137,508

PATENT SPECIFICATION

Convention Date (Switzerland), Jan. 4, 1919.

Application Date (In the United Kingdom), Aug. 30, 1919. No. 10,717/19.

Complete Accepted, Jan. 29, 1920.

COMPLETE SPECIFICATION.

An Improved Friction Lighter.

I, HERMANN THORENS, of Ste. Croix, Switzerland, Manufacturer, 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 friction lighters of the type comprising a stone composed of a pyrophoric element against which there is rubbed the rough surface of a steel wheel actuated by a spring through the intermediary and on the opening of the lid of the apparatus.

In such friction lighters the resistance opposed by the friction of the parts is a factor of importance, and it is particularly apparent when the action of the spring is beginning, and the inertia of the mechanism has to be overcome. If this fact is not taken into account the wheel only gets up its speed gradually, and the commencement of the rotation constitutes a lost motion which causes misfires or weak sparks that do not ensure the igniting of the saturated wick which is usually used in such lighters.

Attempts have been made to overcome this disadvantage and it is known for friction lighters designed with this object in view to comprise in combination with other known parts, a member pivotally mounted on the arbor of the friction wheel such member having one portion thereof in the form of a pawl held in engagement with a ratchet surface on the side of such friction wheel, the other portion of said member being provided with an opening into which projects a lug fixed to the lid of the apparatus. The lug is adapted to engage the side of such opening on the lid being opened and thus rotate the member and incidentally the friction wheel to which it is connected by means of the ratchet and pawl. The opening in such member is so designed that the lid opens a short distance before the lug projecting therefrom engages with the side of the said opening and thus the friction wheel is not rotated until the inertia of the mechanism is overcome.

It is also known in apparatus of the type first hereinbefore referred to for the friction wheel to be provided with a number of pins projecting from one side thereof and for the said friction wheel to be rotated in contact with the pyrophoric element on the opening of the lid owing to the engagement with the aforesaid pins of a hooked pawl after the same has made an appreciable movement, such hooked pawl being pivotally connected to the lid and pressed into contact with such pins by means of a spring.

The object of this invention is to overcome the aforesaid disadvantage in a simple and efficient manner.

With this object in view the invention consists of a friction lighter of the

[*Price* 6*d.*]

type hereinbefore mentioned, in which the actuation of the wheel contacting with the pyrophoric element is retarded relatively to the instant of the beginning of the movement of the lid, for the purpose of imparting to the wheel a sudden impulse, said friction lighter being characterised by a hook connected pivotally with considerable friction to the lid and so arranged as to engage, after the latter has begun its opening movement, under one of the various pins arranged on the crown face of the wheel, the said hook, on the commencement of the closing movement of the lid, releasing the said pin, and, as the closing closing movement continues, rocking around the axis of the lid until the end of the hook contacts with a stopping surface upon which it slides, the hook being turned on its own pivot until, on the complete closure of the lid, it is in a position for effecting the operation of the lighter on the reopening of the lid.

A constructional form of the improved friction lighter according to this invention is illustrated by way of example in the accompanying drawings in which:—

Fig. 1 shows it open, the front wall being removed.

Fig. 2 shows the apparatus closed, from the same side as that shown in Fig. 1.

Fig. 3 shows on a larger scale the various relative positions of the hook and the pins referred to in the opening statement.

Fig. 4 is a plan of the apparatus showing the lid in the open position.

Fig. 5 is a front elevation and Fig. 6 a sectional elevation of the removable burner.

Referring to the above mentioned drawings, *a* is a box to which a lid *b* is hinged, the greater portion of which is occupied by a reservoir *c* in which is immersed a wick (Fig. 6), one of whose ends passes out through the burner d. This burner is removable and is composed of a nozzle prolonged by a split tube that has a slight spring action which is introduced into a short neck soldered to the top of the reservoir *c*.

This construction has the advantage of guiding the wick for a considerable length, so that when by reason of the want of petrol this wick is unduly consumed, it will not fall back into the reservoir.

In removing the burner, the wick is removed with it, and then it can be pushed back to a useful length.

On the side shown in Fig. 1 there is soldered a bracket *f* formed in one piece with the top of the reservoir *c* in which is rivetted an axle pin on which the wheel *g* can rotate freely. The bracket *f* is prolonged upwardly by an arm in a claw f^1 of which there is adapted to slide a pyrophoric stone pressed against the wheel by a straight end *k* of a spring whose turns surround the axis of the hinge of the lid, and whose other end *l* bears against the lid.

This spring works in torsion and has a tendency to keep the lid open, and it is prolonged inside the latter for maintenance of an extinguisher *h* which when the lid is closed, fits upon the burner *d*. A push stud is further provided for maintaining this closure. The hook *i* is pivotally connected with considerable friction to a part fixed to the lid. It is so arranged as to engage one of the three pins which are carried by the crown face of the wheel, and so as to move the said wheel at each opening of the lid. This drive is effected in the following manner:—

When the lid is closed and the spring is stressed, the hook (see Fig. 3) is in the position I. At the time of opening this hook moves (by virtue of the considerable friction of its pivotal connection) not around its own pivot, but around the axle pin of the lid as a centre, and comes into the position II, in which it meets one of the pins of the wheel over which it first slides until it engages it with its nose, and then couples the wheel to the lid.

The stoppages of the latter constitute also the stoppage of the wheel, and the parts are in the relative positions indicated at III.

When the lid is closed again, the hook retains at first relatively to the latter the position which it occupied in its third stage still by virtue of the considerable friction of its pivotal connection, and it moves with the lid around the axle

pin of the latter until it meets the upper portion of the reservoir (position IV) which forms here the stopping surface referred to in the opening statement, over which surface it slides and returns into the position I.

It will be seen that before the wheel is operated, all the other movable parts of the apparatus will have acquired a certain speed. This has the result of producing a sudden and rapid rotation of the wheel, and although the latter rotates only through one third of a revolution at each operation, the spark is a powerful spark and the saturated wick is ignited with certainty.

Another advantage of the construction shown consists in the fact that all the parts of the friction lighter which are subject to wear can be replaced without the aid of any tool. As a matter of fact if, the lid being open, the lid be closed a little, the hook will become disengaged from the pin. If the hook is then pressed back slightly, and thus turned on its pivot, it will, on the release of the lid, pass the pin without engaging therewith and occupy the position shown at V. (Fig. 3).

In this position the hook which was keeping the wheel in place on its axle, no longer prevents the removal of the wheel. The slot formed in the box allows of its replacement.

On the other hand, the part b^1 of the lid abuts against the underside of the limb of the spring that bears upon the pyrophoric element and places the latter out of operation. In position V, this limb occupies the position shown at k in Figure 3, and allows of an easy removal of the stone.

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

1. A friction lighter of the type hereinbefore mentioned, in which the actuation of the wheel contacting with the pyrophoric element is retarded relatively to the instant of the beginning of the movement of the lid, for the purpose of imparting to the wheel a sudden impulse, said friction lighter being characterised by a hook connected pivotally with considerable friction to the lid and so arranged as to engage, after the latter has begun its opening movement, under one of the various pins arranged on the crown face of the wheel, the said hook, on the commencement of the closing movement of the lid, releasing the said pin, and, as the closing movement continues, rocking around the axis of the lid until the end of the hook contacts with a stopping surface upon which it slides, the book thus being turned on its own pivot until, on the complete closure of the lid, it is in a position for effecting the operation of the lighter on the reopening of the lid.

2. A friction lighter as claimed in Claim 1, wherein the wheel is mounted loose on its axle and is held in place by the hook which operates it, so that the removal of the said hook allows of the removal of the said wheel.

3. A friction lighter as claimed in Claim 2, wherein the spring that moves the lid bears at one end upon the pyrophoric element and at its other end against the bottom of the lid and means are provided whereby, upon the opening of the lid beyond its normal position of stoppage in the open position, as by the unhooking of the hook from the pin of the wheel, the end of the spring bearing on the pyrophoric element is lifted therefrom thus allowing of the said element being replaced.

4. The improved friction lighter constructed and operating substantially as hereinbefore described, and as illustrated in and by the accompanying drawings.

Dated this 28th day of April, 1919.

MARKS & CLERK.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1920.

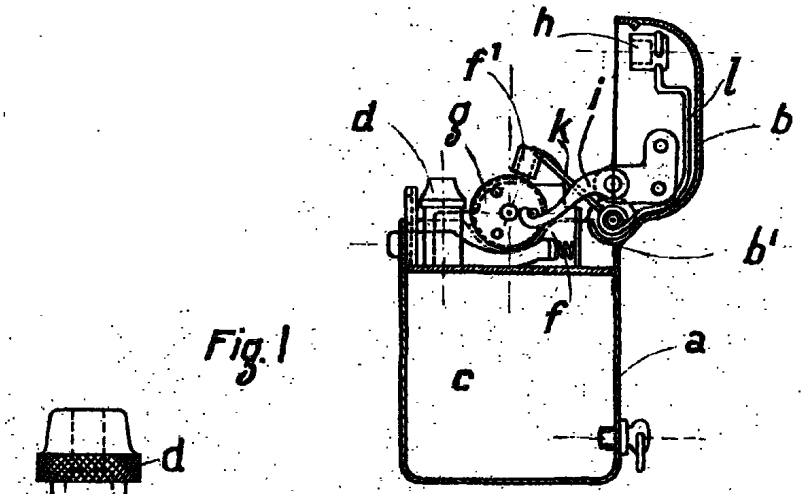
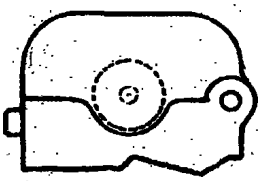


Fig. 1

Fig. 5.

Fig. 2



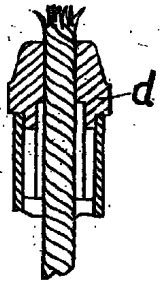
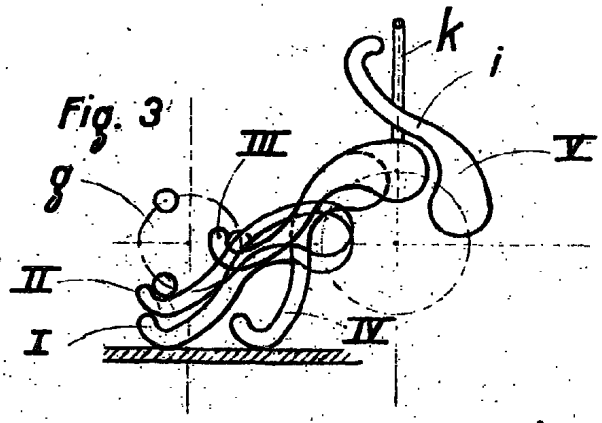


Fig. 6.

Fig. 3



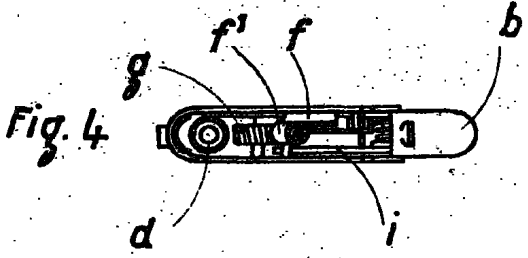


Fig. 4

Malby & Sons, Photo-Litho.