Dec. 30, 1947. B. LOWENTHAL 2,433,467

PYROPHORIC LIGHTER

Filed May 7, 1945

FIG. 1.

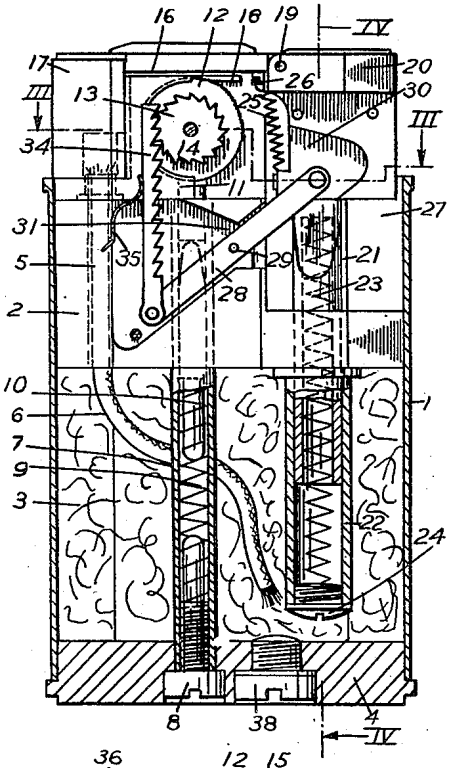


FIG. 2.

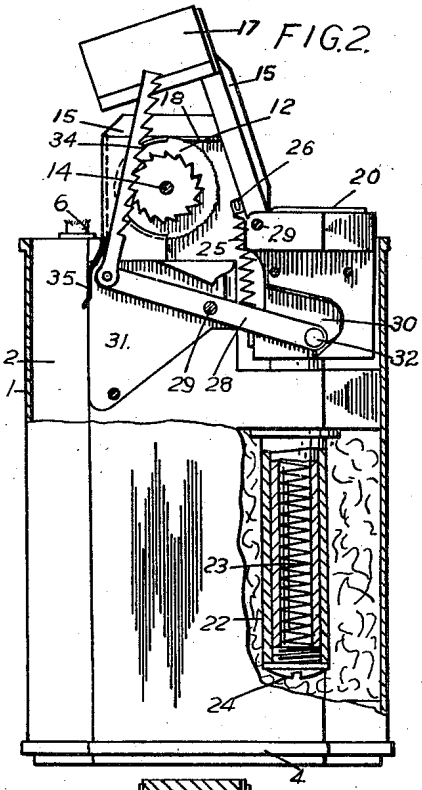


FIG. 3.

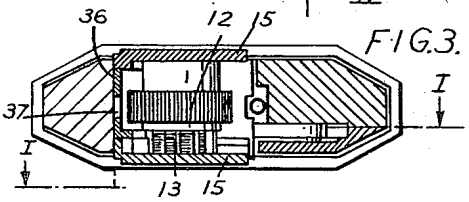


FIG. 4.

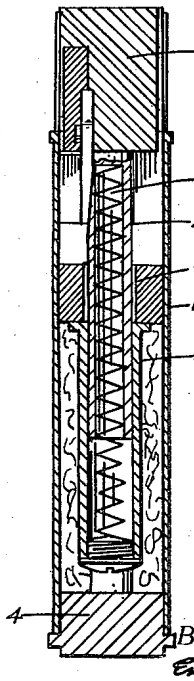
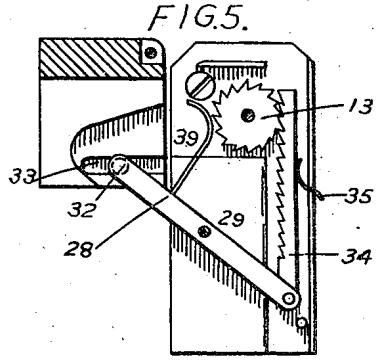


FIG. 5.



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PYROPHORIC LIGHTER

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6 Claims. (Cl. 67—7.1)

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This invention relates to a pyrophoric lighter comprising a casing containing or forming a fuel reservoir on which is mounted a friction or flint wheel which bears against a flint and, when rotated, projects a spark onto a wick which extends from the fuel container to a point on top of the reservoir adjacent the flint. The invention is concerned more particularly with a lighter of the kind in which the friction wheel and the wick are enclosed by a wick cap or cover which can be opened by depressing a lever or thumb piece and the opening of which automatically effects a partial rotation of the friction wheel and causes the wick to be ignited, while, on releasing the lever or thumb piece, the wick cap or cover is automatically closed.

Hitherto, in lighters of this kind the operating lever has been pivotally mounted on the top of the fuel reservoir and the rotation of the friction wheel has been effected by means of a rack which was connected to the wick cap or cover and engaged a ratchet wheel connected to the friction wheel. The known construction had the disadvantage that there were openings or spaces below the operating lever which were liable to collect dirt and, moreover, detracted from the appearance of the lighter.

An object of the present invention is to provide an improved lighter of the kind set forth.

According to the invention, the rotation of the flint wheel is effected by means of a rack which engages a ratchet wheel connected to the flint wheel and a lever which is pivoted to the casing and of which one end is pivoted to the rack and the other end is operatively connected to the operating member of the wick cap or cover. According to a further feature of the invention, the casing of the lighter is provided above the fuel reservoir with a recess into which the operating member of the wick cap or cover enters when it is depressed to operate the wick cap or cover. As a consequence of this construction it becomes possible, in accordance with another feature of the invention, to make the side and top surfaces of the lighter substantially free from any apertures and projections, so that the above-mentioned disadvantage is avoided.

According to one preferred form of construction, the friction wheel and a ratchet wheel by which it is operated are fixed on a spindle which is carried in side plates attached to or integral with the sides of the casing, and the ratchet wheel is engaged, as aforesaid, by a rack which is pivoted to one end of a lever of which the other end is operatively connected to the operating member,

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The wick cap or cover is then in the form of a plate-like portion which normally rests on ledges projecting inwardly from the side plates and of which the rear end is pivotally connected to the operating member, and a portion which projects downwardly from the front of the plate-like portion and encloses the wick and, when the wick cap is closed, forms a continuation of the side-plates.

In order that the invention may be easily understood and readily carried into effect, a pyrophoric lighter constructed in accordance with the invention is illustrated, by way of example, in the accompanying drawing, in which:

Figure 1 is a vertical section through the lighter taken on the line I—I of Fig. 3 with the wick cap closed;

Figure 2 is a similar section showing the wick cap open;

Figure 3 is a section on the line III—III of Fig. 1;

Figure 4 is a transverse section on the line IV—IV of Figure 1; and

Figure 5 is a detail sectional view.

Referring to the drawing, the lighter comprises a casing 1 of which the upper part encloses the head part 2 and the lower part constitutes the fuel reservoir and is filled as usual with absorbent material 3. The lower part is closed on top by the head 2 and at the bottom by a cover 4. The head part 2 is provided adjacent its front end with a bore 5 through which a wick 6, which is surrounded by the absorbent material 3, is passed. Adjacent the wick 6, a tube 7 is fitted in a bore in the head part 2 and its lower end, which enters a bore in the cover 4, is closed by a screw 8. The tube 7 contains a spring 9 and a flint support 10 by which a flint 11 in the upper end of the tube is pressed against a flint wheel 12. The flint wheel 12 is fast on a spindle 14 which is rotatable in side plates 15 extending from the head part 2. A ratchet wheel 13 is also fixed on the spindle 14 beside the flint wheel 12.

On top of the head part 2 is mounted a wick cap which consists of a substantially flat plate-like portion 16 and a downwardly extending V-shaped portion 17 which normally encloses the wick and of which the edges are flush with the edges of the side plates 15. The portion 16 normally rests on ledges 18 which project inwardly from the side plates 15 and is pivoted by a pivot 19 to an operating member 20. To the underside of the member 20 is fixed a tube 21 which is a sliding fit in a tube 22, the upper end of which is fixed to the underside of the head part 2. A spring 23 is disposed within the tubes 21 and 22

and its upper end bears against the part 20 while its lower end bears against a screw 24 by which the end of the tube 22 is closed. The member 20 is therefore normally held in the position indicated in Figure 1 by the spring 23, but can be depressed against the action of the spring so as to enter a recess 27 provided in the head part 2. A spring 25 which tends to hold the wick cap 16, 17 in the position of Figure 1 is anchored at one end to a hook 26 on the part 16 and at the other end to the head part 2.

A lever 28 is pivoted by a pivot 29 intermediate its ends to the head part 2 and can move in recesses 30 and 31 provided in the side of the part 2. One end of the lever has a projecting stud 32 which can slide in a slot 33 in the part 20 and to the other end of the lever is pivoted a rack 34 which engages the ratchet wheel 13. The teeth of the rack are held in engagement with those of the ratchet wheel by means of a spring 35 which is held in a slot in the head part 2 and bears against the back of the rack.

A screen 36 having an aperture 37 for the passage of the sparks is provided between the flint wheel 12 and the wick 6. This screen acts as a guard for the flint wheel and helps to prevent excess fuel from the wick from wetting the flint wheel.

The fuel reservoir is provided as usual with a filling opening which is closed by a screw 38.

In operation, when the part 20 is depressed the part 16 of the wick cap slides along the ledges 18 and is simultaneously pivoted about the rear edges of those ledges which are curved and thereby move into the open position shown in Figure 2. At the same time the lever 28 is rotated about its pivot so that the rack 34 is moved upwardly and partially rotates the flint wheel which engages the flint and produces a spark to ignite the wick in the normal manner. When the part 20 is released it is returned by its spring 23 into the position of Figure 1, the wick cap 16, 17 being simultaneously returned into its original position by the spring 25. The rack is also returned without rotating the ratchet wheel, which is held against rotation by means of a pawl 39.

As will be seen, especially from Figures 1 and 3, when the wick cap is closed, the lighter presents on all sides substantially flush surfaces which are free from openings which detract from the appearance of the lighter and are liable to collect dust.

I claim:

1. In a cigarette lighter that includes a casing, a wick projecting therefrom, an igniting device associated with the wick, and operating mechanism including a plunger mounted for rectilinear reciprocation and arranged to actuate the igniting device during depression of the plunger, automatically operating closure means pivoted to the plunger and comprising a cover for the wick, and guide means arranged between the plunger and the wick to support a portion of the cover against movement in the direction of movement of the plunger when depressed and to permit the cover to side and to pivot between the cover and plunger to travel with the latter to swing the cover open when the plunger is depressed.

2. In a cigarette lighter that includes a casing, a wick projecting therefrom, an igniting device associated with the wick, and operating mechanism including a plunger mounted for rectilinear reciprocation and arranged to actuate the igniting device during depression of the plunger; automatically operating closure means according to claim 1 wherein the cover comprises a plate pivoted at one end to the plunger for swinging about an axis transverse to the path of movement of the plunger and carrying a wick-enclosing element at its other end, and the supporting means is provided with a bearing surface spaced toward the wick from the pivot to permit the pivoted end of said plate to be swung down with the plunger thereby lifting the wick-enclosing member from the wick.

3. In a cigarette lighter that includes a casing, a wick projecting therefrom, an igniting device associated with the wick, and operating mechanism including a plunger mounted for rectilinear reciprocation and arranged to actuate the igniting device during depression of the plunger; automatically operating closure means according to claim 1 including spring means arranged to exert pressure on the cover at a point spaced from the pivot toward the wick to urge the cover to swing toward closed position.

4. In a cigarette lighter that includes a casing, a wick projecting therefrom, an igniting device associated with the wick and comprising a flint and a friction wheel, and operating mechanism including a plunger mounted for rectilinear reciprocation and arranged for turning the friction wheel during depression of the plunger; cover means comprising a member pivoted to the plunger and extending over the wick, a supporting structure projecting from the casing between the wick and the plunger, said structure rotatably supporting the friction wheel and having a bearing surface terminating at a point spaced from the pivot in the direction of the wick, said surface slidably supporting the cover member and permitting its pivoted end to swing with the plunger to raise the other end from the wick as the plunger is depressed.

5. In a cigarette lighter that includes a casing, a wick projecting therefrom, an igniting device associated with the wick and comprising a flint and a friction wheel, and operating mechanism including a plunger located in spaced relation to the friction wheel and on the opposite side thereof to the wick and mounted for rectilinear reciprocation, said mechanism being arranged to rotate the friction wheel upon depression of the plunger; a cover plate pivoted at one end to the plunger for swinging about an axis transverse to the path of the plunger and at its other end carrying a wick-enclosing cup, a pair of plates projecting from the casing in spaced apart relation on opposite sides of the friction wheel and rotatably supporting said wheel, said plates having bearing surfaces disposed outwardly of the friction wheel and slidably contacting the cover plate at a point spaced from the pivot toward the wick, permitting the cover plate to slide toward the plunger and its pivoted end to move with the plunger, to swing the wick-enclosing cup from the wick during depression of the plunger.

6. In a cigarette lighter, including a casing, a wick projecting therefrom, a flint and friction wheel igniting device and operating mechanism including a plunger reciprocally mounted and arranged to rotate the wheel during depression of the plunger; a pair of plates projecting from the casing in spaced apart relation and on opposite sides of the friction wheel and rotatably supporting said wheel between them, a partition extending between the said plates between the friction the friction wheel and the wick and having a relatively small aperture substantially coaxial with a line connecting the exposed end of said

wick and the point of contact between the flint and friction wheel, and a cover plate extending across the outer surfaces of the two plates, said plate being operatively connected with the plunger at one end for swinging as the plunger is reciprocated and carrying at its other end a wick-enclosing cup that is removed from the wick as the plate is swung by depression of the plunger.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,660,401	Strauss	Feb. 28, 1928
1,743,349	Holtzman	Jan. 14, 1930
1,762,123	Aronson	June 3, 1930
2,164,872	Evans	July 4, 1939

FOREIGN PATENTS

Number	Country	Date
703,142	France	Feb. 2, 1931