Feb. 26, 1946. J. HOLTZMAN 2,395,783

LIGHTER

Original Filed June 12, 1940

Fig. 1.

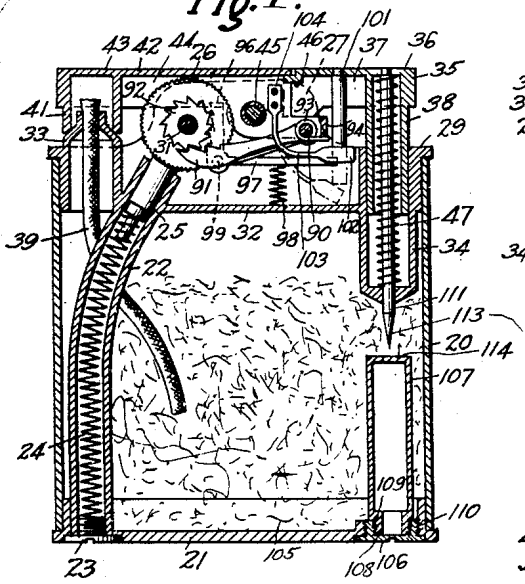


Fig. 2.

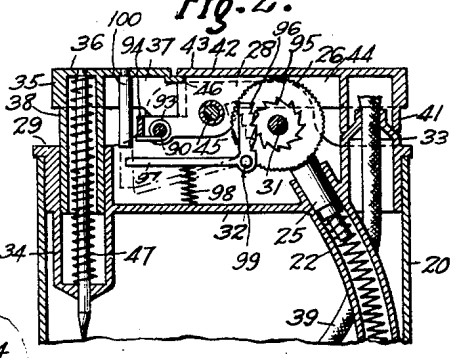


Fig. 3.

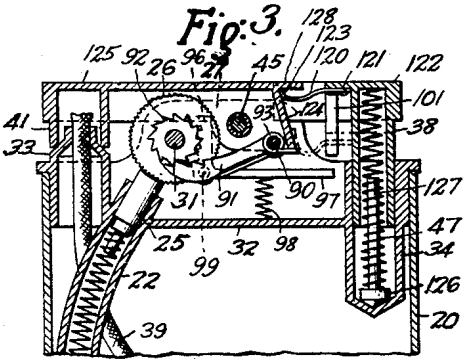


Fig. 4.

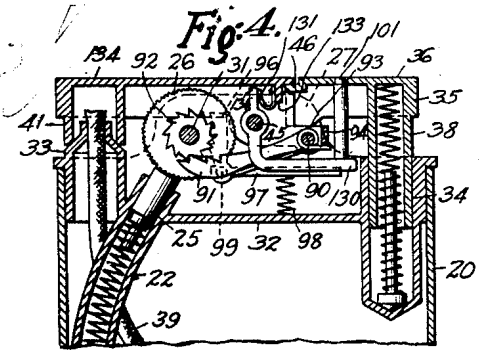


Fig. 5.

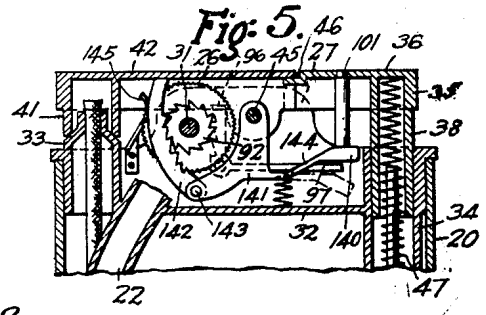
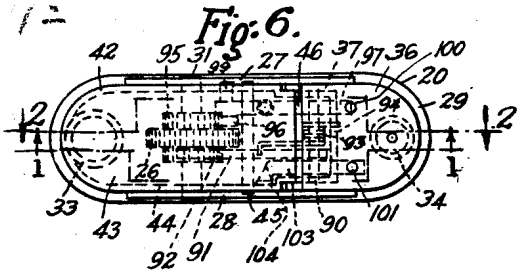


Fig. 6.



INVENTOR.

John Holtzman

Patented Feb. 26, 1946

2,395,783

UNITED STATES PATENT OFFICE

2,395,783

LIGHTER

John Holtzman, New York, N. Y., assignor of one-half to Irving F. Goodfriend, New York, N. Y.

Continuation of application Serial No. 340,109, June 12, 1940, which is a division of application Serial No. 16,171, April 13, 1935. This application June 11, 1942, Serial No. 446,590

13 Claims. (Cl. 67—7.1)

This invention relates to cigar and cigarette lighters of the pocket or table stand type, wherein a serrated wheel is actuated to abrade a pyrophoric element and thereby throws sparks on to a fuel-fed wick to ignite the wick. This application is a continuation of my co-pending application for patent Ser. No. 340,109, filed June 12, 1940, and which latter application was a division of my application for patent for Lighter, Ser. No. 16,171, filed April 13, 1935.

My invention is designed to provide simple, compact and dependable actuating means for the abrading wheel and contemplates such arrangements and combinations of parts as will meet the severe requirements of practical use and the conditions of quantity production at minimum cost.

The various objects of my invention will appear as the description progresses, and will further be clear from the drawing, wherein,

Fig. 1 is a vertical section of one form of my improved lighter, taken on the line 1—1 of Fig. 6.

Fig. 2 is a similar section of the same, taken on the line 2—2 of Fig. 6.

Figs. 3, 4 and 5 are similar sections, respectively, of other modified forms of my improved lighter.

Fig. 6 is a top plan view of the lighter shown in Figs. 1 and 2.

It will be understood that the practical embodiments of my invention may assume various forms which I will describe separately in detail.

Referring now to Figs. 1, 2 and 6, I have there shown a lighter provided with the casing **20** of preferably rectangular outline and comparatively thin in a lateral direction and provided with the bottom **21**. The tube **22** for the pyrophoric material extends to the bottom and is removably closed by the screw **23**.

Said screw retains the spring **24** within the tube **22**, the spring acting upon a suitable block **25** of pyrophoric material to urge said block into contact with the abrading wheel **26**. The sides **27** and **28** of the casing are extended above the upper end **29**, to provide spaced upstanding projections in which the abrading wheel shaft **31** is mounted. As its upper part, the casing **20** is closed by the wall **32** which supports the tube **22**. Said wall **32** carries the wick tube **33** arranged at one edge of the casing, and the spring holding and guiding tube **34** arranged at the other end thereof.

Mounted for movement into and out of the casing in a straight line path is the movable finger piece member **35** provided with a flat top **36** and with depending sides **37**, said finger piece being also provided with a spring-holding tube **38** telescoping into the tube **34**. The finger piece **36** is mounted for vertical reciprocatory movement and during said movement, causes operation of the lighter mechanism including the uncapping of the wick **39** and the rotation of the abrading wheel **26** to produce sparks from the pyrophoric block **25** and thereby to light said wick. The depending sides **37** of the finger piece are arranged outwardly of the sides of the snuffer member **42** and slide therepast on the operation of the finger piece.

The wick **33** is capped by the capping tube **41** carried by the snuffer member **42** which is provided with a flat top **43** and with depending sides **44**. Said snuffer member **42** is mounted for swinging movement on the shaft **45**, which passes through the sides **44** of the snuffer member and into the upstanding projections of the casing. The top **36** of the finger piece is depressed and extended as at **46**.

In the closed position of the lighter, the extended part **46** is arranged underneath the top of the snuffer member and owing to the action on the finger piece of the finger piece spring **47**, and the consequent tendency of the part **46** to move upwardly, maintains the snuffer member **42** normally in wick-capping position by its tendency to rotate said snuffer member in a counter-clockwise direction as viewed in Fig. 1.

Mounted on and extending between the depending sides **44** of the snuffer member is the pin **90**. Carried by said pin is the abrading wheel operating pawl **91**, terminating in suitable ratchet teeth which engage the ratchet wheel **92** loose on the sahft **31** and secured to the abrading wheel. Said pawl **91** is urged into engagement with the ratchet wheel **92** by means of a suitable coil spring **93** mounted on the pin **90**. One end of the spring engages the pawl, and the other end engages the end cross bar **94** at the right end of the snuffer member as viewed in Fig. 1. The ratchet wheel **92** is mounted on the shaft **31** on one side of the abrading wheel **26** while a second ratchet wheel **95** is loosely mounted on the same shaft on the other side of the abrading wheel and is also connected thereto.

Means are provided for normally maintaining the abrading wheel against rotation during part of the downward movement of the finger piece **36**. Said means comprises the pawl **96** engaging the ratchet wheel **95** and forming one arm of the bell-crank lever **97**, the other arm of which is acted on by the spring **98**. The bell-crank

lever 97 is pivoted to one of the sides of the casing as by means of the pin 99.

An upright pin 100 (Fig. 2) carried by the finger piece 36 is arranged to engage the end of the bell-crank lever 97 and to rotate said lever to release the abrading wheel on downward movement of the finger piece, said pin and bell-crank lever moving into the dash-dot line positions thereof illustrated in Fig. 2. A second pin 101 carried by the finger piece 36 is arranged to engage one end 102 of the sheet metal spring 103 when the finger piece is depressed. The other end 104 of said spring 103 is secured to one of the depending sides 44 of the snuffer member whereby no movement of the snuffer member nor of the abrading wheel occurs by reason of the initial downward movement of the finger piece 36, said initial movement instead flexing the spring 103 into the dash-dot line position thereof shown in Fig. 1.

When, however, the pin 100 has rotated the bell-crank lever 97 sufficiently to remove the pawl 96 thereof from the ratchet wheel 95, then the spring 103 becomes effective, in its tendency to resume its normal position, to rotate the snuffer member 42 about its pivot 45 since the end 104 of the spring moves toward the end 102 thereof and thereby rotates the snuffer member in a clockwise direction. Rotation of the snuffer member in turn causes movement of the pin 90 carried thereby and of the pawl 91, said pawl in turn rotating the ratchet wheel 92 and causing rotation of the abrading wheel 26 secured thereto whereby sparks are produced and the wick 39 ignited. Release of the finger piece 36 permits said spring 103 to resume its normal position under the influence of the spring 47, whereby the snuffer member 42 is rotated into its initial position, shown in Fig. 1, by the part 46.

It will be understood that as is customary in the art, the casing 20 is stuffed with suitable absorbent stuffing 105. Fuel may be inserted into the casing through the opening normally closed by the filling screw 106 in the bottom of the casing 21.

However, I have shown a means which makes it comparatively easy to fill the casing with fuel and to impregnate the stuffing 105. Said means comprises the fuel container 107 of comparatively soft material such as tin, lead, aluminum or the like which is provided with a threaded neck 108 adapted to be screwed into the internal threads 109 of the screw 106 before said screw is inserted into the fuel inlet opening 110. The screw 106 being threaded on to the neck 108 of the container while said neck is uppermost to form a leak-proof joint therebetween, the container and the screw are together screwed into the threads of the opening 110 into the position shown in Fig. 1. A pin as 111 carried by the finger piece 36 and passing through the spring 47 is provided with a pointed piercing end 113 adapted to penetrate the top 114 of the container when the finger piece 36 is depressed. The container is thereby pierced and permits the liquid, paste or fuel pellets contained therein to evaporate through the opening thus formed and to penetrate and impregnate the stuffing 105 and the wick 39.

It will be understood that when the container 107 is empty of fuel, it may readily be removed by removing the screw 106 which carries the container with it, and substituting a new filled container in the manner hereinbefore described.

In that form of my invention shown in Fig. 3, for the spring 103 is substituted the spring 120 secured at one end 121 to the finger piece 122 and at its other free end 123 engaging the bevelled end 124 of the snuffer member 125. The remaining parts of the lighter are substantially identical with those disclosed in Figs. 1, 2 and 6 excepting that the spring 47 is supported by the spring stop 126 provided with the upstanding portion 127 entering but of less length than that of the spring 47. The spring bending pin 101 is also omitted.

It will be seen that in this form of my invention, on the initial part of the downward movement of the finger piece 122, the spring 120 is bent to assume the dash-dot line position shown in Fig. 3 until the pin 100 moves the bell-crank lever 97 a sufficient distance to release the pawl 96 from the ratchet wheel with which it is in engagement. Thereafter, the spring 120 is released and acting on the surface 124 of the snuffer member, causes rotation of said snuffer member about its pivot 45 and thereby causes rotation of the abrading wheel 26 and ignition of the wick in substantially the manner hereinbefore described in connection with Figs. 1, 2 and 6. On the release and consequent upward movement of the finger piece, the spring 120 engages the projection 128 of the snuffer member and rotates said member into its normal or initial position.

Referring to that form of my invention shown in Fig. 4, the lever 130, secured to the snuffer shaft 45, is interposed between the pin 101 and the spring 131. Said spring 131 is secured at one end thereof to a projection as 132 on the snuffer member 133, the other end of said spring engaging the arm 134 of the lever 130. The other arm of said lever 130 is engaged by the pin 101.

In this form of my invention, it will be seen that on the depression of the finger piece 36 and the consequent downward movement of the pin 101, the lever 130 is rotated in a clockwise direction as viewed in Fig. 4 to initially compress the spring 131, it being understood that at the same time, the pin 100 rotates the bell-crank lever 97 to release the ratchet wheel 95. The final part of the downward movement of the finger piece and after said ratchet wheel has been released, permits the spring 131 to expand. The lever 130 being held in its rotated position by the pin 101, said spring in its expansion causes rotation of the snuffer member 135 in a clockwise direction to uncap the wick and to cause rotation of the abrading wheel 26 through the pawl 91 and ratchet wheel 92.

In that form of my invention shown in Fig. 5, the pin 101 engages the end 140 of the member 141. Said member 141 is pivoted on the shaft 45 and carries the pawl 142 pivoted thereto as at 143, said pawl engaging the ratchet wheel 92 which operates the abrading 26. Between the end 140 and the remainder of the member 141 is the integral flexible spring-like part 144.

It will be understood that when the finger piece 36 is depressed, during the initial part of its movement the pin 101 engages the end 140 of the spring part 144, thereby bending said part into dash-dot line position shown in Fig. 5. Simultaneously, the pin 100 rotates the bell-crank lever 97 into the abrading wheel releasing position. On the final part of the movement of the finger piece 36, the part 144, in its tendency to assume its initial position, rotates the snuffer member 42 and at the same time operates the pawl 142 to rotate the ratchet wheel 92 and to cause rotation of the abrading wheel 26 to ignite the wick.

A suitable spring as 145 acts upon the pawl 142 to maintain said pawl yieldably in engagement with the ratchet wheel 92, said pawl yielding and failing to operate said ratchet wheel on the return movement of the snuffer member 42 to its initial or snuffing position under the action of the extension 46, which return movement occurs on the release of the finger piece.

While I have shown and described various preferred embodiments of my invention, I do not wish to be understood as limiting myself thereto but intend to claim my invention as broadly as may be permitted by the state of the prior art and the terms of the appended claims.

I claim:

1. In a lighter, a casing provided with upstanding projections, a snuffer member pivotally mounted between the projections, a finger piece, means on the finger piece for engaging the snuffer member to urge said snuffer member into wick snuffing position, an abrading wheel, a spring member interposed between the finger piece and the snuffer member, means for connecting the spring member to the snuffer member, a pin secured at one end to the finger piece and having a free end arranged to engage the spring member for stressing the spring member on the depression of the finger piece, means including a second pin projecting from the finger piece, a bell-crank lever pivoted to the casing and terminating in a pawl and having an arm provided with a free end arranged in the path of the second pin, and a ratchet wheel mounted coaxially with the abrading wheel and normally engaged by the pawl for maintaining the snuffer member in its initial wick snuffing position during the initial part of the depression of the finger piece, said last-mentioned means being operated by the finger piece for releasing the same during the latter part of the depression of the finger piece to permit release of the spring member and thereby to rotate the snuffer member, and means for rotating the abrading wheel on the rotation of the snuffer including a second ratchet wheel mounted coaxially with the abrading wheel and a second pawl carried by the snuffer and engaging said second ratchet wheel.

2. In a lighter mechanism, a pivotally mounted snuffer member, a depressible finger piece, the top surfaces of the finger piece and snuffer member being coplanar in the normal positions thereof, a projection on the finger piece engaging the snuffer member, a spring urging said projection against the snuffer member to maintain said snuffer member in snuffing position, a sheet metal spring member fixed at one end and free at the other for operating the snuffer member, a pin on the finger piece having a free end for engaging and stressing said spring, means for normally preventing the spring when stressed from operating the snuffer member including a pivotally mounted bell-crank pawl having a free arm and a ratchet wheel engaged by the pawl, and a second pin on the finger piece for engaging the free arm of the bell-crank pawl and for releasing said pawl from the ratchet wheel during the latter part of the movement of the finger piece whereby the snuffer member is operated by the stressed spring and spark-producing mechanism operated on the movement of the snuffer member out of its normal position.

3. In a lighter mechanism, the combination with a fuel container of an abrading wheel rotatably mounted over the top of said container, a block of pyrophoric material yieldingly supported against said wheel, a wick extending into said container, a snuffer for said wick, a finger piece adapted to be moved in a rectilinear direction and located in the corner of said fuel container, said snuffer and said finger piece normally presenting a flat top on the lighter, means formed on said finger piece and container for guiding said finger piece in a straight line path, a ratchet wheel associated with said abrading wheel, a lever pivoted on the same axis as the snuffer, a ratchet rack in operative engagement with said ratchet wheel arranged to rotate the wheel in one direction only and pivoted at one end to the lever, the other end of the rack normally engaging the snuffer, spring means forming part of the lever and arranged in the path of the finger piece to be stressed thereby, latch means in said lighter mechanism to normally retain said snuffer in position to cover the wick and means responsive to movement of said finger piece for disconnecting said latch to operate the wheel and the snuffer after a certain movement of the finger piece has taken place.

4. In a lighter mechanism, the combination with a fuel container of an abrading wheel, means mounting a block of pyrophoric material against said wheel, a wick extending into said container, a snuffer for said wick, a finger piece adapted to be moved in a straight line path to control the actuation of said snuffer, said container having a wall mounting all the parts hereinbefore mentioned, said finger piece being located at a corner of said container, means associated with the container for guiding said finger piece in its movement, said snuffer and finger piece normally forming a flat top on the lighter, means connecting said finger piece and said snuffer including a spring tensioned on operative movement of the finger piece, and releasable latch means biased for holding the snuffer to be pressed against the wick, said latch means including a bell-crank lever pivoted to the container intermediate its ends and having an arm provided with ratchet teeth and a second arm in the path of the finger piece, said snuffer being adapted to be moved upwardly upon the rectilinear manual movement of said finger piece against the action of said spring to actuate the abrading wheel.

5. In a lighter construction in combination, a fuel container having a wick exposed therefrom, a lever member carrying a snuffer cap pivotally mounted to said fuel container for movement of said snuffer cap into and out of wick covering position, a rotatable sparking wheel mounted adjacent said wick and having a pyrophoric element operatively related thereto, a finger piece member adapted to be actuated to move in a straight line path slidably mounted on the top part of said fuel container, a sheet metal spring interposed between said members, one end of said spring being secured to one of said members, the other end of the spring being free to move and bendable out of its normal position and through a predetermined angle relatively to said one end, said spring being arranged to be tensioned upon the rectilinear movement of said finger piece member in one direction, latch means for holding said lever member against movement in wick uncovering position, means associated with the finger piece member for tripping said latch means after said finger piece member has tensioned said spring to a certain extent and means responsive to the movement of the finger piece member to rotate said wheel for producing pyrophoric sparks to light the wick.

6. In a lighter mechanism, the combination with a fuel container, an abrading wheel, means

mounting a block of pyrophoric material against said wheel, a wick extending into said fuel container, a snuffer for said wick, a finger piece adapted to be moved in a straight line path to actuate said snuffer, said container having extensions mounting all said parts, means connecting said finger piece and said snuffer including a bendable sheet metal spring and latch means biased to hold the snuffer against the wick and including a bell-crank lever pivoted to the container intermediate its ends and having a first pawl arm and a second arm having a free end in the path of the finger piece, said snuffer being adapted to be moved upwardly upon the rectilinear manual movement of said finger piece against the action of said spring to actuate the abrading wheel.

7. In a lighter mechanism the combination with a fuel container of an abrading wheel rotatably mounted over the top of said container, a shaft for the wheel, a block of pyrophoric material yieldingly supported against said wheel, a wick extending into said fuel container, a snuffer for said wick, a finger piece adapted to be moved in a straight line path to actuate the snuffer, a ratchet wheel associated with said abrading wheel, a ratchet rack in operative movement with said ratchet wheel arranged to rotate said wheel in one direction only, spring means connecting said finger piece and said snuffer, latch means in said lighter mechanism to normally retain said snuffer in said position to cover the wick, said latch means comprising a bell-crank lever, a plurality of ratchet teeth at one end of the lever and a ratchet wheel loosely arranged on the shaft and connected to the abrading wheel and means responsive to movement of said finger piece in a rectilinear path for disconnecting the ratchet teeth from the ratchet wheel of said latch means to operate the wheel after a certain movement of the finger piece has taken place.

8. In a lighter mechanism, the combination with a fuel container having an elongated top wall, a wick projecting from said wall adjacent one end thereof, an abrading wheel revolubly mounted above said wall, a block of pyrophoric material in contact with said wheel, a snuffer for said wick pivotally mounted over the top wall of said container, a finger piece slidably mounted over the top wall of the fuel container and adapted to be moved in a straight line path, a spring connection between said finger piece and the abrading wheel, a latch normally preventing rotation of said wheel, and tripping means operated by the rectilinear movement of the finger piece and including pins projecting from the finger piece to release the latch when said finger piece is moved to a certain position to allow the wheel to be rotated by said spring means, said latch comprising a bell-crank lever pivotally mounted intermediate its ends and having one arm provided with a pawl and having a second arm terminating in a free end arranged in the path of one of said pins, and a ratchet wheel mounted coaxially of the abrading wheel and normally engaged by the pawl.

9. In a lighter mechanism, the combination with a fuel container of an abrading wheel, means mounting a block of pyrophoric material against said wheel, a wick extending into said container, a snuffer for said wick, a finger piece adapted to be moved in a straight line path to control the actuation of said snuffer, said container having a wall mounting all the parts hereinbefore mentioned, said finger piece being located at a corner of said container, means associated with the container for guiding said finger piece in its movement, said snuffer and finger piece normally forming a flat top on the lighter, means connecting said finger piece and said snuffer including a spring tensioned on operative movement of the finger piece, and releasable latch means biased for holding the snuffer to be pressed against the wick, said latch means including a spring pressed lever fitted to the container intermediate its ends and extending in the path of the rectilinear movement of the finger piece, said lever arranged to lock the snuffer at a point in the rear of the axis of the wheel intermediate the said axis and the finger piece, in a position to cover the wick and a ratchet rack pivotally mounted to the snuffer to rotate the sparking wheel.

10. In a lighter, an abrading wheel, a first ratchet wheel secured to one side of the abrading wheel, a second ratchet wheel secured to the other side of the abrading wheel, a first pawl engaging said first ratchet wheel, a spring-pressed depressible finger piece, a bell-crank lever carrying said second pawl, a pin on the finger piece having a free end arranged to engage the lever to remove the second pawl from its ratchet wheel after a predetermined amount of movement of the finger piece, a snuffer member carrying said first pawl, and a spring for operating said snuffer member to cause operation of said first pawl and movement of the abrading wheel after said second pawl has been released from its ratchet wheel, by said pin, said spring being stressed on the depression of the finger piece, and said spring becoming operative after said second pawl has been released from its ratchet wheel.

11. In a lighter, a casing having a fuel inlet opening, spark producing mechanism on the casing, a spring-pressed depressible finger piece controlling the operation of said mechanism, a fuel container arranged removably in the opening, and a piercing member carried by the finger piece in spaced relation to the container and arranged to engage and piece the container on the depression of the finger piece.

12. In a lighter, a removable liquid receptacle, a reciprocable finger piece, means carried by the finger piece in normal spaced relation to the receptacle to pierce the receptacle on the movement of the finger piece in a given direction and then to move away from the receptacle, means for guiding the finger piece during its movement, and means controlled by the finger piece to operate the lighter.

13. In a lighter, the combination of a fuel container, a wick extending into said container, means to light the wick, a snuffer member for covering the wick, a sealed auxiliary container filled with combustible material and adapted to be removably inserted into said main container and an externally reciprocable finger piece controlling the operation of the snuffer member and the wick lighting means and provided with a piercing element for puncturing said auxiliary container to permit the combustible material to enter into main container.

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