

April 17, 1956

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2,741,903

LIGHTER

Filed Dec. 10, 1954

2 Sheets-Sheet 1

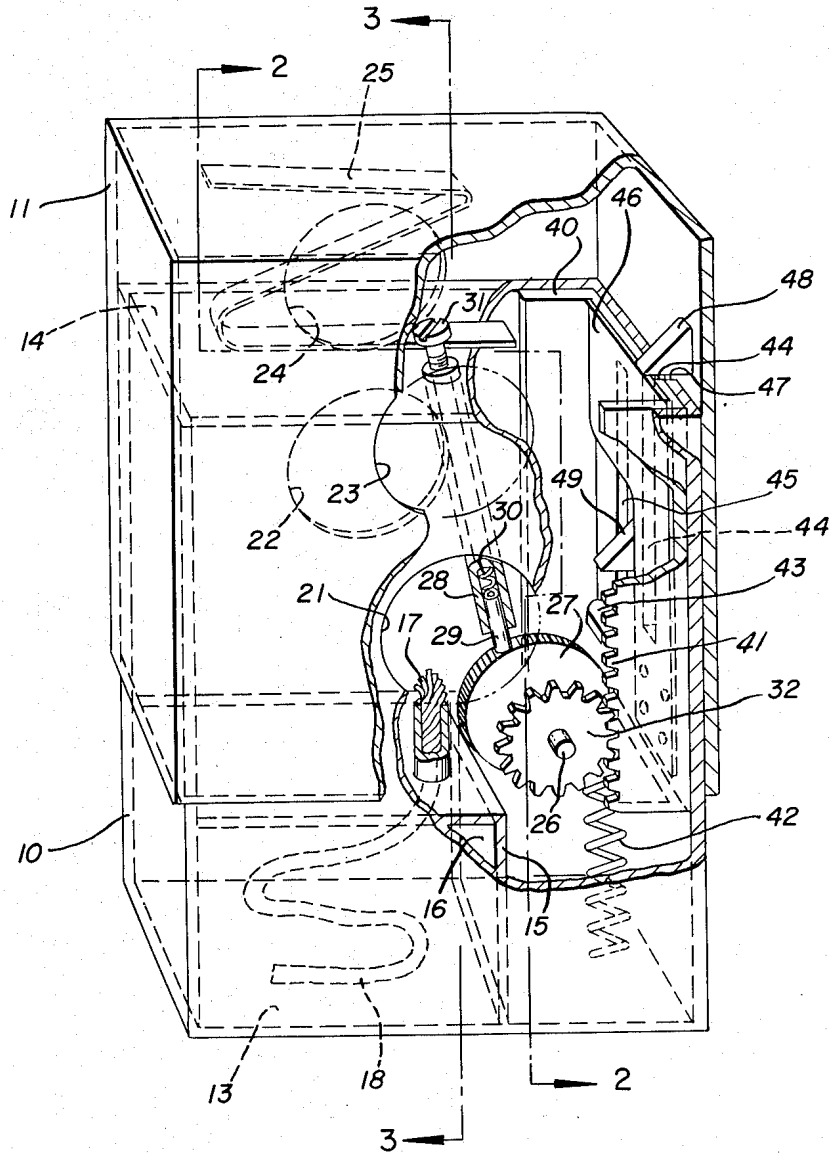


FIG. 1

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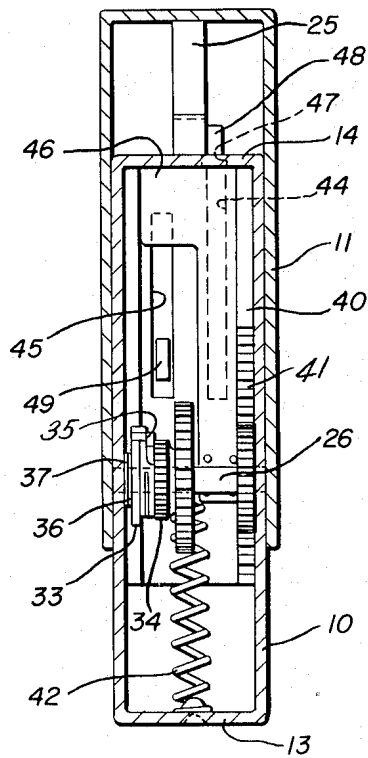


FIG. 2

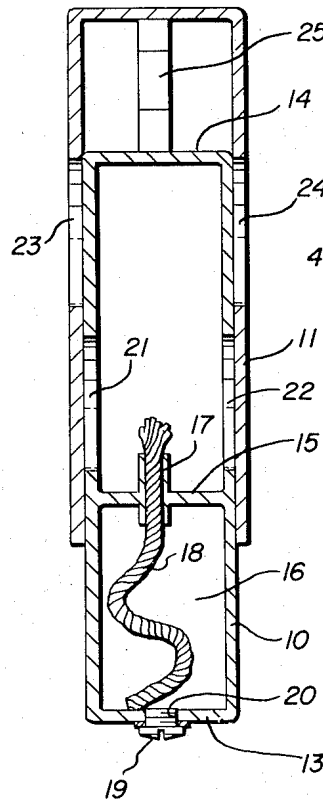


FIG. 3

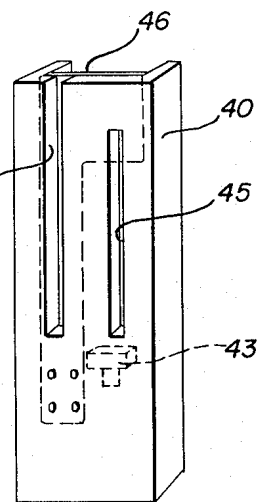


FIG. 4

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Application December 10, 1954, Serial No. 474,467

3 Claims. (Cl. 67—7.1)

This invention relates to lighters of the type in which a wick saturated with an inflammable liquid is ignited by a spark generated by rotation of a rotary wheel having a milled edge in contact with a body of flint or other spark producing material, and is especially useful as a pocket lighter.

While many pocket lighters have been proposed, such lighters as have been placed on the market have had certain faults in that either the inflammable material was subject to evaporation prior to striking of the spark, or the flame blows out in the wind, or the spark striking action is too slow to insure a good shower of sparks.

It is the object of the present invention to avoid the foregoing and other difficulties by providing a quick-acting spark mechanism, by avoiding exposure of the wick for a long period prior to generation of sparks, and to protect the flame adequately from sparks.

These and other objects will appear from the following description and the accompanying drawings.

Of the drawings:

Fig. 1 is a perspective view of the lighter in closed position, parts being broken away and parts shown in section to more clearly show the mechanism;

Fig. 2 is a sectional view thereof, taken on line 2—2 of Fig. 1;

Fig. 3 is a sectional view thereof, taken on line 3—3 of Fig. 1; and

Fig. 4 is a detail perspective view of the rack and its associated leaf spring.

Referring to the drawings, the numeral 10 designates the inner case and the numeral 11 the cover or outer case which are telescopically movable one relative to another vertically of the drawings. The inner case has a closed bottom 13 and a substantially closed top 14. An L-shaped partition 15 is provided in the inner case and defines a rectangular space 16 with the bottom and side walls thereof to contain a supply of inflammable liquid.

A tubular wick support 17 extends through the partition 15 for supporting a wick 18. A closure plug 19 fills a threaded opening 20 leading to the space 16 for filling it.

The inner case has a pair of oppositely aligned openings 21, 22, one at each side of the wick support 17. The outer case has a pair of aligned openings 23, 24 normally offset above the openings 21, 22 respectively but adapted to be aligned therewith to provide an open passage at the wick at the ignition period. The inner and outer cases are normally held in the position illustrated in Figs. 1 to 3 by a leaf spring 25 mounted between them and are slidable one on the other by compression of the spring to align openings 21, 23 and 22, 24.

For igniting the flame at the wick support 17, a shaft 26 is mounted for rotation horizontally of the inner case in bearings provided in its walls. A flint striking wheel 27, having a milled edge, is mounted for free rotation about the shaft and is aligned with a flint guiding tube 28 received in the top wall of the inner case. A flint 29 is guided by the tube and is pressed against the wheel by a coil spring 30 and tension screw 31.

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For rotating the wheel 27, a pinion 32 is fixed to shaft 26 as is also a disc 33 (see Fig. 2). A ratchet wheel 34 is fixed to wheel 27. A pawl 35, for engaging the ratchet wheel, is pivotally mounted on disc 33 and is pressed into engagement therewith by a spring 36. A spring washer 37 is mounted about shaft 26 between the disc 33 and the wall of the case to act as a drag.

According to the invention, it is desirable to provide for striking a spark only after the inner and outer cases have been pressed toward each other and the openings 23, 24 aligned with openings 21, 22. It is also proposed that the spark striking action be accomplished with a snap action. To accomplish this a snap bolt 40, of U-shaped cross section is mounted in the inner case for vertical sliding movement. It has rack teeth 41 formed on one flange thereof for engaging the pinion 32 so that vertical movement thereof downward or toward the bottom of the inner case rotates pinion 32 and shaft 26 but does not rotate wheel 27 because of the ratchet connection. On reverse movement of the snap bolt, the rack rotates the wheel 27. The snap bolt 40 is urged upwardly by a compression coil spring 42 mounted between a shoulder lug 43 on the snap bolt and the bottom wall 13 of the inner case.

For controlling operation of the snap bolt 40, the bolt is formed with a vertical slot therethrough 44 open at its upper end and a second vertical slot 45 closed at both ends. A flat spring 46 of L-shape is mounted within the channel of the snap bolt with its long arm covering the slot 44 and riveted to the snap bolt at the lower end of the arm below the end of the slot 44 and with the short arm of the spring extending across the slot 45 and flush with the upper end of the snap bolt. The spring normally lays flat against the floor of the channel of the snap bolt.

A clearance slot 47 is provided through the wall of the inner case to expose the slot 44. A driving tooth 48 secured to the outer case 11 has a flat lower face and an inclined upper face. In the closed position of the case illustrated, the tooth 48 extends over the slots 44 and 47 which clear it with its flat lower face resting upon the upper edge of the spring 46. A cam lug 49 has an inclined upper face which extends inwardly of the case in the path of the horizontal arm of the spring 46. The arrangement is such that as the outer and inner cases are pressed toward each other the tooth 48 moves the snap bolt downward compressing the coil spring 42. As the cases reach a position where their openings 21, 22, 23 and 24 are aligned, the inclined upper face of the cam lug 49 flexes the horizontal arm of spring 46 inwardly beyond the driving tooth 48. This releases the snap bolt 40 which is then snapped upwardly, rotating the pinion 32 and the flint striking wheel 27 to provide a shower of sparks.

Upon release of pressure of the hand between the inner and outer cases, the upper inclined face of the driving tooth 48 deflects the spring 46 to pass above the horizontal short arm thereof and the spring returns to a position below the flat lower face of the tooth ready for the succeeding operation of the lighter.

In operating the lighter the inner and outer cases thereof are merely pressed toward each other until the side openings expose the wick at which point the snap bolt is released as heretofore described, lighting the wick. The case may then be held in this position until the operator has lit his cigarette, cigar or pipe. The case shields the flame from the wind and the cigarette, cigar or pipe may be held opposite the openings and the flame drawn outwardly of one of the openings by suction of the operator on the cigarette, cigar or pipe. Upon obtaining a light, release of pressure on the case closes it and resets the mechanism.

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Variations may be made without departing from the scope of the invention as it is defined in the following claims.

I claim:

1. A lighter comprising an inner case and an outer case telescopically assembled for movement toward and from each other, said inner case having a compartment for lighter fluid, a wick extending from said compartment, a pinion shaft adjacent thereto, a ratchet driven flint striking wheel driven by said pinion shaft, and a flint engaging said wheel to ignite said wick, said inner and outer cases having opposite side openings normally misaligned and alignable adjacent said wick by telescoping pressure on said inner and outer cases, a snap bolt slidably mounted in said inner case, said bolt having a rack for rotating said pinion shaft, a spring mounted between said inner and outer cases for holding them in extended position, and means on one of said cases for positively engaging and spring loading said snap bolt during a contracting movement of said cases and cooperative means on the other case and said snap bolt including a laterally deflectable spring on said snap bolt and a cam on said case for releasing the snap bolt for snap action when said side openings of the cases become aligned at said wick.

2. A lighter comprising an inner case and an outer case telescopically assembled for movement toward and from each other, said inner case having a compartment for lighter fluid, a wick extending from said compartment, a pinion shaft adjacent thereto, a ratchet driven flint striking wheel driven by said pinion shaft, and a flint engaging said wheel to ignite said wick, said inner and outer cases having opposite side openings normally misaligned and alignable adjacent said wick by telescoping pressure on said inner and outer cases, a snap bolt slidably mounted in said inner case, said bolt having a rack for rotating said pinion shaft, a spring mounted between said inner and outer cases for holding them in extended position, and means on one of said cases for positively engaging and spring loading said snap bolt during a contracting movement of said cases and cooperative means

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on the other case and said snap bolt including a laterally deflectable spring on said snap bolt and a cam on said case for releasing the snap bolt for snap action when said side openings of the cases become aligned at said wick, said means being adapted to reset said snap bolt at the extended position.

3. A lighter comprising an inner case and an outer case telescopically assembled for movement toward and from each other, said inner case having a compartment for lighter fluid, a wick extending from said compartment, a pinion shaft adjacent thereto, a ratchet driven flint striking wheel driven by said pinion shaft, and a flint engaging said wheel to ignite said wick, said inner and outer cases having opposite side openings normally misaligned and alignable adjacent said wick by telescoping pressure on said inner and outer cases, a snap bolt slidably mounted in said inner case, said bolt having a rack for rotating said pinion shaft, a spring mounted between said inner and outer cases for holding them in extended position, and means on said cases for spring loading said snap bolt during a contracting movement of said cases and for releasing the snap bolt for snap action when said side openings of the cases become aligned at said wick, said means being adapted to reset said snap bolt at the extended position, and comprising a flat spring leaf secured to said snap bolt, a driving tooth on said outer case and extending over said spring leaf to force said snap bolt downwardly, a cam member on said inner case in the path of said spring and engageable therewith to release the spring leaf from said driving tooth and permit return of said snap bolt.

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