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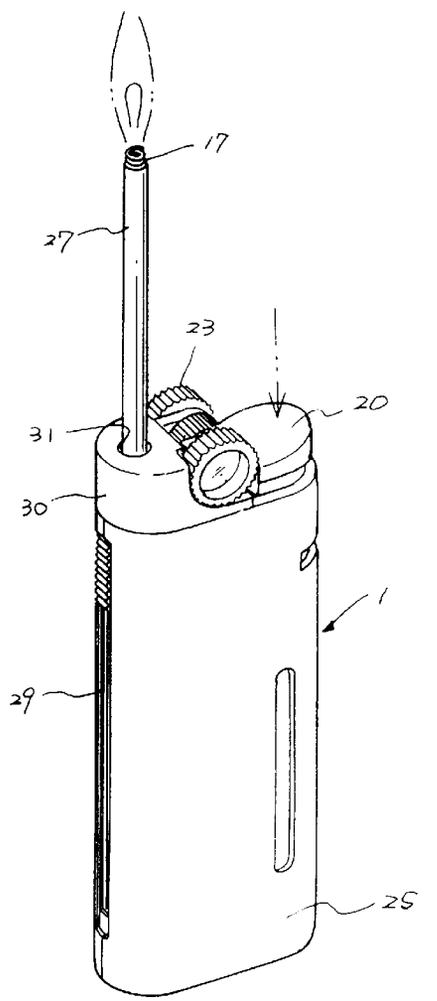
(54) Pocket lighter.

(57) A pocket lighter comprises a windshield (30) provided with an aperture (31). A moveable burner nozzle (17) is arranged so as to be moveable between a retracted position in which it is housed within the windshield (30) and an extended position in which the burner nozzle (17) is located outside of the windshield (30). The burner nozzle (17) may form part of a slide pipe (27) which is slidable through the aperture (31) to move the burner nozzle (17) between its extended and retracted positions.

Fig. 3



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Known pocket lighters commonly include a nozzle provided within a windshield such that when ignited, the flame extends through a nozzle aperture. This type of pocket lighter is intended for use in the ignition of cigarettes, but it is not convenient for lighting fireworks, kerosene heaters, kitchen gas heaters, and candles in high places. When such goods are lit using such a lighter, it is very dangerous for a user as his hand is exposed to the open flame of the lighter.

A specific ignition device has been developed in which a burner nozzle is provided spaced apart from the lighter body. This device is used mainly for purposes other than cigarette ignition, and the device is too large to carry in the same manner as a pocket lighter.

An object of the invention is to provide a pocket lighter which is adapted to provide two or more ignition locations, one in which the flame extends through the windshielded area of a lighter for the ignition of cigarettes or the like while the other is for producing a flame at a location remote from the lighter body by moving the burner nozzle to an extended position. The extended nozzle is restored to the normal location after use. This lighter does not lose its original purpose of being easy to carry.

According to the present invention there is provided a pocket lighter comprising a windshield provided with a flame aperture, and a burner nozzle, and characterized by means for moving said burner nozzle through said flame aperture between a retracted position in which the burner nozzle is located inside of the windshield and an extended position in which the burner nozzle is located beyond the windshield.

When the burner nozzle is within the windshield, the lighter is used as a normal lighter, and the windshield prevents the flame from spattering for safe ignition. On the other hand, when the burner nozzle is moved to the extended position beyond the windshield, a flame is produced in a remote location for use in the ignition of fireworks, heaters, etc. This remote flame generation attains the safety for its user's hand. After this remote ignition is finished, the burner nozzle is returned to its original position. Thus, the lighter may be carried in the normal manner.

Accordingly, a user of the lighter, can select from two ignition locations on demand, and when the remote ignition is finished, the extended burner nozzle is retracted into the original position, so that the lighter can be carried conveniently in the users' pocket.

The invention will further be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a lighter of a first embodiment of the invention;

Figure 2 is a perspective view of the lighter of Figure 1, where the lighter is ignited with the burner nozzle in its retracted, normal position;

Figure 3 is a perspective view of the lighter of Figure 1, with the burner nozzle in its extended position;

Figure 4 is a cross-sectional view of the lighter of Figure 1 showing details of the internal mechanisms;

Figure 5 is a cross-sectional view of the lighter of Figure 1 showing the burner nozzle in the retracted, normal position;

Figure 6 is a cross-sectional view of the lighter of Figure 1 showing the burner nozzle in the extended position;

Figure 7 is a cross-sectional view of a second embodiment showing the burner nozzle in the retracted, normal position;

Figure 8 is a cross-sectional view of the second embodiment showing the burner nozzle in the extended position;

Figure 9 is a cross-sectional view of a third embodiment showing the nozzle in the retracted, normal position;

Figure 10 is a cross-sectional view of the third embodiment showing the burner nozzle in the extended position;

Figure 11 is a cross-sectional view of a fourth embodiment showing the nozzle in the retracted, normal position;

Figure 12 is a cross-sectional view of the fourth embodiment showing the nozzle in the extended position;

Figure 13 is a vertical longitudinal sectional view of an alternative stopper for use with a pocket lighter; and

Figure 14 is a vertical longitudinal sectional view showing the operation of the stopper of Figure 13.

Figures 1 to 6 show the first embodiment of the present invention. The pocket lighter comprises a body 1 having a fuel reservoir 2 therein which communicates with a bore or pit 4 formed on an upper lid 3 of the reservoir 2 via an aperture 5. The bottom of the pit 4 receives a bottom portion 8 of a burner valve 12 housing a filter 6 and a mesh 7, both of which act as flow regulating members for the fuel. A valve screw 9 is provided on the upper part of the pit 4 to control the position of the bottom portion 8, and hence to control the compression of the filter 6 and the mesh 7 to ensure that an adequate quantity of gas fuel is permitted to flow from the reservoir 2 via the aperture 5.

A middle bottom portion 11 of the burner valve 12 having a seat 10 is screwed or otherwise housed in the lower portion of the screw 9, and the burner valve 12 is adhered or connected to the middle bottom portion 11. The burner valve 12 is freely movable vertically, a protrusion 13 being located in the inside of the burner valve 12 opposite the valve seat 10. A spring 15 is provided between the protrusion 13 and a valve element 14 which is provided within the burner valve 12. This spring tightly forces the valve element 14 onto the valve seat 10 to close the valve.

On the top of the burner valve 12, a joint 16 is inserted, and a gas pipe 18 extends from an outlet 19 of the joint 16 to a burner nozzle 17 whereby gas fuel from the reservoir 2 is supplied to the burner nozzle 17. An operating lever 20 is provided above the joint 16, and a spring 21 is provided between the lower surface of the lever 20 and the upper surface of the valve screw 9. As shown in Figure 4, the burner valve 12 is constantly forced in an upward direction by the spring 21 ensuring that a gap is formed between an upper end of a bar 22 formed on the centre of the bottom portion 8 and the bottom surface of the valve element 14. An ignition mechanism, comprising a wheel 23, a flint 24 and so on, which is exactly the same as that used in the prior art, is mounted on the upper lid of the reservoir 2. On the bottom of the reservoir 2 a refillable valve device 25 is provided. While the preferred embodiment of the present invention has been described using this refillable lighter, it can of course be applicable to a disposable lighter. It is also to be understood by those skilled in the art that changes and variations using other burner valve devices may be made without departing from the scope of the appended claims.

The gas pipe 18 extends downwards along one side of the reservoir 2, and it is adapted to curve at the bottom adjacent the tank cover 26, and turns in an upward direction. Therefore, the shape of this gas pipe 18 is a "U" shape. A slide pipe 27 having the burner nozzle 17 at its upper end sealably envelopes part of the gas pipe and is freely moveable up and down. A manual actuator 28 is fixed on the bottom end of the slide pipe 27, and extends to the outside portion of a slit 29 provided in the tank cover 26. The actuator 28 is integral with the slide pipe 27. The actuator 28 is intended to be finger operated, and is moved up and down along the slit to drive the slide pipe 27. By the movement of the actuator 28, the burner nozzle 17 can extend beyond the windshield 30 through a flame emerging aperture 31 thereof.

A return spring 33 is provided between a plate 32 covering an upper end of the tank cover 26 and an upper end of the actuator 28, and as shown in Figures 1, 2, 4 and 5, this spring biases the slide pipe 27 downwards.

As shown in Figure 4 to Figure 6, a stopper 34 is provided which is moveable in response to the operating lever 20. A protuberance 35 is arranged to cooperate with the stopper 34, the protuberance 35 being provided at the inner end of the actuator 28. When the operating lever 20 is pushed down and the actuator 28 is simultaneously elevated against the pressure of the return spring 33, the stopper 34 comes into engagement with the protuberance 35, to hold the slide pipe 27 in the extended position. When the operating lever 20 is released, the stopper 34 comes out of engagement with the protuberance 35 and the return spring 33 automatically drives the slide pipe 27 to its retracted original position.

In the above described device, when the operating lever 20 is in the released position, the burner valve 12, as shown in Figure 4, is biased upward by the spring 21, to ensure that the gap exists between the lower surface of the valve element 14 and the upper end of the bar 22, and thus the valve is kept closed to prevent the emission of gas fuel.

When the operating lever 20 is pushed down forcibly against the power of the spring 21, the burner valve 21 and its middle portion 11 descend together. The valve element 14 also descends until its lower surface engages the bar 22 formed on the bottom portion 8 at which point further movement of the burner valve 12 results in opening of the valve.

When the valve is opened, gas fuel flows into the pit 4 from the reservoir 2 via the aperture 5, and the fuel is regulated so that an adequate quantity flows through the filter 6 and the mesh 7, and then the fuel comes into the burner valve 12, and it passes through the joint 16, the gas pipe 18 and the slide pipe 27 to the burner nozzle 17.

After cigarette ignition, when the operating lever 20 is released, the burner valve 12 returns to its original position under the power of the spring 21, and the valve element 14 detaches from the bar 22 to contact onto the valve seat 10. Thus, the supply of gas fuel is interrupted. In the valve closing condition, a gap is formed in the lower space of the middle portion 11 and gas fuel is stored for next ignition. Thus continual ignitions can be operated smoothly under the adequate supply of the required fuel.

For normal cigarette ignition, the operating lever 20 is pushed down and fuel is supplied to the burner nozzle 17, and then a flame is obtained at the burner nozzle within the windshield 30 area.

For remote ignition, the slide pipe 27 is elevated by operating the actuator 28 after ignition. Then, as shown in Figure 6, the burner nozzle 17 extends beyond the windshield 30 through the flame emerging aperture 31. During the continuous burning obtained by the operating lever 20 actuation, the end of the stopper 34 approaches the slide pipe 27, and when the slide pipe 27 is fully raised, the protuberance 35 formed in the actuator 28 engages with the stopper 34, so that the slide pipe 27 is retained in the extended position. Accordingly, a flame is produced beyond the windshield 30 in the extended position of the burner nozzle 17. The generated flame may then be used to ignite the required articles such as fireworks, heaters, and candles. When the operating lever is released, the burner valve 12 is elevated to its original position for valve closing to interrupt the supply of fuel. At the same time, the stopper 34 is detached from the protuberance 35, and the slide pipe 27 returns to its original position.

With reference to Figure 7 and Figure 8, a second embodiment is explained. An extra metallic element

forming a guide pipe 36 is connected to the gas pipe 18, and the slide pipe 27 is arranged to envelope part of the guide pipe 36, so that the sliding movement of the slide pipe can be achieved more smoothly.

With reference to Figure 9 and Figure 10, a third embodiment is shown. A gas pipe 18 is produced of a flexible material, such as urethane or flexible tube, and the slide pipe 27 is connected to the top end of the gas pipe 18. Thus, the number of assembly parts is economically diminished.

With reference to Figure 11 and Figure 12, a fourth embodiment is explained. In the inside of a tank cover 26, a row of "V" shaped recesses is provided adjacent the slide pipe 27, and an engaging tooth 38 is arranged to engage with the recesses, the tooth 38 being formed on the actuator 28. When the engaging tooth 38 rests in a selected recess, movement of the slide pipe 27 is restricted. In this embodiment, it is not necessary to provide a return spring 33 nor a stopper 34, as this mechanism provides an automatic stoppage system. Thus, the number of parts can be diminished for economy. The row of recesses may be provided within a groove 37.

With reference to Figure 13 and Figure 14, a modified stopper mechanism is indicated. A stopper 34 is provided as an integral part of an operating lever 20. The operating lever 20 is rotatable about an axis 39. As shown in Figure 14, when the operating lever 20 is rotated, the joint 16 is raised to open the valve for fuel emission, while the stopper 34 turns to approach the slide pipe 27 and the stopper 34 finally engages with the protuberance 35 provided on the actuator 28.

Claims

1. A pocket lighter comprising a windshield (30) provided with a flame aperture (31), and a burner nozzle (17), and characterized by means (27, 28) for moving said burner nozzle (17) through said flame aperture (31) between a retracted position in which the burner nozzle (17) is located inside of the windshield (30) and an extended position in which the burner nozzle (17) is located beyond the windshield (30).

2. A pocket lighter as claimed in Claim 1, characterized by a slide pipe (27), the burner nozzle (17) forming part of the slide pipe (27).

3. A pocket lighter as claimed in Claim 2, characterized by a return spring (33) biasing said slide pipe (27) towards a position in which said burner nozzle (17) is in its retracted position.

4. A pocket lighter as claimed in Claim 3, characterized by retainer means (34, 35) arranged to act against the return spring (33) when said burner nozzle (17) is in its extended position.

5. A pocket lighter as claimed in Claim 2, characterized by a tooth (38) mounted on said slide pipe (27), the tooth (38) being arranged to engage the cover of the pocket lighter in order to maintain the position of the burner nozzle (17).

6. A pocket lighter as claimed in any one of Claims 2 to 5, characterized by a gas pipe (18) including a guide region upon which the slide pipe (27) is movable.

7. A pocket lighter as claimed in any one of Claims 2 to 5, characterized by a gas pipe (18) comprising a flexible member, the slide pipe (27) being connected to the gas pipe (18).

8. A pocket lighter as claimed in any one of Claim s 2 to 5, characterized in that the burner nozzle (17) is provided at an upper end of the slide pipe (27).

9. A pocket lighter as claimed in any one of Claims 2 to 7, characterized by a manual actuator (28) for moving said slide pipe (27) to move the burner nozzle (17) between its retracted and extended positions.

Fig. 2

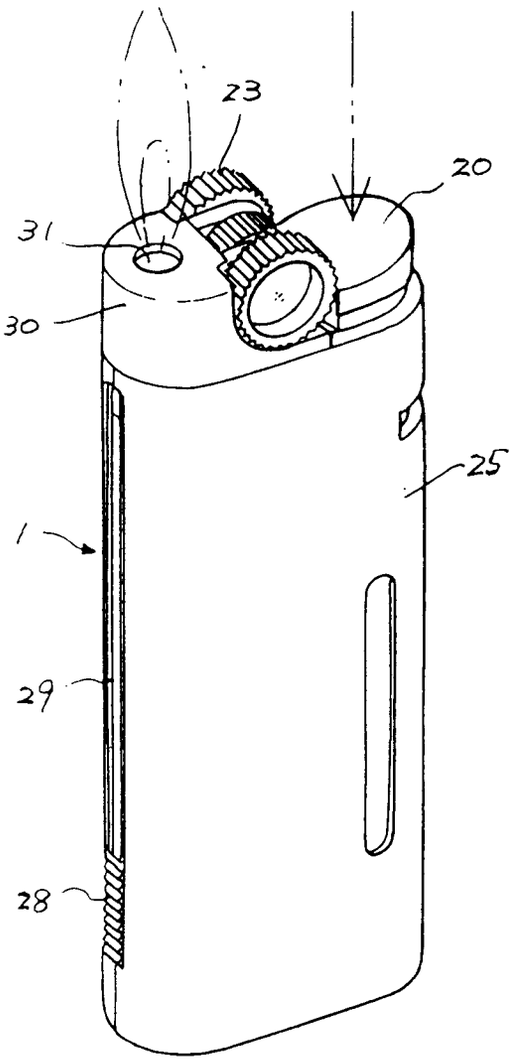

Fig. 1

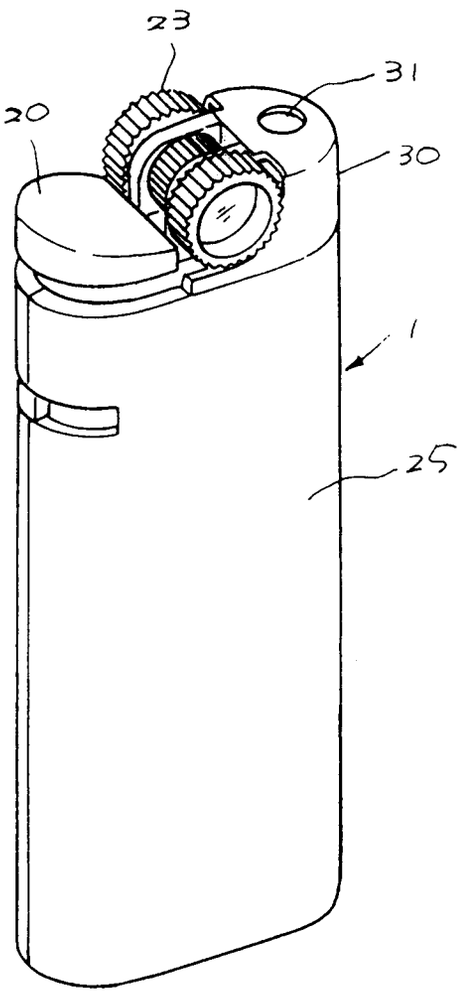

Fig. 3

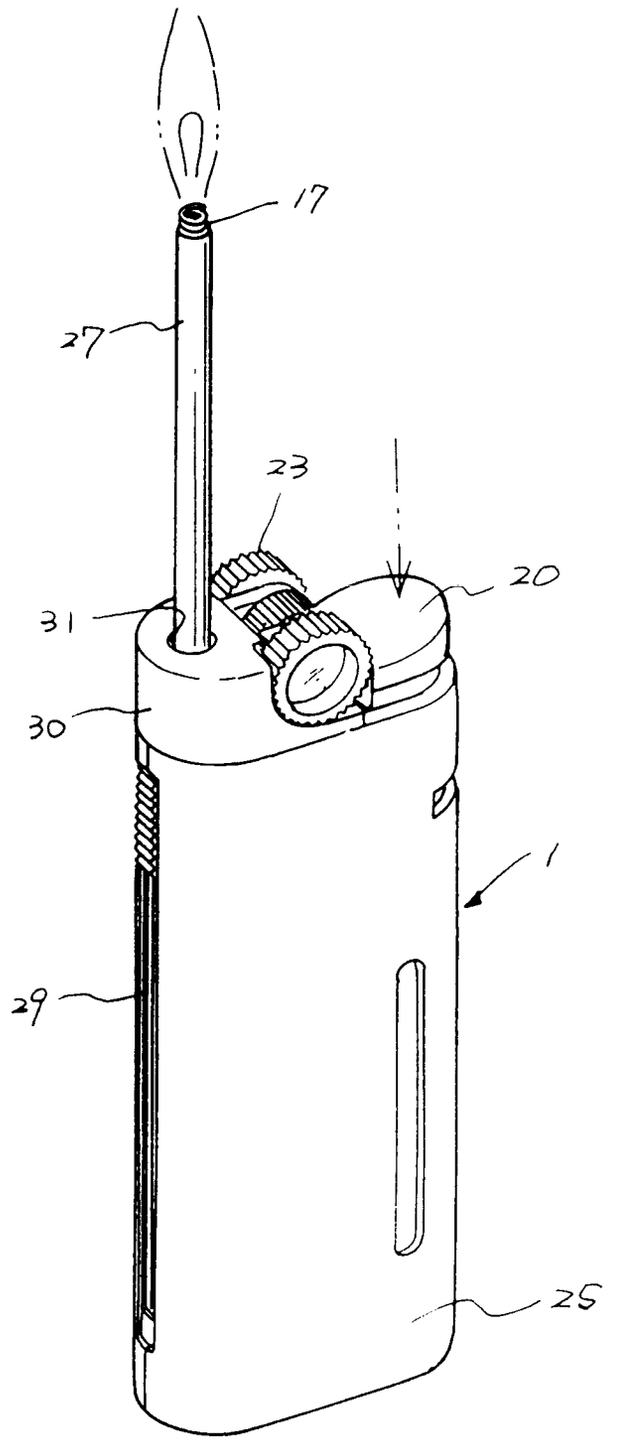

Fig.4

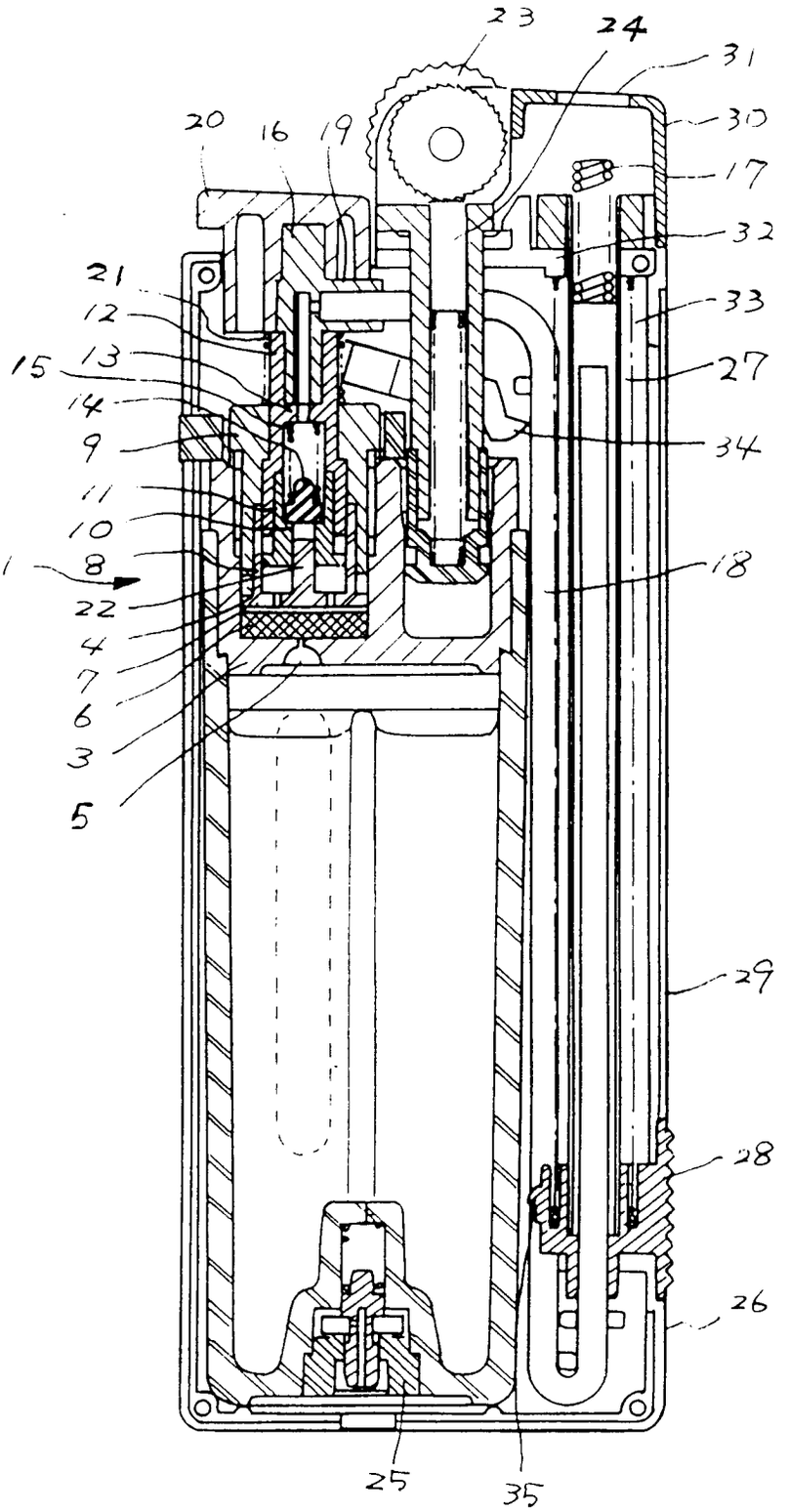
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Fig.5

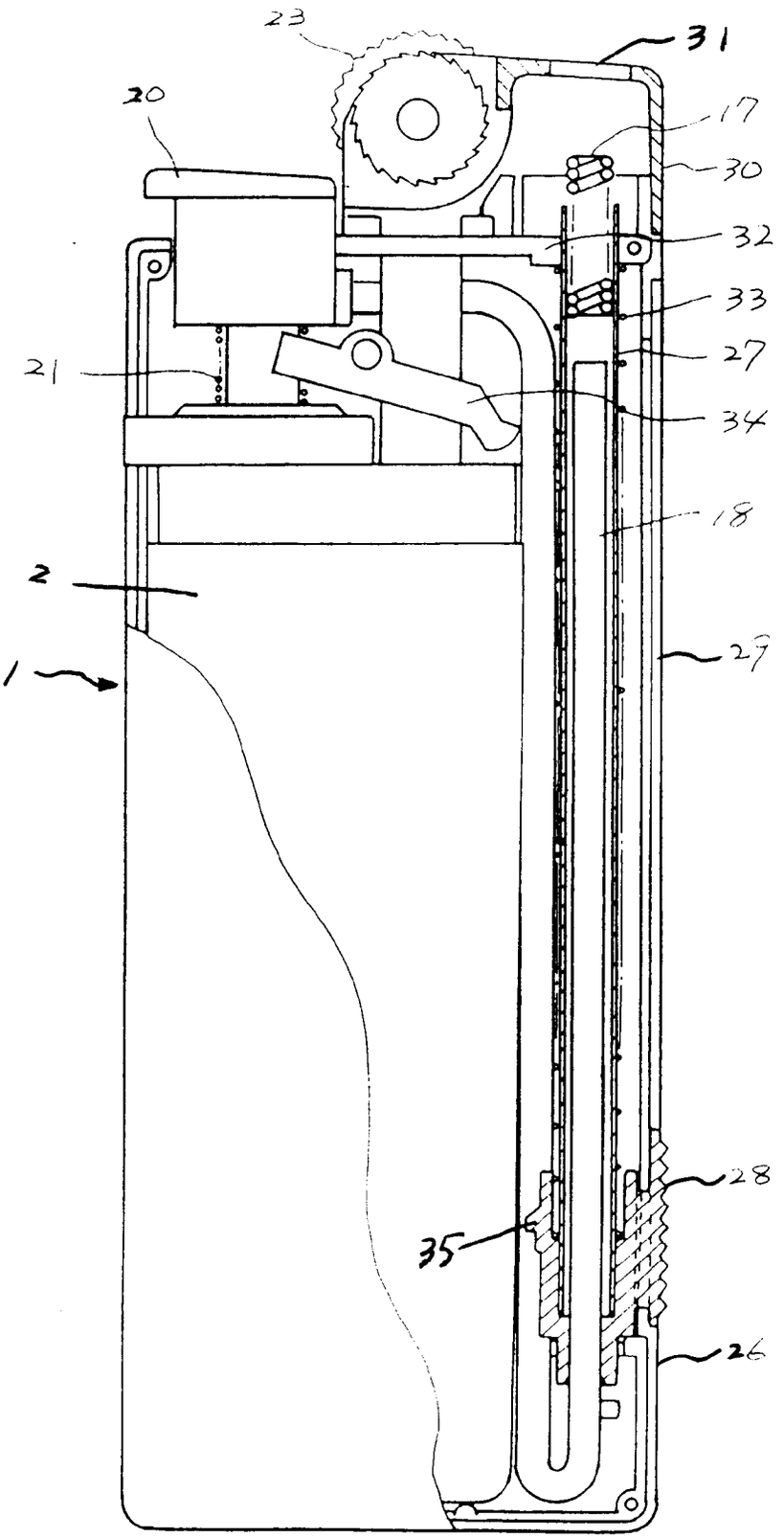

Fig.6

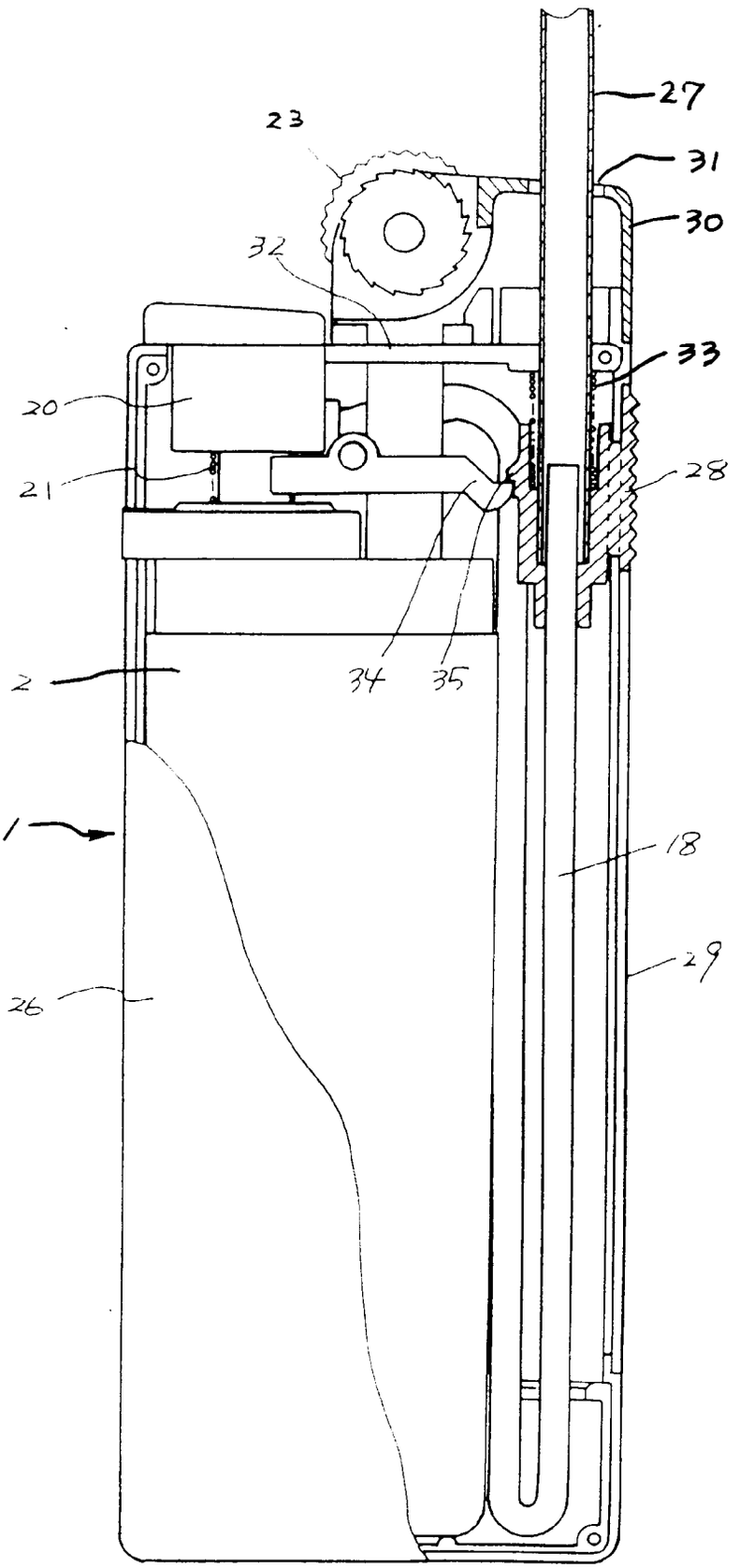

Fig. 7

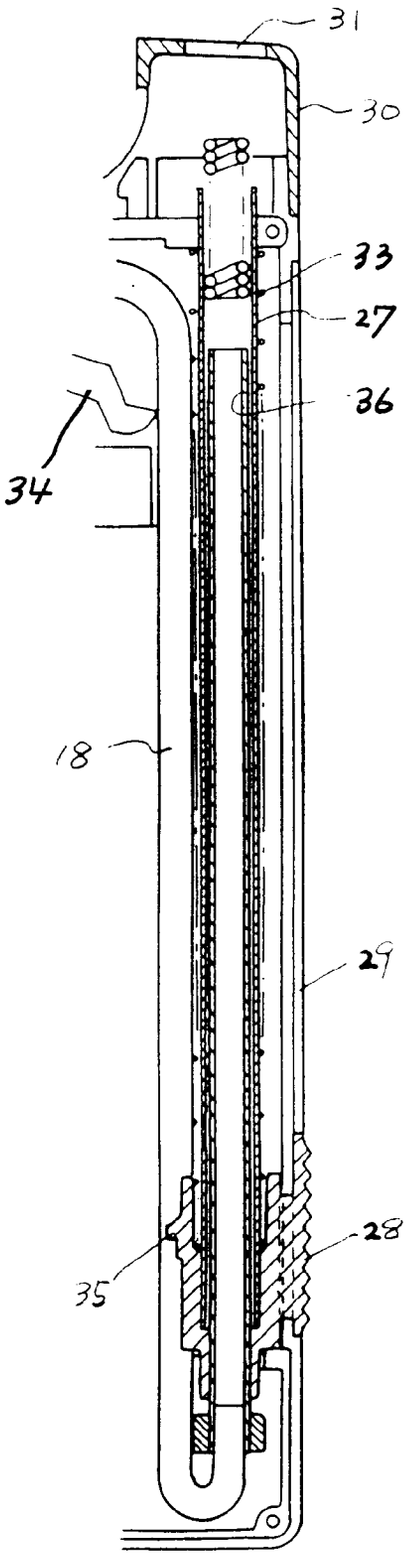

Fig.8

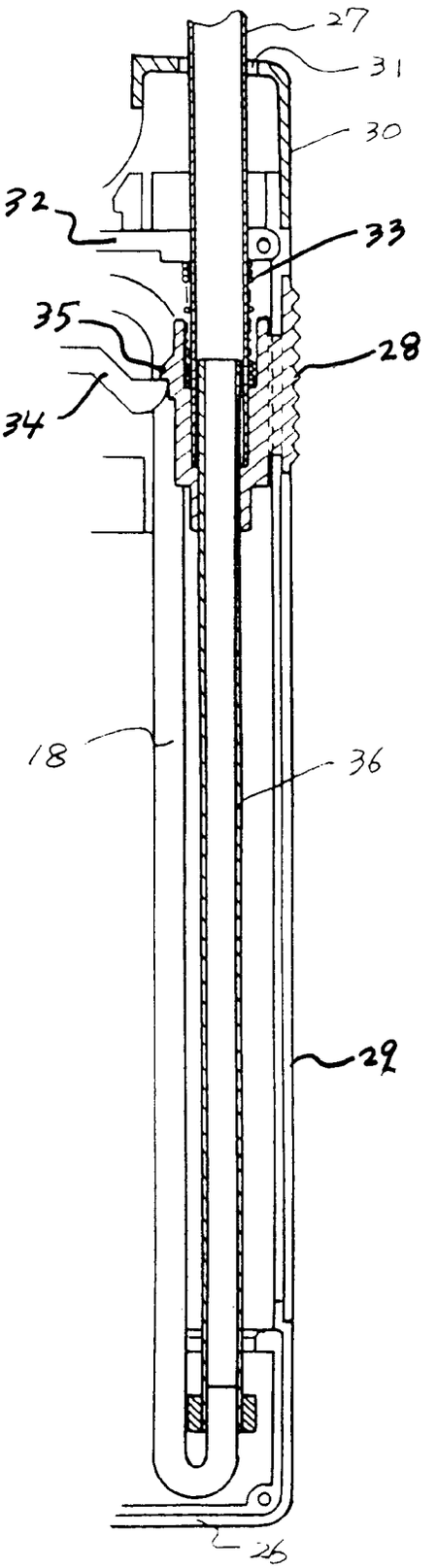

Fig. 9

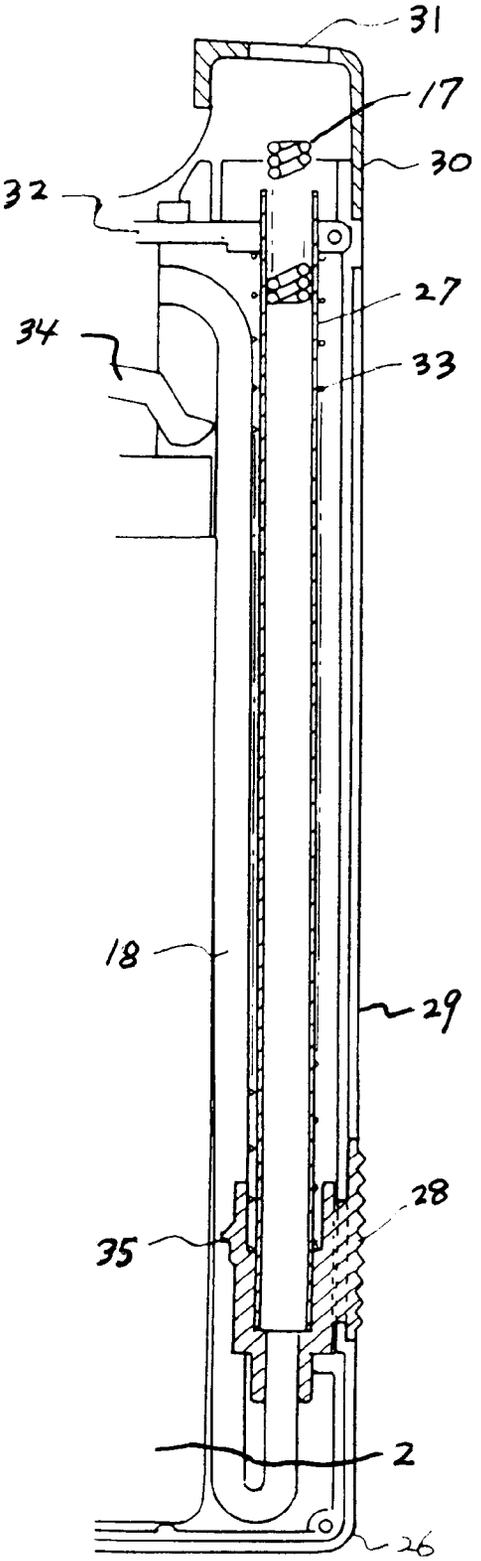

Fig. 10

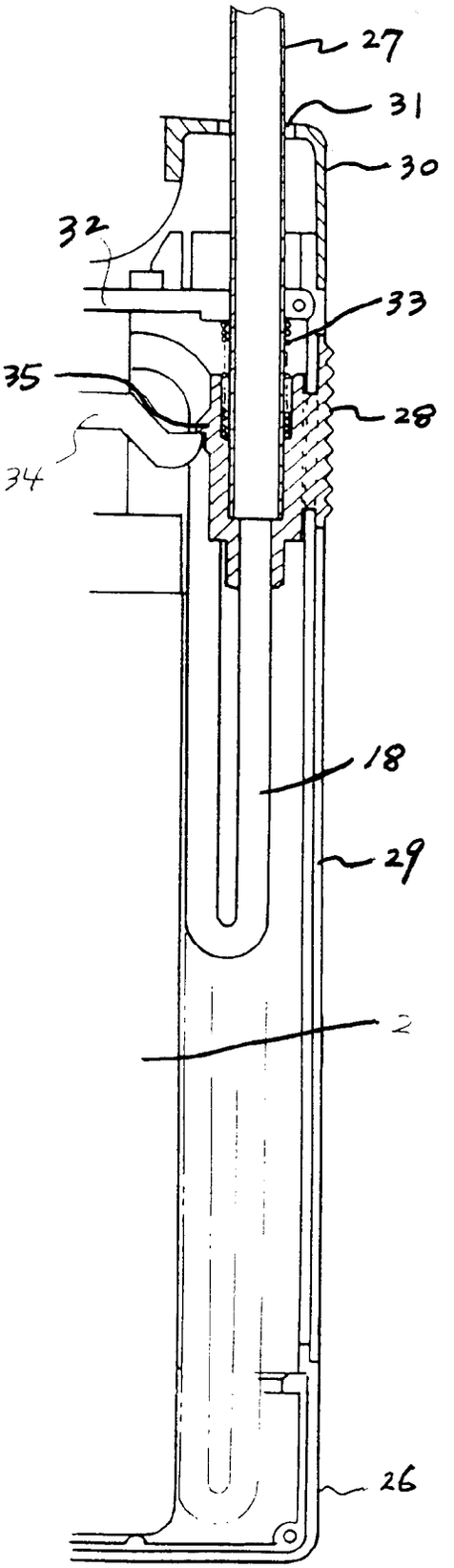

Fig.11

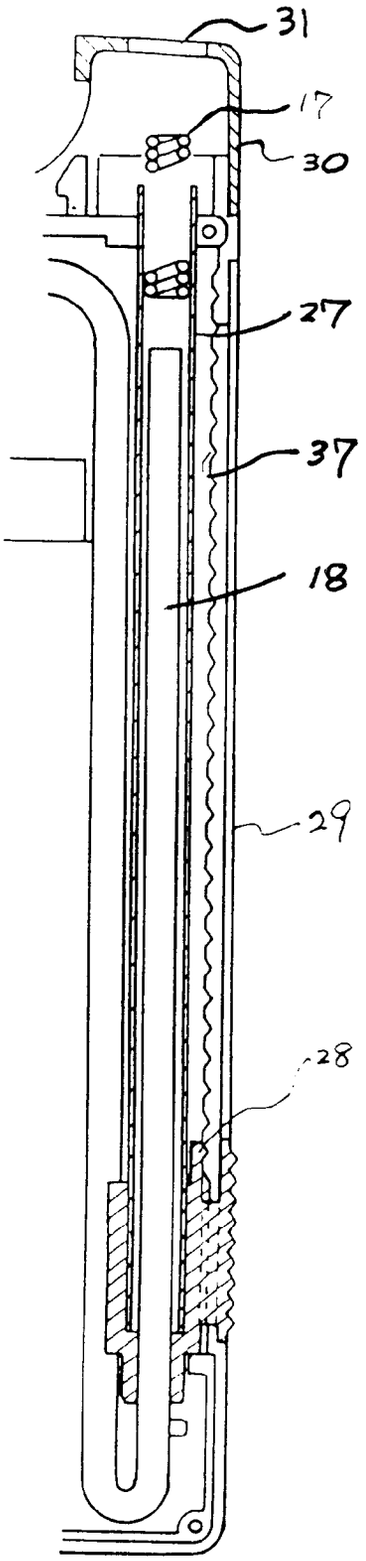

Fig.12

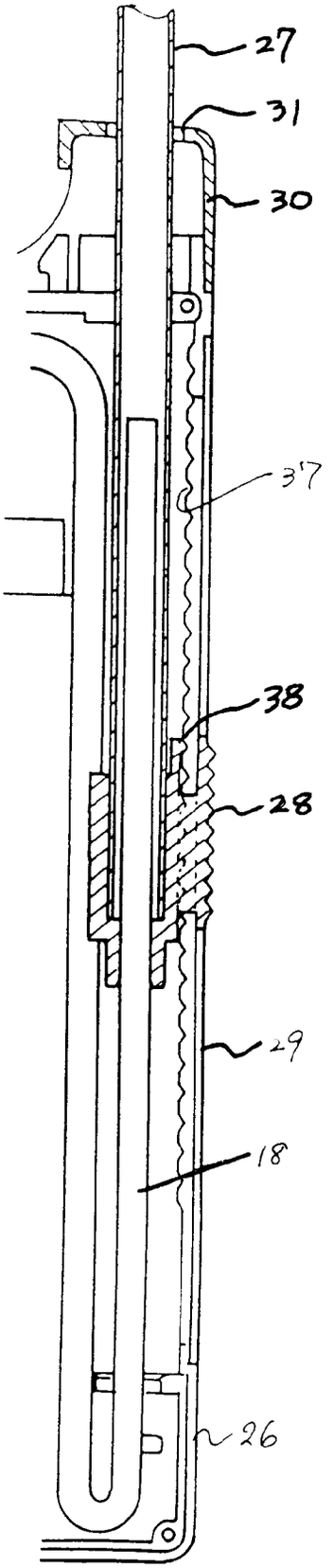

Fig. 13

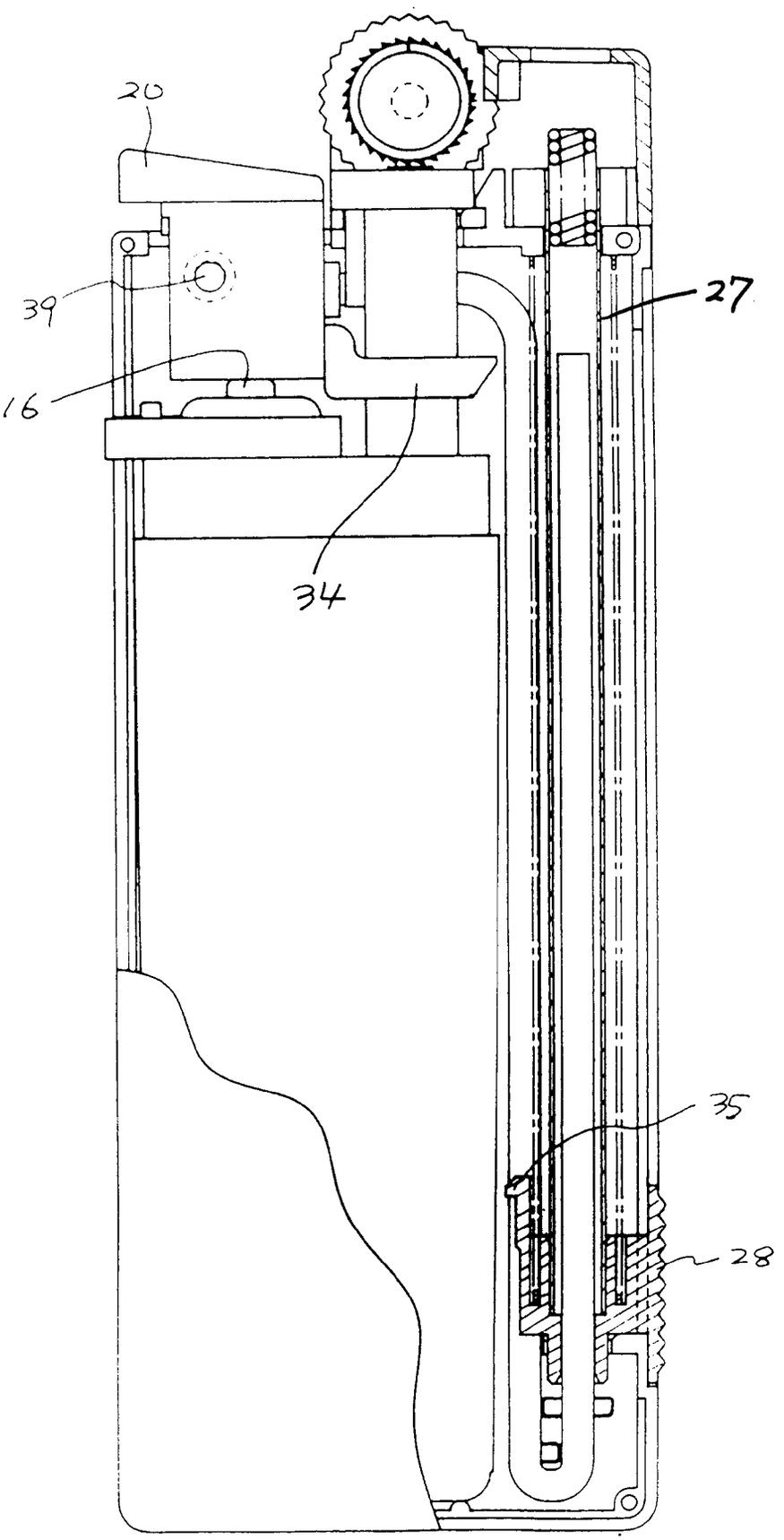

Fig.14