

Jan. 11, 1966

A. RACEK

3,228,215

GAS-FUELLED LIGHTER

Filed Feb. 21, 1964

3 Sheets-Sheet 1

Fig. 1

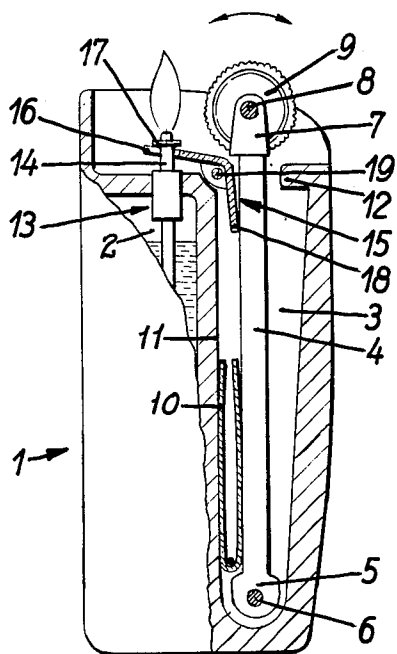
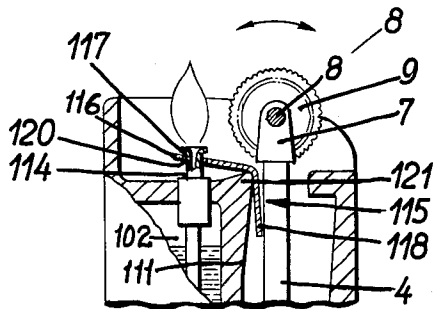


Fig. 2



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Fig. 3

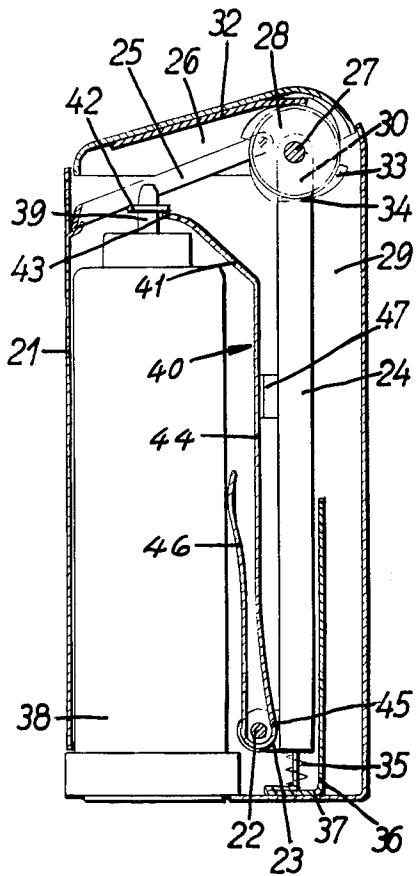
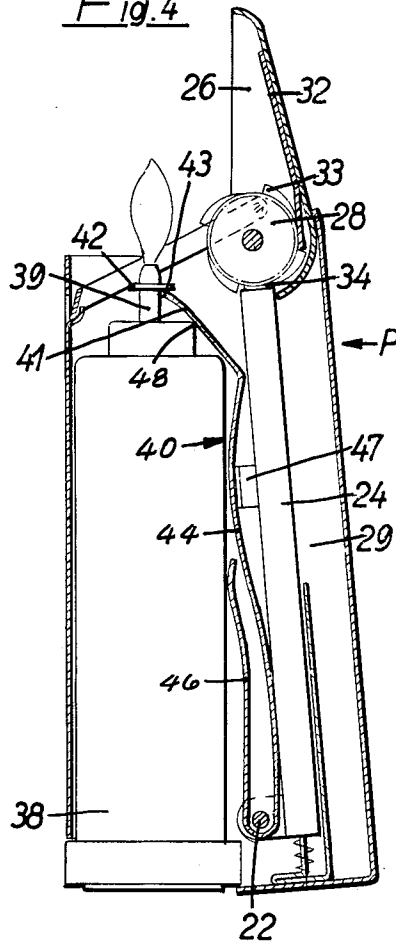


Fig. 4



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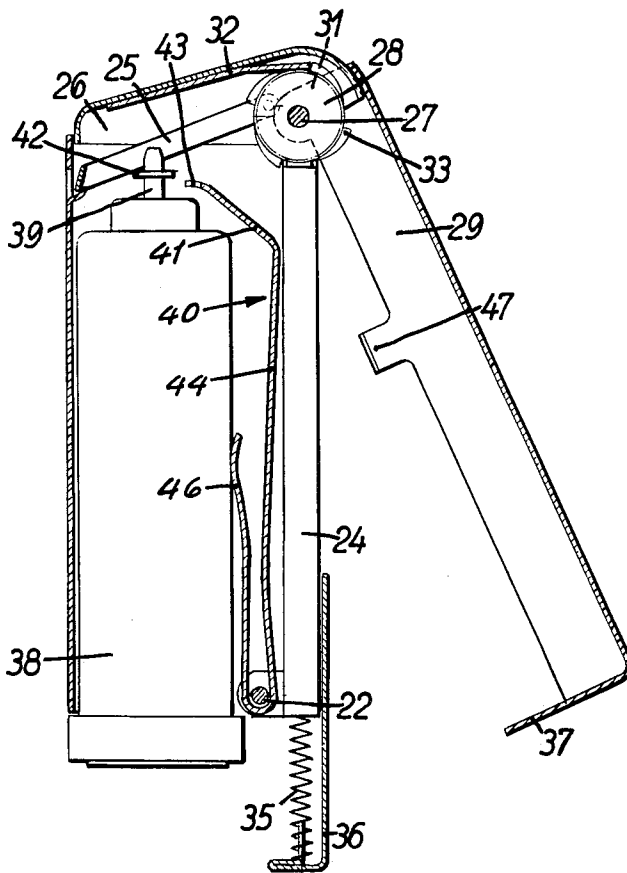
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Fig. 5



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GAS-FUELLED LIGHTER

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925,647; Austria, July 12, 1963, A 5,606/63

6 Claims. (Cl. 67-7.1)

This invention relates to a gas-fuelled lighter, in which a flint tube and at least a part of the housing are relatively movable, and the actuation of a gas valve is derived from this relative movement.

In a known gas-fuelled lighter of this kind, the flint tube is pivoted to a support adjacent to that end of the flint tube which carries the friction wheel, and the gas tank is secured to this support. An extension is rigidly connected to the flint tube and has a free end which acts on the gas valve, which consists of a pressure valve. This valve is operable by the relative pivotal movement of the flint tube and gas tank toward each other. This has the disadvantage that this pivotal movement may occur when it is not desired, e.g., when the lighter is being carried in a pocket.

In another known design, the flint tube is pivoted in an opening of the gas tank and the end provided with the friction wheel is guided, e.g., in fixed guides. Discs which are disposed laterally of the friction wheel coast with a lever for actuating the gas valve in such a manner that a pivotal movement of the flint tube toward the gas valve causes the discs to roll onto the lever so that the same is depressed and the pressure valve is closed.

A pivotal movement in the opposite direction will open the valve. This actuating device too is not entirely satisfactory, particularly because a reliable sealing of the valve is not ensured.

It is an object of the invention to provide a gas-fuelled lighter of the kind mentioned first hereinbefore, in which the disadvantages of the known lighters are avoided. This is essentially achieved in that the element for actuating the gas valve has an angled configuration and comprises one arm coacting with the gas valve and another arm coacting with at least one of the parts which take part in the relative movement.

The design of the actuating element according to the invention ensures a satisfactory function of the lighter, enables the unintended opening to be avoided by simple means, and ensures a sealing of the valve.

According to another feature of the invention, the actuating element consists of its simplest embodiment of a bell-crank lever, which is fulcrumed at its vertex. The bell-crank lever may either be pivoted on a pin or be provided with an opening and be held by a valve stem extending through this opening whereas the vertex of the lever bears on the edge portion disposed between the shell and the top of the gas tank.

In another embodiment of the invention, the actuating element consists of a toggle, one end of which coacts with the gas valve and which bears on at least one of the relatively movable parts for the movement of said lever to open the gas valve. It has been found suitable to provide for the actuation of the toggle by a member which surrounds the flint tube and is coupled to it and is pivotally movable about the friction wheel shaft and provided with at least one pressure nose acting on the toggle. This feature enables a simple manufacture and operation of the lighter and such an arrangement of the toggle that, when the shell member has been swung away from the flint tube, that arm of the toggle which coacts with the valve is clear of the valve stem whereas this arm is movable towards the valve stem by the pressure nose provided on the shell member when the same is pivotally moved inwardly. Hence, the toggle can be moved in an ex-

remely simple manner out and into the range of the movement of the gas valve. As a result, the gas tank can easily be replaced.

Further features and advantages of the invention will be explained hereinafter with reference to the accompanying drawings, which show embodiments of the invention by way of example.

FIG. 1 is a longitudinal sectional view showing a gas fuelled lighter according to the invention.

FIG. 2 shows the top portion of a modified embodiment.

FIGS. 3, 4, and 5 are longitudinal sectional views showing another embodiment of a lighter according to the invention with the coacting parts in different positions.

The lighter shown in FIG. 1 has a body 1, which has a fuel tank chamber 2 and an open-topped well 3. The well 3 accommodates a flint tube 4, which has an enlarged lower end 5, which is pivoted to a pin 6. A friction wheel 9 is rotatably mounted by a pin 8 in a fork 7 at the opposite end of the flint tube. A spring 10 has one end bearing on that wall 11 of the well 3 which defines the tank, and another end bearing on the flint tube 4. This spring tends to move the flint tube pivotally in the clockwise sense and to urge it against a lug 12.

The gas tank 2 carries a gas valve and throttle device 13, which has a valve stem 14, which can be lifted and protrudes upwardly from the tank. When the valve stem 14 is being lifted, the gas outlet valve is opened in known manner and the outflowing gas can be ignited by a spark, which is produced by means of the friction wheel 9. A bell-crank lever 15 is provided for automatically opening the valve in response to an operation of the friction wheel. One arm 16 of this lever has a forked end, which engages the shoulder 17 of the valve stem 14 from below. The other arm 18 of the lever coacts with the flint tube 4. The bell-crank lever 15 is pivoted at its vertex by means of a pin 19.

When the friction wheel 9 is operated by being rotated in the clockwise sense by the thumb of a hand of the user, a force is exerted which opposes the force of the spring 10 so that the flint tube 4 is pivotally moved in the counterclockwise sense. At the same time at which the spark is produced, the bell-crank lever 15 is thus rotated in the clockwise sense and the valve stem 14 is lifted. When the friction wheel 9 is released, the flint tube 4 and the valve stem 14 return to their initial position under the action of the spring 10 and of the spring (not shown) of the gas valve 13.

In the embodiment shown in FIG. 2, an arm 116 of a bell-crank lever 115 has an opening 120, through which a valve stem 114 extends. The upper end of the stem 114 is flanged to form a stop shoulder 117. The bell-crank lever 115 is held on the stem 114.

In this embodiment, the pivot shown in FIG. 1 is omitted. It is sufficient if the vertex of the bell-crank lever bears on an edge portion 121 between the top 102 and the wall 111 of the gas tank. An arm 118 bears again on the flint tube 4. The remaining parts of the lighter, and the flint tube are the same as in FIG. 1.

The lighter shown in FIGS. 3 to 5 has a housing 21, to which a flint tube 24 having a lug 23 is pivoted by a pin 22. A bent member 25 is pivoted to the housing 21 at one end and to a lighter cover 26 at the other end. A friction wheel 28 is rotatable on a pin 27, which forms a pivotal connection between the cover 26, the flint tube 24, and a back shell 29, which covers the flint tube. Lugs 30 connected to the flint tube serve for mounting the flint tube on the pin 27. These lugs embrace the friction wheel like a fork and are shown in dotted lines in FIG. 3. In FIG. 5, lugs 31 are indicated in dotted lines. These lugs 31 embrace also the friction wheel 28 like a fork and serve for mounting the back shell 29 on the pin 27.

A driver leaf 32 is provided in known manner on the inside of the cover 26 and engages the teeth of a driver wheel 33 connected to the friction wheel 28. A spring 35 which urges a flint 34 against the friction wheel 28 is guided in the flint tube 24 and bears by means of a slide member 36 on a bottom 37 of the back shell 29.

A gas tank 38 is slidably inserted in the housing 21. A valve stem 39 of this tank forms in known manner the outwardly protruding member of a gas valve, which is opened when the stem 39 is lifted. To enable the opening of the valve simultaneously with the rotation of the friction wheel, an angled leaf spring 40 is provided, one arm 41 of which coacts like a toggle with the valve stem 39, more particularly with a stop shoulder 42 of this stem. For this purpose, the arm 41 has a forked portion 43. When the lighter is closed, another arm 44 is approximately parallel to the flint tube 24 and is bent at its lower end 45 around the pin 22. An extension 46 bears resiliently on the gas tank 38. At least one pressure nose 47 is provided on the back shell 29 and serves to deform the spring 40 during the operation of the lighter. The nose may also be provided on the flint tube 24 in the manner suggested in FIGS. 3 and 4.

The mode of operation of the lighter just described is as follows: when the back shell 29 is pivotally moved outwardly about the pin 27 so that the slide member and the gas tank are released from the bottom 37 of the back shell (position shown in FIG. 5), the spring 40 relaxes to such an extent that its arm 41 is clear of the valve stem 39, particularly of the stop shoulder 42 so that the tank 38 can be pulled out of the housing 21 in a downward direction. The flint can also be replaced in this position.

When the back shell 29 is pivotally moved in the opposite direction, the pressure nose or noses 47 of this shell will engage the arm 44 and will move the same pivotally in the clockwise sense to such an extent that the forked end of the arm 41 engages the stop shoulder 42 of the valve stem 39 from below (position shown in FIG. 3). If it is desired to light the lighter, pressure in the direction of the arrow P is exerted upon the back shell 29 so that the latter and the flint tube 24 are pivotally moved about the pin 22. This causes the bent member 25 to open the cover 26 so that the driver 32 rotates the driver wheel 33 and with it the friction wheel 28 and sparks are produced at the flint 34. At the same time, the pressure noses 47 of the shell 29 are urged against the arm 44 of the spring 40 so that the arm 41 bearing on the gas tank 38 at 48 is lifted like a toggle and the fork 43 lifts also the stop shoulder 42 and the valve stem 39. The gas can now flow out and is ignited by the spark produced at the same time. The open position of the lighter is shown in FIG. 4.

When the lighter is released, the spring 40 is relaxed so that the back shell 29 and the flint tube 24 are pivotally moved back into the position shown in FIG. 3 and the stem 39 is returned by the valve spring, not shown, so that the valve is closed.

The provision of the spring has the advantage that the resulting lifting movement of the arm lifting the valve is mainly parallel to the axis of the valve. When a rigid bell-crank lever is used, the end of its arm will necessarily describe an arc of a circle around the pivot of the lever. In the case of a spring, the pure rotation of the rigid lever is changed to a combined translating and rotary movement.

Numerous modifications are possible within the scope of the invention. For instance, in a lighter having no pivoted back shell, the leaf spring might be designed so that the arm coacting with the valve assumes a position similar to that of FIG. 3 when the lighter is closed whereas this arm is pivotally moved below the valve only during the first phase of the opening movement.

The leaf spring 40 might be replaced by a toggle con-

sisting of two rigid parts, which are connected to each other by an articulated joint.

I claim:

1. A gas fuelled lighter comprising first and second structural members pivotally connected together to perform a predetermined rotation movement relative to one another, one of said structural members constituting at least in part a housing and including gas valve means, the other of said structural members including a flint tube pivotally connected to one end thereof to said housing and having an opposite remote end, a friction wheel adjacent said opposite end of the tube, said lighter further comprising actuating means coupled to said valve means and to said members to actuate the valve means in response to relative rotation between said members, said actuating means including an actuating element having one arm coupled to said valve means and another arm extending at an angle to the first said arm and positioned for contacting and coacting with at least one of the structural members during said relative movement to respectively actuate and close the valve means dependent upon the particular direction of relative movement and means rotatably supporting the friction wheel in relation with said members such that rotation of the friction wheel in a predetermined direction is accompanied by actuation of the gas valve means, said actuating element being a toggle in which said one arm which has a free end coacting with said gas valve means, said friction wheel being mounted for rotation about an axis to cooperate with said flint tube, said other structural member comprising a further member which surrounds said flint tube and is coupled to said flint tube and is pivotally movable relative to said part of said housing constituted by said one structural member about said axis of rotation, said further member including at least one pressure nose engageable with said toggle to cause the latter to actuate said valve means in an opening sense.

2. A gas-fuelled lighter as claimed in claim 1, in which said toggle consists of an integral, angled leaf spring.

3. A gas fuelled lighter comprising first and second structural members pivotally connected together to perform a predetermined rotation movement relative to one another, one of said structural members constituting at least in part a housing and including gas valve means, the other of said structural members including a flint tube pivotally connected at one end thereof to said housing and having an opposite remote end, a friction wheel adjacent said opposite end of the tube, said lighter further comprising actuating means coupled to said valve means and to said members to actuate the valve means in response to relative rotation between said members, said actuating means including an actuating element having one arm coupled to said valve means and another arm extending at an angle to the first said arm and positioned for contacting and coacting with at least one of the structural members during said relative movement to respectively actuate and close the valve means dependent upon the particular direction of relative movement and means rotatably supporting the friction wheel in relation with said members such that rotation of the friction wheel in a predetermined direction is accompanied by actuation of the gas valve means, said friction wheel being mounted for rotation about an axis to cooperate with said flint tube, said other structural member comprising a further member which surrounds said flint tube and is coupled to said flint tube and is pivotally movable relative to said part of said housing constituted by said one structural member about said axis of rotation, said further member including at least one pressure nose engageable with said toggle to cause the latter to actuate said valve means in an opening sense, said further member being a shell member which is pivotally movable in directions away from and toward said one structural member and said one arm of said actuating element is arranged to be moved away from said valve means by a movement of said shell

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member in a direction away from said one structural member, said pressure nose being arranged to urge said one arm of said toggle against said valve means in response to a movement of said shell member in a direction toward said one structural member.

4. A gas fuelled lighter comprising first and second structural members pivotally connected together to perform a predetermined rotation movement relative to one another, one of said structural members constituting at least in part a housing and including gas valve means, the other of said structural members including a flint tube pivotally connected at one end thereof to said housing and having an opposite remote end, a friction wheel adjacent said opposite end of the tube, said lighter further comprising actuating means coupled to said valve means and to said members to actuate the valve means in response to relative rotation between said members, said actuating means including an actuating element having one arm coupled to said valve means and another arm extending at an angle to the first said arm and positioned for contacting and coaxing with at least one of the structural members during said relative movement to respectively actuate and close the valve means dependent upon the particular direction of relative movement and means rotatably supporting the friction wheel in relation with said members such that rotation of the friction wheel in a predetermined direction is accompanied by actuation of the gas valve means, said actuating element being a toggle in which said one arm which has a free end coaxing with said gas valve means, said friction wheel being mounted for rotation about an axis to cooperate with said flint tube, said other structural members comprising a further member which surrounds said flint tube and is coupled to said flint tube and is pivotally movable relative to said part of the housing constituted by said one structural member about said axis of rotation, said flint tube including at least one pressure nose engageable with said toggle to cause the latter to actuate said valve means in an opening sense.

5. A gas fuelled lighter comprising a body, a flint tube member, means pivotally connected said body and flint tube member together for relative pivotal movement, a housing member covering the flint tube member and engaged therewith for common pivotal movement relative to the body, a fuel tank adapted for being supported in said body and including valve means for the selective

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release of fuel, an actuating element having a position adjacent the flint tube, said actuating element having a free end in engagement with the valve means, said housing member and flint tube member being conjointly movable towards and away from said actuating element between first and second positions in which the valve means is respectively opened and closed, said flint tube member in the first position being approximately parallel to a portion of the actuating element, nose means positioned on one of said members for moving approximately perpendicular to said portion of the actuating element as the members are moved towards the second position to contact and deform the actuating element and cause the free end thereof to be displaced such that the valve means is opened, a friction wheel and means rotatably supporting the friction wheel on one of the members at a location above the flint tube member such that movement of said members from said first to said second position is associated with rotation of the friction wheel.

6. A lighter as claimed in claim 5, wherein said actuating element constitutes a toggle lever which is secured with the flint tube member at a location remote from the free end which engages the valve means, said toggle lever including an inclined arm portion at said free end which engages the valve means and causes the displacement of the valve means in a direction approximately perpendicular to the direction of movement of the nose means.

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