July 1, 1941. G. W. ALEXANDER 2,247,901

BATTERYLESS FLASHLIGHT

Filed April 24, 1940 3 Sheets-Sheet 1

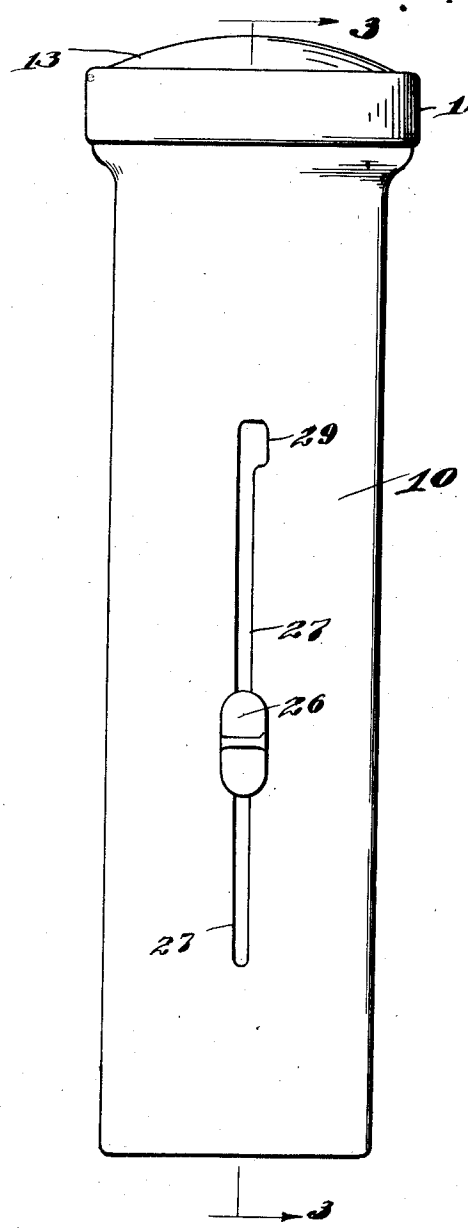


Fig. 2.

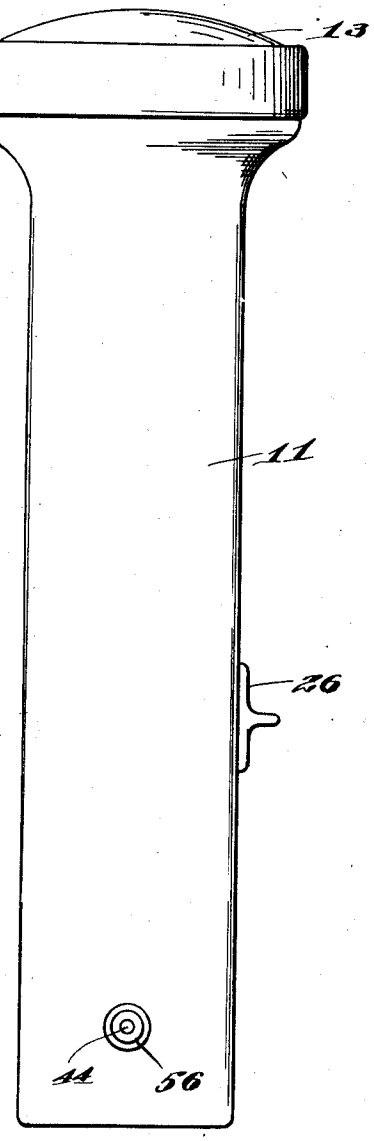


Fig. 1.

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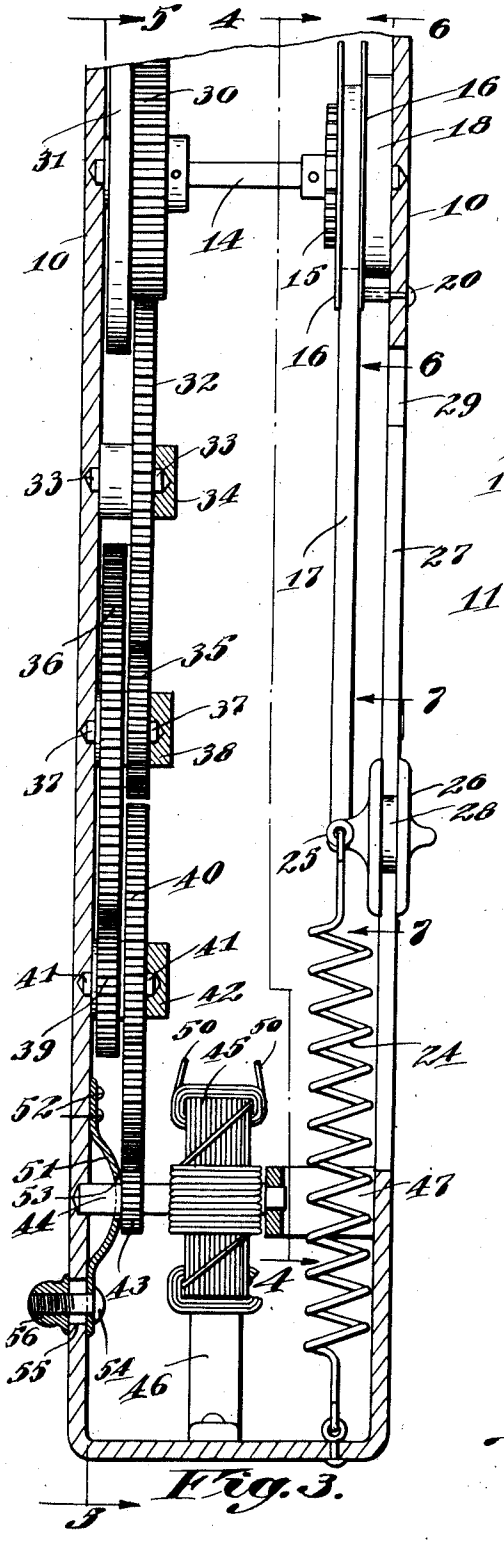


Fig. 3.

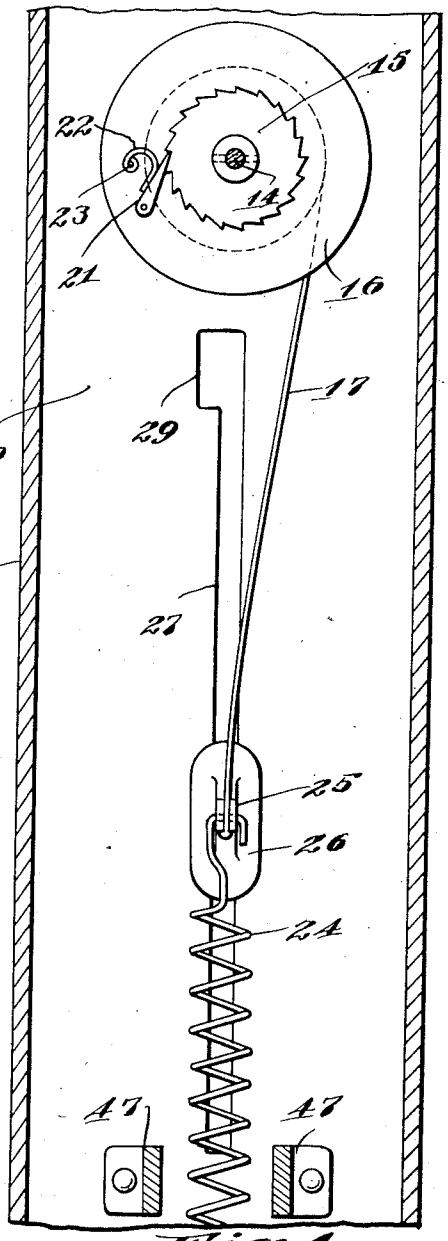


Fig. 4.

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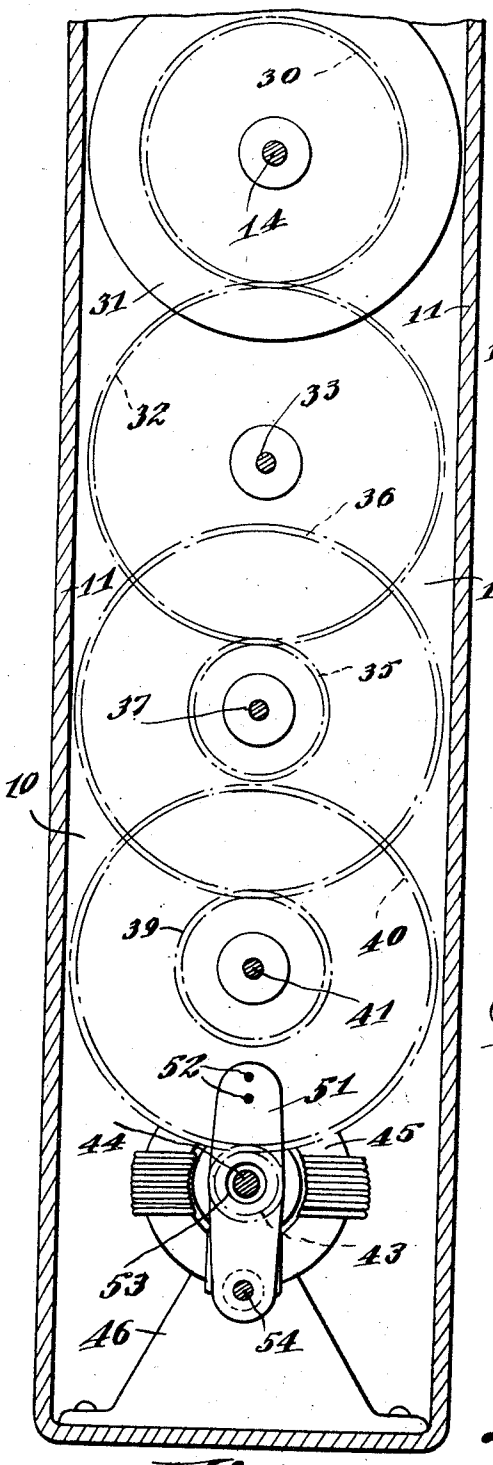


Fig. 5.

Fig. 6.

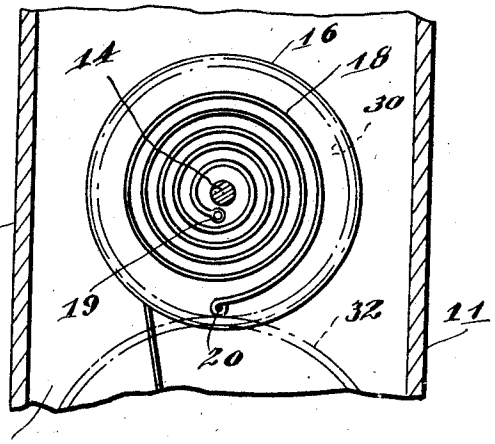
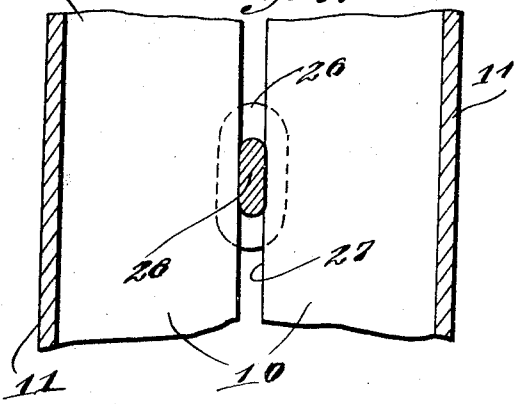


Fig. 7.



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UNITED STATES PATENT OFFICE

2,247,901

BATTERYLESS FLASHLIGHT

George W. Alexander, Boston, Mass.

Application April 24, 1940, Serial No. 331,433

1 Claim. (Cl. 240—10.5)

My present invention relates to flashlights and more particularly to an improved batteryless flashlight in which a spring motor furnishes the motive power to operate a small generator furnishing the electrical current which operates the small incandescent flashlight lamp.

The principal object of my invention is an improved batteryless flashlight;

Another object is to provide a mechanism for furnishing electrical energy to an incandescent lamp in which the speed of the electrical generator may be varied at will, and

Other objects and novel features comprising the construction and operation of my invention will be apparent as the description of the same progresses.

In the drawings illustrating the preferred embodiment of my invention:

Fig. 1 is a side elevation of the flashlight;

Fig. 2 is another side elevation taken at ninety degrees to Fig. 1;

Fig. 3 is a cross-section taken on the line 3—3 of Fig. 2, one end being cut away for convenience;

Fig. 4 is a cross-section taken on the line 4—4 of Fig. 3, the lower end being broken off for convenience;

Fig. 5 is a cross-section taken on the line 5—5 of Fig. 3, the top of the flashlight being broken off, as in Fig. 3;

Fig. 6 is a detail cross-section taken on the line 6—6 of Fig. 3, the top and bottom portions being broken away, and

Fig. 7 is a fragmentary cross-section taken on the line 7—7 of Fig. 3 showing a detail of the slide member.

Referring more in detail to the drawings, 10 indicates the broad side of the flashlight and 11 indicates the narrow side. The upper end of the two sides terminate in a round end fitted with a screw cap 12 which clamps the lens 13 to the flashlight casing in the conventional manner.

In the upper portion of the flashlight casing, and journalled in the two broad sides 10 is a shaft 14 which has pinned thereto a ratchet wheel 15. Journalled on the shaft 14 adjacent the ratchet wheel 15 is a reel member 16 on which is wound a tape 17. Surrounding the shaft 14 and between the reel 16 and the adjacent side 10 of the flashlight casing is a coiled flat spring member 18. The inner end of the spring 18 is pinned to the adjacent side of the reel 16, as indicated at 19, see Fig. 6, the other or outer end of the spring 18 being anchored to the adjacent side wall 10 by means of the pin 20.

On the side of the reel 16 adjacent to the ratchet wheel 15, I have provided a pin 21 on which is pivoted a pawl member 21 which is maintained in contact with the ratchet teeth by means of a tension spring 22 pivoted on pin 23 mounted in the face of the reel 16.

Anchored to the lower end of the flashlight casing is a coil spring 24 the upper end of which engages through an eye member 25 located on the inner side of the slide member 26. The eye member 25 is slotted to admit the end of the tape 17, the spring end passing both through the eye 25 and the end of the tape 17. In the adjacent side 10 of the flashlight casing is a slot 27 in which the central portion 28 of the slide member 26 operates. At the upper end of the slot 27 is an offset recess 29 into which the central portion 28 of the slide 26 may be placed for the purpose of locking the slide.

When the slide member 26 is pulled upward in the slot 27 toward the recess 29, the flat coil spring 18 causes the reel 16 to rotate in a counter-clockwise direction, as viewed in Fig. 4. During this operation, the pawl 21 which is pivoted to the side of the reel 16 revolves around the ratchet wheel 15. When the slide member 26 is released, the spring 24 which is much stronger than the flat coil spring 18 causes the reel 16 to reverse its direction to a clockwise direction, as viewed in Fig. 4 and the pawl 21 now engages the teeth of the ratchet wheel 15 causing the shaft 14 to rotate.

Pinned to the other end of the shaft 14 is gear 30 and fly-wheel 31. Engaged with the gear 30 is a gear train comprising the gear 32 pivoted at 33 in the bracket 34 and side wall 10. Engaging with the gear 32 is a pinion 35 which is solidly fixed to an adjacent gear 36 both being pivoted at 37 in the bracket 38 and side wall 10. Engaging with the gear 36 is a pinion 39 which is solidly fixed to an adjacent gear 40 both being pivoted at 41 in the bracket 42 and side wall 10. Engaging with the gear 40 is a pinion 43 fixed on the shaft 44 of the rotatable member of the generator 45 which is supported from the bottom of the flashlight casing by means of the base member 46. The shaft 44 is journalled in a bracket 47 attached to one side 10 of the flashlight casing, the other end being pivoted in the opposite side.

In operation, the generator output from the wires 50 are directly connected to the two sides of the filament of an incandescent lamp located in the top of the flashlight, and when the slide

member is released from the high point adjacent the top of the slot 27, the energized spring 24 turns the reel 16 and ratchet 15 causing the shaft and gear train to revolve the generator shaft 44 at high speed generating electricity to light the incandescent lamp.

To vary the speed of the generator and the voltage at the incandescent lamp, I have provided a spring brake member 51 fixed to the side wall 10 at 52. This spring member 51 is provided with a bowed central portion in which is located an opening 53 through which passes the shaft 44 of the generator. The other end of the bowed spring member 51 is fixed to a threaded stud 54 which is slidably mounted in a slot 55 located in the side 10 of the flashlight casing. A threaded nut member 56 engages the threaded stud 54 on the outside face of the side wall 10. By pressing upward on the nut 56 the pressure of the bowed portion of the spring 51 against the side of the pinion 43 may be increased or decreased at will to control the speed of the generator shaft 44, or the spring pressure may be fixed at any point by tightening the nut 56.

The drawings illustrating my invention are more or less diagrammatic in form and I may vary the shape and proportions somewhat in actual practice and I may use several springs similar to spring 24, etc., all of which being duplications of the mechanisms shown and all falling within the spirit of the invention.

Having thus described my invention, what I claim as new is:

In a batteryless flashlight, a casing, a drive shaft journalled in said casing, a ratchet wheel pinned to said shaft, a reel journalled on said shaft, a spiral spring located between said reel and one side of said casing, one end of said spring anchored to said casing and the other end anchored to said reel, a pawl pivoted on said reel and engaged with said ratchet wheel said pawl being provided for the purpose of locking said reel to said drive shaft when said reel is rotated in one direction, a gear pinned to said shaft, an electric generator mounted in said casing, said generator having a rotatable shaft journalled in said casing, a pinion fixed to said generator shaft, intermediate pinions and gears connecting said generator shaft pinion with said drive shaft gear, a tension spring attached at one end to said casing, a tape attached at one end to said reel the other end being attached to said tension spring, a slot located in the side of said casing, a slide member located in said slot, said slide member attached on the inside of said casing to said tape and the extensible end of said tension spring, a friction brake spring engaging one side of said generator shaft pinion, means for regulating the tension of said brake spring on said generator shaft pinion.

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