

PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

Improvements in Portable Pyrophoric Cigar and like Lighters.

We, M. E. BERNHARDT COMPANY, INC., a corporation organised under the laws of the State of New York, United States of America, and having a place of business at 127, West 30th Street, in the City of New York, Borough of Manhattan, County and State of New York, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to portable lighters, and more particularly to that form of portable lighter intended to be carried in the pocket, which are usually referred to either as "portable lighters" or "cigar lighters".

The object of the invention is to provide a compact, simple and effective construction, and one in which there shall be little or no liability of an accidental operation of the device while carried in the pocket.

With this object in view the present invention consists in a portable pyrophoric cigar and like lighter which comprises a casing a swinging arm pivotally supported at one end on the top of said casing, a latch arranged to engage the forward end of the arm and means whereby said latch may be displaced laterally with relation to the plane in which the arm swings to release the arm.

The present invention is illustrated in the accompanying drawings, in which

Figure 1 shows the lighter in side elevation;

Figure 2 shows an enlarged sectional view on the line 2—2 of Figure 3;

Figure 3 shows an enlarged top plan view;

Figure 4 shows an enlarged view of the upper portion of the device with the arm broken away to show a side view of the sparking wheel and the mechanism for operating it;

Figure 5 shows an under plan view of the disk carrying the latch with a part in section and looking upwardly on the line 5—5 in Figure 2;

Figure 6 is a fragmentary view taken on the line 6—6 in Figure 2 looking

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downwardly, a portion being shown in section.

In the drawings 1 indicates a casing which may be of any suitable size and shape, and made of any suitable material. Within the casing 1 is a chamber 2 filled with a fibrous packing 3 and adapted to contain an inflammable liquid, all as usual in such devices. The casing 1 is provided with a bottom 4 and a top 5, and in the bottom 4 is a screw threaded opening 6, with a screw 7 fitted therein, by means of which the inflammable liquid may be admitted to the chamber 2 as required. The screw 7 is provided with a head 8 seated in a recess formed in the bottom 4, so that its under surface is flush with the under surface of the bottom 4, and beneath the head 8 is a washer 9, so that when the screw shall have been screwed tightly into place a liquid-tight joint will be formed. The head 8 of the screw 7 is of such a diameter that it will project slightly as indicated at 10, beyond the outer wall of the casing 1, as indicated by dotted lines 11 in Figure 3, so that the head 8 may be engaged to turn the screw 7.

At the opposite end of the casing 1 there is permanently seated in the bottom 4 and the top 5 a tube 12, said tube being open at both ends, as clearly shown in Figure 2. Within the tube 12 is a coil spring 13, which at its lower end is seated about a post 14 carried by a screw 15, the screw engaging a threaded portion 16 at the lower end of the tube 12. The screw 15 is provided with a head 17 fitting a recess 18 formed in the under surface of the bottom 4, and of such a diameter that it will project as shown at 19, whereby the head 17 may be grasped and turned to remove or insert the screw to open or close the lower end of the tube 12. In the upper end of the tube 12 is a short cylindrical follower 20 provided with a post 21 with which the upper end of the spring 13 engages, and the follower 20 engages and supports a cylindrical block of pyrophoric material 22; the arrangement being such that the spring 13 exerts a constant upward pressure on the block of pyrophoric material 22 for a purpose

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which will be hereinafter fully set forth.

On the upper surface of the top 5 and surrounding the upper end of the tube 12 is fixedly mounted a base 23 from which
 5 project upwardly the opposed standards or supports 24. The supports 24 receive a shaft 25 upon which is mounted the sparking wheel 26, and the downwardly extending ears 27 of the operating arm or
 10 lever 28, both of which, the sparking wheel and operating arm, turn about the shaft 25 as a center. The sparking wheel is provided on its periphery with the ratchet teeth 29, against which the spring
 15 13 presses the block of pyrophoric material 22, the teeth 29 being pitched all in one direction, so that when the wheel shall be turned the teeth, engaging with the pyrophoric material, will turn to the
 20 right, as the device is shown in Figure 2, and will, acting somewhat as a file, detach and ignite fine particles from the upper end of the pyrophoric material 22.

It is intended that the sparking wheel
 25 26 shall be revolved or turned in one direction only, and only by the upward swing of the arm 28. For this purpose the arm 28 is provided with a spring pawl 30 located within the hollow arm 28 and
 30 engaging at its free end 31 with a series of ratchet teeth 32, formed upon one side of the wheel 26, see Figure 4. The spaces between the teeth 32 of the sparking wheel 26 are beveled, as at 33, so that
 35 the free end 31 of the spring pawl 30 can ride over and engage step by step the ratchet teeth 32, as the arm 28 is raised and lowered, thus providing that the sparking wheel shall always turn in one
 40 direction only, the turning movement being produced by the upward movement of the arm 28. Upon the opposite side of the sparking wheel 26 is formed a recess 34 to receive the coils of a spring 35,
 45 which is coiled about the shaft 25. One arm 36 of the spring 35 is received within and engages the arm 28, the other arm 37 engages the base 23, all as clearly shown in Figure 2 of the drawing, the arrange-
 50 ment being such that the spring 35 normally exerts pressure on the arm 28 to rock said arm about the shaft 25 whereby to raise the said arm and impart a turning motion to the sparking wheel 26.

The arm 28 is normally held in its
 55 closed position by means of a latch 38, which engages a shoulder 39 at the forward end of the arm. Preferably the shoulder is formed upon a block 40 fitted within the arm 28 and in which the forward
 60 end of the spring 30 is permanently seated, and the forward end of the block 40 beneath the shoulder 39 is beveled, as shown at 41, and in like manner the forward
 65 upper edge of the latch 38 is beveled

or rounded as shown at 42. The latch 38
 is carried by a latch plate 43 pivotally mounted upon a shaft 44 within a recess
 between the opposed members of a slotted
 post 45, which post is carried by a circular
 70 base 46 supported by the top 5 of the casing, and positioned so that the latch 38 will engage the shoulder 39 to hold the arm 28 in closed position. The latch 38 is normally held in engaging position
 75 by means of a spring 47 fitted within the slotted post and held therein by a pin 48, one arm of the spring engaging the latch plate 43 carrying the latch 38, and the other arm engaging the upper surface of the base 46. The lower end of the latch
 80 plate 43 is provided with a downwardly extending toe 49 forming a stop whereby to normally position the latch 38 to properly engage the shoulder 39 when the latch plate 43 is rocked forward by the spring 47. The base 46 is provided upon its under surface with a post 49
 85 seated in a cup 50, and held therein by a screw 51, which passes through the closed end of the cup and engages the lower end of the post 49. The upper end of the cup 50 is provided with a flange which is seated in a recess 52 formed in the upper
 90 surface of the top 5 of the casing 1, the lower end of the cup passing through an opening 53 in the top 5. The cup is held from turning in its seat by any suitable means, and of course appropriate means will be employed to provide for a tight
 95 joint between the cup and the chamber 2.

Within the cup 50 is a spiral spring 54 surrounding the post 49, one end of the spring being connected to the bottom of the cup as at 55, and the upper end of
 100 the spring being fixed to the base 46, as at 56. A pin 57 projects upwardly from the flange of the cup and enters a curved recess 58 in the under surface of the base 46. The above arrangement is such that
 105 the spring 54 normally holds the base 46 and latch plate 43 in the position where the latch 38 will engage the shoulder 39 at the end of the arm, and when in this position one end of the curved recess 58
 110 will engage the pin 57, thus forming a positive stop to accurately position the parts in normal operative position. When it is desired to release the arm 28 and permit the spring 36 to raise the arm 28 by
 115 engaging the edge of the base 46 by the thumb or finger it may be turned axially against the tension of the spring 54 a distance permitted by the length of the recess 58, which will be sufficient to later-
 120 ally displace the latch 38, thus disengaging it from the shoulder 39, permitting the spring to quickly throw upward the arm 28, to turn the sparking wheel, and producing the igniting sparks.
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When the base 46 is disengaged or released the spring 54 turns the base 46 returning the parts to normal position as shown in the drawing, in readiness for the latch 38 to again engage the shoulder 39 at the forward end of the arm 28. When returned to normal position because of the complementary beveled and rounded surfaces 41 and 42, it will only be necessary to depress the arm 28 to cause the re-engagement of the latch 38 with the shoulder 39, to complementary beveled surfaces rocking the latch plate 43 against the tension of the spring 47 as the arm 28 is forced down against the tension of the spring 35.

The latch plate 43 is shown as having a rearwardly extending projection 59 extending slightly beyond the post 45, so that it may be engaged by the thumb or finger of the operator to rock the latch plate 43 backward, in lieu of engaging the base 46 and turning the same to displace the latch laterally, if it is desired to do so; but it should be understood that this extending projection 59 is not at all necessary but constitutes merely a supplementary or auxiliary latch actuating device, and obviously it may be dispensed with if desired.

Projecting from the top 5 of the case is a wick tube 60 affixed thereto in any suitable manner, and which passes through the top 5 and opens into the chamber 2, it being provided with a shoulder 61, which rests upon and may be soldered to the top 5. A wick 62 leads from the chamber 2 through the wick tube and projects from the top thereof as shown in Figure 2. This wick conducts the inflammable liquid by capillary action so that the upper end of the wick may be ignited by sparks from the pyrophoric material.

Surrounding the wick tube is a circular seat 63 formed in the upper surface of the top 5, and arranged to receive the lower open flaring peripheral edge 64 of a muffler or extinguisher 65, which is at its upper end attached to and carried by the arm 28 in position to receive, enclose and cover the upper end of the wick tube, and when in the position shown in the drawings will extinguish the flame and protect and preserve in moistened condition the upper end of the wick.

If desired a container for spare sparking blocks may be provided as indicated in the form of a cylindrical case 66, with its closed end passed through the base 4 and secured therein, and projecting into the chamber 2. The open end of this tubular case will be positioned so that when the screw 15 is fitted into the lower end of the tube 12 the open end of the

casing 66 will be closed by the disk 17.

In operation, assuming the parts to be in the position shown in full lines in the drawing, by simply engaging the peripheral edge of the base 46 and turning it about its axis, the divided post 45 will be turned therewith carrying with it the latch plate 43, and thus displacing the latch 38 laterally, until it disengages the shoulder 39, whereupon the spring 35 will quickly throw upward the arm 28 carrying with it the extinguisher 65, thus uncovering the wick 62. This upward movement of the arm 28 will, by means of the spring pawl 30, and the ratchet teeth 32 impart a quick rapid movement of the sparking wheel 26 over the sparking material 22, the movement of the teeth of the sparking wheel as they engage the sparking material being towards the right in Figure 2. This will cause sparks to be generated which will flow towards the wick 62 igniting it. Thereafter the base 46 having been released will be restored to its normal position by the spring 54, thus placing the latch plate 43 and latch 38 in the position shown in full lines in the drawing, so that when the arm 28 shall be forcibly depressed against the tension of the spring 35, the latch 38 may again engage the shoulder 39 and hold the parts locked in position for another operation.

It will be understood that by the pawl and ratchet arrangement 30 and 32 the arm 28 in its downward movement will impart no turning movement to the sparking wheel, and that the turning movement of the sparking wheel is progressive and step by step always in the same direction, so that all parts thereof will be utilized.

As hereinbefore indicated the latch plate 43 may be operated to release the arm 28 by engaging and depressing the projection 59, if such projection be employed; but it is not essential, and may be omitted if desired. It will be noted that the construction of the arm 28 at its rear end with the downwardly extending members 27 forms a protective covering or housing for the sparking wheel 26, protecting the greater part of the toothed surface thereof. It will be further noted that the peripheral edge of the base 46 is so positioned when the casing is grasped in the hand it may be engaged by the thumb of the same hand, and that a slight movement of the thumb while in contact with the base 46 will be sufficient to turn the base and latch plate carried thereby, imparting a lateral movement to the latch plate to release the arm. Thus the lighter constitutes a practical one hand operated device. It is to be particularly noted

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- that while the disengagement of the latch and arm is effected by a relative displacement laterally, they are engaged by a relative displacement in the same plane.
- 5 Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—
- 10 1. A portable pyrophoric cigar and like lighter comprising a casing, a swinging arm pivotally supported at one end on the top of said casing, a latch arranged to engage the forward end of the arm and
- 15 means whereby said latch may be displaced laterally with relation to the plane in which the arm swings to release said arm.
2. A portable lighter as claimed in
- 20 Claim 1, in which the pivoted arm is raised by means of a spring and adapted in its upward movement to operate a sparking mechanism.
3. A portable lighter as claimed in
- 25 Claim 2, in which a spring pressed latch is adapted to engage a shoulder on the forward end of the pivoted arm to hold said arm in the closed position.
4. A portable lighter as claimed in
- 30 Claim 2 or 3, in which the latch is mounted on a rotatable support, said support having a stop for limiting its movement and a spring for returning said support to the normal position.
- 35 5. A portable lighter as claimed in Claim 2, having a rotatable latch for engaging said arm, a disc supporting said latch and adapted to be rotated so as to displace said latch laterally with relation
- 40 to the spring pressed arm, a stop limiting the rotary movement of said disc and latch, and a spring to return said disc and latch to the normal position.
6. A portable lighter as claimed in
- 45 Claim 2, having a cup shaped bearing carried by the top of the casing, a disc rotatably mounted on the casing above said bearing for carrying said latch, a spring within the bearing to return the disc to normal position, and a stop to limit the turning movement of the disc
- 50 so as to position the latch to engage the arm.
7. A portable pyrophoric cigar and like lighter as claimed in Claim 2, having a
- 55 tube open at both ends passing through the casing from the top to the bottom thereof, a block of sparking material projecting from the upper end of said tube to engage a sparking wheel, a screw closing the lower end of the tube, and a
- 60 spring located within the tube acting to hold the sparking material against the sparking wheel, said screw having an enlarged head, and a chamber fitted within the bottom of the casing adjacent said tube with its open end closed by the head of the screw.
8. A portable pyrophoric cigar and like
- 70 lighter as claimed in Claim 2, having a sparking wheel mounted upon the pivot of the swinging arm and provided upon one face with ratchet teeth, having bevelled recesses therebetween, and a spring pawl carried by the spring actuated arm, the
- 75 free end contacting with the ratchet teeth of the sparking wheel to impart to said wheel a step-by-step movement in one direction only by the upward movement
- 80 of the arm.
9. A portable lighter as claimed in Claim 2, in which the latch may be displaced in the plane in which the arm swings as well as laterally with respect
- 85 to the plane.
10. A portable pyrophoric cigar and like lighter substantially as described and as illustrated in and by the accompanying drawings.

Dated this 2nd day of April, 1928.
MARKS & CLERK.

[This Drawing is a reproduction of the Original on a reduced scale.]

