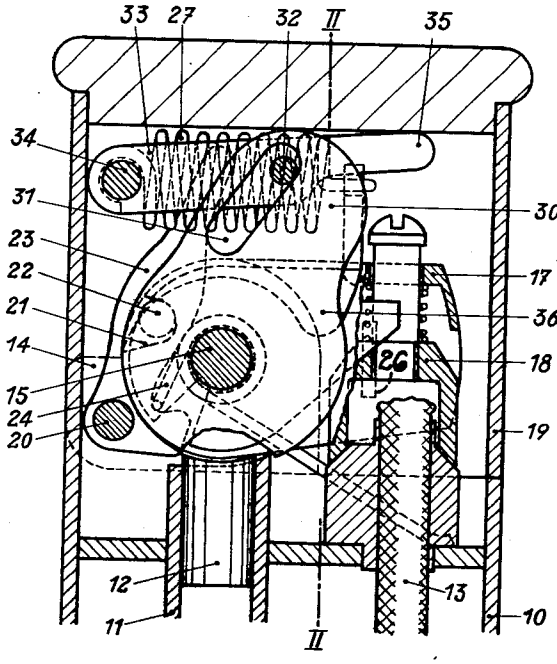
March 26, 1940. L. BOLLE 2,194,844

PYROPHORIC LIGHTER

Filed Nov. 17, 1938

Fig. 1



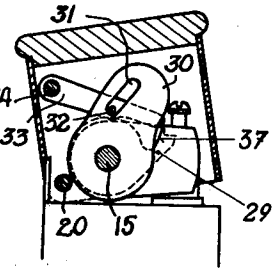


Fig. 5

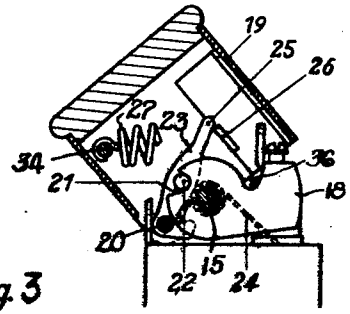


Fig. 3

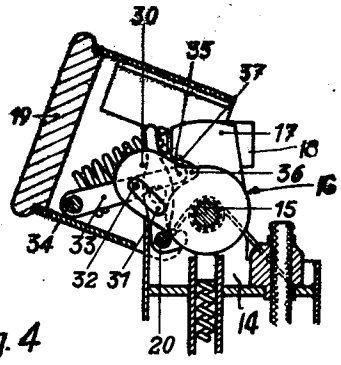
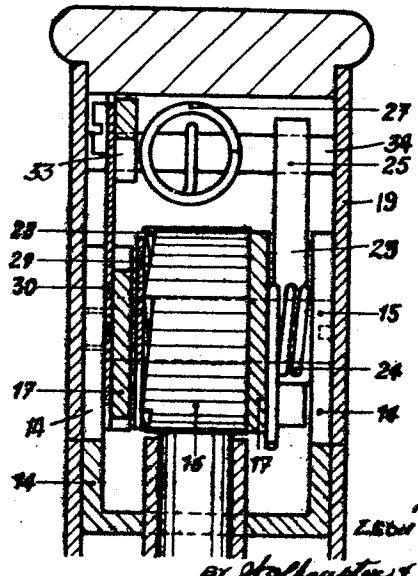


Fig. 4

Fig. 2



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PYROPHORIC LIGHTER

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Application November 17, 1938, Serial No. 241,059
In Switzerland November 25, 1937

5 Claims. (Cl. 67—7.1)

In many cigar and cigarette lighters now on the market the flint wheel, adapted to ignite the wick, is actuated by opening the cover, which, during its movement, tensions a driving spring whose force when released actuates a driving member which turns the wheel. In devices of this type it frequently happens during the course of use, that, either by reason of wear of the parts or for some other reason, the engagement of the pawl, or other driving member, with the flint wheel does not fully occur at the time of the closing movement of the cover. Consequently when the cover is next opened, the lighter does not function.

According to the present invention this disadvantage is eliminated by reason of the fact that during the closing movement of the cover a movable detent ensures the return of the actuating member or pawl for the friction wheel to the position at which engagement between the pawl and the wheel is insured under all conditions of use, and is then withdrawn to allow the cover to flow freely without being hindered by any of the members which it actuates either while opening or closing.

A form of construction of the subject of the invention is illustrated diagrammatically by way of example in the accompanying drawing.

Fig. 1 shows in elevation the position of all the members when the cover is closed.

Fig. 2 is a vertical cross-section on the line II—II of Fig. 1.

Figs. 3 to 5 show to a smaller scale different positions of the members of the lighter during use.

The lighter is provided with a body 10 containing a holder 11 for a flint 12 and a wick 13. On the body 10 are provided two supports 14 between which is mounted a main shaft 15 on which the friction wheel 16 turns. On the shaft 15 there is also rotatably mounted the spaced supporting arms 17 of a snuffer cap 18. To the supports 14 there is also hinged at 20 the cover 19 of the lighter which constitutes the actuating member. One of said arms 17 is provided with a notch 21 with which engages, in the closed position, a projection 22 on a lever 23 pivotally mounted on the shaft 20 and subjected to the action of a spring 24 which constantly tends to cause the projection 22 to engage with the notch 21. The free end 25 of this lever 23 is in the path of abutment 26 (Fig. 3), on the cover 19.

The upper part of the snuffer cap 18 is connected by a coil spring 27 to the bar 34 in the upper part of the cover 19. This spring 27 constitutes the actuating spring of the lighter.

On one of its faces the friction wheel 16 is provided with ratchet teeth 28 with which cooperates a pawl 29, secured to one of the arms 17. It may for example be formed from a spring disk.

On the shaft 15 there is mounted between one of the supports 14 and one of the arms 17 an oscillating cam plate 30 provided near its free end with a slot 31 serving as a guide for a pin 32 on a movable detent 33 pivotally mounted on said bar 34 on the cover 19. The free end 35 of said stop arm 33 is adapted to co-operate with a corresponding recess 36 in one of the arms 17 as described hereinafter.

The operation of this lighter is as follows.

The members being in the position shown in Fig. 1 then when the cover 19 is pivoted about its shaft 20 so as to open the lighter, the spring 27 is tensioned. The tension increases until the moment at which the abutment 26 on the cover comes into contact with the end 25 of the lever 23, as shown in Fig. 3. The rearward movement of the lever causes the projection 22 to be disengaged from the notch 21 against the action of the spring 24, and, at the moment that one of the arms 17 of the snuffer frame is released, it rocks suddenly about shaft 15 under the action of the coil spring 27 which contracts, thus uncovering the wick 13 and entraining the friction wheel 16 by the pawl 29. Consequently it effects ignition of the wick 13 by the sparks projected from the pyrophoric flint 12.

At this moment the members are in the position shown in Fig. 4 and the pivoted detent 33 has been moved by the pin 32 engaging in guide slot 31 of the cam plate 30 so that the end 35 of said detent is opposite the recess 36 of one of the arms 17. It will be obvious, without further explanation, that when the cover 19 is moved in its closing direction, the end 35 of the detent 33 engages with the recess 36 of the adjacent arm 17 of the snuffer cap so that said cap is moved at the same time as the cover 19 and until the pin 32 has reached the end of the slot 31 of the cam plate 30. The inclination of this slot produces an upward oscillation of the detent 33, whose end 35 slides on the curved or inclined portion 37 of the recess 36 and escapes from the recess as indicated in Fig. 5, enabling all the parts to return into the position shown in Fig. 1.

The arrangement is such that in practice the detent 33 constituting the hinged stop pushes the arms 17 of the snuffer cap to such a position so as to ensure an engagement of rachet 28 and pawl 29 and the correct positioning of the cap on its seat.

Experience has shown that it is advantageous to mount the cam plate 30, effecting the movement of the detent 33, with slight friction between one of the arms 17 of the snuffer cap and one of the supports 14 so as to prevent, in the case of an incomplete opening of the cover, the arm 33 from falling into the recess 36 and

remaining stationary therein which would prevent the return of the cover into the closed position.

In the form of construction shown in the drawing, it will be seen from Figs 4 and 5 that the detent **33** is guided, whilst in engagement with one of the arms **17** of the snuffer cap between the cam plate **30** and the spring pawl **29** of the friction wheel.

Instead of hinging the detent on the cover it may be hinged on the operating member for the friction wheel.

The construction above described has the following advantages.

1. The withdrawal of the movable detent at the end of the closing movement of the cover enables the latter to close freely without being hindered by any of the members which it actuates either when being opened or when being closed.

2. As the cap is mounted under spring action and with play on the operating member for the friction wheel, a fluid-tight closure of the wick carrier is ensured as it can assume its position freely on the seat of the wick carrier. This method of connecting the snuffer cap with the pawl for engaging the friction wheel also enables the latter to be pushed by the movable detent slightly beyond its engaging position by the detent so as to ensure under all conditions, and particularly in the case of wear, the engagement of this latter.

I claim:

1. In a cigarette lighter, the combination, including, a pivoted cover, a pivotally mounted arm carrying a snuffer cap and spring biased to cap seating position independently of the cover, a flint wheel having a ratchet face and a pawl secured to said arm for operating said wheel, an actuating spring connecting the cover and snuffer cap arm, a detent pivoted to the cover, and means for controlling the detent to cause it to serve as a stop for the snuffer cap arm when the cover is opened and to push said arm to set the pawl for engaging the ratchet wheel and also move the snuffer cap to fully seated position before the cover is closed.

2. In a cigarette lighter, the combination, including, a pivoted cover, a pivotally mounted arm carrying a snuffer cap, said arm being spring biased to seating position independently of the cover, a flint wheel and pawl mounted co-axially with the pivotal mounting for said arm, said pawl being carried by said arm, an actuating spring connecting the cover and snuffer cap arm and disposed to one side of the point of pivotal support for said arm, a detent pivoted to the cover, a pin projecting from one side of the detent, and a slotted cam plate mounted also co-axially with the snuffer cap arm for guiding the detent into and out of engaging relation to the snuffer cap arm.

3. In a cigarette lighter, the combination, including, a cover pivoted to the body, a wick holder, a flint wheel having a ratchet face, a snuffer cap having arms embracing the flint wheel and pivoted co-axially with the flint wheel, one of said arms having a spring pawl secured to its inner face adapted to engage with the flint wheel, spring means for normally urging the snuffer cap to seated position on the wick holder, an actuating spring connecting the cover and snuffer cap, a detent pivotally carried by the cover, and means mounted co-axially with the flint wheel and snuffer cap and interconnected with said detent to cause said detent to engage a portion of the snuffer cap when the same is lifted and the cover is fully opened, and when the cover moves forward toward closing position on the body to move the snuffer cap to fully closed position and also positively reset the pawl to engage the ratchet on the side of the flint wheel and finally lifting said detent out of the path of the snuffer cap for the next operation of the cover.

4. In a cigarette lighter, including a body, a cover pivoted thereto, a wick holder, a flint holder and a support on the body, a main shaft mounted in the support, a flint wheel on the shaft and having a ratchet face, a pawl on the shaft for actuating the flint wheel, a wick snuffer cap having offset spaced arms rockably mounted on said shaft, one of said arms embracing one side of the flint wheel and the other of said arms carrying said pawl, one of said arms having a notch and a recess, a lever pivoted at one end co-axially with the cover and having a projection at one side thereof for engaging said notch, a spring for urging the lever in a direction to maintain the projection in the notch and thus urge the snuffer cap to seated position on the wick holder, an abutment on the cover for engaging the free end of the lever when the cover is raised thereby to move the lever so as to lift its projection out of the notch, a bar in the upper part of the cover and vertically alined with the pivot between the cover and the body, an actuating spring for the cover having one end connected to the bar and the other end connected to the snuffer cap, a detent pivoted to the bar and having a laterally offset pin, and a cam plate rockably mounted on the main shaft and having a slot for receiving said pin, said slotted plate on the opening of the cover guiding the detent to a position where its free end engages in the said recess of one of the snuffer cap arms to limit rearward movement of the snuffer cap and whereby when the cover is moved toward closed position, the detent will push the snuffer cap into full seating position before the cover is fully closed and the cam plate will lift the detent out of the recess and to a point adjacent the underside of the cover so that said detent will not interfere with the next opening of the cover.

5. In a cigarette lighter, the combination including, a co-axially mounted snuffer cap and flint wheel, cooperating means respectively on the flint wheel and a portion of the snuffer cap supporting means for actuating the flint wheel, a pivoted cover, a detent carried by the cover and pivoted thereto at a point remote from the point of pivoting of the cover, and means mounted co-axially with the snuffer cap and flint wheel for controlling the movement of the detent whereby when the cover is opened the free end of the detent is moved to a position to engage a portion of the snuffer cap, and whereby when the cover is closed said detent will push the snuffer cap to seating position and also reset the pawl and ratchet means prior to the final closing movement of the cover.

LÉON BOLLE.