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## PATENT SPECIFICATION



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508,643

Application Date (in United Kingdom) : Nov. 3, 1938. No. 31864/37.

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### COMPLETE SPECIFICATION

#### Improvements relating to Pyrophoric Lighters

We, LA NATIONALE S.A., a Swiss Corporation of Geneva, Switzerland, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

Pyrophoric lighters are already known wherein the rotation of the friction wheel, adapted to ignite the wick, is effected by opening the hinged cover which, during its movement, tensions a driving spring until this movement releases a driving member for the friction wheel on which the said spring acts. In devices of this character the return movement of the driving member for the friction wheel is effected, on closing the cover, by a projection on this member coming into contact with the cover. This member is held in its starting position by a member engaging therewith and acting in the manner of a detent which is actuated by the movement of the cover. With these known constructions it frequently arises during the course of use, that, either by reason of the wear of the parts or for some other reason the engagement of the driving member for the friction wheel with its retaining member does not take place at the end of the closing movement of the cover. Consequently when the cover is next opened the lighter does not function.

In specification No. 455,113 there is described a lighter in which a hinged cover constitutes the operating member for a friction wheel, whilst a spiral actuating spring is attached at one end to the cover and at the other end to the friction wheel mechanism.

According to the present invention this disadvantage is eliminated by the provision of a pivoted lever which, during the closing movement of the cover, returns the said driving member for the friction wheel positively to the position at which the engagement of the detent is ensured under all conditions, and is then withdrawn from engagement with said driving member so as to allow the cover to close freely without being hindered by any of the members which it actuates

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either whilst opening or whilst closing.

The invention will now be described by way of example with reference to the accompanying drawing. 55

Fig. 1 shows a sectional elevation of the lighter with all the members in the position which they assume when the cover is closed. 60

Fig. 2 is a vertical cross-section on the line 11—11 of Fig. 1.

Figs. 3 to 5 show fragmentary views to a smaller scale when the cover is in different positions. 65

The lighter is provided with a body 10 containing a tube 11 for a pyrophoric stone 12 and a wick 13. On the body 10 are provided two supports 14 between which is mounted a shaft 15 on which the friction wheel 16 turns. On the shaft 15 there is also rotatably mounted the carrier 17 for a wick cap 18. In the supports 14 there is also mounted the shaft 20 for the cover 19 of the lighter, this cover constituting the actuating member. The cap carrier 17 consists of a pair of limbs pivoted at one end on the shaft 15 and at the other end connected together by an apertured boss receiving a pin 40 on which the cap 18 is mounted. The pin 40 is free to slide and turn in the carrier 17 whilst a spring 41 is located between the cap 18 and the carrier, the arrangement, which is known, being such that the cap is enabled to assume automatically its correct position on a seating provided around the outlet opening for the wick 13. One of the arms of the cap carrier 17 is provided with a notch 21 with which engages, when the cover 19 is in the closed position, a projection 22 on a lever 23 which is pivotally mounted on the shaft 20 and is subjected to the action of a spring 24, coiled around the shaft 15, which constantly tends to cause the projection 22 to engage with the notch 21. The free end 25 of the lever 23 is in the path of a stop 26 (Fig. 3), on the cover 19. 90

The cap carrier 17 is connected by a spring 27 to the upper part of the cover 19 at 34. This spring 27 constitutes the actuating spring of the lighter. 95

On one of its faces the friction wheel 16 105 is provided with ratchet teeth 28 with

which co-operates a pawl 29 secured to the cap carrier 17. This pawl may for example be formed by a spring.

On the shaft 15 there is mounted  
5 between one of the supports 14 and one of the arms of the cap carrier 17 an arm 30 provided at its free end with a guide slot 31 serving as a guide for a pin 32 on a lever 33 pivotally mounted at 34 on the  
10 cover 19. The free end 35 of this arm 33 is adapted to co-operate with a corresponding recess 36 in the cap carrier 17 as described hereinafter.

The operation of this lighter is as  
15 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.  
20 The tension increases until the moment at which the stop 26 on the cover comes into contact with the end 25 of the lever 23, which operates in the manner of a detent, and causes it to partake in its movement.  
25 The movement of the lever causes the projection 22 to be disengaged from the notch 21 of the limb of the cap carrier 17 against the action of the spring 24 and at the moment that the carrier 17 is released  
30 it rocks suddenly about its shaft 15 under the action of the spring 27 which contracts, thus uncovering the wick 13 and entraining the friction wheel 16 by the pawl 29. Consequently it effects  
35 ignition of the wick 13 by the sparks projected from the pyrophoric flint 12.

The members are then in the position shown in Fig. 4 and the lever 33 has been brought by the guide slot 31 of the arm  
40 30 with its end 35 opposite the recess 36 of the carrier 17. It will be obvious, without further explanation, that when the cover 19 is moved in its closing direction, the end 35 of the lever 33 engages  
45 with the recess 36 of the carrier 17 so that this is moved at the same time as the cover 19 until the pin 32 has reached the end of the slot 31 of the arm 30, the inclination of this slot producing an upward move-  
50 ment of the lever 33, of which the end slides on the curved or inclined portion 37 of the recess 36 and ends by escaping from the recess as indicated in Fig. 5, enabling all the parts to return into the  
55 position shown in Fig. 1.

The arrangement is such that in practice the lever 33 pushes the cap carrier 17 beyond its starting position so as to ensure engagement with its retaining  
60 lever 23 and a correct positioning of the cap on its seating.

Experiment has shown that it is advantageous to mount the arm 30, effecting the movement of the lever 33,  
65 with slight friction between one of the

arms of the cap carrier 17 and one of the supports 14 so as to prevent, in the case of an incomplete opening of the cover, the lever 33 from falling into the recess  
70 36 of the cap carrier 17 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.  
75 4 and 5 that the lever 33 is guided, whilst in engagement with the cap carrier 17, between the arm 30 and the spring 27.

The construction above described has the following advantages.

1. The withdrawal of the lever 33 from the recess 36 at the end of the closing movement of the cover enables the latter to close freely without being hindered by  
80 any of the members which it actuates either when being opened or when being closed.

2. As the wick cap is mounted under spring action and with play on the operating member for the friction wheel, a fluid-tight closure of the cap is ensured as it can assume its position freely on the corresponding seating of the wick carrier. This method of connection of the cap to  
85 the operating member for the friction wheel also enables the latter to be pushed by the lever 33 slightly beyond its retaining position by the detent so as to ensure under all conditions, and particularly in  
90 the case of wear, the engagement of this latter.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we  
105 claim is:—

1. A pyrophoric lighter, wherein a member, which drives a friction wheel to produce a spark for igniting the wick, is actuated by a spring, which is tensioned  
110 when the hinged cover is open until the cover releases the driving member by acting on a detent by which it is held, characterised by the provision of a pivoted lever which effects, during the closing  
115 movement of the cover, the return of the driving member positively to the position at which the engagement of the detent is ensured under all conditions, and is then withdrawn from engagement with said  
120 driving member so as to enable the cover to be closed freely without being hindered by any of the members which it actuates, either whilst being opened or whilst being closed.

2. A lighter according to claim 1, wherein the driving member is formed by a wick-cap carrier pivotally mounted on the shaft of the friction wheel, characterised in that the wick cap is resiliently  
130

- mounted on the carrier in such a manner as to be capable of sliding axially and turning about its axis so that it always engages automatically in a correct position  
 5 on its seat.
3. A lighter according to claims 1 and 2, characterised in that the lever is pivoted at one of its ends to the cover, the movements of the free end of the lever being  
 10 controlled by a guide pivotally mounted on the shaft of the friction wheel.
4. A lighter according to claims 1, 2 and 3, characterised in that the guide for the lever is formed by an arm provided  
 15 with a guide slot with which engages a projection provided on the pivoted lever.
5. A lighter according to claims 1, 2, 3 and 4, characterised in that the driving member is provided with a recess which  
 20 in the open position of the cover is opposite the free end of the pivoted lever, the arrangement being such that when closing the cover this end engages the recess and remains therein until the driving member has been returned into  
 25 its correct starting position, the end then sliding on a curved portion of this recess so as to be disengaged therefrom.
6. A lighter according to claims 1 to 5, characterised in that the pivoted lever  
 30 moves the driving member beyond its starting point so as to ensure the engagement of the retaining member as also the fitting of the wick cap on its seat.
7. A pyrophoric lighter, substantially  
 35 as hereinbefore described with reference to the accompanying drawing.
- Dated this 3rd day of November, 1938.  
 For the Applicants,  
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 Chartered Patent Agents,  
 93—94, Chancery Lane, London, W.C.2.

[This Drawing is a reproduction of the Original on a reduced scale.]

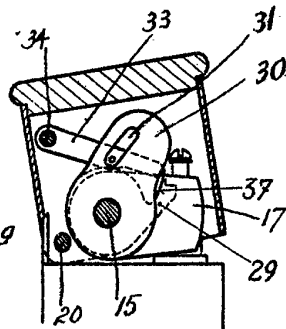
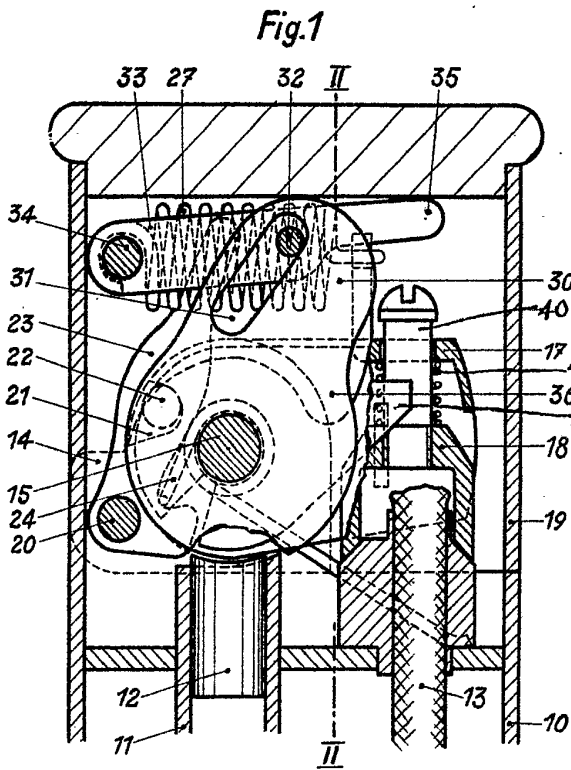


Fig. 5

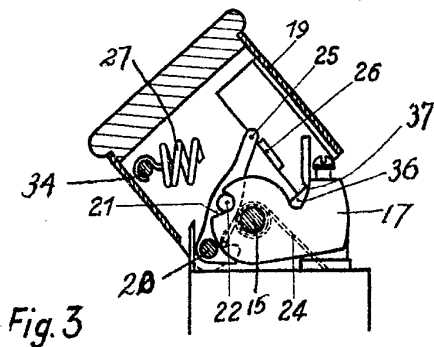


Fig. 3

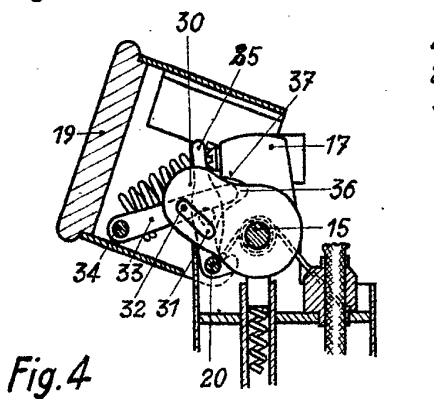


Fig. 4

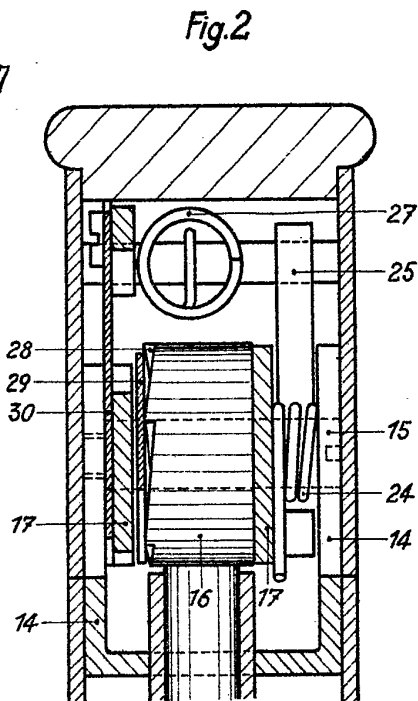


Fig. 2