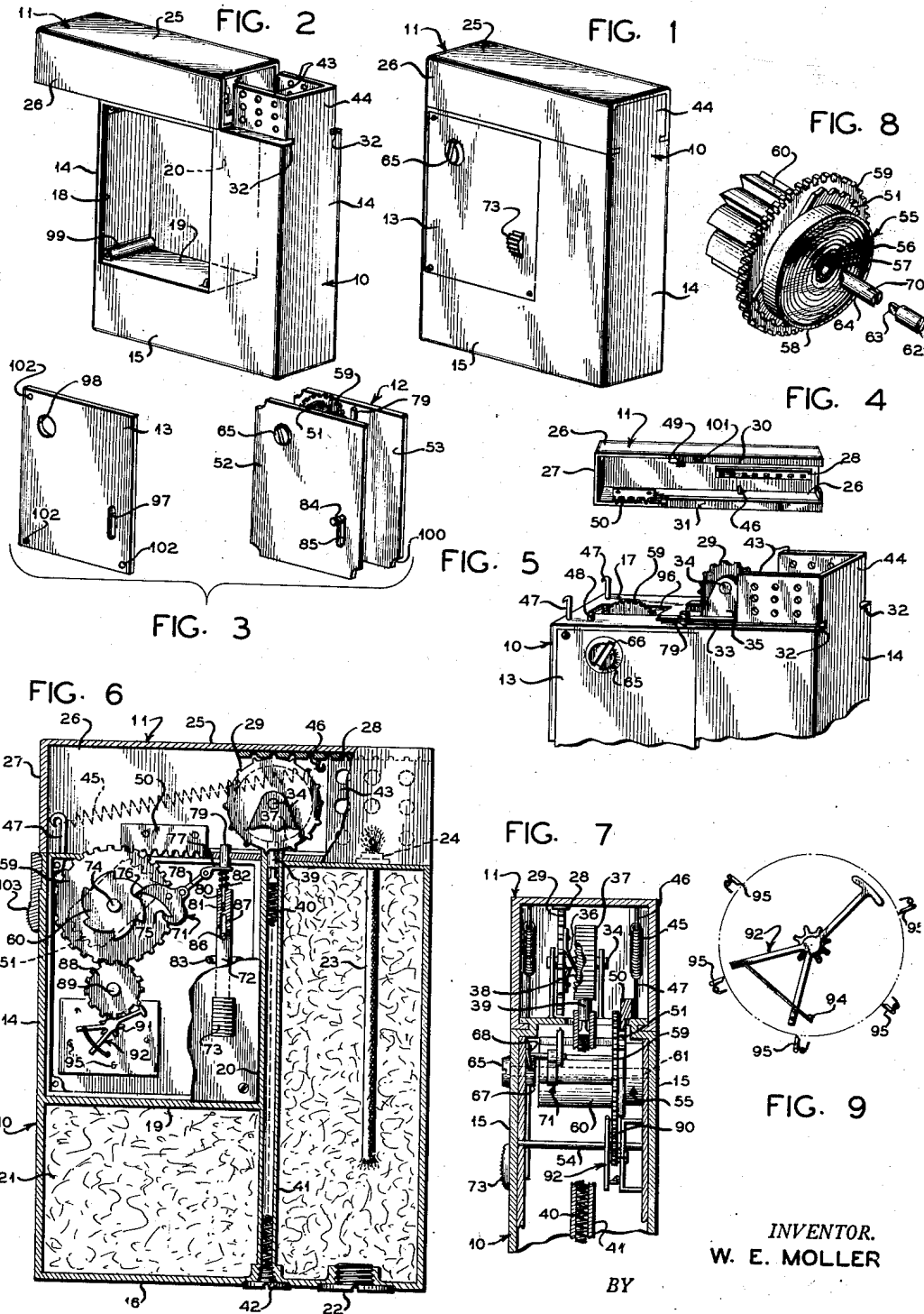


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AUTOMATIC CIGARETTE LIGHTER

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## AUTOMATIC CIGARETTE LIGHTER

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This invention relates to igniting devices and more particularly to a pyrophoric lighter of the type generally used for lighting cigars and cigarettes, the primary object of which is the provision of a device of this character which is of simple and durable construction and more certain of satisfactory operation.

Lighters of this general class have been in use for many years but have suffered from a number of deficiencies which have in many instances materially decreased their usefulness. Among the most common of these deficiencies are the inability to light, and the failure of various parts of the mechanism because of their poor construction, or exposure to conditions for which they are not adapted.

Accordingly, it is an object of the present invention to produce a lighter in which the above mentioned deficiencies are overcome.

A further object of the invention is to produce a lighter in which means is provided for automatically actuating the spark producing means once or a plurality of times in order that ignition of the lighter may be made substantially certain.

A further object of the invention is the provision of a durable lighter which is relatively easy to disassemble and repair by reason of the novel configuration and arrangement of the parts.

Further objects and advantages of the present invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a perspective of the device in closed position;

Fig. 2, a perspective of the device showing the cover in open position and the gear box removed;

Fig. 3, a perspective of the gear box and its cover;

Fig. 4, a perspective showing the interior of the cover;

Fig. 5, a fragmentary perspective of the lighter with the cover removed;

Fig. 6, a vertical sectional view of the lighter;

Fig. 7, a section on the line 7—7 of Fig. 6;

Fig. 8, a perspective of the spring motor mechanism; and,

Fig. 9, an elevation of the governor mechanism.

Referring to the drawing a lighter is disclosed having a casing or housing 10, a slideable cover 11, a removable gear box unit 12, and a cover plate therefor 13. The housing has end walls 14, front and rear walls 15, a lower wall 16 and

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an upper wall 17. For receiving the unit 12 the housing is provided with an opening 18 which is enclosed on two sides by the two walls 14 and 17 and by interior walls 19 and 20 secured to the front and rear walls 15.

The casing or housing may be of any convenient shape and contains a supply of absorbent cotton or the like 21 which may be saturated with lighter fluid. A removable filler plug 22 is threaded into an opening in the lower wall 16 of the housing, and a wick 23 extends from the interior of said housing in contact with the absorbent material 21 through an opening in the upper wall 17 and is secured by means of a threaded collar 24.

The cover 11 comprises a top 25, side walls 26 and an end wall 27. Mounted within the cover and attached to the under side of the top 25 is a rack 28 which is adapted to engage the teeth of an igniter wheel actuating pinion 29. The side walls of said cover are provided with flanges 30 and 31 for reception in guide means or grooves 32 formed on the upper wall of the housing by means of angle bars 33 which may be attached thereto or be integrally therewith.

The pinion 29 referred to above is mounted on a shaft 34 which is secured in opposed brackets 35. A spring clutch 36 is secured to the face of the pinion and is adapted to engage a striking wheel 37 by means of serrations 38 in its face. A flint 39 is resiliently pressed against the striking wheel by a spring 40 which is confined in a tube 41 passing through the upper wall of the lighter and secured to the lower wall in any suitable manner or formed integrally therewith. The flint 39 and spring 40 are retained within the tube 41 by an adjusting screw or stud 42 as is well known in this art.

At the corner of the housing nearest the wick, perforated shield members 43 are attached to an end wall member 44, to protect the wick from air currents and the like.

The shield members and end wall may be attached to the housing or formed integrally therewith as shown in the drawing.

It is apparent from the above that slidably movement of the cover 11 relative to the housing 10, when the rack 28 is in engagement with the pinion 29, will cause rotation of the spark producing means. In order to produce movement of the slidably cover, helical spring members 45 are attached thereto by hooks 46 and to the upper wall 17 of the housing by hooks 47. A set screw 48 is positioned with its point projecting above the wall 17 in such a manner as to

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abut a stop 49 on the flange 30 of the cover, when the cover reaches a predetermined open position.

The removable gear box unit 12, referred to above, provides an energy storing means in order that successive operation of the spark producing mechanism may be produced without the necessity of manually returning the cover to its closed position each time. For returning the cover automatically, the cover is provided with a rack 50 which is adapted to be engaged by a spring actuated segmental gear 51, forming part of the unit 12. The unit 12 includes front and rear walls 52 and 53 secured together by one or more rod members 54.

Positioned between the faces of the walls 52 and 53 is a spring motor mechanism 55 which includes a coil spring 56 having its inner end attached to a sleeve 57 and its outer end to a housing 58. The housing 58, the double segmented gear 51, a fine tooth gear 59, and an elongated ratchet wheel or toothed member 60 are secured together as a rigid unit, having their respective axes aligned. The sleeve 57 projects sufficiently beyond the face of the spring 56 to be journaled in an aperture 61 in the wall 53 of the unit 12. A rod member 62 having a tongue 63 on an end thereof is tightly positioned in sleeve 57 so that relative rotation therebetween is prevented. The bore of the spring housing, that of the gears 51 and 59, and that of the ratchet wheel 60, is slightly larger than the shaft 62 in order that the members may rotate relative to said shaft.

For winding spring 56, a winding stem 64 of rod stock similar to that of member 62 is provided and includes an enlarged head 65 with a slot 66 for the reception of a thin article such as the edge of a coin. Said rod 62 has rigidly attached thereto a ratchet 67 for engagement with a spring biased pawl 68. A slot 70 is provided in the end of the stem for reception of the tongue 63 of the rod 62. By rotating the winding stem clockwise, energy may be stored in the spring 56.

To permit the gears 51 and 59 to project there-through an opening 96 is provided in the upper wall of the housing 10.

For manually controlling the operation of the spring motor mechanism and the movement of the slidable cover 11, a control lever 72 is provided which is connected through suitable linkage to a dog or pawl 71 and a reciprocable member or post 79. The dog 71 has a hooked end 75 and a relatively straight end 76. The post 79 is adapted to project through the wall 17 and the flange 33 of the housing 10 and through an opening 101 in the flange 30 of the cover 11 for maintaining the cover in closed position.

Said post 79 is attached to a base 77 and has a rod member 80 of reduced size on the opposite side of the base 77, said rod member being adapted to reciprocate in an elongated recess 81 in the lever 72. The reciprocable member is resiliently attached to the lever 72 by a spring 82.

A projection 84 on said lever is adapted to be received in an elongated slot 85 of the wall 52, and a projection 86 on the inner surface of said wall is adapted to be received in an elongated slot 87 of said lever to permit lengthwise slidable movement of the lever. For additionally positioning the lever a guard 83 is attached to the wall 52. The gear box cover member 13 is provided with apertures 97 and 98 for receiving the

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projection 84 and head 65 of the winding stem, respectively.

It is apparent that movement of the lever to an upward position will tend to compress the spring 82, forcing the post 79 upwardly, and that downward movement of the lever will tend to move said post downwardly.

The base 77 of the post 79 is attached to the dog 71 by means of a link 78 which is secured by pins to each of the members. The control lever is thus adapted to move the post 79 and at the same time to rotate the dog 71, so that said dog may be positioned where one or the other of its ends may engage the teeth of the ratchet wheel 60, or where neither of its ends engage said ratchet wheel.

To prevent over-speeding of the spring housing 58 and the associated gears, a governor mechanism is provided and includes a gear 88 mounted on a shaft 89 which is rotatably secured in a support plate 80 attached to the wall 53 of the unit 12. The gear 88 is engaged with the gear 59 of the spring motor mechanism 55 and also with a pinion 91 journaled in the plate 90.

Said pinion has attached thereto a Y fork 92 having a resilient spring arm 93 with a weight 94 on the free end of said arm. Spring loaded pivotally mounted abutments 95 are attached to the plate 90 and positioned in a circle about the axis of the shaft of the pinion 91 and at a distance greater therefrom than that of any part of the fork 92. When the speed of rotation of the fork member reaches a predetermined value the weight on the spring member causes said spring member to contact the abutments 95 thus retarding the speed and thereby preventing the mechanism from over-speeding.

The gear box unit 12 is adapted to be positioned in the housing 10 by means of abutments 99 formed in the housing, which are received in cut-out portions 100 of the corners of the wall members 52 and 53.

Fasteners 102 passing through the cover plate 13 and secured in recesses in the abutments 99 maintain the unit and its cover plate in position.

Should it become necessary to remove the gear box unit for repairs or replacement, or if the same should fail to properly function while in place in the lighter, the lighter may be actuated by manually returning the cover to closed position each time it is desired to operate the striking mechanism. To retain the cover in closed position when the gear box unit control lever is not employed an auxiliary catch 103 may be attached to the housing or cover.

In the operating of the device, assuming that the cover is closed as in Fig. 1, and that the spring motor has been wound as previously described, the cover member 11 may be released by downward movement of the button 73 to move the post 79 downwardly and out of the aperture 101 of said cover. When the cover is thus released the springs 45 produce slidable movement of it and its associated rack, causing rotation of the associated pinion and the sparking wheel 24, thus directing sparks onto the saturated wick 14 to produce a flame.

Assuming that the button 73 has been moved to its lowermost position, the dog 71 is rotated so that the hooked end 76 is in position to engage the teeth of the ratchet wheel 60. When the control lever is moved to its lowermost position the straight end 76 of the dog 71 becomes disengaged from the ratchet wheel but the hooked

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end 75 immediately engages a tooth thereof to prevent rotation. When it is desired to close the cover of the lighter, the control lever is moved to its uppermost position which causes the post 79, acted on by the spring 82, to be urged against the flange 30 of the cover. At the same time, the dog 71 is rotated counterclockwise sufficiently to disengage the hooked end 75 from the ratchet wheel but not sufficiently for the straight end 76 to engage said ratchet wheel. At this stage the spring housing 58 and associated gears, acted on by the coil spring rotate in a clockwise direction and a segment of the gear 51 engages the rack 50 to move the rack and the cover 11 to its initial position covering the housing 10.

When the cover is in the closed position, the aperture 101 in the flange 30 is positioned over the spring pressed post 79 which then enters the same to prevent movement of the cover. As the post 79 moves upwardly the dog 71 is rotated counterclockwise by means of the link 78 an amount sufficient for the straight end 76 thereof to engage the ratchet wheel 60 and prevent further rotation. Each of the segments of the gear 51 is of such length and configuration that it becomes disengaged with the last tooth of the rack when the cover returns to closed position.

If it is desired that the striking members be actuated a plurality of times the control lever 72 may be moved to midway position which withdraws the post 79 from engagement with the aperture 101 of the cover and rotates the dog 71 to a neutral position where neither of its ends can engage the ratchet wheel 60. When in this position, the cover is released to actuate the striking mechanism and as it reaches open position the rack 50 is engaged by a segment of the gear 51 to return the cover to closed position; as soon as the cover is in closed position the rack and segmental gear become disengaged whereby the cover may again slide to open position until it is returned by action of the segmental gear. This may continue until the spring motor runs down if desired, or until a flame is produced, after which the lever may be returned to its lower position to hold the cover open or to its upper position to close the cover.

It is apparent that closing the cover of the device will snuff out the flame of the wick and that no additional means is needed to accomplish this purpose.

It is also apparent that all of the spring members of the device are out of the path of the flame from the wick and will therefore not have their life unduly shortened because of being exposed to the heat therefrom.

From the above, it will be understood that the invention includes an automatic pyrophoric lighter which is simple and durable in construction and whose striking mechanism may be manually controlled to permit actuation one or more times and whose parts are easily disassembled for repairing and cleaning.

It will be obvious to those skilled in the art that various changes may be made in the invention without departing from the spirit and scope thereof and therefore the invention is not limited by that which is shown in the drawings and described in the specification but only as indicated in the appended claims.

What is claimed is:

1. An automatic pyrophoric lighter comprising a housing; a fuel reservoir within said housing; a wick in communication with said fuel reservoir;

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striking means at the top of said housing, said means including a rotative pinion; a cover fitted over and normally closing the top of said housing, said cover carrying a pair of racks, one for engagement with said pinion; a spring attached to said housing and to said cover; a reciprocable member for engagement with said cover for holding said cover in position over the top of said housing against the force exerted by said spring; a spring motor for returning the cover to a position over the housing, and means for winding said spring motor; first and second gears and a ratchet wheel associated with said motor, and forming a rigid unit, the first of said gears being adapted to engage the other of said racks attached to said cover for moving said cover; governor mechanism driven by said second gear for preventing overspeeding of said spring motor; a pivotally mounted dog having a hooked and a straight end, each of which is adapted to engage said ratchet wheel; a link connecting said dog to said reciprocable member; a control lever for varying the position of said reciprocable member and said dog; resilient means connecting said control lever and said reciprocable member; said control lever being adapted to occupy a plurality of positions, whereby said control lever may be placed in one position in which the straight end of said dog engages said ratchet wheel and said reciprocable member engages said cover to prevent operation of the lighter, and whereby in another position said reciprocable member disengages said cover to permit said cover to be moved by said spring whereby said rotative pinion actuates said striking means and the hooked end of said dog engages said ratchet wheel to prevent rotation of said gears and whereby in another position said reciprocable member disengages said cover to permit said cover to be moved by said spring means and said dog disengages said ratchet wheel to permit rotation of said gears and said first gear engages the other of said racks to move said cover to closed position.

2. An automatic pyrophoric lighter comprising a housing; a fuel reservoir within said housing; a wick in communication with said fuel reservoir; striking means at the top of said housing, said means including a rotative pinion; a cover fitted over and normally closing the top of said housing, said cover carrying a pair of racks, one for engagement with said pinion; a spring attached to said housing and to said cover; a reciprocable member for engagement with said cover for holding said cover in position over the top of said housing against the force exerted by said spring; a spring motor for returning the cover to a position over the housing, and means for winding said spring motor; first and second gears and a ratchet wheel associated with said motor, the first of said gears being adapted to engage the other of the racks attached to said cover for moving said cover; means driven by said second gear for preventing overspeeding of said spring motor; a pawl for engagement with said ratchet wheel; a link connecting said pawl to said reciprocable member; a control lever for varying the position of said reciprocable member and said pawl; means connecting said control lever and said reciprocable member; said control lever being adapted to occupy a plurality of positions, whereby said control lever may be placed in one position in which said dog engages said ratchet wheel and said reciprocable member engages said cover to prevent operation of the

lighter, and whereby in another position said reciprocable member disengages said cover to permit said cover to be moved by said spring whereby said rotative pinion actuates said striking means, and said pawl engages said ratchet wheel to prevent rotation of said gears, and whereby in another position said reciprocable member disengages said cover to permit said cover to be moved by said spring, and said pawl disengages said ratchet wheel to permit rotation of said gears, and said first gear engages said rack to move said cover to closed position.

3. An automatic pyrophoric lighter comprising a housing; a fuel reservoir within said housing; a wick in communication with said fuel reservoir; striking means at the top of said housing, said means including a rotative pinion; a cover fitted over and normally closing the top of said housing, said cover carrying a pair of racks, one for engagement with said pinion; a spring attached to said housing and to said cover; a reciprocable member for engagement with said cover for holding said cover in position over the top of said housing against the force exerted by said spring; a spring motor for returning the cover to a position over the housing, and means for winding said spring motor; first, second, and third toothed members associated with said motor and forming a rigid unit, the first of said toothed members being adapted to engage the other of the racks attached to said cover for moving said cover; means driven by said second toothed member for preventing overspeeding of said motor; a dog for engagement with said third toothed member; means connecting said dog with said reciprocable member; means for varying the position of said reciprocable member and said dog, means connecting said reciprocable member and said position varying means; whereby said position varying means may be positioned so that said dog engages said third toothed member and said reciprocable member engages said cover to prevent operation of the lighter, and whereby in another position said reciprocable member disengages said cover to permit said cover to be moved by said spring whereby said rotative pinion actuates said striking means, and said dog engages said third toothed member to prevent rotation of said toothed members, and whereby in another position said reciprocable member disengages said cover to permit said cover to be moved by said spring means, and said dog disengages said third toothed member to permit rotation of said toothed members and said first toothed members engages the other of said racks to move said cover to closed position.

4. An automatic pyrophoric lighter comprising a housing; a fuel reservoir within said housing; a wick in communication with said fuel reservoir; striking means associated with said wick, said means including a rotative pinion; a cover for said housing; said cover carrying a pair of racks, one for engagement with said rotative pinion; a spring attached to said housing and said cover; a reciprocable member for engagement with said cover for holding said cover in closed position against the force exerted by said spring; a spring motor for returning the cover to closed position; means for winding said spring motor; first and second gears, and a ratchet wheel associated with said motor, the first of said gears being adapted to engage the other said racks attached to said cover for moving said cover; governor mechanism driven by said second gear for preventing overspeeding of said spring motor; a pivotally

mounted dog having a hooked and a straight end, each of which is adapted to engage said ratchet wheel; a link connecting said dog to said reciprocable member; a control lever for varying the position of said reciprocable member and said dog; and means connecting said control lever and said reciprocable member; whereby said control lever may be actuated to place said reciprocable member, and said dog in one position to prevent operation of the lighter, or in another position to permit said cover to be moved by said spring to actuate the striking means, or in another position to permit said first gear to engage the other of said racks to return said cover to closed position.

5. An automatic pyrophoric lighter comprising a housing; a fuel reservoir within said housing; a wick in communication with said fuel reservoir; striking means associated with said wick, said means including a rotative pinion; a cover for said housing, said cover carrying a pair of racks, one for engagement with said rotative pinion; a spring attached to said housing and said cover; a member for engagement with said cover for holding said cover in closed position against the force exerted by said spring; a spring motor for returning the cover to closed position; means for winding said spring motor; a gear, and a ratchet wheel associated with said motor, said gear being adapted to engage the other said racks attached to said cover for moving said cover; a pivotally mounted dog adapted to engage said ratchet wheel; means connecting said dog to said member; a control lever for varying the position of said member and said dog; and means connecting said control lever and said member; whereby said control lever may be actuated to place said member, and said dog in one position to prevent operation of the lighter, or in another position to permit said cover to be moved by said spring to actuate the striking means, or in another position to permit said gear to engage the other of said racks to return said cover to closed position.

6. An automatic pyrophoric lighter comprising a housing, a fuel reservoir within said housing, a wick associated with said fuel reservoir, striking means associated with said wick, said means including a rotative pinion, a slidable cover for said housing, said cover carrying a rack in engagement with the pinion, spring means attached to said housing and said cover, releasable means for holding the cover in position over the top of the housing against the force exerted by the spring means, and means for returning the cover member to a position over the housing, said last means comprising a separable unit which may be removed from said housing without impairing the ability of the lighter to be manually operated.

7. An automatic pyrophoric lighter comprising a housing, a fuel reservoir within said housing, a wick in communication with the reservoir, striking means associated with the wick, said means including a rotative pinion, a slidable cover fitted over and normally closing the top of said housing, a rack carried by said cover in engagement with the pinion, spring means attached to said housing and to said cover for moving the cover and rack to rotate the striking means, releasable means for holding the cover in position over the top of the housing against the force exerted by the spring means, and means for returning the cover to a position over the housing.

8. In an automatic pyrophoric lighter having striking means actuated by a sliding cover, means for returning the cover to its initial position, said

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means including a rack attached to said cover, a segmental gear for driving said rack, a governor mechanism for preventing overspeeding of said segmental gear, a gear for engagement with said governor mechanism, a ratchet wheel for controlling the operation of said segmental gear, and a spring motor for driving said segmental gear.

9. In an automatic pyrophoric lighter having striking means actuated by a sliding cover, spring actuated means for moving the cover to actuate the striking means, means for returning the cover to its initial position, said means including a rack attached to said cover, a segmental gear for engagement with said rack, and a spring motor mechanism for driving said segmental gear.

10. An automatic pyrophoric lighter comprising a housing, a fuel reservoir within the housing, a wick, means for igniting the wick including a striking means, a cover mounted on the housing and adapted to move from a first to a second position, a first engaging means on the cover for moving the striking means when the cover moves, a second engaging means on the cover, a first energy storing means normally urging the cover from the first toward the second position, a second energy storing means in said housing, and a

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third engaging means associated with said second energy storing means and adapted to alternately engage the second engaging means on said cover when said cover is in said second position and to return said cover to said first position, said third engaging means being associated with said second energy storing means and being adapted to disengage from said second engaging means on said cover when said cover is in said first position.

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## REFERENCES CITED

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

## UNITED STATES PATENTS

| Number    | Name    | Date          |
|-----------|---------|---------------|
| 1,788,544 | Rombach | Jan. 13, 1931 |
| 1,328,887 | Aronson | Oct. 27, 1931 |
| 1,859,908 | Aronson | May 24, 1932  |
| 1,988,838 | Harris  | Apr. 23, 1935 |

## FOREIGN PATENTS

| Number  | Country       | Date          |
|---------|---------------|---------------|
| 435,465 | France        | Dec. 27, 1911 |
| 447,031 | Great Britain | Feb. 13, 1935 |