

Nov. 18, 1952

C. ZELLWEGER
PYROPHORIC LIGHTER

2,618,140

Filed July 31, 1951

2 SHEETS--SHEET 1

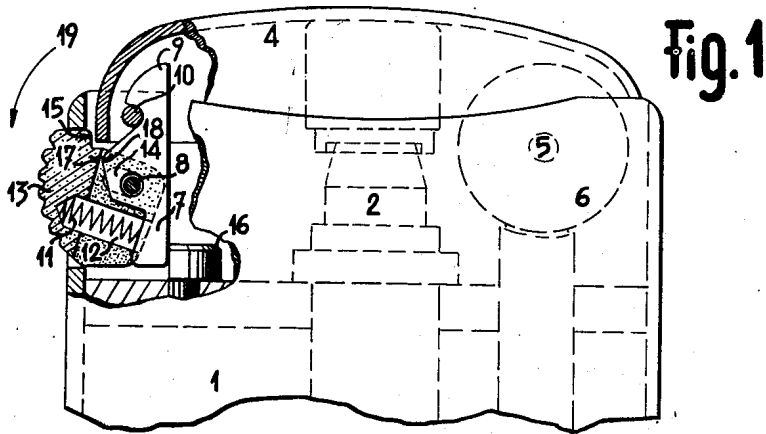


Fig. 1

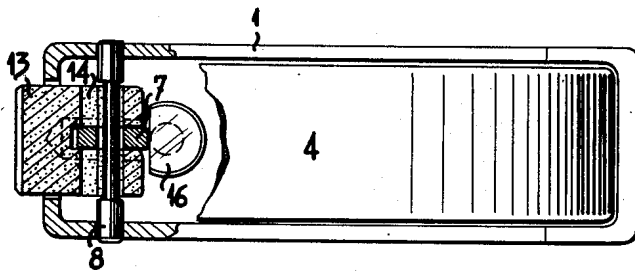


Fig. 2

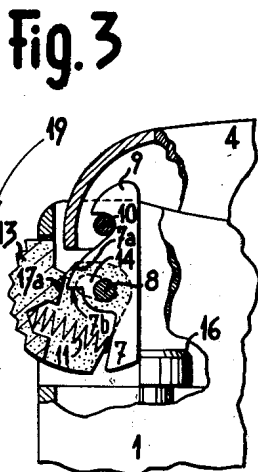


Fig. 3

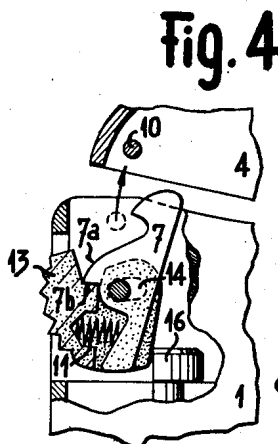


Fig. 4

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2 SHEETS—SHEET 2

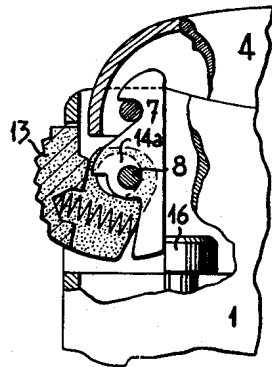


Fig. 5

Fig. 6

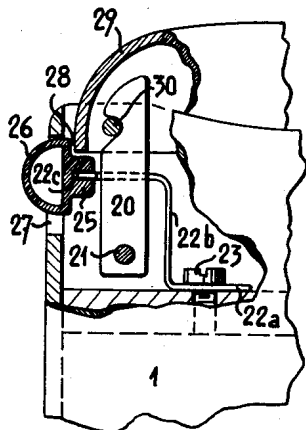


Fig. 8

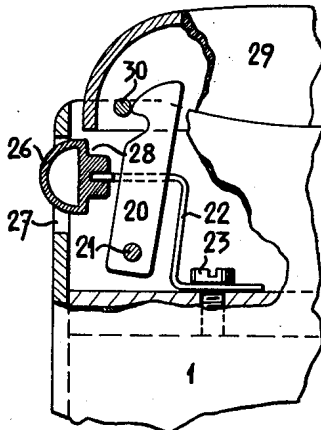


Fig. 7

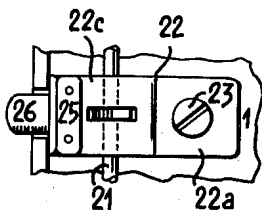


Fig. 9

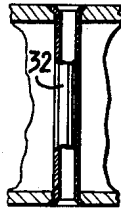
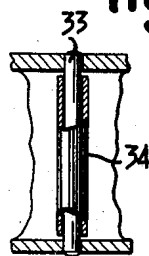


Fig. 10



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PYROPHORIC LIGHTER

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5 Claims. (Cl. 67—7.1)

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The present invention relates to a lighter of the type provided with a cover spring biased to open position and released by a manual control element that requires several different movements to release the catch. The purpose of this arrangement is to provide a safeguard against accidental opening of the cover in the pocket of the user in case pressure should unintentionally be exerted against the control element.

While lighters with safety devices are known in the art, the means designed to control the opening of the cover occupies several positions, one being the latching position and the other, the active or unlatching position, but several different movements and numerous parts are necessary to bring about the opening of the cover, and several springs are required to return the retaining catch and the control element to their normal position.

The object of the present invention is to provide a simplified construction designed to overcome multiple parts and movements by utilizing a single control element rockably connected with the catch and a single return spring common to both.

The accompanying drawing shows, by way of example, some embodiments of the object of the invention.

Figure 1 is a view, partly in section, of the upper part of a lighter of one form of construction.

Figure 2 is a top view thereof, partially in section to further illustrate the control mechanism.

Figures 3 and 4 are sectional elevations of another form of embodiment.

Figure 5 is a detail sectional view of a further modification.

Figure 6 is a sectional elevation of the cover control mechanism of a still further form of execution.

Figure 7 is a detail plan view of the construction of Figure 6.

Figure 8 is a view similar to Figure 6, showing the position of the elements during the closing motion of the cover.

Figures 9 and 10 are detail views of the keeper means on a larger scale.

Similar reference characters represent corresponding parts throughout the several figures of the drawings.

With reference to Figure 1, it will be noted that the lighter 1 supports a burner 2 on the upper part of its fuel chamber. Cover 4 is rockably mounted on a pin 5 which supports also the flint wheel 6. The cover is biased to open position by conventional spring means, not shown.

The cover 4 is retained in the closed position, against the action of its spring, by a latch or catch 7 in the form of a lever with two arms and pivotally mounted on a pin 8 supported by the lighter body. One of the ends of the latch has a hook 9 which engages with a fixed stop or keeper constituted by a bar 10 of cover 4 under the action of a spring 11. This spring, which acts on the end of the latch opposite the end carrying hook 9, is housed in a cavity 12 of a two stage control element 13 also rockably mounted on pin 8. That part of 13 which is in contact with pin 8 is provided with a slot or elongated hole 14 so as to form a guide and to permit said member 13 to move in a plane perpendicular to pin 8. The member 13 also has a projection or shoulder 15 facing the edge of cover 4 when the latter is in the closed position (see Figure 1).

The rocking motion of latch 7 under the action of spring 11 is limited at its lower end by a stop 16 rigidly mounted on the fuel chamber. As shown by the drawing, latch 7 is housed in a central slot of the control member 13 (Figure 2), and there is provided radially relative to pin 8, a clearance between part 17 of control element 13 and part 18 of catch 7.

The operation of this device is as follows:

With the elements in the position shown in Figure 1, to open cover 4, the first thing to do is to actuate control member 13 in the direction of arrow 19 to cause it to rock on axis 8 and to change from the inactive or locking position into a position to be active to release the cover. To achieve this result, element 13 must turn through a sufficient angle so that shoulder 15 will no longer face the edge of cover 4 which, in the closed position, constitutes a fixed abutment relative to member 13. This motion compresses spring 11 with the result that the bearing engagement of latch 7 with keeper 10 of the cover is increased. This constitutes the first stage of movement and provides the margin of safety desired.

After control member 13 has turned sufficiently so that the shoulder 15 no longer prevents an inward motion on its pivoting axis 8, said member 13 is in the active position and is caused to slide in slot 14 perpendicularly to said axis. After a slight inward displacement, corresponding to the clearance provided between facing shoulders 17 and 18 of the control member and the latch, the former drives the latter and the latch rocks on its axis until hook 9 releases keeper bar 10 of the cover, which then opens under the

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action of its spring. This further movement is the second stage.

With reference to Figures 3 and 4, it will be seen that the latch or catch 7 has an inwardly curved or arcuate edge part 7^a, whose curvature is substantially concentric with pin 8, and which terminates in a shoulder 7^b ending approximately at the height of pin 8. Control member 13 has a projection 17^a designed to slide under the shoulder 7^b for the purpose of actuating the catch.

The arrangement of the elements described in Figures 3 and 4 is such that when control member 13 is actuated in the direction of arrow 19 to bring about the opening of cover 4, part 17^a of the control member slides on part 7^a of the catch until it reaches shoulder 7^b under which it becomes jammed. Thus, only after this rocking motion can pressure be exerted on catch 7, by pushing the control member inward and upward, to disengage catch 7 from stop 10 and release cover 4 by causing the control element to slide on pin 8, because of slot 14, as shown in Figure 4.

It will be seen from the position of the elements shown in Figure 3, that it is impossible to actuate catch 7 by a simple radial push of the control member and that an angular displacement in the direction of arrow 19 is necessary. This arrangement makes it also possible to prevent control member 13 from pivoting on the edge of cover 4 at the beginning of its actuating stroke such as can happen in the first form of construction.

In the example of Figure 5, slot 14 of control member 13 is replaced by a circular opening 14^a which surrounds pin 8 of the catch with sufficient clearance to permit both rocking and sliding motion of said member. The operation is the same as that described in connection with Figures 3 and 4.

Referring now to Figures 6 to 8, body 1 of the lighter supports a latch 20 rockably mounted on a pin 21. On the upper surface of the fuel chamber is a spring leaf 22 bent as two places in such a way as to present two substantially parallel end parts 22^a and 22^c, and a middle section 22^b which is substantially perpendicular relative to the two other end parts. Leaf 22 is fastened at its end 22^a by means of a screw 23. Its part 22^c has a slot 24 through which passes the latch 20. At its free end, part 22^c supports a push button 25, the head 26 of which projects through an opening 27 in the lighter body. Said head 26 forms a shoulder 28 on button 25. In the at-rest position, the edge of cover 29 comes to bear against said shoulder 28. Cover 29 supports a keeper bar 30 which is engaged by latch 20 under the action of spring 22.

As shown by the drawing, latch 20 is energized by leaf 22 when part 22^c of the catch is longitudinally displaced by means of push button 25. To effect such displacement, the push button must be moved out of its at-rest position (Figure 6) in which it is held by spring 22, by displacing it vertically downward by its head 26, in slot 27 of the lighter body. This results in shoulder 28 becoming disengaged from the lower edge of cover 29. The control element is now in the active position. By pushing it inwardly of the lighter, leaf 22 causes catch 21 to slide on keeper bar 30 so that the cover opens under the action of its spring (not shown).

When the cover is to be closed, keeper bar

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30 slides on the inclined part 31 of the upper end of latch 20 (Figure 8)). This increases the tension of spring 22 until the hook of the latch engages keeper bar 30. The elements return then to the position shown in Figure 6.

In all forms of construction, the pivot axis of the latch as well as the keeper of the cover may be constituted either by a simple tube 32 riveted at its ends as shown in Figure 9, or by a cylindrical pin 33 forcibly driven into a tube 34 forming stops between the lateral walls of the lighter body or of the cover, as shown in Figure 10.

I claim:

1. In an automatic lighter having a body supporting the flint wheel and the burner, a cover spring biased to open position, a keeper on the cover, and safety latch means on the body for cooperation with said keeper, said means including a latch element pivoted medially thereof to the body and having an outwardly facing hook portion at its upper end, a stop abutment on the body for engaging the lower end of the latch element, and a manually operated two stage control element having an elongated opening whose long axis intersects the pivot axis of the latch element and is oscillatable thereabout, a spring having one end bearing against the lower end of the latch element and tending normally to force the same toward the stop abutment, the opposite end of the spring bearing against the control element and tending normally to keep the inner end of the opening about the pivot of the latch element, said latch element turning in its first stage to energize the spring and force the lower end of the latch member against the stop abutment and maintain the hook portion in tightened engagement with the keeper element, and said latch element in its second stage turning to move the long axis of the opening past dead center to permit the said element to move inwardly limited by the outer end of the opening engaging the pivot axis of the latch and permit the lower end of the latch to move outwardly away from the abutment and the hook portion thereof to disengage the keeper on the cover, said control element and latch upon manual release returning to their normal position.

2. An automatic lighter according to claim 1, wherein the spring is located in a socket in the control element, and the latch element and control element are provided with normally spaced apart shoulders which engage during the second stage of movement of the control element to assist in the inward movement of the control element.

3. An automatic lighter according to claim 1, wherein the latch element has an arcuate inner edge terminating in an angularly disposed shoulder and the control member has a projection which initially rides on a portion of said arcuate inner edge and escapes therefrom to move beneath said shoulder to permit the pivot for the latch element to move to the outer end of the slot of the control member and enable the latch element to release the keeper on the cover.

4. An automatic lighter according to claim 1, wherein the opening is circular and of greater diameter than the pivot of the latch element.

5. In an automatic lighter having a body supporting the flint wheel and the burner, a cover spring biased to open position, a keeper on the cover, and safety latch means on the body for cooperation with said keeper, said means including a latch element pivoted at its lower end to the body and having an outwardly facing keeper

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engaging hook portion at its upper end, and a manually operated two stage control element comprising a leaf spring having a central vertical flexing portion and an upper outwardly extending arm having a slot receiving the medial portion of the latch element and a lower rearwardly extending arm, means for securing the latter arm to the body, a push button secured to the outer end of the upper arm and exposed through an opening in the body, a shoulder on the body receiving the outer edge of the cover and normally preventing the push button from accidentally being pushed inward, and said push button upon being manually moved downwardly moving the shoulder away from the edge of the

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cover and then adapted to move inwardly against the tension of the vertical flexing portion whereby the outer end of the slot therein rocks the latch element to disengage its hook portion from the keeper on the cover.

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REFERENCES CITED

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

FOREIGN PATENTS

Number	Country	Date
549,138	France -----	Nov. 10, 1922