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PYROPHORIC LIGHTER

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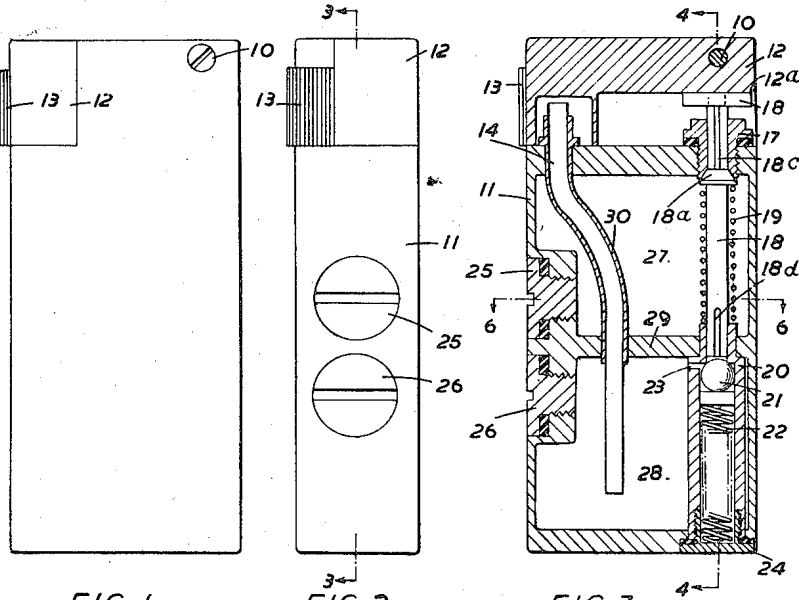


FIG. 1.

FIG. 2.

FIG. 3.

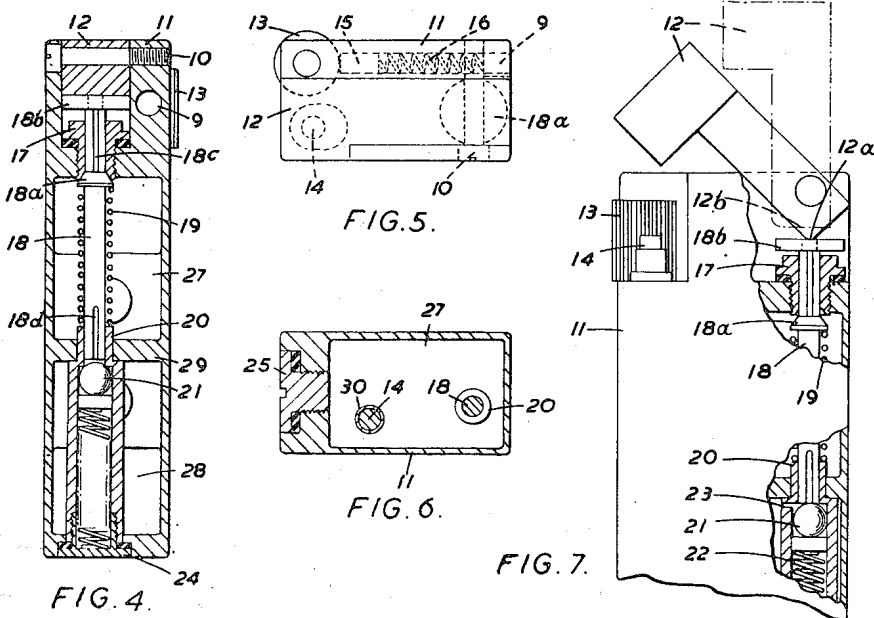


FIG. 4.

FIG. 5.

FIG. 6.

FIG. 7.

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PYROPHORIC LIGHTER

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2 Claims. (Cl. 67-7.1)

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This invention relates to pyrophoric lighters for cigarettes and the like comprising a liquid fuel container, a wick and pyrophoric igniting means including a friction wheel and a spring-loaded pyrophoric element or "flint."

An object of the invention is to provide an improved pyrophoric lighter of the type referred to having improved means for economising the fuel, in particular by subdividing the fuel container into a reservoir chamber and an absorbent-packed chamber, communicating by means of an improved type of valve arrangement.

A particular object of the invention is to provide means whereby communication from the reservoir to the absorbent-chamber is positively prevented as long as a protective cover for the igniting means is closed and also when the cover is fully open, so that fuel can only pass from the reservoir to the absorbent-chamber during the actions of opening and closing the cover.

Another object of the invention is to provide such cover with a snap-over action biasing it to both closed and fully open positions, and at the same time to eliminate the need for a separate cover spring the snap-over spring bias being furnished by a valve-closure spring.

Yet another object is the provision of an atmospheric valve for the reservoir operating concurrently with a valve controlling communication between the reservoir and absorbent-chamber, opening of the valves being effected by a common operating member and closure of the valves being independently effected by spring means so as to ensure that seating of either valve does not prevent the other from meeting its seating.

Further objects of the invention include improved methods of construction whereby the main objects are attained without sacrifice of robustness and simplicity of structure, ease of manufacture, reliability, and facility of operation.

How these objects and others as may herein after appear may be attained by the present invention, the scope of which is defined in the appended claims, will appear from the following description of a specific embodiment of the invention as illustrated in the accompanying drawings and given by way of example only. In the drawings:

Figure 1 shows the lighter in side elevation;

Figure 2 shows it in end elevation;

Figure 3 shows it in section on the line 3-3 of Figure 2;

Figure 4 shows it in section on the line 4-4 of Figure 3;

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Figure 5 is a top plan view of the lighter;

Figure 6 shows it in section on the line 6-6 of Figure 3; and

Figure 7 is a partial view in elevation, as in Figure 1, partly sectioned as in Figure 3, showing the cover half-open and the valve opened, and showing the cover fully open (in dotted lines).

In the drawings, 11 is the lighter body, 12 is a flame cover hinged to the body by screw 10, 13 is a steel friction wheel, 14 a wick, 15 a "flint" housed in a bore 9 formed in the body 16 and pressed against the wheel 13 by a spring 16.

The interior of the body is divided by means of a partition 29 into two chambers 27, 28 provided with filling openings closed by screw-plugs 25, 26. The lower chamber 28 is packed with wadding (not shown) and receives the lower end of the wick 14 which is enclosed in a tube 30 where it passes through the upper chamber 27. The upper end of tube 30 forms a nipple from which the upper end of the wick projects and is exposed near the friction wheel 13.

In the top of the body is an opening provided with a nipple 17 communicating with chamber 27. The lower end of nipple 17 is shaped to provide a seating for a poppet 18^a formed on a valve stem 18 which slides in nipple 17 and terminates in an enlarged head 18^b which abuts on the underside of the cover 12. The poppet 18^a constitutes an atmospheric valve for the chamber 27 and the stem 18 is grooved at 18^c to provide an air passage through the nipple 17 which constitutes the atmospheric vent. The stem 18 extends below the poppet 18^a and its lower end is guided in a nipple formed on the upper end of a tube 20 located in the lower chamber 28. This nipple provides communication between the lower and upper chambers and forms the lower abutment of a spring 19 whose upper end abuts on the underside of the poppet 18^a. The internal shoulder at the lower end of this nipple provides a seating for a ball 21 held onto its seating by a spring 22 enclosed in the tube 20 and constituting a valve controlling the admission of fuel from chamber 27 to chamber 28 which communicates with the interior of tube 20 by a small passage 23. Spring 22 is retained by a screw-plug 24 and flow of fuel through the nipple forming the top of tube 20 past the stem 18 is accommodated by grooves 18^a in the stem 18.

When the cover 12 is closed there is a small clearance between the head 18^b and the underside of the cover, the poppet 18^a being held on its seating by spring 19 and there is a clearance

between the lower end of stem 18 and ball 21 which is held on its seating by spring 22, so that fuel cannot escape from chamber 27 into chamber 28 and the atmospheric vent of chamber 27 is closed.

On half-opening the cover 12 its rear corner 12^a depresses head 18^b, thus depressing stem 18 and poppet 18^a to open the atmospheric vent of chamber 27 and pushing ball 21 off its seating to allow fuel to flow from chamber 27 to chamber 28 (see Figure 7). On fully opening the cover its flat outer end 12^b comes into register with the stem-head 18^b allowing the stem 18 to rise again under the action of spring 19 and close the atmospheric valve 18^a and enabling spring 22 to return ball 21 onto its seating, thus sealing chamber 28 from chamber 27. The fully open position of the cover is shown in dotted line at 12' in Figure 7.

The pressure of spring 19 acting through the stem-head 18^b urges the cover 12 into the closed or fully open position according to the cover's position relative to the dead-centre position in which it is half-open as shown in full line in Figure 7.

This gives a snap-over action and consequently when the cover is opened the valves 18^a, 21 are opened momentarily, and the same thing occurs when the cover is closed, so that at each opening and closing of the cover a small dose of fuel is transferred from chamber 27 to chamber 28. At all other times the reservoir chamber 27 is sealed. In this way loss of fuel by evaporation or leakage is minimised.

I claim:

1. A lighter for cigarettes and the like including a hollow body; a partition subdividing the interior of the body into two chambers, one of which constitutes a reservoir for liquid fuel, and the other of which is packed with an absorbent substance, said partition having an opening therein; a spark-producing device mounted on the exterior of the body and comprising a spring-loaded pyrophoric element and a rotatable friction wheel engaging therewith; a wick having an exposed end adjacent said spark-producing device with the other end of said wick received in the absorbent-packed chamber; an atmospheric valve communicating with said reservoir chamber; a valve controlling said opening in said partition; a hinged cover mounted on said body and protecting said spark-producing means when closed; a common valve operating member hav-

ing an end portion extending outside the body and engageable by the cover to move both of said valves to open position when said cover is in an intermediate position between its closed and fully open positions while allowing both valves to close when said cover is in either of the last named positions; said atmospheric valve including a poppet-type closure member integral with the valve operating member, and the valve controlling the opening in the partition separating the chambers including a closure member constituted by a loose ball engageable by said valve operating member; independent springs for closing the poppet-type and ball closure members; and two combined seating and guiding members mounted, respectively, in an external wall of the body and in the opening in the partition separating said two chambers and providing seatings for the poppet-type closure member and ball, respectively, said valve operating member being in the form of a stem slidably supported in both of the combined seating and guide members.

2. A lighter for cigarettes and the like as defined in claim 1 in which the said independent springs comprise a first compression spring having one end abutting the combined seating and guide member in said opening in said partition and its other end engaging said poppet-type closure member, and a second compression spring having one end engaging the ball closure member; and in which the combined seating and guide member in said opening in said partition has a tubular extension enclosing said second compression spring and providing an abutment for the other end of said second compression spring.

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