

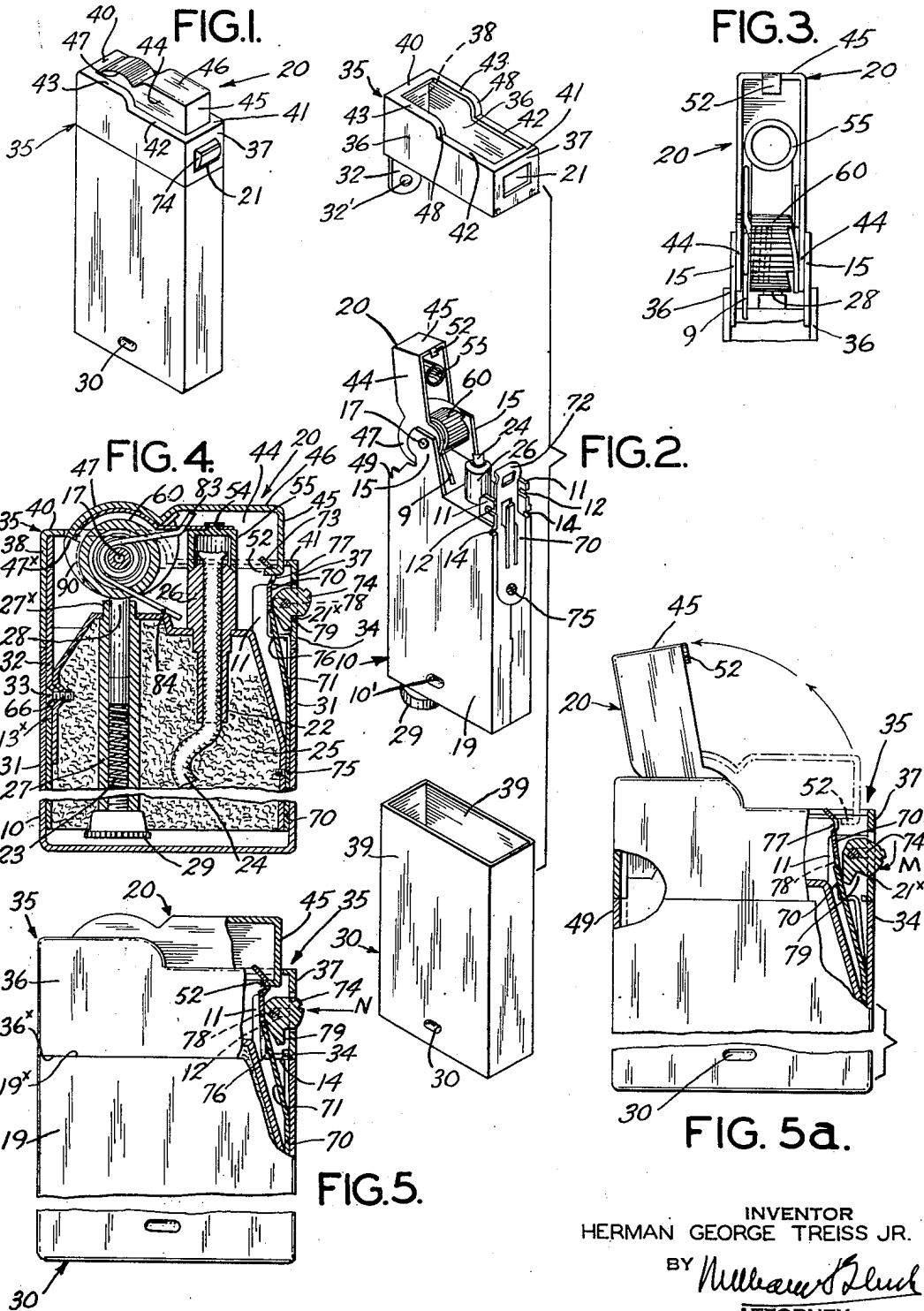
Dec. 8, 1953

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CIGARETTE LIGHTER

2,661,617

Filed June 21, 1949

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

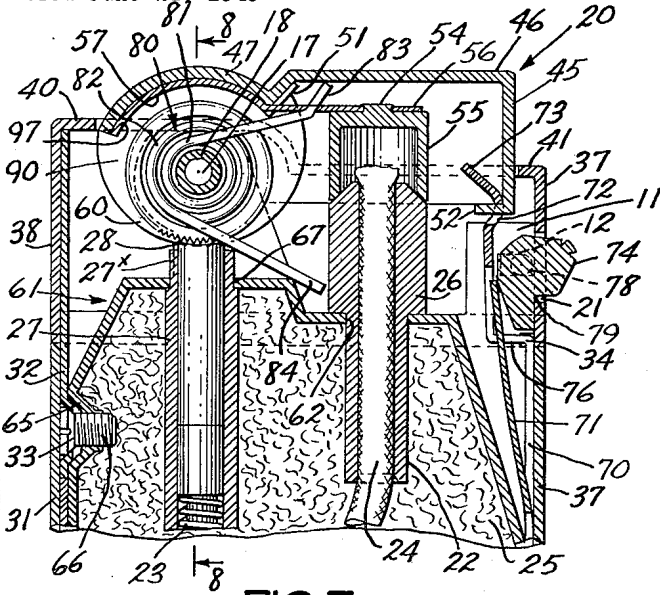


FIG. 7.

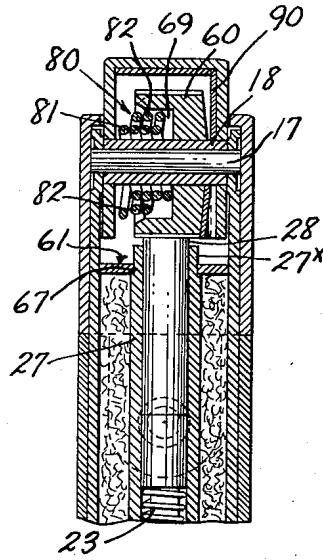


FIG. 8.

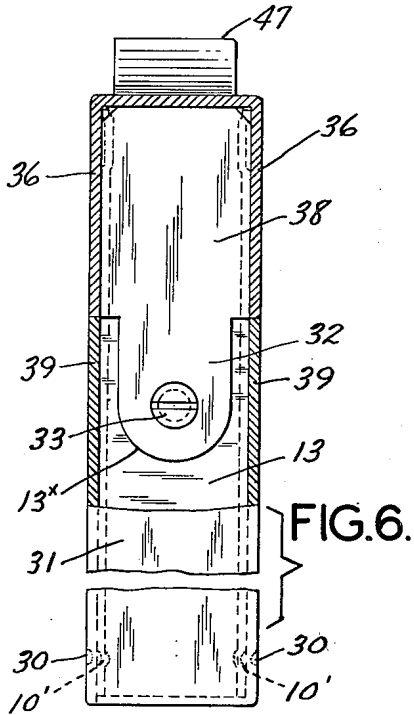


FIG. 6.

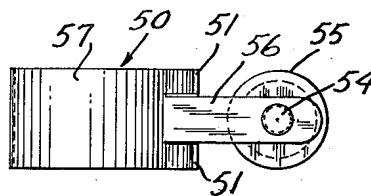


FIG. 9.

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CIGARETTE LIGHTER

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8 Claims. (Cl. 67—7.1)

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This invention relates to cigarette lighters and, more particularly, of the type having a "foreshortened" cap as described in the Landwehr Patents 2,461,329 and 2,461,330. As there explained, the chief objects of a "foreshortened cap" lighter are, on the one hand, to keep the flame at a sufficient distance from the front wall to prevent it, ignited by the opening of the cover, from burning the thumb of the user. On the other hand, the "foreshortened" cap is mounted to swing about an axis well to the front of the rear wall, thus eliminating the possibility of the cap when it snaps open, striking the finger of the user at the rear wall of the lighter.

In the aforesaid patents the rear portions of the side walls of the foreshortened cap are bounded by edges in the form of circular arcs concentric with the pivot axis of the cap; the cap is associated with an intermediate casing, the side walls of which have parallel cut-outs in the form of circular arcs corresponding to the said circular arcs of the cap, which is snugly received therein. One of the objects of this invention is to provide a lighter of the type described in which the intermediate casing is not provided with cut-outs to receive the circular-arc rear portion of the cap. Instead, in the improved lighter of this invention, the side walls of the cap are disposed interiorly within the side walls of the intermediate casing. Some of the advantages of this improved arrangement are that the fabrication of the intermediate casing is simplified; there is no need of close tolerance as in the prior construction in which the cap side walls had to fit precisely in the wall cut-outs of the intermediate casing.

In the aforementioned prior lighter, the lower edges of the side walls of the cap abut the upper edges of the side walls of the intermediate casing, which edges thus serve as a stop limiting the closing position of the cap. In the improved arrangement of the instant lighter (as briefly described above), the side walls of the cap are disposed interiorly of the side walls of the intermediate casing, so that said casing walls are no longer abutment stops for the cap. This aspect relates to another important object of the invention, namely, an improved wick-tube sealing arrangement, and how this is achieved in the instant invention will be fully explained in the ensuing description thereof.

The aforesaid disposition of the side walls of the cap interiorly of the side walls of the intermediate casing relates to another aspect of this invention, namely, the additional object which

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is to center the flint wheel upon its spindle. How this is achieved will also be fully explained hereinafter.

In the aforesaid prior art lighter in which the side walls of the cap are coplanar with the side walls of the intermediate casing, the pin on which the cap is pivoted is exposed at both ends. In the improved lighter, on the other hand, wherein the side walls of the cap are disposed inwardly of the supporting ears and the latter, in turn, are disposed inwardly of the side walls of the intermediate casing, the ends of the pivot pin are not exposed, being hidden by the said side walls of the intermediate casing.

Another object of the invention is to provide an improved safety latch for the cap.

For the attainment of the foregoing and such other objects of the invention as may appear or be pointed out herein, I have shown a preferred embodiment of my invention on the accompanying drawing, wherein:

Fig. 1 is a perspective view of the improved lighter;

Fig. 2, likewise in perspective, shows the lighter in "exploded view" with the intermediate casing in overlying relation to the main lighter part, and with the outer casing, in underlying relation;

Fig. 3 is an end view of the top portion of the lighter, with the cap in open position;

Fig. 4 is an elevational sectional view of the lighter, with the cap in closed position;

Fig. 5 is a front view of the lighter, with the cap in closed position, the outer wall at the cap latch being broken away to reveal the operation of the latch when subjected to pressure normal to the lighter wall;

Fig. 5a is a view similar to Fig. 5 but showing the cap opened as a result of the proper manipulation of the latch;

Fig. 6 is an end view (enlarged) of the lighter, from the rear, with the upper portion of the casing broken away;

Fig. 7 is an elevational section (on an enlarged scale) through the upper portion of the improved lighter;

Fig. 8 is a section taken on the line 8—8 of Fig. 7; and

Fig. 9 is a plan view of the snuffer-cap spring.

The aforementioned cap—also referred to as the "snuffer cap"—is designated 20 and comprises side walls 44, front wall 45 and top wall 46. The rear portions of said side walls 44 have edges 47 in the form of circular arcs concentric with the pivot pin 17 of the cap. The aforementioned

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intermediate casing is designated 35 and comprises side walls 36, a front wall 37 and a rear wall 38. The transverse dimension of the cap 20 (i. e., across its front wall 45) is considerably less than the inside transverse width of the intermediate casing 35 (i. e., across its front and rear walls 37, 38) so that the cap will be received interiorly of the intermediate casing. More particularly, the transverse width of the cap is sufficiently smaller than the inside width of the intermediate casing to provide space for a pair of supporting ears 15 which project upwardly from the side walls 19, 19 of fuel tank 10.

It will be observed from Fig. 2 that the ears 15, 15 are integral with the side walls 19, 19 of fuel tank 10 so that absolutely flush sides are presented. The fuel tank 10 (and its associated parts, see Fig. 2) is set into the outer casing 30, the side walls 19, 19 of the fuel tank in sliding engagement within the side walls 39, 39 of outer casing 30. The intermediate casing 35 is then set over the upper portion of the fuel tank, the side walls 36, 36 of the intermediate casing in sliding engagement with the upstanding ears 15, 15 and sides 19, 19 (at least, the upper portions) of fuel tank 10. In the home position of the outer casing 30 and intermediate casing 35, see Fig. 5, the lower edge 36^x of the side walls 36 of the intermediate casing 35 is in abutment with the upper edge 19^x of the side walls 39 of outer casing 30. Similarly, the rear wall 38 abuts the rear wall 31 of outer casing 30, see Fig. 4, while the front wall 37 abuts 31 in a similar manner.

The top edges of the intermediate casing 35 are stepped, Figs. 1 and 2, to present a raised rear portion 43 and a lowered front portion 42, the step being arcuate as indicated at 43. The object of lowering the front portion of intermediate casing 35 is to assure a "freer flame," by providing clearance at this point, as will be subsequently seen, where the wick projects upwardly.

The intermediate casing 35 is secured to the fuel tank 10 by the following means: a short lug 32 depends from the rear wall 38 of intermediate casing 35, being secured interiorly thereto, as by welding, see Figs. 4, 6 and 7. A small aperture 32', Fig. 2, is provided at the distal end of lug 32, for a small screw 33, Figs. 4, 6 and 7, which screws into a tapped hole 66 provided in the rear portion of a tank enclosure member, designated generally 61, see Fig. 7. As shown in said figure, said rear portion of enclosure member 61 is provided with a countersunk boss 65 which provides a thickened wall for the threads and a countersunk recess for the flat head of screw 33. As shown in Fig. 6, the rear wall 13 of tank 13 has an arcuate recess 13^x in which said depending lug 32 is received, so that a flush surface is present, see Fig. 7, to receive the outer casing, i. e., its rear wall 31.

To prevent the front of intermediate casing 35 from tilting despite the foregoing securement at its rear, the following means are employed: A pair of very small notches 14, 14, see Fig. 2, are provided at the front edge of the fuel tank near its upper end; and a pair of projections 34, 34, see Figs. 5, 5a and 7, are provided at the lower edge of the front wall 37 of intermediate casing 35 and interiorly thereof. To associate the intermediate casing with the fuel tank, the pair of projections 34, 34 of the intermediate casing are inserted in the notches 14, 14 of the fuel tank, with the intermediate casing in cocked or tilted position. The intermediate casing is then turned, with 14, 34 as a pivot, downwardly, with its depending lug

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32 being received in the said recess 13^x of the rear wall of the fuel tank; the screw 33 is then applied to lock the intermediate casing in position.

The side walls 19, 19 of the fuel tank are notched at their upper rear corners, see Fig. 2, where the corner notch in view is designated 49; the rear wall 38 of the intermediate casing is received in said pair of corner notches 49, 49.

It is understood that the outer casing 30 is held associated with fuel tank 10 by the frictional engagement of their respective wall surfaces, so that the outer casing 30 may be pulled off to expose the open bottom of the fuel tank to get at the cap screw 29, Fig. 4, which closes the flint tube 27, and to add fuel to be absorbed by cotton 25, and to get at the wick 24.

Flint tube 27 opens at the top of the fuel tank, where flint 28 extends into contact with flint wheel 60, being pressed upwardly by compression spring 23. As best shown in Fig. 7 the top portion of said tank enclosure member 61 is provided with an aperture 67 wherethrough the upper reduced end (27^x) of flint tube 27 protrudes. As briefly indicated in the objects of the invention, one of these is to locate the flint wheel 60 centrally of the lighter, that is, at the center of pivot pin 17. This has not been possible in prior constructions, as for example in the aforesaid Landwehr patents (see Fig. 4 of No. 2,461,329), from which it will be seen that the flint 28, although itself disposed centrally, engages to one side of the flint wheel 60, because the latter is not disposed centrally. This, the cause of uneven wear of the flint wheel and unequal pressures at the two bearings or ends of pivot pin 17, is remedied in the improved lighter in the following manner: In the first place, by reason of the fact that the side walls 44, 44 of the cap 20 are now inside of, or interiorly of, the fuel tank ears 15, 15, see especially Fig. 3, while the latter are, in turn, interiorly of the side walls 36, 36 of intermediate casing 35, the inside dimension between cap walls 44, 44 is considerably less than in the prior construction (wherein the side walls of the cap are coplanar with the side walls of the intermediate casing). This reduction in interior dimension of the cap helps to center the flint wheel transversely thereof. In the second place, the flint wheel 60 in the improved lighter is shell-shaped, see Fig. 8, to provide a cavity 69 for reception of a coil spring, now to be described.

Thirdly, this centering is further made possible by employing spring 80 which has two layers or convolutions—see Fig. 8, inner convolutions 81 and outer convolutions 82, both convolutions being partially received in the said end cavity 69 of the flint wheel. The spring wire is wound, in two convolutions, as described, about the pivot pin 17, or rather, a bushing 18 which encircles pivot pin 17. The wire is continuous, in that the last convolution of the inner layer 81 connects with the last convolution of the outer layer 82; the other ends beyond the wheel cavity (69) extend as shown in Fig. 7; the end of the inner convolution or layer (81) is designated 83 and extends upwardly, with its distal end in underlying relation to the top wall 46 of the cap or cover 20; the end of the outer layer or convolution (82) is designated 84 and extends downwardly, with its distal portion abutting the tank closure member 61.

The top edges of the side walls 36, 36, of intermediate casing 35 is flanged inwardly at 42 and

43 to bring the inner edges of the flanges in adjacency to the side walls 44, 44 of cap 20. The top edge of the front and rear walls 37, 38 of the intermediate casing is also flanged inwardly at 40 (rear) and 41 (front) to bring the inner edge of flanges 41 and 40 in adjacency to the front wall 45 of cap 20, and to the rear arcuate top wall 47, see Fig. 4.

Referring to Fig. 7, the top portion of tank enclosure member 61 is provided with an aperture 62 wherethrough the wick tube 22 extends, the enlarged head 26 of which rests on the member 61. The flame at the exposed tip of the wick is extinguished by a snuffer cup 55 which has a snug fit with the top beveled end of wick tube head 26, as best shown in Fig. 7. The purpose of this snug fit is to seal the open end of the wick tube to prevent evaporation of the volatile fuel therein. To assure this sealing fit of the snuffer 55 with wick head 26, the snuffer 55 is articulated at the distal end of a spring strip finger 56, as by a rivet 54; the riveted securement is a loose one so that snuffer 55 has an extent of free movement so that the snuffer may adjust itself in seating on the tapered top end of wick head 26. It is understood that when the cap 20 is closed and snuffer 55 engaged with wick head 26, the spring finger 56 will be placed under tension so as to provide sealing pressure at the joint between 55 and 26.

Strip spring finger 56 is an integral part of strip spring 50, see especially Fig. 9, which has a wider arcuate portion 57, see also Fig. 7. As shown in the latter figure, arcuate portion 57 is snug against the underside of the arcuate roof portion of cap 20. The strip spring 50 is not secured to the snuffer cap 20, nor to any other part, being held in position by assemblage. That is, the part 50 is held in assembled position by the pawl disc 90. The latter is apertured for the pivot pin 17 and its bushing 18 and has an arcuate recess 97 in which both the arcuate roof portion 47 of the cap and the arcuate portion 57 of the spring 50 (Fig. 9) are received. In this manner, the spring 50 is held securely between pawl disc 90 and the underside of cap 20. Strip spring 50 further has a pair of upturned ears 51, 51 which fit in underlying relation with the cover 20, see Fig. 7.

The significance of the circumstance that the stopping abutment between the edges of the side walls of the intermediate casing 35 and the cap 20—present in the aforesaid Landwehr lighter—have been eliminated, as particularized in the statement of invention hereof, may now be explained: In the aforesaid prior art lighter, the snuffer cap is positively stopped by abutment of the lower edges of its side walls with the top edges of the side walls of the intermediate casing; hence, in the prior art lighter, the cap will be positively stopped at such edges, rather than at the seal joint between the snuffer and the wick head. In the improved lighter, on the other hand, by reason of the entire elimination of the other stop, the closing movement of the cap is positively stopped at the wick head, so that a more effective seal is assured.

The aforesaid spring wire 80, Figs. 2 and 3, tends to turn cap 20, on its pivot pin 17, in opening direction which movement is stopped by abutment of the rear edge 47^x, see Fig. 4, of the top arcuate roof 47 of cap 20, with the exposed top end 27^x of the flint tube 27. This opening urgency is normally restrained by the latch means which includes a main spring 70, which

is secured to the front wall of the fuel tank (more particularly, to the front portion of tank closure member 61) by a screw 75 at its lower end, Figs. 2, 4 and an auxiliary spring 71 which is tongued out of the main spring. Main spring 70 is provided with an inwardly directed offset 76, whereas auxiliary spring 71 is straight throughout its length. As clearly shown in Fig. 7, offset 76 is at a point in that portion of main spring 70 having the opening resulting by tonguing out the auxiliary spring therefrom. Main spring 70 has an aperture 72 at its upper, distal end in which is received and latched, an inwardly-directed tab 52 at the lower edge of front wall 45 of the cap 20.

In the closed position of the cap, as in Figs. 4 and 7, tab 52 is received in aperture 72 of the main spring 70 and thus latched down, against the opening urgency of spring 80. The latch is released by the proper manipulation (as will be explained) of a button 74. This button is a discrete part and is held in proper position by the intermediate casing 35, in the following manner: Button 74 has a short pin 78, 78 projecting laterally from its both ends, which pins are nestled in a pair of parallel notches 12, 12 provided in a pair of parallel ears 11, 11 uprising from the top of fuel tank 10, at its both sides, see especially Fig. 2. The front wall 37 of the intermediate casing 30 is provided with a window 21 wherethrough a portion of button 74 protrudes. The button 74 is provided at its lower portion with a rabbet or square-cornered notch 79. The parts just described are assembled in the following manner: the button 74 is positioned with its two lateral pins 78, 78 received in notches 12, 12 and with its squared recess 79 facing outwardly and disposed below the pins. The intermediate casing 35 is then slipped into place (as fully described above) with the manipulative portion of button 74 protruding through window 21 of the intermediate casing.

The latching means just described is, in effect, a safety latch in that the cap will be operated (and the wick ignited) only by the proper manipulation thereof. That is, the improved latching means is designed so that it will not release by normal pressure against front wall of the lighter. This aspect is important because the improved lighter cannot be opened (and ignited) by accidental pressure against button 74, as when in one's pocket. What happens to the improved latching means when normal pressure is brought to bear against its button is shown in Fig. 5. In the normal, closed position of the cap, as shown in Fig. 4, the squared notch or rabbet 79 of button 74 is disposed at the lower edge 21^x of window 21 of the intermediate casing and is maintained in close adjacency therewith by the distal end of auxiliary spring 71. Now if a normal pressure, such as represented by the arrow "N," Fig. 5, bears against button 74, the latter will move, translationally, rearwardly against the auxiliary spring 71, see Fig. 5, but such translational movement of button 74 is insufficient to move the main spring rearwardly (to release tab 52). But if the button is additionally given a downward (rotational) movement, as represented by the curved arrow "M" in Fig. 5a, not only does it move translationally rearwardly—as it did in Fig. 5—but it also is rotated through a limited angle by the downward manipulative force applied to it. This rotational movement of button 74 causes the lower end of the button

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to move the main spring 79, as in Fig. 5a, sufficiently to release cap tab 52.

To summarize the operation of the latch; the adjacency to the edge 21x of window 21 of the transverse shoulder of latch notch 79 precludes the release of the cover by accidental pressure of either a downward or a rotational character. This shoulder must first clear edge 21x. This it can do only by an inward initial movement of the latch to free it for rotation. The latch releasing movement is then completed only by rotation to cause its cam 79 to move the cover locking spring to cover releasing position.

It will be observed, best from Fig. 7, that the upper distal end of main spring 79 has a rearwardly-inclined cam surface 73 of considerable size. It will also be seen from this figure that the aperture 72 is considerably larger than the thickness of the tab 52. As a result of both circumstances, the parts need not be made to a precise or close manufacturing tolerance. It will be seen that in closing and re-latching the cover 20, its tab 52 will push main spring 79 rearwardly during a considerable angle of turning, and not at one rigid or predetermined angle; also that there may be a variation in the precise position of aperture 72 without any danger that the parts (52 and 72) will not interact as designed.

The frictional engagement of the outer casing 30 with the fuel tank 10 may be supplemented, if desired, by inter-engagement of the indentations 10' and 30' (see Fig. 2).

The disk 30 has an inwardly directed pawl 90' formed by a cutting and bending operation (see Fig. 3). This pawl is normally in engagement with ratchet teeth formed on the side of the flint wheel. The pawl disk thus serves additionally to rotate the flint wheel when and as the cap is opened.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:

1. In a lighter of the class described, in combination, a fuel tank slidably received in an outer casing, said fuel tank having a pair of apertured ears flush with its side walls, a cap having parallel side walls disposed interiorly of said pair of ears and pivotally mounted thereto by means of a pin supported in the apertures of said ears, an intermediate casing open at top and bottom slidably received on the upper portion of the fuel tank extending above the top edges of said outer casing, said top edges and the bottom edges of the intermediate casing being in abutment, the upper portion of said cap extending through the top opening of the intermediate casing, the front wall of said fuel tank being provided at its upper edge with a notch and the front wall of the intermediate casing being provided at its lower edge with an inwardly-directed projection receivable in the said notch, the rear wall of the intermediate casing having a depending lug received in a recess in the rear wall of the fuel tank and secured thereto after the said reception of the casing projection in the fuel tank notch, the side walls of the intermediate casing covering both ends of the said cap pivot pin.

2. A snuffer holder for use with a cigarette lighter of the type provided with a spring opened pivotal cap having an arcuate portion overlying a flint wheel, a straight portion extending therefrom connected by a V-shaped portion, and a pawl disk for turning the flint wheel operated by opening movement of the cap, the cap, wheel

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and pawl disk being mounted on a common pivot; said snuffer holder comprising, an arcuate portion conformed to fit closely adjacent the concave face of the arcuate portion of the cap in overlying relation to the pawl disk, and a straight resilient portion extending therefrom below the top of the arcuate portion and provided at its distal end with means for securement of a snuffer, said straight resilient portion having a wing on each side adjacent its connection with the arcuate portion, each wing forming a V-shaped connection with said arcuate portion for seating the said V-shaped portion of the cap to cause the snuffer holder to move pivotally with the cap.

3. In a cigarette lighter the combination of, an outer casing having a window, a cap, spring urged toward open position, a yieldable latch disposed within the casing for releasably securing said cap in its closed position, a fulcrumed latch releasing member movably mounted in said casing window, means for restricting movement of the latch releasing member to a rectilinear direction for a predetermined distance, and pivot means on said member for turning the member after said rectilinear movement, to displace the latch and release the cap.

4. In a cigarette lighter the combination of an outer casing having a window, a cap for closing the casing, spring urged to open position, a yieldable latch for releasably securing the cap in closed position, a fulcrumed latch releasing member movably mounted in said casing window, said member being provided with a floating pivot, and means restricting the direction of movement of the releasing member to a rectilinear direction for a distance predetermined by the limit of movement of the floating pivot, whereby the said latch releasing member, to move the latch and release the cap, must first be moved in a rectilinear direction for said predetermined distance and then be turned about the pivot at the limit of the latter motion.

5. In a cigarette lighter, an outer casing having a window, a cap urged toward open position by a spring, a yieldable latch within the casing for releasably securing the cap in closing position, a latch release member mounted upon a fulcrum about which it may have a swinging movement and normally disposed in said casing window, said member being also movable in the window in a rectilinear direction with respect to the fulcrum, and cooperating means on the release member and casing to prevent the swinging movement thereof to release the latch and open the cap until such rectilinear movement of the release member has been effected.

6. In a cigarette lighter, the combination of an outer casing having a window, a cap, spring urged to open position, a yieldable latch for releasably securing the cap in closed position, a latch releasing member movably received in said casing window, a pair of pins extending laterally from each side of the latch releasing member and received in longitudinal recesses extending inwardly of the casing, a rabbeted notch in said member in which the lower edge of the window is received, to prevent pivotal motion of the latch releasing member when in the outermost position of its pins, whereby the latch releasing member must be moved inwardly of the casing along said longitudinal recesses sufficiently to disengage said notch from the casing before it can be turned about its lateral pins to displace the latch and release the cap to its open position.

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7. In a cigarette lighter the combination of an outer casing having a window, a cap for closing the casing, spring urged to open position, a yieldable latch for releasably securing the cap in closed position, a fulcrumed latch releasing member movable in said window, said member comprising, a body having trunnions received in longitudinally extending recesses within the casing, a shoulder engaging the casing adjacent the window and preventing turning of the member, and an eccentric portion for displacing the latch and releasing the cap upon turning of the latch releasing member, after it has been moved in the direction of the longitudinal recesses to disengage the shoulder.

8. In a lighter of the class described, in combination, a main casing, a cap pivotally mounted thereon and spring-urged into open position and provided with an inwardly-directed lug, a main spring secured at its lower end to a wall of the casing and apertured at its upper distal end for latching said cap lug, an auxiliary spring tongued out of the main spring and offset at the upper portion of the auxiliary spring to permit inward movement thereof independently of the main spring, a button disposed in an opening in said wall of the casing and mounted therein for both a translational movement inwardly of the casing also for an angular movement, and cooperating means on the casing and button for restricting

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the button initially to a movement translationally inwardly of the casing and then freeing said button from such restriction for subsequent turning movement thereof through a predetermined angle from a normal position, the distal end of the auxiliary spring returning the button to its said normal position, said inward translational movement moving the auxiliary spring inwardly but being insufficient to so move the main spring, said button turning from normal position being effective to move the auxiliary spring sufficiently to move the main spring and release the cap.

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