

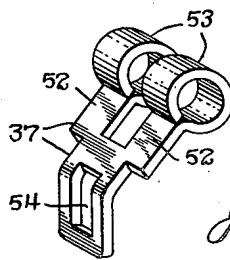
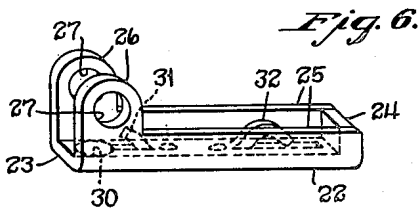
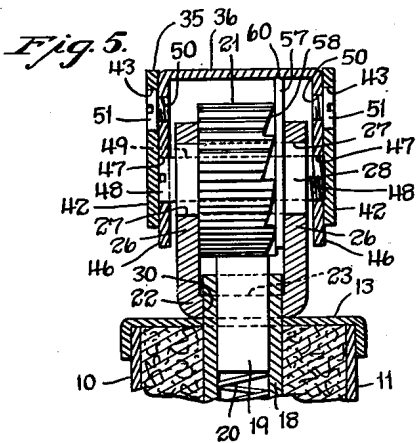
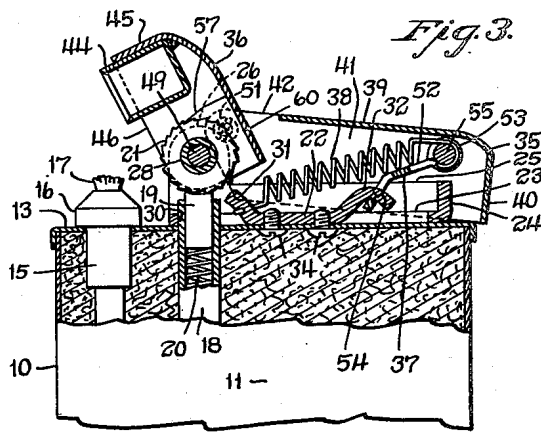
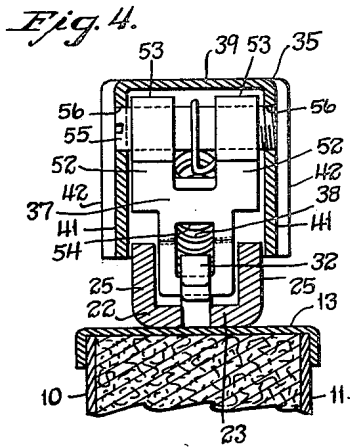
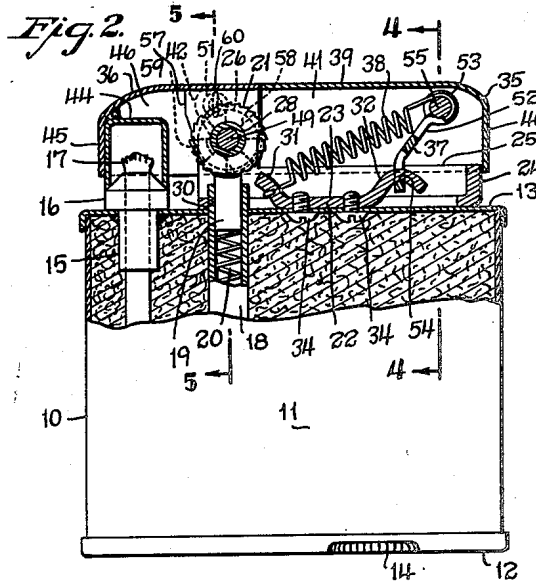
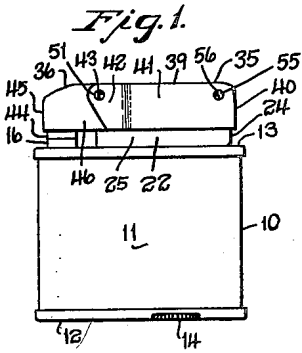
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POCKET LIGHTER

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## POCKET LIGHTER

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1 Claim. (Cl. 67—7.1)

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The present invention relates in general to illuminating burners and more especially to pocket-lighters of the type having a pyrophoric element for igniting a wick.

An object of the invention is to provide a pocket-lighter of durable and inexpensive construction and one which is easy and natural to operate.

A further object of the invention is to provide a pocket-lighter with superior operating-means characterized by a compound movement comparable to the natural movement of the operator's thumb when igniting the lighter.

With the above and other objects in view, as will appear to those skilled in the art from the present disclosure, this invention includes all features in the said disclosure which are novel over the prior art.

In the accompanying drawings, in which certain modes of carrying out the present invention are shown for illustrative purposes:

Fig. 1 is a side elevation of a pocket-lighter embodying the improved operating-means of this invention;

Fig. 2 is an enlarged side elevation partly in section of the lighter of Fig. 1, showing the operating-means of the lighter in its normal position;

Fig. 3 is a fragmentary enlarged side elevation partly in section of the lighter of Fig. 1, showing the operating-means in the position it assumes upon ignition of the wick;

Fig. 4 is an enlarged fragmentary transverse vertical section on line 4—4 of Fig. 2;

Fig. 5 is an enlarged fragmentary transverse vertical section on line 5—5 of Fig. 2;

Fig. 6 is a perspective view of the base-member of the operating-unit of the pocket-lighter; and

Fig. 7 is an enlarged perspective view of the lost-motion link of the linkage-means of the finger-piece.

The invention is embodied in a pocket-lighter indicated generally at 10 and comprising a fluid-fuel receptacle 11 having a bottom 12 and a top 13, the bottom being provided with a filling-plug 14. The top 13 is provided adjacent one end with a substantially-vertical aperture in which is secured a wick-holder 15 characterized by an enlarged head 16 and adapted to support a wick 17, the lower end of which extends down into the body of the receptacle, the upper end of the wick projecting above the enlarged head of the holder.

A second substantially-vertical aperture is provided in the top 13 of the receptacle through which the upper end of a tube 18 projects. The

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tube 18 is provided for supporting a pyrophoric element 19 in proximity to the wick 17 and to this end, the lower end of the tube 18 is secured to the bottom 12 of the receptacle over an aperture therein which is normally closed by a screw-plug (not shown). Mounted within the tube 18 is a coil spring 20, the upper end of which supports the pyrophoric element 19, the length and force of the spring 20 being so selected that the upper end of the pyrophoric element is resiliently supported above the upper end of the tube 18.

As in lighters of this type, the pyrophoric element 19 is adapted to be urged by the force of the spring 20 upwardly against the periphery of an abradant wheel which is indicated at 21 and which is adapted to be rotated in a clockwise direction as seen in Figs. 2 and 3, by manually-operated means hereinafter described, to cause a shower of sparks to jump across the intervening space between the pyrophoric element 19 and the upper exposed end of the wick 17 to ignite the latter.

To these ends, the invention embodies an operating-unit which is arranged to be secured to the top of the receptacle and which includes the abradant wheel 21 and the operating-means therefor. Referring especially to Fig. 6, the operating-unit embodies a substantially-rectangular base-member 22 which is formed preferably from relatively-stiff sheet-metal stock and consists of a bottom 23, an upturned end wall 24 and upturned side walls 25—25, the latter being provided at their left-hand ends as seen in Figs. 2, 3 and 6, and hereinafter referred to as the forward end of the base-member, with integral upwardly-extending ears 26—26 having axially-aligned bearing-apertures 27—27 extending transversely therethrough for supporting a bearing-sleeve 28 of the abradant wheel, the outwardly-extending ends of the bearing-sleeve 28 constituting journals rotatably mounted in the bearing-apertures 27—27 of the ears 26—26. A vertical aperture 30 is provided in the bottom 23 of the base-member between its upstanding ears 26—26 for accommodating the upwardly-projecting end of the pyrophoric-element supporting-tube 18 when the base-member 22 is assembled on the top 13 of the receptacle, as hereinafter described.

An anchor 31 is provided in the bottom 23 of the base-member adjacent the vertical aperture 30 and substantially coincident with the longitudinal axis of the base-member, an anchor 31 being formed preferably by cutting two longitudinal substantially-parallel slots in the bottom 23

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of the base-member, each slot intersecting an edge of the vertical aperture 30; and then bending up the free end of the elongated finger of metal formed between the slots. A second anchor 32 is provided in the bottom 23 of the base-member adjacent the right-hand end thereof, as seen in Fig. 6, which end is hereinafter referred to as the rear end of the base-member, and substantially in alignment with the anchor 31, the second anchor 32 also comprising an elongated finger of metal bent up from the slotted bottom 23 of the base-member. The anchor 32 is, however, somewhat longer than the anchor 31. Moreover, its free end faces in the opposite direction from that of the anchor 31 and is bent downward slightly to form a hook.

A pair of vertically internally-threaded apertures are provided in the bottom 23 of the base-member between the two anchors 31 and 32 to receive the externally-threaded shanks of a pair of assembling-screws 34—34 by which the base-member is secured to the top of the receptacle, the screws being screwed into the apertures of the base-member from the underside of the top 13 of the receptacle prior to securing the latter on the upper open end thereof.

The aforesaid operating-means of the operating-unit comprises a manually-operated finger-piece indicated generally at 35, linkage-means including a wick-snuffer indicated generally at 36 and a lost-motion link 37 for supporting the finger-piece for compound movement with respect to the base-member 22; pawl-and-ratchet means for transmitting movement of the linkage-means to the abradant wheel; and resilient means comprising a coil spring 38 for resiliently holding the finger-piece in its normal position with respect to the wick, as shown in Fig. 2.

Referring especially to Figs. 2, 3 and 4, the finger-piece 35 is a rectangular sheet-metal member substantially U-shaped in cross section and embodying a top 39, a rear end wall 40, and oppositely-disposed side walls 41—41, the latter being provided at their forward ends with integral tapered extensions 42—42 offset laterally therefrom and having transverse axially-aligned apertures 43—43. As illustrated especially well in Figs. 4 and 5, the width of the finger-piece 35 is such that its side walls 41—41 are adapted to telescope over the upstanding side walls 25—25 of the base-member 22.

The aforesaid wick-snuffer 36 is likewise a rectangular sheet-metal member substantially U-shaped in cross section, but shorter than the finger-piece 35. Moreover, the wick-snuffer is provided with an inverted cup-shaped snuffing element 44, which is soldered or otherwise secured within the snuffer against its front end wall 45, the lower open end of the snuffing element 44 projecting downwardly slightly below the bottom edges of the side walls 46—46 of the wick-snuffer. As shown especially well in Fig. 2, the inside diameter of the snuffing element 44 is of such size that when it is in its normal operating position as shown in Fig. 2, it will engage freely over the wick 17 and make a substantially-airtight seal with the enlarged head 16 of the wick-holder 15, so as to snuff out a lighted wick.

The side walls 46—46 of the wick-snuffer are provided adjacent their rear ends with two sets of axially-aligned apertures, one set of apertures 47—47 being adjacent the lower rear end corners respectively of the side walls 46—46 and adapted to accommodate pivotal-means constituting the outwardly-projecting ends 48—48 of a screw 49

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which extends through the bearing-sleeve or axis 28 of the abradant wheel, one end of the screw being threadedly engaged in the aperture 47 in the corresponding side wall of the wick-snuffer to secure the latter in its assembled position on the upstanding ears 26—26 of the base-member.

The second set of apertures 50—50 of the wick-snuffer is located adjacent the upper edges of its respective side walls 46—46 and slightly forwardly of the pivotal-means 48—48 thereof, as seen in Fig. 2. Furthermore, the apertures 50—50 are internally threaded and adapted to receive screws 51—51 by which the apertured extensions 42—42 of the finger-piece 35 are pivotally secured thereto, the lateral offset of each apertured extension 42—42 permitting the latter to telescope over the respective side walls 46—46 of the wick-snuffer, as shown especially well in Fig. 5.

It will be clear that in accordance with this construction, the side walls 46—46 of the snuffer constitute, in effect, lever-arms or links pivotally connected between the extensions 42—42 at the forward end of the finger-piece and the pivotal-means 48—48 of the abradant wheel.

The rear end of the finger-piece is connected with the top of the receptacle by the aforesaid lost-motion link 37 which, as shown especially well in Figs. 2, 3 and 7, comprises a substantially Y-shaped member formed preferably of flat metal stock, the bifurcated arms 52—52 of which have laterally-spaced axially-aligned cylindrical bearing-sleeves 53—53 at the upper outer ends thereof extending substantially transversely of the longitudinal axis of the link. The opposite or lower end of the link is provided with a longitudinal substantially-rectangular aperture 54, the width of which is only slightly greater than the width of the hook-shaped anchor 32 of the base-member so that the apertured end of the link may be engaged thereon, but with substantially no lateral play. The length of the aperture 54 of the link is, however, considerably greater than the thickness of the hook-shaped anchor 32, as a consequence of which the link has considerable freedom of movement longitudinally with respect thereto for effecting a lost-motion connection therewith, as and for the purposes hereinafter described. To connect the lost-motion link 37 to the finger-piece 35, the upper end of the link is inserted up into the finger-piece and is pivotally connected thereto by a transverse pivot-pin 55, which, as shown especially well in Fig. 4, extends through axially-aligned apertures 56—56 formed in the side walls 41—41 of the finger-piece adjacent its rear end wall 40; and through the axially-aligned bearing-sleeves 53—53 of the link 37, one end of the pivot-pin 55 being threadedly secured in the aperture 56 in the corresponding side wall of the finger-piece.

Secured to the pivot-pin 55 intermediate the bearing-sleeves 53—53 of the link 37, is the upper end of the coil spring 38, the opposite end of which is secured to the forward anchor 31 of the base-member, the coil spring thus constituting resilient means, the force of which acts constantly in a direction to pull the finger-piece forwardly and to resist displacement of the finger-piece rearwardly.

From the foregoing description it will be clear that the finger-piece 35 is supported by linkage-means comprising the lost-motion link 37 and the lever-arms or side walls 46—46 of the wick-snuffer, the pivoted lost-motion link 37 and the pivoted lever-arms 46—46 coacting with the fin-

ger-piece to permit the latter, initially, to move substantially longitudinally rearwardly away from the wick and thereafter to pull the finger-piece downwardly. Thus, upon pressing down the finger-piece, the linkage-means thereof will cause the finger-piece to move both rearwardly and downwardly with respect to the wick, which compound movement corresponds substantially to the natural movement of the operator's thumb when actuating the finger-piece to ignite the wick. On releasing the finger-piece, the force of the tensioned spring 38, acting in conjunction with the linkage-means pulls the finger-piece upwardly and forwardly to its normal position with respect to the wick.

The aforesaid rearward and downward displacement of the finger-piece is adapted to be transmitted by pawl-and-ratchet means to the abradant wheel to rotate the latter in a clockwise direction as seen in Figs. 2 and 3, and relative to the pyrophoric element 19 to produce a shower of sparks for igniting the wick 17. To this end, a thin spring-metal substantially-tongue-shaped pawl-member 57 is rotatably mounted adjacent its lower rounded end on the bearing-sleeve 23 of the abradant wheel between the inner face of one of the upstanding ears 26 of the base-member and the abradant wheel, the corresponding outer face of which is provided with radial ratchet-teeth 58, as shown especially well in Fig. 5, adapted to be engaged by a laterally-offset pawl-tooth 59 of the pawl-member 57. The upper substantially-straight edge 60 of the pawl-member is adapted to engage snugly against the underside of the top of the pivoted wick-snuffer 36 to prevent rotation of the pawl-member relative thereto. Hence, upon operation of the finger-piece, the resulting clockwise pivotal movement of the wick-snuffer will simultaneously rotate the pawl-member 57 clockwise about the bearing-sleeve or axis of the abradant wheel, thereby engaging the laterally-offset pawl-tooth 59 of the pawl-member with one of the ratchet-teeth 58 of the abradant wheel and rotating the latter relative to the pyrophoric element to produce a shower of sparks for igniting the wick. On the subsequent return of the finger-piece from its depressed position to its normal position, the wick-snuffer is pivoted counterclockwise, whereupon the pawl-tooth overrides the ratchet-teeth of the abradant wheel.

Assuming the elements of the lighter are assembled as shown and described herein, then it will be clear that by pressing down on the top of the finger-piece, the above-described linkage-means thereof will cause the finger-piece to move both rearwardly and downwardly in a direction which compares favorably with the normal direction of movement of the operator's thumb. As the finger-piece is so moved, the pivotal connections 51 of the finger-piece with the pivoted wick-snuffer serve to rotate the latter about the axis of the abradant wheel in a clockwise direction, as seen in Fig. 2, thereby lifting the snuffing element 44 of the snuffer upwardly to uncover the upper end of the wick. Simultaneously, the pawl-tooth of the wick-snuffer engages a ratchet-tooth 58 of the abradant wheel to rotate the latter relative to the pyrophoric element 19, whereupon a shower of sparks is delivered onto the wick to ignite the latter. After the lighter has been used to light a cigarette, cigar, or the like, the operator releases the finger-piece, whereupon the force of the tensioned spring acting in conjunction with the linkage-means of the finger-piece, pulls the

latter upwardly and forwardly to its normal position. During the upward and forward movement of the finger-piece, the wick-snuffer is rotated in a counterclockwise direction, thereby to bring the snuffing element 44 of the wick-snuffer down over the flaming wick, thereby sealing off the latter from the surrounding air so as to effectively snuff out the flame.

From the foregoing description it will be clear that the operating-unit embodying the base-member, the finger-piece, the linkage and spring thereof, and the abradant wheel, is adapted to be assembled in a single operation on the top of the receptacle by means of the two assembling-screws 34, and that in so doing, the abradant wheel is brought into operative engagement with the pyrophoric element of the receptacle and the snuffing element of the snuffer is brought into operative engagement with the wick. The pocket-lighter of this invention is, therefore, characterized by its simplicity of construction and assembly, as well as by its easy and natural mode of operation.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claim are intended to be embraced therein.

I claim:

In a spark-ignition type lighter having a fuel-receptacle with a top, a fuel-conducting tube projecting outwardly from said receptacle-top, and sparking-mechanism on said receptacle-top in igniting relation with fuel from said tube, the combination of a bracket on said receptacle-top having an end-wall, opposite side-walls between which said sparking-mechanism extends, and a web provided between said side-walls and having a punched-out loop; a channel-shaped snuffer-element open at one end and closed at the other end and having opposite side-flanges and a connecting web of which the former are at said open end and in inverted channel disposition pivotally mounted on said bracket side-walls for turning movement of said element into and from operative position; an inverted channel-shaped handle-element open at one end and closed at the other end and having opposite side-flanges and a connecting web, the side-flanges of said elements being at said open ends thereof in overlapping relation with each other and pivotally connected eccentrically of the pivot mounting of said snuffer-element so that said elements together form a linear inverted channel closed at both ends and telescopically projecting externally over said bracket walls when said snuffer-element is in its operative position, and said snuffer-element is turned from its operative position on depressing said handle-element toward said receptacle; a link between said bracket and handle-element being concealed by the side-walls of the former and the side-flanges of the latter, said link having at one end an eye through which extends said loop of the bracket to constitute a floating pivot connection between said bracket and link, the other end of said link being pivotally connected with said handle element in the channel thereof, and said link being adapted to guide said handle-element for compound rotary and bodily movement when depressing and rais-

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ing the latter; and spring-means concealed by said bracket side-walls and the side-flanges of one of said elements and normally urging said handle-element into its raised position in which said snuffer-element is in its operative position.

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REFERENCES CITED

The following references are of record in the file of this patent:

Number
1,941,873
1,967,885

5

Number
556,910
591,119
616,709

10

8

UNITED STATES PATENTS

Name	Date
Aronson -----	Jan. 2, 1934
Holtzman -----	July 24, 1934

FOREIGN PATENTS

Country	Date
Germany -----	Aug. 16, 1932
Great Britain -----	Aug. 7, 1947
Great Britain -----	Jan. 17, 1949