March 17, 1953 S. MEYER 2,631,446

CIGARETTE LIGHTER

Filed Aug. 9, 1949

FIG. 1

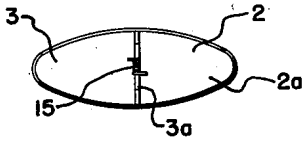


FIG. 3

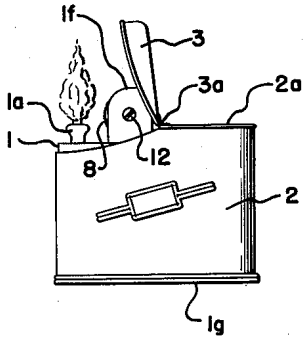


FIG. 2

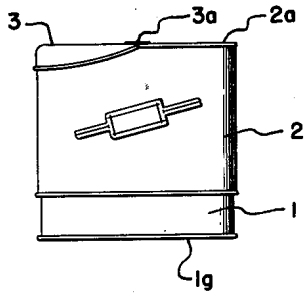


FIG. 8

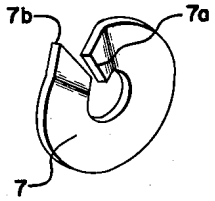


FIG. 4

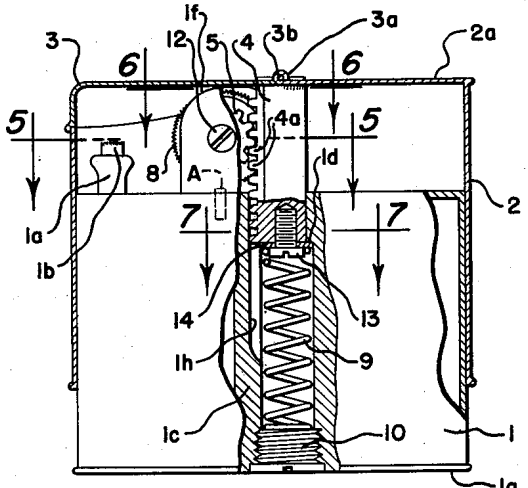


FIG. 5

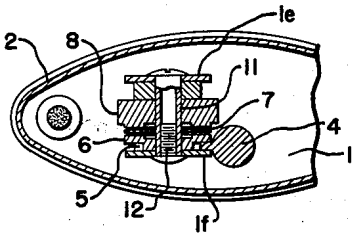


FIG. 6

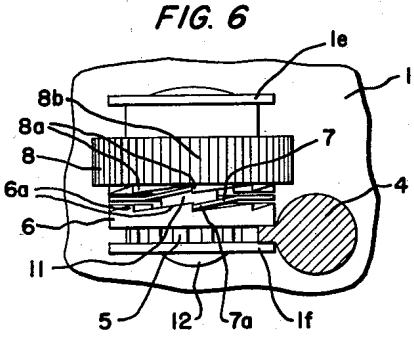
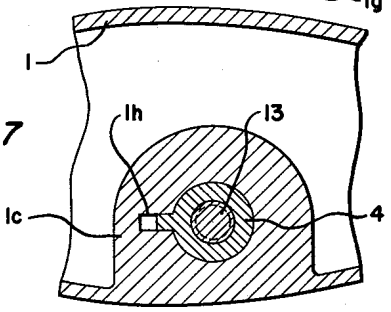


FIG. 7



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CIGARETTE LIGHTER

Samuel Meyer, San Diego, Calif.

Application August 9, 1949, Serial No. 109,331

3 Claims. (Cl. 67—7.1)

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My invention relates to a cigarette lighter, and the objects of my invention are:

First, to provide a cigarette lighter of this class having novel telescopic fluid casing and cover means which automatically actuate the cover lid and spark wheel concurrently when said fluid casing and cover are telescopically pressed together;

Second, to provide a cigarette lighter of this class having novel cover lid opening means for exposing the lighter wick;

Third, to provide a cigarette lighter of this class having noval rack and pinion flint wheel actuating mechanism, combined with a novel over-running clutch, which permits the rack and pinion to be in meshed relationship with each other at all times during reciprocal movement of the rack in both directions;

Fourth, to provide a cigarette lighter of this class which is very compact and efficient;

Fifth, to provide a cigarette lighter of this class which is very neat and in which the operating elements thereof are completely enclosed when the lighter is not in operation;

Sixth, to provide a cigarette lighter of this class in which the telescopic relationship of the fluid casing and the cover provides for large bearing area to be engaged by the fingers of the operator, whereby relative ease of operation of the lighter is afforded;

Seventh, to provide a cigarette lighter of this class having a novel over-running clutch; and

Eighth, to provide a cigarette lighter of this class which is very simple and economical of construction, efficient in operation, and which will not readily deteriorate or get out of order.

With these and other objects in view, as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions, as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon, forming a part of this application, in which:

Fig. 1 is a top or plan view of my cigarette lighter, showing the same in closed position; Fig. 2 is a side elevational view thereof; Fig. 3 is a side elevational view of the lighter as shown in Fig. 2, illustrating the cover in compressed position and the lid open, and a flame issuing from the wick of the lighter; Fig. 4 is a vertical sectional view of the lighter, showing portions fragmentarily and portions further broken away to amplify the illustration; Fig. 5 is a fragmentary sectional view, taken from the line 5—5 of Fig. 4; Fig. 6 is an enlarged fragmentary sectional view, taken from the line 6—6 of Fig. 4; Fig. 7 is an enlarged fragmentary sectional view, taken from the line 7—7 of Fig. 4; and Fig. 8 is a perspective view of the clutch operating spring of my cigarette lighter.

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Similar characters of reference refer to similar parts and portions throughout the several views of the drawings.

The fluid casing 1, cover 2, lid 3, rack 4, pinion 5, clutch member 6, clutch spring 7, spark wheel 8, rack return spring 9, plug 10, bushing 11, bolts 12 and 13, rack stop plate 14, and the lid spring 15, constitute the principal parts and portions of my cigarette lighter.

The fluid casing 1 is a substantially conventional cigarette lighter fluid casing, having a wick tube 1*a* projecting from the upper surface thereof, in which the wick 1*b* is located. Centrally of the fluid casing 1 is the rack well 1*c*, in which the rack 4 is reciprocally mounted. Secured to this rack 4 is the stop plate 14, held in place by the screw 13 internally screw-threaded into the end of the rack 4. This stop plate 14 engages an offset shoulder portion 1*d* in the well 1*c* for limiting the outward movement of the rack 4, urged by the spring 9, which is abutted at its opposite end by means of the screw-threaded plug 10, screw-threaded in the lower terminus of the well 1*c*, as shown in Fig. 4 of the drawings.

The rack 4 is fixed to the cover 2 for limiting the upward telescopic movement thereof relative to the casing 1, and it is to be noted that other stop means may be provided for limiting the cover 2 relative to the casing 1, in its upward movement, urged by the spring 9. Various means, such as stop screws, or the like, may be provided, if desired, so that the cover 2 remains in certain telescopic relation with the casing 1 when urged to its extreme travel by means of the spring 9, as hereinbefore described.

The rack 4 is provided with involute teeth 4*a* which engage the involute teeth of the pinion 5. Fixed to this pinion 5 is a clutch member 6, which may be optionally integral with the pinion 5, as desired. This clutch member 6 is provided with radially disposed buttress ratchet portions 6*a*, engageable with the angularly disposed end 7*a* of the clutch spring 7, which is shown in perspective in Fig. 8 of the drawings. The opposite end 7*b*, of the clutch spring 7 is engageable with the radially disposed buttress ratchet teeth 8*a* of the spark wheel 8, which may be optionally

integral therewith, as desired. The spark wheel 8 is provided with a substantially conventional external serrated portion 8*b*, engageable with the conventional flint, as illustrated by dash lines A in Fig. 4 of the drawings.

The pinion 5, clutch spring 7 and spark wheel 8 are all mounted on a hollow tubular bushing 11, supported by upstanding bracket 1*e* and 1*f*, which are maintained in spaced relationship to each other by the bolt 12, screw-threaded in the bushing 11, for holding the bracket portions 1*e* and 1*f* in certain spaced relationship to each other. The cover 2, as shown in Fig. 4, is substantially an inverted cup-shaped member, having a lid 3 pivoted thereon by hinge portions 3*a*, through which a pin 3*b* passes, all as shown best in Fig. 4 of the drawings. Secured on this pin 3*b* is a coil spring 15, which tends to hold the lid in closed position, as shown in Fig. 4.

The operation of my cigarette lighter is substantially as follows: When it is desired to ignite fuel in the wick 1*b* and expose the flame thereon, as shown in Fig. 3 of the drawings, a person exerts pressure on the upper surface 2*a* of the cover 2, while exerting opposed pressure on the lower surface 1*g* of the fluid casing 1, which may be accomplished by pressing the cover and the casing intermediate the fore finger and the thumb of a person's hand. Telescopic compression causes compression of the spring 9 and concurrent rotation of the pinion 5 in its meshed relation with the rack 4, which reciprocates longitudinally of the well 1*c* of the fluid casing 1. The slot 1*h* in the well 1*c* receives the teeth 4*a* of the rack 4, preventing rotation thereof, so that the teeth 4*a* are always maintained in alignment with the teeth of the pinion 5.

During rotation of the pinion 5 in a clockwise direction, as shown in Fig. 4 of the drawings, the clutch spring 7 interlocks the clutch portion 6*a* of the clutch member 6, and the clutch portion 8*a* of the spark wheel 8, causing rotation thereof and concurrent striking of the flint A, which ignites the fuel on the wick 1*b*. During telescopic movement of the cover 2 over the casing 1, the upper end portions of the brackets 1*e* and 1*f* force the lid 3 to pivot about the axis of the pin 3*b* into the open position as shown in Fig. 3 of the drawings, so that the flame burning on the wick 1*b* is readily accessible to a person lighting a cigarette, and the flame is also exposed for receiving an adequate supply of oxygen.

When pressure is released from the casing 1 and cover 2, after the operation of the lighter has been completed, the spring 9 forces the rack 4 upwardly, together with the cover 2, until the stop plate 14 engages the ledge 1*d* internally of the well 1*c* of the fluid casing 1, which limits the outward telescopic movement of the cover 2 relative to the fluid casing 1. As the cover 2 reaches the position as shown in Fig. 4 of the drawings, the lid 3 is completely pivoted downwardly into its engaged relation with the cover 2 by means of the spring 15, operating about the axis of the pin 3*b* in the hinge portions 3*a* which pivotally connect the lid 3 with the cover 2.

In the operation of the clutch spring 7 during return movement of the rack 4, the opposite ends 7*a* and 7*b* are compressed toward each other longitudinally of the axis of the bolt 12, whereby the clutch is over-running, and the end portions 7*a* and 7*b* of the clutch spring 7 alternately pass over the inclined buttress ratchet portions 6*a* and 8*a* of the clutch portions secured to the pinion 5 and the spark wheel 8. Thus, the rack 4 is maintained in meshed relationship with the pinion 5 at all times, so that positive operation of the lighter is assured with each compressive movement of the cover 2 over the casing 1, as hereinbefore described.

Though I have shown and described a particular construction, combination and arrangement of parts and portions, I do not wish to be limited to this particular construction, combination and arrangement, but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a cigarette lighter, a reciprocating gear rack, a revoluble pinion arranged in constant meshed relationship with said gear rack, a spark wheel axially aligned with said pinion, and a free running over-running clutch interengaging said pinion and said spark wheel, said over-running clutch including a pair of members connected with said pinion and said spark wheel, respectively, having opposed buttress ratchet teeth, and a substantially disc-shaped clutch spring having opposed angular offset end portions engageable at each of said buttress teeth portions, a casing on which said ratchet wheel and said pinion are revolubly mounted, said casing having a well in which said rack is reciprocally mounted, a cover positioned in telescopic relationship over said casing parallel to the axis of said rack, engageable with said rack for reciprocating the same in said well laterally of the axis of said pinion.

2. In a cigarette lighter, a reciprocating gear rack, a revoluble pinion arranged in constant meshed relationship with said gear rack, a spark wheel axially aligned with said pinion, and a free running over-running clutch interengaging said pinion and said spark wheel, said over-running clutch including a pair of members connected with said pinion and said spark wheel, respectively, having opposed buttress ratchet teeth, and a substantially disc-shaped clutch spring having opposed angular offset end portions engageable at each of said buttress teeth portions, a casing on which said ratchet wheel and said pinion are revolubly mounted, said casing having a well in which said rack is reciprocally mounted, a cover positioned in telescopic relationship over said casing parallel to the axis of said rack, engageable with said rack for reciprocating the same in said well laterally of the axis of said pinion, a lid pivoted on said cover over said ratchet wheel, and means adjacent said ratchet wheel engageable with said lid for pivotally opening the same when said cover is compressed toward said casing.

3. In a cigarette lighter, a reciprocating gear rack, a revoluble pinion arranged in constant meshed relationship with said gear rack, a spark wheel axially aligned with said pinion, and a free running over-running clutch interengaging said pinion and said spark wheel, said over-running clutch including a pair of members connected with said pinion and said spark wheel, respectively, having opposed buttress ratchet teeth, and a substantially disc-shaped clutch spring having opposed angular offset end portions engageable at each of said buttress teeth portions, a casing on which said ratchet wheel and said pinion are revolubly mounted, said casing having a well in which said rack is reciprocally mounted, a cover positioned in telescopic relationship over said casing parallel to the axis of said rack, engage-

able with said rack for reciprocating the same in said well laterally of the axis of said pinion, a lid pivoted on said cover over said ratchet wheel, and means adjacent said ratchet wheel engageable with said lid for pivotally opening the same when said cover is compressed toward said casing, a spring in said well at one end of said rack, for forcing said rack outwardly and extending the telescopic relationship of said cover and said casing.

SAMUEL MEYER.

REFERENCES CITED

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

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