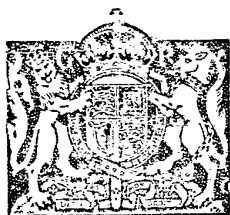


PATENT SPECIFICATION



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COMPLETE SPECIFICATION.

Improvements in Pocket Lighters.

I, FRANK BERNHARD DEHN, M.Sc., Ph.D., A.I.C., of Kingsway House, 103, Kingsway, London, W.C. 2, England, a British Subject, Chartered Patent Agent, do hereby declare the nature of this invention (which has been communicated to me by Standard Devices Incorporated, a corporation organised under the laws of the State of Delaware, United States of America, of 267, Fifth Avenue, City, County and State of New York, United States of America) and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

My invention relates to pocket lighters for cigars and cigarettes, my purpose being to provide a number of mechanical improvements of various kinds in the construction and action of the lighter.

More particularly stated, I seek to do away with a considerable number of movable members carrying gear teeth, and to substitute in place thereof a lever and parts coacting therewith all of simple construction, and used for transmitting pressure of the thumb to the snuffer and other driven members of the lighter.

My invention further contemplates provision for allowing a small degree of lost motion between the thumb piece and the friction wheel forming a part of my lighter, these parts being so connected with the snuffer and co-related that when pressure is applied to the thumb piece the snuffer is moved slightly before the friction wheel is actuated, and the friction wheel is then moved abruptly as the snuffer continues its movement; the net result being that the ignition is rendered relatively sudden.

My invention further contemplates improvements in the flint feed mechanism for the purpose of enabling the lighter to use very long flints, and to center and guide said flints, and also to protect the friction wheel and other parts from injury incidental to the mechanism being actuated after the flint is used up.

In addition my invention contemplates provision for housing one or more spare flints, to be normally held in reserve and to be used from time to time as occasion

may require.

My invention further comprehends a pocket lighter in which the ignition mechanism is housed within a casing one corner of which is movable relatively to other parts thereof, so that the operator, in using the device to strike a light, practically presses one corner of the casing inwardly, without substantially disturbing the casing or marring the symmetrical form thereof.

My invention also contemplates giving the casing and parts carried thereby such form and arrangement as to conserve a certain space within the casing and render the same available for holding a relatively larger volume of liquid hydrocarbon fuel.

My invention also covers various details in the construction of the casing used as a housing for the other parts, the idea being to give the casing such form as to enable nearly all of it to be cast in a single piece in which are integrally incorporated a number of parts which would ordinarily be made separate therefrom; and at the same time, to improve the efficiency of said piece and its various component parts.

Reference is made to the accompanying drawing forming a part of this specification, and in which like reference characters indicate like parts throughout the several figures.

Figure 1 is a substantially central section through one form of my improved lighter, the mechanism thereof appearing as idle and the movable parts being shown in their respective normal positions.

Figure 2 is a section upon the same plane as Figure 1, but with the various movable parts in their abnormal positions, as when the lamp is burning.

Figure 2a is a plan view of the lever shown in Figure 1, and a friction wheel actuated by the lever as indicated in Figure 4.

Figure 3 is a side elevation of the form appearing in Figure 1, but without the cover and showing the casing partly in section so as to disclose the flint feed.

Figure 4 is a section to enlarged scale on the line 4—4 of Figure 1, looking in the direction indicated by the arrows.

Figure 5 is a side elevation of the

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snuffer, which has the form of a slide.

Figure 6 is a plan view of the snuffer.

Figure 7 is a side elevation of the thumb piece, which also has the form of a slide.

5 Figure 8 is a plan view of the thumb piece.

Figure 9 is an elevation of the rocking lever.

10 Figure 10 is a plan view of the rocking lever.

Figure 11 is a section on the line 11—11 of Figure 3, looking in the direction indicated by the arrows.

15 Figure 12 is a vertical section showing an improved top plate forming a part of my invention, and provided with a pocket for holding a spare flint.

Figure 13 is an inverted plan or bottom view of the cap plate shown in Figure 12.

20 Figure 14 is a fragmentary section showing a form of casing and parts carried thereby suitable for use with my invention, but differing from those appearing in the lower portion of Figure 3.

25 Figure 15 is a fragmentary section like the lower middle portion of Figure 3, but upon a larger scale and showing one form of the flint feed mechanism.

30 A casing made of metal is shown at 16, and carries a cover 17 made of leather or other material suitable for the purpose.

35 The casing has the general form of a thin flat box with rounded edges, and one of these edges is provided with an opening 18, having the form of a slot.

40 The casing is further provided with a partition 19 extending across it and practically dividing it into compartments. A portion of the partition is formed into a burner tube 20, as shown more particularly in Figure 1. The lower portion of the casing is so formed as to serve as a lamp, the wick of which extends through the burner tube 20.

45 Located within the casing and snugly fitted into one edge thereof is a snuffer 22, of a form indicated more particularly in Figures 5 and 6.

50 Engaging the snuffer 22 is a compression spring 23, which normally presses downward according to Figures 1 and 2.

55 The snuffer carries a lug 24 extending across it and integral with it, this lug being provided upon opposite sides of the snuffer with a pair of grooves 25, as indicated more particularly in Figures 5 and 6.

60 The casing 16 is provided internally with a pair of ribs 26, 26, integral with it and facing each other, as indicated in Figure 4. These ribs fit neatly into the grooves 25, 25, so that the snuffer is mounted to slide relatively to the casing, and for this purpose is guided by the ribs 65 26, 26, and by the adjacent edge portion

of the casing. The inner conformity of the casing is such that the snuffer fits neatly against it, as may be understood from Figure 4.

The snuffer 22 carries a lug 27 which is provided with a slot 28 and is thus somewhat in the form of a fork, which is integral with the body portion of the snuffer. A pin 29 carried by the lug 27 extends across the slot 28.

70 A lever 30, having a form indicated more particularly in Figures 9 and 10, is provided at one of its ends with an open slot 37, so formed that the pin 29 fits loosely but neatly into it.

80 The lever 30 is provided with a middle portion 31 of substantially circular form, as may be understood from Figure 9. The portion 31 is provided with ratchet teeth 32, four in number, these teeth being integral with the portion 31. They are preferably formed by stamping. Each ratchet tooth 32 acts as a spring tooth, and is integral with the lever 30.

90 The lever 30 is provided with a hole 33, and through it extends a stationary shaft 34, upon which the lever is journaled to rock.

95 A friction wheel is shown at 35, and is provided with a ratchet disk 36, the diameter of which is slightly greater than the general diameter of the flint wheel. One face of the disk 36 is formed to cooperate with the clutch teeth 32 of the lever 30, so as to be actuated thereby. 100 Thus a step-by-step turning movement is conferred upon friction wheel 35, by a rocking movement of the lever 30.

105 The lever 30 is provided at one of its ends with an open slot 38. A pin 39, shown more particularly in Figures 7 and 8, fits neatly into this slot 38, and is carried by a lug 40, having the form of a fork and provided with a slot 41 across which this pin extends. The lug 40 is 110 carried by a thumb piece 42, and as here shown is integral therewith.

115 The thumb piece 42 carries a flange 43, projecting slightly outward. This flange with the adjacent flat portion of the thumb piece is engaged by the operator's thumb for the purpose of enabling the operator to depress the thumb piece.

120 The thumb piece carries a lug 44, provided with a pair of grooves 45, 45, and the casing 16 carries a pair of ribs 46, 46, integral with it and fitting into these grooves. The thumb piece also fits neatly into adjacent edge portion of the casing, and is thus slidably mounted relatively to 125 the casing. The casing is cut away at one corner to make room for the thumb piece.

130 Engaging the thumb piece 42 and partially extending thereinto is a spring 46a. This spring encircles a guide 47

carried by the partition 19, and is thus seated upon the partition, so as to be compressed whenever the thumb piece 42 is depressed.

5 The various movable parts are so arranged and co-related that whenever the thumb piece 42 is depressed so as to compress the spring 46a, the lever 30 is rocked, and the snuffer 22 is thereby carried away
10 from the wick 21, the slot 18 is thereby opened so as to expose the wick and give it air, and the spring 23 is compressed; all as may be understood from Figure 2.

Each time the thumb piece is depressed
15 the lever 30 rocks in a clockwise direction according to Figure 1, and each time the thumb piece is relaxed from its position indicated in Figure 2 and allowed to resume its position indicated in Figure 1,
20 the friction wheel remains idle. Thus the pawl teeth 32, acting upon the ratchet face of the disk 36, turn the friction wheel 35 step by step, in a clockwise direction according to Figure 2.

25 When my lighter is in its normal condition, as indicated in Figure 1, the teeth 32 are slightly out of engagement with the ratchet teeth of disk 36, as may be understood from Figure 4; but whenever the
30 thumb piece 42 is depressed it causes the lever 30 to first begin raising the snuffer 22, and then, by engagement of its teeth 32, with the ratchet teeth of the disk 38 it causes the friction wheel 35 to turn.

35 By this arrangement the friction wheel first lags behind a little, and then makes a turning movement which is quite abrupt, and which does not begin until after the snuffer is in motion, and the wick is not
40 only exposed, but also given a little air.

The upper end of the casing, according to Figures 1 and 2, is fitted with an end cap 48, provided with a downwardly extending portion 49, held in position by
45 rivets, one of which is shown at 50.

Carried by the casing 16, and cast integral therewith, is a single rib 51, having a form which may be understood by reference to Figures 3 and 11.

50 This rib is substantially semi-cylindrical in cross section, and is provided with a longitudinal passage 52 having substantially a cylindrical form. The rib is further provided with a pair of grooves
55 53, 53, merging into the passage 52 and extending lengthwise in the same general direction as the rib.

60 Located within the passage 52 is a plunger 54, in the form of a slide, and provided with fins 55 integral with it, these fins extending out into the grooves 53.

The casing 16 carries a screw 57, which extends into the passage 52. Engaging the screw 57 and extending therefrom to

the plunger 54 is a spring 56. By removing the screw 57 the spring 56 and the slide 54 can be taken out.

The rib 51 is provided with a neck portion 58, of the form shown more particularly in Figure 3. 70

A flint is shown at 59. This flint is made of pyrophoric material, and extends loosely through the neck 58 and into engagement with the friction wheel 35. 75

Each time the friction wheel 35 turns one step, as elsewhere described it rasps the adjacent end portion of the flint, and thus throws sparks to the left according to Figure 3, so as to light the wick. 80

The purpose of the fins 55 and the grooves 53, 53 into which these fins project, as shown in Figures 3 and 11, is to provide a limiting stop for arresting the travel of the plunger 54 when the flint 59 is practically used up and the plunger 54 reaches the end of its stroke. 85

The fins 55 center the plunger 54 and guide the same throughout the path of travel thereof; but when the plunger lodges against the neck 58 it is thereby arrested in its travel. This occurs before the flint 59 is quite used up, so that the plunger can never under any circumstances move into direct engagement with the friction wheel. 90

It will be noted that owing to the length of the rib 51 the passage 52 is long enough to enable the plunger 54 to travel quite a distance, preferably about one-fourth
100 of the total length of the passage. Hence, the plunger pressing against the end of a flint can follow the flint for a relatively long distance, and the flint can be as long as the distance thus travelled by the
105 plunger.

This arrangement enables my device to use very long flints. By using long flints the trouble of renewing the flint is reduced, so that the lighter may be used for a greater length of time, other factors being equal, without renewing the flint. And since the plunger 54 never touches the friction wheel, the friction wheel and the plunger are both kept in better order
115 because of this fact.

In Figure 15 I show a rib 60 which differs from the rib 51 above described by having a truly cylindrical passage 61. The rib 60 has a neck 62. A flint is shown
120 at 63. Slidably fitted into the passage 61 is a plunger 64, the upper end of which is formed to extend up into the neck 62, nearly but not quite flush with the adjacent outer end surface of the rib. 125

By this arrangement the plunger moves upwardly according to Figure 15, as the flint 63 is gradually worn away or used up, until the flint becomes so short that the plunger lodges directly against the
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neck 62. The little piece of flint remaining unused is then removed, and replaced by a new flint. The flints last a long time, and when any particular flint is so far used up that the plunger 64 can no longer press it against the friction wheel, both the plunger and the flint wheel are protected from injury due to any rasping action as between the plunger and the friction wheel.

In Figure 14 I show the casing 16 as provided with a rib 66, something like the rib 51 above described; and fitted into this rib 66 is a plunger 67, the travel of which is limited by the neck 68, the plunger 67 and neck 68 being substantially like the plunger 54 and the neck 58 above described. A flint 69 extends through the neck 68, and is constantly pressed against the friction wheel by the plunger 67.

The rib 66 is provided with a portion 70 extending laterally from it and integral with the casing 16. This portion 70 is hollow, and serves as a pocket for holding a number of loose flints 71. A screw 72, carried by the casing 16, closes the outer end of open end of the pocket. By taking out the screw 72, the flints 71 are rendered accessible, and may be removed and replaced either as a group or one at a time, as required.

Thus the form shown in Figure 14 is provided with a magazine for carrying spare flints, and these may be appropriated from time to time, as required.

In Figure 12 and 13 I show a top plate 73 which differs from the top plate 48 above described, in that the top plate 43 carries a pocket 74 which serves the double purpose of a magazine for housing a flint 59 and a guide for centering and seating the spring 23. The top plate 73 also carries a screw 75, serving as a closure member for the pocket 74. Except as otherwise described, the top plate 73 is like the top plate 48.

The operation of my device may be readily understood from the foregoing description.

Whenever the operator wishes to use the lighter, he places his thumb upon the thumb piece and depresses the same. The thumb piece acts upon the lever 30, and this lever acts upon the various movable parts controlled by it, all as above described, so that the snuffer is moved away from the wick, the slot 18 is opened wide at a single stroke of the snuffer 22, and the friction wheel is turned one step and caused to rasp the flint, throwing sparks toward the wick and causing the same to be ignited. However, as above noted the snuffer begins to move before the friction wheel begins to turn, so that the wick is first partially exposed and thus

supplied with a little fresh air before any sparks are produced, and then the wick is suddenly showered with sparks, due to abruptness of motion of the friction wheel.

For reasons above stated, long flints may be employed, so that the renewal of the flint need not be made often and even then, by means of either of the magazines above described, one or more spare flints may be always kept on hand and appropriated as needed. No injury can ever be caused to either the friction wheel or the plunger used to press the flint into engagement with the friction wheel, because the said plunger never makes direct engagement with the friction wheel.

In practice, the lighter is operated from time to time until the flint in active service is worn away and nothing of it is left except possibly a thin disk; and as the plunger now ceases to press upon this disk and the lighter thereby fails to work properly, the operator is by this condition apprised that a new flint is required. He thereupon brings into use a new flint, and in so doing throws out the little residual piece of the old flint.

I do not limit myself to the precise mechanism illustrated and described, as variations may be made therein without departing from my invention, the scope of which is commensurate with my claims.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A pocket lighter comprising a casing provided with a slot, a snuffer slidably mounted within said casing in order to open and close said slot, a thumb piece slidably mounted within said casing, a lever connected with said thumb piece and with said snuffer for enabling pressure of the operator's thumb upon said thumb piece to actuate said snuffer, a wick carried by said casing and disposed adjacent said slot, and mechanism carried by said casing and controllable by movements of said lever for igniting said wick.

2. A pocket lighter according to claim 1, including means for supporting a flint within said casing and adjacent said slot, a friction wheel revolubly mounted within said casing and engaging said flint, and means for enabling said lever, while being rocked by pressure of the operator's thumb upon said piece, to turn said friction wheel.

3. A pocket lighter according to claim 2, wherein said last mentioned means comprises ratchet mechanism carried by said lever and said friction wheel.

4. A pocket lighter according to claim 2, wherein the casing is provided with a

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rib integral therewith and having a longitudinal passage and a neck portion, a plunger slidably mounted within said passage for engaging a flint extending through said neck portion, a spring located within said passage and engaging said plunger for the purpose of forcing said plunger towards said friction wheel, and a screw extending into said passage and engaging said spring.

5. A pocket lighter according to claim 4, including a pair of grooves merging into said passage, said plunger being provided with portions extending into said grooves for the purpose of centering and guiding said plunger within said passage.

6. A pocket lighter according to claim 4, characterized by said plunger having a portion fashioned to fit into said neck portion and serving as a limiting stop for the travel of said plunger toward one end of said rib.

7. A pocket lighter according to claim 4, wherein said casing is provided with a top plate having a pocket for holding a spare flint, and a closure member carried by said top plate and normally closing said pocket.

8. A pocket lighter according to claim 1, wherein said thumb piece comprises a corner piece carried by said casing and movable relatively thereto by the operator's thumb.

9. A pocket lighter according to claim 1, including a partition extending across the casing internally so as to divide it

into two compartments one for holding liquid fuel, said partition being integral with the casing.

10. A pocket cigar lighter, comprising a casing provided with an opening, a snuffer slidably mounted within said casing for the purpose of closing said opening, an ignition mechanism connected with said snuffer for igniting a wick as said snuffer is moved away from said opening, a corner piece carried by said casing and movable relatively thereto, and connections from said corner piece to said ignition mechanism for enabling movement of said corner piece to actuate said ignition mechanism and snuffer.

11. A pocket lighter, comprising a casing provided with an opening, a snuffer slidably mounted within said casing for the purpose of closing said opening, an ignition mechanism connected with said snuffer for igniting a wick as said snuffer is moved away from said opening, a corner piece carried by said casing and movable relatively thereto and a lever extending from the corner piece to the snuffer and connected with said ignition mechanism, for enabling movement of said corner piece to actuate said ignition mechanism and snuffer.

Dated this 11th day of October, 1929.

For the Applicant,
FRANK B. DEHN, & Co.,
Chartered Patent Agents,
Kingsway House, 103, Kingsway, London,
W.C. 2.

[This Drawing is a reproduction of the Original on a reduced scale.]

