Sept. 14, 1948. J. F. ROGERS 2,449,414

LIGHTER

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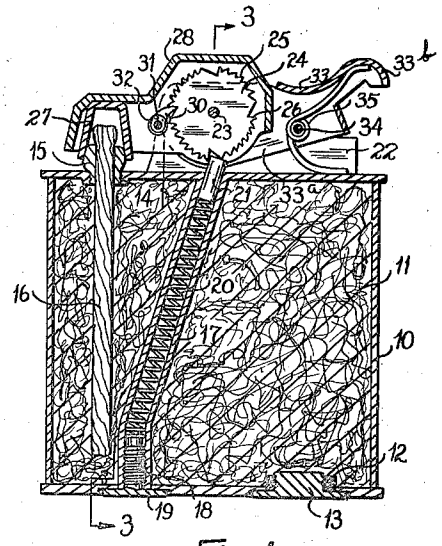


FIG. 1

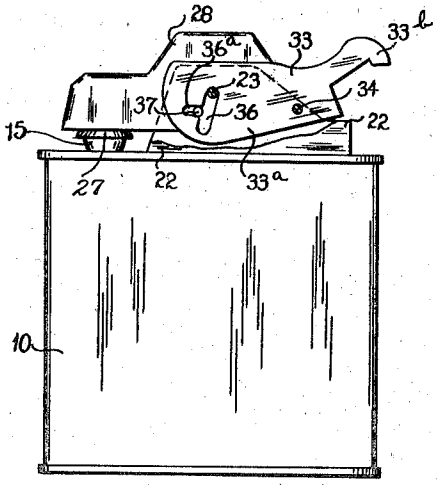


FIG. 2

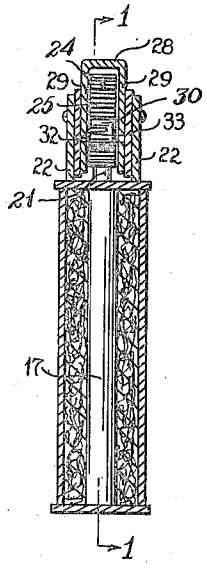


FIG. 3

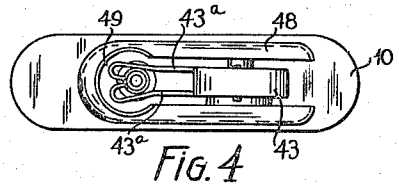


FIG. 4

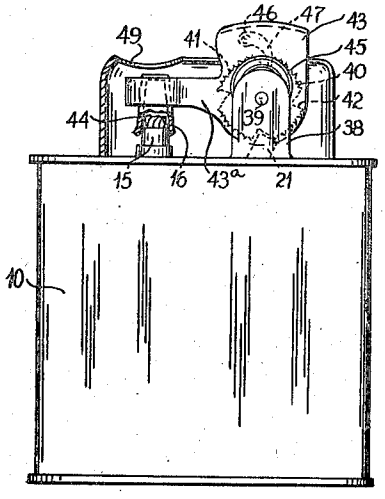


FIG. 5

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LIGHTER

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6 Claims. (Cl. 67—7.1)

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This invention relates to lighters of the so-called sparking type, and has as its primary object the provision of a lighter which is simple in construction, inexpensive to manufacture and efficient in operation.

Another object of the present invention is to provide for a lighter of this type a novel sparking mechanism of simplified construction and operation, and which assures the production of a sharp, strong spark each time the mechanism is actuated, thereby assuring ignition of the wick.

Another object is to provide for a lighter of this type a sparking mechanism which is formed of a minimum number of parts, and wherein a single element takes the place of the usual ratchet wheel and the serrated steel sparking wheel which contacts the flint in the production of the spark.

A general object is to provide a lighter of the character referred to and which is certain in its operation inasmuch as a single actuation of the sparking mechanism effects substantially without fail the ignition of the wick.

Further and additional objects and advantages not hereinbefore referred to will become apparent during the detailed description of several embodiments of the invention which is to follow.

Referring to the accompanying drawing illustrating the embodiments of the invention,

Fig. 1 is a vertical sectional view through one form of lighter embodying the invention, and is taken substantially on line 1—1 of Fig. 3, looking in the direction of the arrows.

Fig. 2 is an elevational view of the lighter shown in Fig. 1 with a certain portion of the sparking mechanism broken away to reveal a part located therebehind.

Fig. 3 is a transverse vertical sectional view through the lighter, and is taken substantially on the irregular line 3—3 of Fig. 1, looking in the direction of the arrows.

Fig. 4 is a top plan view of a modified form of lighter embodying the invention; and

Fig. 5 is a view partly in elevation and partly in section of the modified form shown in Fig. 4.

The lighter shown in Figs. 1 to 3 inclusive comprises a casing 10 which, in the present instance, is elongated and tubular in cross section and of any desired height. The casing 10 is filled with a suitable absorbent material 11 and this material can be saturated with the volatile

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inflammable liquid through a screw-threaded opening 12 in the bottom of the casing and which opening is normally closed by the removable screw-threaded plug or cap 13.

The upper or top of the casing 10 is provided with a screw-threaded opening 14, in which the screw-threaded wick-guide 15 is removably mounted. A wick 16 extends through the guide 15 and has its lower end surrounded by the absorbent material 11, as will be well understood.

A tube 17 extends from the bottom to the top of the casing 10, with the upper and longer portion of the tube being shown in this instance as inclined to the vertical, while the lower and shorter portion thereof extends vertically. It will be understood that the tube 17 could, if desired, be otherwise formed, and that it could extend entirely angularly or entirely vertically.

The lower vertical portion of the tube 17 communicates with an opening in the bottom of the casing and is internally screw-threaded so that the threaded post 18 of a removable cap or plug 19 can be screwed into this portion of the tube to close the same and said opening in the bottom of the casing. Said post 18 is provided at its inner end with a smooth reduced portion engaging the lower end of a coil spring 20, which extends upwardly in the inclined portion of the tube 17, and has its upper end abutting the lower end of the flint 21 that projects outwardly of an opening in the top of the casing 10, and is adapted to engage under spring pressure the serrated steel wheel later to be referred to.

The sparking mechanism is carried by the top of the casing 10 and includes a pair of spaced, vertically extending ears 22 secured to the top of the casing 10 by any suitable means, as for instance by welding. A pin 23 is journaled in the ears 22, and mounted on this pin is the steel sparking wheel 24. Heretofore in lighters of this type it has been customary in the sparking mechanism to provide a steel sparking wheel with the circumference thereof that contacts the flint scored or serrated, and, in addition, to provide a ratchet wheel forming part of the operating elements of the sparking mechanism.

In accordance with the present invention the sparking mechanism is simplified and rendered more efficient and positive in function and the parts thereof are reduced in number inasmuch

as the single steel sparking wheel 24 performs herein the dual function of the sparking wheel and the ratchet wheel heretofore considered necessary in lighters of this type.

The wheel 24 is provided on its circumference with the usual shallow serrations or grooves 25, and in addition is provided on its circumference with relatively deep grooves forming ratchet teeth 26, there being four such deep grooves and ratchet teeth indicated in the drawing for purposes of illustration. The four deep grooves forming the ratchet teeth 26 are V-shaped with one side extending in a radial direction while the other side is at an angle to the radial and these grooves have the utilitarian purposes now to be referred to.

When the lighter is not in use and the wheel 24 is at rest, the upper end of the flint 21 will engage in one of the deep grooves forming the ratchet teeth 26 and be held therein by the pressure of the spring 20. Therefore, when the sparking mechanism is actuated and the sparking wheel 24 rotated in a clockwise direction, the first part of such rotation of the wheel will meet substantial resistance because of the engagement of the flint in the deep groove or ratchet tooth 26. In overcoming this resistance and in causing the flint 21 to ride out of the deep groove 26, substantial frictional contact or pressure is created between the upper end of the flint 21 and the periphery of the wheel 24 adjacent said deep groove, and such frictional contact or pressure produces from the flint sharp and strong sparks, thereby assuring ignition of the wick 16. This is an important feature in a lighter of this type and constitutes a marked advantage over prior lighters. The sparking wheel 24 also serves the function of the separate ratchet wheel heretofore used.

A hood 27 is soldered or otherwise secured to a member 28 that has depending ears or flanges 29 extending on opposite sides of the steel sparking wheel 24. The flanges 29 are provided with transverse openings through which the pin 23 extends, so that the member 28 is adapted to move about the axis of the pin 23, and the hood 27 is so positioned with respect to the pin 23 that it will cooperate with the exposed wick 16 to thereby extinguish the flame as will be well understood.

A pawl 30 is mounted upon a pin 31, the ends of which are supported by the ears or flanges 29. A coil spring 32 surrounds the pin 31 and has one end fixed, while the opposite end cooperates with the pawl 30 to hold the latter in engagement with the steel wheel 24 and particularly with the deep grooves forming the ratchet teeth 26 thereof. It will be seen that when the member 28 is moved about the axis of the pin 23 in a clockwise direction, as viewed in the drawing, the hood 27 is removed from the wick 16 and due to the fact that the pawl 30 is carried by the member 28, the steel wheel 24 with which the pawl cooperates is caused to move in a clockwise direction. The pawl 30 may be substantially coextensive in width with the wheel 24 and said pawl and wheel are aligned in the same plane, wherefore the thrust of the pawl does not tend to twist the wheel sideways and cause a resultant rapid wearing of the parts. Since the flint 21 is engaging in one of the deep grooves 26 of the wheel 24 at the start of the wheel movement, the clockwise rotation of said wheel always produces a sharp, strong spark, as has been previously described.

To facilitate the clockwise actuation of the member 28 from its normally closed position indicated in Fig. 1 to its raised position, at which time the wick 16 is ignited, an actuating handle 33 is provided, and said handle has depending ears or flanges 33*a* provided at their lower portions with transverse openings through which extends a pin 34 that is journaled in the ears 22 at a point to the rear of the pin 23 and slightly below the horizontal center thereof.

The handle 33 is provided with an extension 33*b*, the upper surface of which may be knurled, and said extension is adapted to act as a thumb support for moving the handle about the axis of the pin 34. A coil spring 35 encircles the pin 34 between the flanges 33*a*, and has one end engaging the top plate of the casing 10 while its opposite end engages the undersurface of the extension 33*b*, and said spring functions to return the handle 33 from its raised position to its normal idle position indicated in Fig. 1.

The flanges 33*a* of the handle 33 are provided with T-shaped slots 36, which are located and extend in the position indicated in Fig. 2 when the lighter parts are in their normal idle relationship. These T-shaped slots 36 align in the opposite flanges 33*a* and the T-portions of the slots are so positioned with respect to the axis of the pin 34 that the pin 23 rides within the slots when the handle 33 is depressed and moved about the axis of the pin 34 in actuating the lighter.

The legs 36*a* of the slots 36 extend forwardly of the cross-portions of the slots and are positioned so as to cooperate with projections or pins 37 which extend outwardly and are carried by the flanges 29 of the member 28. These pins or projections 37 are slightly below the horizontal center of the pin 23 and forwardly thereof, and move about the axis of the pin 33, while the slots 36 move about the axis of the pin 34.

It will therefore be seen that when the handle 33 is depressed so as to move about the axis of the pin 34 in a clockwise direction, as viewed in the drawing, the legs 36*a* of the slots 36 cooperate with the pins or extensions 37 of the member 28 and cause said member to be moved about the axis of the pin 23 from the position shown in Fig. 1 to a position angularly displaced therefrom, in a clockwise direction. During this movement of the member 28 the steel wheel 24 has been rotated in a clockwise direction by the pawl 30 carried by the member 28, and thus said wheel 24 has first overcome the frictional resistance of the flint 21 in riding out of the deep groove 26 in which it extended and has caused a sharp, intense spark or series of sparks which ignite the wick 16, it being recalled that the hood 27 no longer covers the wick. When it is desired to extinguish the flame of the wick, the pressure on the handle 33 is released and the spring 35 returns the movable parts to their normal idle position with the pawl idling over the wheel during such return movement.

In the modified form of lighter embodying the invention shown in Figs. 4 and 5, the casing, the wick, wick guide and mounting for the flint 21 may be substantially of the same construction as in the previously described form, and therefore the same reference characters are employed to indicate these parts in the modified form.

The upper plate of the casing 10 in the modified form of construction is provided with a pair of spaced, vertically extending ears 38, in which is journaled a pin 39. A steel sparking wheel 40

similar to the steel wheel 24 of the previously described form is mounted on the pin 39 and is provided on its periphery with shallow serration teeth or grooves 41 and with four equally spaced relatively deep grooves or ratchet teeth 42. Straddling the wheel 40 are the downwardly extending legs of a U-shaped actuating member 43, said legs being located intermediate the wheel 40 and the ears 38, and being provided with transverse openings rotatably interfitting the pin 39. The legs of the actuating member 43 are provided with forwardly projecting spring arm extensions 43a, the free ends of which support a wick hood 44 comparable to and serving the purpose of the hood 27 previously described.

A rat trap spring 45 functions to normally maintain the actuating member 43 in the idle position shown in Fig. 5. The member 43 is provided with a transversely extending pin 46, on which is mounted a pawl 47 adapted to engage in the relatively deep grooves or ratchet teeth 42 of the wheel 40, it being understood that a suitable spring maintains said pawl in such engagement.

It will be seen that when the actuating member is moved in a clockwise direction against the action of the rat trap spring 45, that the pawl 47 effects a clockwise rotation of the wheel 40. This rotation of the wheel 40 must first overcome the frictional resistance exerted by the flint 21 which is engaging in the then lowermost deep groove or ratchet tooth 42. In overcoming such resistance it will be understood that the strong engagement of the flint with the periphery of the wheel 40 causes a sharp, strong spark to be emitted, which ignites the wick as in the previously described form. It will also be understood that when the user releases the pressure of the actuating member 43, the rat trap spring 45 returns said member to its normal idle position, as indicated in Fig. 5, and during this return movement the pawl 47 idles over the circumference of the wheel until it comes to rest in the then uppermost ratchet tooth 42.

Surrounding the sparking mechanism of the modified form of construction is a U-shaped wind guard 48 which may be detachably mounted in position, as will be understood, and which is provided in line with the wick 16 with an enlarged opening 49, affording to the user of the lighter access to the flame. Preferably the wind guard 48 will be provided in its sides adjacent to the wick with breather openings, not shown but well understood in this art.

Although preferred embodiments of the invention have been illustrated and described herein, it will be understood that the invention is susceptible of various modifications and adaptations within the scope of the appended claims.

Having thus described my invention, I claim:

1. In a lighter of the character described, a casing having a compartment for absorbent material adapted to be saturated with inflammable fluid, a wick extending into said compartment from exteriorly of said casing, a spring pressed flint carried by said casing and projecting exteriorly thereof adjacent to said wick, a sparking mechanism carried by said casing and including a sparking wheel provided on its periphery with shallow serrations or grooves and with circularly spaced relatively deep grooves, said flint engaging in one of said deep grooves when the lighter parts are in their idle relationship, and means engageable with said wheel in another of said deep grooves for rotating said wheel to overcome the resistance of said flint and to cause said flint to ride out of said deep groove and a strong spark to be emitted from said flint to ignite said wick.

2. In a lighter of the character described, a casing having a compartment for absorbent material adapted to be saturated with inflammable fluid, a wick extending into said compartment from exteriorly of said casing, a spring pressed flint carried by said casing and projecting exteriorly thereof adjacent to said wick, a sparking mechanism carried by said casing and including a combined sparking and ratchet wheel provided on its periphery with shallow grooves or serrations and with circularly spaced relatively deep grooves forming ratchet teeth, said flint engaging in one of said deep grooves when the lighter parts are in their idle relationship, and means for rotating said wheel to overcome the resistance of said flint and to cause said flint to ride out of said deep groove and a strong spark to be emitted from said flint to ignite said wick, said means including a wheel actuating pawl engaging another of said deep grooves during said rotation of said wheel.

3. In a lighter of the character described, a casing having a compartment for absorbent material adapted to be saturated with inflammable fluid, a wick extending into said compartment from exteriorly of said casing, a sparking mechanism carried by said casing and including a combined sparking and ratchet wheel provided on its periphery with serrations and with circularly spaced ratchet teeth, a spring pressed flint carried by said casing and projecting exteriorly thereof adjacent to said wick and cooperating with the periphery of said wheel and engaging in one of said ratchet teeth when said wheel is idle, and means for rotating said wheel including a pawl operatively cooperating with the ratchet teeth of said wheel.

4. In a lighter of the character described, a casing having a compartment for absorbent material and adapted to be saturated with inflammable fluid, a wick extending into said compartment from exteriorly of said casing, a spring pressed flint carried by said casing and projecting exteriorly thereof adjacent to said wick, spaced ears carried by said casing, a pin carried by said ears, a combined sparking and ratchet wheel mounted on said pin and provided on its periphery with shallow serrations or grooves and with circularly spaced relatively deep grooves forming ratchet teeth, said flint always engaging in a deep groove of said wheel when the lighter parts are in their normal idle relationship, a member mounted on said pin and rockable relative to said wheel, a spring pressed pawl carried by said member and engaging a deep groove of said wheel when the parts are in idle relationship, wherefore rocking movement of said member in one direction from said relationship imparts rotation to said wheel, an operating member rockably carried by said casing independently of said first member, spring means acting to maintain said operating member normally in its idle position, said operating member being provided with an elongated slot in which said pin may have relative movement, and cooperating means on said members operatively interconnecting the same, whereby rocking movement of said operating member is imparted to said other member.

5. A lighter as defined in claim 4 and wherein

said first member straddles said wheel and said pawl is positioned to have its longitudinal center line located midway of the side faces of said wheel whereby the thrust of said pawl on the periphery of said wheel does not tend to twist said wheel sideways.

6. A lighter as defined in claim 4 and wherein the periphery of said wheel and the pawl are substantially of equal width and are aligned with each other whereby said pawl imparts rotation to said wheel without any tendency to twist the wheel sideways.

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