Sept. 27, 1949. R. E. PETERSON 2,482,794

PORTABLE LIGHTER AND THE LIKE

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Fig. 1.

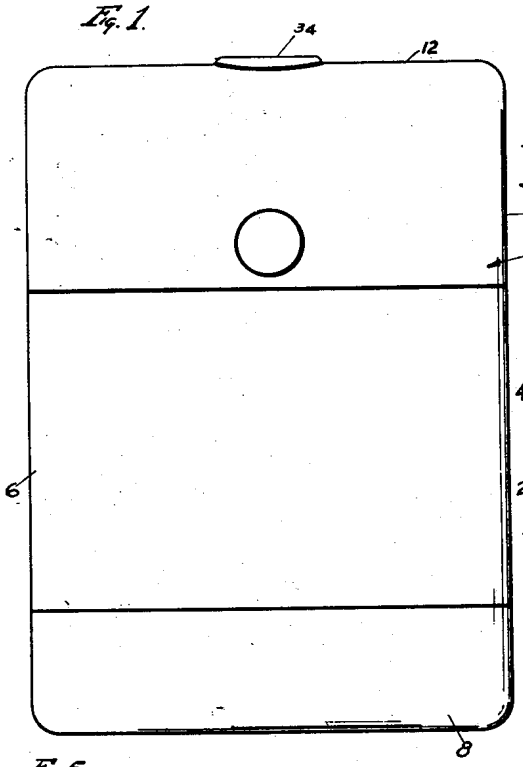


Fig. 2.

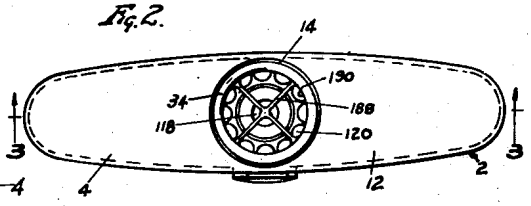


Fig. 3.

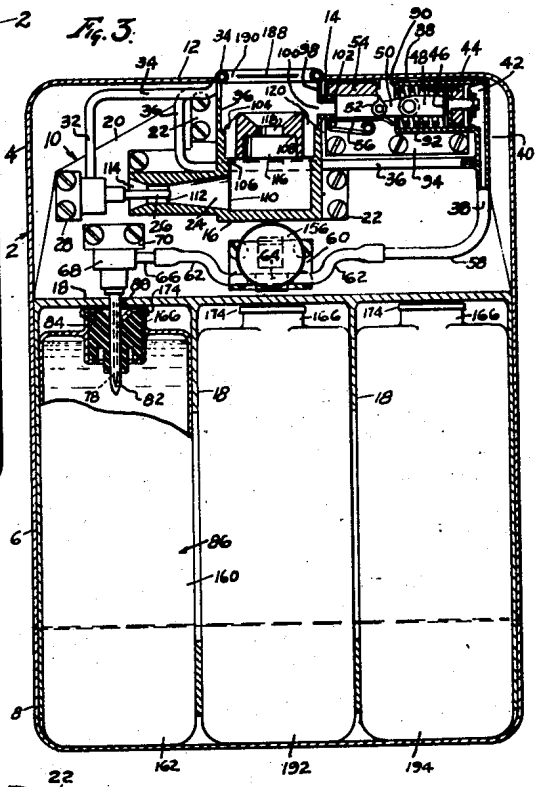


Fig. 5.

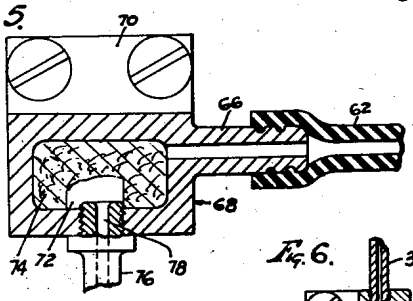


Fig. 6.

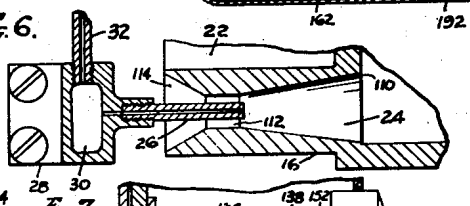


Fig. 4.

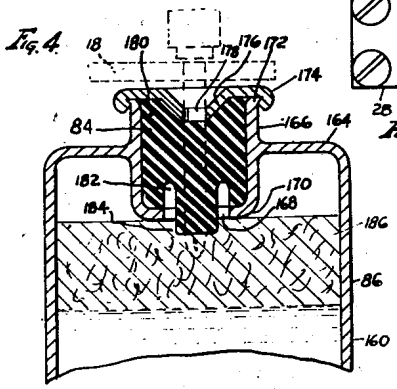


Fig. 7.

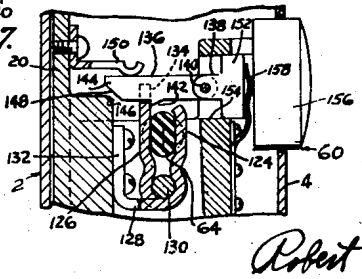
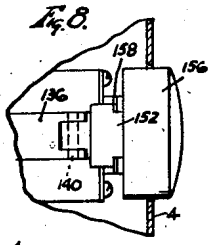


Fig. 8.



INVENTOR

Robert E. Peterson

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PORTABLE LIGHTER AND THE LIKE

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Fig. 10.

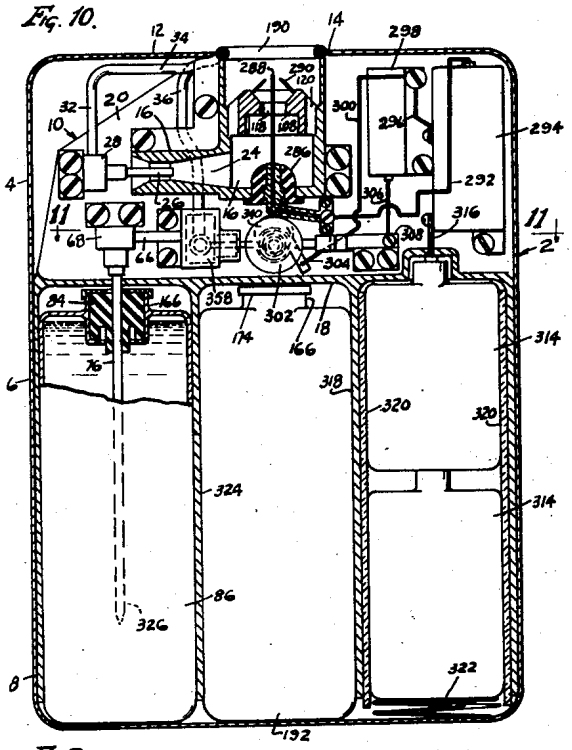


Fig. 11.

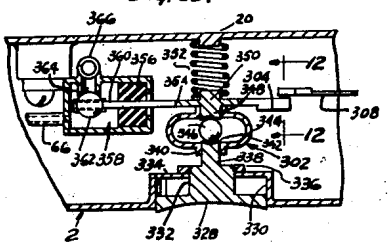


Fig. 12.

Fig. 13.

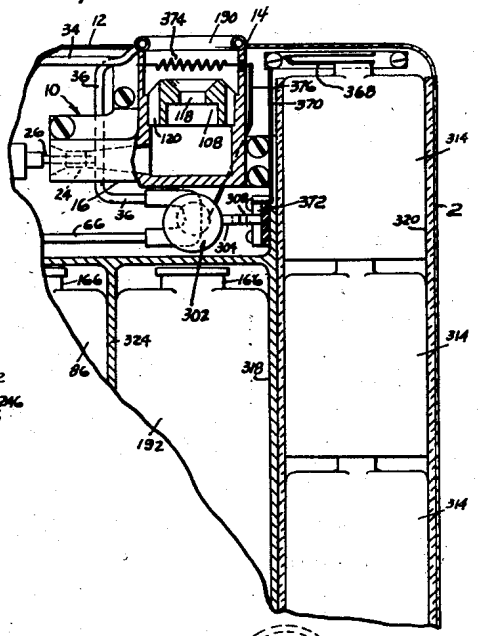


Fig. 9.

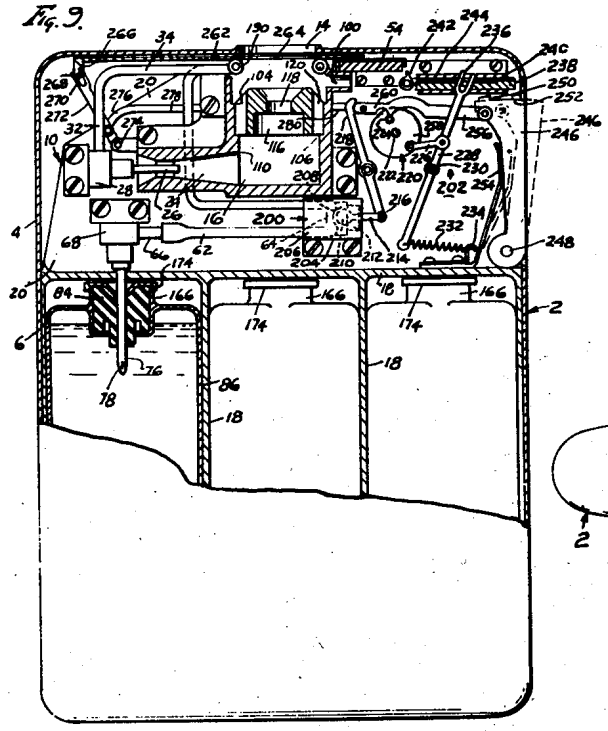
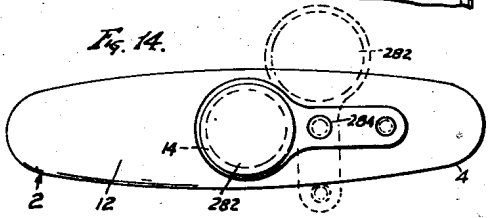


Fig. 14.



INVENTOR

Robert E. Peterson.

Patented Sept. 27, 1949 2,482,794

UNITED STATES PATENT OFFICE

2,482,794

PORTABLE LIGHTER AND THE LIKE

Robert E. Peterson, Los Angeles, Calif., assignor to Repeter Products, Inc., Long Island City, N. Y., a corporation of New York

Application September 12, 1944, Serial No. 553,701

21 Claims. (Cl. 67—7)

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My invention relates to portable lighters.

The principal object of my invention is to provide a lighter which is self-contained and which is capable of igniting and staying lit in strong draughts.

A further object of my invention is to provide a lighter mechanism which is of simple construction, comprising easily replaceable parts, including a valve so constructed as to control the volume of gas flowing from the gas container to the burner to provide a flame which will burn for a predetermined period of time.

Another object of my invention is to provide a lighter equipped with a Venturi-like carbureting device whereby an efficient mixture of air and fuel may flow into the burner.

Still another object of my invention is to provide an ignition system for the lighter including a set of dry cell batteries and a catalytic agent connected thereto, a switch being so associated with the valve which controls the passage of gas into the burner as to cause current to flow from the batteries to the catalytic agent when the valve is opened, thereby heating the catalyst sufficiently to ignite the gases in the burner.

A further object of my invention is to provide an electric ignition system for the lighter including one or more batteries, an induction coil and a condenser actuated by means of this ignition system, energization of the circuit being by a switch which is closed when the fuel valve is opened, thus providing a hot spark in the burner for ignition as the gas is passing therethrough.

A still further object of my invention is to provide a lighter with a pressure operated striker mounted in close proximity to a spark producing element located adjacent the burner so that when the pressure of gas is released from the container by the action of the valve, the forward movement of a piston causes the striker to engage the spark producing element, thereby igniting the gases passing through the burner.

Another object of my invention is to provide a catalyzer in the burner which may be heated by other means than an electric current passing therethrough, for igniting the gas in the burner while the catalyst is exposed to the flow of the gas.

A further object of my invention is to provide the lighter with several gas containers which are interchangeable whenever the gas is exhausted from the active container.

Other objects and advantages of my invention as will hereinafter more fully appear, I attain

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by the construction herein shown in the drawings and described in the specification forming a part of my application.

Reference is had to the accompanying drawings, in which the similar reference characters denote the similar parts.

In the drawings:

Fig. 1 is a front elevational view of the lighter showing the construction of the outside case housing.

Fig. 2 is a top view of the lighter, showing the position of the burner outlet having the cover removed.

Fig. 3 is a vertical sectional and partly elevational view of the lighter, showing the position of the inflammable gas containers in relation to the operating mechanism of the lighter, taken on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged fragmentary and sectional view of the gas container, showing the construction of the neck member of a gas container and the position of the filtering means therein.

Fig. 5 is an enlarged sectional view of the container drain connection, showing in part the position of a puncturing needle disposed within its housing and also showing the filtering element within the housing well.

Fig. 6 shows the relative positions of the gas fluid inlet connection in relation to the Venturi-like carbureting device, showing same as a fragmentary sectional view slightly enlarged.

Fig. 7 shows an enlarged fragmentary and sectional and partly elevational view of the valve means, showing its push button connection and its plunger in relation to the gas conduit connection.

Fig. 8 is a fragmentary top view of the valve means showing the position of its retractable element.

Fig. 9 is a vertically sectional and partly elevational view of the lighter, showing the gas igniting apparatus in a modified form.

Fig. 10 is a vertically sectional and partly elevational view of the lighter, showing the application of dry cell batteries, an ignition coil and a condenser and means for igniting the gases in the burner.

Fig. 11 is a fragmentary and horizontally sectional view of the valve means, taken on the line 11—11 of Fig. 10.

Fig. 12 is a vertically sectional view of the switch point contact elements, taken on the line 12—12 of Fig. 11.

Fig. 13 is a fragmentary sectional view of the

lighter showing same in its modified form, wherein the dry cell batteries and a catalyst ignition means for igniting the gases in the burner member are used.

Fig. 14 is the top view of the lighter, showing the cover in position and over the burner member thereof.

Describing my invention more in detail, the lighter comprises a housing 2 (Fig. 3) having a top section 4, a middle section 6 and a bottom section 8, the bottom section 8 and top section 4 being removable so that the lighter igniting apparatus generally indicated at 10 may be assembled, replaced, or reconditioned as is necessary or desirable.

The top section 4 at its top edge 12 is provided with a mouth opening 14 which provides a passage for gases from a burner 16. Sections 6 and 8 of the housing have partitions 18 disposed therein which provide compartments adapted to house essential parts of the lighter.

Also within the case 2 a suitable mounting bracket 20 is disposed within housing section 4 and comprises an integral part of the upper portion of partition 18; all the operating parts of the lighter apparatus 10 being mounted on this partition.

Burner 16 is held in place on bracket 20 by means of brackets 22 and has a Venturi-like carbureting device 24 extending therefrom, a conduit needle 26 being held in position in the Venturi tube by a bracket 28. Needle 26 is connected to an accumulator chamber 30 supported by a bracket 28, the upper section of the chamber being connected to a conduit 32.

Conduit 32 connects with an auxiliary pipe 34 which first extends upwardly then forms a circular ring that overlies the edge of mouth opening 14 then continues downwardly as at 36 to connect with a gas inlet pipe 38.

The upper end 40 of gas inlet pipe 38 is connected to the closed end of a cylinder 42 wherein a piston 44 is slidably positioned. One end 46 of piston 44 has connected thereto and extending therefrom a rod 48 on the free end of which a striker bar 50 is pivotally mounted. This bar in turn pivotally supports a striker 52 whose extremity is disposed adjacent the surface of a cerium element 54. A spring 56, having one end fastened to bracket 20 and its other end pressing against the bottom of bar 50, forces the bar upwardly and accordingly holds striker 56 against the cerium element 54 during the reciprocal action of piston 44 within cylinder 42 to create a shower of sparks when the striker moves to the left.

The lower end 58 of inlet pipe 38 is connected to a valve 60 by a resilient tube 62, the center section 64 of which passes through valve 60 and has its extended end connected by a nipple 66 to a gas drain 68.

Gas drain 68 is supported by a bracket 70 secured to bracket 20 and is provided with a well 72 (Fig. 5) wherein a filter 74 is placed. Threaded into the bottom of drain 68 is a needle 76 in the nature of a hypodermic needle, provided with a passage 78 extending downwardly through partition 18, as shown at 80 in Fig. 3. The end 82 of needle 76 extends through a sealing element 84 set into the neck of a gas container 86 designed to retain liquefied gas, e. g. propane, at a pressure of approximately 150 pounds.

In order to contain the reciprocal movement of piston 44 within cylinder 42 during the operation of the lighter, the cylinder is provided at its front end 88 with an inwardly extending flange 90, forming a seat for one end of a spring 92. The other end of this spring bears against surface 46 of piston 44. A bracket 94 fastened to mounting bracket 20 supports cylinder 42 in proper operative position.

Burner 16 comprises a casing 96 which may, if so desired, be cylindrical in shape, the upper section 98 of the burner being positioned at the mouth opening 14 of housing 2 below the ring formed by the auxiliary pipe 34, a passage 100 into the burner being provided as shown in Figs. 3 and 9.

This passage 100 receives a tubular extension member 102, which extends outwardly of casing 96 and over the edge section of cerium element 54, thus to direct the sparks from the cerium element into casing 96 of the burner when striker 52 is operated.

Also, casing 96 is provided with a shoulder 104 and a supporting edge 106 for supporting a burner jet 108 in proper operative position, slightly below spark passage 100 and above the discharge end 110 of carbureting device 24.

It may be noted that conduit needle 26 is disposed within the throat section 112 of the Venturi tube. Carbureting device 24 has a slightly enlarged intake opening 114 to provide free passage of air into the mixing chamber for mixture with the fuel, thus to provide a readily combustible mixture during the operation of the lighter.

It may also be noted that the burner jet 108 has a gas and air mixing chamber 116, having a central outlet 118 and also a plurality of gas passages 120 which together accommodate the flow of gases passing through the jet. This particular construction of the burner and carbureting device 24 advantageously maintains the gas flame produced at proper intensity with the result that the flame is not extinguished by strong draughts directed into the mouth opening 14 of the burner.

In order to regulate passage of high pressure fuel through valve 60, resilient section 64 of tubing 62 is held and maintained between a pair of clamping members 124 and 126 (Fig. 7). These clamping members comprise a yoke straddling a pin 130 suitably mounted in the body of valve 60, and are preferably integral with an extending arm 132 which is fastened to bracket 20.

Clamping member 124 is preferably held stationary while member 126 is flexible, is slightly longer and extends upwardly with its free end provided with a suitable notch 134, or the like, adapted to hold therein a tripper bar 136.

Tripper bar 136 of valve 60 is hingedly mounted on a valve boss projection 138, being held in place thereon by a pin 140. Tripper bar 136 is provided with a downwardly extending tripper lug 142 adapted to engage the end of clamping member 126, the end 144 of the tripper bar extending rearwardly toward a cam 146 against which the inclined end 148 of the tripper bar is adapted to engage. To hold the tripper bar in proper operative position, a hold-down spring 150 is so fastened to bracket 20 as to press downwardly on the tripper bar.

The tripper bar is held in position by a boss or plunger 152 slidably mounted within a socket 154 formed in the body of valve 60 between clamping member 126 and a leaf spring 158 fastened to the valve body. A manually operable valve button 156 is slidably carried by housing 4 on the other side of spring 158 for operating plunger 152 and accordingly tripper bar 136 when pressed inwardly of the housing.

Gas container 86 comprises an elongated cartridge 160 sealed at its bottom 62 and having at its top section 164 (Fig. 4) a neck 166 which protrudes into the cartridge. The bottom of neck 166 is in the form of a passage 168 having an inwardly bent edge 170.

The top edge section 172 of the neck 166 is flared downwardly, as shown, to hold in sealing engagement a flanged enclosing cap 174. This cap has a downwardly bent frusto-conical section 176 provided with a needle passage 178 which serves as a guide when needle 76 is forced into position upon installation of the gas container.

Within neck 166 is placed seal 180 which is of a resilient material provided at its bottom section with a recess 182 and a center extension 184, thus providing a seal for needle 76 when the needle extends therethrough.

Also, within cartridge 160 and in close proximity to neck 166 is a filter 186 which prevents the flow of solid fluid from the cartridge and which expedites the gasification of the liquefied gas before it passes into needle opening 78, particularly when container 86 is in any other but upright position.

In order to prevent other solid matter from falling into or being deposited within casing 96 of burner 16, grid 188 (Figs. 2 and 3) is provided at mouth section 14 within the passage formed by ring 190 of auxiliary pipe or tubing 34.

In operation, when valve 60 is opened by pressing button 156, a quantity of inflammable gas is released into tubing 38. Only a predetermined quantity of gas is released, however, because at the end of the valve stroke, tripper 136 is raised by cam 146, thus releasing the end 134 of clamping member 126 which accordingly reengages tube 64, thus closing the tube to interrupt the flow of gas therethrough.

In this manner a measured quantity of gas is released which flows through pipe 38 into tubes 36 and 40.

From tube 40 the gas passes into cylinder 42 causing the piston 44 to move rapidly to the left. Because of the upward pressure imposed upon rod 50 by spring 56, striker 52 is caused to engage frictionally with the surface of cerium member 54. The sparks thereby produced are directed into passage 100 and thence into burner 16.

At the same time, gas passing through tube 36 flows into and through the ring 190 and thence into tube 34 and well 30. From well 30 the gas flows through conduit 26 and from this conduit, together with a quantity of air, into carbureting device 24, finally passing through jet 108 into the top section of burner 16 where it is ignited by sparks produced by striker 52, as hereinbefore described.

The ignited gases cause ring 190 to become heated, causing an expansion of the gases therein. In addition, the gas which at first flowed into cylinder 42 is forced therefrom as the piston retracts under the bias of spring 92 into pipe 36 and thence into ring 190. By restricting the passage into gas conduit 36 only a limited quantity of gas can pass therethrough; hence only a limited amount of gas is burned within burner 16 wherein it will normally burn for three to four seconds. Repeated actuations of valve 60 of course permit release of additional gas from container 86 if a longer burning period is desired.

When gas is exhausted from the active container 86 bottom section 8 of housing 2 may be removed to permit the exhausted container to be removed. The exhausted container may then be

readily replaced by either one of the auxiliary containers 192 or 194 by forcing such auxiliary container upwardly until needle 76 punctures and extends through sealing member 84, as described hereinbefore.

It will also be noted that needle 76 may, if so desired, be longer, as shown in Figure 10, in which case filter 186 may be omitted. I have found that the filter 74 when placed and maintained within well 72 of the gas drain 68, as shown in Figure 5, is quite sufficient for the purpose herein required.

It may also be noted that gas containers 86, 192 and 194 may be charged and sealed in any manner most desirable in practice and may then be distributed for the users of the lighter.

In Figure 9 I have shown the lighter in a modified form, particularly with respect to the valve 200 and actuating mechanism 202 which produces the spark by which the gases in burner 16 are ignited.

Valve 200 comprises a housing 204, having a suitable holder 206 adapted to hold a section of the resilient gas tube 64 in place, holder 206 being mounted upon mounting bracket 20 as shown.

In holder 206 a suitable passage 208 is provided for a ball or roller shaped restrictor 210 which is adapted to bear against and compress resilient tubing 64 for restricting the gas passage therethrough.

Restrictor 210 is held in place by means of a suitable resilient plug 212 through which an extension rod 214 protrudes. The end of this rod is pivotally connected to a pivoted lever 216 which is mounted on a suitable pin, as shown, and which has a hook 218 on the end thereof for a purpose which will be described hereinafter.

In close proximity to lever 216, a tripping wheel 220 is mounted on a center pin 222, wheel 220 being provided with a tripping pin 224 at one side thereof. On the diammetrically opposite side of the wheel a connecting lever 226 is pivotally mounted and is connected to a striker actuating lever 228 mounted on a pivot pin 230. The lower end of lever 228 has fastened thereto one end of a retractable spring 232, the other end of which is connected to a spring hook 234. The upper end of lever 228 is provided with a yoke 236 adapted to embrace a pin fastened to a striker bar 238.

Striker bar 238 is slidably mounted within a frame 240 which is held in its position on bracket 20 by means of a set of screws, the front section of bar 238 being provided with a striker 242 which is pivotally mounted on a spring bar 244 fastened to bar 238. Bar 244, being resilient, holds the upwardly extending point of striker 242 against the surface of cerium member 54, thereby holding the striker in its operative position during the operation of the spark producing apparatus.

In order to actuate the spark producing apparatus, a finger piece 246 is provided, the finger piece being pivotally mounted on a pivot pin 248, and having a stop 250 on its upper end 252. A spring 254 biases the finger piece toward its rest or broken line position.

Finger piece 246 has pivotally connected thereto a cross lever 256 which has formed therein a catch groove 258 adapted to engage tripping pin 224. The extended end 260 of lever 256 normally engages under hook 218 of lever 216. When lever 216 is moved to the limit of its counterclockwise movement by inward movement of finger piece 246, its lever 256 has been moved inwardly a sufficient amount for its catch groove 258 to have overridden pin 224. Thereupon lever 228 be-

comes free and is pulled back by means of spring 232. This causes striker end 242 to engage the surface of cerium member 54, thereby providing a stream of sparks which are directed into passage 100 and burner 16.

In order to prevent any foreign matter from entering and accumulating in burner 16, a lid or cover 262 is slidably mounted beneath the top section 4 of housing 2 below mouth 14.

This slidable cover 262 has an opening 264 and an extension end 266, provided with an eyelet or pivoting connection 268, to which is connected a yoke 270, formed on the end of a lid lever 272. Lever 272 is pivoted on a pivot pin 274 secured to mounting bracket 20.

One end 276 of an extension rod 278 is pivotally connected to lever 272 adjacent its pivot 274, the other end 280 of the rod being attached to the end 260 of cross lever 256. Thus when the finger piece 246 is pressed counterclockwise, causing lever 228 to actuate the spark-producing members 242 and 54, opening 264 of cover 262 is moved into a position over the mouth of burner 16 to permit passage of the ignited gas therefrom. When finger piece 246 is released, its spring 254 rocks it clockwise, and through the connection afforded by levers 256, 278 and 272, moves cover 262 to its closed position, thus closing the burner passage and mouth 14.

To provide a secondary closure for the burner opening and mouth 14, top section 4 of housing case 2 is provided with a manually actuated lid 282 as shown in Figure 14, pivotally mounted on top 4 as by a pin 284, and held in its closed position by a detent on the top of housing 2.

In Figures 10, 11 and 12 is shown another form of my lighter, wherein burner 16 is provided with an insulating plug 286 adapted to support a wire 288, the end of which protrudes through jet passage 118, and the point of which is disclosed in close proximity to a set of spark conductors 290.

Hot wire 288 is connected by means of a high tension wire 292 to an induction coil 294, one side of which is connected by a lead 296 to a condenser 298 grounded as by a lead 300. Wire 300 also electrically connects the condenser to one side 304 of the combined valve and switch 302.

Condenser 298 is also connected by means of a lead 306 to the other terminal 308 of switch 302. The two switch terminals 304 and 308, respectively, have contact points 305 and 309, insulated as at 310 and 312, respectively (Figure 12).

These contact points are angularly faced, are normally juxtaposed, as shown, and are resiliently mounted so that during the reciprocal action of valve 302, contact points 304 and 308 enage while passing one another in one direction and slide over each other and then spring back into their normal positions. Upon the return or closing action of valve 302, the opposite sides of the contact points engage and slide past one another at their insulated portions 310 and 312, and thereafter assume their original normal positions shown.

In this manner, and during the operation of valve 302, contact points 304 and 308 make and break the electric current passing from batteries 314 through induction coil 294 and condenser 298, thus to provide a hot spark between points 290 and the end of wire 288 to ignite the gases passing into and through burner 16.

Batteries 314 are connected by means of a lead wire 316 to induction coil 294, and are insulated within the case by means of a suitable insulating sleeve 320. A pressure spring 322 supports the batteries in place, and also provides a ground connection for the electric system described.

As shown in Figure 10, housing 2 is provided with a partition 324 which separates the auxiliary container 192 from the active container 86, which is held in proper condition, as hereinbefore described, and as shown in Figure 3.

It may be noted that needle conduit 76 may be made quite long, if so desired (see Figure 10), so that its point 326 may reach to any desired depth of the liquefied gas contained within active container 86.

The combined valve and switch 302 comprises a button section 328 which is mounted within a socket 330 formed in housing 2, and which has a stem 332 passing through a socket wall 334 with respect to which it is held in place by a nut 36.

Stem 332 (Figure 11) is provided with an extension 338 disposed within a guide ring 340 of a control guard 342 terminating in a ball socket 344.

Control guard 342 is circular in cross section and is provided with a ball 346 which is permitted to roll therein at will, unless it lies at the bottom section of the guard and directly in line with a valve ball socket 348. Socket 348 is formed at the end of a stem 350, the end of which is received and supported in position by one end of a spring 352, the other end of the spring being supported by a boss formed in one side of bracket 20.

Stem 350 is provided at one of its sides with an extension which forms a resilient mount for contact point 305, the opposite side of the stem having extending therefrom a valve rod 354. This rod passes into and through a resilient packing and fulcrum member 356 mounted within a valve housing 358, the rod terminating in a rod end 360 upon which a valve ball 362 is loosely mounted. The surface of ball 362 normally closes the outlet passage 364 of the gas tube connection 366 which leads into tube ring 190 (Figure 10) of the lighter.

The gas inlet connection 66 (Figure 11) connects with valve housing 358, wherein the gas pressure forces ball 362 against the gas outlet passage 364. Thus when button 328 is pressed and while ball 362 is in its engaging position within guard 342 in line with ball sockets 344 and 348, the pressure imposed on stem 350 causes contact points 304 and 308 to slide into contact position to complete the circuit to electrode 288.

In pressing valve 302, stem 350 is moved backwardly compressing spring 352. The positional change of stem 350 causes rod extension 354 to pivot within resilient packing 356 to cause floating ball 362 to lift off the ball seat which comprises the end of outlet passage 364. When finger piece 328 is released, spring 352 forces stem 350 into its normal position, thus pivoting extension 354 clockwise to reseat ball 362 and close off outlet passage 364.

When ball 362 is thus raised, to open passage 364, gaseous fluid is allowed to pass from inlet tube 66 into valve housing 358 and then pass into outlet passage 364 through which it flows to jet 108 of burner 16 for ignition.

In Figure 13, which is a slight modification of the structure shown in Figure 10, any suitable construction of valve 302 may be used, having, however, a set of contact points 304 and 308, as heretofore described.

In this assembly, however, a set of dry cell batteries 314 are used, electrically engaging a contact plate 368 from which extends a lead wire 370 connecting the batteries to a switch terminal 372 connected to contact member 308.

Within burner 16 is a platinum or palladium catalyst 374 which may be mounted therein in any manner most desirable in practice. One side of catalyst 374 is grounded, while its other side is connected by a lead 376 to contact member 304. Thus when contact members 304 and 308 of switch 302 are relatively moved, as described, a circuit through the catalyst is completed, and the catalyst is heated sufficiently to ignite the gases passing through burner 16.

It may now be seen that the lighter herein described and in either form or construction may be used not only for providing a light for cigarettes and cigars but it also may be used for pipe lighting or for providing a torch flame for any other purpose.

While I have thus described my invention with great particularity, it will be clear that the same may be modified throughout a wide range. I accordingly do not propose to be limited to the exact details of construction herein shown on the drawings and described in the specification, but reserve the rights in practice to make the necessary changes and modifications therein which may come within the scope of the appended claims.

I claim:

1. In a portable lighter, the combination of, a casing, a partition in said casing forming a pair of compartments therein, a cartridge of low boiling liquid fuel in one of said compartments, a valve, means connecting said cartridge and said valve for the flow of fuel from one to the other, a Venturi device including a fuel inlet and an air inlet, means connecting said valve with the fuel inlet for the flow of fuel from said valve to said venturi whereby when said valve is open to permit the passage of high pressure gaseous fuel said Venturi device draws air through said air inlet for combining with gaseous fuel drawn in through said fuel inlet, a mixing chamber connected to said Venturi device to receive therefrom and mix the fuel and air, a burner chamber in said casing located adjacent an opening therein and connected to said mixing chamber to receive therefrom and burn the air-fuel mixture, means operatively associated with said burner chamber for igniting the air-fuel mixture flowing thereto, a manually operable finger piece mounted in said casing, and means connecting said finger piece to said valve and to said igniting means for opening said valve and effecting the operation of said igniting means when said finger piece is operated.

2. A lighter as defined in claim 1, wherein the axes of said Venturi device and said mixing chamber are angularly related so that a turbulent condition of the air-fuel mixture flowing into said mixing chamber is created therein.

3. In a portable lighter, the combination of, a casing, and in said casing: a valve, a first fuel passageway connected to said valve, a carbureting device including a fuel inlet and an air inlet, a second fuel passageway connecting said valve with said fuel inlet, means to open said valve so that pressure fluid may flow through said fuel passageways and said carbureting device may draw air from said air inlet, a mixing chamber connected to said carbureting device to receive therefrom and mix the fuel and air, a burner chamber in said casing located adjacent an opening therein and connected to said mixing chamber to receive therefrom and burn the air-fuel mixture, and an air-fuel igniting assembly mounted in said casing and including a member in igniting relation to said burner chamber, said

assembly including: a manually operable finger piece having a portion accessible exteriorly of said casing and actuation transmitting mechanism operatively associated with said finger piece, with said valve opening means, and with said igniting assembly, whereby when said finger piece is operated said valve is opened and said igniting assembly is operated.

4. The invention of claim 3 wherein there is provided a compartment in said casing adapted to contain a low boiling liquid fuel, and means in said casing responsive to movement of said lighter from a substantially upright position to preclude the possibility of flow of liquid fuel from said compartment.

5. In a portable torch or the like, the combination of, a receptacle for a low boiling liquefied fuel which is maintained in its liquid form by reason of its own vapor pressure, said receptacle including an outlet fitting, a resilient sealing element in said fitting, fuel igniting and burning mechanism detachably associated with said receptacle, a conduit connecting said receptacle and said fuel burning mechanism, said conduit having at one end a hollow needle-like member adapted to be forced through said sealing element without materially damaging or displacing it from said fitting when said receptacle and said fuel igniting and burning mechanism are attached, a valve structure operatively associated with said conduit and being normally closed to preclude the flow of gaseous fuel therethrough but openable to permit flow therethrough, said fuel burning mechanism including a burner chamber, a carbureting assembly at the other end of said conduit for ejecting an air-fuel mixture into said burner chamber, and a manually operable transmission system for opening said valve and effecting operation of said fuel igniting mechanism to ignite the air-fuel mixture flowing into said burner chamber.

6. In a portable torch or the like, the combination of, a receptacle for a low boiling liquefied fuel which is maintained in its liquid form by reason of its own vapor pressure, said receptacle including an outlet fitting, a resilient sealing element in said fitting, igniting and burning mechanism detachably associated with said receptacle, a conduit connecting said receptacle and said fuel burning mechanism, said conduit having at one end a hollow needle-like member adapted to pierce and extend through said sealing element without materially damaging or displacing it from said fitting when said receptacle and said fuel igniting and burning mechanism are attached, a valve structure operatively associated with said conduit and being normally closed to preclude the flow of gaseous fuel therethrough but openable to permit flow therethrough, said valve structure including a length of resilient tubing which forms a part of said conduit and a clamping element which is biased normally to pinch said tubing closed, said fuel burning mechanism including a burner chamber, a carbureting device at the other end of said conduit arranged to inject an air-fuel mixture into said burner chamber, and a manually operable transmission system for opening said valve and effecting operation of said fuel igniting mechanism to ignite the air-fuel mixture flowing into said burner chamber.

7. Apparatus as defined in claim 3 wherein a restricted passageway is disposed between said mixing and burner chambers, said igniting mech-

anism being located adjacent the exit end of said passageway.

8. A device as described in claim 6 wherein the clamping element which forms part of the valve comprises a plunger-like member, and the means by which the plunger-like member is biased against the resilient tubing to hold the tubing closed comprises a resilient element in constant engagement with said plunger-like member as constantly to exert its bias on said plunger-like member to force said member toward its closed position.

9. A device as defined in claim 5, wherein said igniting mechanism includes a movable member adapted upon movement to engage a stationary element to produce a shower of sparks.

10. A device as defined in claim 3, wherein said igniting mechanism includes a movable member adapted upon movement to engage a stationary element to produce a shower of sparks, means connected to said movable member and responsive to the pressure of the gas when said valve is opened for moving said member, and conduit means connected to said valve and said fuel inlet connecting conduit and leading to said responsive means for actuating said responsive means when said valve is opened.

11. A device as defined in claim 3 wherein a movable closure for said casing opening is provided, and means connected to said closure and to said finger piece to open said closure when said finger piece is operated.

12. In a portable lighter, the combination of, a casing, a partition in said casing forming a pair of compartments therein, a cartridge of low boiling liquid fuel in one of said compartments, a valve, means connecting said cartridge and said valve for the flow of fuel from one to the other, a Venturi device including a fuel inlet and an air inlet, means connecting said valve with the fuel inlet for the flow of fuel from said valve to said Venturi whereby when said valve is open to permit the passage of high pressure gaseous fuel said Venturi device draws air through said air inlet for combining with gaseous fuel drawn in through said fuel inlet, a mixing chamber connected to said Venturi device to receive therefrom and mix the fuel and air, a burner chamber in said casing located adjacent an opening therein and connected to said mixing chamber to receive therefrom and burn the air-fuel mixture, means operatively associated with said burner chamber for igniting the air-fuel mixture flowing thereto, a manually operable finger piece mounted in said casing, means connecting said finger piece to said valve and to said igniting means for opening said valve and effecting the operation of said igniting means when said finger piece is operated, and means to preclude opening of said valve upon operation of said finger piece unless said lighter is in a substantially upright position.

13. Apparatus according to claim 3 wherein the conduit which connects the valve with said fuel inlet includes a portion positioned adjacent said burner chamber whereby the gas flowing through said conduit is preheated before flowing into said fuel inlet.

14. In a portable lighter, the combination of, a casing, a partition in said casing forming a pair of compartments therein, a cartridge of low boiling liquid fuel in one of said compartments, a valve, means connecting said cartridge and said valve for the flow of fuel from one to the other, a Venturi device including a fuel inlet and an

air inlet, means connecting said valve with the fuel inlet for the flow of fuel from said valve to said Venturi whereby when said valve is open to permit the passage of high pressure gaseous fuel said Venturi device draws air through said air inlet for combining with gaseous fuel drawn in through said fuel inlet, a mixing chamber connected to said Venturi device to receive therefrom and mix the fuel and air, a burner chamber in said casing located adjacent an opening therein and connected to said mixing chamber to receive therefrom and burn the air-fuel mixture, means operatively associated with said burner chamber for igniting the air-fuel mixture flowing thereto, a manually operable finger piece mounted in said casing, means connecting said finger piece to said valve and to said igniting means for opening said valve and effecting the operation of said igniting means when said finger piece is operated, and a movable closure for said casing opening.

15. In a portable torch or the like, the combination of, a casing adapted to receive a receptacle for a low boiling liquefied fuel which is maintained in its liquid form by reason of its own vapor pressure, igniting and burning mechanism in said casing, a conduit adapted to connect said fuel burning mechanism with a receptacle when the receptacle is mounted in the casing, said conduit having at one end a coupling member adapted to make communication between said conduit and such receptacle when such receptacle and said fuel igniting and burning mechanism are assembled in said casing, a valve structure operatively associated with said conduit and being normally closed to preclude the flow of gaseous fuel therethrough but openable to permit flow therethrough, said valve structure including a length of resilient tubing which forms a part of said conduit and a clamping element which is biased normally to pinch said tubing closed, said fuel burning mechanism including a burner chamber, a carbureting device at the other end of said conduit arranged to inject an air-fuel mixture into said burner chamber, and a manually operable transmission system for opening said valve and effecting operation of said fuel igniting mechanism to ignite the air-fuel mixture flowing into said burner chamber.

16. In a portable torch or the like, the combination of, a receptacle for a low boiling liquefied fuel which is maintained in its liquid form by reason of its own vapor pressure, means forming a combustion chamber detachably associated with said receptacle, a conduit connecting said receptacle and said combustion chamber, said conduit having at one end a coupling member adapted to make communication between said conduit and said receptacle when said receptacle and said combustion chamber are assembled, a valve structure operatively associated with said conduit and being normally closed to preclude the flow of gaseous fuel therethrough but openable to permit flow therethrough, said valve structure including a flexible member having an opening therethrough which forms a part of said conduit, and a closing element which is biased normally to close said opening, a carbureting device at the other end of said conduit arranged to inject an air-fuel mixture into said combustion chamber, and a manually operable transmission system for opening said valve.

17. A low-boiling-point fuel-burning apparatus of the character described including: a relatively high tensile strength container adapted to hold a quantity of low-boiling-point liquefied fuel

under its own vapor pressure; a fuel passageway communicating at one end with said container; a normally closed valve associated with said passageway blocking the flow of fuel therethrough; a valve opening mechanism associated with said valve, whereby the valve may be opened to permit fuel to flow therethrough and through said passageway; a carbureting device in communication with said passageway at its other end; an air supply communicating with said carbureting device; a mixing chamber on the discharge side of said carbureting device; a burner chamber communicating with said mixing chamber; an igniting mechanism operatively associated with said burner chamber, whereby the air-fuel mixture within the burner chamber may be ignited; an exteriorly accessible finger piece; and a transmission system extending from said finger piece to said igniting and valve opening mechanisms, whereby said finger piece is enabled to open said valve and ignite the air-fuel mixture.

18. In a portable lighter, the combination of, a casing, a compartment containing a low boiling liquid fuel in said casing, a valve, a first fuel passageway connecting said fuel compartment and said valve, a carbureting device including a fuel inlet and an air inlet, a second fuel passageway connecting said valve with said fuel inlet whereby when said valve is open pressure fluid flows through said fuel passageways and said carbureting device draws air from said air inlet, a mixing chamber connected to said carbureting device to receive therefrom and mix the fuel and air, a burner chamber in said casing located adjacent an opening therein and connected to said mixing chamber to receive therefrom and burn the air-fuel mixture, and an air-fuel igniting assembly mounted in said casing and including a member in igniting relation to said burner chamber, said assembly including: a manually

operable finger piece having a portion accessible exteriorly of said casing and actuation transmitting mechanism connecting said finger piece to said valve and to said igniting assembly, whereby when said finger piece is operated said valve is opened and said igniting assembly is operated, said igniting assembly comprising a circuit including as components a battery, a switch and said member.

19. A device as defined in claim 18, wherein said battery is releasably mounted in said casing, said circuit also including as components a condenser and an induction coil.

20. A device as defined in claim 18, wherein said battery is detachably mounted within said casing and said member comprises a resistance, said resistance and said switch being connected in series so that said resistance is energized when said switch is closed upon operation of said finger piece.

21. A device as defined in claim 3, wherein said fuel inlet and said air inlet are coaxial.

ROBERT E. PETERSON.

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