

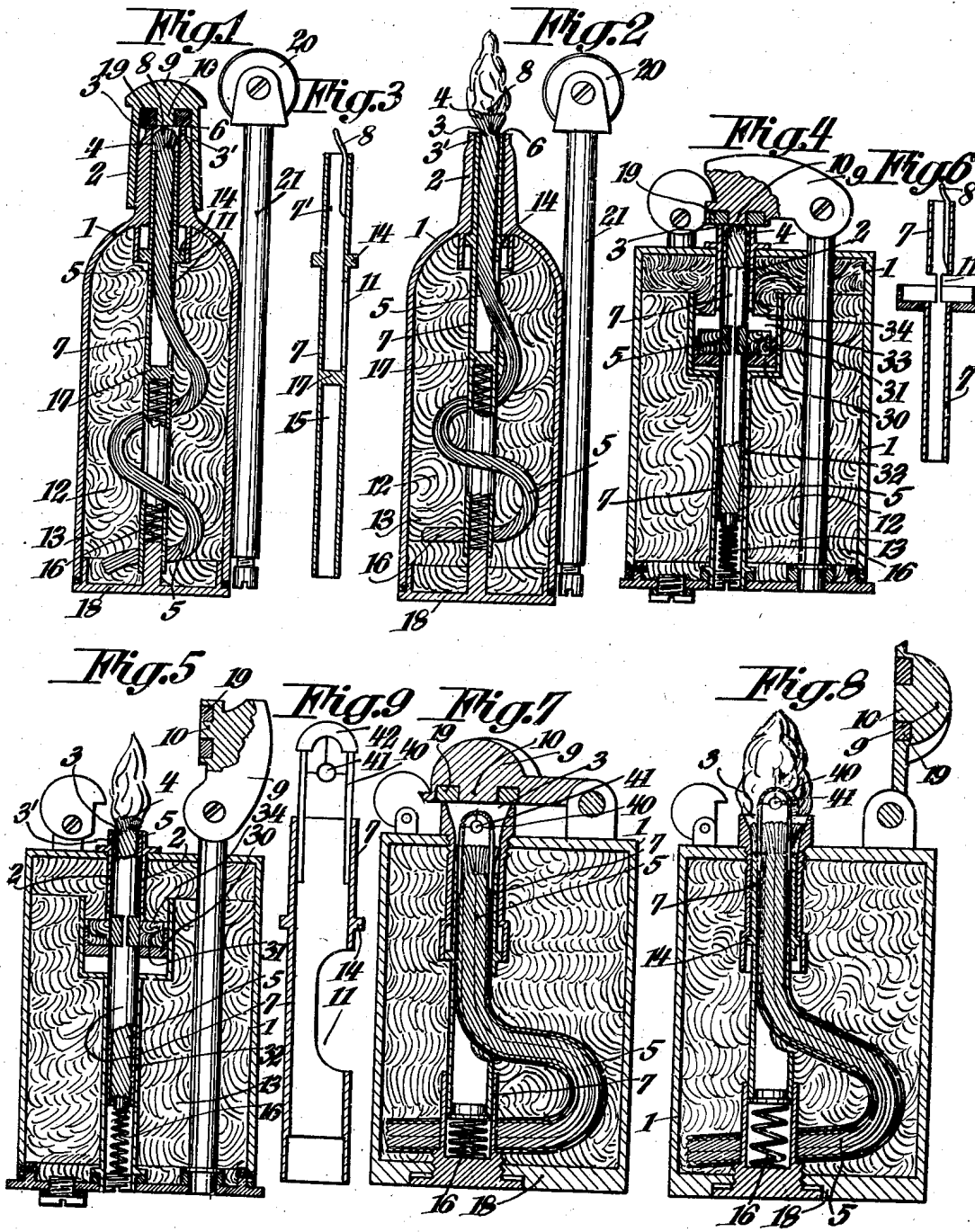
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L. REICH

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LIGHTER

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Inventor
Louis Reich
7
First Inventor
Lawrence

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LIGHTER

Luise Reich, Vienna, Germany; vested in the
Alien Property Custodian

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In pocket lighters with liquid fuel a considerable quantity of the fuel escapes through the burner tube even when the lighter is not in use and evaporates in the atmosphere, as a perfect closure of the end of the burner tube is not possible owing to the residues from combustion and fibres of the end of the wick located therein. It has already been proposed to make the burner tube and the wick of the lighter so that they extend right through the fuel container the lower end of the wick projecting from the bottom of the container so that it can be gripped and, when the lighter is not to be used, the upper end of the wick is pulled into the burner tube and the lid placed on the upper end of the burner tube which has thus been made free. These arrangements are unsuitable for practical use, especially as pocket lighters, because the end of the wick hanging out from the lower end of the lighter and always saturated with fuel, soils the pocket, moreover in these lighters the saving in fuel, which is attained by the tight closure of the upper end of the burner tube, is neutralized and even converted into a greater loss by the unimpeded evaporation of the fuel from the wick end projecting from the bottom of the lighter.

The object of the invention is, to produce an arrangement in which the burning end of the wick is automatically pulled into the burner tube when the lighter is no longer required for use, so that the end of the burner tube is automatically freed from the parts of the wick and can be hermetically closed by the lid. This is attained according to the invention in that control means are provided which positively remove the upper end of the fuel suction element or wick out of the region of the burner tube mouth when the lid is put on the lighter. To further ensure against the unintentional escapement of fuel through the wick tube the element for sucking up the fuel may, according to another important feature of the invention, be separable from the fuel container in such a manner that, when the flame is extinguished, the suction contact between the fuel suction element and the fuel reserve is interrupted.

Several embodiments of the invention are illustrated by way of example in the accompanying drawing, in which:

Fig. 1 shows in longitudinal section a benzene pocket lighter with friction wheel ignition, with closed lid and the upper wick end drawn back into the tube,

Fig. 2 is a similar view showing the lighter in open state,

Fig. 3 shows a detail of the lighter, namely the wick holder with the means for lowering the holder,

Fig. 4 is a longitudinal section through a second form of construction with closed lid, lowered wick end and interrupted suction contact between wick and fuel reserve,

Fig. 5 is a similar view of the same pocket lighter in burning condition with projecting wick end and re-established suction contact between the wick and fuel reserve,

Fig. 6 shows the wick holder with the control means and with the carrier for the suction member which brings the fuel from the container into the wick,

Fig. 7 shows in longitudinal section and in closed condition, a lighter for methyl alcohol, in which the ignition is effected by a contact ignition substance such as palladium or the like fitted on the control means for the wick holder,

Fig. 8 is a similar view showing the lighter in burning condition,

Fig. 9 is a longitudinal section showing the wick holder with the control means and contact igniting and coloring means mounted thereon.

In Figs. 1 to 3 a container 1, filled with cotton wool or other capillary substance and fuel, has at its upper end an extension forming a burner tube 2 whose mouth is designated by 3. In order, when the flame is extinguished, to entirely and perfectly free the closable burner tube mouth 3 from the burnt end 4 of the suction element constructed as a wick 5, control means are provided which enable a mutual alteration in position between the burnt end 4 of the wick and the mouth 3 of the burner tube 2 so that, when the flame is extinguished, the burnt wick end 4 lies lower than the burner tube mouth 3 but at least in the level 6 determined by the mouth of the burner tube. These control means consist of a control pin 8 arranged in the holder 7 for the wick 5 and of a catch 10 arranged on the lid 9 of the lighter. The wick 5 is threaded in the holder 7 in such a manner that it can enter the interior 12 of the container proper through an aperture 11 of the holder and is then in suction contact with the reserve of fuel 13 stored in the cotton wool. An inwardly directed point 7' is formed in the wall of the holder 7 to hold the wick in position in the holder. The wick holder 7 also has an abutment 14 which only allows the end 4 of the wick to be moved out as far as is necessary for forming a sootless flame. This abutment 14 thus limits the mutual displacement between the end 4 of the wick 5 and the burner

tube mouth 3. In the lower end 15 of the wick holder 7 a pressure spring 16 is arranged which bears at one end against a transverse partition 17 in the holder and at its other end against the bottom of the container 18.

To reduce the cross-sectional area of the wick end 4 when removing this end out of the region of the level 6 of the burner tube mouth 3 and to thus further reduce the evaporation of the liquid fuel, guiding means are provided for the wick end 4 and formed for example by the upper portion 3' of the burner tube 2.

The operation is as follows: When the lighter is in closed condition the catch 10 on the lid 9 presses against the control pin 8 and holds the wick holder 7, and consequently the wick 5, in the retracted position shown in Fig. 2, in which position the end 4 of the wick 5 is below the level 6 of the burner tube mouth so that at this level 6 there is no wick, with the result that the mouth 3 of the burner tube 2 and consequently the fuel container 1 is closed absolutely tightly by the elastic insertion 19 in the lid 9. The spring 16 is then under increased pressure. If the lighter is to be lighted, the lid 9 is removed, whereupon the wick holder 7 ascends under the action of the pressure spring 16 and the end 4 of the wick 5 projects from the mouth 3 of the burner tube 2 so far as the abutment 14 on the holder 7 will allow. The spark is then produced by the friction wheel 20 of the known ignition device 21 and ignites the fuel in the wick end in the usual manner. When it is desired to extinguish the flame the lid 9 is placed on the container, the wick holder 7 being again depressed by the catch 10 bearing against the control pin 8 arranged on the holder. The end 4 of the wick 5 is therefore positively moved out of the region of the burner tube mouth 3 by closing the lighter by means of its lid 9. The end 4 of the wick 5 swelled by the liquid fuel is reduced to the cross-sectional area of the burner tube diameter by being pulled into the upper part 3' of the burner tube 2, the condition shown in Fig. 2 being once more attained.

In Figs. 4 to 6 the fuel container is again designated by 1 and the burner tube by 2, this tube being inserted in the upper part of the container 1. The burner tube mouth is designated by 3. When the parts are in the position shown in Fig. 4, the burner tube mouth 3 is closed by the lid 9 of the lighter, the lid 9 having an insertion 19 of elastic packing material for obtaining a particularly tight closure. 7 is the wick holder which carries the pin 8 cooperating with control pin 10. The wick holder 7 has apertures 11 through which portions of the wick 5 are exposed and can be brought into suction contact with the fuel. The wick holder 7 has a cup-shaped support 30 destined to hold a suction element 31 for conducting the fuel from the fuel container 1 to the wick 5. The wick holder 7 with the support 30 and the suction element 31 are movable in a housing 32 so that the above mentioned lowering of the wick end 4 is rendered possible but at the same time an interruption of the suction contact between the fuel reserve 13 and the suction element 31 can take place. However, by the interruption of the suction contact between the fuel reserve 13 and the suction element 31 the suction contact between the fuel reserve 13 and the wick is also indirectly interrupted when the lighter is in closed condition (Fig. 4).

The gap 33 between the suction element 31 and the contact surface 34 of the capillary substance storing the fuel is so dimensioned that this gap

allows an upward movement of the wick holder of sufficient distance to enable the end 4 of the wick being moved out of the burner tube sufficiently far to ensure the formation of a rootless flame.

The form of construction illustrated in Figs. 4 to 6 operates in the following manner:

When the lighter is in closed condition and the end 4 of the wick 5 is lowered, the suction contact between the suction element 31 and the contact surface 34 is interrupted. If it is desired to light the lighter, the spring lid 9 producing the ignition spark in known manner is swung upwards by spring force with the result that the holder 7, the contact element 31 and the wick end 4 are moved upwards under the influence of the spring 16. At the same time, however, the contact element 31 comes into contact with the surface 34 with the result that a sufficient quantity of fuel is sucked into the wick 5. The wick 5 and the suction element 31 are so dimensioned that a quantity of fuel sufficient for the ignition is always stored in these parts and is amply sufficient for normal use of the lighter, for example for lighting a cigar or cigarette. In closing the lighter the suction element 31 or wick 5 is separated from the capillary substance 13 saturated with fuel, so that further absorption and over saturation of the wick 5 are effectively prevented. Thus, the fuel expanding under the influence of the heat of the body can no longer reach the wick and consequently cannot pass out from the lighter through the end 4 of wick 5, with the result that the escapement of fuel by evaporation is still further reduced. The form of construction illustrated in Figs. 7 to 9 has the same characteristics as that illustrated in Figs. 1 to 3 as regards the lowering of the wick 5 and the removal of the wick end from the burner tube mouth 3 to be closed. Only the lid is constructed as a spring lid. However, as methyl alcohol is used as fuel in the example illustrated in Figs. 7 to 9 and as this fuel ignites on a contact medium such as palladium, platinum black and the like, the control strap 40 arranged on the holder 7 for the wick 5 is constructed as carrier for the contact ignition media 41 and as carrier of substances 42 for giving the flame a predetermined color. This form of construction operates in a similar manner to that shown in Figs. 1 to 3 but the ignition of the fuel is effected catalytically.

I claim:

1. A pocket lighter for liquid fuel with a liquid accumulating means and a wick tube enclosed by a burner tube forming the neck of the fuel container, comprising in combination with the burner tube, a wick tube, a spring in said burner tube under said wick tube permitting of the wick tube being lowered in the burner tube under the upper end of said burner tube, a pin on said wick tube and an abutment on the lid of the pocket lighter, said abutment arranged so that when the pocket lighter is closed the wick is pushed into said burner tube on its whole length and the lid of the pocket lighter tightly closes the mouth of the burner tube, and an abutment on said wick tube in the fuel container for limiting at the removing of the lid the upward movement of said wick tube so that a certain piece of said wick tube projects from the mouth of said burner tube.

2. A pocket lighter for liquid fuel, comprising in combination a fuel container, an accumulating means for liquid fuel in said container, a movable wick tube, a wick, a control means which at the closing of the pocket lighter positively presses downwards the wick tube to remove the burning

end of the wick from the range of the mouth of the burner tube, a disc of absorbent material on said wick tube, the fuel accumulating means having a ring-shaped face with which said disc comes into contact when the wick tube is lifted, said disc being separated from said ring-shaped face when the wick tube descends, so that the flame is extinguished and the admission of fuel from said accumulating means to said absorbing disc is interrupted.

3. A pocket lighter for liquid fuel, comprising in combination a fuel container, an accumulating means for liquid fuel in said container, a wick, a

removable cover for said wick, a body of absorbent material permanently in contact with said wick securing the absorption of fuel from said body into said wick and arranged so that between it and a surface of the accumulating means a touching contact can be produced for enabling the transition of fuel, and control means by which this contact is established when the cover is removed from the wick and is interrupted when the cover is applied to the wick and consequently the flame extinguished.

LUISE REICH.