

June 29, 1954

W. I. NISSEN

2,682,165

LIGHTER ACTUATING MECHANISM

Filed March 11, 1952

2 Sheets-Sheet 1

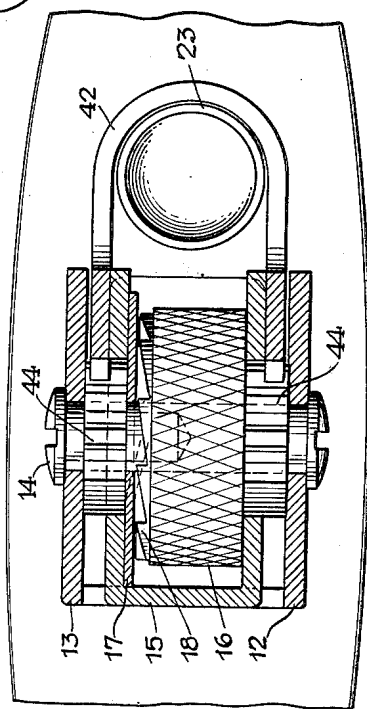
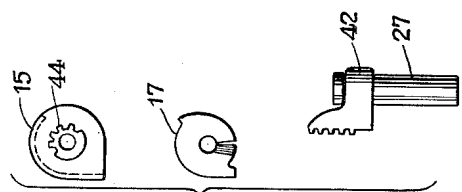
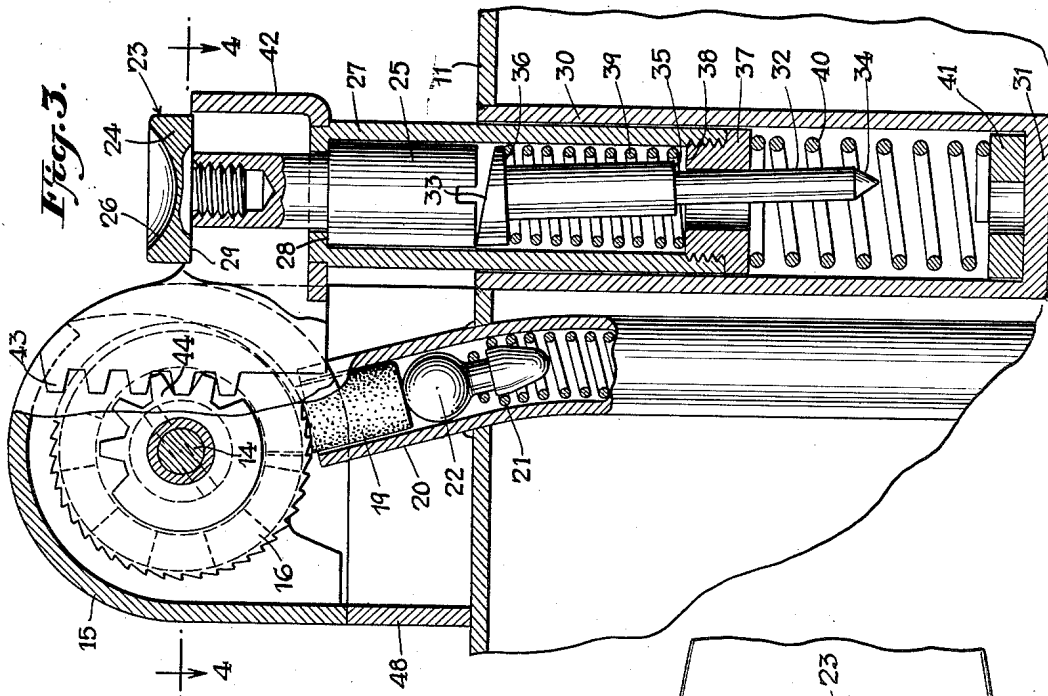


Fig. 1.

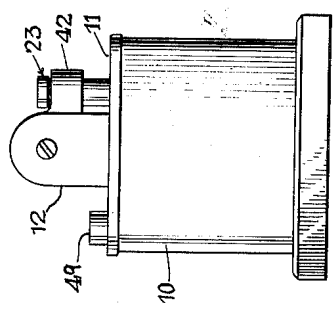


Fig. 2.

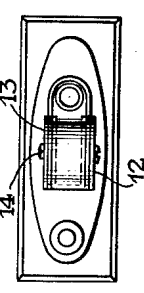


Fig. 4.

Fig. 5.

INVENTOR.
WARREN I. NISSEN.
BY *Ward, Crosby & Neal*
ATTORNEYS.

June 29, 1954

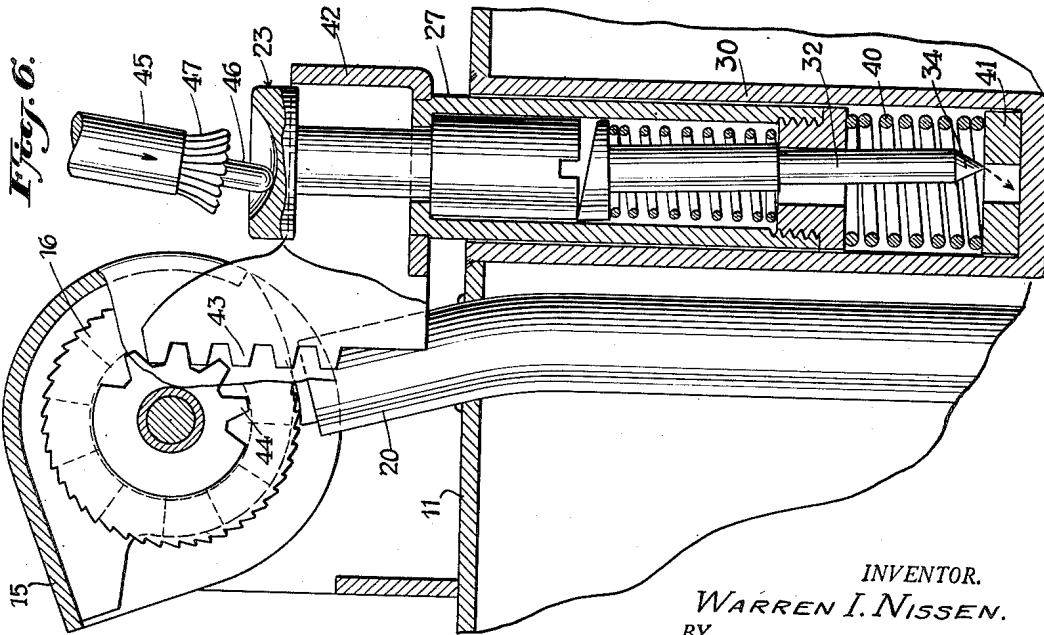
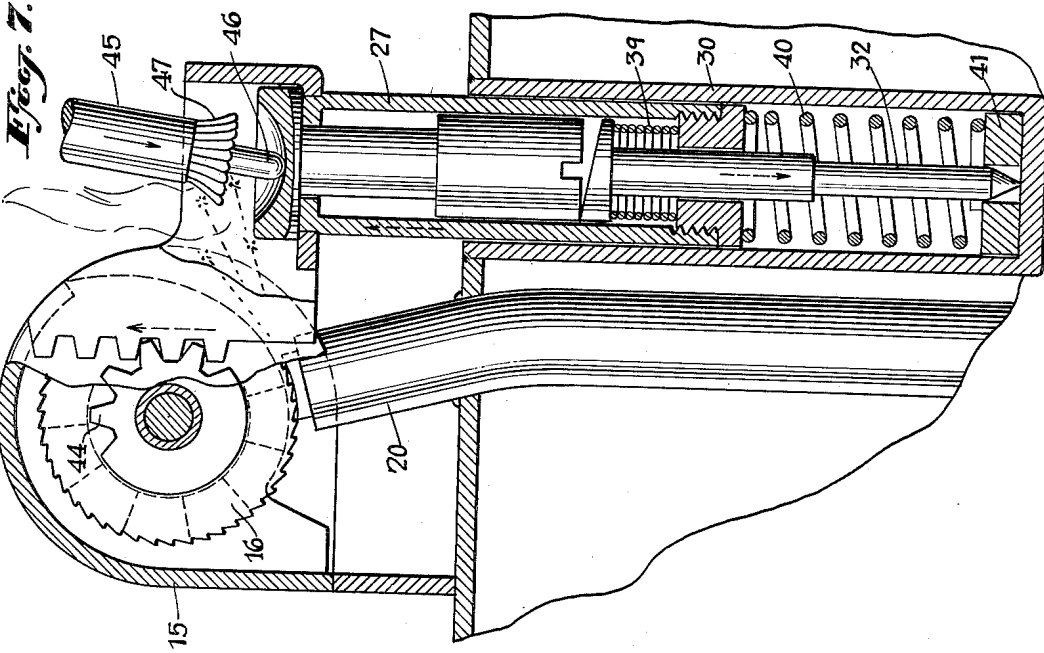
W. I. NISSEN

2,682,165

LIGHTER ACTUATING MECHANISM

Filed March 11, 1952

2 Sheets-Sheet 2



INVENTOR.
WARREN I. NISSEN.
BY *Ward, Crosby & Neal*
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,682,165

LIGHTER ACTUATING MECHANISM

Warren I. Nissen, Basking Ridge, N. J., assignor
to Ronson Corporation, a corporation of New
Jersey

Application March 11, 1952, Serial No. 275,887

9 Claims. (Cl. 67—4.1)

1

2

This invention relates to pyrophoric lighters of the touch tip type in which a torch engageable member is employed to actuate a sparking mechanism, and thus to produce the sparks which ignite a wick at the end of the torch, and particularly to an improved form of actuating mechanism for the spark-producing member.

To secure proper ignition of the torch in lighters of the touch tip type, it is important that the wick end of the torch be in the proper position to receive sparks produced by the sparking mechanism when the sparking mechanism is actuated. Accordingly, it is desirable that the wick end of the torch be in a substantially fixed position adjacent the spark-producing member when the spark-producing member is actuated.

In lighters of the touch tip type heretofore known, it has been difficult to produce actuation of the spark-producing member while maintaining the torch in a substantially fixed position. In addition, it has been difficult to produce a torch operable actuating mechanism for the spark-producing member which is both simple and economical to manufacture.

In accordance with the present invention a torch engageable and movable member is drivingly connected with a spring-pressed second member by means of a latch pin which, after movement thereof through a predetermined distance by the torch, is released from one of the members so that the second member rapidly returns to its initial or idle position. The second member is drivingly interconnected with the spark-producing member so that, after release of the latch pin and during the return of the second member to its idle position, the sparking member is moved rapidly producing a large shower of sparks. During the return of the second member to its idle position, the torch moves only a relatively small amount and hence may be considered as substantially stationary. The actuating mechanism of my invention may be constructed with a relatively small number of parts which may be simply and economically produced.

It is an object of my invention to produce a lighter of the touch tip type which may be relatively small in size and which is simple and economical to manufacture.

Further objects and advantages of the invention will be in part obvious and in part specifically referred to in the description hereinafter set forth which, taken in conjunction with the accompanying drawings, discloses a preferred form of a lighter which is constructed in accordance with the invention. The disclosure, how-

ever, should be considered as merely illustrative of the principles of the invention.

Referring to the drawings:

Fig. 1 is a side elevation view of the preferred embodiment of my invention;

Fig. 2 is a plan view of the embodiment shown in Fig. 1;

Fig. 3 is an enlarged fragmentary cross-sectional, side elevation view of the actuating mechanism of my invention and forming part of the embodiment shown in Figs. 1 and 2;

Fig. 4 is an enlarged plan view partly in cross section of the embodiment shown in Figs. 1-3 and is taken along the line indicated by the numerals 4—4 in Fig. 3;

Fig. 5 is an exploded view of a portion of the actuating mechanism employed to drive the spark-producing member in the embodiment shown in the preceding figures; and

Figs. 6 and 7 are enlarged fragmentary side elevation views partly in cross section of the actuating mechanism of my invention and illustrate, respectively, the relative positions of the parts immediately before the actuation of the spark-producing member and the relative positions of the parts after the wick of the torch has been ignited.

Referring to the drawings, the preferred embodiment of my invention comprises a casing 10 having mounted on the top wall 11 thereof a pair of lugs 12 and 13 which support a shaft 14 secured thereto. Rotatably mounted on the shaft 14 is a hood 15 which partly surrounds a spark-producing member in the form of a sparking wheel 16 having a serrated periphery. The sparking wheel 16 is rotatable on the shaft 14 and is drivingly connected to the hood 15 by means of a pawl 17 which engages ratchet teeth 18 on the side of the sparking wheel 16. Thus, as the hood 15 is rotated in a clockwise direction, as viewed in the various figures of the drawings, the sparking wheel 16 is stationary, but as the hood 15 is rotated in a counter-clockwise direction, as viewed in the drawings, the pawl 17 engages the teeth 18 and rotates the sparking wheel 16 in a counterclockwise direction. The face of the sparking wheel 16 is in engagement with a pyrophoric material, such as the rod 19 held in the tube 20, and pressed against the wheel 16 by the spring 21 and member 22. Accordingly, when the sparking wheel 16 is rotated in a counterclockwise direction, sparks are produced which are used to ignite a torch in the manner hereinafter indicated.

A torch engageable member 23, which may

3

comprise the two parts 24 and 25 threaded together as shown, may be depressed by means of a torch or other device inserted into the recess 26 in the end of part 24. The lower end of the part 25 is held within a plunger 27 in the form of a cylindrical tube and the upward movement of the member 23 is limited by a shoulder 28. Downward movement of the member 23 with respect to the plunger 27 is limited by the face 29 of the part 24.

The plunger 27 has its exterior wall in slidable engagement with the interior wall of a guide cylinder or tube 30 which has an open end for receiving the plunger 27 and a closed end 31. The cylinder 30 is secured to the top wall 11 of the casing 10, such as by solder.

The member 23 is drivingly interconnected with the plunger 27 by means of a latch pin 32 which has oppositely-slanted end portions 33 and 34, the end portion 34 preferably being conical and the end portion 33 preferably lying in a plane which forms an acute angle with the axis of the latch pin 28. The latch pin 32 also has a shoulder 35 intermediate the ends 33 and 34 and also preferably has a shoulder 35 adjacent the end 33.

A latch ring 37 is secured to the end of the plunger 27 and may be threaded into the end of the plunger 27 as shown. The latch ring 37 provides an inwardly-extending annular shoulder 38 at or near the end of the plunger 27. A spring 39 is mounted between the shoulder 38 and the shoulder 26 on the latch pin 32. The spring 39 not only urges the member 23 in an upward direction and to its idle position, but also in conjunction with the slanted end 33 of the latch pin 32 serves to hold the latch pin 32 in the tilted position shown in Fig. 3.

The plunger 27 is urged in an upward and hence to its idle position by means of a spring 40 mounted within the cylinder 30 between the latch ring 37 and a collar or ring 41 mounted within the cylinder 30 and abutting the end wall 31 thereof. The spring 40 is much stronger than the spring 39 so that even though the spring 39 is completely compressed the plunger 27 is held in substantially its idle position as shown in Fig. 3.

The plunger 27 is secured to a member 42 which has a rack portion 43 which engages a pinion segment 44 mounted on the shaft 14. The hood 15 is cut out in a form corresponding to the pinion segment 44 so as to mate therewith and so that when the pinion segments 44 are driven by the rack portions 43 the hood 15 is also rotated. Of course, other forms of driving interconnection between the member 42 and the hood 15 and between the member 42 and the sparking wheel 16 may be employed, but the form shown has been found to give highly satisfactory operation.

The end portion 33 of the latch pin 32 abuts against the part 25 of the member 23 so that when the member 23 is depressed, such as by a torch 45 having an end portion 46 which may be inserted in the recess 26 and having a wick 47, the latch pin 32 moves with the member 23. The shoulder 35 on the latch pin 32 is engageable with the latch ring 37 when the latch pin is tilted as shown in Fig. 3. Thus, as the member 23 is depressed, it moves the latch pin 32 in a downward direction and carries with it the plunger 27 because of the engagement of the shoulder 35 with the shoulder 38 of the latch ring 37.

4

When the member 23 is depressed to the position shown in Fig. 6, the spring 40 is almost fully compressed and the end portion 34 of the latch pin 32 engages the portion of the collar 41 surrounding the aperture in the collar, the aperture being large enough to receive the end of the latch pin 32. As the latch pin is further depressed, the engagement of the end portion 34 with the collar 41 causes the pin 32 to move away from its position in which the shoulder 35 engages the shoulder 38. After the end portion 34 engages the collar 41, the latch pin moves only a relatively short distance before the shoulder 35 becomes completely disengaged from the shoulder 38 which releases the plunger 27. The plunger 27 being released moves rapidly in an upward direction because of the pressure applied thereto by the spring 40, the plunger 27 moving with it the member 42 and hence causing rotation of the sparking wheel 16 in such a direction that the wick 47 of the torch 45 receives a shower of sparks, as indicated in Fig. 7.

During the time that the plunger 27 moves in an upward direction, the member 23 and hence the torch 45 are substantially stationary and the torch 45 is in a position best adapted to receive the sparks produced by the sparking wheel 16 in contact with the pyrophoric material 19. As the plunger 27 moves upward and the member 23 remains stationary, the spring 39 is compressed as shown in Fig. 7, Fig. 7 illustrating the relative position of the parts of the mechanism after the wick 47 is ignited.

When the torch 45 is removed, the spring 39 restores the latch pin 32 and the member 23 to their idle positions, as shown in Fig. 3. The member 48 interconnecting the lugs 12 and 13 serves as a stop for the hood 15 and limits the upward movement of the member 42 and hence the plunger 27.

After the torch 45 has been used, it may be inserted into the holder 49 provided therefor and in which the wick 47 is refueled.

It will be seen that the actuating mechanism of my invention is small and compact and is relatively simple to construct. Furthermore, the actuating mechanism produces a rapid rotation of the sparking wheel 16 which is independent of the pressure applied to the mechanism by the user of the lighter. In addition, the torch 45 is in a substantially fixed position as the sparks are produced and the parts may be arranged so that when the sparks are produced the wick 47 of the torch 45 is in the position best adapted to produce ignition of the wick 47.

Having thus described my invention with particularity, with reference to the preferred embodiment of the same, and having referred to certain modifications thereof, it will be obvious to those skilled in the art, after understanding my invention, that other changes and modifications may be made therein without departing from the spirit or scope of my invention, and it is intended in the appended claims to cover such changes and modifications as are within the scope of the invention.

What I claim is:

1. In a pyrophoric lighter having a spark-producing member, a movable, tubular first member, means urging said first member into an idle position, a second member movable from an idle to a second position and slidable within said first member, a latch pin mounted within said first member and drivingly interconnecting said first and second members, said pin being movable

5

with said second member to a release position, means in said release position to release said pin from one of said first and second members, and means drivingly interconnecting said first member and said spark-producing member.

2. In a pyrophoric lighter having a spark-producing member, a movable first member having an aperture therein and having a shoulder at the edge of said aperture, spring means urging said first member into an idle position, a second member movable from an idle to a second position, a latch pin drivingly interconnecting said first and second members and movable with said second member to a release position, said latch pin extending into said aperture and having a shoulder engageable with said shoulder on said first member, means engageable with said pin in said release position to disengage said shoulders, and means drivingly interconnecting said first member and said spark-producing member.

3. In a pyrophoric lighter having a sparking wheel, means for actuating said wheel comprising a reciprocable, tubular first member, means drivingly interconnecting said first member and said wheel, a manually movable, reciprocable second member co-axial with said first member, a latch pin movable by said second member and in its normal position having a shoulder engageable with said first member to cause said first member to move with said pin. spring means urging said latch pin into said normal position, spring means urging said first member into an idle position, and means engageable with said pin in a predetermined position thereof to move said shoulder out of engagement with said first member.

4. A pyrophoric lighter of the touch tip type having a casing; a burner, a sparking wheel and a torch operable, reciprocable member mounted on said casing, said member having a torch engageable end adjacent said wheel; a pyrophoric material mounted on said casing in contact with said sparking wheel; a guide tube mounted on a wall of said casing and extending therethrough; a hollow plunger surrounding a portion of said member and slidably engaging the interior wall of said tube, said plunger being movable between idle and active positions; means interconnecting said plunger and said wheel to move said wheel on movement of said plunger from active to idle positions; a latch pin having a shoulder intermediate its ends and said pin being mounted within said plunger with one of said ends abutting said member and with said shoulder engageable with said plunger; spring means urging said pin toward said member; means on said tube engageable with the end of said pin remote from said member on movement of said pin by said member to a predetermined position to tilt said pin and disengage said shoulder of said pin from said plunger; and spring means urging said plunger toward its idle position.

5. A pyrophoric lighter of the touch tip type having a casing; a burner, a sparking wheel and a torch operable, reciprocable member mounted on said casing, said member having a torch engageable end adjacent said wheel; a pyrophoric material mounted on said casing in contact with said sparking wheel; a guide cylinder mounted on a wall of said casing and extending therethrough; a hollow plunger surrounding a portion of said member and slidably engaging the interior wall of said cylinder, said plunger being movable between idle and active positions; means interconnecting said plunger and said wheel to move said wheel on movement of said plunger

6

from active to idle positions; a latch pin having oppositely slanted ends and having a shoulder, said shoulder being intermediate said ends and said pin being mounted within said plunger with one of said ends of said pin abutting said member and with said shoulder engageable with said plunger; spring means urging said pin toward said member; means on said cylinder engageable with the end of said pin remote from said member on movement of said pin by said member to a predetermined position to tilt said pin and disengage said shoulder of said pin from said plunger; and spring means urging said plunger toward its idle position.

6. A pyrophoric lighter of the touch tip type having a casing; a burner, a sparking wheel and a torch operable, reciprocable member mounted on said casing, said member having a torch engageable end adjacent said wheel; a hood pivotally mounted on said casing and at least partly surrounding said sparking wheel, said hood normally resting in an idle position and being movable to an active position; a pyrophoric material mounted on said casing in contact with said sparking wheel; a guide cylinder mounted on a wall of said casing and extending therethrough; a hollow plunger surrounding a portion of said member and slidably engaging the interior wall of said cylinder, gear means interconnecting said plunger and said hood to move said hood between idle and active positions on movement of said plunger; pawl means interconnecting said hood and said sparking wheel to move said sparking wheel on movement of said hood from active to idle positions; a latch pin having a conical end and having an opposite end lying in a plane intersecting the axis of said pin at an acute angle and further having a shoulder, said shoulder being intermediate said opposite end and said conical end, said pin being mounted within said plunger with said opposite end of said pin abutting said member and with said shoulder engageable with said plunger; a spring acting between said pin and said plunger to urge said pin away from a portion of said plunger; means on said cylinder engageable with said conical end of said pin on predetermined movement of said pin by said member to tilt said pin and disengage said shoulder of said pin from said plunger; and a spring acting between said plunger and said cylinder to urge said plunger away from a portion of said cylinder.

7. A pyrophoric lighter of the touch tip type having a casing; a burner, a sparking wheel and a torch operable, reciprocable member mounted on said casing, said member having a torch engageable end adjacent said wheel; a hood pivotally mounted on said casing and at least partly surrounding said sparking wheel, said hood normally resting in an idle position and being movable to an active position; a pyrophoric material mounted on said casing in contact with said sparking wheel; a guide cylinder having an open end and a closed end, said cylinder being mounted on a wall of said casing and extending therethrough with said closed end within said casing; a hollow plunger surrounding a portion of said member and slidably engaging the interior wall of said cylinder, said plunger having an inwardly-extending, annular shoulder at the end thereof remote from the torch engageable end of said member; gear means interconnecting said plunger and said hood to move said hood between idle and active positions on movement of said plunger; pawl means interconnecting said

7

hood and said sparking wheel to move said sparking wheel on movement of said hood from active to idle positions; a cylindrical latch pin having a conical end and having an opposite end lying in a plane intersecting the axis of said pin at an acute angle and further having a shoulder, said shoulder being intermediate said opposite end and said conical end, said pin being mounted within said plunger and said annular shoulder with said opposite end of said pin abutting said member and with said shoulder engageable with said annular shoulder; a spring mounted between said pin and said annular shoulder on said plunger and urging said pin away from said shoulder; an annular collar mounted within said cylinder at said closed end, the portion of said collar surrounding the aperture therein being engageable with said conical end of said pin on movement of said pin by said member to tilt said pin and disengage said shoulder of said pin from said annular shoulder; and a spring mounted between said plunger and said collar and urging said plunger away from said collar.

8. A pyrophoric lighter of the touch tip type having a casing; a burner, a sparking wheel and a torch operable, reciprocable member mounted on said casing, said member having a torch engageable end adjacent said wheel; a hood pivotally mounted on said casing and at least partly surrounding said sparking wheel, said hood normally resting in an idle position and being movable to an active position; a pyrophoric material mounted on said casing in contact with said sparking wheel; a guide cylinder having an open end and a closed end, said cylinder being mounted on a wall of said casing and extending there-through with said closed end within said casing; a hollow plunger surrounding a portion of said member and slidably engaging the interior wall of said cylinder, said plunger having an inwardly-extending, annular shoulder at the end thereof remote from the torch engageable end of said member; gear means interconnecting said plunger and said hood to move said hood between idle and active positions on movement of said plunger; pawl means interconnecting said hood and said sparking wheel to move said sparking wheel on movement of said hood from active to idle positions; a

8

cylindrical latch pin having a conical end and having an opposite end lying in a plane intersecting the axis of said pin at an acute angle and further having a pair of shoulders, one of said pair of shoulders being adjacent said opposite end of said pin and the other of said pair of shoulders being intermediate said one shoulder and said conical end, said pin being mounted within said plunger and said annular shoulder with said opposite end of said pin abutting said member and with said other shoulder engageable with said annular shoulder; a spring mounted within said plunger between said one shoulder of said pin and said annular shoulder on said plunger; an annular collar mounted within said cylinder at said closed end, the portion of said collar surrounding the aperture therein being engageable with said conical end of said pin on movement of said pin by said member to tilt said pin and disengage said other shoulder of said pin from said annular shoulder; and a spring mounted between the end of said plunger having said annular shoulder and said collar.

9. In a pyrophoric lighter having a spark-producing member, a movable first member, spring means urging said first member into an idle position, a second member movable from an idle to a second position, one of said members having an aperture therein and having a shoulder at the edge of said aperture, a latch pin drivingly interconnecting said first and second members and movable with said second member to a release position, said latch pin extending into said aperture and having a shoulder engageable with said shoulder on said one of said members to move said first member from its idle position with movement of said second member, means engageable with said pin in said release position to disengage said shoulders and permit said first member to return to said idle position, and means drivingly interconnecting said first member and said spark-producing member.

References Cited in the file of this patent
UNITED STATES PATENTS

| Number | Name | Date |
|-----------|-------|----------------|
| 1,728,866 | Long | Sept. 17, 1929 |
| 2,019,435 | Blair | Oct. 29, 1935 |