

June 11, 1963

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3,092,988

DISPOSABLE LIGHTER CONSTRUCTION

Filed Jan. 9, 1962

3 Sheets-Sheet 1

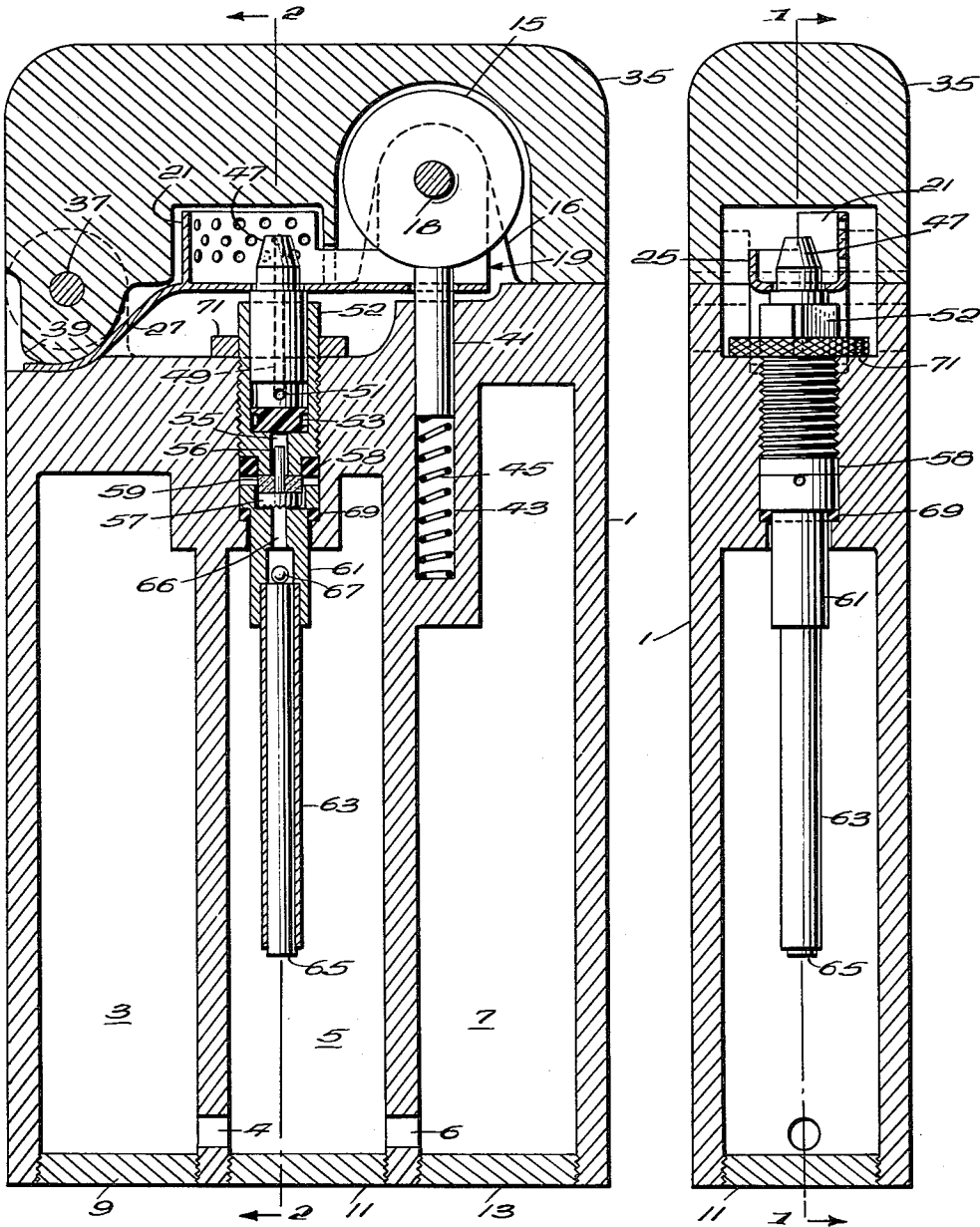


Fig. 1.

Fig. 2. INVENTOR
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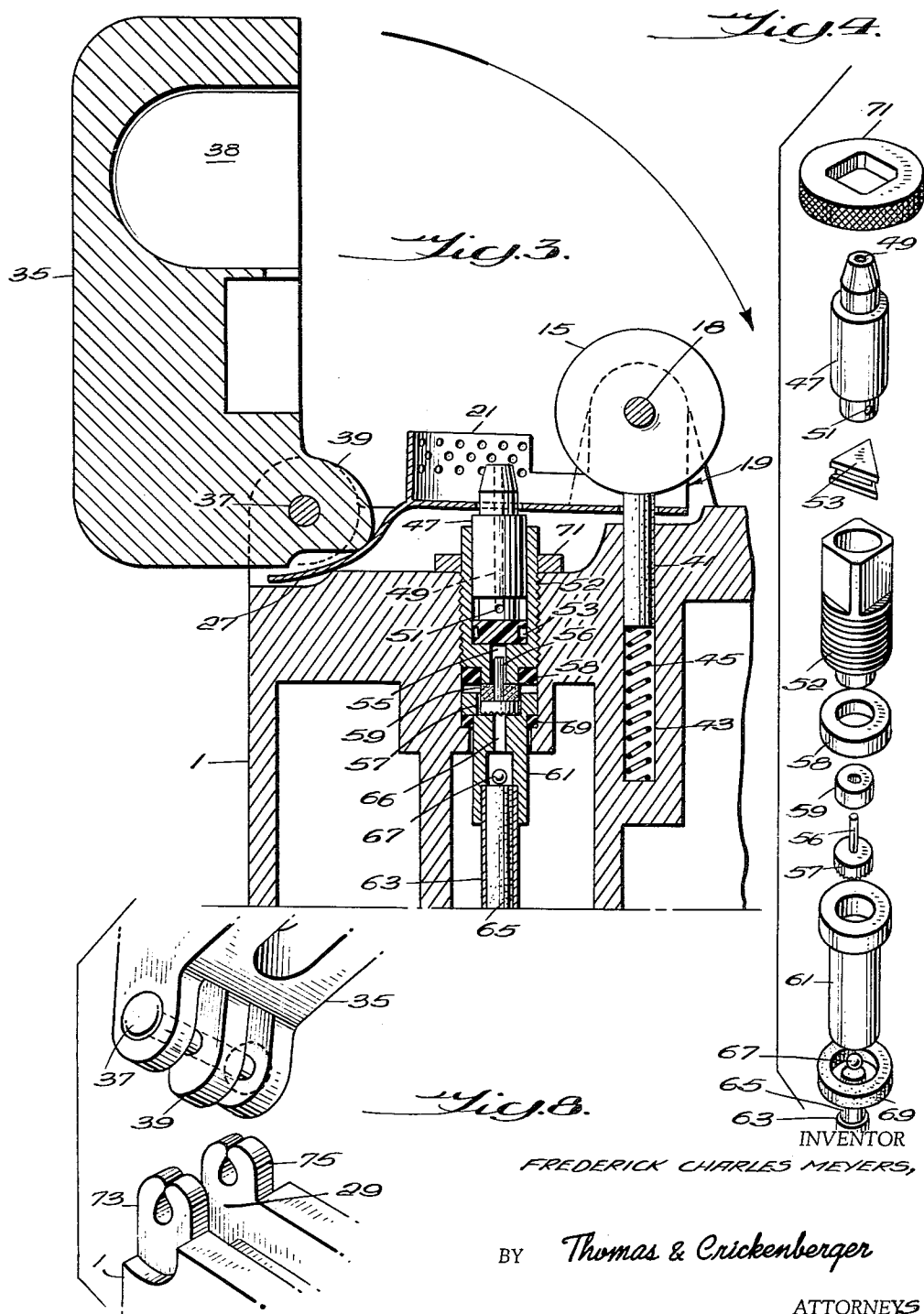
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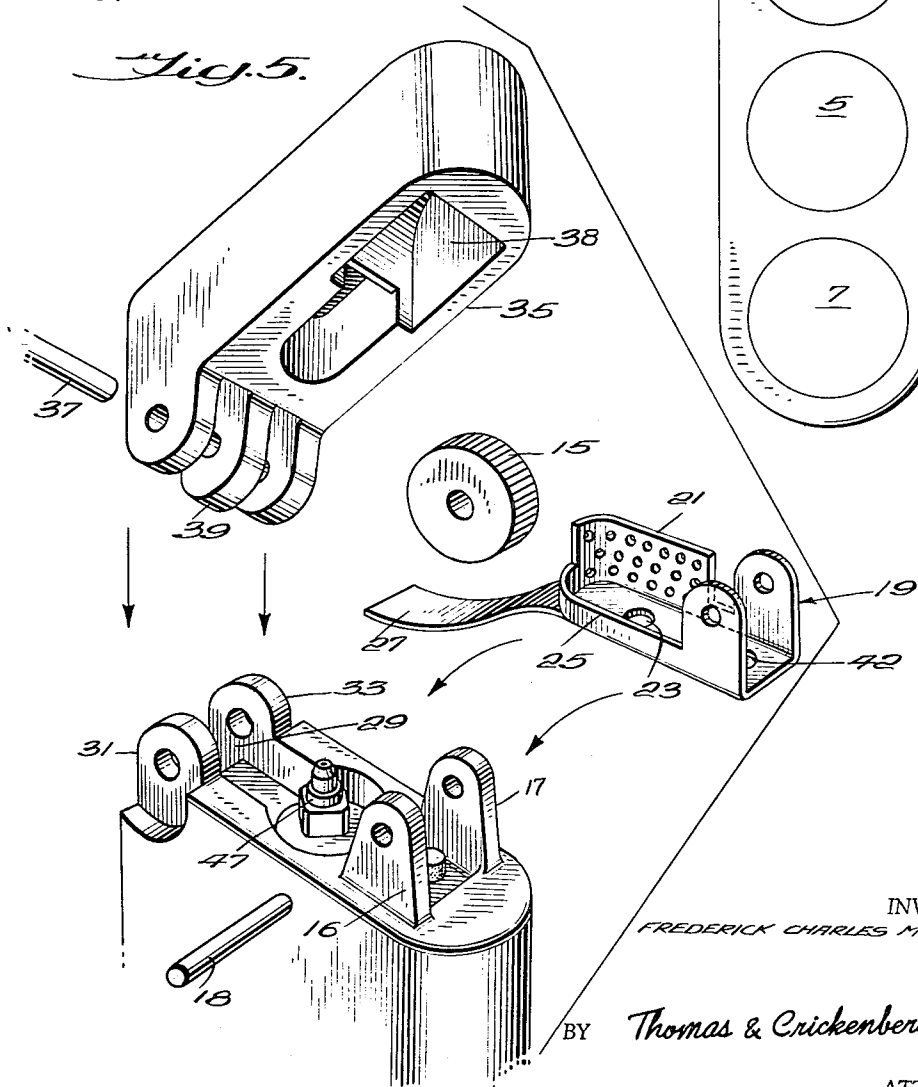
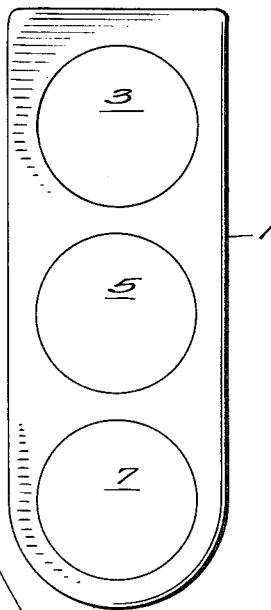
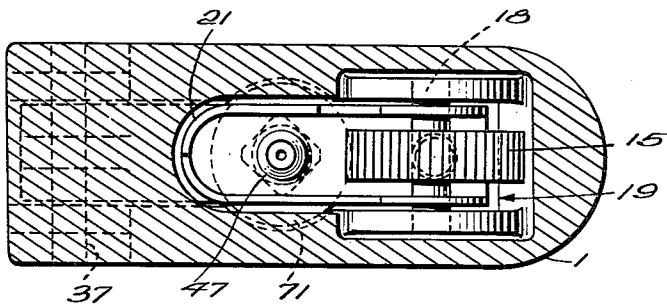
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DISPOSABLE LIGHTER CONSTRUCTION

Filed Jan. 9, 1962

3 Sheets-Sheet 3



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3,092,988

DISPOSABLE LIGHTER CONSTRUCTION
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Filed Jan. 9, 1962, Ser. No. 165,184
9 Claims. (Cl. 67-7.1)

This invention relates to a disposable lighter construction, and more particularly to a butane lighter of plastic construction which may be produced economically and discarded when the fuel is exhausted.

The majority of the presently available lighters employ a conventional wick which is saturated with a flammable fuel. The fuel supply is usually exhausted quickly either by frequent use or evaporation of the volatile fuel. Cans of fuel are sold commercially for replenishing the fuel supply in such lighters, and ownership of a lighter of this type would require that a supply of liquid fuel be maintained for recharging the lighter. Lighters constructed in accordance with the principles of the present invention overcome the limitations and disadvantages of the lighters presently available.

A feature of this invention is the provision of a plastic throwaway lighter of simple and economical construction.

Another feature of the invention is the provision of a plastic lighter in which a single cap is utilized in connection with a replaceable plastic throwaway fuel container and operating mechanism.

A further feature of the invention is the provision of a lighter utilizing butane gas in a plastic storage container of unique construction realizing maximum structural strength and storage capacity.

A still further feature is the provision of a lighter in which the opening and closing of the cap provides a positive fuel valve control action.

Another feature of the invention is the provision of a lighter having an adjustable fuel valve construction by means of which the flame height may be controlled.

Another feature is the provision of a lighter having a unique windshield construction.

Another feature is the provision of a plastic lighter having filler plugs constructed to serve as blow out plugs in case of excess pressure buildup within the fuel storage compartment.

Yet another feature is the provision of a plastic lighter construction having an automatic valve cut-off means to prevent the lighter from burning in an inverted position and damaging the plastic parts.

These features are realized in a lighter construction comprising a plastic body portion having a plurality of intercommunicating cylindrical bores adapted to contain a flammable fuel. The bores are open at one end to facilitate the insertion of the fuel, and closure members are provided for sealing the bores. These closure members are of reduced strength to serve also as blowout plugs in case of excess pressure buildup. Mounted in the body portion opposite the end containing the closure members is a valve assembly equipped with a ball check valve for cutting off the escape of fuel when the lighter is held in an inverted position, and an adjusting nut for regulating the height of the flame. A spark producing assembly is mounted adjacent the valve for igniting the escaping fuel. An elongated spring member including a wind shield surrounding the valve is pivotally mounted on the sparking wheel and has its opposite end extending under a cam-like projection carried by the lighter cap. When the cap is closed, the spring member is depressed so that the wind shield bears against the valve and holds it in a closed position. When the cap is raised, the spring member no longer bears against the valve assembly but serves to hold the cap in raised position, and the valve is opened for the escape of fuel. The cap may be jour-

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naled in a pair of bifurcated plastic ears on the body portion to enable removal thereof by a simple snap action. The body portion is preferably constructed of plastic to constitute a throwaway article when the fuel supply is exhausted.

The foregoing and other objects, features and advantages of the invention will be apparent from the following more particular description of a preferred embodiment of the invention, as illustrated in the accompanying drawings in which:

FIGURE 1 is a cross sectional view of the lighter showing the cap in closed position and a detailed structural positioning of the valve parts as indicated by section line 1-1 of FIGURE 2;

FIGURE 2 is a partial cross sectional view taken along line 2-2 of FIGURE 1 with the valve structure not sectioned;

FIGURE 3 is a partial cross sectional view of the lighter similar to FIGURE 1 with the cap shown in raised position;

FIGURE 4 is an exploded perspective view of the valve structure;

FIGURE 5 is an exploded perspective view showing the component assembly of the top of the lighter;

FIGURE 6 is a cross sectional view taken through the lighter top with top in closed position;

FIGURE 7 is a cross sectional view of the body portion of the lighter showing the cylindrical bore construction; and

FIGURE 8 is a perspective view of an alternative embodiment in which the cap is attached by snap action.

The invention will now be described in particularity with reference to the drawings in which FIGURES 1 and 2 are cross sectional views showing the front and side of the lighter, respectively. The body of the lighter, indicated generally by the number 1, has a plurality of intercommunicating cylindrical bores 3, 5 and 7. Bores 3 and 5 are joined by passageway 4, and bores 5 and 7 are joined by passageway 6. The cylindrical bores have threaded openings in the body portions, and closure members 9, 11 and 13, which are provided for purposes of filling and sealing the lighter, are threadedly mounted therein. The thread structure and thickness of the closure members are designed to produce sections of a strength less than the walls of the plastic container, so that in case of excessive pressures, the closure members will act as blowout plugs before the body portion of the lighter ruptures.

A spark producing assembly is mounted near the top portion of the body 1 and includes a spark wheel 15 which is mounted for rotation on a pair of upstanding lugs 16 and 17 by means of a spark wheel shaft 18 (see FIGURE 5). Also mounted on shaft 18 is an elongated spring member 19 having a wind shield perforated portion 21 located along one side of aperture 23, and a solid wall portion 25 of reduced height located along the other side of aperture 23. A resilient curved section 27 of elongated spring member 19 extends down into recess 29 located between upstanding ear lug members 31 and 33.

A cap member 35 is pivotally mounted on shaft 37 which extends through ear lugs 31 and 33. Shaft 37 may be screw threadedly mounted, or any conventional means may be used which will allow the removal of cap 35 for the purposes of replacing the body portion 1. A recess 38 is provided in cap 35 to accommodate the operating mechanism of the lighter located on body 1 when the cap 35 is moved to a closed position. A depending cam portion 39 on cap 35 occupies recess 29 in the body 1 where it contacts the resilient curved section 27 to produce a rocking movement of elongated spring member 19 about shaft 18 as cap member 35 is opened

and closed. The resilient section 27 exerts a pressure against the depending cam portion 39 to bias the cap 35 in open and closed positions.

A cylindrical member 41 of a flint-like substance is mounted within a recessed bore 43 in the body 1 and projects through aperture 42 in elongated spring 19. A coiled spring member 45 biases the flint 41 so that it is in constant contact with spark wheel 15 in order to produce a shower of sparks upon rotation of spark wheel 15.

The fuel valve assembly will be explained in conjunction with FIGURES 1 and 4, which show the valve in cross section and exploded perspective, respectively. The valve assembly includes a nozzle portion 47 having a longitudinal bore 49 which terminates near the bottom portion of the nozzle 47 where it communicates with a lateral bore 51. Nozzle 47 is slidably seated within the valve body 52 and rests upon triangular spacer member 53, which is constructed of a resilient material. A passageway 55 in the bottom of valve body 52 receives pin 56, the bottom of which carries a circular slug 57 having a serrated bottom portion. Rubber gasket 58 is mounted around the lower portion of valve body 52, and an annular porous filter element 59 surrounds pin 56 and is interposed between valve body 52 and circular slug 57. Slug 57 rests in the top portion of sleeve 61. Inserted in the lower end of sleeve 61 is a wick tube 63 containing a porous wick member 65. A ball member 67 is located between the wick 65 and passageway 66 in sleeve 61. The valve assembly is supported within body 1 on rubber collar member 69. A knurled adjustment nut 71 having a square aperture complementary to the square upper portion of valve body 52 is disposed on valve body 52, and by means of this nut the valve 52 may be threaded into and out of body member 1 to adjust the escape of fuel as will be explained later.

The preferred fuel for this lighter construction is butane, which is a liquid under normal pressure conditions and temperatures slightly below freezing of water and a gas at higher temperatures. Because of the nature of the fuel, the lighter is loaded with fuel under either reduced temperature conditions or conditions in which the fuel is pressurized to keep it in the liquid state. Cylindrical bores 3, 5 and 7 are filled with liquid butane to the desired level, and closure members 9, 11 and 13 are inserted to produce a hermetically sealed structure. At temperatures above the vaporization temperature of butane, a pressure buildup is produced in the fuel storage compartments which forces gaseous butane through the nozzle 47 when the valve is open.

The passage of the butane from the fuel storage compartments follows through wick 65 in wick tubing 63, through passageway 66, around serrated slug 67, through annular porous filter 59, through passageway 56, around triangular spacer 53, and through bores 51 and 49 where it is ignited at the tip of nozzle 47. This escape of fuel is possible when the cap 35 is in a raised position, relieving the pressure of cam 39 on resilient curved section 27 of elongated spring member 19. When the cap 35 is closed, cam section 39 bears against the resilient curved section 27, thus forcing the wind shield portion 41 down against the nozzle section 47. Nozzle 47 compresses the triangular spacer member 53 and shuts off the escape of gas through passageway 55.

The height of the flame may be adjusted by turning knurled adjustment nut 71. This forces the valve body 52 into or out of the body portion 1 and regulates the distance which pin 56 extends into passageway 55, and also the amount of pressure exerted on the porous annular filter 59. The amount of compression of the annular filter 59 and the extent of pin 56 into passageway 55 controls the amount of gas escaping from the fuel storage compartments.

FIGURE 8 shows an alternative means for fastening the cap 35 to the body portion 1. In this embodiment the lugs 73 and 75 are made of a resilient material and

assume a bifurcated configuration. The shaft 37 in cap 35 is attached permanently, such as by riveting, and when pressure is applied, the shaft 37 may be snapped into place between the bifurcated portions of lugs 73 and 75. In this fashion the cap 35 may be removed from the body portion 1 with a simple motion requiring no additional tools or disassembling. In this fashion a single cap member may be utilized with a number of different body portions, and when the fuel supply is exhausted in replacement body portion, it is not necessary to discard the cap member with the rest of the structure. This arrangement permits a relatively expensive cap member to be utilized with inexpensive replacement body portions. It is to be understood, of course, that the cap 35 may also be of inexpensive plastic construction similar to the body portion 1. In this case the entire lighter could be discarded when the fuel supply is exhausted.

Because the structure is plastic, it must be protected from direct contact with the flame. The wind shield perforated portion 21 and solid wall portion 25 prevent the flame from contacting any part of the plastic body portion 1 when the lighter is held in an upright position. When the lighter is inverted such that the flame might turn back against the plastic body 1, the ball 67 in the valve structure seats in the opening of passageway 66 and cuts off the flow of escaping gas, thereby extinguishing the flame. By utilizing only a half wind shield 21, it is possible to keep the height of the flame at a reduced level, thereby conserving the butane fuel. If the wind shield 21 extended completely around aperture 23, it would be necessary to maintain a high flame at all times in order to insure that the lighter would operate effectively.

While the invention has been shown and described with particular reference to certain embodiments, it will be understood by those skilled in the art that various changes in the form and details may be made without departing from the spirit and scope of the invention.

What is claimed is:

1. A lighter comprising a hollow body portion adapted to contain a flammable fuel, valve means mounted in said body portion for controlling the escape of said flammable fuel, a spark producing assembly for igniting said fuel, an elongated spring member including wind shield means surrounding said valve means and having a portion adapted to bear upon said valve means to close said valve means, and cap means pivotally mounted on said body portion and having means thereon engaging said elongated spring member, whereby movement of said cap means to open and closed positions on said body portion will cause said elongated spring member to release and close said valve means.

2. The combination according to claim 1 wherein said wind shield means comprises a wall portion of a first height on one side of said valve means and a solid wall portion of a second substantially lower height on the other side of said valve means.

3. The combination according to claim 1 wherein said hollow portion is provided with a closure member to facilitate filling and having a reduced strength compared to said body portion whereby excess pressure in said body portion will first cause failure of said closure member.

4. A lighter comprising a plastic body portion having a plurality of intercommunicating cylindrical bores adapted to contain a flammable fuel, valve means mounted in said body portion for controlling the escape of said flammable fuel, a spark producing assembly for igniting said fuel, an elongated spring member including wind shield means surrounding said valve means and having a portion adapted to bear upon said valve means to close said valve means, and cap means pivotally mounted on said body portion and having means thereon engaging said elongated spring member, whereby movement of said cap means to open and closed positions on said body portion will cause said elongated spring member to release and close said valve means.

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5. The combination according to claim 4 wherein said wind shield means comprises a perforated wall portion of a first height on one side of said valve means and a solid wall portion of a second substantially lower height on the other side of said valve means.

6. The combination according to claim 4 wherein said cylindrical bores are provided with closure members to facilitate filling and having a reduced strength compared to said body portion whereby excess pressure in said body portion will first cause failure of said closure members.

7. The combination according to claim 4 wherein said valve means are provided with adjustable means for regulating the flame height.

8. The combination according to claim 4 wherein said valve means are provided with means for automatically shutting off the flow of fuel when the lighter is held in an inverted position.

9. The combination according to claim 4 wherein said

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body portion is provided with a pair of resilient bifurcated projections serving as bearings for the pivotal mounting of said cap, whereby said cap may be snapped in and out of engagement with said projections when it is desired to replace said body portion.

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