June 27, 1950 R. WIESSNER 2,513,125

RUBBING-WHEEL TYPE LIGHTER

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Fig. 1

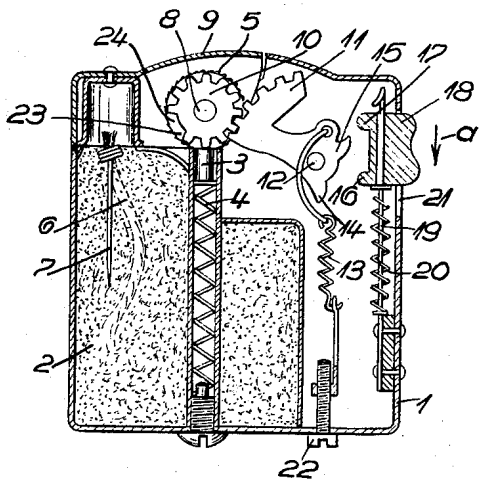


Fig. 2

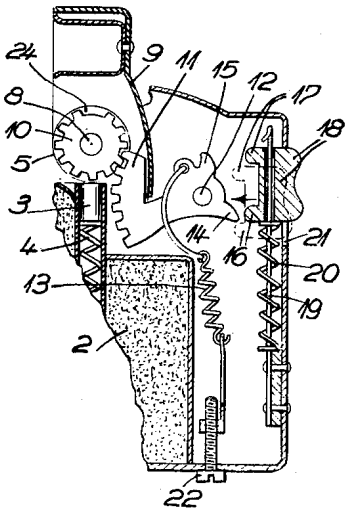
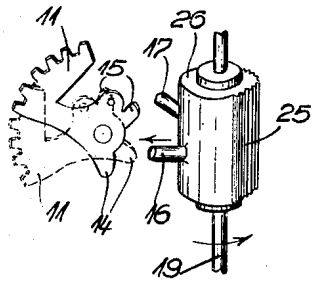


Fig. 3



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RUBBING-WHEEL TYPE LIGHTER

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5 Claims. (Cl. 67—7.1)

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This invention relates to rubbing-wheel type lighters.

The object of the invention is to provide a rubbing-wheel type lighter, comprising a slide which may be moved in two different directions and apart from its safety function is effective at the same time as a power transmitting means directly actuating the drive of the rubbing wheel and of the lighter lid, only one such slide thus being required to move a drive, which works, e. g., under the influence of a tipping spring, to either end position (open or closed) of the lighter, as required.

Rubbing-wheel type lighters are known, which can be actuated by means of a trigger, push slide, or the like alone, which can be moved in two different directions. It has not been possible, however, to apply such a device to other than the so-called spring-lid type lighters, in which the trigger serves exclusively as a safety lock against unintentional flying open of the lighter lid, which is preloaded by a spring, the trigger having no other influence whatever on the drive mechanism of the lighter. For that reason such lighters show all the known drawbacks of spring-lid type lighters, e. g., the necessity of manually closing the lid, which becomes hot and sooty.

The accompanying drawings show by way of example an embodiment of the invention:

Fig. 1 showing the rubbing-wheel type lighter in longitudinal section, the lighter lid being closed;

Fig. 2. the same lighter with the lid open, whereas

Fig. 3 illustrates in a perspective view a detail of a modified embodiment.

The rubbing-wheel type lighter consists as usual of a lighter casing 1, containing the fuel tank 2, the wick 6 carried by a wick carrier 7, and the guiding device for the ignition stone 3, which is pressed by a spring 4 against the rubbing wheel 5. The lid 9 is freely rotatable on the shaft 8 of the rubbing wheel 5, which is in mesh with the toothed wheel 10, said shaft being supported in the casing 1. The lid as well as the rubbing wheel are driven by means of a toothed segment 11, which is pivotally supported on the shaft 12 and in mesh with the toothed wheel 10, the drive of the lid being effected by means of a coupling bolt 24 provided at the lid 9 and entering a wider recess 23 between two teeth on the toothed wheel 10. Said recess 23 is so dimensioned that the lid 9, when being opened or closed, is deflected through a right angle only, whereas the rubbing wheel 5 and the toothed wheel 10 are turned through a

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wider angle, which is necessary for the formation of sparks. In order that the toothed segment 11 be automatically moved from either of its end positions to the other one, a tipping spring 13 is applied to it, whose elastic force can be varied by means of an adjusting screw 22, in order to regulate the tipping moment acting upon the toothed segment 11. Two cam-shaped noses 14, 15 are provided at a suitable distance apart on the toothed segment 11. The nose 15 co-operates, in order to actuate the lighter, with a nose 17 provided on a slide 18, which protrudes outward through a longitudinal slot in the casing 1, whereas a nose 16 on the slide is co-ordinated with a nose 14 on the toothed segment in order to effect the closing of the lighter. The slide 18 is longitudinally movable on an elastic rod 19, which is clamped fast on one side. The slide is held in its upper end position by a helical spring 20 extending over the rod 19.

The lighter operates on the following principle:

In order to open, and thereby to ignite, the closed lighter (Fig. 1), the slide 18 is first moved downward, in the direction of the arrow *a*, against the force of the spring 20, suitably with the thumb of the hand which holds the lighter, so that the two noses 15 and 17 are placed side by side. Then pressure is applied, overcoming the elastic force of the rod 19, against the outside of the slide 18 in the direction of the arrow *b*, which points toward the inside of the casing. Thereby the slide-nose 17 is pressed against the nose 15 on the toothed segment, thus initiating the counterclockwise deflection of the toothed segment 11. After passing the tipping point, the latter movement is performed in a jerk, by virtue of the tipping spring 13, until the end position shown in Fig. 2 is reached. To permit the deflection of the toothed segment 11 without hindrance, the slide 18 must be moved downward before being pressed inward, because, as is also shown in Fig. 2, the nose 14 on the toothed segment can swing freely into the recess between the noses 16, 17 only when the slide is in operating position (indicated by dashed lines). The necessity, moreover, of actuating the slide 18 in two different directions in order to actuate the lighter prevents an unintentional opening and consequent ignition of the latter. In its counterclockwise deflection, the toothed segment 11 takes along the toothed wheel 10 and the rubbing wheel 5, as well as, by means of the coupling bolt 24, the lid 9, and thus causes the wick 6 to be ignited. When the lighter is open, the slide 18 is released and by virtue of the spring 20 and of the recoiling rod 19 automatically re-

turns to its upper initial position (indicated by solid lines in Fig. 2), so that the nose 14 on the toothed segment is now opposite the slide-nose 16. When the lighter lid 9 is now to be closed, after the lighter has been used, it is necessary only to again press the trigger 18 temporarily in the direction of the arrow *b* into the casing 1 to cause the clockwise re-deflection of the toothed segment 11 by virtue of the tipping spring 13, whereupon all parts are again in the positions shown in Fig. 1.

In order to make the actuation of the lighter dependent on two movements of the slide of different direction, the slide, instead of being longitudinally movable on the elastic slide rod 19, can also be rotatably mounted on said rod, as shown in Fig. 3. In this case the slide may have the form, e. g., of a cylindrical roller 26, whose part protruding out of the casing may be roughened or rippled (25) in order to facilitate the rotation of the roller 26. On the roller 26, the noses 16 and 17 of the slide, which serve to deflect the toothed segment in one sense or the other, respectively, are not only displaced by height, but also at an angle apart, so that when the slide-nose 16 co-operates with the nose 15 coordinated with it on the toothed segment, the other slide-nose is turned out of the plane of its nose 14 on the toothed segment, and vice versa.

When the lighter is closed, the slide 26 has relative to the toothed segment the position shown in Fig. 3. Since in this position the slide-nose 17 is placed outside of (in the drawing: behind) the plane of the toothed segment 11, whereas the nose 14 on the toothed segment is deflected downward with the toothed segment, the nose 14 is not in the range of its slide-nose 16. Thus the lighter cannot be operated by mere pressure on the slide 26. To actuate the lighter, it is necessary to turn the slide 26 forward in a counterclockwise sense, against the force of the spring (not shown in the drawing) which holds it in its initial position, and thus to move the slide-nose 17 into its operating position, in which it lies opposite the nose 15 on the toothed segment, whereas at the same time the slide nose 16 is moved out of the plane of the toothed segment. As soon as the toothed segment has been deflected by pressure on the rippled part 25 of the slide 26 into the position shown by dashed lines, and the wick been ignited thereby, the slide 26 is released and by virtue of the return spring automatically returns to its original position. To close the lighter, it is only necessary to press the slide 26, especially because the nose 14 on the toothed segment is now in the range of the slide-nose 16.

What I claim is:

1. A rubbing-wheel type lighter comprising: a lighter casing having a side wall which has a cutting-out; a pivoted cover; a toothed wheel for operating the rubbing wheel and opening and closing the cover; a toothed segment in mesh with said toothed wheel; a shaft carrying said toothed segment; a guide element extending parallel with the cut-out portion of said side wall; and a slide protruding through said cutting out and being movable along said guide element from an initial position to a position in which it is adapted to engage with the toothed segment, the slide being also movable in a second direction into the lighter casing for operating the toothed segment, one of the directions of movement of the slide being at right angles with the shaft carrying the toothed segment, the slide being adapted to engage with the toothed segment for opening the cover only after having performed the first movement along the guide element.

2. A rubbing-wheel type lighter as set forth in claim 1, comprising a spring for urging the toothed segment into either of two positions.

3. A rubbing-wheel type lighter comprising: a lighter casing having a side wall which has a cutting out; a pivoted cover; a toothed wheel for operating the rubbing wheel and opening and closing the cover; a toothed segment in mesh with said toothed wheel and movable between two positions which correspond to the open and closed positions of the cover, respectively; eccentric noses on said toothed segment; a shaft carrying said toothed segment; a spring in cooperation with said toothed segment for urging it into either of said two positions; an elastically flexible rod extending parallel with the cut-out portion of said side wall; a slide protruding through the cutting out and being movable along said rod from an initial position to a position in which it is adapted to engage with one of said eccentric noses, the slide being also movable in a second direction into the lighter casing for operating the toothed segment by engagement with a segment nose, one of the directions of movement of the slide being at right angles with the shaft carrying the toothed segment, the slide being adapted to engage with the segment nose for opening the cover only after having performed the first movement along the rod; and a spring mounted on said guide rod and urging the slide into its initial position.

4. A rubbing-wheel type lighter comprising: a lighter casing having a side wall which has a cutting out; a pivoted cover; a toothed wheel for operating the rubbing wheel and opening and closing the cover; a toothed segment in mesh with said toothed wheel and movable between two positions which correspond to the open and closed positions of the cover, respectively; eccentric noses on said toothed segment; a shaft carrying said toothed segment; a spring in cooperation with said toothed segment for urging it into either of said two positions; an elastically flexible rod extending parallel with the cut-out portion of said side wall; a slide protruding through the cutting out and having two noses, each slide nose being coordinated with a segment nose, the slide being movable along the guide rod from an initial position to a position in which one slide nose is in register with its segment nose, the slide being also movable in a second direction into the lighter casing for operating the toothed segment by engagement of a slide nose with its respective segment nose, one of the directions of movement of the slide being at right angles with the shaft carrying the toothed segment, one slide nose being adapted to engage with its segment nose, for opening the cover, only after the slide has performed its first movement along the rod, the other slide nose being in register with its segment nose only when the segment is in the position which corresponds to the open position of the lighter cover; and a spring mounted on said rod and urging the slide into its initial position.

5. A rubbing-wheel type lighter comprising: a lighter casing having a side wall which has a cutting out; a pivoted cover; a toothed wheel for operating the rubbing wheel and opening and closing the cover; a toothed segment in mesh with said toothed wheel and movable between two positions which correspond to the open and closed

positions of the cover, respectively; eccentric noses on said toothed segment; a spring in cooperation with said toothed segment for urging it into either of said two positions; a rod extending parallel with the cut-out portion of said side wall; a slide protruding through the cutting out and having two noses at different levels, each slide nose being coordinated with a segment nose, the slide being movable along the rod from an initial position to a position in which one slide nose is in register with its segment nose, the slide being rotatable about the rod for operating the toothed segment by engagement of a slide nose with its respective segment nose, one slide nose being adapted to engage with its segment nose, for opening the cover, only after the slide has performed its first movement along the rod, the other slide nose being in register with its

segment nose only when the segment is in the position which corresponds to the open position of the lighter; and a spring mounted on said rod and urging the slide into its initial position.

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