Feb. 14, 1967 J. E. AYRES 3,303,673

OPERATING MECHANISM FOR CIGARETTE LIGHTER

Filed Nov. 2, 1964

Fig. 1.

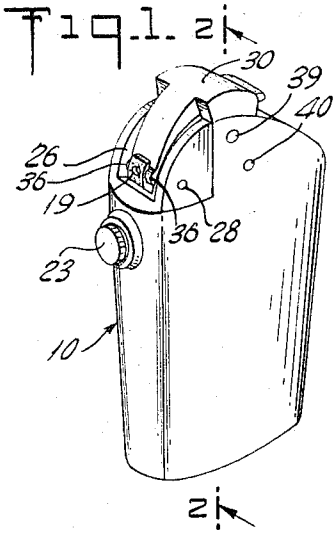


Fig. 6.

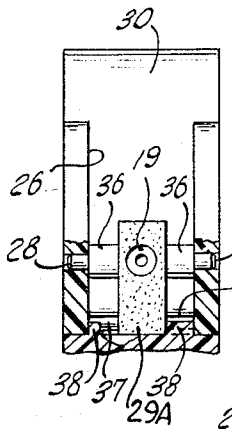
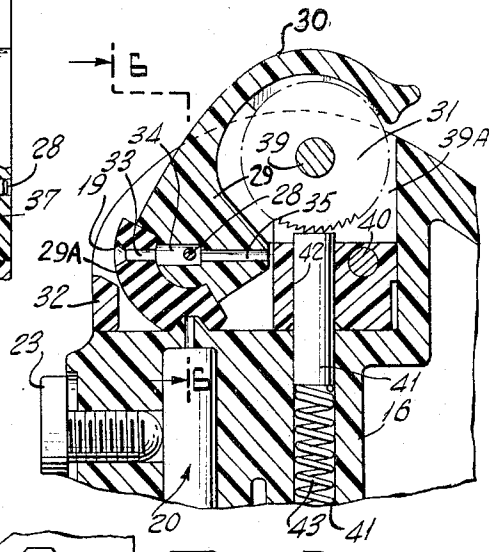


Fig. 3.



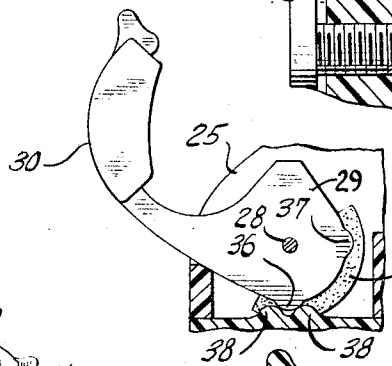


Fig. 5.

Fig. 2.

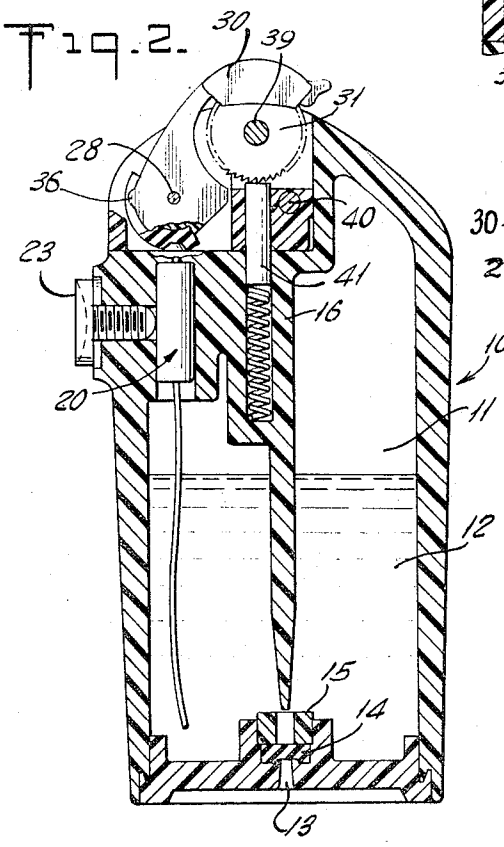
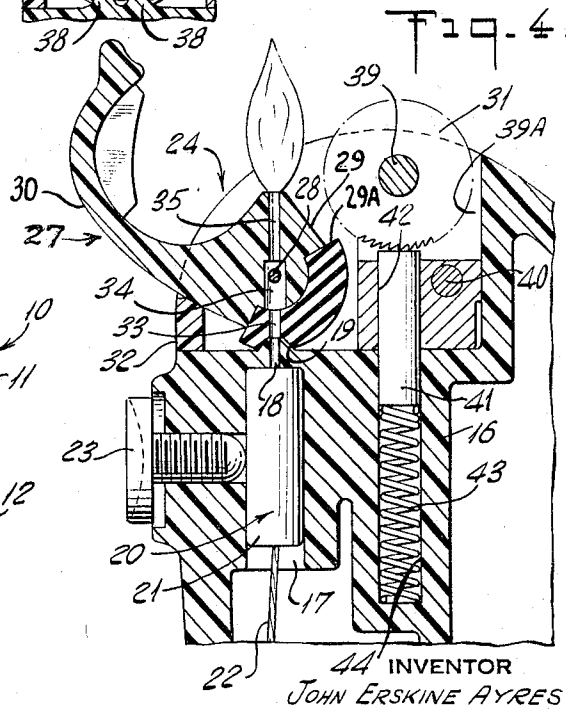


Fig. 4.



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3,303,673

OPERATING MECHANISM FOR CIGARETTE LIGHTER

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Filed Nov. 2, 1964, Ser. No. 408,168
3 Claims. (Cl. 67—7.1)

The present invention relates to new and useful improvements in operating mechanisms for cigarette lighters. It relates, more particularly, to a snuffer for opening and closing the gas discharge port of a gas burning cigarette lighter.

An object of the present invention is to provide a simple and effective operating mechanism for a cigarette lighter by means of which a fuel discharge port of a gas operated lighter can be opened or closed while the lighter is held in one hand by the user and which does not require shifting of the lighter's position in the user's hand to operate the spark producing mechanism.

Another object of the invention is to provide an operating mechanism for a cigarette lighter which insures that there will be no leakage or loss of fuel when the lighter is not in use and operating mechanism is in closed position.

A further object of the invention is to provide an operating mechanism for a cigarette lighter which is constructed in such a way that the user will not inadvertently fail to close the discharge port of the lighter after use. This is particularly important with a gas-operated lighter as the escape of fuel in the form of gas when the flame has been extinguished is difficult to detect visually and upon failure to close the discharge port, the escape of fuel will quickly exhaust the supply of fuel and make the lighter inoperative.

Other objectives and advantages of the present invention will become apparent and be better understood from the following description and the accompanying drawings, in which:

FIG. 1 is a perspective view illustrating a lighter having an operating mechanism embodying the present invention;

FIG. 2 is a side view in vertical section along line 2—2 of the lighter shown in FIG. 1 and is drawn to a larger scale;

FIG. 3 is a fragmentary side view in vertical section of the lighter shown in FIGS. 1 and 2 illustrating certain details of the operating mechanism in closed position and is drawn to a larger scale than FIG. 2;

FIG. 4 is a fragmentary side view in vertical section corresponding to FIG. 3, but with the operating mechanism in open position;

FIG. 5 is a fragmentary side view in vertical section of a portion of the lighter operating mechanism shown in FIG. 4 with the section being taken in a different plane than in FIG. 4; and

FIG. 6 is a fragmentary end view in section taken along line 6—6, of FIG. 3.

Referring now to the drawings in detail, there is a hollow lighter body **10** which is preferably molded of plastic and forms a chamber **11** containing a supply **12** of a vaporizable gas producing fuel, such as isobutane, under pressure in liquid form.

Generally speaking, the lighter body and certain other parts of the lighter are similar to those described in my copending application for United States Letters Patent, Serial No. 132,047, filed August 17, 1961, for "Disposable Gas Operated Cigarette Lighter," now U.S. Patent No. 3,154,935, issued November 3, 1964, and reference may be made thereto for a more detailed description.

If desired, an inlet passageway **13** may be formed in the bottom of the lighter body for the filling or refilling of the chamber with fuel. A plug or diaphragm **14** of rubber or the like which extends across and closes the inner end of the inlet passageway is held in place by a collar **15** which is cemented in place. Fuel under pressure in liquid form may be introduced into the fuel chamber under pressure through a hollow needle (not shown) which pierces the rubber diaphragm. The rubber diaphragm is self sealing and closes upon removal of the needle.

An upper end wall **16** of the fuel chamber in the lighter body contains an internal choke-receiving recess or cavity **17** which communicates at its upper end with a short, restricted discharge passageway **18** leading to an outlet opening in the exterior surface of the upper end wall of the lighter body. A raised protuberance **19** formed on the exterior surface of the upper end wall of the lighter body surrounds the outlet opening of the discharge passageway.

A choke **20** which controls the rate at which fuel can pass from the fuel chamber to the discharge passageway is press fitted into the recess in the upper wall of the lighter body. The choke is pre-set for a maximum desired discharge rate and comprises a cylindrical body **21** of resilient material, such as rubber, having a cotton thread **22** of about $\frac{1}{32}$ of an inch in diameter extending through the center thereof and to the bottom of the fuel chamber so that the lower end of the thread will be immersed in the supply of fuel in liquid form. A screw **23** is threaded in an opening in one side of the lighter body with its inner end being positioned to bear against the cylindrical rubber body of the choke at a point intermediate its ends. By turning the screw so as to cause inward movement of its end and thereby exert pressure on the body of the choke, the rate at which fuel passes through the choke and the size or length of the flame produced can be reduced to suit the user's requirement.

The flame control and choke referred to above are more fully described and claimed in my application for United States Letters Patent, Serial No. 408,167, being filed concurrently herewith and references may be made thereto for additional details.

A flame guard and flint wheel supporting member **24** which may be formed as a separate piece is carried on top of the lighter body with a portion thereof extending over the outlet of the discharge passageway. As shown, the flame guard and flint wheel supporting member fits into a relieved portion at one side of the lighter body.

The flame guard and flint wheel supporting member which may be molded of a flame resistant, thermosetting material such as a phenolic resin, has a pair of spaced forwardly extending side walls **25**. The spaced side walls define a slotted opening **26** which extends over the outlet opening of the discharge passageway in the upper wall of the lighter body and an operating member **27** is pivotally mounted on a pin **28** in the slotted opening immediately above the discharge passageway in the lighter body. The pin is supported by and extends between the spaced side walls.

The operating member which may be termed a snuffer, includes a rotatable body **29** through the center of which the supporting pin extends and a curved operating lever **30** is connected to and extends from the rotatable body. The pivoted or rotatable body has a curved lower surface opposing the discharge outlet in the lighter body. An arcuately shaped sealing insert **29A** made of a resilient or deformable material, such as buna-N rubber of 65 durometer, is carried on the curved lower surface of the body of the operating member and deformably engages with the surface of the lighter body surrounding the discharge

outlet while permitting movement of the body of the operating member through an angle of about 90° between its closed and open positions.

In closed position, as shown in FIG. 3, the resilient insert carried by the rotatable body is in sealing engagement with the protuberance on the lighter body and closes the discharge port. Under these conditions, the outer end of the curved operating lever extends over a flint wheel **31** in a position where it is readily accessible for movement of the operating member to open position prior to operation of the flint wheel.

When the operating member is moved to its open position, as shown in FIG. 4, the base of the operating lever engages with a stop bar **32** extending between the side walls of the flame guard member and a passageway **33** which extends through the resilient insert, is aligned with the discharge port in the lighter body. The entrance to the passageway in the insert may be relieved or tapered slightly so as to receive the protuberance surrounding the discharge port and insure its alignment with the discharge port.

The passageway in the resilient insert communicates with an enlarged bore **34** in the body of the operating member which in turn communicates with a bore **35** of reduced size extending through the body of the operating member to a discharge outlet from which gas which produces the flame escapes as indicated in FIG. 4. The pin on which the body of the operating member is pivotally supported extends transversely through the body and through the enlarged bore therein which is made large enough to permit passage of gas therethrough to the reduced bore.

As shown in FIG. 5, interengaging detent means may be provided on the lighter body and the operating member to hold the operating member in its open or closed position. The detent means comprises spaced projections **36** and **37** extending from the curved surface of the rotatable body of the operating member and a pair of projections **38** on the opposing surface of the lighter body which form a mating recess for the projections on the rotatable body.

When the operating member is in its open position as shown in FIG. 4, it will be noted that the outer end of the operating lever extends well beyond the lighter body and serves as a reminder to move the operating member to closed position even though the flame may have been extinguished prior to such movement.

The flame guard member is shaped at its rear so as to fit between upstanding spaced walls which are formed as part of the lighter body. The flint wheel is mounted in a recess **39A** which extends rearwardly from the slotted opening defined by the spaced side walls of the flame guard member and is rotatably supported on a rivet or pin **39** which extends through portions of the flame guard member defining said recess and also, through the upstanding side walls of the lighter body. The flint wheel supporting rivet and a dowel pin **40** which extends through the flame guard member and the upstanding walls on the lighter body serve to secure the flame guard member in place on top of the lighter body.

A flint **41** extends through an opening **42** in the flame guard member beneath the flint wheel and is urged into engagement with the flint wheel by a compression spring **43**. The spring is located in a well **44** formed in the top or upper wall of the lighter body.

It will be understood that various modifications and changes may be made in the particular embodiment of the invention which has been illustrated and described herein

without departing from the scope of the invention as defined by the following claims.

I claim:

1. In a gas-burning cigarette lighter of the type which includes a hollow body defining a fuel chamber containing a supply of inflammable gas under pressure and in liquid form, said body having an end wall containing a discharge outlet with said outlet being in communication with said fuel chamber, the improvement which comprises:

(a) a pair of spaced walls of rigid material carried by and extending upwardly from the upper wall of the lighter body on opposite sides of the discharge outlet;

(b) a shaft extending between said side walls at a point above the discharge outlet;

(c) a control member of rigid material pivotally mounted on said shaft in the space between said upstanding walls with an arcuate surface thereof opposing said discharge outlet;

(d) said control member being manually movable between an open position and a closed position and having a bore extending therethrough;

(e) said bore having an end located in said arcuate surface and communicating with the discharge outlet in the lighter body in the open position of the control member;

(f) a sealing member of resilient material carried by the arcuate surface of the control member and entering into sealing engagement with an exterior surface of the lighter body surrounding the discharge outlet in both the open and closed positions of the control member,

(g) said sealing member having a passageway extending therethrough and communicating with the bore in the control member and with the discharge outlet in the open position of the control member; and

(h) an operating lever connected to the control member;

(i) said operating lever having a free end extending beyond the spaced walls when the control member is in its open position.

2. In a gas-burning lighter, the improvement as defined in claim **1** which includes,

(a) interengaging detent means formed on opposing surfaces of the lighter body and the control member for releasably holding the control member in its open and closed positions.

3. In a gas-burning lighter, the improvement as defined in claim **1** which includes,

(a) a flint; and

(b) a spark wheel engaging with said flint at a point between the spaced upstanding walls and adjacent a discharge end of the bore extending through the control member when the control member is in its open position.

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