PATENT SPECIFICATION

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PROVISIONAL SPECIFICATION.

Improvements in or relating to Pyrophoric Lighters.

(Communication from KREMER & BAYER, a German Firm, of Offenbach, Germany.)

We, W. M. CURWEN & COMPANY LIMITED, a British Company, of 6 & 8, Emerald Street, London, W.C.1, do hereby declare the nature of this invention to be as follows:—

This invention comprises improvements in or relating to pyrophoric lighters of the type comprising in combination with a container for the petrol or other fuel, a friction wheel mounted on the top of the container and rotatable in proximity to a wick supplied with fuel by the container, a hinged cap movable at will to cover or uncover the wick, and a coupling between the cap and the wheel such that opening movement of the cap will automatically cause rotation of the wheel to effect ignition.

According to this invention a lighter of the above type is characterised by having the wick cap mounted to hinge about the axis of the friction wheel.

Hitherto in lighters of the type described the wick cap (which may form part of a lid constituting also a cover for the friction wheel) has been hinged at a region spaced apart from the friction wheel and the coupling between the cap and the wheel has necessarily been of a somewhat complicated form. Where according to the present invention the wick cap is mounted to hinge about the axis of the friction wheel, a simpler and more direct coupling can be employed between the cap and the wheel and moreover the cap can be of smaller dimensions and more compact.

In one construction embodying the invention the coupling between the cap and the wheel is in the form of a one-way clutch operable to lock the cap to the wheel for rotation together on opening movement of the cap but arranged to free the wheel upon reverse movement of the cap. In its preferred form the one-way clutch is constituted by a wedging member (e.g. a roller) or members located between the serrated periphery of the friction wheel and an adjacent surface of the cap and arranged to jam in one direction and to free in the other.

[*Price* 1/-]

According to another feature of the invention the top of the container is surmounted by a hood which at one end is cut away to accommodate the wick cap, the latter being so shaped that when closed it forms a continuation of the unbroken portion of the hood and in combination with said portion constitutes a complete enclosure for the top of the container. With this arrangement the lighter presents a neat and compact appearance.

A still further feature of the invention is concerned with a snap-action spring and a device for opening and closing movement of the wick cap.

One example embodying the foregoing and other features of the invention will now be described. In this example the lighter comprises a flat rectangular container of the usual form to contain petrol or other fuel by which the wick is to be supplied. The top of the container is surmounted by a hood or cover which in cross-section is of inverted-U shape. At one end the hood is secured to the container by means of a claw upstanding from the container and engaging in an aperture in the hood. At its opposite end the hood is secured to the container by means of the wick tube. For this purpose, that end of the hood which will be adjacent to the wick is formed with a base-piece which is apertured to receive the stem of the wick tube, the latter being screw-threaded and adapted to be engaged in a screwthreaded aperture in the top of the container.

The usual friction wheel is mounted on the hood in proximity to the wick tube, the axis of the wheel being transverse to the long sides of the container top. The friction wheel is mounted on an axle which extends between the opposite side walls of the hood, and likewise mounted on this axle is a hinged cap for the wick tube. The wick tube end of the hood is cut away to accommodate this wick cap and the latter is so formed that in its closed position it constitutes a virtual continuation of the unbroken portion of the hood, and in combination with that portion provides a complete and compact enclosure for the

top of the container.

The wick cap is formed with a compartment adapted to fit slightly over the top of the wick tube when the cap is closed and also with a portion which partly encircles the periphery of the friction wheel, and with wing pieces which embrace the sides of the friction wheel and which are apertured to take the axle of the wheel. Thus the wick cap is movable on the axle of the friction wheel from a closed or horizontal position into an open or upright position in which the wick is exposed. Movement of the wick cap is controlled by a spring housed in the unbroken portion of the hood. This spring is at one end anchored by the claw which secures the hood, and at the other end it engages the cross-piece of a stirrup whereof the arms embrace the sides of the wick cap and are pivotally connected thereto. In the closed position of the wick cap the pivoted ends of the stirrup arms lie beyond the wheel axle, on the opposite side thereof from the spring, and they also lie below the wheel axle so that the line of pull of the spring lies below the axle. The arms of the stirrup are upwardly curved so as to clear the axle of the wheel when the wick cap is closed. A small trigger is provided for opening the wick cap. This is pivotally mounted on one side of the hood, is accessible from the outside thereof, and has a finger extending through an aperture in the side wall aforesaid into underlying engagement with the adjacent arm of the stirrup. The arrangement is such that when the trigger is depressed the finger will raise the wick cap and immediately the latter reaches a position in which the line of pull of the spring is above the wheel axle, the cap will be sprung into the upright position by the snap action. The cap is prevented from going too far by portions of the hood which act as stops in conjunction with the arms of the stirrup.

Between the cap and the friction wheel there is a one-way clutch constituted by a roller disposed with its axis parallel to the axle of the wheel in a space between the inner wall of the cap and the adjacent periphery of the wheel. The space in the cap which keeps the roller is wedge-shaped and so dimensioned that when the roller is at the narrow end of the cavity it jams between the cap and the wheel, while at the broader end of the cavity the roller is free. This clutch (which is in itself of known type) is so arranged that when the wick cap is sprung upwardly the roller aforesaid is jammed between the friction wheel and the cap and so the friction wheel is rotated. On the other hand when the cap is being closed the roller is free and there is no rotation of the friction wheel. A flint or the like is pressed upwardly as by a spring into contact with the under-surface of the friction wheel, so that sparks will be directed towards the wick when the cap is opened.

An important advantage of the invention is that by virtue of the one-way clutch the whole periphery of the friction wheel is rendered effective. At each operation the wheel is turned through only a small angle and successive operations bring into play successive portions of the circumference of the wheel.

If desired the side walls of the hood may be continued round the wick to constitute a " storm shield ", which may be apertured in the usual way

Dated this 12th day of December, 1930.

BOULT, WADE & TENNANT,
111 & 112, Hatton Garden, London, E.C.1,
Chartered Patent Agents.

COMPLETE SPECIFICATION.

Improvements in or relating to Pyrophoric Lighters.

We, W. M. CURWEN & COMPANY, LIMITED, a British Company, of 6 & 8, Emerald Street, London, W.C.1, 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 comprises improvements in or relating to pyrophoric lighters of the type comprising in combination a body portion constituting or containing a reservoir for the petrol or other fuel, a friction wheel mounted on the top of the body portion and rotatable in proximity to a wick supplied with fuel by the reservoir, and a hinged cap movable at will to cover or uncover the wick.

This invention provides a lighter of the type above specified, having a hood which surmounts the top of the body and is cut away at one end to accommodate the hinged cap and wherein the cap is so shaped that in the closed position it forms a continuation of the hood and in conjunction therewith forms a complete cover for the top of the body and for the friction wheel and wick.

Preferably the cap is hinged for movement about the axis of the friction wheel, and there may be a coupling between the cap and the wheel such that opening movement of the cap will automatically cause rotation of the wheel to effect ignition. The mounting of the cap for movement about the axis of the friction wheel lends itself particularly well to the previously specified features of shape of the cap and the hood, and moreover it permits the use of a simple coupling between the cap and the wheel.

In one construction according to this invention, the coupling between the cap and the wheel is in the form of a one-way clutch operable to lock the cap to the wheel for rotation together on opening movement of the cap but arranged to free the wheel upon reverse movement of the cap. In its preferred form, the one-way clutch is constituted by a wedging member (e.g. a roller) or members located between the serrated periphery of the friction wheel and an adjacent surface of the cap and arranged to jam in one direction and to free in the other.

One example according to the present invention will now be described in detail with reference to the accompanying drawings, in which

Figure 1 is a perspective view of a lighter with the wick cap closed,

Figure 2 is a similar view showing the wick cap open,

Figure 3 shows a snap-over spring and associated parts for the wick cap,

Figure 4 is a section through the lighter, and

Figure 5 is a plan of the lighter with the wick cap open.

Throughout this description like reference numerals indicate like parts.

In this example the lighter comprises a flat rectangular container 10 of the usual form to contain petrol or other fuel by which the wick is to be supplied. The top of the container 10 is surmounted by a hood or cover 11 which in cross-section is of inverted U-shape. At one end of the hood is a claw 12 upstanding from the container. At its opposite end the hood is secured to the container by means of the wick tube 14. For this purpose, that end of the hood which will be adjacent to the wick is formed with a base-piece 15 which is apertured at 16 to receive the stem of the wick tube, the latter being screw-threaded and adapted to be engaged in a screw-threaded aperture in the top of the container.

Between the base plate 15 of the hood and the top of the container 10, a strip of absorbent material 39 is located around the wick tube and also around the tube 36 which carries the flint 32. Adjacent to the wick tube 14 this base plate 15 is perforated as at 40. It frequently occurs that lighters are provided with more fuel that the wadding in the reservoir can absorb, and when such a lighter is placed in the pocket, superfluous fuel leaks along the wick tube and finds its way on to the flint. When this happens, the friction wheel cannot strike sparks from the flint and the material rubbed off the latter lodges between the teeth of the friction wheel and clogs them. In the construction shown in the drawings such fuel will be absorbed by the layer 39 and will, therefore, be prevented from reaching the flint.

The usual friction wheel 17 is mounted on the hood in proximity to the wick tube 14, the axis of the wheel being transverse to the long sides of the container top. The friction wheel is mounted on an axle 18 which extends between the opposite side walls of the hood, and likewise mounted on this axle is a hinged cap 19 for the wick tube. The wick tube end of the hood 11 is cut away to accommodate the wick cap 19 and the latter is so formed that in its closed position it constitutes a virtual continuation of the unbroken portion of the hood, and in combination with that portion provides a complete and compact enclosure for the top of the container.

The wick cap is formed with a compartment 20 adapted to fit snugly over the top of the wick tube when the cap is closed and also with a portion 21 which partly encircles the periphery of the friction wheel 17, and with wing pieces which embrace the sides of the friction wheel and which are apertured at 22 to take the axle of the wheel. Thus the wick cap 19 is movable on the axle 18 of the friction wheel from a closed or horizontal position (Figure 1) into an open or upright position (Figure 2) in which the wick is exposed. Movement of the wick cap is controlled by a spring 23 housed in the unbroken portion of the hood. This spring is at one end anchored by the claw 12 which secures the hood, and at the other end it engages the cross-piece 24 of a stirrup whereof the arms 25 embrace the sides of the wick cap and are pivotally connected thereto at 26. In the closed position of the wick cap the pivoted ends of the stirrup arms 25 lie beyond the wheel axle, on the opposite side thereof from the spring, and in such a position that the line of pull of the spring lies below the axle. The arms of the stirrup are upwardly curved as shown so as to clear the axle of the wheel when the wick cap is closed. A small trigger 27 is provided for opening the wick cap. This is pivotally mounted on one side of the hood, is accessible from the outside

thereof, and has a finger 28 extending through an aperture in the side wall aforesaid into underlying engagement with the adjacent arm of the stirrup. The arrangement is such that when the trigger 27 is depressed the finger 28 will raise the wick cap and immediately the latter reaches a position in which the line of pull of the spring is above the wheel axle, the cap will be sprung into the upright position by the snap action. The cap is prevented from going too far by portions 29 (Figures 1 and 5) of the hood which act as stops in conjunction with the arms 25 of the stirrup.

Between the inner wall of the cap 19 and the periphery of the friction wheel 17 there is a one-way clutch constituted by a roller 30 disposed with its axis parallel to the wheel axle 18. The roller 30 is located (as shown in Figure 4) in a cavity between the back wall of the portion 21 of the cap and an abutment 31. When the wick cap is sprung upwardly the roller 30 is jammed between the friction wheel and the cap and so the friction wheel is rotated. The abutment 31 ensures that this jamming action will take place on upward movement of the wick cap. On the other hand when the cap is being closed the roller is free to move within the cavity aforesaid away from the periphery of the friction wheel and consequently there is no rotation imparted to the latter. By virtue of this one-way clutch (which is in itself of known type) the whole periphery of the friction wheel is rendered effective. It will be appreciated that at each operation, the wheel is turned through only a small angle and successive operations bring into play successive portions of the circumference of the wheel.

If desired the side walls of the hood 11 may be continued round the wick to constitute a storm shield, which may be apertured in the usual way.

In the base of the lighter is a screw plug 33 which closes the aperture for filling the lighter with fuel, and a second screw plug 34 which is hollow and at its inner end is sealed by a screw 35 and provides a receptacle for spare flints. The flint 32 which is in use is positioned in a tubular flint holder 36 (see Figure 4) which extends from one end of the lighter to the other. There is a shallow recess 37 in the base of the lighter and this recess accommodates the head 38 of an adjuster. The head is slotted so that it may be rotated by a coin gripped in the fingers.

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 specified, having a hood which surmounts the top of the body and is cut away at one end to accommodate the hinged cap and wherein the cap is so shaped that in the closed position it forms a continuation of the hood and in conjunction therewith forms a complete cover for the top of the body and for the friction wheel and wick.

2. A lighter according to Claim 1, wherein the cap is hinged for movement about the axis of the friction wheel.

3. A lighter according to Claim 1 or Claim 2, having a coupling between the cap and the wheel such that opening movement of the cap will automatically cause rotation of the wheel to effect ignition.

4. A lighter according to Claim 3 having a one-way clutch operable to lock the cap to the wheel for rotation together on opening movement of the cap but arranged to free the wheel upon reverse movement of the cap.

5. A lighter according to Claim 4, wherein the one-way clutch comprises a wedging member (e.g. a roller) or members located between the serrated periphery of the wheel and an adjacent surface of the cap and arranged to jam in one direction and to free in the other.

6. A lighter according to any of the preceding claims, having a snap-action spring for opening the cap.

7. In a lighter according to Claim 6, a stirrup pivoted to the cap, and a tension spring pulling on the stirrup, the pivot between the stirrup and the cap being so situated that in the closed position of the cap the line of pull of the spring lies below the friction wheel axle and in the opened position of the cap the line of pull lies above that axle.

8. In a lighter according to any of the preceding claims, a layer of absorbent material surrounding the wick tube and preferably also the flint tube, for the purpose specified.

9. A lighter according to Claim 8, having a base plate on the hood at the cut-away end thereof and overlying an end of the lighter body and wherein the aforesaid layer of absorbent material is located beneath the base plate.

10. A lighter according to Claim 9, wherein the base-plate is perforated adjacent to the wick.

11. A pyrophoric lighter substantially as described herein and substantially as shown in the accompanying drawings.

Dated this 4th day of September, 1931.

BOULT, WADE & TENNANT,
111 & 112, Hatton Garden, London,
E.C.1,
Chartered Patent Agents.

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Fig. 1.

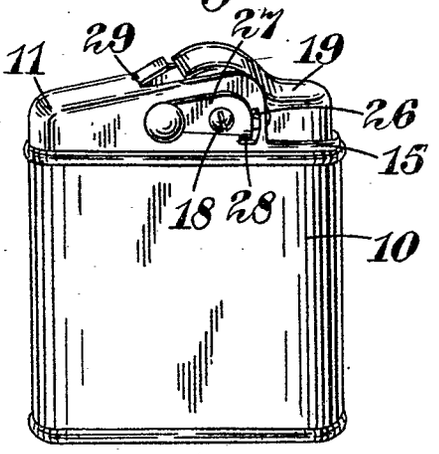


Fig. 2.

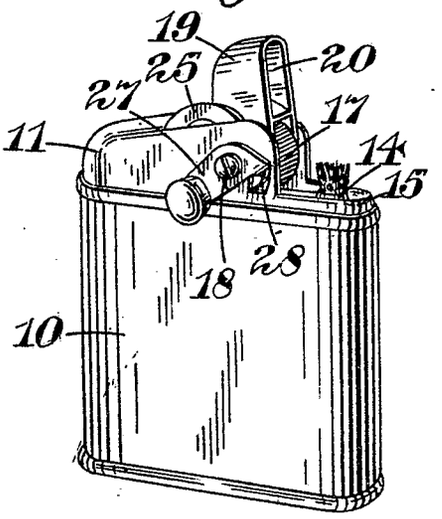


Fig. 4.

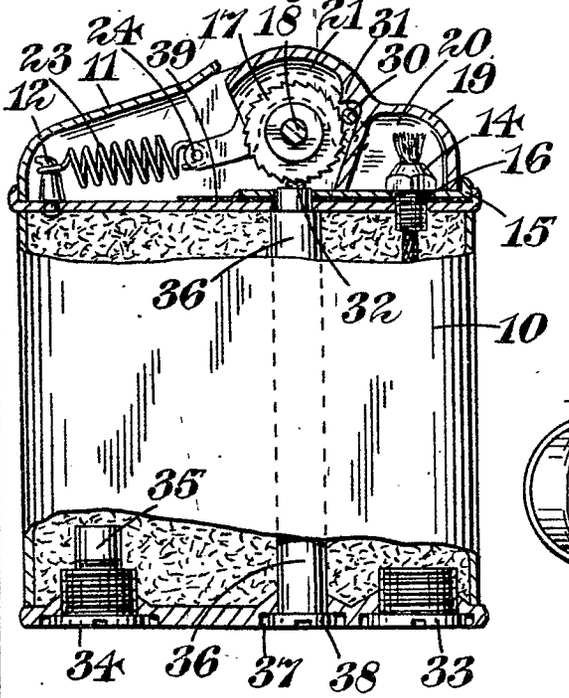


Fig. 3.

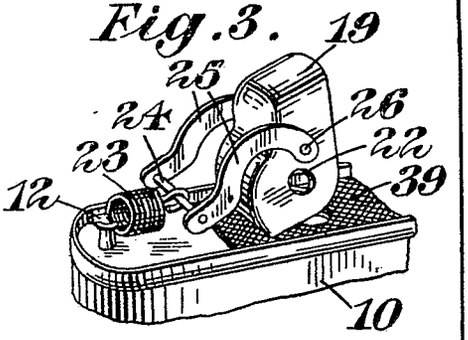
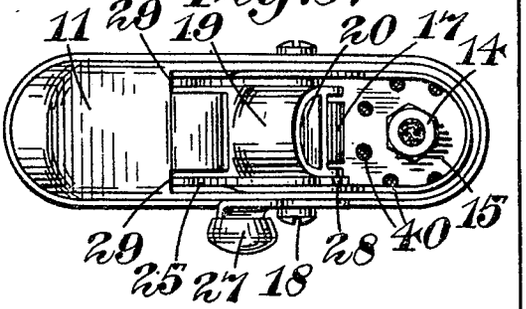


Fig. 5.



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