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## PATENT SPECIFICATION



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### PROVISIONAL SPECIFICATION

#### Improvements in and relating to Pyrophoric Lighters

We, ALFRED DUNHILL LIMITED, a British Company, of 30, Duke Street, St. James's London, S.W.1, and VERNON DUNHILL, a British subject of the company's address, do hereby declare the nature of this invention to be as follows:—

This invention relates to pyrophoric lighters of the type wherein the spark is produced by relative movement between abrasive means, such as a friction wheel and a flint or other pyrophoric material arranged in contact with the abrasive means. An object of the invention is to provide improved operating means for a lighter of this type.

According to the present invention the operating mechanism comprises a pivoted arm which is arranged to be engaged by a sliding bar and rotated against the action of a spring, the arm being released from the bar after a predetermined travel, whereupon the arm is returned under spring force and engages with and actuates the friction wheel for the purpose of igniting the wick of the lighter. The pivot of the arm is preferably concentric with the friction wheel pivot and a one way clutch coupling provided so that the friction wheel is actuated only on the return movement of the arm, further the arm may have a hook shaped member at its free end adapted to be engaged by a projection or nose on the sliding bar when the bar is moved in one direction, the nose passing beneath and past the hook when the bar is moved in an opposite direction.

One end of the sliding bar is preferably pivoted to a lid or cover of the member accommodating the operating mechanism and is actuated to rotate the friction wheel when the lid or cover is opened.

In one embodiment of the invention the operating mechanism is accommodated in a housing designed to resemble a book, for example a novel, and comprises a body portion having its side wall simulating the edges of leaves of a book. The body is provided with end covers bound in leather, cloth, or other book binding material one cover being rigid with the body and the other, prefer-

ably the front one being hinged to the body so that it may be opened in a similar manner to a normal book. On the face of the body beneath the hinged cover, a wick and a flint tube are adjacently mounted and a friction wheel pivoted in rubbing engagement with the flint. A channel section arm is pivotally mounted on the pivot of the friction wheel and coupled to the latter by a one way clutch device. The free end of the arm is connected by means of a pivoted link to a coil spring which is anchored to the body, the free end of the arm being provided with a hook shaped member.

A sliding bar is provided one end of which is pivoted to the inner face of the hinged cover and the other end guided to move to and fro across the face of the body, by providing the free end of the bar with a projection engaging beneath a plate secured to and spaced from the body. The free end of the bar is also provided with a projection or nose arranged to engage with the hook on the pivoted arm.

In operation when the front hinged cover of the book is opened the nose on the sliding bar engages with the hook and rotates the arm about its pivot against the action of the spring. As the bar is moving in a rectilinear and the arm in a rotary path, after a predetermined travel, the nose is pulled past the hook which is sharply returned by the spring. On this return movement the arm is clutched to the friction wheel and rotates it against the flint, the wick being ignited in the usual way. On the cover being closed the nose on the bar slides beneath and past the hook on the arm and the mechanism is reset for operation.

The bar and arm are preferably arranged to move in planes parallel with the face of the body and the mechanism covered by a plate detachably secured as by screws to the body, a guide slot being provided in the plate through which the bar extends.

A wick cap may be carried by an arm pivoted to the hinged cover, the arm being urged by a spring to project from the hinged cover when it is opened, into

engagement with a stop carried by the cover. With such an arrangement the wick cap snuffs the wick before the cover reaches the flame and damage or soiling of the cover is thereby prevented. Further when the cover is closed, the wick cap is urged by its spring to provide a tight fitting cover.

The flint tube may comprise a barrel or like member having a spring pressed plunger urging the flint into contact with the friction wheel. This barrel has an open slot at the end adjacent the friction wheel to permit a flint to be inserted, the plunger being withdrawn by a trigger

for this to be done. Part at least of the body may be hollow to receive or form a fuel container. A spring catch or the like may be provided for normally fastening the hinged cover to the body.

The dimensions and character of the book may be varied as desired according to whether it is to be used as a table lighter or is to be carried in a handbag or pocket.

Dated this 17th day of August, 1938.

ABEL & IMRAY,

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London, W.C.2.

## COMPLETE SPECIFICATION

### Improvements in and relating to Pyrophoric Lighters

We, ALFRED DUNHILL LIMITED, a British Company of 30, Duke Street, St. James's, London, S.W.1, and ALFRED HENRY DUNHILL, of 30, Duke Street, St. James's, London, S.W.1, SAMUEL ERNEST CASH, and ALFRED SAMUEL CASH, both of 51, Lincoln's Inn Fields, London, W.C.2, all British subjects, legal representatives of VERNON DUNHILL, deceased, late of the said Company's address, 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:—

This invention relates to pyrophoric lighters of the type wherein a pivoted arm is moved about its pivot by a slider against the action of a spring and released after a predetermined travel to return under spring force to rotate a friction wheel arranged in contact with a flint or other pyrophoric means for the purpose of igniting the wick. An object of the invention is to provide improved operating means for a lighter of this type.

According to the present invention a pyrophoric lighter of the above type has a slider comprising a bar or the like, one end of which is pivoted to a cover hinged to the lighter body and the other end is adapted to slide across the body of the lighter, the arrangement being such that as the cover is closed the bar slides beneath the arm, and as it is opened the bar engages with and moves the arm about its pivot against the action of the spring. The pivot of the arm is preferably concentric with the friction wheel pivot and a one way clutch coupling provided so that the friction wheel is actuated only on the return movement of the arm; further the arm may be

adapted to be engaged by a projection or nose on the sliding bar when the bar is moved in one direction, the nose passing beneath and past the end of the arm when the bar is moved in an opposite direction.

To enable the invention to be fully understood it will now be described with reference to the accompanying drawings and in which:—

Fig. 1 is a plan view of one form of lighter embodying operating mechanism according to the invention with the cover in open position,

Fig. 2 is a sectional end view on line 2—2 of Fig. 1 but with the cover partly closed, and

Fig. 3 is a sectional end view on the line generally indicated by 3—3 of Fig. 1, the slot in the cover plate being, however, shown in this figure for the sake of clarity.

As shown in the drawings the lighter simulates a book, for example a novel, and comprises a body portion 1 filled with material 1 adapted to absorb petrol and having walls 2 simulating the edges of leaves of a book. The body has end covers bound in leather, cloth or other book binding material, the back cover 3 being rigid with the body 1 and the front cover 4 being hinged to the body and opening in a similar manner to a book.

On the body 1 there are arranged a wick 5, flint tube 6 and a pivoted friction wheel 7. A channel section arm 8 is pivoted on the spindle 9 which also forms the spindle of the friction wheel 7, the arm 8 being coupled to the friction wheel by a one way clutch in known manner. The free end of the arm 8 is connected by a link 10 to one end of a coil spring 11, the other end of which is anchored at 12 to the body 1. Inter-

mediate its ends the spring 11 slidably engages a stud 13 which serves to deflect the normal line of the spring. A sliding bar 14 is pivoted at 15 to the front cover 4 and its free end is provided with a projection 16 which engages with a guideway 17. The free end of the bar 14 has a further nose or projection 18 which is adapted to engage with and actuate the pivoted arm 8. The body 1 is preferably provided with a detachable cover plate 1<sup>b</sup> which is arranged to cover substantially the whole of the operating mechanism with the exception of the wick 5 and flint tube 6, the cover having a slot through which the bar 14 extends. The cover plate is adapted to be attached by screws engaging with the posts 19. A wick cap 20 is pivoted to the end cover 4 and urged by a spring 21 to project into engagement with a stop 22 when the end cover is in the open position shown in the drawings.

In operation as the cover 4 is closed the bar 14 slides in the guideway 17, the projection 18 lifting and sliding beneath the end of the arm 8. When the cover 4 is raised the projection 18 engages with and moves the arm 8 about its pivot against the action of the spring 11 as shown in chain lines in Fig. 1. As the bar 14 moves in a rectilinear and the arm 8 in a rotary path, after a predetermined travel, the projection 18 is pulled past the arm which is sharply returned by the spring 11. On this return movement the arm is clutched to the friction wheel 7 and rotates it against the flint to ignite the wick 5. On the cover 4 being closed the mechanism is reset for further operation.

By provision of the stud 13 the resultant pull exerted on the arm 8 is such that its end is correctly positioned for engagement by the bar 14. Further the positioning of the wick cap 20 ensures that the cap snuffs the wick as the cover 4 is closed before the cover itself can reach the flame and damage or soiling of the cover is thereby prevented. When the cover is fully closed the wick cap is urged by its spring 21 to provide a tight fitting cover for the wick 5.

The flint tube may comprise a barrel or like member having a spring pressed plunger urging the flint into contact with the friction wheel. This barrel has an open slot at the end adjacent the friction wheel to permit a flint to be inserted, the plunger being withdrawn by a trigger for this to be done. A screw cap 23 covers an opening in the body and is removed to enable the lighter to be filled with petrol.

The dimensions and character of the book may be varied as desired according

to whether it is to be used as a table lighter or is to be carried in a handbag or pocket.

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 claim is:—

1. A pyrophoric lighter of the type referred to wherein the slider comprises a bar or the like one end of which is pivoted to a cover hinged to the lighter body and the other end is adapted to slide across the body of the lighter, the arrangement being such that as the cover is closed the bar slides beneath the arm, and as it is opened the bar engages with and moves the arm about its pivot against the action of the spring.

2. A lighter according to claim 1 wherein the arm pivots about the same axis as the friction wheel of the lighter.

3. A lighter according to either of the preceding claims wherein the sliding bar engages in a guideway arranged on the body of the lighter adjacent to the operating mechanism.

4. A lighter according to claim 3 wherein the sliding bar is provided with two projections one of which engages in the guideway and the other is adapted to engage the pivoted arm.

5. A lighter according to any one of the preceding claims 2 to 4 wherein the pivoted arm is coupled to the friction wheel of the lighter by a one way clutch device.

6. A lighter according to any one of the preceding claims wherein a wick cap is hinged to and urged by a spring to project from the cover, the arrangement being such that as the cover is closed the cap snuffs the ignited wick before the cover can come into contact with the flame.

7. A lighter simulating a book, such as a novel, and having operating mechanism according to claim 1 or 2 mounted on a body portion simulating the pages of the book, the sliding bar for operating the mechanism being pivoted to a hinged cover simulating an end cover of the book.

8. A pyrophoric lighter having operating mechanism constructed, arranged and operating substantially as described with reference to the accompanying drawings.

Dated this 22nd day of December, 1938.

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FIG. 1.

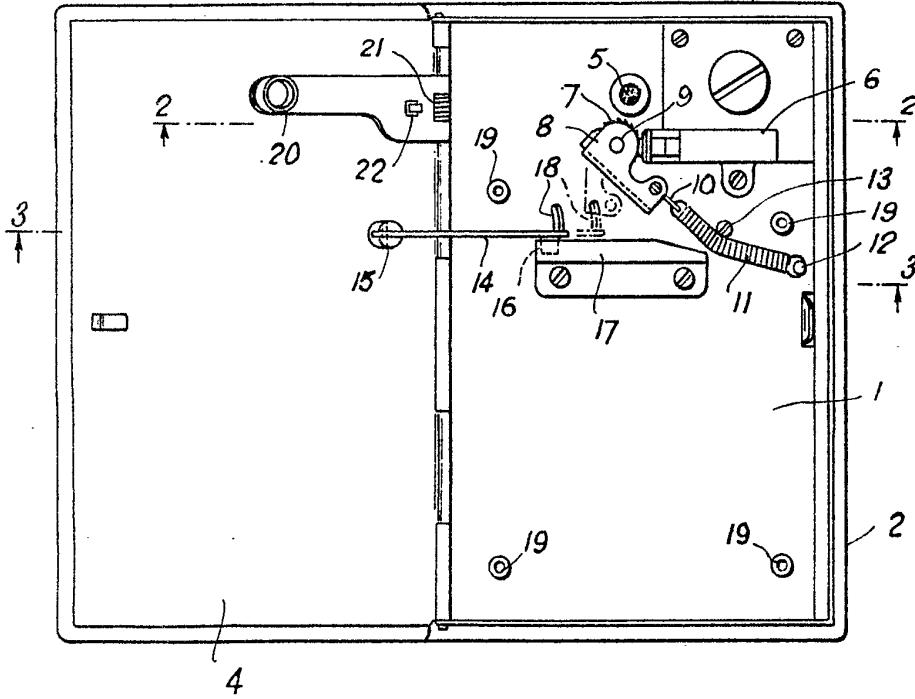


FIG. 2.

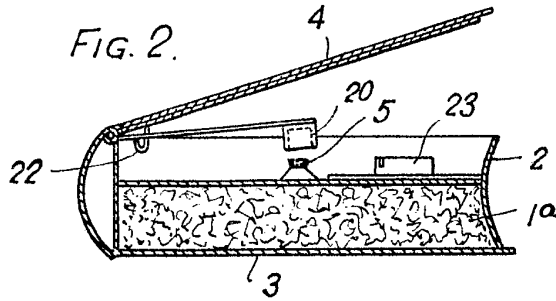
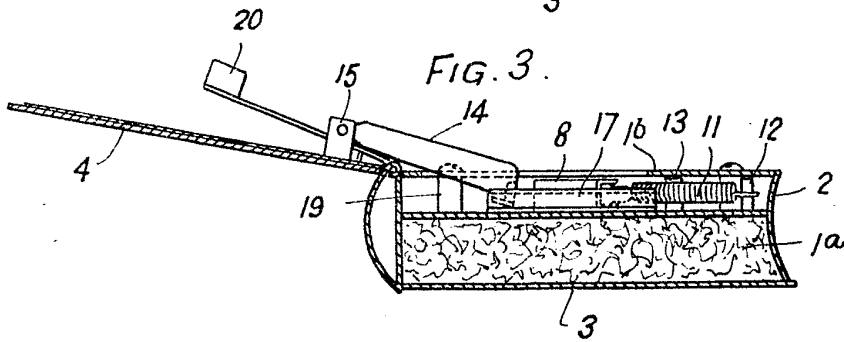


FIG. 3.



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