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CIGARETTE LIGHTER

Filed May 20, 1963 3 Sheets-Sheet 1

Fig. 1

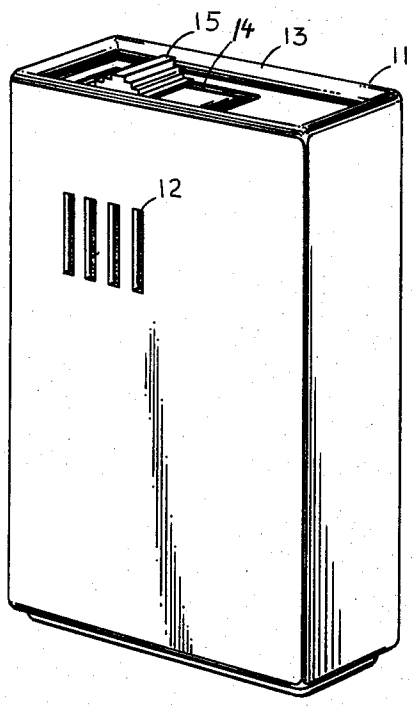


Fig. 2

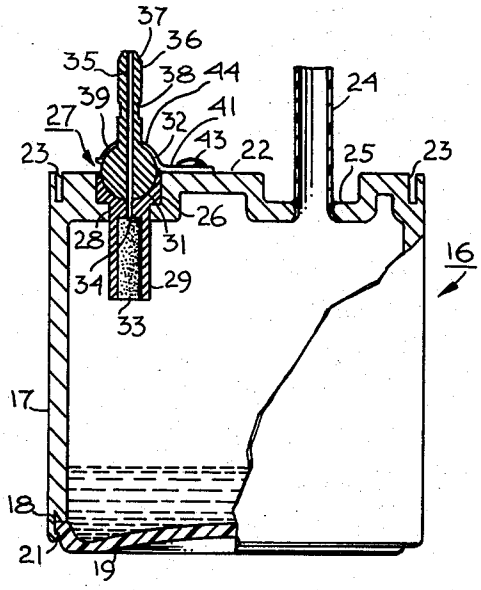
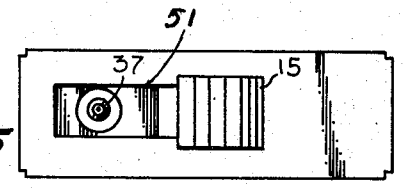


Fig. 5



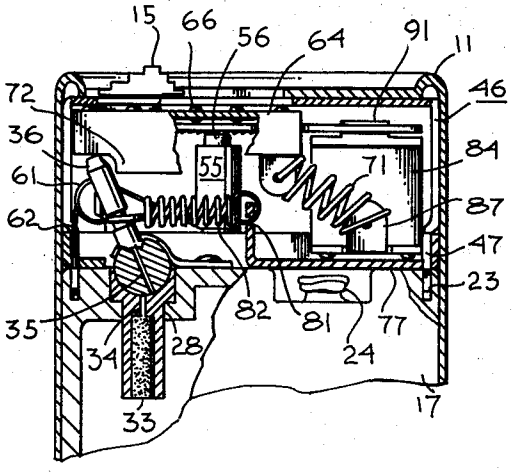


Fig. 3

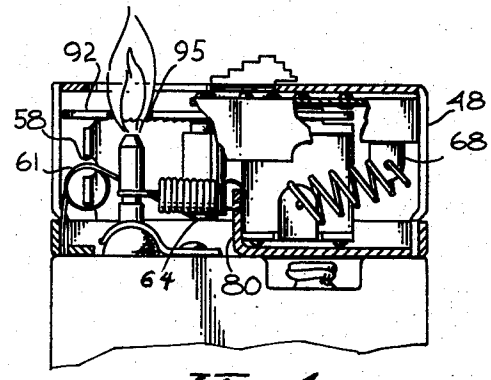


Fig. 4

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Fig. 7

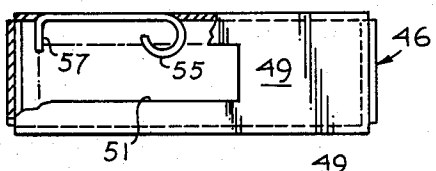


Fig. 6

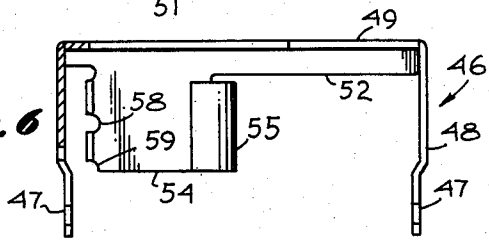


Fig. 8

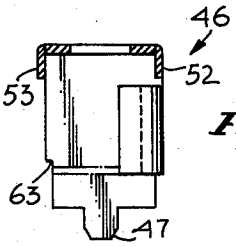


Fig. 10

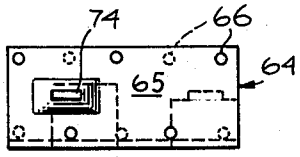


Fig. 9

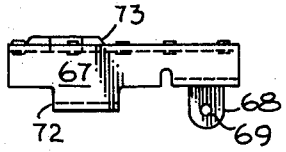


Fig. 11

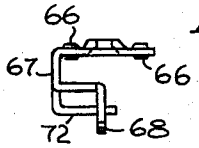


Fig. 12

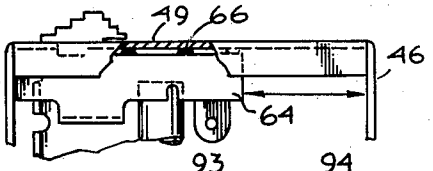


Fig. 13

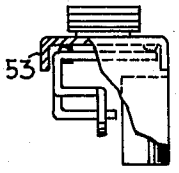


Fig. 14

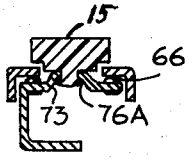


Fig. 15

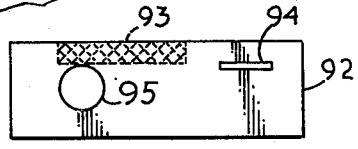


Fig. 16

Fig. 17

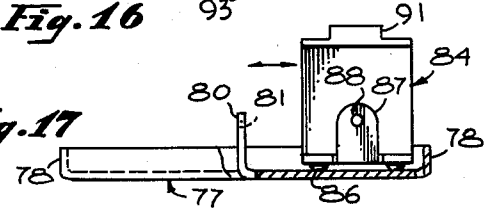


Fig. 18

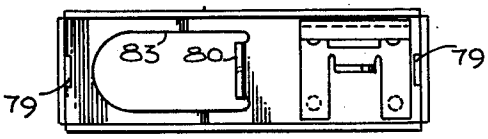
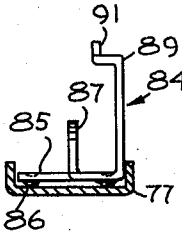


Fig. 19



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CIGARETTE LIGHTER

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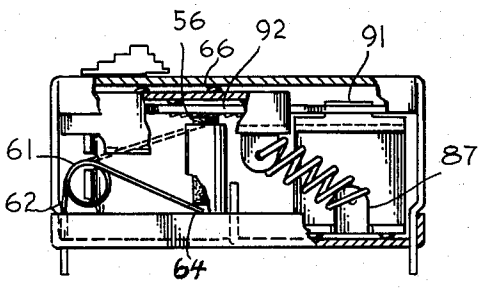

Fig. 20

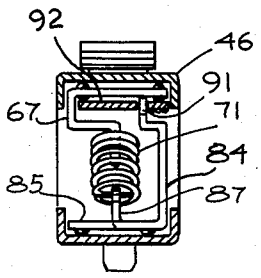

Fig. 21

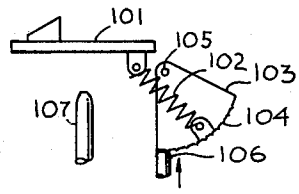

Fig. 22 (a)

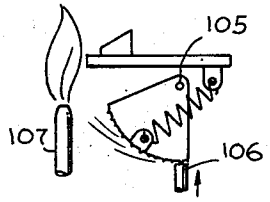

Fig. 22 (b)

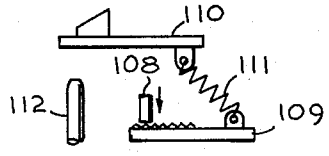

Fig. 23 (a)

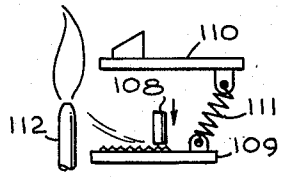

Fig. 23 (b)

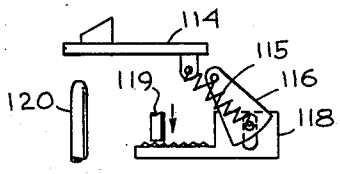

Fig. 24A

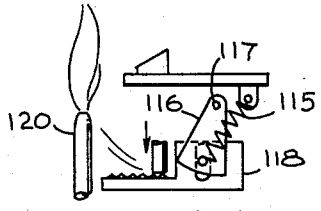

Fig. 24B

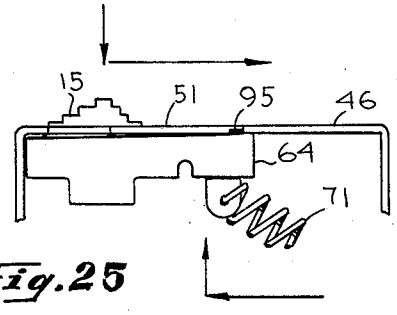

Fig. 25

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United States Patent Office 3,148,522 Patented Sept. 15, 1964

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CIGARETTE LIGHTER

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Filed May 20, 1963, Ser. No. 281,698
16 Claims. (Cl. 67—7.1)

This invention relates to cigarette lighters and more particularly to improvements therein.

The more popular types of cigarette lighters generally possess a flint wheel which cooperates with a flint to emit sparks for igniting a wick or an inflammable gas, such as butane. The flint wheel usually is rotated by the user either with his thumb or through a relatively complex linking mechanism. The flint wheel has often caused a failure in the operation of lighters. The wheel may become misaligned along its axis of rotation and as such will not make the desired contact with the flint, thus producing no sparks and causing the lighter to fail. In those lighters wherein mechanisms actuate the flint wheel rather than the thumb, slippage can and does occur in the linkage mechanism between the actuating portion and the wheel, so that the user is forced to continuously press the actuating mechanism to achieve adequate rotation of the wheel against the flint.

Cigarette lighters using a container of fuel in the form of inflammable gas usually have a complicated valve member for regulating the amount of the gaseous fuel utilized in the flame. These valves have involved mechanisms used for varying the orifice through which the gas is emitted to be ignited. Also, the lighters of this type include a mechanism for opening and closing the valve orifice. A review of the prior technology relative to this feature of the lighters readily exposes the numerous complicated mechanisms to accomplish the emission of the gas of the lighter to the flame. These complicated mechanisms tend to have mechanical difficulties and lead to failures in the operation of the lighter.

In the gas fuel type of lighters, usually the fuel valve is opened to emit fuel at the same time that sparks are emitted from the flint wheel. Often there is not enough gas present immediately for the sparks to effectively ignite. Thus, the user must repeat the rotation of the flint wheel continuously until ignition of the gas occurs.

An object of this invention is to provide a lighter having a novel and improved igniting mechanism.

Yet another object of this invention is the provision of a simplified igniting mechanism for a lighter.

Still another object of this invention is to provide a novel lighter employing a fuel gas having novel means for metering the flow of the gas from the storage tank to and through the orifice from which it is to be emitted.

Yet another object of this invention is to provide a novel lighter employing fuel gas wherein the conventional flint wheel has been eliminated.

The above and other objects of this invention are accomplished by a lighter device employing a flat, sliding serrated metal plate which serves as the striking piece for the flint. A toggle action mechanism employing a compression spring causes the flat plate to slide across the surface of the flint to create the necessary sparks for ignition of a gaseous fuel. The actuation of the toggle action mechanism, in addition to causing the striking plate to rub across the surface of the flint, also enables the valve to the fuel supply to open. Instead of utilizing variable orifices or the like, the flow of the fuel from the storage tank through the valve means to be emitted for purposes of creating a flame is metered through a flow regulator which comprises a cylindrical pellet of a microporous material such as a sintered porous metal. The nozzle through which the fuel is emitted has a base portion with an aperture running therethrough.

The base of the nozzle is engaged in a seat member having a corresponding aperture. The pellet is located within this seat member. When closed, the aperture of the nozzle is not aligned with the one in the seat, thus no fuel escapes.

When the toggle mechanism is actuated the aperture in the base of the nozzle and the aperture of the seat are aligned, thus, providing a passage for the fuel to the region where sparks are produced.

In the operation of the device the fuel is emitted from the nozzle slightly previous to the sliding of the ignition plate across the flint to create sparks. As a result, sufficient gas is present at the time the sparks are created to insure actual ignition of the fuel. When the toggle actuating mechanism is moved to a closed position, the nozzle aperture is out of communication with the tank source, thus extinguishing the flame.

The novel features that are considered characteristic of this invention are set forth with particularity in the appended claims. The invention itself both as to its organization and method of operation, as well as additional objects and advantages thereof, will best be understood from the following description when read in connection with the accompanying drawings, in which:

FIGURE 1 is a perspective view illustrating the external appearance of the novel lighter as fully assembled.

FIGURE 2 is a partial sectioned view with outside cover removed depicting the fuel storage tank and valve means communicating therewith.

FIGURE 3 is a sectional view of the actuating means for the lighter operation showing the lighter in a closed, or off position.

FIGURE 4 depicts the actuating mechanism for the lighter in the open position wherein the flame is ignited.

FIGURE 5 is a top view of FIGURE 4.

FIGURE 6 is a sectional view of the top frame for the lighter.

FIGURE 7 is a top view of the part shown in FIGURE 6.

FIGURE 8 is a side view of the part shown in FIGURE 6.

FIGURE 9 is a view of the top sliding portion.

FIGURE 10 is the top view of FIGURE 9.

FIGURE 11 is a side view of the part shown in FIGURE 9.

FIGURE 12 is a partially sectioned pictorial view of the top frame assembly.

FIGURE 13 is a partially sectioned pictorial view of the portion of the top frame assembly disclosing the slide button mechanism and the slide.

FIGURE 14 is a sectioned side view of the structure shown in FIGURE 13.

FIGURE 15 is a plan view of the striker plate.

FIGURE 16 is a side view of the plate shown in FIGURE 15.

FIGURE 17 is a partially sectioned view of the bottom frame assembly including the bottom slide member.

FIGURE 18 is a top view of FIGURE 17.

FIGURE 19 is a side view of FIGURE 17.

FIGURE 20 is a partially sectioned pictorial view of the striking mechanism assembly.

FIGURE 21 is a side view of FIGURE 20.

FIGURES 22*a* and 22*b* depict an alternative mechanism for the generation of the spark.

FIGURES 23*a* and 23*b* represent another alternative embodiment for generation of the spark.

FIGURES 24*a* and 24*b* represent still another alternative embodiment of the spark generating mechanism.

FIGURE 25 is a sectional view of a slide actuating mechanism of the lighter with a safety catch.

Referring now to the drawings, in FIGURE 1 the lighter has an outer casing **11**, provided with a plurality of

apertures 12, for admitting air to the area of the flame. The top portion 13 of the casing is provided with a rectangular opening 14, in which a slide button 15, for actuating the striking mechanism, may reciprocate. To operate the lighter, all that is required is that the slide button be slid to the right and a flame, as shown in FIGURE 4 is provided. The top of the lighter then has the appearance shown in FIGURE 5. To stop the flame, the slide button is returned to the position shown in FIGURE 1.

In FIGURE 2 there is seen a fuel tank 16, having a somewhat rectangular shape, which is seated in the lower portion of the case 11 of the lighter. The base of the side walls 17 of the fuel tank are provided with a triangularly formed inwardly extending aperture 18. This particular aperture provides a sealing shoulder for the base 19 of the tank. A flange 21, extending around the periphery of the base, insures a tight fit between the base and the walls of the tank when this flange is engaged with the sealing aperture 18. The base is preferably fabricated of a semi-resilient material, such as polyethylene. It may be desirable to make this base translucent in order to form a visible fuel gage. As will be noted, the base is also preferably turned inward toward the tank to provide strength against pressure of the fuel.

The top side 22 of the fuel tank is provided with two downwardly extending slots 23 at each end, which serve to engage the top frame member, which may be better seen in FIGURES 3 and 4. Also exending from the top side of the tank is a filling tube 24, which extends upwardly from a recessed portion 25. Upon filling of the tank under pressure, the filling tube 24 is folded over and crimped to form a gas-tight seal as indicated in FIGURES 3 and 4. The recessed portion 25 serves to accommodate the crimped tube, so that it does not extend above the top surface 22.

The top 22 of the fuel tank is additionally provided with a vertically downward extending shouldered recessed opening 26 which serves to accommodate part of the valve assembly 27. Tightly fitted within the recess 26 is the seat portion 28 of the valve assembly. This seat portion is cylindrically shaped and has a downwardly extending portion 29 which communicates with the inside of the fuel tank. The seat portion is preferably made of a resilient plastic or rubber material. The top of the seat portion 26 is a hemispherically shaped portion 31, which serves to engage the base portion 32 of the nozzle 36. Tightly fitted within the downwardly extending portion 29 of the seat of the valve assembly is the flow regulator 33 which consists of an elongated cylindrical pellet of microporous material such as a sintered porous metal, for example, sintered bronze. This flow regulator serves to replace complicated valve mechanisms previously used for metering the proper amount of gas flow to the nozzle. Such porous metal is of the type usually used for oilless bearings. When the valve is open, the gas from the tank flows through the sintered porous metal flow regulator 33, on through a connecting orifice 34 in the base portion of the valve assembly, and the orifice 35 provided in the nozzle 36. In the elongated neck portion 37 of the nozzle, there is present an annular groove 38 which serves to accommodate an actuating spring, as will be shown in more detail in the description of FIGURE 4.

The nozzle 36 and seat portion of the valve assembly 27 are secured in place by means of a retainer spring 39. The retainer spring which is fabricated from a spring steel sheet has a flat base portion 41 provided with a riveting aperture through which a rivet 43 may secure it to the top 22 of the tank. The retainer spring 39 is also provided with a curved portion for retaining the spherical base 32 of the nozzle. The curved part of the spring 39 has an aperture which sets the boundaries over which the nozzle may rotate.

FIGURES 6 and 7 and 8 respectively show the front, top and side views of a top frame member 46. This top

frame member 46, as seen in FIGURE 3, is seated within the slots 23 of the tank by means of the tabs 47 formed at the two opposite ends of the bottom of the frame. This is more clearly shown in FIGURES 6 and 8. The top surface 49 of the frame is provided with a guide slot 51 which serves to guide the motion of the actuating button 15 of the lighter. The top portion 49 extends downward along its longitudinal sides to provide two side guide portions 52 and 53, which serve to guide the mechanisms contained within the frame, as will be later explained in relation to the description, of FIGURE 3 and as seen in better detail in FIGURES 13 and 14. One of the side portions 52, has an additional extension 54. One side of the extension 54 is curved inward to provide an open sided tube 55 which houses the flint 56, as particularly shown in FIGURE 3 and FIGURE 20.

Part of the extension 54 also extends inward and opposite to the tubular portion to form a tabular piece 57, which is notched in the middle at 58 as well as at the bottom 59, to accommodate a flint actuating spring 61 (see FIGURE 20). The flint actuating spring 61 is essentially a torsion spring, which has a fixed end 62 that engages a notch 63 in a side of the top frame, and a flint actuating end 64 contacting the bottom of the flint for exerting upward pressure thereon. It is noted that the cylinder 55 housing the flint 56, is thus not entirely closed so as to allow the end 64 of the flint actuating spring 61, to move upward compensating thereby for the usage thereof.

Fitted within the top frame 46 is a top slide 64, which is shown in FIGURES 9 through 14. The upper surface 65 of the top slide is adjacent to the lower surface of the frame member 46, when the lighter is assembled. As seen in FIGURES 10 and 11, two rows of half sheared glide bosses 66, extend up and down from the surface 65. The upper glide bosses serve to separate the slide from the top frame as well as to enable the gliding motion of the slide within the frame. The top slide has one side 67, part of which extends downward, then inward and then forms a downwardly extending tab 68 provided with an aperture 69. This tab serves to act as a pivot member and retainer for a toggle spring 71, as seen in FIGURES 3 and 4. A second portion of the downward extending side 67 is bent inward and parallel to the top 65 to form a valve retaining means 72 which, as shown in FIGURE 3, abuts the nozzle 36 of the valve assembly and serves to restrain it from moving to an open position when the lighter is closed.

The top surface 65 of the top slide member 64 has a raised mount portion 73, with an aperture 74 therein to accommodate the slide button 15. The slide button, as may be seen in FIGURE 14, which may be formed of a thermo-plastic moulding, die casting or the like, is characterized in that it has a shoulder portion 76 at the bottom thereof, which engages the raised portion 73 and possesses a riveting boss 76A which serves to secure the button within the aperture provided.

A bottom frame member 77, as particularly seen in the respective front, top and side views of FIGURES 17, 18 and 19, is provided with two upwardly turned ends 78 and slotted apertures 79 adjacent such upturned ends. As may be seen in FIGURE 3 the upturned ends 78 are engaged, when assembled in the lighter, between the tabular portion 47 of the upper frame member 46 and the outer casing 11 of the lighter. The tabular portion 47 of the upper frame extends through the slots 79 into the additional slots 23 provided in the tank case so as to fixably secure the bottom frame member within the lighter.

Between the two upwardly turned ends 78 there is also present a flange portion 80 also upwardly directed at a right angle to the base of the frame 77. The flange 80 has a small hole 81 therein, in which one end of the valve return spring 82 is secured (see FIGURE 3). An opening 83 of the bottom frame is provided to accommodate

the valve assembly **27** and valve retaining spring **39**. As may be seen in FIGURES 3 and 4, the other end of the spring is engaged with the notch portion **38** of the nozzle **36**.

Disposed on top of and within the bottom frame member between the end **78** and upturned flange **80** is a bottom slide member **84**. The base **85** of the bottom slide member is provided with downwardly turned bosses **86** which serve to separate the base from the bottom frame and provide a gliding means for this member. Extending upwardly from the base **85** of the bottom slide is a flange portion **87** having an aperture **88** which as may be seen in FIGURES 3 and 4, serves to engage one end of the toggle spring **71**. Additionally, a side **89** of the member **84**, extends upwardly from the base parallel and opposite to the flange **87**, and at its uppermost end has a tabular portion **91** which engages the striker plate **92**, in a manner to be described in connection with FIGURES 15 and 16.

The striker plate, as seen in FIGURES 15 and 16, possesses a flint striking surface **93**, which may be embossed or coined in the metal when it is stamped. The plate additionally has a slot **94** therein, in which the previously mentioned tab **91** of the bottom slide is inserted. A flame aperture **95** is additionally provided within the striker plate through which the flame from the nozzle may escape for utilization by the possessor of the device. The striker plate is constrained by the upward pressure of the flint spring **61** against the base of the flint **56**, which thus exerts upward pressure upon the bottom of the striker plate. The top of the plate is directed against the downwardly extending sliding bosses **66** of the top slide member. This detail is best seen in FIGURES 20 and 21. FIGURE 21 especially, discloses the relationship of the top frame **46**, top slide **64**, bottom slide **84**, and bottom frame **77**, with the connection of the toggle spring **71** between the top and the bottom slide members.

The placing on the drawing of FIGURES 6, 9, 12, 16, and 17, is analogous to what their disposition would be in an exploded view of the invention.

The operation of the device of the invention will now be described with reference to FIGURES 3 and 4. FIGURE 3 depicts the lighter in a closed position. In this closed or off position, the toggle spring **71** forces the top and bottom slides **64** and **84**, respectively, in opposite directions against the two ends of the top frame. This is also clearly shown in FIGURE 20. The valve assembly in this position is closed, not permitting any gas to escape. This is because the inwardly turned flange portion **72** of the top slide forces or tilts the nozzle **36** to an inclined position against the upward pull of the valve spring **82**. When the nozzle is so tilted, the orifice **35**, in its spherical base portion, is not in communication with the orifice **34** in the seat portion **28**, of the assembly. It should be pointed out that the valve return spring **82** is necessarily a weaker spring than the toggle spring **71**, so as not to overcome the force of the toggle spring, keeping the top slide in a closed position. In this closed position the bottom slide **84** is directed against the opposite end of the lighter from the actuating button **15**, carrying with it the striker plate **92**, which is in engagement therewith by means of the tabular portion **91** of the bottom slide. This is more clearly shown in FIGURES 20 and 21.

When the button **15** is moved within the slot **51**, to assume the position shown in FIGURES 4 and 5, the top slide **64** with which it is engaged also moves accordingly in the same direction and is guided between the side portions **52** and **53** of the top frame **46**. The slightly raised shoulder **73** of the top slide serves as a bearing surface for the button **15** as it moves within the slot **51**. Thus as the top slide with the flange **72** moves away from the nozzle **36**, it allows it to be pulled to an upright or open position due to the pull of the valve return spring **82**. At this time the gaseous fuel is emitted from the nozzle **36** of the valve assembly, since passages **34** and **35** are in alignment. Up to this point in the operation of the device, the only operation in response to movement of the button and upper slide **64** is the movement of the nozzle to an upright position whereby fuel gas can commence to flow.

When the compression spring **71** passes the point of maximum compression which occurs when the two spring tab portions of the top and bottom slides **68** and **87** respectively, are aligned, the over-center or toggle action causes the top slide to be rapidly propelled to the limit of travel allowed by the side **48** of the top frame member, as particularly seen in FIGURE 4. Simultaneously, the spring action rapidly propels the bottom slide **84** in the opposite direction. The bottom slide is limited in its movement by the upturned portion **80** of the bottom frame which serves as a stop for the bottom slide. Since the bottom slide engages the striker plate **92** by means of the tabular portion **91**, the striker is also propelled at the same rate as the bottom slide through the action of the compression spring. The striker plate **92** thus moves rapidly over the flint **56**, being forced against it by the action of the flint spring **61**, causing sparks to be emitted from the flint creating the necessary energy for igniting the fuel that has been escaping from the nozzle **36**. Concurrently with this action, the striker plate which was propelled in a direction toward the nozzle comes to rest with the aperture **95** therein being situated directly over the nozzle permitting the flame created to escape through the opening left by the area evacuated by the movement of the actuating button **15**. Thus, in this action that transpires, the striker plate moves in contact with the bosses **66** on the bottom of the top slide **64**, and in a direction directly opposite to the top slide until both members come to rest at opposite sides of the device. The upwardly directed bosses **66**, of the top slide reduce friction between the top slide and the under surface of the top frame due to the upward pressure of the compression spring.

Just prior to the striking action which causes sparks to be emitted, the escaping gas from the nozzle is trapped beneath the striker plate. This gas flows out along under the surface of the striker, providing a readily accessible target for the sparks which are directed forward by the striking surface **93** of the striker plate. Additionally, the sparks are reflected by the inwardly directed flange portion **57** of the top frame member, which portion serves as a spark reflector. These sparks are directed back into the spreading gas jet so that the fuel ignition reliability of the lighter is exceedingly high. Once the aperture **95** of the striker plate is positioned over the nozzle **36**, the flame emerges. The flame draws an adequate air supply through the air vents **12** in the case, which may be seen in FIGURE 1.

In order to close the lighter and extinguish the flame, the slide button **15** is directed back to its originally closed position. The toggle action of the spring causes the bottom slide and striker plate to be propelled in opposite directions of the assembly and the top slide is forced to a fully closed position, turning off the fuel valve assembly by the previously referred to action of the flange portion **72** of the top slide against the nozzle. As can readily be seen, the presence of the compression spring relative to the moving components provides a toggle type actuation.

Though the invention as described, discloses an embodiment wherein no provision is made for replacement of either the flint **56** or the fuel, since the device is so simple in construction and operation that it may be disposable, provision may be made to replace either the flint or the fuel or both, by simple modification of the design.

Referring now to FIGURES 22*a* and 22*b*, there is shown an alternative embodiment of the toggle spring striking mechanism which may be employed if desired,

in place of the one shown. A top sliding beam member **101**, has one end of a toggle spring **102** attached to a tab on the beam member. The other end of the toggle spring is attached to a tab on the outer periphery of a sector wheel member **103** which is provided with a striker surface **104** on the outer circumference thereof. The sector wheel is pivtoably supported from a pivot **105**.

FIGURE 22*a* indicates the mechanism in a closed and unoperated position. FIGURE 22*b* indicates the operated position of the mechanism whereby the sector wheel **103** has moved about the pivot point **105**, causing the striker surface to be drawn across the flint **106**, whereby sparks are emitted. It is to be noted in this arrangement that the flint is situated below the nozzle **107** since the sparks are thrown in an outward direction towards the nozzle due to the motion and curvature of the sector wheel. The underlying concept of this particular embodiment is that the transverse motion of the striker plate described in the preferred embodiment is made a rotary motion.

Another embodiment of the toggle action striking mechanism is shown respectively in the unoperated and operated positions in FIGURES 23*a* and 23*b*. Here a flint **108** is urged downwardly upon a flat and slidable striking plate **109**. The top sliding beam member **110** has one end of the toggle spring **111** attached thereto, the other end being attached to the slidable striking plate. The striking plate is located below the nozzle but the motion of the striking plate against the flint causes the sparks to be directed forward and upward against the nozzle **112**.

FIGURES 24*a* and 24*b* show still another spark creating mechanism. This comprises a sliding top beam **114**, having a tab at one end, to which one end of a toggle spring **115** is secured. The other end of the toggle is secured to a pivotal member **116** which is pivotably supported by a pin **117**. The other end of the pivotal member is attached to a slidable striker member **117**.

When the top beam **114** is slid to the right, as shown in FIGURE 24*b*, the toggle action spring causes a snap action pivotal motion of the member **116** to the left moving therewith the striker member **118**, to which it is attached, to the left. This draws the ribbed portion across the downwardly directed flint **119**, whereby sparks are directed upward at the nozzle **120**.

FIGURE 25 discloses an alternative safety catch feature of the lighter, which may be provided if desired. An additional gliding boss **95** is provided on the top slide **64**, such that in the closed position it engages or abuts against the top frame **46** protruding into the opening **51** in the top frame. The latching action is caused by the upward pressure of the toggle spring **71**. To operate the slide, the button must be first pressed downwardly to disengage the boss **95** from the top frame and then is moved to slide in the previously described manner. Since such an action is unlikely to occur accidentally, it is believed that this provides a safety feature for the operation of the device.

There has accordingly been described herein a novel mechanism for a lighter which provides a reliable and safe operation and which can be inexpensively fabricated.

I claim:

1. A lighter comprising means for storing fuel, an outlet for said fuel from said storage means, flint means positioned near said outlet, a flint striker plate in operative relationship with said flint means, and toggle action means for relatively moving said striker plate and said flint means to direct sparks from said flint means at said fuel outlet to ignite fuel emitted therefrom, said toggle action means including a top and bottom slide member, means for slidably supporting said top and bottom slide members spaced apart parallel to one another, a compression spring connected between said top and bottom slide members, means for sliding said top slide member in one direction to compress said compression spring to its maximum compression whereupon said bottom slide member is urged to slide in a direction opposite to said one direction, and means coupling said striker plate to said bottom slide member for moving it to responsive motion of said second slide member.

2. A lighter comprising means for storing fuel, an outlet for said fuel from said storage means, flint means positioned near said outlet, a flint striker plate in operative relationship with said flint means, and toggle action means for relatively moving said striker plate and said flint means to direct sparks from said flint means at said fuel outlet to ignite fuel emitted therefrom, said toggle action means comprising a top frame, a bottom frame disposed oppositely of said top frame, said striker plate being adjacent said top frame, a top slide member disposed between said top frame and said striker plate, said top slide member having means for engaging one end of said compression spring, a bottom slide member disposed on said bottom frame, said bottom slide member having an upwardly directed flange portion in engagement with said striker plate and having a means for engaging the opposite end of said compression spring, and a finger operable means engaged with said top slide member for causing movement thereof, whereby movement of said top slide member relative to said bottom slide member causes compression of said compression spring.

3. The device of claim 1 wherein said outlet for said fuel from said storage means comprises an elongated nozzle having a base portion, said nozzle and said base portion having an aperture extending therethrough, a seat for said base portion contiguous with said fuel storage means, said seat being provided with an aperture communicating with said fuel storage means, said nozzle and said seat comprising a valve device whereby upon rotatation of said base portion of said nozzle in said seat such that when said aperture in said nozzle is aligned with said aperture in said seat the gas in said storage means escapes through said nozzle.

4. The device of claim 3 additionally comprising a pellet of microporous material disposed in said seat portion in the end of the aperture therein within said storage means for regulating the flow of the gas from said storage through said nozzle.

5. A mechanism for actuating a striker plate relative to a flint used in a cigarette lighter comprising a compression spring, a first slide means engaging one end of said compression spring, a second means engaging the opposite end of said spring, said second means being disposed relative diagonally opposite to said first slide means, means for actuating said first slide means relative to said second means to cause compression of said spring whereby said second means is caused to move in a direction to relieve the compression of said spring, and means for actuating said striker plate relative to said flint responsive to said motion of said second means.

6. The mechanism of claim 5 wherein said first slide means comprises a flat plate having a downwardly projecting spring engaging portion, and wherein said second means comprises a flat plate having an upwardly projecting spring engaging portion, said first plate being disposed above and parallel to said second plate, said striker plate being disposed between said first and second plates.

7. The mechanism of claim 5 wherein said first slide means comprises a flat plate having a downwardly projecting spring engaging portion, and wherein said second means comprises a flat plate having an upwardly projecting spring engaging portion, said first plate being disposed above and parallel to said second plate, said striker plate being formed on said second plate.

8. The mechanism of claim 5 wherein said first slide means comprises a flat piece having a downwardly projecting spring engaging portion, and wherein said second means comprises a pivotal member, means for pivotably supporting one end of said pivotal member adjacent with

said first slide means, means on the other end of said pivotal member for engaging the other end of said compression spring, and means attaching said striker plate to the other end of said pivotal member.

9. The mechanism of claim 8 wherein said pivotal member is a sector wheel.

10. A mechanism for actuating a striker plate relative to a flint used in a cigarette lighter comprising a compression spring, a first slide means engaging one end of said compression spring, a sector wheel, means for pivotably supporting said sector wheel with its pivotal center adjacent the location of the engagement of said first slide means and said one end of said compression spring, means at the periphery of said sector wheel engaging the other end of said compression spring, striker plate means on the outer periphery of said sector wheel, means holding said flint in operative engagement with said striker plate means, and means for moving said first slide means to compress said compression spring whereby said sector wheel pivots to relieve said compression to thereby strike sparks from said flint.

11. A valve assembly for communication with a cigarette lighter gaseous fuel storage tank comprising an elongated nozzle having a base shaped as a figure of revolution, said nozzle and said base having an aperture extending therethrough, a seat for said base contiguous with said fuel storage means, having a seating portion conforming to the shape of said base and said seat having an aperture therethrough communicating with said fuel storage means, said base being in relatively movable engagement with this seating portion of said seat, means biasing said nozzle and base to a position relative to said seat whereby the apertures therethrough are unaligned, and means for rotating said base portion and said nozzle in said seat against said bias to a position such that said aperture in said nozzle is aligned with said aperture in said seat whereby the gas in said storage means escapes through said nozzle.

12. A valve assembly as recited in claim 11 wherein said valve assembly includes a pellet of microporous material positioned in the end of the aperture in said seat which communicates with said fuel storage means to meter the gas which will flow through said valve assembly from said fuel storage tank.

13. A lighter comprising means for storing a gaseous fuel, a valve assembly in said means for storing fuel including a movable nozzle having a first position in which no fuel escapes from said storage means through said nozzle and a second position in which fuel escapes from said storage means through said nozzle, flint means positioned near said nozzle when it is in its second position, a flint striker plate postioned in pressing contact with said flint means, means for biasing said nozzle toward its second position, and toggle action means slidable between an inoperative and operative position, said toggle action means including means for holding said nozzle in its first position while said toggle action means is in its inoperative position, and means for moving said striker plate over said flint means to direct sparks from said flint means at said nozzle to ignite fuel emitted therefrom when said toggle action means is slid toward its operative position.

14. A cigarette lighter having in combination a container for storing gaseous fuel, valve means mounted in said container and having a closed position for preventing the escape of said gaseous fuel from said container and an open position wherein gaseous fuel is permitted to escape from said container, flint means positioned near said valve means, a flint striker plate positioned in pressing contact with said flint means, and a toggle action means having an off and an on position and being slidable therebetween, said toggle action means including means for maintaining said valve means in its first position when said toggle action means is in its off position, and means responsive to said toggle action means being slid toward its on position for enabling said valve means to move toward its second position, and means for moving said striker plate over said flint means to direct sparks from said flint means at said valve means to ignite fuel emitted therefrom responsive to said toggle action means being slid to its on position after said valve means has reached its second position.

15. A cigarette lighter comprising a housing, an opening in the top of said housing, means for slidably mounting a switch actuator in said opening to close said opening when in the off position and to clear said opening when in the on position, a gaseous fuel container within said housing, valve means mounted in said fuel container and including a pivotable nozzle having a first position at which said valve means is closed and a second position at which said valve means is open to permit fuel in said container to escape through said nozzle, said nozzle when in said second position extending toward the opening in said housing, means for biasing said nozzle towards said second position, means connected to said switch actuator for holding said nozzle in its first position against the bias when said switch actuator is in its off position, flint means supported near the position of said nozzle when in its second position, flint striker means in operative engagement with said flint, and toggle action means responsive to said switch actuator being slid toward its on position to actuate said flint striker means whereby sparks are emitted toward said nozzle to ignite the gaseous fuel emitted therefrom when in its second position.

16. A cigarette lighter as recited in claim 15 wherein said flint striker means comprises a slidable plate, means for slidably positioning said slidable plate between the second position of said nozzle and the opening in said housing, a hole in said flint striker plate positioned at a portion thereof which intervenes between said nozzle and the opening in said housing after said striker plate has been moved to cause sparks to the emitted from said flint means.

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