GASEOUS FUEL

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Application November 6, 1950, Serial No. 194,242

1 Claim. (Cl. 67—7.1)

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This invention relates to a cigarette and cigar lighter in which liquefied petroleum gas is used as fuel.

In conventional pyrophoric cigarette and cigar lighters liquid fuel is provided under atmospheric pressure. Its volatility is relatively low and it is stored in the casing of the lighter. A wick is immersed at one end in said liquid fuel and the other end projects outwardly from the casing to a point adjacent the sparking wheel. As long as there is fuel in the casing, the wick remains saturated and readily ignitible. There is no need to provide a valve to close off or open the supply of fuel.

In cigarette and cigar lighters of the character herein described and claimed, the fuel is supplied in removable and replaceable containers or cartridges. Butane is the fuel generally employed in this connection but other gases such as propane and pentane or mixtures of these, and other gases, may be used. Taking butane as the gas most generally used in cigarette lighters of this type, it will be understood that the gas is placed in the replaceable containers in liquefied form and under pressure. A valve is supplied to allow the gas to escape, when needed, and to shut off the flow of gas when it is no longer needed. A sparking wheel mechanism is also provided for the purpose of igniting the gas and hence it is necessary both to open the valve to the gas supply and to operate the sparking mechanism in order to produce a flame.

Cigarette and cigar lighters currently on the market, utilizing butane as fuel, require two separate operations in order to obtain the light: the first operation involves the opening of the gas valve and the second operation relates to the actuation of the sparking mechanism. The forefinger is generally used to operate the valve mechanism and the thumb is generally used to operate the sparking mechanism. There is no mechanical link or connection between the valve mechanism on the one hand and the sparking mechanism on the other hand. The only relationship that exists between the two mechanisms resides in the fact that it is a single person who operates the two mechanisms and that he normally does so with two fingers of the same hand.

It is the principal object of the present invention to provide a cigarette and cigar lighter wherein a liquefied gas is used as the fuel, in which a mechanical connection between the valve mechanism and the sparking mechanism is incorporated, together with a single actuating

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means for actuating or operating both mechanisms. In the preferred form of this invention, a slidably mounted thumb-piece is provided which is linked to the valve and sparking mechanisms. When this thumb-piece is pushed forwardly with the thumb, it actuates both mechanisms, that is it causes the valve to open and the sparking mechanism to spark. This, of course, has the effect of producing a flame. When the thumb-piece is retracted to its normally inoperative position, it causes the valve to close and it produces no further sparking action on the part of the sparking mechanism.

Another important object of the present invention is the provision of a cigarette and cigar lighter of the character described in which a valve closure is provided to cover the valve opening when the lighter is not in use. This prevents clogging of the valve opening.

A preferred form of this invention is shown in the accompanying drawing, in which:

Fig. 1 is a side view of a cigarette and cigar lighter made in accordance with this invention.

Fig. 2 is a front end view thereof.

Fig. 3 is a view of the back end of said cigarette and cigar lighter.

Fig. 4 is a top view thereof.

Fig. 5 is a vertical section therethrough, showing the entire working mechanism, including the fuel container and its valve mechanism.

Fig. 6 is a horizontal section through said lighter on the line 6—6 of Fig. 1.

Fig. 7 is a fragmentary vertical section showing the thumb-piece in forward position and the valve closure in open position.

Fig. 8 is a sectional view through the valve closure.

Fig. 9 is a sectional view through the actuating thumb-piece which actuates the valve and sparking mechanisms and also the valve closure.

Fig. 10 is a top view of the valve opening member.

Fig. 11 is a horizontal section taken on the line 11—11 of Fig. 1, showing particularly the sparking wheel mechanism.

Fig. 12 is a perspective view in somewhat exploded form, of the entire cigarette and cigar lighter herein claimed, showing the casing of said lighter open and ready to receive a fuel cartridge and also showing a fuel cartridge ready for insertion into said casing.

Fig. 13 is a side view of the pawl which acts upon the ratchet teeth of the sparking wheel when the thumb-piece is pushed forwardly with the thumb.

The cigarette and cigar lighter herein claimed has a casing 20 with a door 21 which is swingably mounted thereon by means of hinge 22. A catch 23 is provided to lock the door in closed position and a rib 57 may be provided to reinforce the upper portion of the door. The door may be opened, as shown in Fig. 12, so that fuel tank or cartridge 25 may be inserted into the casing or removed therefrom. The fuel tank contains a liquefied gas fuel, such as butane and the pressure of the gas within the tank normally exceeds atmospheric pressure. Hence a valve 26 is provided on said tank and said valve is normally in closed position to prevent escape of the gas. The valve is of conventional construction and it may be opened by simply raising its nozzle member 27 to allow some of the gas to escape when needed.

Mounted in the casing is a vertically extending tube 30 in which a spring-urged flint is mounted for movement into engagement with the sparking wheel 31. It will be noted that a vertically extending groove 32 is provided in one side of the fuel tank to accommodate tube 30 when said fuel tank is installed in the casing. It is by reason of this groove that the tube containing the flint may be placed virtually in the center of the casing. An extension 46 of the bottom wall of the casing 20 supports the bottom end of tube 30, the bottom wall of the door 21 being cut away as at 49 to correspond with the shape of the extension 46. It will also be noted that an indentation or recess 33 is formed in one upper corner of the fuel tank and it will be seen that a bracket 34 is accommodated therein. Tank 25 is urged upwardly against a bracket 34 by leaf spring 48 secured at one of its ends to the bottom wall of casing 20 by means of rivets 47. This bracket supports a leaf spring 35 which acts upon the thumb-piece 36 hereinafter more fully described. Bracket 34 serves as a shelf to support said leaf spring 35 and one end of said leaf spring is secured to said bracket by means of a pin or rivet 37. The opposite end of the leaf spring is secured to the inside of the thumb-piece by means of a pin or rivet 38.

Sparking wheel 31 is rotatably mounted on pin 40 which is supported by the two upwardly extending side wall portions 58, 59 of the casing. Ratchet teeth 41 are formed on one side of the sparking wheel and these ratchet teeth are engaged by a pawl 42 which is struck out from a plate 43. This plate has a hole 44 formed therein to accommodate pin 40 so as to position the pawl at all times for engagement with the ratchet teeth. The top edge 45 of said plate 43 abuts the top wall of a closure member 50 which is also pivotally mounted on said pin 40 by means of holes 52 in the closure member. The top edge of the pawl plate is a straight edge and the top wall of said closure member is squarely abutted thereby and hence relative pivotal movement between the pawl plate and the closure member on pin 40 is prevented. When the closure member pivots on said pin the pawl plate pivots with it. When such pivotal movement is in one direction, the pawl engages the ratchet teeth and causes the sparking wheel to turn in the same direction. When the pivotal movement is in the opposite direction, the pawl slips over the ratchet teeth and the sparking wheel remains stationary. The spring-urged flint always engages the sparking wheel and when the sparking wheel is caused to turn as above mentioned, sparks are produced. When the sparking wheel is stationary, the spring-urged flint helps to hold it in stationary position until the pawl acts upon the ratchet teeth to turn the sparking wheel.

A rubber block 51 is secured to closure member 50. When the closure member is caused to pivot in counter-clockwise direction, from its position in Fig. 7 to its position in Fig. 5, the rubber block is brought into engagement with the nozzle of the valve on the fuel tank. This produces two results: in the first place, the closure member presses downwardly upon the nozzle of the valve to help keep the valve in closed position and in the second place the rubber block closes off the valve opening to prevent foreign matter from entering and clogging up the passageway through which the gas must travel. It will hereinafter become apparent that leaf spring 35 tends to hold the closure member in tensioned engagement with the valve nozzle except when the lighter is in use.

Thumb-piece 36 is slidably mounted for forward and backward movement at the top of the casing. The two side walls 58, 59 of the casing project upwardly as aforementioned and they serve as guides to prevent the thumb-piece from moving laterally. Leaf spring 35 engages the thumb-piece to urge it to its backward position shown in Fig. 5. The thumb-piece may be moved forwardly against the action of said spring by simply pushing upon it with the thumb. Its forward position is shown in Fig. 7. It will be noted that the thumb-piece is pivotally connected to the closure member 50 by means of pin 55 which passes through openings 53, 53a of closure member 50 and thumb-piece 36 respectively. This pin is spaced a short distance from and is eccentric to pivot pin 40 on which the closure member, the pawl plate and the sparking wheel are mounted for angular movement. Hence, when the thumb-piece is pushed forwardly from its Fig. 5 position to its Fig. 7 position, it causes the closure member to swing upwardly in clockwise direction. The closure member is thereby caused to disengage the valve nozzle and at the same time it causes the pawl to act upon the sparking wheel and thereby to cause said sparking wheel to turn in abrasive engagement with the flint. Sparks are thereby produced, and it will be apparent that said sparks are caused to fly in the direction of the valve nozzle. When the thumb-piece is released by the thumb, the leaf spring forces it backwardly to its Fig. 5 position. Simultaneously therewith, the closure member and pawl plate are caused to swing in counter-clockwise direction until the rubber block once again engages and presses downwardly upon the valve nozzle. The tension of the leaf spring tends to hold said closure member in tensioned engagement with the said nozzle. It will be noted that an arcuate slot 56 is provided in the thumb-piece to accommodate pivot pin 40. This renders it possible for the thumb-piece to move freely both forwardly and backwardly without conflict with said pivot pin. This arrangement also assists in guiding the thumb-piece in its forward and backward movement.

It will be seen in Figs. 5 and 7 that bifurcated arm 60 is pivotally connected at one end to thumb-piece 36 by means of pins 61 passing through openings 54. It will be understood from the sectional view of Fig. 11 that the thumb-piece and closure member are also bifurcated, like arm 60, to accommodate the sparking wheel, pawl plate and flint between them. More specifically, arm

60 is bifurcated at both ends, at its back end where it is attached to the thumb-piece to straddle the sparking wheel, pawl plate and flint, and at its forward end to accommodate the valve. As Fig. 7 clearly shows, bifurcated arm 60 fits under the nozzle of the valve and its bifurcated construction allows it to receive the valve stem 26a. When the thumb-piece is pushed forwardly, bifurcated arm 60 also moves forwardly but at the same time it also moves upwardly on pins 61 by reason of its engagement with shoulder 26b of the valve. In other words, the bifurcated arm is cammed upwardly by said valve shoulder and in consequence of such upward movement, the bifurcated arm engages the valve nozzle and lifts it to open position. The gas is now free to escape from the fuel tank. When the thumb-piece is released by the thumb and urged backwardly by the leaf spring to its Fig. 5 position, the bifurcated arm is thereby pulled backwardly and it is enabled to swing downwardly from its Fig. 7 position to its Fig. 5 position. The valve nozzle is now free to move downwardly to closed position which it readily does by spring action or otherwise, in conventional manner.

It will be apparent from the foregoing that all that need be done to light the instant lighter is to hold the casing in one hand and to push the thumb-piece forwardly with the thumb of that hand. This has the effect of disengaging the closure member from the valve nozzle, lifting the valve nozzle to open the valve, and turning the sparking wheel against the flint to produce sparks in the direction of the valve nozzle. These sparks will ignite the gas escaping through the valve nozzle and the operation is complete. When the thumb-piece is released by the thumb, the valve will close, the closure member will engage and seal off the valve nozzle, and the sparking wheel will remain stationary preparatory to the next lighting operation.

The foregoing is illustrative of the basic principles of this invention. It will be understood that modifications may be incorporated into the preferred embodiment of the invention shown in the drawing and it will also be understood that other forms of the invention may be provided within its broad scope and spirit. It should also be understood that the closure member is an optional feature of the invention and it may or may not be used, as desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

In a cigarette and cigar lighter of the character described, a casing, a fuel tank in said casing, a valve on said fuel tank near the front thereof, said valve having a nozzle which lifts to open the valve and lowers to close the valve, a lifting arm which engages the nozzle and a thumb-piece which is pivotally connected to said lifting arm, said thumb-piece being movably mounted in said casing for forward movement relative to said valve, a conical shoulder on the valve below the valve nozzle on which the lifting arm rides and which cams the lifting arm upwardly, when the thumb-piece pushes it forwardly, to open the valve by raising the valve nozzle, a spring-urged flint situated in the casing adjacent the valve nozzle, a sparking wheel rotatably mounted in said casing in abrasive engagement with said flint, and a pawl and ratchet mechanism between the thumb-piece and said sparking wheel to cause said sparking wheel to turn against the flint when the thumb-piece is moved forwardly.

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