June 30, 1959 C. C. FUERST 2,892,333

CIGARETTE LIGHTER

Filed Nov. 18, 1957 3 Sheets-Sheet 1

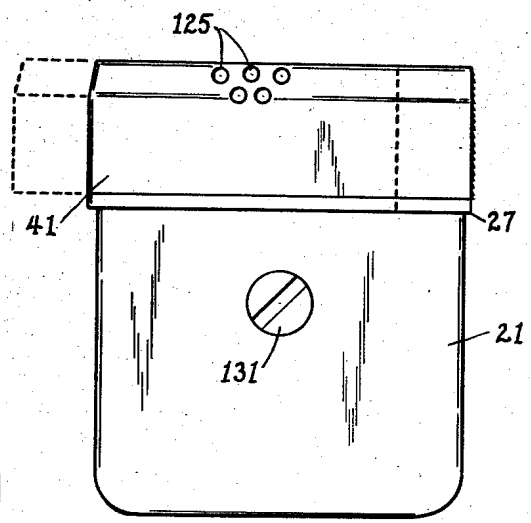

FIG.1

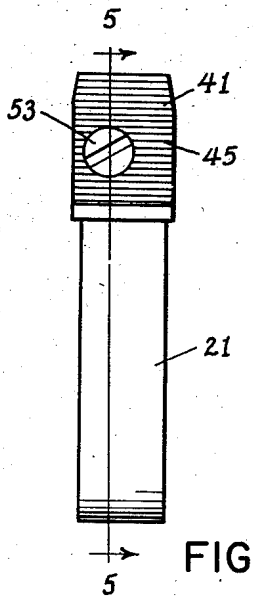

FIG.2

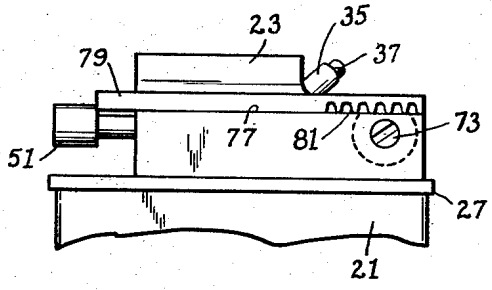

FIG.3

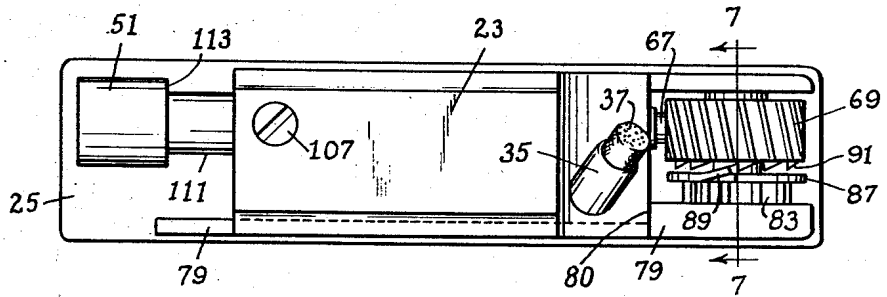

FIG.4

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CIGARETTE LIGHTER

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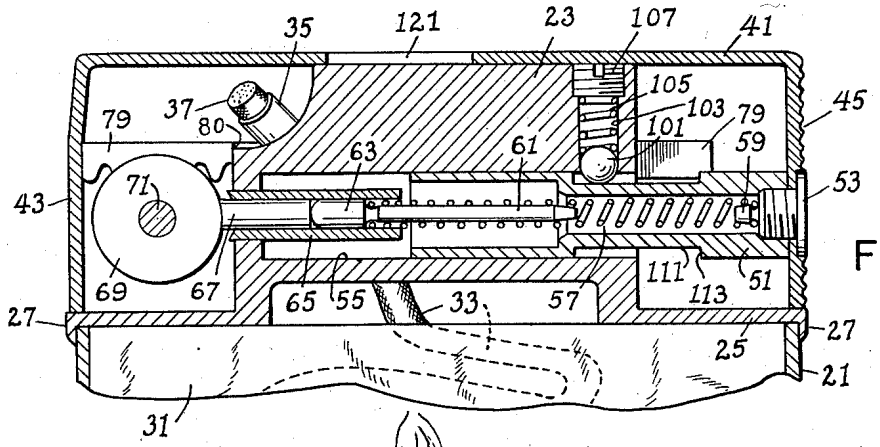

FIG.5

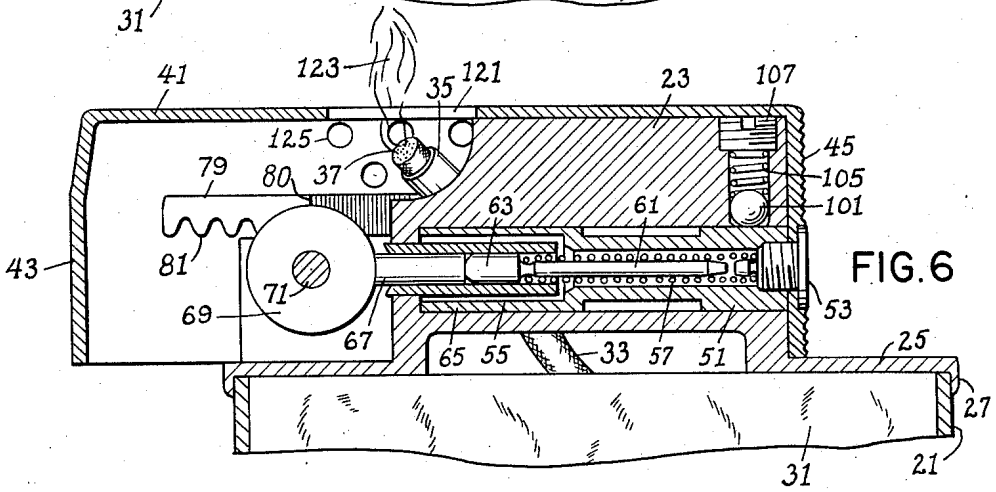

FIG.6

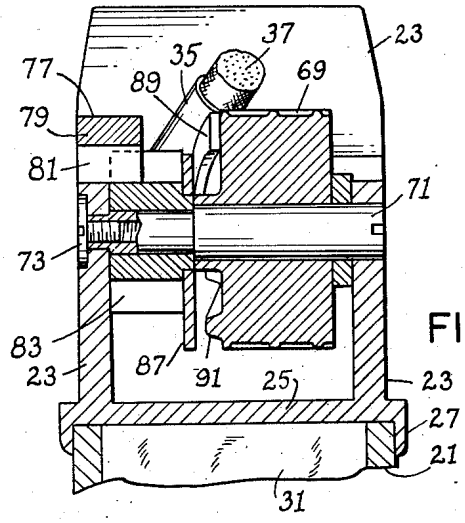

FIG.7

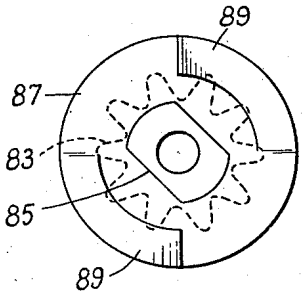

FIG.8

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CIGARETTE LIGHTER

Filed Nov. 18, 1957 3 Sheets-Sheet 3

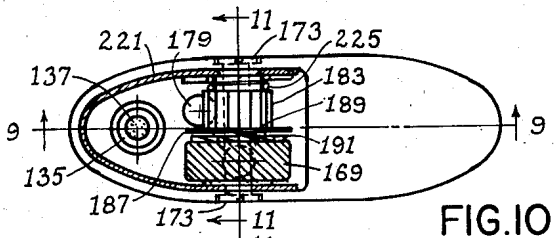

FIG.10

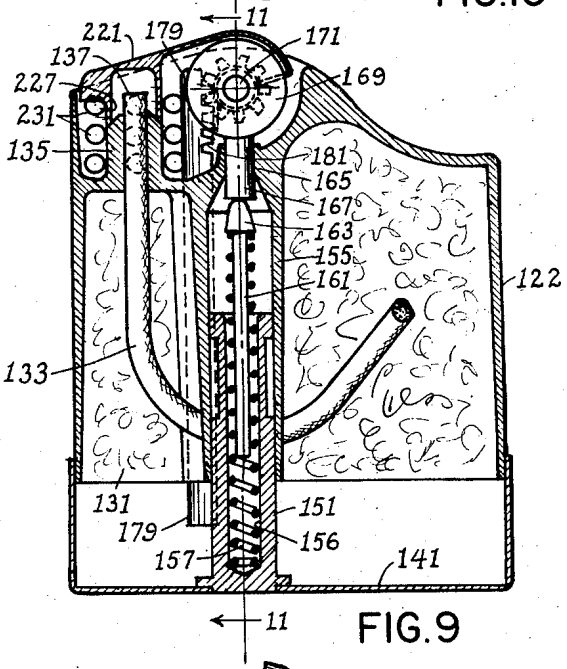

FIG.9

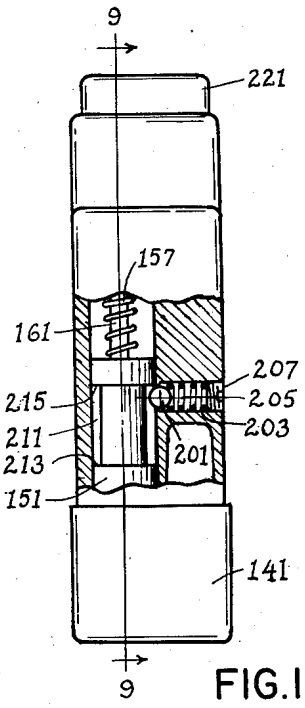

FIG.11

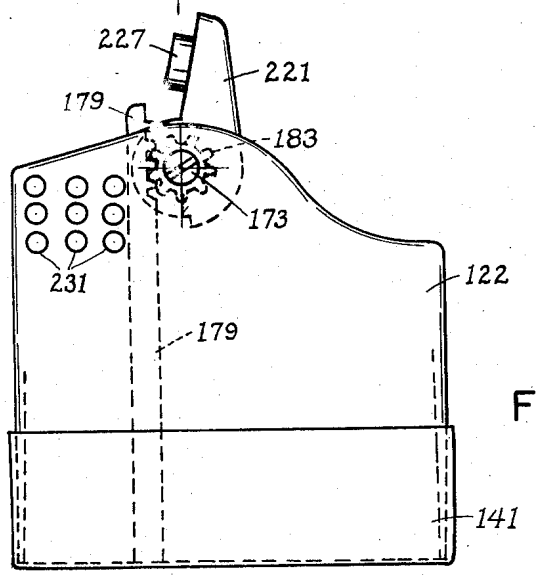

FIG.12

United States Patent Office 2,892,333
Patented June 30, 1959

2,892,333

CIGARETTE LIGHTER

Carl C. Fuerst, Rochester, N.Y.

Application November 18, 1957, Serial No. 696,989

7 Claims. (Cl. 67—7.1)

The present invention relates to what is commonly called a cigarette lighter, although the present construction is capable of efficient use in lighting cigars and pipes as well as cigarettes. The words "cigarette lighter" as hereafter used in this application are intended merely as a convenient general description, without implying any limitation.

An object of the invention is the provision of a generally improved and more satisfactory cigarette lighter.

Another object is the provision of a lighter which will light more reliably and surely, after a given amount of use or wear, than prior lighters.

Still another object is the provision of a lighter so designed as to be easy and comparatively inexpensive to manufacture, and one which is reliable and sturdy in use.

A further object of the invention is the provision of a lighter which, for a given external size, has a greater fuel capacity than conventional lighters of the same general class. A still further object is the provision of a lighter with an improved sparking mechanism having a more positive and reliable sparking action than prior lighters of the same general class.

A still further object is the provision of a lighter in which a single spring serves the double function of pressing the flint against the sparking wheel and restoring the lighter from actuated position to relaxed or rest position.

These and other desirable objects may be attained in the manner disclosed as an illustrative embodiment of the invention in the following description and in the accompanying drawings forming a part hereof, in which:

Fig. 1 is a side elevation of a lighter in accordance with one embodiment of the invention, showing in full lines the position of the parts in normal relaxed position, and in dotted lines the position assumed when the lighter is actuated to produce a light;

Fig. 2 is an edge view or end elevation of the same, viewed from the right hand side of Fig. 1;

Fig. 3 is a fragmentary side elevation of various elements in the upper part of the lighter, with a cover member removed to show the parts within, viewed from the right side of Fig. 2, or the back of Fig. 1;

Fig. 4 is a top plan of the lighter, again with the cover member removed to show the parts beneath, this view being on a larger scale than that of Figs. 1–3;

Fig. 5 is a vertical section taken approximately on the line 5—5 of Fig. 2, with the lower part of the structure broken away, and on the same scale as that of Fig. 4;

Fig. 6 is a view similar to Fig. 5 but with the movable parts displaced from normal relaxed position to the lighter position;

Fig. 7 is a fragmentary vertical section taken approximately on the line 7—7 of Fig. 4, but on a still larger scale;

Fig. 8 is a detail of the ratchet and pinion for the sparking mechanism;

Fig. 9 is a vertical section taken approximately centrally longitudinally through a lighter in accordance with a second embodiment of the invention, showing the parts in normal relaxed position, the section being approximately on the line 9—9 of Fig. 10 and Fig. 11;

Fig. 10 is a view partly in plan and partly in horizontal section of the top portion of the construction shown in Fig. 9;

Fig. 11 is an edge view or end elevation of the construction shown in Fig. 9, with parts broken away and parts in vertical section; and

Fig. 12 is a side elevation of the lighter shown in Fig. 9, with the parts shifted to the lighting position.

The same reference numerals throughout the several views indicate the same parts.

Referring first to the embodiment shown in Figs. 1–8, there is a main body in the form of a hollow sheet metal member 21 of convenient size to be held in the hand of the user, the top of the sheet metal body being permanently closed by a casting 23, preferably a die casting of brass or the like, having at its bottom a horizontally extending flange 25 with down-turned marginal flanges 27 embracing the top edges of the sheet metal body 21 and soldered tightly thereto.

The body 21 contains a loose filling 31 of absorbent material, such as cotton, in which material the wick 33 winds around in an irregular manner. The wick 33 extends obliquely upwardly through a suitable cavity or opening in the casting 23, and projects out through a small wick tube or sleeve 35 set obliquely in the casting 23 and having, for example, a soldered connection therewith, the end of the wick projecting a slight distance from the end of the wick tube or sleeve 35, as shown at 37. The angular position of the wick, as shown, enables the end 37 of the wick to be placed very close to the periphery of the sparking wheel described below, in position to receive and be ignited by even a faint spark, without being in the way of the moving parts and without danger of damaging or clogging the moving parts either from soot or from the heat of the flame, which rises upwardly away from the sparking wheel.

The casting 23, the wick 33, and the wick sleeve 35 are stationary relative to the body 21. Slidably mounted on the casting 23 is a hollow sheet metal cover member indicated in general at 41. This cover member has side walls which fit against the opposite side surfaces of the casting 23 with a snug sliding fit, and end walls 43 and 45 which form stops or abutments limiting the endwise movement of the cover 41, the extreme rightward position of which is shown in Fig. 5 and in full lines in Fig. 1, and the extreme leftward position of which is shown in Fig. 6 and in dotted lines in Fig. 1.

Extending horizontally within the cover 41, in the direction of movement of the cover, is a tube 51 secured to the cover by means of a screw 53 extending through the right hand end wall 45 of the cover and threaded into the right hand end of the tube. The tube has a snug sliding fit in a bore 55 formed in the casting 23, as readily seen in Figs. 5 and 6. The tube is thus guided for longitudinal movement in the bore, and since the tube is firmly secured to the cover 41 by the screw 53, the engagement of this tube in the bore of the casting serves to hold the cover in place on the top of the lighter body, allowing the cover to move longitudinally in the direction of the tube, but preventing it from being displaced upwardly until the screw 53 is removed, whereupon the cover may be lifted upwardly and the entire lighter mechanism disassembled for cleaning or repairs, or for renewal of the wick or flint as may be required from time to time.

Within the tube 51 is a coil spring 57, the right hand end of which (viewed as in Figs. 5 and 6) reacts against the screw 53 and is held in place by a small projection 59

on this screw extending into the last coil or two of the spring. The left hand portion of the spring loosely surrounds and is guided by a guide rod **61** extending rightwardly from a plunger **63**, against a shoulder of which plunger the left end of the spring reacts. Both the member **59** and the plunger **61** are necked down as seen in Figs. 5 and 6, and the end convolutions of the spring **57** are tightly engaged in the annular grooves or necks, so that the members **53**, **57**, **59**, **61**, and **63** are all permanently connected and will all be withdrawn from the lighter as a unit when the screw **53** is removed. The plunger **63** is longitudinally slidable in a flint guide tube **65** suitably fixed to the casting **23**, the plunger pressing leftwardly against the flint **67** so as to press the left end of the flint against the roughened periphery of a sparking wheel **69** which rotates on a shaft **71** secured in spaced side flanges at the left end of the casting **23** and held in place by a retaining screw **73** (Fig. 7) which, when tightened, draws a shoulder near the left end of the shaft **71** up against the inner or right hand face of the left hand side flange of the casting **23**. It will be noted that the left hand portion (Figs. 5 and 6) of the tube **51** has a sufficiently large internal diameter to telescope loosely around the flint guide tube **65** when the parts are moved from the rest position of Fig. 5 to the igniting position of Fig. 6. At the end of this leftward movement, the left end of the tube **51** comes into contact with a fixed part of the casting **23** simultaneously with the end wall **45** of the cover coming into contact with another fixed part of the casting **23**, thus stopping the further leftward movement of the cover.

A guide groove **77** is formed horizontally in one side face of the casting **23** (the left face when viewed as in Fig. 7, the far or rear face when viewed as in Figs. 5 and 6, and the near face when viewed as in Fig. 3) to form a guideway in which the rack bar **79** may freely move longitudinally, parallel to the direction of movement of the cover **41**. This rack bar **79** has rack teeth **81** formed on the under face of the end which is at the right when viewed as in Figs. 3 and 4, and at the left when viewed as in Figs. 5 and 6. These rack teeth mesh with the teeth on a pinion **83** having a hub extending a short distance axially from one side of the pinion, this hub having opposite flat spots **85** (Fig. 8) to make a non-rotary interlocking connection with a plate **87** engaging these flat spots and having a pair of arcuate resilient ears **89** formed integrally with the plate **87** and bent out of the plane of the rest of the plate to form a pair of pawls engaging resiliently with ratchet teeth **91** formed on the adjacent face of the sparking wheel **69**.

The rack bar **79** has no spring, and is not rigidly connected to any other part. It is somewhat shorter than the free space between the end walls **43** and **45** of the cover, and is operated first in one direction and then in the other by contact with these end walls **43** and **45**, but with some lost motion because of its shorter dimension. The purpose of the lost motion connection will be explained below. To insure that the lost motion occurs at the beginning of an operating stroke of the actuating member **41**, the toothed part of the rack bar is wider than the remainder of the length of the bar (see Fig. 4) thus providing a shoulder **80** which engages the fixed casting **23** to limit the return stroke of the rack bar when the actuating member **41** returns to its initial rest position.

One of the features of the sparking mechanism, to help to insure reliable production of a spark, is a retarder which temporarily holds the sparking parts against substantial movement until a substantial degree of manual pressure is built up, and which then releases the parts for a quick or snap-action sparking movement under the influence of the pressure which has been built up. This is accomplished by a retarding ball **101** pressed downwardly against the top of the tube **51** in a vertical bore **103** formed in the casting **23** and intersecting the bore **55**,

downward pressure on the ball being exerted by a coil spring **105** in the bore **103**, the upper end of which reacts against a screw plug **107** at the top of the bore. The lower end of the bore **103** is slightly reduced in diameter to prevent escape of the ball **101** when the tube **51** is withdrawn from the bore **55** during assembly or disassembly. The bottom of the ball **101** engages the top of the tube **51**, in a reduced or necked down portion **111** of this tube when the parts are in normal relaxed position, but during the movement of the parts to lighting position, the ball moves up over the annular shoulder **113** at the right hand end (viewed as in Figs. 5 and 6) of the necked down portion **111**.

It will be seen from Figs. 5 and 6 that the reduced diameter portion **111** has substantial length in an axial direction along the tube **51**. When the parts are in normal position, the ball **101** is near the left end of the reduced diameter portion **111**. To operate the lighter to produce a light, the main body **21** is grasped in the fingers, and the thumb is engaged against the end wall **45** of the cover, to push the cover toward the left, that is, toward the ultimate position shown in Fig. 6. The outer face of the wall **45** may be serrated as shown, to avoid slippage of the thumb.

During the first part of this leftward movement, there is little resistance to the motion of the parts. The leftward movement will compress the spring **57**, increasing the tension or force of this spring and thus pushing the spring with greater force against the plunger **63**, which in turn will push the flint **67** with greater force against the roughened periphery of the sparking wheel **69**. However, no turning of the sparking wheel will occur at this time, because of the gap between the right wall **45** of the cover and the right end of the rack bar **79**, this gap being well seen in Fig. 5.

After the cover has moved through about half of its maximum range of movement, the shoulder **113** will come up against the spring pressed ball **101** and temporarily stop further leftward movement of the cover. At just about this same time, the right hand end wall of the cover **45** will come up against the right hand end of the rack bar **79**. The user then increases his thumb pressure against the cover, in order to overcome the resistance produced by the ball **101** engaging the shoulder **113**.

When the thumb pressure is increased to a substantital extent, it finally overcomes the resistance of the ball **101**, and the shoulder **113** cams the ball **101** upwardly in its bore **103**, against the pressure of the spring **105**. When the ball **101** is cammed up over the shoulder **113**, this suddenly reduces the resistance to leftward movement of the cover, and as the user is already exerting considerable leftward manual pressure on the cover, the cover will now move suddenly and swiftly to the left, with what may be termed a snap action, shoving the rack bar **79** leftwardly with a very swift motion. This will spin the pinion **83** quite rapidly, so that the sparking wheel **69** will similarly be rotated quite rapidly, by the action of the rotating resilient pawl teeth **89** engaging the ratchet wheel **91** on the sparking wheel.

This leftward motion (when viewed as in Figs. 5 and 6) of the cover will cause counterclockwise rotation of the sparking wheel, and the rapidity of the motion (due to the sudden lessening of the resistance to motion, while considerable force is being applied to the cover) will produce sparks from the flint **67** in a very certain and reliable manner, much more surely than if the cover is moved more slowly, as might be the case if no initial resistance were offered. The counterclockwise rotation of the sparking wheel will throw the sparks approximately tangentially upwardly from the flint **67**, to the vicinity of the wick end **37** which lies closely adjacent to the sparking wheel and in the line of travel of the sparks, thus igniting the wick which is, of course, supplied with fuel from the absorbent material **31** in the fuel reservoir **21**.

The leftward motion of the cover **41**, to produce the sparking action, brings a large flame opening **121** in the top of the cover to a position directly over the wick **37**, as seen in Fig. 6, so that the flame may come out through this opening as at **123** and can be used to light a cigarette, cigar, pipe, or any other combustible substance which it is desired to ignite. To support the combustion, air may enter the air holes **125** formed in the opposite side of the cover **21**, in the vicinity of the main flame opening **121**.

When the user is through with the flame, he merely releases the leftward pressure on the end **45** of the cover, whereupon the spring **57** moves the cover back in a rightward direction to its normal rest position shown in Fig. 5. This brings the main flame opening **121** over a solid part of the casting **23**, and the side air openings **125** likewise over a solid part of the casting, cutting off all further flow of air through the openings **121** and **125**, so that the flame is immediately extinguished. The rightward movement of the cover also causes the left end wall **43** thereof to engage the left end of the rack bar **79** and moves the rack bar rightwardly to its initial starting position shown in Fig. 5. The rightward movement of the rack bar turns the pinion **83** in a clockwise direction, but the friction of the flint **67** against the sparking wheel **69** is sufficient to prevent corresponding rotation of the sparking wheel itself, so that the resilient pawl teeth **89** ratchet idly over the ratchet teeth **91** on the sparking wheel. The parts are now ready for another sparking and igniting operation, and the cycle may be repeated as often as desired.

It will be noted that the single spring **57** serves the double function of returning the cover **41** to its normal rest position, and also pressing the flint **67** against the sparking wheel **69**. It also is noted that at the time the sparking wheel is turned, the spring **57** has been partially compressed by the leftward movement of the cover, so that the flint **67** is now under an increased degree of pressure against the sparking wheel, insuring a good sparking action even if the sparking wheel has been much used and is relatively worn. The higher degree of spring pressure on the flint at the time of sparking, coupled with the very rapid turning of the wheel due to the finger pressure required to overcome the resistance of the ball **101**, makes this construction extremely reliable in action, as compared with various prior cigarette lighters.

When it is necessary to replace the flint or the wick, this may be done very easily in a most simple manner. The screw **53** is removed, which is done easily because the screwdriver slot in the head of this screw **53** is made sufficiently wide (see Fig. 2) so that a small coin such as a dime may be used to remove the screw, if a regular screwdriver is not handy. When the screw **53** has been removed, the spring **57** and plunger **63** is withdrawn with the screw. The entire cover **41** may then be lifted vertically upwardly off of the casting **23**, and a new flint can be inserted through the hole in the tube **51**, without the need for withdrawing the tube itself from the casting **23**. Then the cover is replaced by a vertical downward motion onto the casting **23**, and the screw **53** with the spring and plunger attached is replaced. The entire disassembling and reassembling operation is extremely simple and rapid.

Likewise, when the cover is disassembled, the wick may be easily replaced, and if it is necessary to replace the sparking wheel this also may be done by removing the screw **73**, which allows the shaft **71** to be taken out for removal of the sparking wheel **69** and the pinion **83**.

The reservoir **21** is supplied with fuel from time to time through an opening in the side wall, closed by a screw plug **131** (Fig. 1) which, like the screw **53**, has a sufficiently wide screwdriver slot so that a small coin may be used to remove the screw. Due to the fact that none of the operating mechanism is in the reservoir, the reservoir has a large fuel capacity in comparison to conventional lighters, where the flint tube or other mechanism parts are usually located in the reservoir.

It is seen that an extremely simple construction has been provided, easy and relatively inexpensive to make, and sturdy and reliable in action.

Referring now to the second embodiment of the invention as illustrated in Figs. 9–12 of the drawings, this second embodiment includes many of the same principles present in the first embodiment, and has many of the same advantages.

The main body in this second embodiment is a die cast metal body **122** open at the bottom, and containing a filling **131** of absorbent material such as cotton, in which is embedded the wick **133** passing upwardly through a wick guide tube **135** formed integrally as part of the die casting, the upper end of the wick projecting as at **137**. A vertical die cast tube **155**, again formed preferably as an integral part of the main die casting, receives a tube **151** which is staked or riveted to the hollow or cup-shaped sheet metal bottom closure member **141** which fits snugly but slidably around the bottom portion of the die cast body **122**, in vertically sliding telescopic relation thereto.

In a longitudinal bore **156** formed centrally in the tube **151**, is a coil spring **157**, the lower end of which reacts against and has a tight press fit in the bottom of the bore, and the upper end of which surrounds a guide rod **161** and presses against the head **163** thereof, the last convolution of the spring being engaged tightly in a circumferential groove or neck in the rod **161** just below the head **163**. The head presses upwardly against the bottom of the flint **167** mounted for longitudinal sliding in the flint guide tube **165** which is preferably an integral part of the die casting, pressing the flint upwardly against the periphery of the sparking wheel **169** rotatably mounted on the shaft **171** the ends of which are supported in suitable openings in spaced vertical flanges on the die casting, and held in place by a screw **173** which draws a shoulder on the shaft up against the casting in a manner similar to that illustrated in Fig. 7.

The construction of the wheel itself and its rotating mechanism is approximately the same as in the embodiment previously described. That is, the wheel **169** has a roughened circumferential surface which, upon rotation in a clockwise direction (viewed as in Figs. 9 and 12) rubs against the flint **167** and produces sparks, throwing them tangentially toward and against the projecting upper end **137** of the wick **133**, to ignite the wick. The wheel carries ratchet teeth **191** engaged by pawl teeth **189** formed on a pawl member **187** secured to the pinion **183** to turn therewith, in a manner similar to the arrangement of the pinion **83**, pawl member **87**, pawl teeth **89**, etc., of the first embodiment.

The pinion **183** is driven by rack teeth **181** on a rack bar **179**, sliding vertically in a guideway formed in the die casting, the lower end of the rack bar being spaced somewhat upwardly from the bottom of the closure member **141** when the parts are in normal relaxed position as seen in Fig. 9. When the bottom member **141** is pushed upwardly against the force of the spring **157**, the first part of its upward movement does not cause any movement of the rack bar **179**. During this first part of the upward movement, a spring detent ball **201**, urged by a coil spring **205** held in the lateral bore **203** by a closure screw **207**, offers no resistance to the upward movement of the member **141** and tube **151**, because a cut-away portion **211** of this tube is at that time opposite the ball **201** as seen in Fig. 11. However, at just about the same time that the bottom **141** reaches the lower end of the rack bar **179**, the shoulder **213** at the lower end of the cut-away portion **211** of the tube **151** reaches the ball **201**, and presents considerable resistance to further upward movement of the bottom member **141**, the action being similar to the action of the ball **101** on longitudinal movement of the tube **51** in the first embodiment. Then

when sufficient upward pressure on the bottom member **141** is produced to overcome the resistance of the ball **201**, the member **141** suddenly snaps upwardly fast, under the influence of the increased pressure, pushing the rack bar **179** rapidly upwardly to turn the pinion **183** and spin the sparking wheel **169** rapidly to make the sparks to ignite the wick, similar to the action in the first embodiment.

The turning of the pinion **183** by the upward movement of the rack bar **179** serves also to turn a cover member **221** having side flanges rotatable on the shaft **171** and staked to the pinion **183** to turn therewith. A spring **225** coiled around the hub of the pinion **183** has one end held in a stationary part of the die casting **122** and the other end engaging the cover to tend to swing it down to the closed position, in which an annular flange portion **227** surrounds the upper end of the wick **137** and tightly engages the upper end of the wick tube **135** to extinguish the flame.

When the bottom member **141** is pushed upwardly, through its maximum range of travel, the extent of rotation of the pinion **183** is approximately 100 degrees, thus swinging the cover **221** up from the closed position shown in Fig. 9 to the fully open position shown in Fig. 12, and turning the sparking wheel **169** through approximately the same extent of 100 degrees, which is amply sufficient to produce the necessary spark to ignite the wick. Air to support combustion can come in not only at the top of the wick, which is now freely open on account of the cover being moved to its open position, but also through the lateral air holes **231** formed in the die cast body in appropriate locations around or near the wick tube **135**.

As the bottom member **141** is moved upwardly to ignite the lighter, the spring **157** compresses and thus produces additional upward pressure on the flint **167**, just as the pressure on the flint is increased in the first embodiment. When the upward pressure on the bottom member **141** is released, the spring **157** expands to move the bottom member down to its normal relaxed position shown in Figs. 9 and 11, which position is determined by engagement of the ball **201** with the shoulder **215** on the tubular member **151**, as seen in Fig. 11. As the bottom member **141** moves downwardly, the spring **225** swings the cover **221** and the gear **183** in a counterclockwise direction to the closed position shown in Fig. 9, extinguishing the flame. The rack bar **179** is moved downwardly by the rotation of the pinion **183**, to its downward limit of movement, as fast as the downward motion of the bottom member **141** permits the rack bar to move down, and when the rack bar reaches its lowest position, the bottom member **141** continues to move further downwardly to the ultimate position shown in Fig. 9. The sparking wheel **169**, however, does not turn counterclockwise, because the frictional resistance offered by the flint **167** is greater than the frictional torque produced by reverse turning of the resilient pawls **189**, so the pawls simply ratchet idly over the ratchet teeth **191** on the sparking wheel.

It will be noted from Fig. 11 that the ball-retaining constriction at the left end of the bore **203** holds the ball **201** out of contact with the cut-away portion **211** of the tube **151**. Hence the ball does not impede the operating movement of the tube **151** even to the slightest extent, until the shoulder **213** comes into contact with the ball during the upward movement of the tube. On the reverse or return movement of the parts to normal position, the ball **201** does not impede the latter part of the return stroke back to the normal position determined by engagement of the shoulder **215** with the ball. This is important because the return stroke is powered only by the light spring **157**, and during the latter part of the return stroke the spring is relatively relaxed without much power, so that it is desirable to avoid even the slight frictional drag which would be occasioned by having the ball **201** in actual contact with the tube **151** during the latter part of the return stroke, in order to insure that a full return stroke is performed.

When it is desired either to refill the lighter with lighter fluid, or to insert a new flint, all that is needed is to pull the bottom member **141** forcibly away from the body **122** (holding the latter preferably in an inverted position) to overcome the resistance offered by the spring pressed ball **201** against the shoulder **215**. When this resistance is overcome, the bottom member can be pulled entirely free from the main body **122**, withdrawing the tubular member **151**, the spring **157**, and the member **161**, **163** with it, to open completely the bottom of the lighter. A fresh supply of lighter fluid may be deposited in the absorbent packing material **131**. Also a new flint **167** can be dropped into the lighter if needed. Then the bottom member **141** is put back in position, first inserting the end of the tubular member **151** within the tube **155**, and pushing it forcibly inwardly past the ball **201** to its normal rest position as shown in Fig. 9.

The general operation of this second embodiment is quite similar to the first embodiment, as will be seen from the foregoing description. The second embodiment has the advantage that the case may be opened up for replacement of lighter fluid or replacement of a flint, without the necessity for removing any screws whatever. Although somewhat rearranged in a different position of orientation, most of the parts of the second embodiment correspond in function to respective parts of the first embodiment. So far as reasonably possible, the parts of the second embodiment are indicated by reference numerals which are one hundred higher than the approximately corresponding parts of the first embodiment. In both embodiments, the spring pressed ball **101** or **201** serves the function of a resistance overcome by the finger pressure of the user so as to give a quick snap action to the turning of the sparking wheel. In addition, in the second embodiment, the spring pressed ball **201** serves the further function of holding the parts together in normal position of rest, until the bottom member is pulled away with sufficient force to open up the bottom of the lighter.

It is seen from the foregoing disclosure that the above mentioned objects of the invention are well fulfilled. It is to be understood that the foregoing disclosure is given by way of illustrative example only, rather than by way of limitation, and that without departing from the invention, the details may be varied within the scope of the appended claims.

What is claimed is:

1. A cigarette lighter comprising a body, an actuating member encompassing a portion of said body and having a snug sliding fit thereon for reciprocating movement relative to said body through a limited range during normal operation and being capable of complete disengagement from said body by continued straight-line movement in one of its directions of reciprocation, a rack bar mounted on said body for reciprocating motion relative thereto in a direction substantially parallel to the direction of movement of said actuating member, a lost motion connection between said rack bar and said actuating member for moving said rack bar during a part only of the movement of said actuating member in one direction, a wick mounted on said body, a sparking wheel also mounted on said body, means for holding a flint in engagement with said sparking wheel, means including a pinion meshing with said rack bar for turning said sparking wheel from movement of said rack bar to create a spark to ignite said wick, and a resilient detent mounted on said body and engaging said actuating member to resist movement of said actuating member to a position disengaged from said body and also to resist movement of said actuating member in a spark-producing direction after a substantial initial movement thereof in said last mentioned direction.

2. A cigarette lighter comprising a body, an actuating member encompassing a portion of said body and having a snug sliding fit thereon for reciprocating movement relative to said body through a limited range during normal operation and being capable of complete disengagement from said body by continued straight-line movement in one of its directions of reciprocation, a rack bar mounted on said body for reciprocating motion relative thereto in a direction substantially parallel to the direction of movement of said actuating member, a lost motion connection between said rack bar and said actuating member for moving said rack bar during a part only of the movement of said actuating member in one direction, a wick mounted on said body, a sparking wheel also mounted on said body, a flint engaging said wheel, means including a pinion meshing with said rack bar for turning said wheel from movement of said rack bar to create a spark to ignite said wick, a single spring pressing said flint against said wheel and also urging said actuating member in a direction to disengage it completely from said body, and resilient detent means including a spring pressed ball mounted on said body and engaging said actuating member to resist movement of said actuating member to a position disengaged from said body and also to resist movement of said actuating member in a spark-producing direction after a substantial initial movement thereof in said last mentioned direction.

3. A lighter comprising first and second hollow members arranged for straight-line reciprocating movement relative to each other in a spark-producing direction and in a reverse direction, said members being so constructed that upon continuance of movement in said reverse direction the members may be completely disengaged and separated from each other, fuel storage means in said first member, a sparking wheel rotatably mounted on said first member, a first tubular portion on said first member, a second tubular portion on said second member, one of said tubular portions surrounding the other in telescopic relation thereto, a flint guided in said first tubular portion and engaging said sparking wheel to create a spark when said sparking wheel is turned, a wick mounted on said first member in position to be ignited by a spark from said flint and wheel, a coil compression spring within said tubular portions and tending to press said flint against said wheel and simultaneously to separate said first and second members in said reverse disengaging direction, a rack bar operated by movement of said first and second members in said spark-producing direction for turning said wheel to create a spark, said second tubular portion having a reduced part intermediate its length and an abutment shoulder at each end of said reduced part, and a spring pressed ball detent mounted on said first member and normally lying partly in said reduced part of said second tubular portion when said first and second members are in normal rest position with respect to each other, said abutment shoulders being so placed that one of said shoulders engages said ball detent in the normal rest position to define such position and to resist further movement of said members in said reverse direction to disengage them from each other and the other of said shoulders engages said ball detent at an intermediate point of movement of said members in a spark-producing direction, to produce temporary resistance to said last mentioned movement until manual operating pressure is increased sufficiently to overcome such resistance.

4. A construction as defined in claim 3, in which said ball detent is out of contact with said reduced part of said second tubular portion, so that it produces no frictional drag on movement of said members relative to each other in either direction in the range where said reduced part is opposite said ball detent.

5. A lighter comprising two members slidable in a straight-line with respect to each other through a normal operating range from a normal rest position in a spark-producing direction to a lighting position and back in a reverse direction to said rest position, said members also being movable in said reverse direction beyond said rest position to disconnect said members from each other, wick and fuel supply means, sparking wheel means, and flint holding means all mounted on one of said members, and a single spring pressing in one direction to tend to move said members in said reverse direction and pressing in the opposite direction to hold a flint in tight engagement with said sparking wheel means, characterized by the features of a resilient detent mounted on one of said members, and two spaced abutment shoulders secured to the other of said members and spaced from each other in the direction of movement of said members with respect to each other, one of said abutment shoulders being positioned to engage said detent when said members are in said normal rest position to hold said members against disconnection from each other by the pressure of said spring and to prevent such disconnection until sufficient additional force is applied to said members to displace said detent so that said one of said shoulders may pass said detent, the other of said abutment shoulders being positioned to engage said detent after a substantial amount of movement of said members in said spark-producing direction to provide resistance to further and complete movement in said spark-producing direction until sufficient additional force is applied to said members to displace said detent so that said other of said abutment shoulders may pass said detent, whereby a quick snap-action movement of said members may be obtained during the latter part of the movement in said spark-producing direction, under the influence of the additional force necessary to cause said other shoulder to pass said detent.

6. A construction as defined in claim 5, further characterized in that said other abutment shoulder is so positioned that it comes into contact with said detent only after a substantial part of the movement of said members through said normal range, so that said snap-action movement occurs only after said spring has been compressed to a substantial extent to increase the pressure of said flint against said sparking wheel.

7. A construction as defined in claim 5, further characterized in that said detent is so positioned as to be completely out of contact with said other of said members in all positions in the range of travel between contact of one shoulder with said detent and contact of the other shoulder therewith.

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