

[54] **GAS-FUELED LIGHTER**
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[22] Filed: **Aug. 11, 1971**
[21] Appl. No.: **170,870**
[52] U.S. Cl.**431/253, 431/254, 431/277**
[51] Int. Cl.**F23q 1/02**
[58] Field of Search**431/253, 254, 277; 110/1 F**

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[57] **ABSTRACT**
A lighter of the liquified gas fuel type having a case containing a fuel reservoir and a wick for conducting fuel to a normally closed valve operatively associated with an extensible conduit having an orifice at its outer end together with spark generating means and a valve actuator, the actuator being arranged to move the valve to an open position to permit gaseous fuel to enter the extensible conduit which in the retracted position permits the gaseous fuel to be ignited by the spark generating means and which may be extended telescopically to locate the burner orifice at the other end of the conduit in a location remotely spaced from the case for positioning the flame adjacent an area of limited access.

7 Claims, 5 Drawing Figures

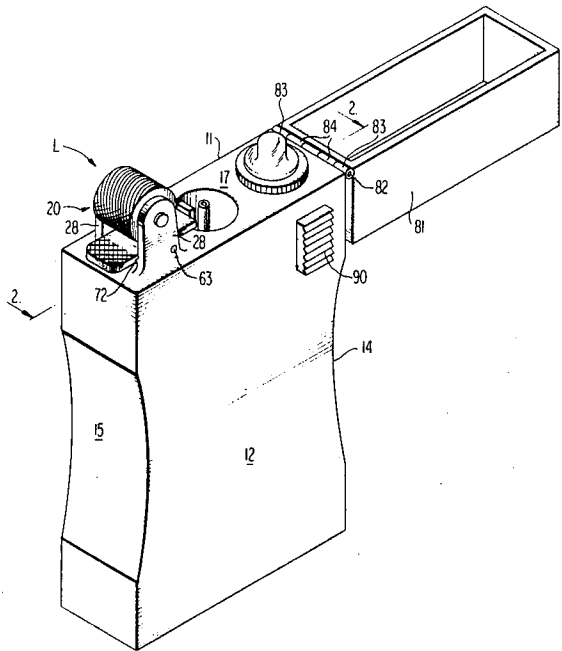


FIG. 1

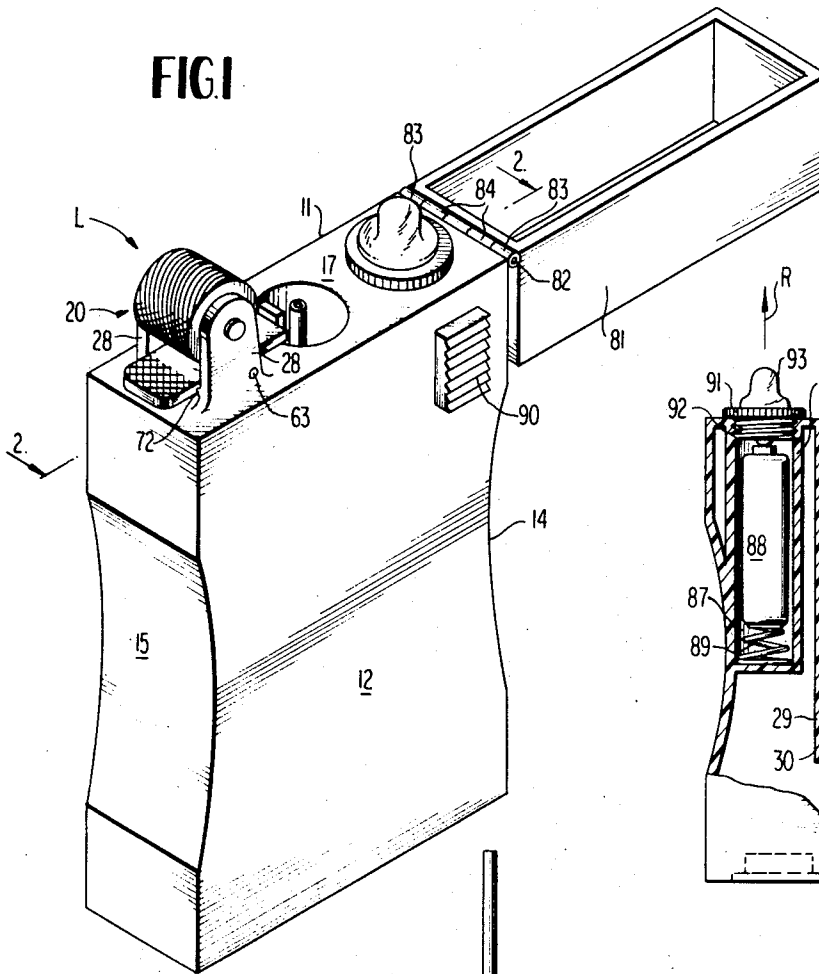


FIG. 2

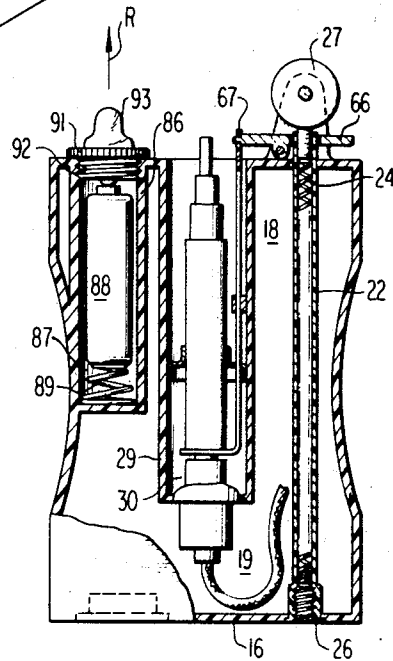
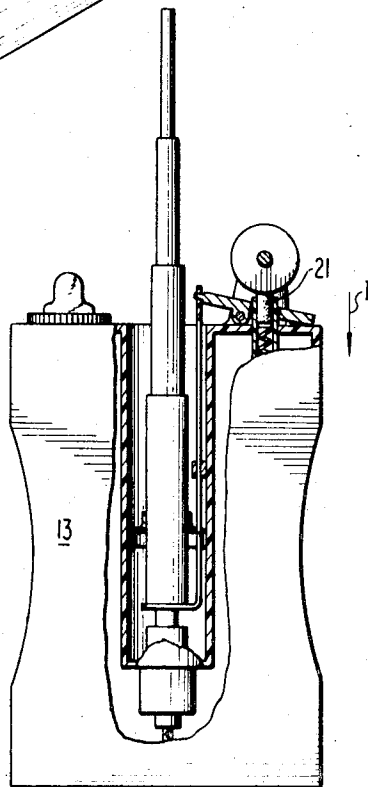


FIG. 3



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FIG 4

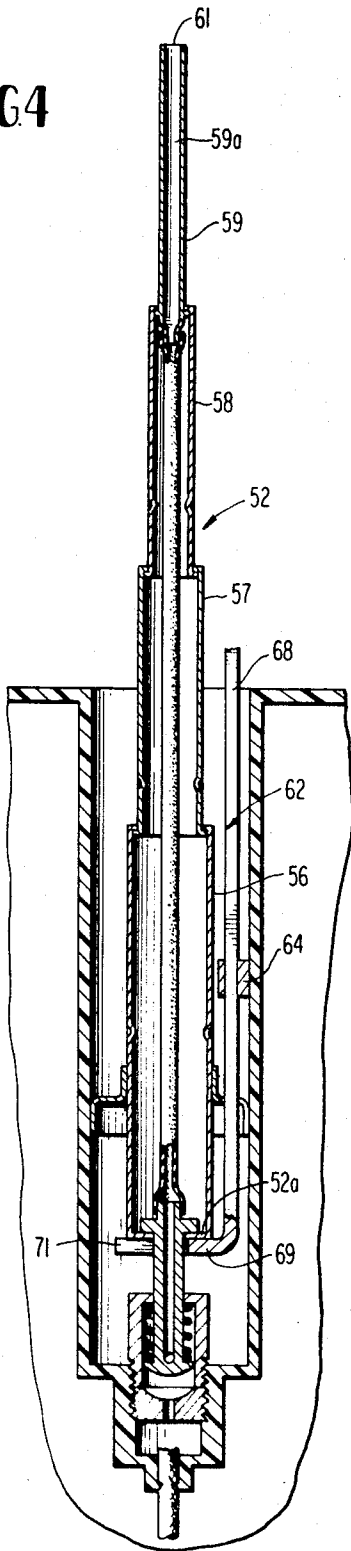
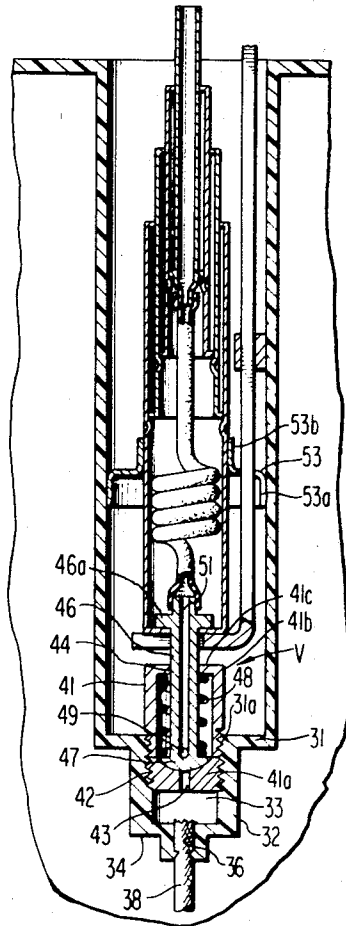


FIG 5



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GAS-FUELED LIGHTER

A widely accepted and commercially available lighter of the type used by cigarette and cigar smokers today employs a liquified gas fuel such as butane which may be readily ignited by spark generating means such as a flint wheel or the like. The common arrangement for such gas-fueled lighters is to provide a reservoir for the liquid fuel which is contained within a case and by means of a valve normally maintained in the closed position, the fuel is permitted to vaporize by actuation of the valve through a suitable manually operated lever serving as a valve actuator. Actuation of the valve permits the vaporized fuel to flow through an elongated conduit or tube and out an orifice at the end of the tube for ignition by the spark generating means to provide a flame. Release of the valve actuator permits the valve to move to the closed position interrupting the flow of fuel and snuffing out the flame so that only a minimum amount of fuel is consumed at each ignition. It is, of course, necessary to maintain the burner orifice or jet adjacent to the spark generating means and by positioning the lighter adjacent to the object to be ignited, a convenient and compact lighter is provided for lighting cigarettes, cigars and the like. The advantages of such a lighter construction have been long recognized and efforts have been made to adapt such lighters to other uses. However, since such lighters are specifically adapted to cigarette and cigar lighting, such efforts have been frustrated mainly due to the fact that the flame produced by such lighters is maintained in close proximity to the case.

One of the general areas in which such a lighter construction might lend itself but for its structural limitations is in the area of igniting combustible material or fueled devices which are relatively inaccessible due to space limitations and the like. Such problems with present day lighters are mainly due to the inability of the flame on such lighters to reach the object to be ignited as a result of the close proximity of the flame in the lighter to the lighter case. One area which has always been a source of trouble in initiating ignition by flame is in the area of gas-fired devices such as gas heaters or the like in which a pilot light or flame is utilized to initiate combustion. The remote and inaccessible location as well as the lack of illumination of such pilot flame jets makes it virtually impossible to utilize any fueled lighter commercially available today with a result that the operator must utilize such awkward and inefficient means such as long matches, rolled-up paper or the like which are not only messy and difficult to manipulate but frequently result in a dangerous operation such as searing of the operator's hands during the lighting operation.

Accordingly, a primary object of this invention is to provide a new and novel gas-fueled lighter.

Another object of this invention is to provide a new and novel gas-fueled lighter which permits the flame of the lighter to be utilized for ignition of combustible objects in a remote and inaccessible location.

A further object of this invention is to provide a new and novel gas-fueled lighter which may be readily employed for either cigarette or cigar lighting or for the lighting of an object at a location remote from the lighter itself.

Still another object of this invention is to provide a new and novel gas-fueled lighter which is readily

adaptable for igniting the pilot flame on gas-fired appliances or the like.

This invention further contemplates the provision of a new and novel gas-fueled lighter which is compact and inexpensive in construction, which permits the flame on the lighter to be maintained for a selected period of time, which completely eliminates any hazard to the operator in igniting objects remote from the lighter and which may be readily adapted for the ignition of combustible objects of a wide variety of types.

Still another object of this invention is to provide a new and novel gas-fueled lighter which incorporates illuminating means for illuminating an object to be ignited.

The objects stated above and other related objects in this invention are accomplished by the provision of a case in which is disposed a reservoir for fuel such as liquified gas and having spark generating means for igniting the vaporized fuel. The lighter includes valve means movable between an open and a closed position together with wick means disposed in wicking relationship with the fuel in the reservoir and communicating with the valve means. Means such as a manually operated lever are provided for moving the valve between the open and closed position. An extensible conduit is disposed in operative communication at one end with the valve means and is provided with a burner orifice at its other end, the conduit being movable between a retracted position with the burner orifice in igniting relationship with the spark generating means and an extended position to locate the burner orifice in a remotely spaced relationship with the case.

The novel features which are believed to be characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and method of operation may be best understood by reference to the following description taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of a lighter constructed in accordance with the invention;

FIG. 2 is a sectional view taken substantially along line 2—2 of FIG. 1;

FIG. 3 is a side elevation view partially broken away of the lighter of FIG. 1 with the burner conduit in an extended position;

FIG. 4 is an enlarged sectional view of a portion of the lighter of FIG. 3; and

FIG. 5 is a view similar to FIG. 4 with the burner conduit in a retracted position.

As generally illustrative of the invention, there is shown in FIG. 1 a lighter constructed in accordance with the invention and designated generally by the letter L. The lighter L includes a housing or case 11 which may be formed of suitable material such as metal, plastic or the like and the case 11 is preferably shaped so as to be manipulated easily in the hands of an operator. The case 11 includes side walls 12, 13, end walls 14, 15, which may be formed in a slightly concave manner to conform to the hand of the operator, a bottom wall 16 and a top wall 17 which define an interior 18. The lighter L is of the type which utilizes a liquified gas fuel such as butane and includes a reservoir 19 within the case interior 18 for containing a supply of such liquid gas fuel as in a conventional butane lighter.

The lighter L also includes spark generating means 20 of conventional type for igniting the fuel which, as is well known, includes a flint 21 disposed within the bore of a tube 22 disposed in a vertically extending position within the case interior 18. The flint 21 is spring loaded upwardly by means such as a spring 24 retained in the tube 22 by means of a screw cap 26 engageable with a threaded opening in the case bottom wall 16 so that the spring 24 urges the flint upwardly against a conventional flint wheel 27 rotatably mounted on upstanding flanges 28 secured to the case top wall 17. As is well known, manual rotation of the flint wheel 27 against the upper end of the flint 21 produces a spark for igniting the vaporized fuel.

As specifically illustrative of the invention, the interior 18 of the case 11 is partitioned by means of an enclosure 29 to define an inner cavity 30 and the enclosure 29 is provided with a bottom plate 31 with a central opening 31a. A tubular housing 32 is provided on the bottom plate 31 in coaxial relationship with the opening 31a and includes an interior 33 having a bottom wall 34 provided with a central passage 36.

The passage 36 is arranged to accommodate the upper end of wick means such as a wick 38 of conventional construction, the lower portion which is immersed in the fuel contained within the fuel reservoir 19 with the upper end of the wick communicating with valve means designated generally by the letter V disposed within the cavity 30 as shown best in FIGS. 4, 5.

More specifically, the valve means V include a cylindrical valve member 41 suitably secured within the tubular housing 32 in an adjusted position by means such as a threaded connection 42. The valve member 41 includes a solid portion 41a having a central passage 43 and a hollow portion 41b having a central opening 44 in its top wall 41c for accommodating a valve stem 46 having a head 47. The valve stem 46 is arranged to be moved reciprocally in sliding relationship with the opening 44 on a vertical axis between an open position and a closed position with the head 47 in seating engagement with the upper end of the valve member passage as shown best in FIG. 5 under the yielding urging force of a spring 48 positioned between the head 47 and the top wall 41c of the valve member 41.

The valve stem 46 is provided with a pair of lateral ports 49 which communicate at their inner ends with a central passage 51 which extends through the stem 46 and an upper flanged portion 46a. As explained hereinafter, the valve stem 46 is operatively connected to the lower end of a vertically movable extensible conduit designated generally by the numeral 52 and provided with a bottom wall 52a. The conduit 52 is arranged for reciprocal movement vertically in laterally extending guide brackets 53 having vertically extending end portions 53a, 53b, end portions 53a being suitably secured to the inner surface of the enclosure wall 29 and the other end portion 53b extending in supporting relationship with the conduit 52 for sliding movement therein.

In the illustrated embodiment, the extensible conduit 52 includes a plurality of support sections of tubular form; and, in the specific embodiment, includes four such sections 56 - 59 arranged together in telescopically sliding relationship as shown best in FIG. 4 so as

to permit the conduit 52 to be moved between the retracted position of FIG. 5 and the extended position of FIG. 4.

The tubular section 59 is provided with a central bore 59a and is suitably connected at its lower end to the upper end 60a of a flexible tube 60 of suitable material such as plastic or the like, the interior of which is in communication with the central bore 59a of section 59. The lower end 60b of the flexible tube 60 is suitably connected to the flanged portion 46a of the stem 46 and with the interior of the tube 60 in communication with the central passage 51 of the valve stem 46 with the flexible tube 60 extending through tubular sections 56 - 58. The upper end 61 of the tubular section 59 is open to provide a burner jet or orifice 61 so that in the retracted position of the conduit 52, as shown in FIG. 2, the orifice 61 is positioned adjacent the spark generating means 20.

As the tube 60 is attached at its lower end 60b to the valve stem flanged portion 46a and at its upper end 60a to tubular section 59, the construction of the tube 60 is such that it is adjustable in length from the retracted position of FIG. 5 to the extended position of FIG. 4. By way of example, the tube 60 which, as referred to above, may be made of suitable material such as plastic or the like may be in the form of a series of relatively small coils so as to be movable into any selected length. In another form, the tube 60 may be provided with a coil spring embedded throughout the material of the tube which in the relaxed condition of the tube, retracts the tube into a crimped, shortened form for its minimum length in the retracted position of the conduit 52 as shown in FIG. 5 but which permits expansion of the tube into the extended position of FIG. 4.

Means are provided for manually moving the valve means V between the open and closed positions. More specifically, valve actuation means, designated generally by the numeral 62, is suitably mounted on the lighter L by means such as a pivot rod 63 and guide means 64. The valve actuating means 62 is substantially Z-shaped in configuration and includes a manually operable lever 66 pivotally mounted by means of the pivot rod 63 on the top wall 17 of the case 11. The lever 66 is pivotally connected at 67 to a vertically extending straight portion 68 which extends within the cavity 30 as defined by the enclosure 29.

At the lower end of the portion 68, a horizontally extending arm 69 is suitably secured by welding or the like and is provided with a bifurcated outer end portion 71 which is arranged to extend around the valve stem 46 in underlying relationship with the bottom wall 52a of the extensible conduit 52.

When it is desired to move the valve means V into the open position for operation of the lighter, the lever 66 is depressed by the operator with the case 11 being held in the operator's hand so that the lever 66 pivots downwardly in the direction of the arrow I of FIG. 3. The depressed lever pivots on the pivot rod 63 raising the arm 69 and bringing the bifurcated portion 71 into lifting engagement with the underside of the conduit bottom wall 52a. A slight upward movement of conduit 52 and valve stem 46 is thereby affected due to engagement between the conduit bottom wall 52a and flanged portion 46a of stem 46 so that the valve head 47 is removed from closing engagement with the upper end

of the valve member passage 43 communicating the interior 33 of the housing 32 with the interior of hollow portion 41b of the valve member 41 through the central passage 43. When the lever 66 is released, the action of the spring 48 moves the valve stem 46 downwardly to position the head 47 in closing engagement with the upper end of the passage 43.

If it is desired to maintain the valve means V in the open position and free the operator's hand, retaining means are provided on the case 11 which are releasably engageable with the lever 66 in the depressed position to retain the valve means V in the open position of FIG. 4. In the specific embodiment, the retaining means are preferably in the form of a lug 72 on one of the flint wheel supporting flanges 28 on the top wall of the case 11 which is arranged for snap fitting engagement with the edge portion of lever 66, as shown best in FIG. 1.

In the preferred embodiment, the lighter L is provided with a cover 81 which is pivotally mounted on the upper end of the case 11 for movement between an open position and a closed position in covering relationship with the underlying component parts of the lighter as shown best in FIG. 1. The cover 81 is trough-shaped in configuration for enclosing the top wall 17 of the case 11 and is preferably both pivotally and detachably mounted on the case by suitable means such as a pivot rod 82 extending through cooperating spaced sleeves 83, 84 on the case top wall 11 and cover 81 respectively.

In order to provide illumination for the object to be ignited with the lighter L of the invention, illuminating means are provided on the lighter for projecting a beam of light in a direction generally parallel to the extended conduit 52. More specifically, an enclosure 86 is provided in the case interior 18 adjacent the end wall 14 and the top wall 17 as shown best in FIG. 2. The enclosure 84 defines a cavity 87 which is arranged to accommodate a battery 88 mounted on a suitable terminal spring 89.

In order to insert the battery 88 in the cavity 87, a screw-threaded cap 91 is removably positioned in an internally threaded opening 92 in the case upper wall 17. A lamp 93 of conventional construction is also provided which may be mounted in the cap 91 and the lamp 92 is provided with suitable connections (not shown for clarity) for energization by the battery 88 and the projection of a beam of light in the forward direction indicated by the arrow R in FIG. 2. A switch 90 of conventional construction is provided on the case side wall 12 by means of which the lamp 93 may be connected to and disconnected from the battery 88.

In the operation of the lighter L, when it is desired to ignite an object in a confined space and perhaps also where lighting conditions are poor cover 81 may be removed if desired and the conduit 52 is positioned in the retracted position of FIG. 5. Holding the case 11 in the hand, the operator depresses the lever 66 elevating the valve stem 46 to expose the upper end of the central passage 43 in the valve member 41 as a result of the engagement between the bifurcated portion 71 of arm 69 with the bottom wall 52a of conduit 52. At the time the lever 66 is depressed, the flint wheel 27 is rotated in the conventional manner against the flint 21 to generate a spark.

The liquified fuel in the reservoir 19 in which the wick 38 is immersed vaporizes in the interior 33 of housing 32 and the gaseous vapor flows through the central passage 43 into the hollow portion 41b of the valve member 41, then through the lateral ports 49 and central passage 51 of the valve stem 46 into the contracted tube 60 and into the atmosphere through the burner orifice of jet 61 for ignition by the generated spark in the well-known manner. As the orifice 61 is adjacent the spark generating means 20, ignition of the gas is easily accomplished. As explained above, the lever 66 is preferably retained in the depressed position by engagement of the lever 66 with the lug 72 the case 11 so that the valve means V remains open and vaporized fuel is fed continuously to the jet 61.

The flexible conduit 52 may then be manually extended by grasping tubular section 59 thereby moving the tube 60 so as to locate the flame emanating from the orifice 61 in a remotely spaced relationship with the case 11. The extended conduit 52 may then be inserted into a relatively inaccessible space igniting the object to be lighted without interference by the case 11. At the same time, the lamp 92 may be energized by the manual switch 90 suitably connected electrically with the battery 88 and lamp 92 so as to provide an illuminating beam of light for visual observation of the object to be ignited and the space in which such object is located.

While there has been described what at present is considered to be the preferred embodiment of the invention, it will be understood by those skilled in the art that various changes and modifications may be made therein without departing from the invention.

Having thus described the invention, what is claimed is:

1. A gas-fueled lighter of the type having a case, a fuel reservoir in said case and spark generating means for igniting vaporized fuel from said reservoir the improvement which comprises, valve means in said case movable between an open and a closed position, wick means disposed in wicking relationship with the fuel in said reservoir and communicating with said valve means, means for manually moving said valve means between said open and closed positions, an extensible conduit supported on said case, said conduit having one end in operative communication with said valve means and a burner orifice at its other end, said conduit being movable between a retracted position with said burner orifice in igniting relationship with said spark generating means and an extended position to locate said burner orifice in a remote relationship with said case.

2. A gas-fueled lighter in accordance with claim 1 wherein said extensible conduit comprises a plurality of tubular sections arranged in telescopic relationship, said plurality of tubular sections including an upper section having an open upper end for forming said burner orifice.

3. A gas-fueled lighter in accordance with claim 2 wherein said extensible conduit includes a flexible tube disposed within said tubular sections, said flexible tube having an inner end connected in communication with said upper section and a lower end connected in communication with said valve means adjacent said conduit one end, said flexible tube being arranged to collapse in

said retracted position of said conduit and to extend in the extended position for conducting vaporized fuel from said valve means to said burner orifice.

4. A gas-fueled lighter in accordance with claim 3 wherein said case composes side walls, end walls, a bottom wall and a top wall defining an interior and including a vertically extending enclosure for said extensible conduit disposed in said case interior, said enclosure defining a cavity having an upper end opening into said case top wall, means on the inner wall of said enclosure for supporting said conduit centrally in said enclosure whereby said burner orifice is positioned adjacent the open upper end of said cavity in the retracted position of said conduit.

5. A gas-fueled lighter in accordance with claim 4 wherein said valve means including means for normally urging said valve means into said closed position and wherein said valve moving means include lever means

operatively connected at one end with said valve means, said lever means including a manually operable lever pivotally mounted on said case top wall adjacent said spark generating means, said lever being pivotally movable into one position to permit said valve means to be maintained in said closed position and said lever being pivotally movable into a second position by an operator to move said valve means into an open position against said urging means.

6. A gas-fueled lighter in accordance with claim 5 including means on said case for releasably retaining said lever in said second position.

7. A gas-fueled lighter in accordance with claim 6 including illuminating means on said case for providing a beam of light extending upwardly from said case top wall.

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