Oct. 21, 1924. 1,512,468

G. I. JOHNSON

FLASH LIGHT

Filed May 11, 1922 2 Sheets-Sheet 1

Fig. 2.

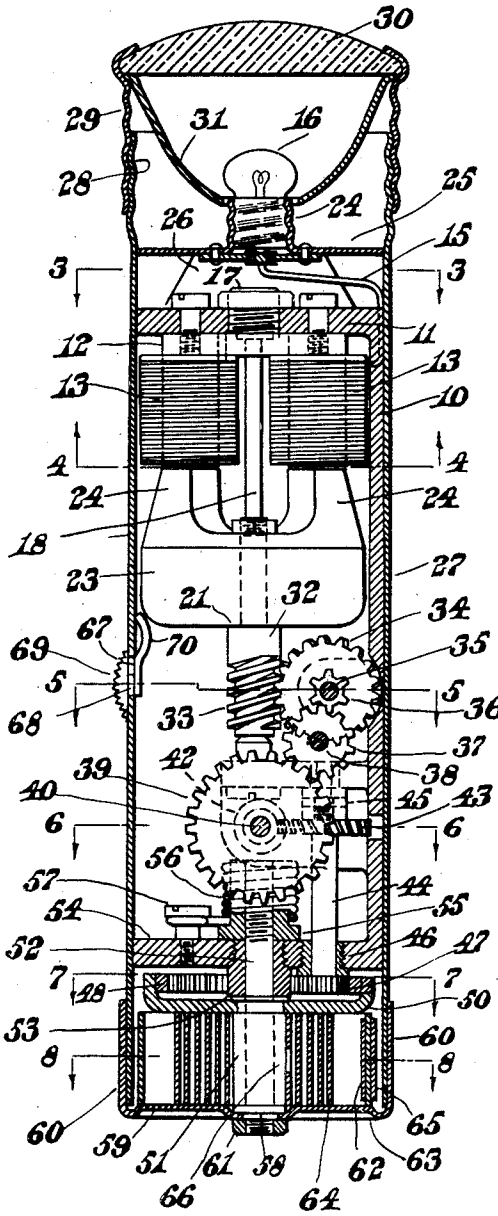
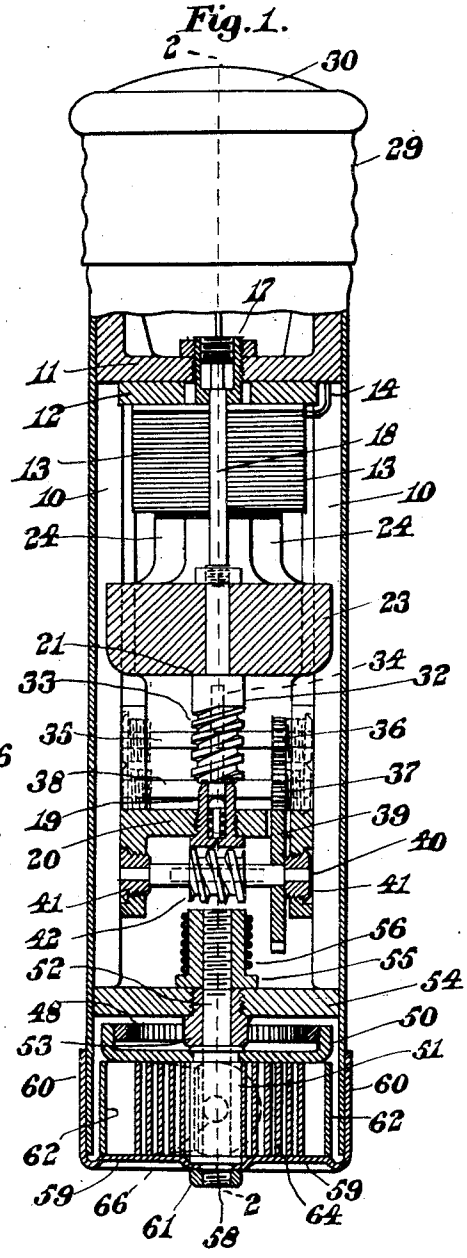


Fig. 1.



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Fig. 3.

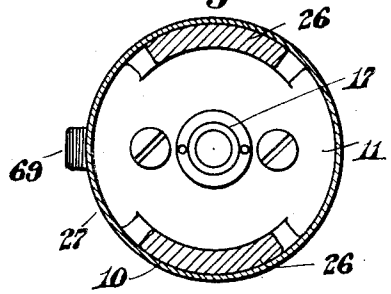


Fig. 7.

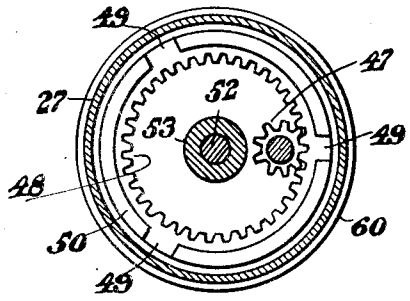


Fig. 4.

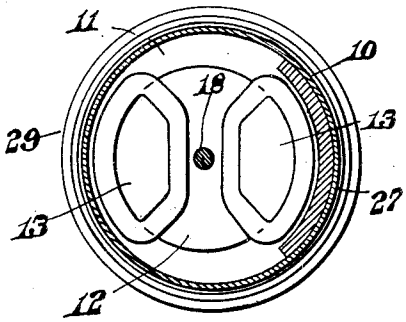


Fig. 8.

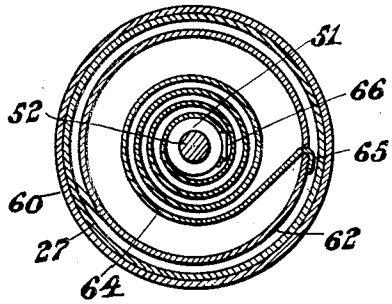


Fig. 5.

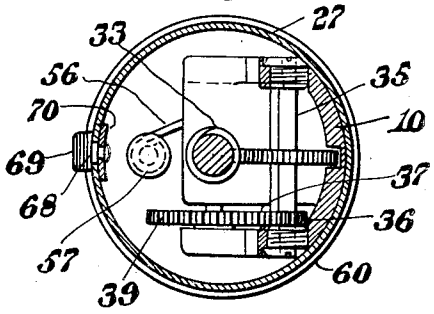


Fig. 9.

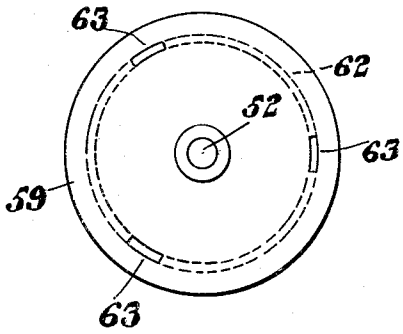
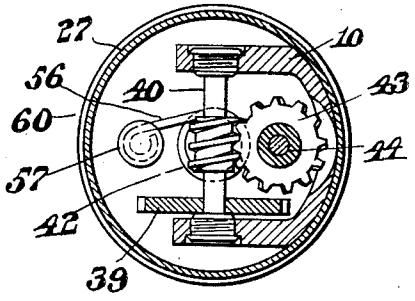


Fig. 6.



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Patented Oct. 21, 1924. 1,512,468

UNITED STATES PATENT OFFICE.

GUSTAF I. JOHNSON, OF MALDEN, MASSACHUSETTS.

FLASH LIGHT.

Application filed May 11, 1922. Serial No. 560,223.

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 flash lights and particularly to devices of this character provided with spring actuated instrumentalities for generating the current for the lamp.

The object of the invention is the production of a flash light in which the generator may be actuated by spring mechanism which may be wound readily by means surrounding one end of the casing.

Another object of the invention is the provision of means preventing the operation of the generator when not in use but which may be actuated quickly to release the generator and permit the operation by spring mechanism contained within the casing.

The invention consists of a casing having a lamp in one end, the current for which is produced by a magneto generator and spring mechanism within the opposite end of said casing for actuating the generator.

The invention further consists in novel means for winding the spring and retaining one end thereof during the winding operation.

The invention further consists in a brake mechanism adapted to coact with the revolving magnet and lock it from rotation when the device is not in use.

The invention further 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 shown 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 that the invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described, except as required by the scope of the appended claims.

Of the drawings:

Figure 1 represents a section partly in elevation of a flash light embodying the principles of the present invention.

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

Figure 3 represents a transverse section of same on line 3, 3 on Fig. 2.

Figure 4 represents a transverse section of same on line 4, 4 on Fig. 2.

Figure 5 represents a transverse section of same on line 5, 5 on Fig. 2.

Figure 6 represents a transverse section of same on line 6, 6 on Fig. 2.

Figure 7 represents a transverse section of same on line 7, 7 on Fig. 2.

Figure 8 represents a transverse section of same on line 8, 8 on Fig. 2, and

Figure 9 represents an end elevation of the spring winding member.

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. The threaded member 17 has adjustably mounted therein a plug forming an abutment for one end of the shaft 18, said plug being adapted to take up the end thrust of said shaft.

On the shaft 18 between the shoulder 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 lamp 16 is removably mounted in a socket 24 secured to a plate 25 mounted upon the end projections 26 of the frame 10.

The frame 10 is enclosed within a tubular casing 27, one end of which is threaded as at 28.

Mounted upon this threaded end 28 is a tubular member 29 having a lens 30 in its outer end and enclosing a reflector 31 surrounding the lamp 16.

One end of the shaft 18 is enlarged as at 32 and has formed therein a worm 33. Meshing with this worm 33 is a worm gear 34 secured to a shaft 35, revolubly mounted in bearings in the frame 10 and having secured thereto a pinion 36 which engages with a gear 37 mounted upon the shaft 38 parallel to the shaft 35.

The teeth of this gear 37 mesh with the teeth of a large gear 39 on a shaft 40 extending transversely of the casing 27 and revolubly mounted in bearings 41 in the frame 10. This shaft 40 has secured thereto a worm 42 meshing with the teeth of a worm gear 43 secured to a revoluble shaft 44 mounted in bearings 45 and 46 in the frame 10.

The lower end of the shaft 44 has secured thereto a pinion 47 meshing with the teeth of an annular gear 48. This annular gear 48 has projecting ears 49 extending into slots in the annular wall of a cup-shaped member 50. This cup-shaped member 50 is rigidly secured to a sleeve 51 surrounding a stud 52 mounted in a bearing 53 secured in an end plate 54 forming part of the frame 10.

The inner end of the stud 52 has threaded thereto a nut 55 the cylindrical hub of which is surrounded by a coil of wire 56, the inner diameter of which is normally slightly less than the diameter of said cylindrical hub.

One end of the wire 56 is anchored to the end plate 54 at 57. The wire is so coiled about the nut 55 that when the stud 52 is rotated in one direction, the coil 56 will unwind sufficiently to permit the rotation of said stud in that direction, while if the stud starts to rotate in the opposite direction, the coil will be wound tight about the hub of the nut 55 and rotary movement of the stud in the reverse direction is prevented.

This stud 52 is provided with a squared or flat-sided portion 58, on which is mounted a cup-shaped member 59, the annular flange 60 of which surrounds the end of the casing 27, opposite to the end in which the lamp 16 is disposed.

This cup-shaped member 59 is secured in position upon the stud 52 by means of a nut 61. Within the end of the casing 27 and secured to the cup-shaped member 59 is an annular flange 62 having ears 63 projecting from one edge thereof through slots in the cup-shaped member 59, said ears 62 being upset to lock the annular flange 62 to the cup-shaped member 59.

Within the annular flange 62 is a spiral spring 64, one end of which is secured at 65 to the annular flange 62, while the inner end of said spring is secured at 66 to the sleeve 51.

This spring is adapted to actuate the mechanism within the casing 27 for rotating the magnet 23 at a high rate of speed. When it is desired to put the flash light in condition to operate, the operator grasps the casing 27 in one hand and rotates the cup-shaped member 59 about the longitudinal axis of the flash light, thereby winding the spring 64 tightly.

During this winding operation, the nut 55 is unwinding the coil of wire 56, thereby permitting the free rotation of the stud 52.

As soon as the winding operation has been completed, any tendency of the spring to turn the cup-shaped winding member 59 in the opposite direction will be prevented by the nut 55 winding the coil 56 tightly against the periphery of its hub and making sufficient frictional contact therewith to prevent rotation of the stud 52 in the reverse direction.

In a slot 67 formed in the wall of the casing 27 is mounted a slidable member 68, having a serrated head 69 outside of the casing by which said member 68 may be moved lengthwise of the slot 67.

Secured to the inner end of the member 68 within the casing 27 is a cam finger 70 which is adapted to be moved into frictional contact with the cylindrical periphery of the magnet 24, and normally prevent the rotation of said magnet when the use of the flash light is not desired.

When it is desired to use the flash light, the operator moves the finger 70 free from contact with the magnet 23 into the position indicated in Fig. 2 of the drawings.

When frictional contact of the finger 70 has been removed from said magnet 23, the spring 64 will immediately begin to operate to rotate the sleeve 51, said spring 64 unwinding from the center.

This rotation imparted to the sleeve 51 will be transmitted to the annular gear 48, thereby rotating the pinion 47 and shaft 44. Through the worm gear 43, the worm 42 on the shaft 40 will be rotated, this rotary movement being transmitted through the spur gears 39, 37, 36, and worm gear 34 to the worm 33 formed upon the shaft 18.

By the operation of this train of gears, the rotary movement imparted to the sleeve 51 will cause the magnet 23 to be rotated at a very high rate of speed and thereby pro-

duce sufficient electric current to light the lamp 16.

By means of this construction of flash light, the magneto generator may be actuated by means of a spring mechanism confined within the casing, and this spring mechanism is readily wound by means of a winding device mounted upon one end of the casing 27, while the lamp of the flash light is mounted in the opposite end of said casing.

It is obvious, therefore, that all clutch mechanisms are entirely dispensed with, and there is no need of any manually operated device for imparting a rotary movement to the generator.

By means of the braking device 70, the generator may be prevented from operating until the use of the flash light is desired, whereupon by simple manipulation of the serrated head 68, the flash light may be placed in condition to operate immediately.

This makes a very simple construction of flash light in which no batteries are required, and in which the electric current for the lamp can be readily generated by mechanisms confined within the casing.

It is believed that the operation and many advantages of the invention will be readily understood without further description.

Having thus described my invention, I claim:

1. In a device of the class described, the combination of a frame; a magneto generator including field coils and a magnet rotatable about an axis parallel with said field coils and provided with poles projecting from one face thereof with their end faces adapted to travel in a path adjacent and opposite the ends of the cores of said field coils, and all mounted upon said frame; a casing enclosing said frame a lamp at one end of said casing; electric connections between said lamp and generator; means within the casing for rotating said magnet at a high rate of speed; an actuating spring within the opposite end of said casing for imparting movement to said rotating means; a rotatable member on said casing for winding said spring; and gripping means within the casing for holding one end of the spring during the winding operation but adapted to be automatically released when the spring is unwinding.

2. In a device of the class described, the combination of a casing; a frame therein; field coils secured to one end of said frame and parallel to the axis of said casing; a lamp secured to the same end of the casing; electric connections between said coils and lamp; a shaft rotatable in bearings on said frame; a magnet on said shaft having poles, the end faces of which are opposed to the ends of the cores of the field coils; spring mechanism for rotating said shaft; means mounted on the opposite end of said casing for winding said spring; and means for holding the inner end of said spring during the winding operation.

3. In a device of the class described, the combination of a casing; a frame therein; field coils secured to one end of said frame; a lamp secured to the same end of the casing; electric connections between said coils and lamp; a shaft rotatable in bearings on said frame; a magnet on said shaft; a spring for rotating said shaft; a rotatable sleeve to which one end of the spring is attached; means on the opposite end of the casing for winding said spring; and gripping means preventing the rotation of said sleeve during the winding operation but adapted to be automatically released during the unwinding of the spring.

4. In a device of the class described, the combination of a magneto generator including a rotatable magnet; a lamp; electric connections between said generator and lamp; mechanism for actuating said generator; a spring within the casing for rotating said actuating mechanism; a casing enclosing said generator; a brake member mounted on and adjustable endwise of said casing to prevent rotation of the generator magnet; means outside of the casing for winding the spring mechanism; and gripping means within the casing for holding the inner end of the spring during the winding operation and adapted to be automatically released when the spring is unwinding.

5. In a device of the class described, the combination of a magneto generator including a rotating magnet, a revoluble shaft on which said magnet is mounted; a lamp; electric connections between the lamp and generator; a spring for rotating said magnet; a sleeve to which one end of said spring is attached; an annular winding member to which the opposite end of said spring is attached; a stud within said sleeve to which said winding member is secured; and means coacting with said stud permitting its rotation in one direction only.

6. In a device of the class described, the combination of a magneto generator including a rotating magnet; a revoluble shaft on which said magnet is mounted; a lamp; electric connections between said lamp and generator; a spring for rotating said magnet; a sleeve to which one end of said spring is attached; a winding member to which the opposite end of said spring is attached; a stud within said sleeve to which the winding member is secured; a nut secured to said stud; and an anchored wire coiled about said nut and adapted to permit the rotation of said stud in one direction only.

7. In a device of the class described, the combination of a magneto generator including a rotatable magnet; a casing therefor; a lamp at one end of said casing; electric con-

nections between said lamp and generator; means within the casing for rotating said magnet at a high rate of speed; a spring within the casing for actuating said rotating means; a cup-shaped winding member on the opposite end of said casing; an annular flange on said member within said casing to which one end of said spring is attached; a rotatable sleeve to which the other end of said spring is secured; and a train of gearing between said sleeve and magnet and adapted to be actuated when rotary movement is imparted to said sleeve by said spring.

8. In a device of the class described, the combination of a casing; a frame therein; field coils secured to one end of said frame; a lamp secured to the same end of said casing; electric connections between said coils and lamp; a shaft rotatable in bearings on said frame; a magnet on said shaft; a worm on said shaft; a worm gear meshing therewith; a train of spur gears rotatable therewith, one of which is secured to a transverse shaft; a worm on said transverse shaft; a worm gear meshing with said worm; a pinion for rotating said last-mentioned worm gear; an annular gear for driving said pinion; and a spring for rotating said annular gear.

9. In a device of the class described, the combination of a casing; a removable frame therein; field coils secured to one end of said frame; a lamp secured to the same end of the casing; electric connections between said coils and lamp; a shaft rotatable in bearings on said frame; a magnet on said shaft; a spring mechanism for rotating said shaft; means for winding said spring mounted on the end of said casing and including an annular flange within the casing to which one end of the spring is attached; and gripping means for holding the inner end of said spring during the winding operation, but adapted to be automatically released when the spring is being unwound.

10. In a device of the class described, the combination of a casing; a frame therein; field coils secured to one end of said frame; a lamp secured to the same end of the casing; electric connections between said coils and lamp; a shaft rotatable in bearings on said frame; a magnet on said shaft; a spring for rotating said shaft; a rotatable sleeve to which one end of the spring is attached; a stud about which said sleeve is adapted to rotate and having a squared end; a member mounted on the squared end of said stud for winding said spring; and means preventing the rotation of said sleeve during the winding operation.

11. In a device of the class described, the combination of a casing; a removable frame therein; field coils secured to one end of said frame; a lamp secured to the same end of said casing; electric connections between said coils and lamp; a shaft rotatable in bearings on said frame; a magnet on said shaft having a cylindrical body portion and poles extending therefrom the end faces of which are opposed to the ends of the wires of said field coils; and a brake member slidable in a slot in and extending longitudinally of said casing and provided on the inside of said casing with a finger adapted to engage with said body portion and prevent rotation of said magnet.

Signed by me at 746 Old South Bldg., Boston, Mass., this 10th day of May, 1922.

GUSTAF I. JOHNSON.

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