

Feb. 8, 1949.

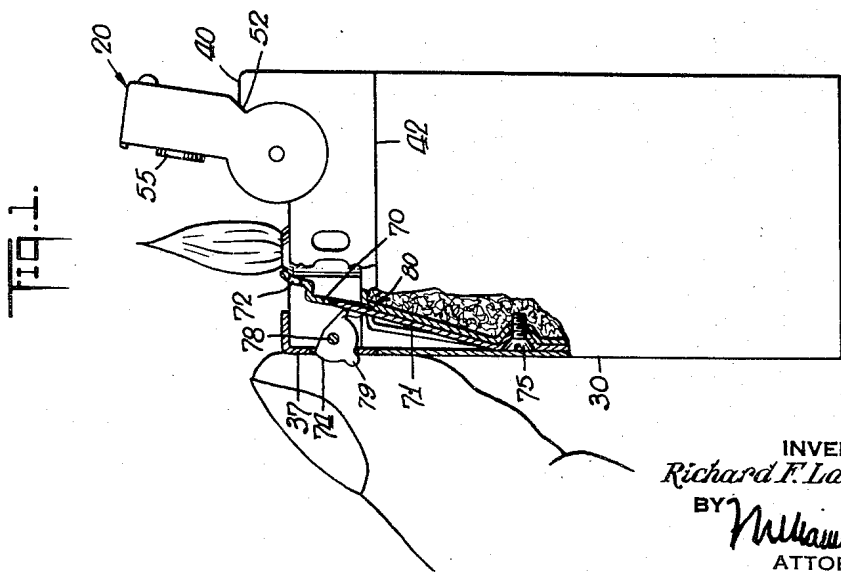
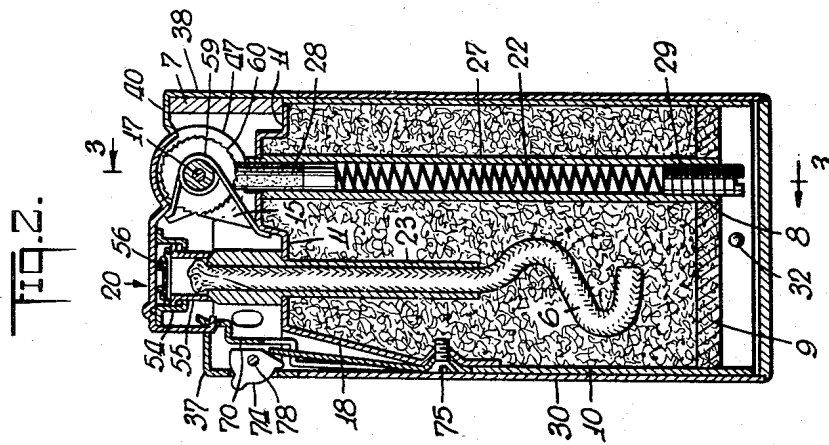
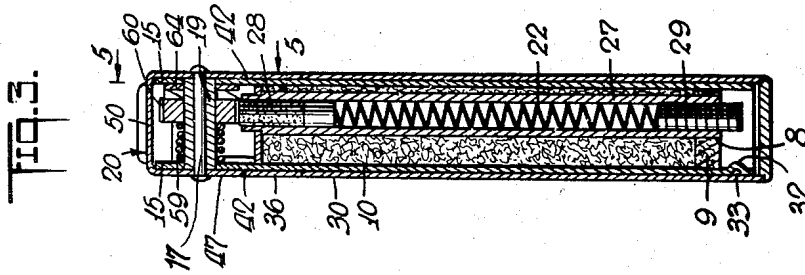
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2,461,330

LIGHTER

Filed Feb. 9, 1946

2 Sheets-Sheet 1



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FIG. 4.

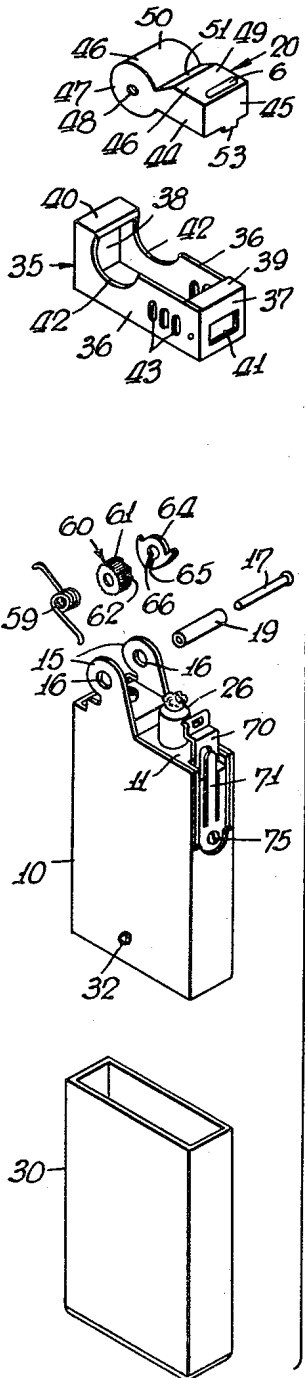
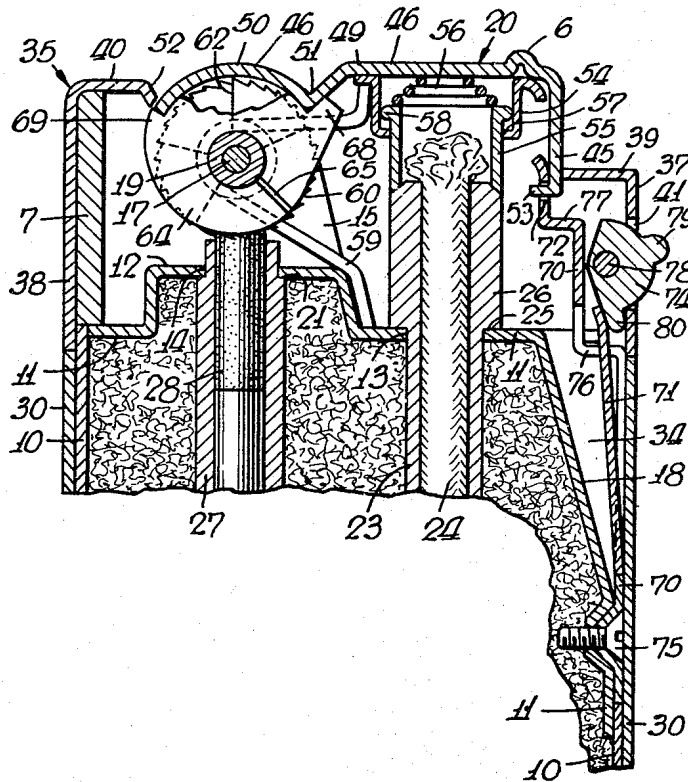


FIG. 5.



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2,461,330

LIGHTER

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Application February 9, 1946, Serial No. 646,549

7 Claims. (Cl. 67-7.1)

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My present invention relates to improvements in lighters adapted for lighting cigars and cigarettes, and aims primarily to provide a novel and advantageous lighter having special features of construction whereby assembly and disassembly of the parts are facilitated and the operation of the device is advantageous in comparison with the operation of lighters heretofore in use.

Another object of the invention is to provide a lighter with a foreshortened cap and associated parts whereby the flame is kept at such a distance from the front wall of the lighter to prevent the flame, ignited by the opening of the cover, from burning the thumb of the user.

Another object of the invention is to provide a lighter with a foreshortened cap mounted to swing about an axis well to the front of the rear wall of the lighter, thus eliminating the possibility of the cover when it snaps open, striking the finger of the user at the rear wall of the lighter.

A further object of the invention is to provide a lighter wherein fuel leaking from the wick will be kept away from the flint and flint-wheel.

Still a further object of the invention is the provision of a safety latch which will not be operated when the lighter is in the pocket of the user, as, for example, by the jarring motion in walking or by any sudden impact or blow.

For the attainment of these objects and such other objects, features and advantages as may hereafter appear or be pointed out, I have illustrated an embodiment of my invention wherein:

Fig. 1 is a side view of the improved lighter, with its cover in open position, the front top portion of the lighter being shown in section;

Fig. 2 is a side sectional elevation through the lighter;

Fig. 3 is a sectional elevation taken on the line 3-3 of Fig. 2;

Fig. 4 shows perspective views of the various parts of the device in disassembled condition; and

Fig. 5 is an enlarged sectional view of the upper part of the lighter, taken substantially on the line 5-5 of Fig. 3.

Referring to the drawings, the lighter comprises a fuel tank 10, preferably of oblong horizontal cross-section. This fuel tank is open at the bottom and closed at the top by a top closure strip 11 having a raised platform 12. Top closure strip 11 is provided with an opening 13 preferably located midway between the sides of the fuel tank and the raised platform 12 is provided with an opening 14. Rearwardly inclined arms 15 extend upwardly from opposite side walls of the fuel tank and have registering or axially aligned

openings 16 to receive a pivot rivet pin 17 and bearing bushing 19 vertically above said opening 14.

Top closure strip 11 has a downwardly sloped portion 18 at the front wall of the fuel tank to provide a tapered depression in which is received part of a leaf spring locking latch 70 for a cover or snuffer cap 20. The front wall of fuel tank 10 terminates at a point short of its top; the top closure strip 11 is secured at this point inwardly of the front wall, its sloped portion 18 closing the upper front of the tank as well as its top. The lower end of said latch 70 is secured by screw 75 to the closure strip 11 at the lower end of said depression. Spring latch 70, out of which is tongued an auxiliary spring 71 (subsequently explained), extends above the top closure 11 of the fuel tank and has an opening 72 at its distal end in which is received an inwardly turned lip 53 of cap 20. Spring latch 70 is moved inwardly by a pivoted button 74, to free its distal end from locking engagement with the cap.

A wick tube 23 having a wick 24 therein is dropped through opening 13 in top closure strip 11 to seat a shoulder 25 at the lower end of an enlarged head 26, on the upper surface of top strip 11. A flint tube 27 is closed at the bottom by screw threaded closure member 29, and the flint 28 is elevated in the tube by spring 22 into engagement with the flint wheel as will shortly be pointed out. The diameter of flint tube 27 is reduced at its upper end to provide a shoulder 21 which underlies the elevated platform 12 of top closure strip 11; the reduced upper end of flint tube 27 is force-fitted in an aperture 14 in top closure strip 11. Due to the higher level of the elevated platform 12, fuel escaping from the wick will not reach the top of the flint tube or the flint wheel above the same.

The lower part of fuel tank 10 fits closely in the open top of an outer casing 30 closed at its bottom and of somewhat less height than the fuel tank. The outer casing is provided with a small projection 33 punched inwardly which snaps into a depression 32 punched inwardly in the fuel tank, the projection being received in the depression when the outer casing and fuel tank are fully assembled, as in Fig. 3. The lower open end of the fuel tank has a piece of felt 9 which is held in place by frictional fit against the walls of the fuel tank; it is provided with a hole 8 through which the lower end of flint tube 27 extends, for access in replenishing the flint. Felt piece 9 serves to cover the cotton wadding occupying the space within the fuel tank which would otherwise

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be exposed when the outer casing is removed. To refill the lighter with fuel, the outer casing is removed and the fluid poured into the inverted fuel tank until felt piece 9 becomes saturated. The fuel tank 10 when snugly nested in the outer casing will extend above the upper edge thereof. Telescoped on the upper part of the fuel tank 10 is an intermediate casing 35, which is a hollow shell of oblong cross-section, open at the top as well as at the bottom and of approximately the same internal and external width and length in cross-section as the outer casing 30 and is seated on the top edge thereof. Said intermediate casing thus forms a continuation or extension of the outer casing 30. The top closure strip 11 has a pair of ears 34 at each edge of its sloped portion 18, which are downwardly tapered and present vertical edges which abut the outer casing 30.

Said intermediate casing 35 comprises sides 36, front and rear walls 37 and 38 respectively, a bridge piece 39 across the top at the front and a bridge piece 40 across the top at the rear and at a higher level or elevation. In the front wall 37 there is an opening 41 through which a portion of the pivoted button 74 extends. At their rear portions the sides or side walls have curved top edge portions 42 in the forms of circular arcs about an axis substantially the same as that of openings 16 in arms 15 of the fuel tank 10. At their front ends said sides 36 are provided for ventilation purposes with openings 43 preferably in the form of vertical slots.

Above the intermediate casing 35 is the cover proper 20 comprising side walls 44, front wall 45 and top wall 46. The rear portions of said side walls 44 are bounded by edges 47 in the form of circular arcs concentric with central openings 48 in said rear portions of the side walls, and the two openings are in axial alignment with each other. The radii of said circular arc edges 47 are equal and substantially the same as the radii of the curved top edge portions 42 of the intermediate casing 35. The top wall 46 comprises a front portion 49 which may be flat and a rear portion 50 curved to the same radius as the outer edges 47 of the rear portion of said side walls.

The two top wall portions 49 and 50 are separated by a depression 51 of V-shaped cross-section. When the cover 20 is closed, the rear edge of the curved rear portion 50 of the cover is just inside the edge of the downwardly inclined forward edge portion 52 of the bridge piece 40 of the intermediate casing 35. The lower edge of the front wall 45 of the cover 20 when the latter is closed, is located just below the rear edge of the front bridge piece 39 of intermediate casing 35. At the lower edge of the front wall 45 of the cover is provided an inwardly turned lip 53 which is received in the hole 72 at the distal end of leaf spring latch 70 to lock the cover or cap in closed position.

For foreshortening the cap, the intermediate casing 35 is provided as a separate member. This simplifies manufacture and assembly of the parts and also incorporates the following features: The curvature of the top edge portions 42 of the intermediate member and the corresponding curvature of the rear portions of the side walls 44 of the cover closes the casing at the sides for all positions of the cap. The cooperation of the correspondingly curved rear portion 50 of the top of the cap with the inner edge of the bridge piece 40 closes the top of the casing at the rear in all positions of the cap. Such cooperating curva-

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tures therefore keep the upper parts of the casing closed at the sides and back.

The top wall 46 of cover 20 is provided with an elongated protuberance 6 at its front edge which prevents the finger of the user from slipping off the cover in turning it to closed position.

Inside the front part of the cover 20 is a snuffer comprising a tubular member 54 with an outwardly turned flange at its upper end secured to the top wall portion 49 of the cover at its underside, and a second tubular member 55 slidably mounted in member 54 and pressed downwardly by a spiral spring 56 to surround the upper end of the wick 24 and engage the head 26 of the wick tube 23, thus extinguishing the wick.

The guiding of tube 55 may be attained by passing the tube 55 through a corresponding opening provided by an internal flange 57 at the lower part of tubular member 54 and an external flange 58 projecting outwardly from the tubular member 55 above the flange 57. The tubular member 55 is placed in the member 54 from above and is urged downwardly by said spiral spring 56 which is interposed between said front top wall portion 49 and said flange 58 and serves to bring flange 58 to rest against flange 57. Such contact will exist when the cover is open. As the cover is moved to closed position the snuffer tube moves into engagement with head 26 of the wick tube and during the final closing movement of the cover said spring 56 is compressed. The engaging surface at the top of wick tube 23 and the bottom of tube 55 are shown as inclined to increase the effectiveness of the snuffing action.

The completed lighter includes a number of devices mounted on the pivot pin 17 between the arms 15 projecting from the top of the feed tank 10. One of these devices is a centrally looped helical spring 59 surrounding the pivot pin 17, one end of the spring extending forwardly below said pivot pin to engage a fixed part such as the forward edge of one of the arms 15 and the other end extending forwardly above the pivot pin and engaging the cover from below. The arrangement is such that closing the cover stresses the spring and upon unlatching the cover, the spring will act to open the same.

Also mounted on pivot pin 17 is a flint wheel 60 which has a knurled or roughened cylindrical surface 61. The end face of the flint wheel remote from the spring has teeth 62 cut therein. Mounted on said pivot pin 17 between said teeth 62 and the adjacent arm 15 is a metal washer 64 which is radially split at 65 and is bent toward said teeth 62 at one side of said slit to provide an actuating edge or tooth 66 to engage teeth 62. Washer 64 has a radius such that it can be snugly received within the arcuate rear portion 50 of the cover, and is provided with a pair of shoulders 68 and 69. The shoulder 68 abuts the under side of the V-shaped depression 51 and the shoulder 69 abuts the rear edge of said curved top wall portion 50, whereby the washer 64 will be constrained to turn with the cover so that opening of the cover will turn the flint wheel 60.

An important feature of the invention resides in the ease of assembly and of disassembly. The fuel tank 10 with the wick tube 23 and the flint tube 27 placed therein constitute a sub-assembly on which the outer casing 30 and the intermediate casing 35 are assembled to form a casing assembly. An oblong block 7 is positioned adjacent the rear wall 38 of the intermediate casing 35 in underlying relation to bridge-piece 40 and rests on the top of the fuel tank to furnish addi-

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tional support to the intermediate casing. The cover 20 may be placed on the intermediate casing 35 in its open or raised position with the arcuate edges 47 of the rear ends of said side walls 44 seated on the arcuate edge portions 42 of the sides of the intermediate casing 35, and with the rounded ends of the arms 15 of the fuel tank seated within the rounded rear portion of the cover, in contact with the arcuate portion 50 thereof.

The bearing bushing 19 is inserted through the hole 16 of an arm 15 of the fuel tank, through the pawl washer 64, through the flint wheel 60, the loop of spring 59, and through the hole 16 of the other arm; as best seen in Fig. 3, the ends of bushing 19 are flush with the outer surfaces of the arms 15, 15 and abut the side walls 44 of the cover. Then the pivot rivet pin 17 is inserted through the hole 48 at one side wall of the cover, through bearing bushing 19 and extended through the hole 48 at the other side wall of the cover, where it is riveted in place. In the final assembly one end of the spring 59 extends forwardly over said pivot pin 17 and engages the top wall 46 of the cover from below, and the other end of the spring extends forwardly beneath the pivot and engages a fixed part, preferably the left arm 15 of the fuel tank by means of its off-turned end.

Upon completion of the assembly as just described, the cover 20 may be pressed down to closed position where it will be held by spring latch 70, in the distal hole 72 of which will be caught the lip 53 provided at the lower edge of the front wall 45 of the cover. During this movement of the cover, the spring 59 is compressed along the pivot pin 17 to permit the tooth 66 on the washer 64 to ride over a tooth 62 on the flint wheel 60, the spring acting at the same time as a braking connection between the left end of said flint wheel and the left arm 15 to prevent movement thereof with downward movement of the top.

Also during the downward movement of the cover 20, the tubular member 55 of the snuffer moves down over the end of wick 24 until it engages the head 26 of the wick tube 23, further downward movement of the cover causing tubular member 54 to move downwardly over member 55 against the urgency of spring 56. In this way the wick, if lighted, will be extinguished.

Downward turning of pivoted button 74 effects release of the spring latch 70, and the spring 59 throws the cover up until the forward wall of the V-shaped depression 51 strikes the inclined forward part of rear bridge piece 40, which serves as a limit stop. During this upward swing of the cover the washer or actuating member 64 moves with the cover and its actuating edge or tooth 66 at one side of the slit 65 engages one of the teeth 62 and throws or advances the flint wheel 60 one step to strike the flint 28, thus producing one or more sparks to light or ignite the exposed end of the wick 24.

An important feature of the invention is the provision of a safety latch which will not release the cap of the lighter when in the pocket of the user, as, for example, by the jarring motion in walking or by any sudden impact or blow. For this purpose, an auxiliary spring 71 is tongued out of the main spring latch 70, and the main spring 70 is provided with an inwardly directed offset 76 (whereas the auxiliary spring 71 is straight throughout its length). As clearly shown in Figs. 5 and 4, offset 76 is at a point in that portion of main spring 70 having the opening caused by

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tonguing out auxiliary spring 71. (Main spring 70 has a second offset 77 which disposes the distal end of latch 70 to the rear of front face 45 of the cover, so that lip 53 may be received in latch opening 72.) Button 74, which is pivotally mounted at 78, has a protuberance 79 which extends beyond opening 41 of the intermediate casing 35, and a second protuberance 80 within the intermediate casing. In the closed position of the cover, as shown in Fig. 5, auxiliary spring 71 maintains protuberance 80 abutting against the front wall of the casing and button 74 turned to present its finger protuberance 79 in its upper position. To release the cover, finger protuberance 79 is pushed downwardly, causing protuberance 80 to be turned inwardly. During the initial stage of this movement, protuberance 80 merely moves auxiliary spring 71 towards the offset portion of main spring 70. Further downward movement of the finger protuberance is required before protuberance 80 contacts the main spring 70 and moves it rearwardly to release the cap, as shown in Fig. 1. It will be noted from this figure that finger protuberance 79 strikes the front wall 37 to limit further turning of pivoted button 74. Any sudden impact or jarring imparted to finger protuberance 79 will merely result in an idle turning of button as auxiliary spring 71 is moved toward the main spring. Continued steady pressure is required to be applied to the finger protuberance, to cause protuberance 80 to contact main spring 70 and move it to unlatching position.

What I claim as new and desire to secure by Letters Patent, is:

1. In a lighter, a casing, a cover spring-urged to open position and provided with a locking element, a main spring cooperative with the said locking element to maintain the cover closed, and manipulative means engageable with the said spring but normally spaced therefrom, and an auxiliary spring constantly in engagement with the said manipulative means for maintaining the same in its normal position spaced from the said main spring, whereby momentary impact upon the said manipulative means will cause only initial movement thereof against the resistance of said auxiliary spring, continued pressure on said manipulative means being required to cause the same to engage the main spring and release the cover.

2. In a lighter, the combination of a prismatic fuel tank; a casing disposed on top thereof and having a rear bridge-piece and a somewhat lower front bridge-piece, the top edges of the casing side walls adjacent said front bridge-piece being substantially level therewith and the top edges thereof adjacent said rear bridge-piece being arcuate; a cover, the side walls of which have radially-curved rear portions and front portions defined by parallel edges and terminating in a front wall, said radially-curved rear portions being received in said arcuately formed top edges of the casing side walls and with the lower edges of said front portions of the cover side walls in abutting relation to the said substantially level top edges of the casing side walls, and with said front wall of the cover substantially at the rear edge of said front bridge-piece; a pair of parallel ears extending upwardly from the sides of the fuel tank at said arcuate casing edges for pivoting the cover about an axis disposed centrally of said arcuate portions and of said radially-curved rear portions of the cover; said front portion of the cover being closed by a flat top substantially at

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the level of said rear bridge-piece, and said radially-curved rear portions thereof being closed at the top and rear by a part cylindrical surface.

3. The lighter according to claim 2 of the type having a flint wheel rotatively mounted on a pin at said axis and a flint tube vertically disposed therebeneath, wherein said part cylindrical rear portion of the cover terminates, when the cover is in open position, to the rear of said flint tube, said terminus of the part cylindrical portion being below the forward edge of said rear bridge-piece when the cover is in closed position.

4. The lighter according to claim 3 wherein the said flat top and the part cylindrical portion of the cover meet at a V-shaped groove, the forward edge of said rear bridge-piece being received in said groove when the cover is turned to open position, whereby said cover makes an opening angle of greater than 90°.

5. In a lighter, the combination of a prismatic fuel tank having a front recess extending a predetermined distance downwardly, a casing disposed on top of said fuel tank having a front bridge-piece across the top thereof, a cover pivotally mounted on said casing and terminating in a front wall at the rear edge of said bridge-piece, spring means urging the cover to open position, a flat spring anchored at the lower end of said recess with its distal end pressing forwardly against said rear edge of the bridge-piece, said distal end of the spring being apertured and having a rearward camber, said front wall of the cover having a rearwardly directed tongue engageable with said camber of the spring to shift the spring rearwardly and enter its said aperture to hold the cover in closed position, and manipulative means for releasing said flat spring to open the cover.

6. In a lighter, the combination of a casing having a front opening, a cover pivotally mounted on said casing and implemented with a spring urging the cover to open position, a flat spring anchored in said casing with its distal end engageable with said cover to lock it in closed position, said flat spring having an auxiliary spring tongued thereout, the main spring being offset in the region of the upper portion of its said auxiliary spring to present a rearwardly spaced surface, a finger-piece, having a front and a rear projection, pivotally mounted in the casing with

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its said front projection accessible in said front opening, the upper distal end of said auxiliary spring pressing against said rear projection to turn the finger-piece in a direction spacing its rear projection from said rearwardly spaced surface of the main spring, whereby initial pressure on said front projection will turn said finger-piece in the opposite direction a predetermined angle before its said rear projection engages the said rearwardly spaced surface of the main spring, continued pressure on the front projection causing the main spring to flex and release the cover.

7. In a lighter, the combination of a casing, a cover pivotally mounted on said casing and implemented with a spring urging the cover to open position, a flat spring anchored in said casing with its distal end engageable with said cover to lock it in closed position, said flat spring having an auxiliary spring tongued thereout, the main spring being offset in the region of the upper portion of its said auxiliary spring to present a rearwardly spaced surface, a finger-piece pivotally mounted in the casing, the upper distal end of said auxiliary spring pressing against said finger-piece to turn it in a direction spaced from said rearwardly spaced surface of the main spring, whereby initial pressure on said finger-piece will turn it in the opposite direction a predetermined angle before it engages the said rearwardly spaced surface of the main spring, continued pressure on the finger-piece causing the main spring to flex and release the cover.

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