Oct. 21, 1924. 1,512,467

G. I. JOHNSON

FLASH LIGHT

Filed Nov. 19, 1921 2 Sheets-Sheet 1

Fig. 1.

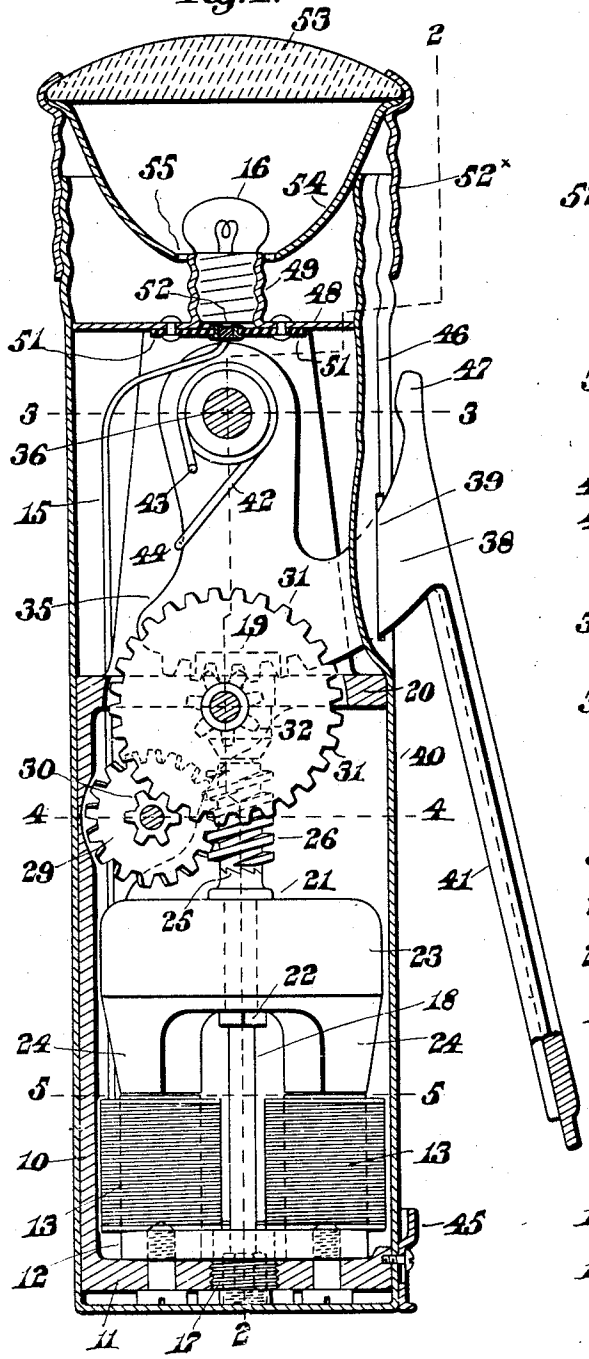
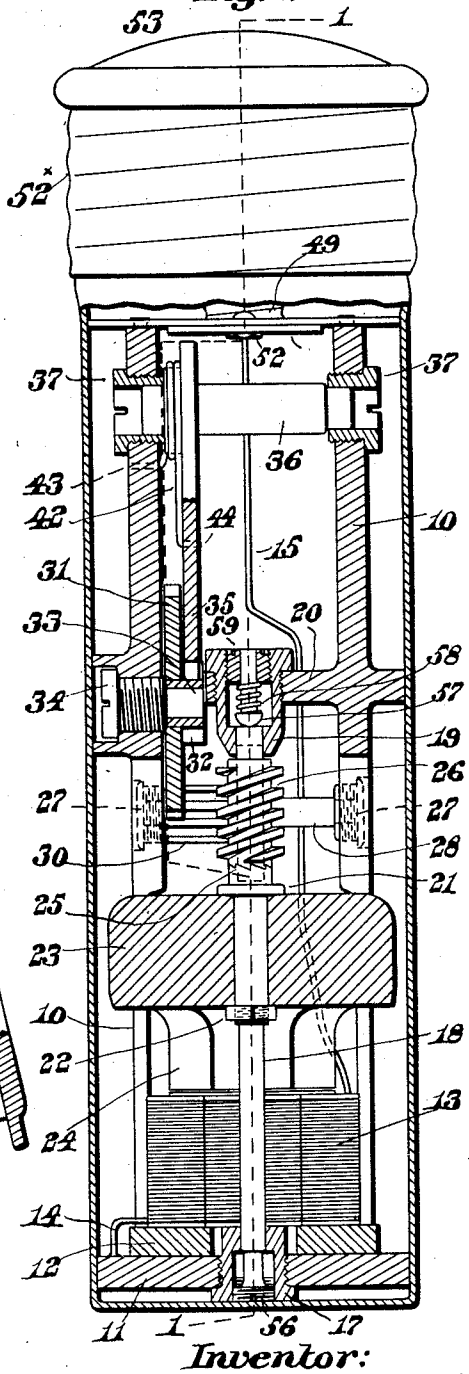


Fig. 2.



Inventor:
Gustaf Ivar Johnson,
by Walter E. Lombard,
Atty.

Oct. 21, 1924. 1,512,467

G. I. JOHNSON

FLASH LIGHT

Filed Nov. 19, 1921 2 Sheets-Sheet 2

Fig. 3.

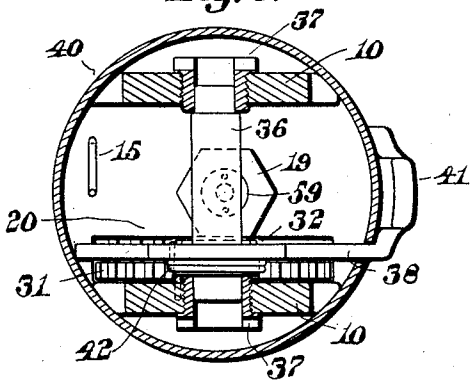


Fig. 5.

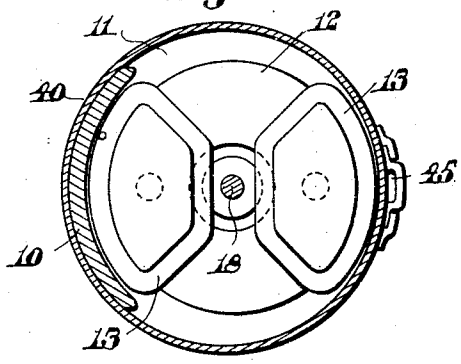


Fig. 4.

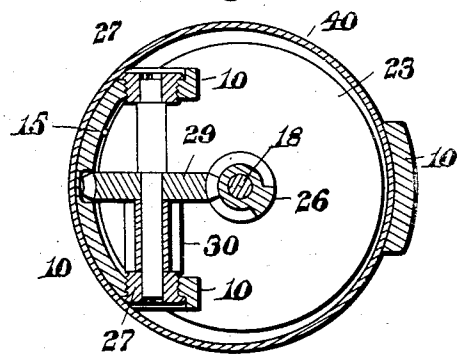


Fig. 6.

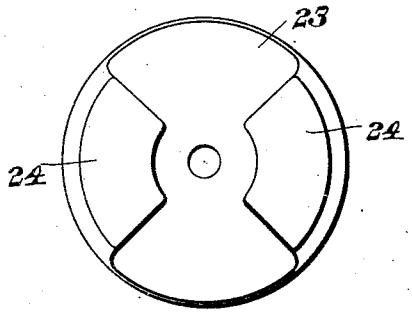
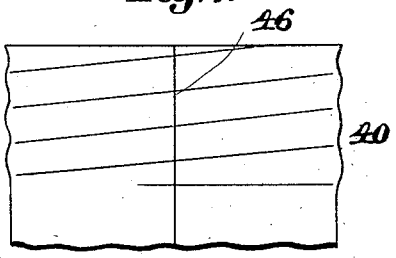


Fig. 7.



Inventor:
Gustaf Ivar Johnson,
by Walter E. Lombard,
Atty.

Patented Oct. 21, 1924. 1,512,467

UNITED STATES PATENT OFFICE.

GUSTAF IVAR JOHNSON, OF MALDEN, MASSACHUSETTS.

FLASH LIGHT.

Application filed November 19, 1921. Serial No. 516,453.

To all whom it may concern:

Be it known that I, GUSTAF I. JOHNSON, a citizen of the United States of America, and a resident of Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Flash Lights, of which the following is a specification.

This invention relates to electric flashlights and particularly to devices of this character provided with manually actuated instrumentalities for generating the current for the lamp.

The present invention is an improvement on the device shown and described in U. S. Patent No. 1,366,461 issued to me January 25, 1921, and the object of the invention is to simplify the construction of the device whereby it may be manufactured at less cost and have fewer movable parts.

The invention consists in certain novel features of construction and arrangement of parts which will be understood readily by reference to the description of the drawings and to the claims to be hereinafter given.

For the purpose of illustrating the invention, one preferred form thereof is illustrated in the drawings, this form having been found to give satisfactory and reliable results although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and the invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described except as required by the scope of the appended claims.

Of the drawings:

Figure 1 represents a section of a flashlight embodying the principles of the present invention, on line 1, 1, on Fig. 2.

Figure 2 represents a section of the same on line 2, 2, on Fig. 1.

Figure 3 represents a transverse section of same on line 3, 3, on Fig. 1.

Figure 4 represents a transverse section of same on line 4, 4, on Fig. 1.

Figure 5 represents a transverse section of same on line 5, 5, on Fig. 1 looking towards the field coils.

Figure 6 represents an end view of the rotating magnet, and

Figure 7 represents an elevation of the lamp end of the casing.

Similar characters indicate like parts throughout the several figures of the drawings.

In the drawings, 10 is a frame having an end plate 11 to which is secured an annular plate 12 on which the field coils 13, 13, are mounted, one end of said coils being grounded to the end plate 11 as indicated at 14 while the opposite end 15 extends to the lamp 16.

The end plate 11 has mounted therein, the threaded member 17 having at its inner end a bearing through which extends the end of a rotatable shaft 18 the opposite end of which is mounted in a bearing in the member 19 screwed into a projection 20 on the frame 10.

On the shaft 18 between the flange 21 and a nut 22 is clamped a permanent magnet 23 having poles 24 which extend toward the field coils 13 with their end faces closely adjacent the ends of the cores of said field coils 13, 13.

When the magnet 23 is rotated at a high rate of speed an electric current is generated in the coils 13 which will be transmitted through the electric connection 15 to the lamp 16.

The shaft 18 is provided adjacent to the magnet 23 with a plurality of ratchet teeth 25 which are normally in engagement with teeth upon a slidable worm 26 mounted upon the shaft 18 and freely revoluble thereon.

It is self evident that the ratchet teeth 25 of said shaft 18 could be formed upon the end of the magnet if desired without departing from the principles of the invention.

In the frame 10 are mounted alined members 27 having oppositely disposed sockets to receive the ends of a shaft 28 to which is secured a worm gear 29 the teeth of which mesh with the slidable worm 26.

This shaft 28 has also secured thereto, a pinion 30 with the teeth of which mesh the teeth of a large gear 31 mounted upon the hub of a second pinion 32 which is freely

revoluble upon the cylindrical projection 33 of a stud 34 screwed into the frame 10.

The second pinion 32 is prevented from becoming displaced from the projection 33 by means of the opposing end of the projection 20 as clearly shown in Fig. 2.

With the teeth of this second pinion 32 mesh the teeth of a segment 35 which is secured to a shaft 36 having trunnions at opposite ends thereof mounted in the alined bearing members 37 threaded to the frame 10 as shown in Fig. 2.

The segment 35 has an extension 38 extending through a slot 39 in a casing 40 in which said frame 10 is enclosed.

The outer end of the extension 38 has formed thereon the arm 41 which is adapted to be manually moved toward the casing 40 about the axes of shaft 36 when it is desired to operate the flash light.

A spring 42 coiled about the shaft 36 with one end 43 anchored in the frame 10 and the other end 44 in contact with the segment 35 serves to force the arm 41 outwardly when the flashlight is in use.

In Fig. 1 of the drawing the arm 41 is shown at an intermediate position for convenience of illustration.

When the flashlight is not in use the arm 41 is moved into contact with the casing 40 and the slidable clip 45 is moved over the end to prevent outward movement of said arm until it is desired to again use the flashlight when the clip 45 is disengaged again to permit the spring 42 to force the arm 41 to its outermost position.

A slit 46 is formed in the casing 40 from the slot 39 to the outer end of the casing and said casing may be sprung open widening the slit sufficiently to permit the insertion of the extension 38 into said slot 39, which having been accomplished the metal of the casing 40 will spring back into place closing the slit 39.

The extension 38 is provided with a projection 47 which is adapted, in the outward movement of the arm 41, to come into contact with the casing 40 and thereby limit the outward movement of said arm.

The frame 10 has secured thereto, at one end, an annular plate 48 provided with a threaded socket 49 to receive the lamp 16.

Secured to the plate 48 is an insulating plate 51 of fibre board or some similar material in the center of which is the lamp contact 52 to which the wire connection 15 is secured.

This contact 52 is preferable in the form of an eyelet or tubular rivet and when the end of the lamp is screwed down against the same the electric connections are complete.

The lamp end of the casing 40 has threaded thereto the sleeve 52× having secured therein the lens 53 and also the reflector 54 so that when said sleeve is adjusted lengthwise of the casing 40 the lens and reflector will move therewith.

The inner end of the reflector has an opening 55 therein large enough to permit the passage of the lamp 16 therethrough. It is obvious that by the adjustment of the sleeve 52 endwise of the casing 40 the lens 53 and reflector 54 will be moved relatively to the lamp 16 and in this manner the spread of the lamp rays may be varied to suit varied conditions.

When the arm 41 is in its outermost position and the operator quickly moves it manually toward the casing 40, the segment 35 will impart rotary movement to the pinion 32 which rotary movement will be transmitted through the train of gears 31, 30, 29, to the worm 26 which has a steep pitch sufficient to permit it to be rotated by the worm gear 29.

The ratio of gearing is such that the worm 26 will be rotated at a great speed and this speed will be transmitted through the one way clutch connection 25 to the magnet 23. One quick inward movement of the arm 41 will cause the magneto generator to generate sufficient electricity to keep the lamp 16 lit for ten seconds and if at the end of this period further light is desired the arm 41 is again moved about the pivot 36.

By continued movements of the arm 41 continuous light may be secured.

Between the teeth 25 and the opposed end of the member 19 the space is slightly in excess of the length of the worm 26 and the depth of the teeth 25 so that when the arm 41 is moved outwardly by the spring 42 the action of the worm gear 29 on the worm 26 will move said worm 26 toward the member 29 and disengage the worm teeth from the teeth 25 at one end of the magnet 23.

No further rotary movement will then be imparted to the magnet 23 and the worm 26 will be free to rotate in a reverse direction until the arm 41 reaches its outermost position and comes to a stop.

When the arm 41 is depressed and the worm gear 29 is driving the worm 26 there will be a tendency to force the shaft 18 endwise toward the field coils 13.

To take care of this end thrust the member 17 has threaded thereto an abutment 56 bearing against the end of the shaft 18.

In the member 19 is mounted a spring pressed member 57 bearing against the opposite end of said shaft and adapted to retain the other end of the shaft in contact with the abutment 56. The spring pressed member 57 makes a more perfect ground and keeps the magnet continually in its proper relation to the field coils.

The tension of the spring 58 may be varied by adjusting the plug 59 threaded to the member 19.

By means of this device the lamp may be lighted at any time and is always ready for use. It dispenses with the usual batteries which are continually deteriorating and are unfit for use when most needed.

It is believed that with the foregoing explanation, the operation and many advantages of the invention will be fully understood without further description.

Having thus described my invention, I claim:

1. In a device of the class described, the combination of a magneto generator including a rotating magnet having clutch means at one end thereof; a shaft on which said magnet is mounted; a member slidable upon said shaft having selfacting clutch means adapted to engage with the magnet; means for retaining the clutch of the magnet in engagement under normal conditions; driving means for said slidable member; a lamp; and electric connections between said lamp and generator.

2. In a device of the class described, the combination of a magneto generator including a rotating magnet; a shaft on which said magnet is mounted; bearings for the opposite ends of said shaft; means for caring for the end thrust of said shaft; a member slidable upon said shaft having a clutch adapted to engage with clutch on said shaft; driving means coacting with said slidable member for retaining the clutch of the shaft and member in engagement under normal conditions; a lamp; and electric connections between said lamp and generator.

3. In a device of the class described, the combination of a magneto generator including a rotating magnet having a clutch at one end thereof; a shaft on which said magnet is mounted; a worm slidable upon said shaft and having a clutch adapted to coact with the magnet clutch; means for normally retaining the two sets of clutches in engagement; a train of gears for rotating said slidable worm; means for actuating the train of gearing; a lamp; and electric connections between said lamp and generator.

4. In a device of the class described, the combination of a magneto generator including a rotating magnet having a clutch at one end thereof; a shaft on which said magnet is mounted; a steep pitch worm slidable upon said shaft and having a clutch adapted to coact with the magnet clutch; means for retaining the two sets of clutches normally in contact; a worm gear meshing with said worm; a pinion rotatable with said worm gear; a large gear meshing with said pinion; a second pinion rotatable with said large gear; and means for rotating said second pinion.

5. In a device of the class described, the combination of a magneto generator including a rotating magnet having a clutch at one end thereof; a shaft on which said magnet is mounted; a steep pitch worm slidable upon said shaft and having a clutch adapted to coact with the magnet clutch; means for retaining the two sets of clutches normally in contact; a worm gear meshing with said worm; a pinion rotatable with said worm gear; a large gear meshing with said pinion; a second pinion rotatable with said large gear; and a pivoted segment for rotating said second pinion.

6. In a device of the class described, the combination of a casing; a frame therein; field coils secured to said frame; a lamp secured to one end of said frame; electric connections between said coils and lamp; a shaft in bearings on said frame; a magnet on said shaft; a member slidable upon said shaft and provided with selfacting clutch means engaging the magnet and means for rotating said slidable member.

7. In a device of the class described, the combination of a casing; a frame therein; field coils secured to said frame; a lamp secured to one end of the frame; electric connections between said coils and lamp; a shaft in bearings on said frame; a magnet on said shaft; means for rotating said magnet; an abutment for one end of said shaft; and a spring pressed member bearing against the opposite end of said shaft and adapted to retain the other shaft end in contact with said abutment.

8. In a device of the class described, the combination of a casing; a frame therein; field coils secured to said frame; a lamp secured to one end of said frame; electric connections between said coils and lamp; a shaft in bearings in said frame; a magnet on said shaft, provided with clutch means; a worm slidable upon said shaft and having clutch means adapted to engage clutch means on said magnet; a worm wheel meshing with said worm; a pinion rotatable with said worm wheel and having alined trunnions; members threaded to said frame having sockets for said trunnions; a gear meshing with said pinion; a second pinion rotatable with said gear; a pivoted segment the teeth of which mesh with the second pinion; and means for moving said segment about its pivot.

9. In a device of the class described, the combination of a casing; a frame therein; field coils secured to said frame; a lamp secured to one end of said frame; electric connections between said coils and lamp; a shaft in bearings in said frame; a magnet on said shaft, provided with clutch means; a worm slidable upon said shaft and having clutch means adapted to engage clutch means on said magnet; a worm wheel meshing with said worm; a pinion rotatable with said worm wheel and having alined trunnions; members threaded to said frame hav-

ing sockets for said trunnions; a gear meshing with said pinion; a second pinion rotatable with said gear; a pivoted segment the teeth of which mesh with the second pinion; a member threaded to said frame provided with a cylindrical support for said gear and second pinion; and means for moving said segment about its pivot.

Signed by me at 746 Old South Bldg., Boston, Mass., this 17th day of November, 1921.

GUSTAF IVAR JOHNSON.

Witnesses:
WALTER E. LOMBARD,
NATHAN C. LOMBARD.