March 7, 1933. L. V. ARONSON 1,900,684

LIGHTER CONSTRUCTION

Filed Nov. 24, 1928

Fig. 1.

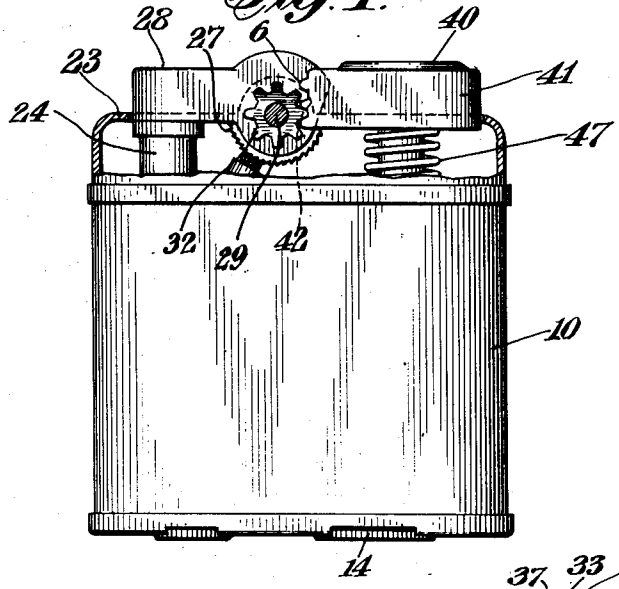


Fig. 2.

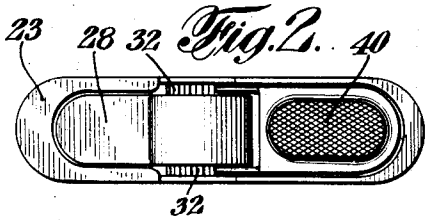


Fig. 4.

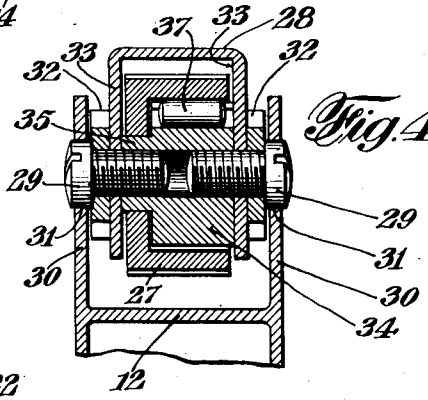


Fig. 3.

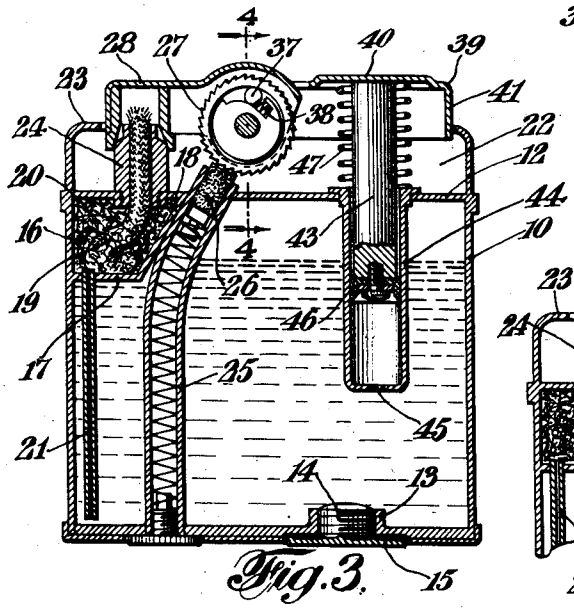
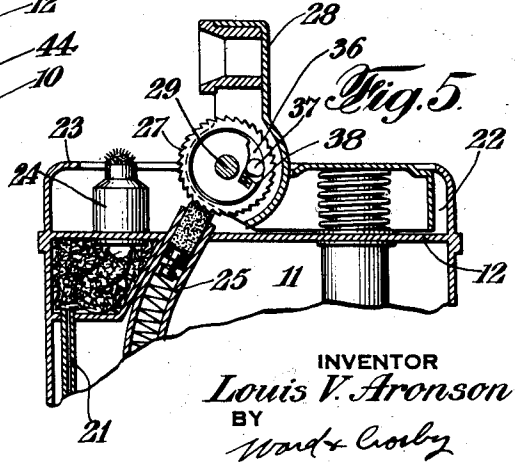


Fig. 5.



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UNITED STATES PATENT OFFICE

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LIGHTER CONSTRUCTION

Application filed November 24, 1928. Serial No. 321,551.

This invention relates to pyrophoris lighters or similar devices. The main object of the invention is to provide an improved form of lighter in which the construction and the arrangement of cooperating elements are simple, effective and compact. One feature of the present invention resides in the novel structural arrangement of the casing and the disposition of the operating elements within said casing. Another feature resides in the construction of the casing, which is designed to hold a much larger supply of fuel than in similar devices known hitherto. Further and more specific objects, features and advantages will more clearly appear from the detailed description given below, taken in connection with the accompanying drawing, which forms a part of this specification and which illustrates an embodiment of the present invention.

Fig. 1 is an elevational view of a lighter embodying the present invention, the view showing the casing having a part of its front face broken away so as to expose the operating elements;

Fig. 2 is a plan view of the lighter as shown in Fig. 1;

Fig. 3 is a longitudinal sectional view of the lighter as shown in Fig. 1;

Fig. 4 is a detail on the line 4—4 of Fig. 3; and

Fig. 5 is a view similar to Fig. 3, showing the operative elements in their operated position.

The casing 10 of the lighter is divided into three chambers. Chamber 11, which is formed by the transverse wall 12, is designed to carry liquid fuel and may be refilled through the filler opening 13, which is usually closed by the cap 14, the cap 14 having an annular packing washer 15 so as to provide a liquid-tight closure for the chamber.

A chamber 16, formed by the walls 17, 18 and 12 and preferably disposed in one corner of the chamber 11, and having relatively small dimensions as compared with the dimensions of the casing or of the chamber 11, is designed to house the wick 19 and is also intended to be filled with absorbent cotton 20, which, as will be described hereinafter, is maintained fully saturated with the liquid fuel which is retained in the chamber 11.

A tube 21, having a restricted passage therein and preferably of capillary dimensions, is attached to the bottom wall 17 of the chamber 16 and extends into the chamber 11, and serves as a conduit or passage for the liquid fuel from the chamber 11 into the chamber 16. This passage is preferably of such dimensions that liquid fuel will not tend to flow readily from one chamber into the other, except when pressure is applied.

Chamber 22, which is disposed transversely of the casing 10 and is disposed between the top 12 of the fuel chamber 11 and the top 23 of the casing 10, is designed to house the operating elements of the lighter. This chamber, therefore, contains the wick tube 24, which is mounted on the top 12 of the fuel chamber. The tube 25, which holds the pyrophoric element 26, extends into the chamber 22 and is disposed in such a manner that it readily cooperates with the friction wheel 27 to produce a spark for igniting the wick. Snuffer 28 is mounted on a shaft 29 and is operable together with the friction wheel 27.

Fig. 4 shows the detailed construction of the snuffer carrier 28 and the friction wheel 27. In this figure, reference characters 30 indicate those portions of the side walls of the casing 10 that project above the top 12 of the fuel chamber, these side walls being provided with registering openings 31, intended to receive and support the unit which comprises the snuffer and snuffer holder 28, the friction wheel 27 and the remaining elements which, as will be described later, serve as the operating means for the snuffer and the friction wheel, and still permit of the operation of the snuffer in both directions and the operation of the friction wheel in only one direction. This unit is carried by the shaft 29, which in the example shown in Fig. 4 is preferably in the form of two pins or screws, the heads of which enter the openings 31, which openings may provide bearing surfaces for said pins. A pair of gears 32 are carried by the pins 29 in the manner shown; these pins also passing through registering

openings in the downwardly depending lateral flanges 33 of the snuffer holder 28, so that the snuffer 28 is movable with the gears 32.

A sleeve 34 is also carried by the pins 29, and is preferably disposed in the space between the flanges 33 of the snuffer 28.

The gears 32, the snuffer 28 and the sleeve 34 are mounted together in such a manner that they are rotatable as a unit, and this may be accomplished either by causing these three elements to be affixed with relation to each other and permitting them to rotate as a unit on the pins 29, or, if desired, these elements may be fixedly mounted on the pins 29 and thus permit all of these elements to rotate with the pins in the bearing openings 31.

The friction wheel 27 is cup-shaped and is carried by the boss 35 of the sleeve 34. The sleeve 34 is provided with a cut-out portion 36, which provides a chamber disposed between the element 34 and the inner face of the cup-shaped friction wheel 27, this chamber serving to house a roller 37, the dimensions of the chamber 36 being such that the roller 37, when disposed at one end of said chamber, rotates freely without transmitting any motion from the sleeve 34 to the friction wheel 27, whereas, when said roller is disposed at the other end of said chamber, it is gripped between the sleeve 34 and the friction wheel 27 and thereby causes the two to rotate in unison. A helical spring 38 is housed in one wall of the chamber 36 so as to yieldingly direct the roller 37 towards the narrow end of the chamber 36.

It will be seen from the above that, when the gears 32 are rotated in clockwise direction, as viewed in Figs. 3 and 5, the snuffer cap 28 will be moved to its open position and the clutch roller 37 will serve to transmit the motion of the gears 32 to the friction wheel 27, which in turn will cause a spark to ignite the wick. When, however, the rotation of the gears 32 is reversed and the same are rotated in a counted-clockwise direction, the snuffer cap 28 will be moved from its open position to its closed position, but the friction wheel 27 will not rotate and will remain in its position.

The top 23 of the casing 10 is provided with an opening, which extends not quite from one end of the top to the other, one part of said opening, however, being normally closed by the snuffer cap 28 when it is in its normally closed position. The other portion of the opening is normally closed by the manual operator 39. The operator 39 consists of a horizontal plate 40, having a U-shaped depending flange 41, the free ends of said flange 41 being provided with teeth 42, which are designed to engage with the gears 32. The operator 39 carries a plunger 43, which is slidable within the cylinder 44 disposed within the fuel chamber 11. Cylinder 44 is provided with an orifice 45, and the plunger 43 carries a resilient washer 46, which forms an air-tight piston cooperating with the inner surface of the cylinder 44. A helical spring 47 surrounds the plunger 43 and is disposed between the wall 12 and the portion 40 of the operator 39, whereby the operator 39 is yieldingly retained in its normal position, which also retains the snuffer cap in its normally closed position.

When the manual operator 39 is depressed, the snuffer cap will be moved from the closed to the open position, the friction wheel 27 will operate to direct sparks against the wick, and at the same time the plunger 43 will be moved downwardly and some liquid fuel from the chamber 11 will be sent through the capillary tube 21 and will cause a jet of fluid to be thrown on to and absorbed by the small amount of absorbent packing disposed in the chamber 16 and surrounding the wick 19. When the pressure on the operator 39 is released, the spring 47 causes the same to be moved back to its normal position, and the reverse movement of the teeth 42 causes a reversal of the direction of movement of the gears 32 and the snuffer 28, while the friction wheel 27 remains in its position.

Various other forms and other features of my invention are disclosed and claimed in my Patent No. 1,673,727, dated June 12, 1928, and in my copending applications Ser. No. 176,159, filed March 17, 1927, and in Ser. No. 196,255, filed June 3, 1927 (the latter being now involved in interference proceedings).

While I have described my invention in detail and with respect to one embodiment thereof, I do not desire to be limited to such details or forms, since many changes and modifications may be made and the invention may be embodied in other forms without departing from the spirit and scope of the invention in its broader aspects. Hence I desire to cover all modifications and forms coming within the language or scope of any one or more of the appended claims.

I claim:

1. A lighter comprising a wick, a pyrophoric ignition device, operating means for said ignition device, a liquid fuel chamber, a wick holding chamber, and means, operable by said operating means, for transferring fuel from said fuel chamber to said wick holding chamber.

2. A lighter comprising a wick, a pyrophoric ignition device, operating means for said ignition device, a liquid fuel chamber, a wick holding chamber, and a pump, operable by said operating means, for transferring fuel from said fuel chamber to said wick holding chamber.

3. A lighter comprising a wick, a pyrophoric ignition device, operating means for said ignition device, a liquid fuel chamber, a wick holding chamber, a restricted passage-

way between said chambers, and means, operable by said operating means, for transferring fuel from said fuel chamber to said wick holding chamber.

4. A lighter comprising a fuel chamber, a wick holding chamber, a pyrophoric ignition device, a manually depressible operator for said ignition device, a cylinder disposed within said fuel chamber, and a plunger carried by said operator, and operable in said cylinder to transfer fuel into said wick chamber.

5. In a pocket lighter, a snuffer carrier comprising a plate and a pair of downwardly extending lateral flanges, a cup shaped friction wheel disposed between said flanges, a rotary sleeve disposed between said flanges and substantially within said friction wheel, means whereby said snuffer carrier and sleeve may be rotated together, and a roller disposed between the peripheral face of said sleeve and the internal cylindrical face of said friction wheel for unidirectionally transferring the motion of the sleeve to the friction wheel.

6. A lighter comprising a liquid fuel chamber, a smaller chamber, absorbent packing within said smaller chamber, a restricted passageway between said chambers, a pyrophoric ignition device, a manually depressible operator for said ignition device, a cylinder disposed within said fuel chamber and having an opening communicating with said fuel chamber, and a plunger, carried by said operator, and operable in said cylinder to transfer fuel into said wick chamber.

7. In a pyrophoric lighter, spark-producing means, operating means therefor, a plural-chamber casing, a wick in one of the chambers, another of the chambers adapted to contain a body of fuel, and means controlled by said operating means for forcing fuel from said first named chamber into said second named chamber.

8. In a pyrophoric lighter, spark-producing means, operating means therefor, a plural-chamber casing, a wick in one of the chambers, another of the chambers adapted to contain a body of fuel, and a pump comprising a reciprocatory plunger for forcing fuel from said first named chamber into said second named chamber, said pump being actuated by said operating means.

9. In a pyrophoric lighter, spark-producing means, operating means therefor comprising a reciprocatory member, a plural-chamber casing, a wick in one of the chambers, another of the chambers adapted to contain a body of fuel, and reciprocatory means actuated by said reciprocatory member for forcing fuel from said first named chamber into said second named chamber.

10. In a pyrophoric lighter, a casing adapted to contain a body of fuel, a wick carried by said casing, a chamber into which said wick extends, and a pump for pumping fuel into said chamber for absorption by said wick, said pump comprising a cylinder dipping into said body of fuel.

11. In a pyrophoric lighter, spark-producing means, operating means therefor, a casing adapted to contain a body of fuel, a wick carried by said casing, a chamber into which said wick extends, and means controlled by said operating means for pumping fuel into absorbing relation with respect to said wick.

12. In a pyrophoric lighter, a casing adapted to contain a body of fuel, a wick carried by said casing, spark-producing means, operating means therefor comprising a reciprocatory member, and a cylinder in said casing, said cylinder receiving said reciprocatory member, said cylinder serving as a pump casing for forcing fuel into absorbing relation with respect to said wick.

In testimony whereof I have signed my name to this specification.

LOUIS V. ARONSON.