United States Patent [19]

Neyret

[11] **3,884,616**

[45] **May 20, 1975**

[54] **LIGHTER WITH HEAD ROTATABLE FOR FLAME ADJUSTMENT**

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[21] Appl. No.: **418,823**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 376,446, July 5, 1973.

[30] **Foreign Application Priority Data**

Nov. 27, 1972 France 72.42707

[52] **U.S. Cl.** **431/142;** 431/254; 431/276

[51] **Int. Cl.** **F23q 2/00**

[58] **Field of Search** 431/142, 143, 254, 276, 431/277

[56] **References Cited**

UNITED STATES PATENTS

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Primary Examiner—Carroll B. Dority, Jr.
Attorney, Agent, or Firm—Karl F. Ross; Herbert Dubno

[57] **ABSTRACT**

A disposable cigarette or cigar lighter has a cylindrical body constituting a butane (liquefied-gas) reservoir and formed with a tubular threaded extension on which a head carrying the flint, flint wheel, and valve is carried. Screwing of the head down on the extension compresses a valve member to restrict a gas-flow passage therethrough and thereby controls the flame height. The flint is slidable axially in the head in a bore parallel to the rotation axis thereof, and opening into an annular circular groove centered on the axis of the head and opening toward the body. A spring received in this groove bears with one end against the flint and with its other end against the top of the reservoir body so as to press the flint against its wheel and to resist rotation of the head relative to the body. The top end of the compression spring is bent in at the flint and received there in an axial groove opening into the circular groove so that the spring and the head are rotationally linked.

6 Claims, 7 Drawing Figures

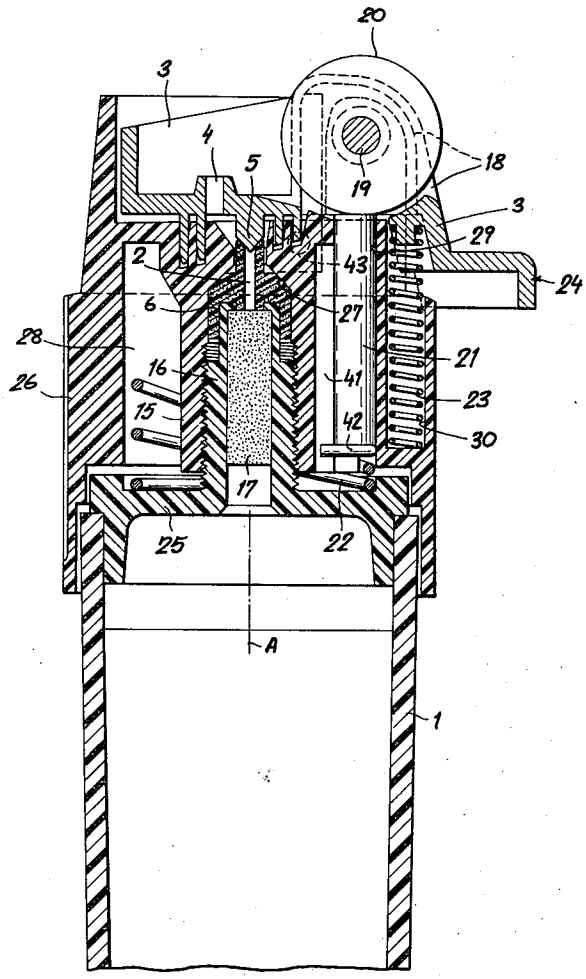


FIG 1

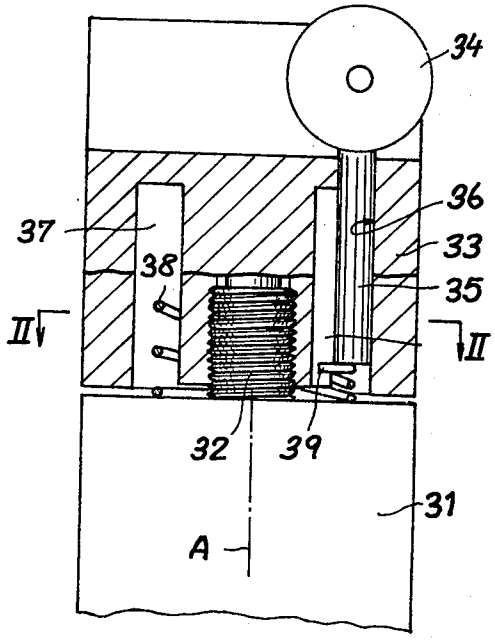


FIG.3

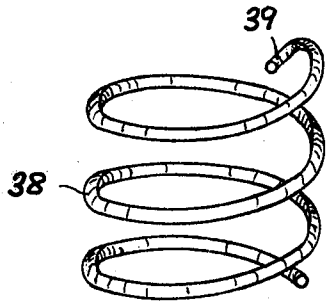
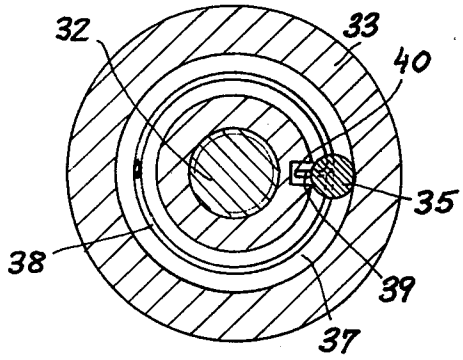


FIG 2



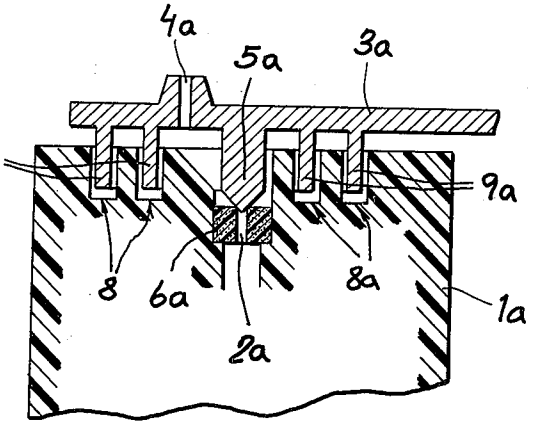


FIG. 4

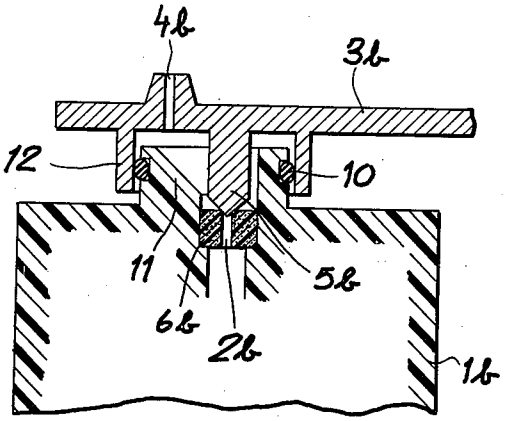


FIG. 5

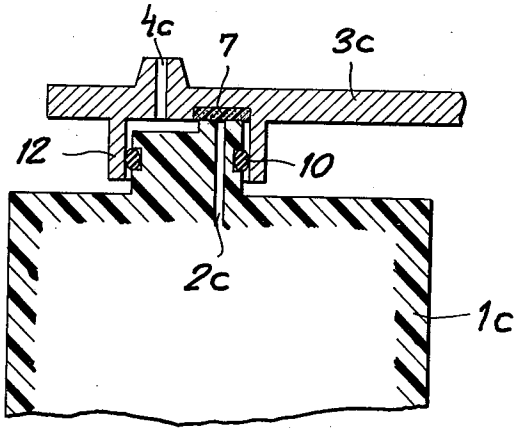


FIG. 6

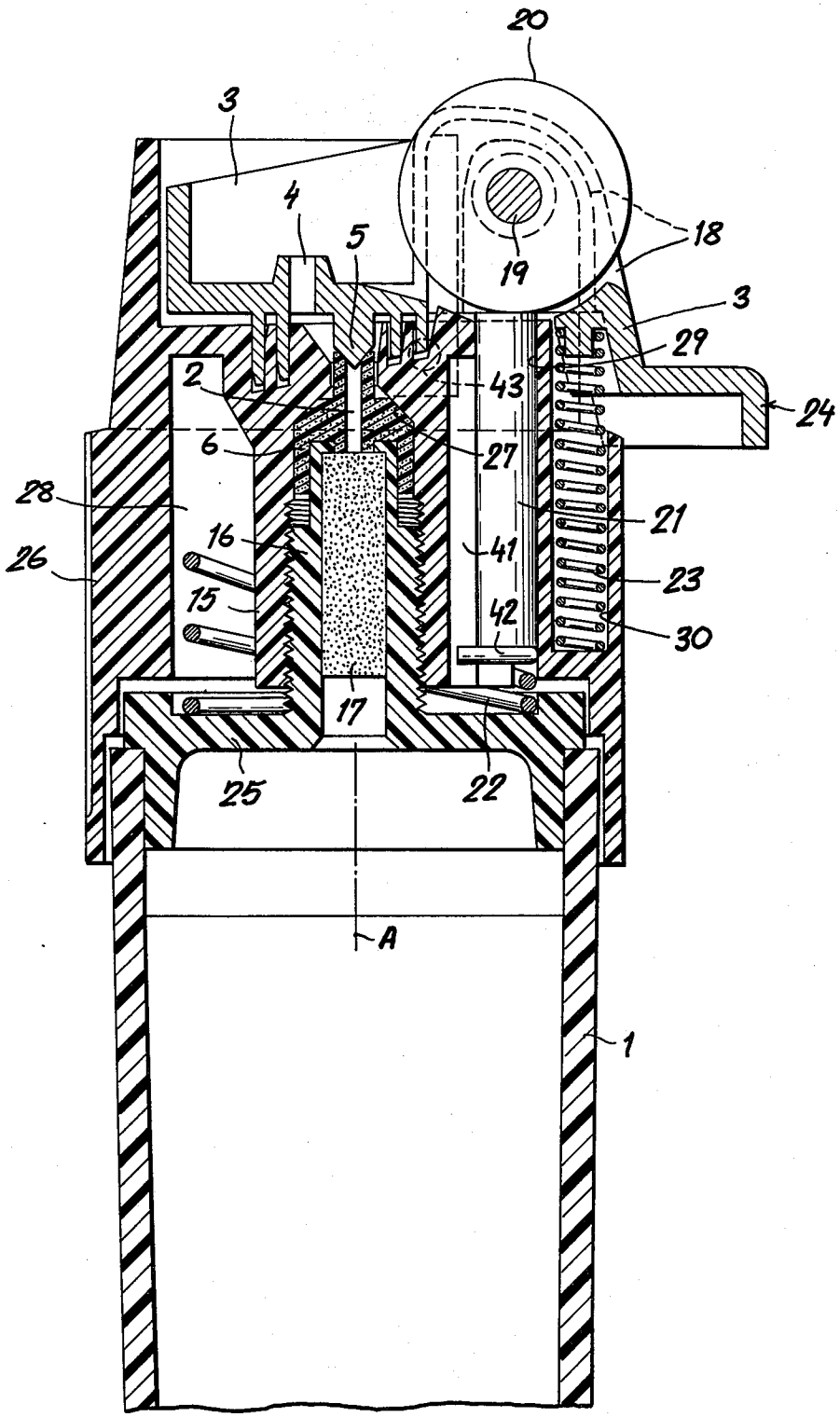


FIG. 7

LIGHTER WITH HEAD ROTATABLE FOR FLAME ADJUSTMENT

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application is a continuation-in-part of my copending patent application Ser. No. 376,446 filed July 5, 1973 and is related to the commonly assigned patent application Ser. No. 348,106 filed Apr. 5, 1973 and now U.S. Pat. No. 3,849,060 of P. Chevallier.

FIELD OF THE INVENTION

The present invention relates to a lighter and more particularly, to a disposable pocket-type lighter for cigarettes, cigars, pipes, and the like.

BACKGROUND OF THE INVENTION

Cigarette lighters are known which have a cylindrical body housing a liquefied gas reservoir and a head provided with means for adjusting the flame height. A wheel is rotatable relative to a flint disposed in the head to spark across a gas orifice that is held open by depression of a short lever projecting from the lighter under the flint wheel.

In a common type of such lighter the flint is accommodated with its compression spring in a tube which projects from the bottom of the head. In order to allow rotation of the head relative to the body it is necessary to form the body with an open groove receiving the projecting tube. This shape limits the capacity of the gas reservoir and increases fabrication costs.

OBJECTS OF THE INVENTION

It is an object of the present invention to provide an improved lighter.

Another object is to further principles set forth in earlier above-cited patent applications. A further object is to provide a lighter with adjustable flame height which has a high-capacity liquefied-gas or fuel reservoir and which is inexpensive to make.

SUMMARY OF THE INVENTION

These objects are attained according to the present invention in a lighter wherein the flint is received in a bore or fuel reservoir formed in the head and extending parallel to the rotation axis of the head of the body. A circular groove opening toward the body is formed in the head centered on the axis, and a helical compression spring received in this groove has one end bearing on the top of the body. The flint bears on the other end of the spring. The head is rotatable to adjust the flame height.

In accordance with another feature of this invention the circular groove and the flint bore coincide so that the bore opens at the groove. This groove, according to a further feature of this invention, is formed with a radially opening axially extending slot in which a bent-over tail of the spring engages. In this manner the spring will rotate on the body with the head, while acting as a friction brake so that once the flame height is set it remains the same. This slot lies next to the flint bore.

DESCRIPTION OF THE DRAWING

The above and other objects, features, and advantages of the present invention will become more readily apparent from the following description, reference being made to the accompanying drawing in which:

FIG. 1 is a side view partly in section and partly in diagrammatic form of a lighter according to this invention;

FIG. 2 is a section taken along line II—II of FIG. 1;

FIG. 3 is a perspective view of the spring of the lighter of FIG. 1;

FIGS. 4–6 are partial axial sections through three valve configurations according to the present invention; and

FIG. 7 is an axial section through a portion of a lighter in accordance with this invention.

SPECIFIC DESCRIPTION

The arrangement shown in FIGS. 1–3 has a cylindrical body forming a liquefied-gas or fuel reservoir **31** made of heavy translucent synthetic-resin material and provided with a threaded stem **32** defining an axis A about which a synthetic-resin head or cover **33** rotates, operating a valve as described hereinafter.

This head **33** supports a wheel **34** which acts on a lighter flint **35**, here an iron-cerium rod, to spark across an outlet orifice described below. This flint **35** is received in a cylindrical bore or passage **36** formed in the head **33** and lying parallel to the axis A.

The head **33** is also formed with a circular-section cylindrical annular groove **37** which opens axially toward the body **31** and which receives a helical compression spring **38** having a bent-over end forming a tail **39** that is engaged in a slot **40** formed inside the groove **37** adjacent the hole **36**.

FIG. **4** shows a lighter body **1***a* having an outlet hole **2***a* provided with a compressible synthetic-resin seat washer **6***a* in which is engaged a needle-valve member **5***a* formed on a lever **3***a* which can be rocked on the body **1***a*. The lever **3***a* is formed with an outlet orifice or nozzle **4***a* which is offset from the member **5***a* and from the hole **2***a* and is formed with a pair of downwardly directed skirts **9** that engage in respective annular grooves **8** formed in the body **1***a*. In this arrangement rocking of the lever **3***a* pulls the point of member **5***a* away from the seat **6***a* so that the space under the lever **3***a* fills up with gas. The interfitting skirts **9***a* and grooves **8***a* act as a labyrinth seal so that the gas escapes solely through the hole **4***a* as a jet, ignited as described below. The labyrinth action is described in more detail in the above-cited Chevallier application.

In FIG. **5** the lever **3***b* is formed with a single skirt **12** which fits over a cylindrical boss **11** formed on the body **1***b*, with an O-ring **10** between the two, so that gas released by lifting of the member **5***b* from the hole **2***b* in the seat **6***b* passes out through the hole **4***b*.

FIG. **6** shows a lighter body **1***c* formed with an outlet hole **2***c* which is normally covered by a gasket seal **7** on a lever **3***c* having a hole **4***c* and otherwise identical to the lever **3***b* of FIG. **2**. In all arrangements tipping of the lever releases gas from the reservoir which is captured under the lever and can only escape through the nozzle orifice.

The lighter of FIG. **7** has a hollow cylindrical body **1** of polymethyl methacrylate and forming a butane reservoir and having an endpiece **25** formed with a threaded tubular extension **16** defining the rotation axis A of a head or top **26** having a tubular center piece **15** threaded onto the extension **16**. A wick **17** in the extension insures effective expansion of the butane.

The top of the extension is fitted with a deformable valve seat member **6** formed with a passage **2** and re-

ceived within frustoconical seat 27 in the head 26. Rotation of the head 26 about the axis A relative to the body 1 to screw the two together will compress the body 6 and thereby reduce the size of opening 2. Therefore rotation of the head 26 relative to the body 1 adjusts the rate of gas escape possible through the passage 2.

The upper portion of the head 26 journals a pivot pin 19 on which is rotatably mounted a wheel 20 engaging the upper end of a flint pin 21 slidable in a bore 29 formed in the head 26 parallel to and eccentrically offset from axis A. A lever 3 bifurcated at 18 and having a projecting handle or actuating portion 24 is formed with an outlet orifice 4, valve member 5, and skirts 9 engaging in grooves 8 in the head 26, much as described for the arrangement of FIG. 4. This lever 3 is pivoted on an axle 43 parallel to the pin 19 of the flint wheel 20 and is urged into the illustrated position with its point 5 closing the hole 2 by a compression spring 23 received in an axis bore 30 formed next to and radially outward of the flint passage 29. In order to operate the lighter, the user holds the body 1 in his hand with his fingers and runs his thumb over the wheel 20 so as to rotate it in a clockwise direction as shown in FIG. 7. As he does this he lets this thumb come to rest on the portion 24 so as to tip the lever 3 up and pull the needle 5 away from the element 6. Sparks struck by the wheel 20 on the flint 21 will be directed across the orifice 4 to ignite gas escaping through this hole. So long as the handle 24 is depressed gas will continue to escape at a rate determined by the size of passage 2. The cross-sectional area of passage 2, which is adjusted by rotation of the head 26 therefore determines the flame height.

The head 26 is formed as described with reference to FIGS. 1–3 with a groove 28 open toward the body 1 and centered on the axis A. A spring 22 is received in this groove 28 and has one end bearing on the endpiece 25 of the body 1 and bears with its other end against the bottom end of the flint 21. The spring end is bent over at 42 and received in an axial groove 41 as is the spring 38 of FIGS. 1–3. In this manner the spring 22 serves two purposes: It pushes the flint 21 up against the wheel 20, and it inhibits rotation of the head 26 relative to the body 1 so that once the flame height is set the setting remains fixed. Since the spring 22 is rotationally linked to the head 26, it will remain in place under the flint 21.

The lighter according to the present invention is extremely durable and inexpensive to manufacture. It can be provided with a new flint and reservoir, so that the cover can be reused, but this cover is so inexpensive that the lighter can be produced for disposable use. Operation is simple, as is setting of the flame height. No longer are tools required to set the flame height, nor will the user risk broken fingernails from turning a small adjustment wheel.

I claim:

1. A lighter comprising:

a body having a gas reservoir;

a head mounted on and rotatable relative to said body about an axis passing through said body, said head being formed with a passage generally parallel to said axis and opening away from said body;

a flint axially displaceable in said passage; and

a compression spring received in said head concentrically to said axis and having one end bearing against said body, said flint bearing against the other end of said spring, said body being generally cylindrical and centered on said axis, said head having valve means operatively connected to said body for limiting gas flow therefrom through said head, said head being formed with an annular circular groove open toward said body and receiving said spring.

2. The lighter defined in claim 1 wherein said spring is generally cylindrical and has a bent-over end portion, said head being formed with an axial groove opening into said circular groove and receiving said end portion.

3. The lighter defined in claim 2 wherein said axial groove is formed in said head on the inner periphery of said circular groove.

4. The lighter defined in claim 2 wherein said body is formed at said axis with a threaded projection, said head being threaded onto said projection.

5. The lighter defined in claim 4 wherein said valve means includes a deformable valve member received between said projection and said head and formed with a throughgoing hole, whereby screwing of said head down on said body compresses said valve member and constricts said hole.

6. The lighter defined in claim 5 wherein said valve means further comprises a valve element rockable on said head between a closed position blocking gas flow through said hole and an open position allowing gas flow through said hole, said lighter further comprising a wheel rotatably mounted on said head and engaging said flint, whereby rotation of said wheel generates sparks with said flint.

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