

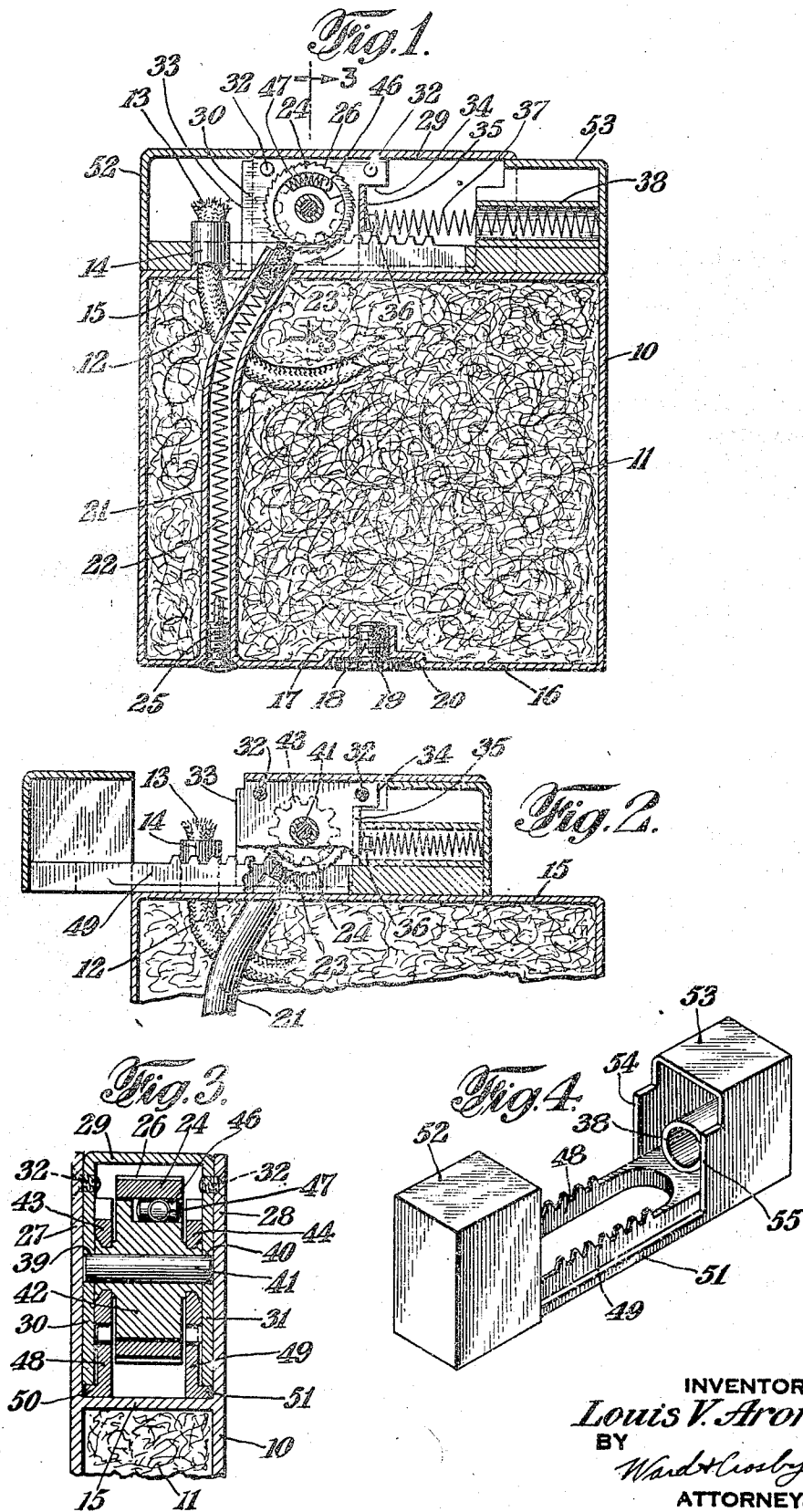
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LIGHTER

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LIGHTER

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This invention relates to lighters and particularly to improvements in the general type of lighter in which a sparking device is located on a fuel chamber and operated by a slidable member to throw sparks toward a wick disposed at one side of the sparking unit.

An object of the invention is to provide a lighter of the type above described which is easy to operate and convenient to carry and which when closed presents a substantially smooth symmetrical appearance.

A still further object is to provide a lighter in which the parts are simple in their construction and relation, and may be quickly and easily assembled by the manufacturer and disassembled by the user when desired for cleaning and repair.

In general, the particular example of the invention here shown may comprise a fuel chamber on top of which is a housing centrally disposed, and containing a sparking unit. A slidable member is disposed to move within said housing and to actuate the sparking member and carries on its ends auxiliary cover members which, when the parts are in closed position, complete the top of the device to form a smooth finished exterior which is snugly closed. When operated, the slidable member and the cover members are moved so that one of the latter moves away from the housing to uncover a wick which is ignited from the sparks thrown out of the sparking unit. Means are provided to limit the movement of said slidable member in either direction and to restore the parts to normal closed position when the finger of the operator is released therefrom, thus requiring only that the finger be used to actuate the device in one direction.

Further and more specific objects, features and advantages will more clearly appear from the detailed description given below taken in connection with the accompanying drawings which form part of the specification, which illustrates one embodiment of the invention, and in which,

Fig. 1 is a vertical longitudinal section taken through the preferred form of the device, showing the parts in closed position,

Fig. 2 is a partial vertical longitudinal section, showing the parts in the opened position,

Fig. 3 is a vertical transverse section of the top of the device taken on the line 3—3 of Fig. 1, and

Fig. 4 is a perspective view of the operating slidable member.

What is now considered to be a preferred form of the invention is shown in the drawings herewith, and comprises a fuel-containing chamber 10 which is preferably relatively thin and rectangular in shape to readily adapt it to fit in a hand bag or the pocket of the user. This chamber contains liquid absorbing material such as absorbent cotton 11 and into it a wick member 12 extends, the upper end 13 of which projects through a sleeve 14 shown as integrally formed on the top wall 15 of the fuel chamber 10, and adjacent one edge thereof. The bottom wall 16 of the fuel chamber 10 has a filling opening 17 closed by a threaded plug 18 the head 19 of which fits into a recess 20 formed in the bottom wall.

Opening into the bottom wall 16 is a tubular member 21 which extends upwardly through the fuel chamber 10 and also through the top wall 15. In the tubular member 21 is disposed a spring 22 which backs a pyrophoric element 23 held thereby against a sparking wheel 24. The spring and the pyrophoric element may be removed by removing a threaded plug 25 which engages in the lower end of the tubular member 21. The teeth 26 of the sparking wheel 24 are so cut therein that when the wheel is rotated the teeth will strike sparks from the pyrophoric element and throw them toward the wick end 13.

Extending upwardly above the top wall 15 of the chamber 10 and shown as preferably in the plane of the side walls thereof, are a pair of supporting plates 27 and 28 which are shown as being integral with these side walls. These plates preferably are of considerable width.

Disposed on top of the fuel chamber 10 is a U-shaped frame for supporting the sparking wheel 24. This frame comprises a top wall

29 lying flush with the tops of the standard plates 27 and 28 and extending the full width thereof. The legs of the frame are plates 30 and 31 of much less width and depend along and within the standard plates 27 and 28 and are fastened thereto by means of screws such as 32. The lower ends of the legs 30 and 31 are spaced slightly from the top 15 of the fuel chamber as seen in Fig. 3 for a reason hereinafter set forth. As viewed in Figs. 1 and 2 the left edges of the legs 30 and 31 are of slightly less height and extend forward of the top wall 29. Only one of these edges is shown and the same is numbered 33. The right hand edges of the legs 30 and 31 are of stepped outline as shown in Figs. 1 and 2 at 34. At the edge 34 there is provided a transverse flange piece 35 having a pin 36 thereon adapted to receive one end of a spring 37. The other end of the spring 37 is housed in a tube 38 supported from a sliding cover member to be hereinafter described.

Journalled in apertures 39 and 40 in the legs 30 and 31 is a shaft 41 rigidly supporting a circular hub 42. Between the legs 30 and 31 and the hub 42 rigidly connected thereto are pinions 43 and 44. The hub 42 is provided with a circumferential recess 45 the bottom of which extends at a gradually increasing distance from the inner face of the annular sparking wheel 24 within which the hub 42 is housed. A wedge pin or roller 46 is disposed within this recess and engaged by a spring 47 which always tends to keep the pin 46 in the deepest portion of the recess. This pin acts as a one-way clutch between the hub 42 and the sparking wheel 24. As the hub is rotated in one direction, the roller 46 tends to be moved into the shallower portions of the recess and cause engagement between the hub and the sparking wheel, and as the hub is rotated in the opposite direction the roller 46 is moved into the deeper portions of the recess and does not engage the sparking wheel.

Slidable on the top of the wall 15 of the fuel chamber 10 are rack bars or actuating elements 48 and 49 which at their lower edges have outwardly extending flanges 50 and 51 disposed between the lower edges of the legs 30 and 31 and the top wall 15. At their opposite ends the rack bars 48 and 49 support box-like cover portions 52 and 53 which have closed top, side, and outer end walls, but which have open inner ends, as shown in Figs. 1, 2 and 4. The box-like cover portion 52 is of the same height as the standard plates 27 and 28 and its inner edges, in the closed position of the device, abut the edges 33 above mentioned.

The height of the box-like cover 53 is sufficient for it to slide snugly beneath the top wall 29 of the sparking wheel supporting frame as shown in Fig. 2. Its width is also

equal to the distance between the inner faces of the standard plates 27 and 28 to permit it to slide therebetween. The inner edges 54 and 55, as seen in Fig. 4, are of a stepped outline complementary to that described with respect to the edges 33 of the legs 30 and 31, which they abut when the parts are in their open position shown in Fig. 2.

As to the operation of the device, the parts are shown in their closed position in Fig. 1. In this position it will first be noticed that the roller pin 46 is lying in or near the deeper part of the recess 45. Consequently there is no engagement between the hub 42 and the spark wheel 24. It will also be noticed that the box-like cover portion 52 is lying on top of the fuel chamber 10 with its inner edges flush with the edges of the standard plates 27 and 28 and with the edges 33 of legs 30 and 31 lying snugly therewithin to make a tight joint. This abutment acts as a stop to the further right-hand movement of the slidable covers. At the same time the box-like cover member 53 lies on top of the fuel chamber 10 with its inner edges extending just within the top wall 29 and the standard plates 27 and 28. The outlines of these interengaging walls and edges are such that when the device is closed it has smooth symmetrical appearance adapting it to use without any likelihood of projecting parts to catch in the clothing or otherwise interfering with the use and operation of the device. This tight fit also prevents any dust or dirt from entering the top of the device, and prevents the operating parts from coming into contact with the user's hands.

When the slide cover is then moved to the left from the position shown in Fig. 1 to the position shown in Fig. 2 it is apparent that the pinions 43 and 44 move the shaft 41 and the hub 42 in a clock-wise direction and tend to move the roller pin 46 into the shallower part of the recess 45 against the action of the spring 47 and thus cause a clutching action between the hub 42 and the sparking wheel 24 which results in rotation of the sparking wheel 24 in a clock-wise direction, to cause its teeth 26 to strike sparks from the pyrophoric element 23 and throw them toward the wick 13 which is saturated with the fuel of the chamber 10. This movement of the slide cover is of course against the resistance of the main spring 37 and continues until the stepped edges of the box-like cover 53 meet the similarly shaped edges of the legs 30 and 31 whereupon the motion is arrested. At this time the box-like cover portion 52 has been moved away from the wick 13 and exposes it as seen in Fig. 2. The striking of sparks and the exposure of the wick take place at approximately the same time.

When the operator's finger is released from the slidable cover, the spring 37 will return the parts to normal closed position where-

upon the edges of the box-like cover member 52 and the standard plates 27 and 28 abut each other as shown in Fig. 1, thus providing a stop means. During this movement to the right, the roller pin 46 has been moved into the deeper part of the recess 45 and the clutching action thus avoided so that the sparking wheel 24 is not rotated backward.

It will be observed that the standard plates 27 and 28 and the sparking wheel supporting frame form a housing on the top of the fuel chamber about midway of its top surface with the sparking wheel 24 housed therein and the wick 13 disposed at one side thereof. It will also be observed that the slidable rack bar slides within this housing and carries at its ends the box-like cover members, and that these cover members are shaped so that their outlines and faces fit snugly with the housing outline and edges and present a smooth appearance when in closed position. One of the box-like cover members engages the housing to stop excessive movement in one direction and the other box-like cover member engages the housing to prevent excessive actuating movement in the other direction. When the device is operated to light the wick there is only one opening presented and that is the one between the cover 52 and the housing. Accordingly the mechanism is largely concealed and protected at all times.

In disassembling the device, the screws 32 are removed whereupon the frame supporting the spark wheel may be lifted out, after which the slidable member may also be lifted out from between the side plates of the housing. When the frame member is removed the shaft 41 may be taken out and then the hub 42 with the pinions 43 and 44 may be slid laterally from the sparking wheel 24. At this time the roller pin 46 may be taken out and cleaned or examined. It is therefore apparent that the parts can be quickly assembled or disassembled and that when assembled they form a compact simple unit which is easy to operate, only one operation being required, namely that of the finger to move the slidable cover to the left as shown in Fig. 2.

While the invention and improvements have been described in detail and with respect to a preferred form thereof, it is not desired to be limited to such details or form since many changes and modifications may be made and the invention embodied in other forms without departing from the spirit and scope of the invention in its broader aspects. Hence, it is desired to cover all modifications and forms coming within the language or scope of any one or more of the appended claims.

What is claimed, is:

1. A lighter comprising a fuel chamber, a housing on one surface thereof intermediate

its ends, a sparking unit disposed within said housing, an actuating rack bar extending through said housing and slidable along said surface to actuate said unit, a wick on said surface adjacent said unit, and movable cover members supported on the ends of said rack bar and normally lying closely abutting the housing to present therewith in closed position a smooth exterior surface.

2. A lighter comprising a fuel chamber, a housing on one surface thereof intermediate its ends, a sparking unit disposed within said housing, an actuating element extending through said housing to engage with said unit, movable cover members on the ends of said element and normally lying closely adjacent said housing to form therewith a smooth exterior, means on one cover member to engage the housing to prevent excessive movement in one direction, and means on the other cover member to engage the housing to prevent excessive movement in the opposite direction.

3. A lighter comprising a fuel chamber, a housing on one surface thereof intermediate its ends, a sparking unit disposed within said housing, an actuating element extending through said housing to engage with said unit, movable cover members on the ends of said element and normally lying closely adjacent said housing to form therewith a smooth exterior, a wick on said surface adjacent said housing and normally lying beneath one of said cover members, means on one cover member to engage the housing to prevent excessive movement in one direction, means on the other cover member to engage the housing to prevent excessive movement in the opposite direction, the cover member over the wick being adapted to be moved to expose the same when the finger of the operator is pressed against the other cover member to slide the element along said surface and actuate the sparking unit, and means to return the parts to the normal closed position when the finger is released.

4. A lighter comprising a fuel casing having a top surface, spaced plates extending upwardly from said surface, a sparking unit supporting frame removably supported between said plates and having a top wall to close the space between the tops of said plates to present a smooth exterior, a rack member extending along said surface beneath said frame to actuate said unit, and means on said frame to hold said rack member against said surface.

5. A lighter comprising a fuel casing having a top surface, spaced plates extending upwardly from said surface, a sparking wheel supporting frame removably supported between said plates and having a top wall to close the space between the tops of said plates to present a smooth exterior, a rack member extending along said surface beneath

said frame to actuate said wheel, means on said frame to hold said rack member against said surface, and means to permit the actuation of the spark wheel only when the rack member is moved in one direction.

5 6. A lighter comprising a fuel casing having a top surface, a housing thereon, a sparking unit disposed within said housing, a rack member extending through said housing and
10 engaging with said unit, said member being slidable along said top surface, box-like cover members on the ends of the rack member and normally lying closely adjacent the housing on opposite sides thereof to form when
15 in closed position a continuous closed chamber on said top of the casing.

7. A lighter comprising a fuel casing, a housing thereon, a sparking unit disposed within said housing, a rack member extending through said housing and engaging with
20 said unit, said member being slidable along said fuel casing, box-like cover members on the ends of said rack member and normally lying closely adjacent said housing on opposite
25 sides thereof to form when in the closed position a continuous closed chamber on a wall surface of said casing, the inner edges of one of said covers having an abutting engagement with said housing in normal
30 position, the inner edges of the other cover member having a sliding relation with said housing when in normal position, said latter cover member being adapted to be moved by the finger of the operator to actuate the unit
35 and move the other cover member, and means on the housing to engage said latter cover member to prevent excessive actuating movement.

8. Pyrophoric lighting mechanism comprising a casing having a top wall, spark-producing means above said wall, a wick at one side of said spark-producing means, a cover for said wick, a reciprocatory member
40 slidable on said wall at the other side of said spark-producing means, said reciprocatory member operating said spark-producing means and removing said cover from said wick, and spring means cooperating
45 with said reciprocatory member and normally biasing it to a position where it forms substantially a corner for said casing.

In testimony whereof I have signed my name to this specification.

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