

UNITED STATES PATENT OFFICE

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LIGHTER

Application filed August 24, 1929. Serial No. 388,230.

My invention relates to a lighting device for providing a flame when the casing thereof is opened.

An object of the invention is the provision of a novel construction of lighter in which closure means are operated in unison with lighting means controlled by a hand operated sleeve.

A further object is the provision of closure members capable of providing walled protection or shields for the flame of the lighter at opposite sides when the closure means are opened, with a recess therebetween for access of the cigarette to the flame.

Another object is to provide means for controlling and limiting the extent of opening of said closure members.

Other objects will appear hereinafter.

The invention consists in the features, and the combination, and arrangement of parts hereinafter described and particularly pointed out in the claims.

In the drawings:

Fig. 1 is a view of a preferred form of my invention in closed position with the open position shown in dotted lines.

Fig. 2 is a view of a modified form in which the cover carries an arcuate rack bar for actuating the friction wheel.

Fig. 3 is a view of a further modification in which the rack bar is spring pressed upwardly to actuate the friction wheel and is depressed by the closure members in closing.

Fig. 4 is a sectional plan view taken on a line A—A as in Fig. 1, of a modification of Fig. 1 in which the covers are hinged along the longer sides of the casing.

Figs. 5, 6, and 7 are views of modifications or improvements applicable to all forms of the invention, but shown in connection with a structure like that of Fig. 1. Fig. 6 is taken substantially on line 6—6 of Fig. 5.

Referring to the drawings, 1 is the inner casing of my lighter which has sleeve 2 slidably mounted thereon to operate and control the covers 3 hinged at opposite sides of the upper end of the casing. In the embodiment of the invention shown in Fig. 1, a vertically disposed rack bar 4 within the casing is secured to the sleeve 2 by a connection

extending through slot 6 in the inner casing wall. This connection may include a slide block 5 which slides along the slot on the inner side of the casing wall and through which the fixed pivot stud 5a for the rack bar projects from the sleeve wall.

The rack bar 4 is in engagement with ratchet portion 7 of friction wheel 8 so as to drive the wheel 8 upon downward movement of the rack bar and sleeve and so that upon upward movement of the sleeve and rack bar relative to the casing, the rack bar will slip over the ratchet. The rack bar is pivotally mounted upon pivot 5a for this purpose and is yieldably held in engagement with the ratchet by spring 9 secured to the block 5.

A sparking stone 10 is slidably carried in the upper end of a tube 11 and is yieldingly held in contact with the roughened or toothed surface of the friction wheel by means of spring 13 mounted in the tube and bearing at its lower end upon the screw closure cap 14 of the tube. A detent 15 for the ratchet 7 is mounted at the upper end of the tube 11, and prevents the turning of the friction wheel upon the up stroke of the rack bar and sleeve.

The reservoir tube 16 with its wick 17 are shown in position, such that the wick will receive the sparks from the friction wheels and sparking stone upon downward movement of the sleeve and rack bar.

The covers or hinged cap members are hingedly mounted at 18 at opposite sides of the casing and springs 19 are provided at the hinges for urging the covers to open position. As shown in dotted lines in Fig. 1, the covers when opened to provide access to the lighter flame with cigar or cigarette, provide walled protection or shields for the flame at opposite sides thereof.

The sleeve 2 is frictionally mounted for easy sliding movement upon the casing and is slightly enlarged at its upper end to clear the hinges 18, the upper edge of the sleeve engaging and pushing the doors or covers into closed position on upward movement and controlling the opening of the covers on

downward movement of the sleeve. Raised portions 20 are provided upon the covers to ensure the complete closing thereof.

A limiting stop 21 is provided upon the casing wall to limit the downward movement of the sleeve and hence the amount of opening of the covers, so that the covers provide walled protection at opposite sides of the flame while providing sufficient opening therebetween for ready access to the flame with a cigarette or cigar.

The operation of this device will be clear from the above description. The lighter casing is closed and the light extinguished upon movement of the sleeve and rack bar, the doors being shut by the sleeve and the rack teeth slipping over the ratchet. To use the lighter the sleeve is drawn sharply down in a simple and quick movement, the doors opening and the rack bar operating the lighter.

In the embodiment shown in Fig. 2, an arcuate rack bar 4a is hingedly secured to a cover 3a at 22 and is spring pressed into engagement with the ratchet 7a by spring 9a carried by the cover 3a.

In the operation of this arrangement, as the sleeve 2a is pulled down, the covers 3a open by force of springs 19a at their hinges 18a and the arcuate rack bar 4a is moved to actuate the friction wheel 8a against the sparking stone 10a, the teeth of the rack bar engaging the teeth of the ratchet portion 7a and rotating the wheel 8a. A detent 15a is provided to prevent rotation of the wheel 8a upon closing movement of the covers 3a by upward movement of the sleeve 2a.

In the embodiment of my invention illustrated in Fig. 3, the rack bar 4' is slidably mounted in a guide tube 23 and is spring pressed upwardly to actuate the sparking wheel 8' by means of spring 24. Depression of the rack bar is effected by means of the elongated cover member 3' which, when in opened position, engages the end of the rack bar, as shown in dotted lines, and upon closing movement impelled by the upwardly moving sleeve, slides over the end of said rack bar and forces it downwardly into the position shown in full lines with the covers closed. In order to secure the requisite extent of movement of the rack bar, the rack bar actuating cover must be of a length to extend considerably beyond the rack bar when closed. This reduces the size of the other hinged cover 3' and causes them to meet at 25. The remaining structure of Fig. 3 is generally the same as that of Fig. 1, except that the rack bar teeth are disposed in the opposite direction in order that the sparking may be produced upon upward movement of the rack bar. The back wall 26 of the guide tube 23 comprises a resilient flat spring capable of yielding outwardly about the point 27 but normally

maintaining the rack bar in engagement with the ratchet.

This spring wall 26 permits the rack bar to be deflected sufficiently in its downward movement to slip over the ratchet, the detent 15' preventing the ratchet 7' and sparking wheel 8' from turning upon said downward movement of the rack bar.

One of the hinged covers in each of the embodiments shown in Figs. 1, 2 and 3 is preferably provided with a flame extinguishing cup or cap 28 secured thereto and movable with the cover to overlies the wick when the cover is closed.

In Fig. 4 is shown in sectional plan view a modified form of my invention in which the covers meet along a line 29 and are hinged at 18'' along the longer sides of the casing, thus providing greater shielding protection for the flame at opposite sides thereof. The hinge springs are shown at 19'', the casing at 1'' with the sleeve 2'' surrounding it, and the wick, friction wheel and rack bar are indicated diagrammatically within the casing at 17'', 8'' and 4'' respectively.

Without departing from the invention, any desired cross sectional shape of the lighter may be adopted, i. e., it may be round or rectangular.

Referring to Figs. 5, 6, and 7, the sparking wheel 8b and wick 17b are mounted within and below the upper end of the casing 1b, and the upper end of the casing is perforated as shown at 30 and provides a windshield 31 for the protection of the flame, in addition to the protection afforded by the open covers. The flame is provided with ample air for combustion by means of the perforations or slits in the windshield 31.

Fig. 5 shows the sleeve in retracted position, with the covers 36 open and swung about hinges 37 into engagement with abutments 39, thus leaving the perforated windshield portion exposed, so that air for the flame may enter through the perforations.

The sleeve 38 surrounds the casing and, as in all of the forms shown, is in sliding contact therewith at all points except where the sleeve must pass over the hinges to engage and close the covers or doors.

A spring grip rendering the wick 17b readily removable and replaceable is provided in the wick tube 16b. The spring grip consists of a ring 32 having fixed thereto spring grip fingers or prongs 32a adapted to grip the wick when the prongs are drawn into the tube 16b. The ring 32 loosely receives the wick and the prongs clamp it. The ring 32 is slidable in the tube and is manipulated by the handle or finger piece 33 secured to the ring and extending upwardly therefrom and then outwardly and downwardly as shown in Fig. 5. The finger piece projects through slots 34 and 35 in the

casing and sleeve walls respectively and is readily moved upwardly to release the wick from the grip and to receive a new one inserted through the ring 32, and is then moved downwardly to clamp the wick in place.

The enlarged heads 32b of the spring prongs 32a, when drawn into the tube, are forced inwardly by engagement with the wall of the tube and thus securely grip the wick.

While the wick grip and the windshield are shown for convenience in only one figure of the drawings, it will be understood that they may be incorporated in all of the forms shown within the scope of the invention.

I claim:

1. In combination in a lighter, an inner casing, a cover hinged to said casing, a sleeve outside of the casing and slidable thereon to operate the cover, and lighting means within the casing operable in unison with said cover.

2. In combination in a lighter, an inner casing, a two part cover hinged at opposite sides of the top of the casing, a sleeve slidable outside of said casing to operate the hinged cover parts, and lighting means within the casing operable in unison with said cover.

3. In combination in a lighter, an inner casing, cover members hinged at opposite sides of the top of said casing, spring means at the hinges of said covers urging them to open position, a sleeve slidable outside of said casing to close the hinged cover parts or to allow them to open, and lighting means within the casing operable in unison with said cover members.

4. In a lighter according to claim 3, means for limiting the downward movement of the sleeve on the casing, said covers being limited in their opening movement by the upper end of the sleeve to provide walled protection at opposite sides of the flame with a central opening for passage of the flame and cigarette.

5. In a lighter according to claim 3, means for limiting the opening movement of the cover members to provide walled protection by the covers at opposite sides of the flame with a central opening for passage of the flame and for insertion of cigar or cigarette into contact with the flame.

6. In combination in a lighter, an inner casing, cover members hinged at opposite sides of the top of said casing, spring means at the hinges of said covers urging them to open position, a sleeve slidable outside of said casing to frictionally engage and close the hinged covers or to allow them to open, a fuel reservoir and wick within said casing, wick igniting means comprising a frictional wheel and sparking stone within the casing,

said frictional wheel having ratchet teeth thereon, and a rack bar secured to said sleeve and movable with the sleeve to operate the lighting means in unison with the opening of the covers upon downward movement of the sleeve.

7. A lighter according to claim 6 in which said inner casing is provided with a slot, a connection between said outer sleeve and said rack bar within the casing, said connection extending through said slot, said sparking stone being slidably mounted within said casing, and a spring for urging said sparking stone into engagement with said friction wheel.

8. In combination in a lighter, a casing, a wick and lighting means therefor within the casing, a cover hinged to the casing, a sleeve outside of the casing and slidable relative to said casing for operating the cover, and a member mounted on one of said movable parts for operating the lighting means when the cover is operated.

9. In a lighter according to claim 3, said lighting means including a wick, a tube for receiving said wick, and a spring grip slidable in said tube and embracing said wick, said grip comprising a ring receiving said wick and having fixed thereto spring prongs tending to spring apart and adapted to be forced towards each other to grip the wick when the prongs are drawn into the tube, said grip being movable to position said prongs without the tube to release the wick or within the tube to grip the wick.

In testimony whereof I affix my signature.
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