May 7, 1963 F. E. GRUBER ET AL 3,088,301

CIGARETTE LIGHTERS

Filed Jan. 26, 1960 2 Sheets-Sheet 1

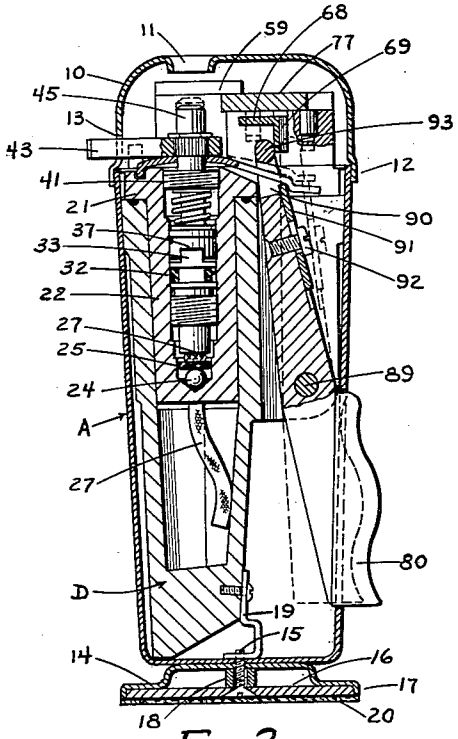


FIG. 2

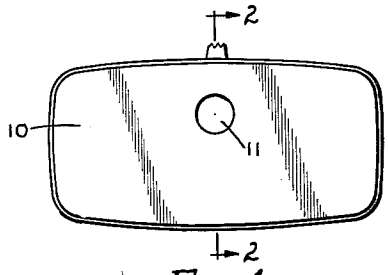


FIG. 1

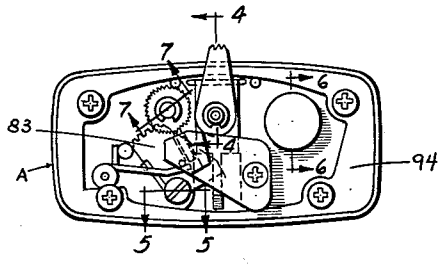


FIG. 3

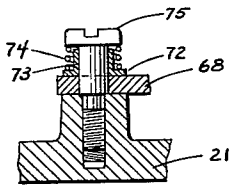


FIG. 5

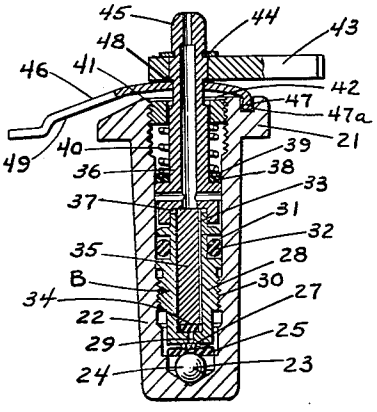


FIG. 4

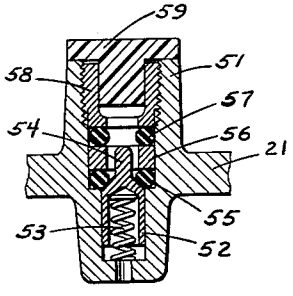


FIG. 6

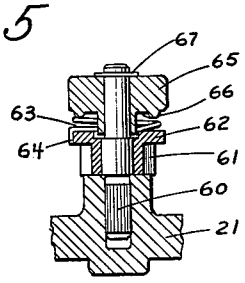


FIG. 7

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CIGARETTE LIGHTERS

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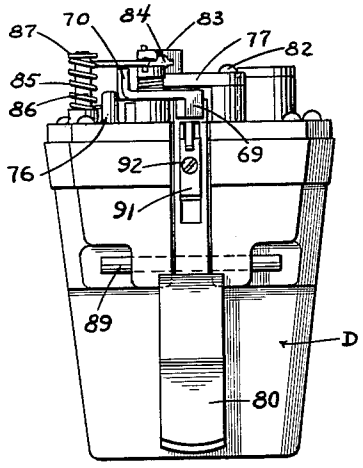


FIG. 8

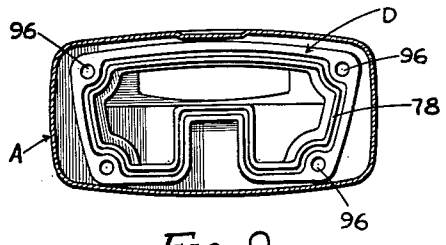


FIG. 9

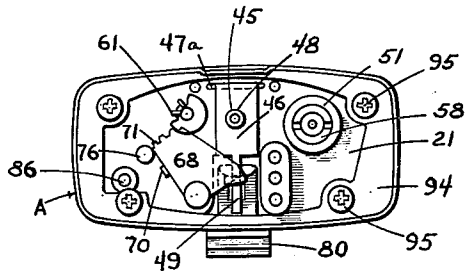


FIG. 10

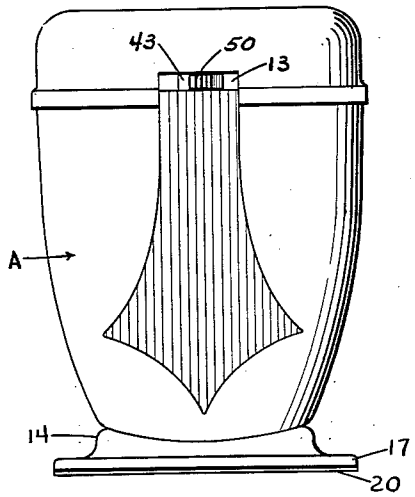


FIG. 12

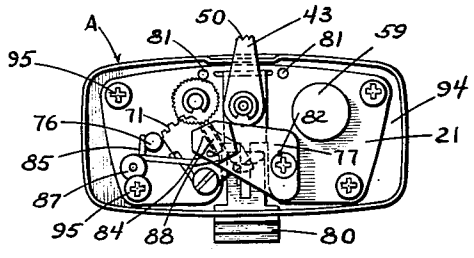


FIG. 11

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CIGARETTE LIGHTERS

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Filed Jan. 26, 1960, Ser. No. 4,730
6 Claims. (Cl. 67—7.1)

This invention relates to a simplified and compact pyrophoric lighter, having an adjustable discharge valve, for use with fuels of the type which vaporize when exposed to the atmosphere. Manufacturers of pyrophoric lighters have attempted to produce a lighter utilizing gas of the butane type, which have included in their construction a valve to effectively meter the amount of vaporized fuel escaping through the discharge valve. Heretofore all such attempts have resulted in devices which are exceedingly large or which contain complex valve structures and, as a result, they are inefficient and tend to mal-function.

In our device we have invented an effective metering valve which is utilized in an efficient pyrophoric lighter. The lever operation is also very efficient and provides a positive action when the lighter is actuated.

A primary object of this invention is to provide a pyrophoric lighter having a minimum number of component parts which will function properly for extended periods of time.

Another object is the provision of a simplified positive action discharge valve which can be adjusted to vary the height of the flame.

Another object is the employment of structurally reinforced parts, designed for minimum space requirements, and which will result in a finished product of a size generally acceptable for its intended purpose.

Another object is the provision of a pyrophoric lighter with a simplified transfer valve to permit refueling the lighter with gas which is in liquified form when under pressure, but which will vaporize when exposed to the atmosphere.

Other objects and advantages of the invention will be made apparent in the disclosure of the accompanying drawings and in the following specification and claims.

In the accompanying drawings, forming a part of this specification:

FIG. 1 is a top plan view of the cigarette lighter with the cover in place;

FIG. 2 is a section on line 2—2 of FIG. 1, with the components shown partially in section and partially in outline;

FIG. 3 is a top plan view of the lighter with the decorative cover removed and the main lever omitted;

FIG. 4 is a section on the lines 4—4 of FIG. 3, showing the discharge valve assembly;

FIG. 5 is a section on the lines 5—5 of FIG. 3, showing the mounting of the flint wheel actuating arm;

FIG. 6 is a section on lines 6—6 of FIG. 3, showing the transfer valve assembly;

FIG. 7 is a section on the lines 7—7 of FIG. 3, showing the flint wheel assembly;

FIG. 8 is a rear elevational view of the lighter mechanism and fuel chamber, removed from the decorative casting;

FIG. 9 is a top plan view of the fuel chamber with the lighter mechanism and cover removed;

FIG. 10 is a top plan view of the lighter, showing the lighter mechanism partially assembled;

FIG. 11 is a top plane view with the locating plate omitted; and

FIG. 12 is a front elevational view of the lighter.

Referring now to the drawings and particularly to FIGURE 3, which is a sectional view of the lighter, the method of assembly and the different component parts of the lighter will be more readily understood.

The decorative outer case for the lighter, generally referred to by the letter A, is made of metal, plastic or other suitable material. The general configuration of the case A is illustrated in FIGURE 12, and the top plan view thereof is shown in FIGURE 1. The top of the case has a removable cover **10** with an aperture **11** formed therein immediately above the discharge valve of the lighter. The cover **10** has an outwardly extending flange **12** formed around its bottom which overlaps the top portion of the lighter case. The front of the cover **10** has a rectangular opening **13** therein, and the flame adjustment lever extends outwardly through this opening.

The case A has a removable base **14** thereon which is attached to the case by means of a screw **15**. A metallic plate **16** fits within the flanged extension **17** of the base **14**, and the holding screw **15** is seated against the plate **16**. Disposed between the plate **16** and the upper portion of the base **14**, is an annular washer **18**, which serves as a spacer between these elements. The screw **15** is threadably attached to the assembly bracket **19** which will be discussed hereinafter. A felt cover **20** is adhesively attached to the bottom of the plate **16** to prevent the marring of surfaces upon which the lighter is placed.

Discharge Valve

FIGURE 4 shows an enlarged detailed section of the discharge valve, generally referred to by the letter B, which is adjustable to meter the amount of vaporized fuel released from the lighter. Through the simple adjustment of the discharge valve the height of the flame can be varied to suit the requirements of the user. The discharge valve B is disposed within the cylindrical tube **22** which extends downwardly from the under surface of the lighter cover **21**. In the device illustrated, the cylindrical tube **22** is cast integrally with the cover **21** and its inner surfaces will be described hereinafter. The bottom of the tube is closed and has an internal cone **23** formed therein. Seated in the internal cone **23** is a spherical steel pellet **24**. Positioned above the pellet is a thin rubber disk **25**, of greater diameter than the pellet **24**. The rubber disk **25** provides a certain portion of the resiliency necessary to obtain the metering effect for the discharge valve.

Slightly above the lower end of the tube **22** is a transverse wick opening not shown in the drawings. The opening comprises two diametrically opposed holes extending through opposite walls of the tube **22** at the position of an absorbent wick **27**, shown in FIG. 4. Wick **27** is looped through the opening and extends downwardly below the tube **22** into the lower portion of the fuel storage chamber, one end of the downward extension of the wick being shown in FIG. 2.

The lower member of the discharge valve B consists of a hollow cylindrical adjusting nut **28** having a closed bottom with a central aperture **29** therein. The lower portion of the adjusting nut is in the form of a smooth cylinder and bears directly against the absorbent wick **27**. Intermediate the ends of the adjusting nut **28** are the adjusting threads **30** which threadably engage the internal walls of the tube **22**. Positioned above the adjusting threads **30** is an annular groove **31** into which is fitted an O-ring **32** which is made of rubber or other suitable material. The O-ring **32** serves to prevent the escape of gas between the adjusting nut **27** and the walls of the tube **22**. At the top of the adjusting nut **28** is a transverse tongue **33** which is engageable with a transverse slot **37** located at the lower end of the valve stem **36**. The hollow bore of adjusting nut **28** contains a resilient sealing disk **34** which rests over the aperture **29** at the lower

end of the adjusting nut 28. This sealing disk is circular and of a diameter slightly less than that of the hollow bore of the adjusting nut 28. The upper portion of the hollow bore contains the valve pin 35, and the lower end thereof bears against the top surface of the sealing disk 34. These parts cooperate to effect opening and closing of the discharge valve.

The upper portion of the exhaust valve consists of the valve stem 36. As indicated, the lower portion of the valve stem is of approximately the same diameter as the adjusting nut 28. The lowermost end of the valve stem 36 has formed therein a transverse slot 37 which engages the tongue 33 of the adjusting nut 28. The upper portion of the valve stem 36 is of reduced diameter and a gasket 38 and bearing washer 39 rest on the shoulder formed by the lower end of the valve stem 36. The valve stem 36 also has a hollow bore which communicates with the fuel chamber through the hollow bore in the adjusting nut 28.

Positioned immediately above the bearing washer, with its lower coil resting thereon, is the coil spring 40 which maintains the valve in a closed position. The valve stem 36 and the adjusting nut 28 are held within the cylindrical tube 22 by means of the circular valve nut 41, which fits around the valve stem 36. The valve nut 41 is threaded around its outer periphery and these threads are engageable with a second set of threads located near the top of the cylindrical tube 32. The bottom edge of the valve nut 41 bears against the coil spring 40, and places the coil spring 40 under tension. This serves to exert a downward force on the bottom end of the valve stem 36, which in turn bears against the valve pin 35 to effect closure of the valve by forcing the sealing disk 34 against the aperture 29. The valve nut 41 has a diametrical slot 42 across its top surface to facilitate adjustment of the spring tension, and also permits the easy assembly of the discharge valve B.

A portion of the valve stem 36 which extends above the valve nut 41 is knurled for cooperative engagement with the flame adjusting arm 43. Immediately above the knurled portion, the valve stem 36 has a reduced annular groove into which is fitted a retaining nut or retaining ring 44. The portion of the valve stem 36 which extends above the flame adjusting arm 43 is designated as the nozzle 45.

To actuate the valve it can be seen that it is necessary to raise the valve stem 36, so as to release the pressure on the sealing disk 34. This is accomplished by means of the cantilevered lifting fork 46 which is disposed between the valve nut 41 and the flame adjusting arm 43. The lifting fork 46 has a depending transverse forward edge 47 which is positioned in the slot 47*a* of the cover of the lighter. The lifting fork is substantially rectangular at its forward end and has an annular opening 48 disposed centrally thereof, whereby the lifting fork 46 may be positioned over the valve stem 36. The rear portion of the lifting fork 46 has a gradually depending tail member 49 which is utilized as a cam surface to force the lifting fork upwardly and thereby open the discharge valve.

The flame adjusting arm 43 has a knurled opening formed therein at one end thereof, which is engageable with the knurled portion of the valve stem 36. The flame adjusting arm 43 extends in a straight line out from the periphery of the knurled opening a distance equivalent to approximately two diameters of retaining ring 44. The outward free end 50 of the arm 43 is serrated and extends through the opening 13 in the case A.

Rotation of the valve stem 36 by means of the flame adjusting arm 43 causes the slot 37 to engage the tongue 33 of the adjusting nut 28. As the valve stem 36 is rotated it also rotates the adjusting nut 28 thereby raising or lowering the end of the adjusting nut. This increases or decreases the pressure on the wick 27 and the rubber disk 25 and effectively meters the amount of vaporized fuel which passes through the aperture 29. Ordinarily wicking will tend to retain a "set-" after a number of adjustments have been made, and therefore the rubber disk 25 has been employed to provide greater resiliency and extended trouble free operation. The metallic pellet 24, at the bottom of the tube 22, provides an effective base against which to compress the wick 27 and the rubber disk 25.

Transfer Valve

The transfer valve, generally referred to as C is best illustrated in FIGURE 6. The housing 51 is generally cylindrical and extends both above and below the storage chamber cover 21, and is formed integrally therewith. The inner upper end of the transfer valve housing 51 is threaded, and the closed lower end of the housing has an opening therein which communicates with the fuel storage chamber.

The transfer valve consists of a hollow cylindrical valve pin 52 which is approximately the same diameter as the reduced lower end of the transfer valve housing. A coil spring 53 is disposed within the open lower end of the valve pin 52, and the lower end of the spring 53 rests upon the closed lower end of the valve housing 51 around the opening therein. The upper end of the valve pin 52 tapers conically upward to the valve pin tip 54 which is of reduced diameter. The conical upper end of the valve pin is engageable with a neoprene or other flexible O-ring seal 55, which has a diameter approximately equal to the inner diameter of the transfer valve housing. The valve pin tip 54 extends through a circular spacer 56, which is positioned on the O-ring seal 55. Resting on the upper surface of the spacer 56 is another O-ring seal 57. The transfer valve assembly is held in position by a hollow retainer retainer screw 58 having an external thread which is engageable with the threads on the inner upper surfaces of the transfer valve housing. The walls of the retainer screw 58 are slotted to facilitate assembly and to permit adjustment of the transfer valve. By utilizing two O-ring seals and the spacer ring 56, it is possible to adjust the transfer valve C without rotating or exerting undue pressure or deforming the O-ring seal 55. Both the upper and lower surfaces of the spacer ring 56 are smooth and provide efficient sealing surfaces for the transfer valve.

To operate the transfer valve, the valve pin is depressed against the spring 53 thereby permitting the pressurized fuel to escape around the valve pin through the opening in the transfer valve housing, and into the fuel storage chamber.

To exclude foreign matter, and maintain the transfer valve in a clean condition, applicants employ a valve plug 59 which is formed of polyethylene or other pliable material. The valve plug 59 is merely friction fitted into the upper open end of the retainer screw 58.

Flint Wheel Assembly

The flint wheel assembly is illustrated in FIGURE 7. The flint wheel shaft 60 is serrated at its lower end and is press fitted into an upstanding boss formed integrally with the storage tank cover 21. The flint wheel actuating gear 61 rotates on the flint wheel shaft with its lower edge in contact with the upper edge of the boss. The lower portion of the flint wheel gear 61 has vertically extending gear teeth formed therearound, and an enlarged flange 62 is formed at the upper end of the gear teeth. A longitudinally extending notch is formed in the flange 62 to retain a depending catch 64 on the ratchet spring 63.

The ratchet spring is generally circular, and is formed as a split ring. The portion of the ring opposite that containing the depending catch 64 is biased upwardly and is engageable with the ratchet teeth 66 formed on the lower surface of the flint wheel 65. The radially ex-

tending edge on the upwardly biased portion serves as a driving edge to actuate the flint wheel 65.

The flint wheel 65 is of the usual type and is constructed with a downwardly depending hub which extends within the annular opening of the ratchet spring 63. The lower surface of the flint wheel 65 contains a plurality of ratchet teeth 66, which are engageable with the driving edge of the ratchet spring 63. The outer cylindrical surface of the flint wheel is serrated to produce a spark when rotated against the lighter flint. The flint wheel actuating gear 61 which supports the ratchet spring 63 beneath the flint wheel 65 are held in place by the flint wheel retainer 67. The retainer 67 is a springable nut which engages in an annular slot near the top of the flint wheel shaft 60.

Flint Wheel Actuating Arm Assembly

The flint wheel actuating arm assembly is shown in FIGURE 5. This assembly is supported above an upstanding threaded boss formed integrally with the storage tank cover 21. The actuating arm 68 is generally flat and has a depending cam plate 69 at the rear thereof and an upstanding spring lug 70 toward the forward end on the side opposite the cam plate 69. A plurality of gear teeth 71 are formed at the forward edge of the actuating arm, and these teeth are engageable with the flint wheel actuating gear 61.

Disposed immediately above the actuating arm 68 is the circular bushing 72, which retains the actuating arm 68 in position. The bushing 72 has an upstanding hub 73, about which is positioned the tension spring 74. The actuating arm 68, the circular bushing 72 and the tension spring 74 are held in position by the shoulder screw 75 which is threaded into the boss on the storage tank cover 21. One end of the tension spring 74 engages with the spring lug 70 and the other end of the coil spring rests against the flint holder casting 77. An upstanding stop 76, formed integrally with the storage tank cover 21 limits the counterclockwise rotation of the actuating arm 68.

Lighter Operation

The general configuration of the storage tank D is shown in FIGURE 9. This figure shows a top plan view of the fuel chamber and illustrates the internal structure thereof. The storage tank D is formed with a peripheral groove 78 into which is fitted a neoprene gasket, not shown, to provide a gas tight seal. The storage tank D is shown in FIGURE 9 in its relationship to the decorative case A. A study of FIGURE 9, together with FIGURE 8 and FIGURE 2, will provide a clear understanding of the general shape of the storage tank D.

FIGURE 10 shows a top plan view of the lighter with the pyrophoric mechanism partially assembled. The transfer valve housing 51, together with the retainer screw 53, is shown with the valve plug 59 removed therefrom. The mounting base 79 is shown with the flint holder casting 77 removed therefrom. The central aperture in the base 79 contains internal threads and the two other openings are cooperable with depending annular bosses formed on the flint holder casting 77. This prevents the casting 77 from rotating.

The lifting fork 46 is clearly illustrated and its depending edge 47 is shown in the opening 47*a*. The nozzle 45 of the discharge valve is also shown extending upwardly through the lifting fork 46. The depending tail member 49 of the lifting fork 46 is also shown extending over the actuating main lever 80.

The cooperative engagement between the flint wheel actuating arm 68 and the flint wheel actuating gear 61 is also illustrated.

FIGURE 11 shows a top plan view of the lighter with the decorative cap 10 removed therefrom. In this instance the valve plug 59 is shown positioned in the transfer valve housing 51. The flame adjusting arm 43 is

shown positioned over the discharge valve stem 36 below the nozzle 45. It should be noted that the flame adjusting arm is limited in its rotational movement by the stops 81 adjacent the opening 13 in the case A.

The flint holder casting is shown attached to the mounting base 79 by means of the screw 82. Referring to FIG. 8, an upstanding flint holder 83 is shown on the end of the flint holder casting 77. The flint is inserted into the slot 84 and held under tension against the flint wheel by means of the flint spring 85. Referring again to FIG. 11, it will be seen that the flint spring 85 is biased at its lower end against the stop 76, and the upper free end bears against the flint 88 in the slot 84. The flint spring 85 is held in position by an upstanding post 86 formed on the storage tank cover 21 and is maintained in place by a rivet head 87.

FIGURE 8 shows a rear elevational view of the lighter mechanism and fuel chamber. The main lever 80 and its mounting on the main lever pin 89 is also illustrated. The main lever pin 89 extends through openings in two portions of the storage tank D. The pin 89 is somewhat elongated and the free ends thereof extend beyond the openings in the storage tank D.

The upper end of the main lever 80 has an opening 90 therein through which extends the depending tail 49 of the lifting fork 46. Immediately below the main lever opening 90 is a wear strip 91 which is held against the main lever by means of the screw 92. The upper end of the wear strip 91 engages with the depending tail 49 and raises the lifting fork when the main lever 80 is forced inwardly at the lower edge. The upper end of the main lever 80 then pivots outwardly and the wear strip 91 lifts the lifting fork 46. This operation is shown in dotted outline in FIGURE 2. When the lifting fork 46 is raised it bears against the flame adjusting arm 43 and raises the valve stem 36 upwardly as shown in dotted outline. As indicated earlier, this releases the pressure on the sealing disk 34 and permits the vaporized gas to escape through the opening in the nozzle 45.

Inward movement of the lower edge of the main lever 80 pivots its uppermost end 93 outwardly into engagement with the cam plate 69. This causes the clockwise rotation of the flint wheel actuating arm 68. This rotation engages the gear teeth 71 with the flint wheel actuating gear 61 and rotates the flint wheel in a counterclockwise direction. As the flint wheel 65 abrades the flint 88 it throws a shower of sparks over the nozzle 45 on the discharge valve B.

It will be seen that the inward movement of the lower end of the main lever 80 simultaneously opens the discharge valve and causes the shower of sparks to be thrown thereover. The escaping vaporized gas is ignited and a flame provided.

The wear strip 91 is adjustable along the main lever 80 as indicated in FIGURE 2. The tension spring 74 urges the flint wheel actuating arm 68 in a counterclockwise direction into abutment with the stop 76. This action also forces the main lever 80 to its normal position of extension.

The lever arrangement illustrated and described provides a postive action lighter, and the fast rotation of the flint wheel produces an abundance of sparks which easily ignite the escaping gas. It will be seen that the lever is maintained in its normal position until sufficient pressure is exerted to overcome the action of the lifting fork 46, and this provides a "snap" action to rotate the flint wheel.

The lighter is held in position within the case A by means of the locating plate 94. The locating plate 94 is positioned on the top surface of the storage tank cover 21 beneath the screws 95. The screws 95 are threadably engaged in the opening 96 in the storage tank D, as shown in FIGURE 9. The storage tank cover 21 is secured very tightly against the storage tank D by means of screws 95. This deforms the O-ring gasket 98 and

establishes a gas tight fit between the cover 21 and the storage tank D.

The lighter mechanism is removable from the case A by removing the screw 15, pressing inwardly and upwardly on the lighter mechanism with the main lever 80 depressed.

This invention provides a convenient and compact pyrophoric lighter, and the scope of the invention should not be limited by the embodiment described but rather should be construed in the light of the following claims.

We claim:

1. A butane cigarette lighter comprising a fuel tank; a hollow cylindrical well depending into said tank; a valve stem rotatably disposed in the top of said well, the lower end thereof having a transverse slot; an adjusting nut of substantially the same diameter as said valve stem threadably secured to the bottom of said well having a tongue on its upper end to engage the slot of said valve stem forming a juncture therewith the adjustable nut further having a hollowed center for passing gas therethrough; an adjusting arm integrally joined to said valve stem for rotating the stem with said adjusting nut along the threads securing the latter to said well; a pair of gaskets disposed respectively above and below the juncture of said valve stem and adjusting nut for sealing the juncture; a wick positioned in contact with the bottom of said adjusting nut; and means to secure and urge said wick compressibly against the bottom of said adjusting nut to meter fuel absorbed by said wick.

2. A butane cigarette lighter comprising a housing; a covered fuel tank recessed within a portion of said housing; a cylindrical well depending into said fuel tank; an absorbent wick extending through the lower end of said well having free ends disposed in the tank for absorbing fuel; a metering valve disposed in said well, one end thereof in compressible contact with said wick, the opposite end protruding above said tank forming a discharging orifice, said valve being threaded to the inner surface of said well for rotatable and vertical movement therein; an adjusting arm integrally joined to the protruding end of said valve for rotating and moving said valve vertically; a resilient member and a spherical member disposed at the bottom of said well below said wick for urging the wick into compressible contact with the bottom of said valve; a lifting fork pivotally mounted on said tank and joined to said valve adjacent to said adjusting arm for lifting said valve upward; pyrophoric means disposed on the cover of said tank adjacent the protruding end of said valve; a partially rotatable actuating arm positioned horizontally over the cover of said tank, one end pivoted thereto and the opposite end having a plurality of teeth for contact with and actuating said pyrophoric means upon rotation of said actuating arm, the actuating arm having a cam depending therefrom; and a main lever substantially vertically disposed and pivoted to the side of said tank, the upper end thereof simultaneously actuating said lifting fork to move said valve up and moving said cam to actuate said pyrophoric means upon moving said lever.

3. A cigarette lighter fueled by pressurized butane comprising in combination; an adjustable discharge valve having first valve means slideable in a vertical direction and second valve means rotatable for vertical movement being joined to the bottom of the first valve means; valve pin means slideable vertically within the second valve means of said discharge valve; an absorbent wick compressibly communicating with the bottom of said discharge valve for passing fuel thereinto; a resilient member and a spherical member symmetrically disposed below said wick for urging the latter into compressible communication with said discharge valve; means for lifting the first valve means of said discharge valve away from the second valve means thereof for allowing said pin means to move vertically within the second valve means permitting gas to pass through said discharge valve; an adjustable arm integrally joined to the upper portion of said discharge valve for rotating the same and moving said second valve means away from and in the direction of said wick, resilient member and spherical member thereby increasing and decreasing the compressible contact between said discharge valve and wick to meter a specific quantity of gas flowing into the discharge valve; pyrophoric means horizontally disposed over the top of said lighter to ignite gas escaping from said discharge valve; and a main actuating lever the center thereof pivotally secured to said tank to provide movement of the upper end to simultaneously engage said lifting means and pyrophoric means.

4. A butane cigarette lighter having a vertically disposed well depending into the body of said lighter; a spherical member seated in the bottom of said well; a resilient disc and an absorbent wick disposed symmetrically immediately above said spherical member for compressible engagement therewith; a substantially hollow adjusting nut above said wick threadably secured to the lower portion of said well to provide vertical movement therein for compressing said wick against said resilient disc and spherical member; the upper edge of said nut having an upwardly extending tongue and the bottom portion having an orifice therein; a valve pin of substantially the same length as said nut seated for vertically slideable movement therein; a resilient sealing member disposed in the bottom of said nut over the orifice thereof for seating said valve pin; a valve stem disposed in said well over said adjusting nut having slot means engaging the top of said valve pin and the tongue of said adjusting nut for contiguous rotation with the latter; spring means for urging said valve stem into engagement with said adjusting nut; lifting means joined to the top of said well for moving said valve stem in an upward direction against the action of said spring means and away from said nut and valve pin thereby allowing the valve pin to move vertically within said nut for releasing said sealing member from its position over the orifice in the bottom portion of said nut.

5. A cigarette lighter comprising a housing; a covered fuel tank recessed within said housing; a discharge valve disposed in said tank with the discharge end extending above said fuel tank; rotatable pyrophoric means disposed horizontally over said tank in spaced relationship with the discharge end of said valve; a lifting fork having one end pivotally secured to the top of said tank and the opposite end being free, said fork being joined to the discharge end of said valve adjacent to the pivotal end of the fork for moving the valve upon pivotal movement of the fork; a four sided horizontally disposed actuating arm having one side pivotally secured to the top of said tank, the opposite side having a plurality of teeth for rotating said pyrophoric means upon the pivotal movement of said actuating arm, said arm having a cam depending from the side from which the arm is pivotally secured to said tank; a main lever centrally secured to the side of the tank for pivotal movement, the upper end thereof upon such pivotal movement simultaneously engaging the free end of the lifting fork for moving said valve and the depending cam of said actuating arm for actuating said pyrophoric means by the pivotal action of said actuating arm.

6. A butane cigarette lighter comprising in combination; a tank; a well vertically disposed in said tank having a conical bottom surface; first valve means disposed in the lower section of the well having a sphere seated in the conical bottom surface thereof, a resilient disc, a wick and a hollow member with a flanged upper surface respectively disposed symmetrically above the sphere, the hollow member threadably secured to the well for rotatable movement toward and away from compressible

contact with the wick, resilient member and sphere; second valve means disposed in the upper portion of said well for vertical and rotatable movement therein, the lower surface of the second valve means secured to the flange of said first valve means for imparting a rotating movement to the latter; an adjustable arm integral with the upper end of said second valve means for imparting a rotatable movement to the first and second valve means; a lifting fork having one end pivotally secured to the top of said tank, the opposite end being free, said fork joined to the upper end of said second valve means for moving the same; and a main lever pivotally secured to the side of the tank, one end of the lever engaging the free end of the lifting fork for moving the fork and said second valve means.

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