Feb. 22, 1949. C. C. CLAMP 2,462,467

PYROPHORIC LIGHTER

Filed Dec. 18, 1945

Fig. 1.

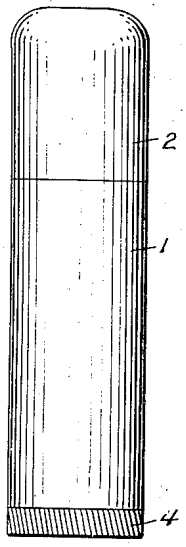


Fig. 2.

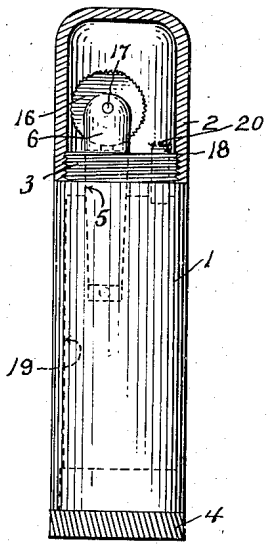


Fig. 3.

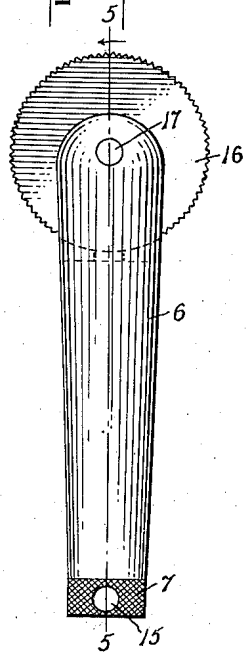


Fig. 4.

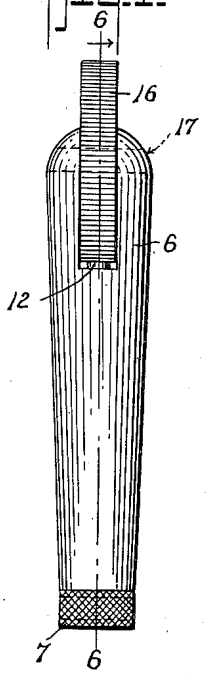


Fig. 5.

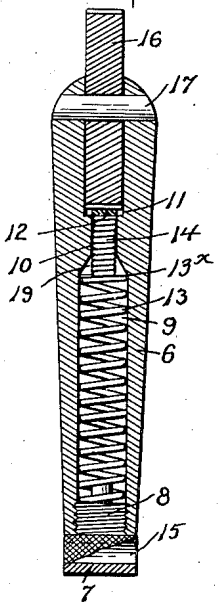
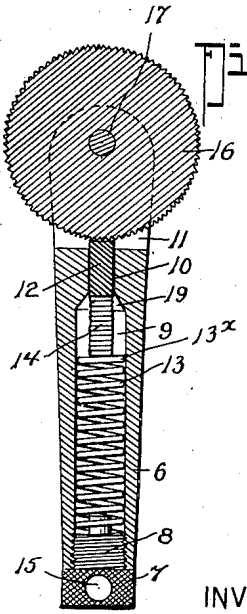


Fig. 6.



INVENTOR,
Charles C. Clamp,
BY
Albert E. Dieterich,
ATTORNEY.

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2,462,467

PYROPHORIC LIGHTER

Charles C. Clamp, San Antonio, Tex.

Application December 18, 1945, Serial No. 635,734

1 Claim. (Cl. 67—7.1)

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My invention which relates, generally, to pyrophoric lighters has particular reference to the sparking mechanism of such lighters.

The invention has for its objects:

1. To provide a lighter in which the sparking unit as a whole is readily removable from the lighter case which contains the fuel reservoir.

2. To provide a lighter that can be filled from the top, if desired, as well as from the bottom.

3. To provide a sparking unit which is rotatably or pivotally mounted in a seat in the case where, when once properly positioned, it is held by retaining friction with a liquid and air tight joint.

4. To provide an individual, self-contained, and complete sparking unit that can be applied to a lighter fuel reservoir having any shaped surface—flat, round, or irregular—where a tapered hole may be machined in that surface conforming to the taper of the sparking unit body.

5. To provide a sparking unit of such construction that it may be positioned so as always to direct the sparks therefrom to a desired spot or in the desired direction.

6. To provide a sparking unit so constructed that it will maintain a universal spring tension against the sparking material (more commonly known as the flint) that contacts the cutter teeth on the spark wheel, thereby creating a positive spark each time the said wheel is turned either partially or completely.

7. To provide a sparking unit of such construction that the spring action will cause the spark wheel to consume all of the spark material (flint) down to a point where it is impossible to hold it against the spark wheel, which is approximately one-sixty-fourth of an inch thick.

8. To provide a sparking unit of such construction that when the last piece of flint is kicked out of position by the spark wheel, the spring tension in the flint chamber is automatically stopped, thereby allowing the spark wheel to be turned freely, no part of the spring being capable of contacting the wheel.

Other objects will in part be obvious and in part will be pointed out hereinafter.

To the attainment of the aforesaid objects and ends, the invention further resides in those novel details of construction, combination and arrangement of parts, all of which will hereafter be described and will then be specifically pointed out in the appended claim, reference being had to the accompanying drawing, in which:

Fig. 1 is a side elevation of a lighter embodying my invention.

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Fig. 2 is a view similar to Fig. 1, the cover of the case being shown in section.

Fig. 3 is an enlarged side elevation of the sparking unit.

Fig. 4 is an elevation of the same, taken 90° from Fig. 3.

Fig. 5 is a vertical section on the line 5—5 of Fig. 3.

Fig. 6 is a vertical section on the line 6—6 of Fig. 4.

In the drawing, in which like numerals of reference indicate like parts in all figures, 1 is the body of the case which contains the fluid chamber 19, the bottom of which is closed by a screw plug 4. The top of the chamber is closed, save for a tapered hole 5 in which the sparking unit is seated, as will later more fully appear.

The case includes the removable top 2, which is threaded onto the threaded neck 3 of the body 1.

The sparking unit, best shown in Figs. 3 to 6 inclusive, comprises a tapered body 6 formed from a solid piece of metal, slotted at 11 and bored at 9 and 10. The slot 11 provides space for the spark wheel 16, which is rotatably mounted on the pin 17. The space between the periphery of the wheel 16 and the bottom of the slot 11 is the spark gap.

The axis of the pin 17 intersects the common axis of the bores 9 and 10 at right angles.

The bore 9 constitutes the spring chamber and is entered from the end of the body 6 that is remote from the wheel 16. The entrant end of the chamber 9 is normally closed by a threaded plug 8 having a head 7 that is milled, as shown, and is provided with a cross bore 15 of the same diameter as the bore 10. The bore 10 constitutes the sparking member or flint chamber which has a flared entrance 19.

The bore 15 constitutes a flint gauge by means of which the proper sized flint to use is determinable. The flint 12 lies in the flint chamber or bore 10 and is pressed radially against the wheel 16 by a spring 13 held in the chamber 9, one end of the spring being formed into a tight coil 14 of a diameter to move freely into chamber 10, as the flint is consumed, and of such length as to completely feed the flint out of the top or exit end of the chamber, but not long enough to contact the wheel 16 when the main body of the spring is stopped by its top convolution 13× arriving at the restriction formed by the tapered entrance 19.

18 represents the wick tube from which the usual wick 20 projects to be ignited by sparks thrown by the wheel 16 toward the wick.

The taper of the body 6 and that of its seat in the top of case 1 is such that a fluid-tight fit is produced when the body 6 is forced into the seat formed by the tapered hole 5.

Because the body 6 is circular in cross-section it can be turned about its axis so as to line up the wheel 16 with the wick 20 and "locked" in place by friction, serving as a stopper for the hole 5 at the same time. The case 1 usually is filled with cotton or other absorbent for the lighter fluid, but as this is common practice in lighters of the present type, illustration thereof is thought to be unnecessary.

In Fig. 6 I have shown a flint of about the usual length employed (this is somewhat variable), while in Fig. 5 I have shown the flint worn down to the thickness at which the next turn of the wheel 16 will kick it out.

To place a new flint, one only has to remove the unit from the case, then remove plug 8 and spring 13, drop a new flint into chamber 10 (the unit being inverted, of course), and replace spring 13 and plug 8, whereupon the unit will be ready for use, and may be plugged into the hole 5 again.

To fill the fluid chamber, the plug 4 may be removed and the chamber filled from the bottom, or it may be filled through the hole 5 when the sparking unit has been removed.

In practice, this is a precision machined lighter. The tolerances are very close and therefore a flint gauge hole has been machined through the head 7 of the screw plug 8. It is placed there for the purpose of first passing the flint to be used through this gauge hole; if the flint will not pass through the hole 15, it will not pass through the flint chamber 10 and should not be used.

From the foregoing description, taken in connection with the accompanying drawing, it is thought that the construction, operation and advantages of the invention will be clear to those skilled in the art.

What I claim is:

In a lighter wherein is provided a sparking unit comprising a tapered body having a longitudinally extending transverse slot at one end, a sparking wheel rotatably mounted in said slot, said body having a bore of one diameter entering from the end of the body remote from the slotted end and having a bore of a reduced diameter between the first bore and said slot, the first bore comprising a spring chamber and the second mentioned bore comprising a flint chamber the axis of which coincides with a radius of said wheel, the improvement which comprises a coil spring having an open wound springy section solely operating in said first mentioned bore, and having a reduced closely coiled section of reduced diameter to operate in said bores to push a flint through said flint chamber in contact with the sparking wheel, said reduced-diameter portion being of a length sufficient to push the flint entirely out of said flint chamber as the flint wears down and said body having means to stop the flint pushing movement of the spring before the end of the reduced-diameter section can contact the sparking wheel and after the flint shall have been substantially consumed.

CHARLES C. CLAMP.

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The following references are of record in the file of this patent:

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