

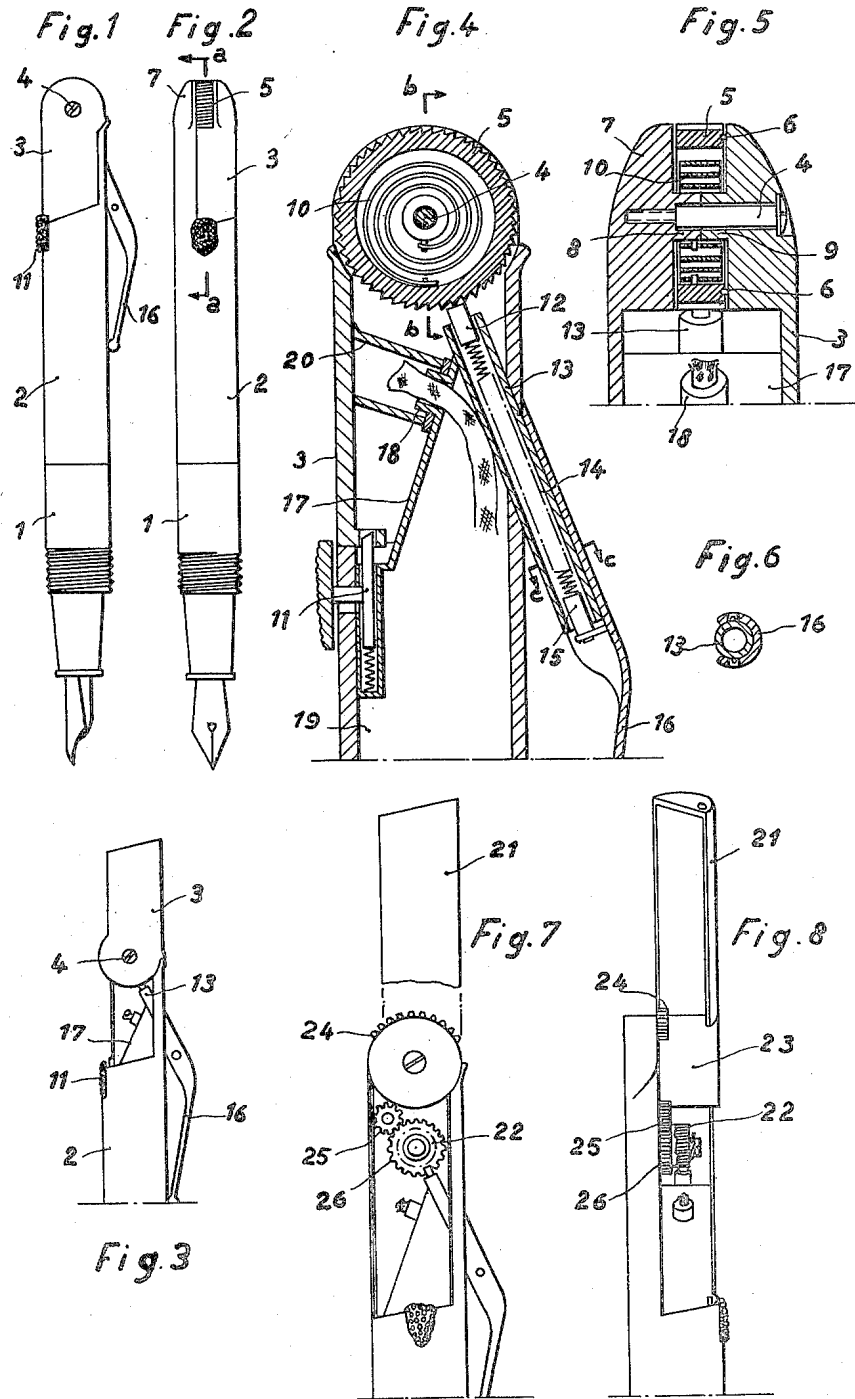
July 18, 1950

R. GANGNEREAU

2,515,504

AUTOMATIC CIGARETTE LIGHTER

Filed Feb. 12, 1948



Inventor:  
Robert Gangnereau  
by [Signature]

# UNITED STATES PATENT OFFICE

2,515,504

## AUTOMATIC CIGARETTE LIGHTER

Robert Gangnereau, Paris, France

Application February 12, 1948, Serial No. 7,968

In France November 15, 1947

### 2 Claims. (Cl. 67—7.1)

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The present invention relates to an automatic cigarette lighter, combined or not with a fountain pen or similar article.

In the usual automatic cigarette lighters, the opening of the cap causes the rotation of the serrated wheel which, rubbing on the flint produces the spark igniting the wick.

In such lighters, the angle of rotation of the cap, and consequently the serrated wheel, is about 90°.

The spark caused by this rotation is often very weak and insufficient to ignite the wick.

The present invention has for its object to increase the rotation of the serrated wheel at the moment of each ignition operation so as to obtain a bigger spark lighting the wick without "misfires."

It applies to automatic cigarette lighters in general and in particular to those which are combined with a fountain pen, propelling pencil, lip-stick case, etc.

According to the first method of embodiment, the serrated wheel is made integral with the closing cap of the lighter.

The cap and the serrated wheel have a course of 180° and the spring ensuring the opening of the cap and the driving of the serrated wheel is housed in this.

This helical spring is made integral with the serrated wheel by its outer extremity, and of the hub fixed to the body of the lighter by its inner extremity.

According to a second method of embodiment, the cap of the lighter opens moreover by a pivoting at 180°, but it is independent of the serrated wheel.

The hub of the cap enclosing a helical spring ensuring its opening, is furnished with a toothed sector which, through the agency of an intermediary pinion drives a pinion integral with the driving device of the serrated wheel.

The rotation of the serrated wheel, on each opening of the cap, being function of the ratio: toothed sector-serrated wheel pinion, it is possible by modifying this ratio to increase or lessen the angle of rotation of the serrated wheel.

Other features will appear in the description which follows in reference to the accompanying drawing by way of example, but not restrictive, in which:

Fig. 1 shows a fountain pen furnished with a cigarette lighter and the object of the present invention;

Fig. 2 is a left portion view thereof;

Fig. 3 is a similar view to the Fig. 1, the cap of the cigarette lighter being open;

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Fig. 4 is, on a larger scale, a section made by *a—*a** of the Fig. 2;

Fig. 5 is a section made by *b—*b** of the Fig. 4;

Fig. 6 is a section made by *c—*c** of the Fig. 5; Fig. 7 is a variant showing front view of an open cigarette lighter;

Fig. 8 is a left view of the Fig. 7.

According to the first method of embodiment (Figs. 1 to 5), 1 is the fountain pen comprising the cigarette lighter 2.

The upper part of the cigarette lighter is furnished with a side cap cover hinged on 4.

This cap cover opens by pivoting upwards around its axis 4. Its shape is almost semi-cylindrical.

The upper part of the cap is grooved to allow the housing of the serrated wheel 5 which is made integral in rotation by the entry of lugs 6, provided on the inner face of the cap, in housings, ad hoc, of the serrated wheel or reciprocally.

The upper part 7 of the lighter is furnished with a boss 8 and the cap likewise has a boss 9. The two bosses forming axial bearings, are passed through by the axis 4 of which a threaded extremity screws into the upper part 7 of the lighter.

The serrated wheel 5 is hollowed out and constitutes the drum of a helical spring 10 of which the outer end is made integral with the serrated wheel and the inner end is fixed on a lug of the boss 8.

It is this spring which ensures the opening of the cap and the drive of the serrated wheel.

This serrated wheel never doing a complete rotation, it is possible if it is completely serrated (Fig. 4) to change its angular position in relation to the cap to obtain a new frictional surface.

On the other hand, it is also possible, as the serrated wheel only operates at about 180°, to use a serrated wheel only cut on 180°, the other part remaining smooth.

Then again, it is still possible to use only a part of the serrated wheel joined on a drum enclosing the helical spring.

The cap is kept closed by a spring lock 11.

The flint 12 is housed in a tube 13 passing through the body of the lighter. It is pushed forward by a spring 14 compressed by a trigger 15.

This trigger 15 is integral with the clip 16 which is slipped on to the end of the tube 13 passing beyond the exterior of the fountain pen.

The clip 16 is held in place by the entry, in two holes diametrically opposed and provided in its semi-cylindrical upper part with bosses of which the tube 13 is furnished (Fig. 6).

This arrangement furthermore is not limitative. Indeed the clip 16 can be soldered on the body of

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the lighter and the tube 13 obturated by a screw as is usually done.

A partition 17 furnished with a wick funnel 18 forms the upper part of the petrol tank 19.

In short, the cap 3 is furnished with a wick funnel cap 20 stopping the evaporation of the gasoline.

According to a second method of embodiment, the cap 21 of the lighter, established in the same manner as in the first method of embodiment, is independent of the serrated wheel 22.

It is controlled by a helical spring enclosed in its hub 23 which comprises a toothed sector 24 which operates through the medium of an intermediary pinion 25, a pinion 26 driving the serrated wheel 22 through the agency of a usual serrated wheel driving device.

The rotation of the serrated wheel on each ignition is function of the ratio existing between the toothed sector 24 and the pinion 26 controlling it.

In using a sector of a primitive diameter higher than that of the pinion 26 there is obtained a multiplying effect ensuring a considerable rotation of the serrated wheel.

All the other members are identical to those described in the first manner of embodiment.

Of course, the lighters described do not apply exclusively to fountain pens and the like, but also to ordinary automatic cigarette lighters.

For this result, the shapes and sizes of the cigarette lighter can vary without the principle of the invention being altered.

What I claim is:

1. In an automatic cigarette lighter comprising a lighter casing and a cap hinged thereto, the combination, with a wick in the casing beneath the cap, of a hollow serrated wheel mounted for rotation on the hinging axis of said cap in the vicinity of the wick; pyrophoric means mounted in said casing for engagement by the hollow serrated wheel; a hub extending into the latter fixed to said casing; means connecting said hollow serrated wheel to said cap for positive rotation therewith; a spring within said hollow serrated wheel secured at one end to the latter and at the other end to said hub whereby to bias the cap into open position; and a manually releasable spring lock upon said casing for normally retaining said cap in closed position on said casing and upon re-

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lease thereof allowing said spring within said hollow serrated wheel to rotate the latter in contact with said pyrophoric means to light said wick and simultaneously open said cap.

2. In a portable automatic cigarette lighter, the combination of an elongated lighter casing terminating at one end in a fixed lug extending longitudinally of the casing from one portion of said end thereof; a cap having a second lug extending from a portion thereof into partial overlapping relation with respect to the fixed lug; a hinge pin serving as a pivot shaft extending transversely through both lugs to allow the cap to be pivotally rotated from a closed position, in which the cap conforms to the outline of said lighter casing, to an open position in which it extends from the latter casing substantially in alignment with a portion thereof; a wick and a pyrophoric member mounted on said casing at said one end thereof independently of the fixed lug thereon; a hollow serrated wheel disposed between both of said lugs and surrounding said hinge pin; a hub projecting rigidly from the latter fixed lug about said hinge pin into the hollow serrated wheel; means connecting the latter wheel to said cap for positive rotation therewith; a spring within said hollow serrated wheel secured to the latter at one end thereof and at the other end secured to said hub whereby to bias the cap towards the open position; and a manually releasable spring lock upon said casing for normally retaining said cap in closed position on said casing and upon release thereof allowing said spring within said hollow serrated wheel to rotate the latter in contact with said pyrophoric means to light said wick and simultaneously open said cap.

ROBERT GANGNEREAU.

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