May 7, 1968 SADAO YOSHINAGA 3,382,028

GAS LIGHTER

Filed March 14, 1966

Fig. 1.

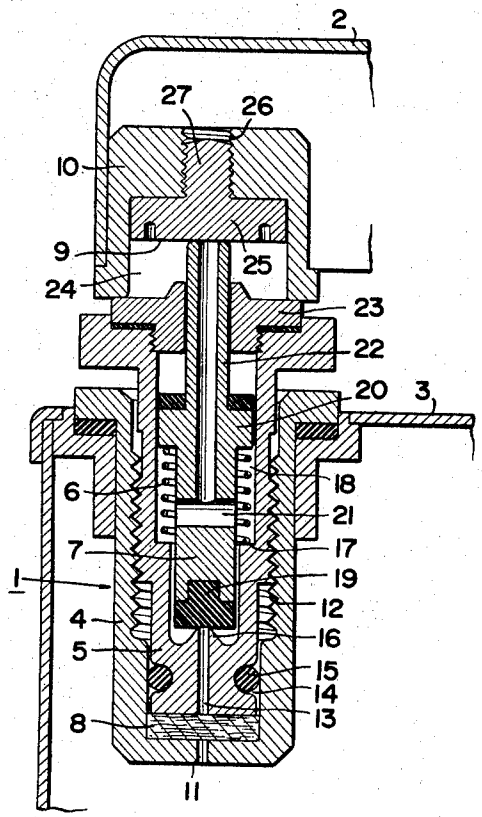


Fig. 2.

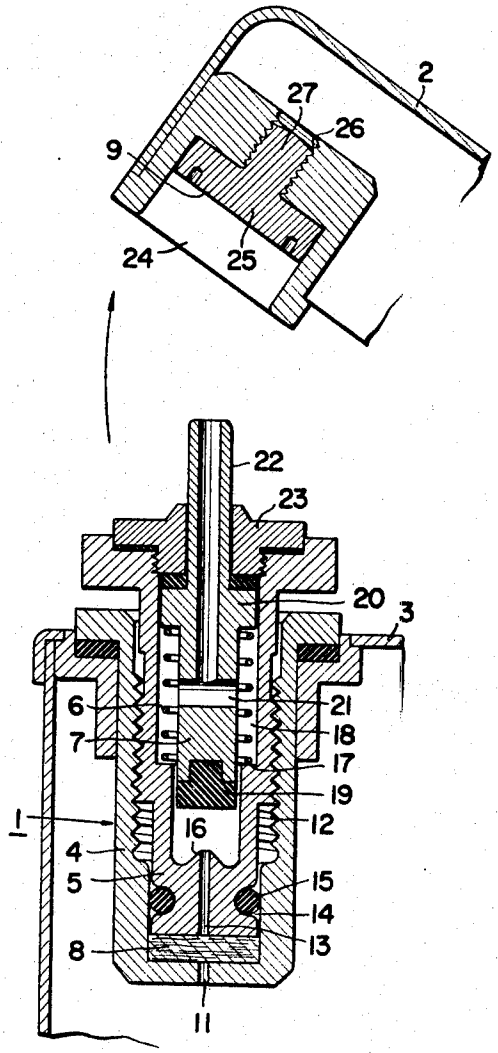
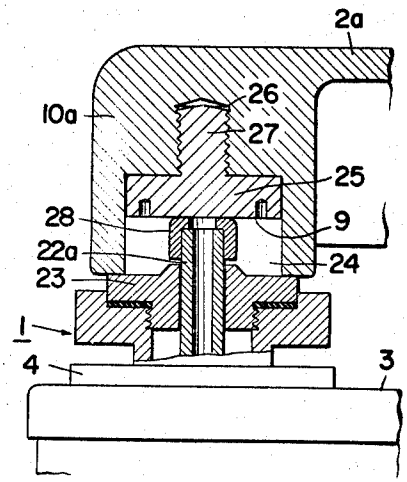


Fig. 3.



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3 Claims. (Cl. 431—150)

The present invention relates generally to burner valves for gas lighters and in particular to novel features eliminating or minimizing damage to operating parts.

Numerous patented gas lighters, such as those disclosed in U.S. Patents Nos. 2,620,643, 2,737,037, 2,836,044 and 3,114,249 for example, employ valve stems designed to be depressed by lighter cap for purposes of closing valve. Usually, the abrupt depression against valve stem tends to damage or wear valve components adjacent edge of valve seat. With continued use, improper functioning usually results. Frequently, a depressing member of resilient material is employed in an attempt to avoid wear and tear, usually resulting in unreliable and poor closing operation of valve.

Accordingly, it is an object of the present invention to provide a system for resiliently suspending a valve stem upwardly in such manner that upon being depressed it will be prevented from striking the valve seat abruptly, thereby relieving or dampening shock caused by the impact of lighter cap and possible damage to the valve body.

Another object of the present invention is to provide in a burner valve mechanism for a gas lighter a depressing member sufficiently hard and stationary such that positive depression against the valve stem may be assured while preventing damage to the nozzle tip, it being preferred that the depressing member be made of aluminum or alloy of same, known as being relatively soft metal.

A further object of the present invention is to provide in a gas lighter burner valve assembly means for resiliently supporting a valve stem to cushion impact against same during lighter use while providing positive valve closing with use of depressing member of metal softer than that otherwise employed in lighter while not being extremely elastic.

Other objects will become apparent from the ensuing specification and accompanying drawing in which:

FIG. 1 is a cross-sectional view of lighter with cap overlying burner valve which is in closed position;

FIG. 2 is a cross-sectional view of lighter with cap in raised position and burner valve in open position; and

FIG. 3 is a cross-sectional view of a second embodiment of burner valve and associated lighter cap of the present invention.

As seen in FIGS. 1 and 2, reference numeral **1** generally designates combustion or burner valve which is mounted at corner of lighter body **3**. In conventional manner (not shown) a sparking or ignition system is employed, as well as filling-valve. Valve **1** consists of outer tubular valve member or housing **4** fixed in position with respect to lighter body **3**, first inner valve member **5** threadedly engageable within outer member **4** for vertical adjustment, and second inner valve member **7** reciprocably mounted within adjustable valve member **5** with the use of coiled spring **6**. Porous elastic material **8** is located between the bottom of stationary outer valve member **4** and first inner adjustable valve member **5**.

Stationary outer valve member **4** includes passageway **11** at the bottom thereof for transporting liquefied gas from lighter reservoir to porous material **8**. Also, the inside wall of member **4** is provided with screw threads **12** permitting vertical adjustment of first inner valve member **5**.

Cap **2**, normally biased in closed position in conventional manner, is provided with stationary support **10** into which depressing member **9**, of soft metal, is screwed as described in detail hereinafter.

Within the bottom of adjustable member **5** is located passageway **13** for transporting fuel from porous member **8** while recess **14** extends about the periphery thereof into which is inserted O-ring **15**. The reference numeral **16** generally designates a valve seat formed by that portion of adjustable member **5** which is adjacent the upper end of passageway **13**. Further upward along adjustable member **5** is located step **17** defining within the upper part of adjustable member **5** an enlarged compartment **18**. Of course, inner valve member **7** is urged upwardly by coiled spring **6** which rests between ledge **20** and step **17**. Mounted within the bottom of inner valve member **7** is body **19**, formed of rubber, soft synthetic resin, or the like.

Within inner valve body **7** is located a first generally horizontal bore **21** and a second generally vertical bore within valve stem or nozzle **22** intersecting same to form a continuous passageway for discharging gaseous fuel from within compartment **18** to outside. As is now apparent, inner valve member **7** is urged upward by spring **6** to thus permit fuel to flow between valve seat **16** and body **19** (FIG. 2). Alternatively, under pressure of lighter cap **2**, valve stem **7** is urged downwardly against the action of spring **6** to position body **19** upon valve seat **16** in covering relationship with respect to passageway **13**.

To assemble, inner valve member **7** is inserted within compartment **18** above adjustable member **5** after which coiled spring **6** is positioned on step **17**. Then, screw cap **23**, provided with a central opening through which valve stem or nozzle **22** protrudes, is screwed in place within adjustable member **5**, thereby enclosing tightly compartment **18**.

Depressing member **9** includes stem **27** threadedly engaged within tapped hole **26** in support **10** above recess **24**. In this manner, the tip of valve stem or nozzle **22** contacts the center **25** of depressing member **9**, the exact time and place of contact being variable by adjusting the extent to which depressing member **9** is screwed within support **10**.

Depressing member **9** is preferably made of aluminum or aluminum alloy, known to be relatively soft among metals but not too elastic. In any event, it is preferred that depressing member **9** be softer than other metal employed in lighter to prevent damage to nozzle **22** upon impact.

In the second embodiment of FIG. 3, cap **2***a* is integral with support **10***a* while attachment **28**, of hard metal such as chrome steel, is mounted upon the tip of valve stem or nozzle **22***a*. In this manner, the area of contact between nozzle **22***a* and center **25** of depressing member **9** is increased, while preventing tip of burner **22***a* from being deformed. Obviously, cap **2** of FIG. 1 may be employed in conjunction with the modified combustion valve of FIG. 3 or the combustion valve of FIG. 1 may be employed in connection with the modified cap of FIG. 3. Of course, the caps and combustion valves of FIGS. 1 and 2 are identical.

Manifestly, variation of the burner valve and cap assembly of the present invention may be envisioned without departing from the spirit and scope of invention as defined in the sub-joined claims.

What is claimed is:

1. A gas fueled cigarette lighter, comprising:

(A) a casing having a reservoir contained therein;

(B) a burner cover mounted upon said casing together with means permitting said cover to be pivoted, said cover including within the bottom thereof an internally threaded portion;

(C) a burner valve assembly mounted upon said casing together with passageway means connecting said valve assembly and said reservoir, said valve assembly including a stationary outer valve member in communication with said reservoir, a first inner valve member adjustably mounted within said outer valve member and containing a passageway therein, a porous elastic member positioned between said stationary outer valve member and said inner valve member such that fuel is transported through said porous member into said passageway of said first inner valve member, together with means for regulating the pressure exerted on said porous member by said first inner valve member to control the flow of fuel therethrough, a second inner valve member having a passageway therein and mounted for reciprocating movement within said first inner valve member to open and close said passageway of said first inner valve member together with means normally resiliently biasing said second inner valve member upwardly to open said passageway of said first inner valve member, said second inner valve member further including an upwardly extending nozzle portion extending beyond such stationary outer valve member and said first inner valve member, together with means for transporting fuel from said passageway of said first inner valve member to said passageway of second inner valve member; and

(D) a depressing member having an externally threaded portion screwed within said internally threaded portion of said burner cover and including a lower surface engaging said nozzle portion of said second inner valve member such that the position of said lower surface in relation to the top of said nozzle portion can be adjusted to thus vary the force applied to said nozzle portion by said depressing member as said depressing member contacts same, said depressing member being made of a metal softer than that otherwise employed in said lighter.

2. A gas lighter as in claim 1, wherein said depressing member is made of aluminum alloy.

3. A gas lighter as in claim 2, including a hard metal attachment mounted upon the top of said nozzle portion of said second inner valve member.

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