J. W. HIGGINS.

PORTABLE ELECTRIC LAMP.

APPLICATION FILED JAN. 26, 1920.

1,400,819. Patented Dec. 20, 1921.

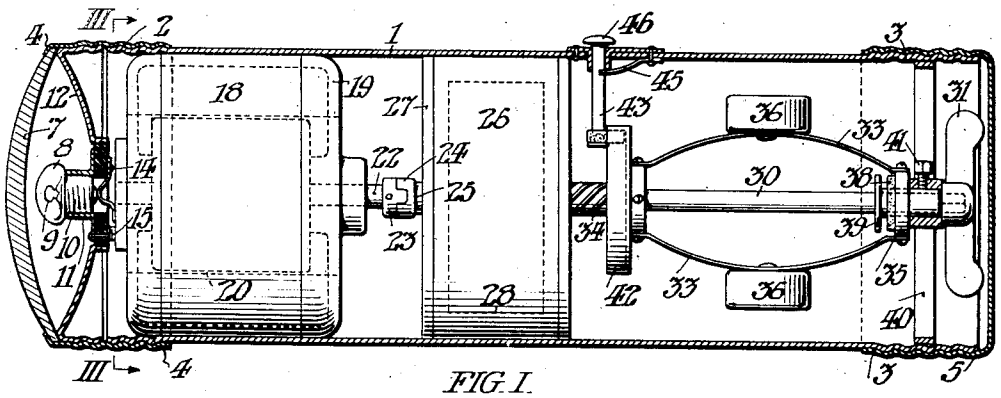


FIG. I.

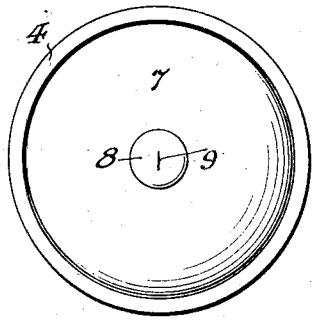


FIG. II.

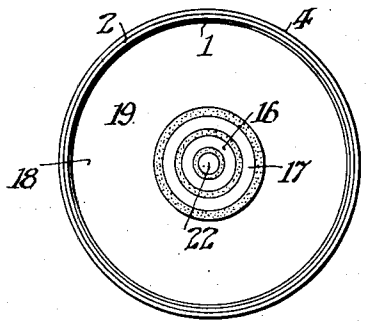


FIG. III.

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UNITED STATES PATENT OFFICE.

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PORTABLE ELECTRIC LAMP.

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To all whom it may concern:

Be it known that I, JOSEPH W. HIGGINS, a citizen of the United States, residing at Bordentown, in the county of Burlington and State of New Jersey, have invented a certain new and useful Improvement in Portable Electric Lamps, whereof the following is a specification, reference being had to the accompanying drawing.

My invention is particularly applicable to portable lamps of the class known as "flash lights" which comprise a tubular casing having a lens at one end covering an incandescent electric bulb of small candle power, and containing a removable primary battery for energizing the filament in said bulb under control of a switch extending exterior to the casing. Of course, such a battery has an extremely limited life, but affords no indication to the user of such a light as to the length of such life as remains available. Therefore, such a device is apt to be inoperative just when it is most needed. Therefore, it is the object and effect of my invention to provide such a lamp with means to utilize mechanical energy stored therein by the operator, to generate the required electrical energy to operate the incandescent bulb.

As hereinafter described, my invention includes the provision of a tubular casing having an incandescent electric lamp bulb in connection with a rotary electric generator; the latter being coöperatively connected with a spring motor provided with a centrifugal governor to regulate its speed; said spring motor being provided with a winding key, whereby the operator may wind the spring and thus store mechanical energy in the lamp casing at any convenient time. Said structure includes a push button device which, while projecting exterior to the casing and operative like the electric switch of the ordinary flash lamp, is in fact a mechanical device which normally stops the rotation of the spring motor but is movable to release the same.

My invention includes the various novel features of construction and arrangement hereinafter more definitely specified.

In said drawing; Figure I is a longitudinal sectional view of a lamp conveniently embodying my invention.

Fig. II is an elevation of the left hand end of said lamp.

Fig. III is a sectional view taken on the line III, III in Fig. I.

In said figures; the casing 1, which is conveniently formed of metal tubing, has screw threads 2 and 3 formed thereon at its opposite ends to detachably secure the respective caps 4 and 5. Said cap 4 has the lens 7 covering the electric incandescent bulb 8 containing the filament 9, preferably tungsten. Said bulb 8 has the usual screw plug 10 which is detachably fitted in the screw socket 11 which is in rigid relation with the reflecting diaphragm 12. Said diaphragm is conveniently screwed into said cap 4 and carries the electric contacts 14 and 15 which are differently radially spaced with respect to the axis of said tubular casing 1, so as to register with the respective contact rings 16 and 17 upon the electric generator 18. Said generator includes the field frame 19 which is fixed in said casing 1, and the motor armature 20 which is mounted to rotate in said frame 19 and provided with the armature shaft 22. Said armature shaft 22 is conveniently provided with the clutch 23 for detachable engagement with the coupling 24 on the driving shaft 25 of the spring motor 26. Said motor 26 includes the frame 27 which is fixed in said casing 1 and incloses the spring 28 which is operatively connected with said shaft 25. Said spring 28 may be wound by rotation of the spring arbor 30 which is provided with the winding handle 31, accessible when said cap 5 is removed from said casing 1. Said arbor 30 serves as a convenient support for the centrifugal governor comprising a series of spring members 33 connecting the governor worm 34 with the collar 35; the latter being free to slide axially on said arbor 30 in accordance with the radial position of said spring members 33 which are respectively provided with weights 36. Said collar 35 carries the brake shoe 38 in coöperative relation with the brake drum 39 which is axially adjustable in the bearing 40 but which is held normally stationary therein by the set screw 41. Said drum may be adjusted to vary the speed attainable by said spring motor governor, before the latter is checked by said brake.

I also find it convenient to provide said

worm 34 with a brake flange 42 in position to be frictionally engaged by the plunger 43 which is normally pressed outwardly by the spring 45 but has the push button knob 46 extending exterior to said casing 1 so that said plunger may be pushed in to release said motor to light the lamp. Of course, release of said knob causes the motor to stop and thus extinguish said light.

It may be observed that all of the rotary elements of the structure above described are axially alined, in coaxial relation with said casing 1, and that such construction and arrangement are advantageous in that it facilitates the assembling of said elements in proper relation with each other, by reason of such respective relation to said casing and, consequently, minimizes the cost of the entire structure, as compared with other portable lamps in which the various elements are otherwise related and supported and must be fitted and calibrated in connection with each other.

It is to be understood that any convenient suitable form of spring motor and generator may be employed, providing that they are connected in coöperative relation. Therefore, I do not desire to limit myself to the precise details of construction and arrangement herein set forth, as it is obvious that various modifications may be made therein, without departing from the essential features of my invention, as defined in the appended claims.

I claim:

1. In a portable electric lamp, the combination with a cylindrical tubular casing, having an external screw thread at each end thereof; of a screw cap removably fitted on one end of said casing, having a lens in coaxial relation with said casing and extending transversely to the axis of said casing and cap, at the outer end of the latter; a reflecting diaphragm having a screw thread detachably engaging said lens cap and spaced from said lens, in coaxial relation with said lens and casing; an incandescent lamp bulb, detachably mounted in coaxial position in said diaphragm and casing; an electric generator in said casing, adjacent to said reflector, and having a rotor in coaxial relation therewith; a clutch member on the shaft of said rotor; a spring motor having a driving shaft in coaxial relation with said casing and rotor shaft; a clutch member on said driving shaft, detachably engaging the clutch member on said rotor shaft; a winding handle for said motor, in coaxial position in said casing; a centrifugal governor for said motor, having a rotary arbor in coaxial position in said casing; means, in coaxial relation with said casing and arbor, whereby the effect of said governor may be adjustably predetermined; a brake flange in coaxial position in said casing, in connection with said motor; a push button device extending transversely through said casing, and operable from the exterior thereof, spring pressed to engage said brake flange and normally hold said motor stationary, but manually movable to release said motor and thereby energize said lamp; and a screw cap on the end of said casing opposite to said lens.

2. In a portable electric lamp, the combination with a cylindrical tubular casing; of a cap removably fitted on one end of said casing, having a lens in coaxial relation with said casing and extending transversely to the axis of said casing and cap; a reflecting diaphragm spaced from said lens, in coaxial relation with said lens and casing; an incandescent lamp bulb, in coaxial position in said casing, behind said lens; an electric generator in said casing, adjacent to said reflector, and having a rotor in coaxial relation therewith; a clutch member on the shaft of said rotor; a spring motor having a driving shaft in coaxial relation with said casing and rotor shaft; a clutch member on said driving shaft, detachably engaging the clutch member on said rotor shaft; a winding handle for said motor, in coaxial position in said casing; a centrifugal governor for said motor, having a rotary arbor in coaxial position in said casing; a brake flange in coaxial position in said casing, in connection with said motor; and a push button device extending transversely through said casing, and operable from the exterior thereof, spring pressed to engage said brake flange and normally hold said motor stationary, but manually movable to release said motor and thereby energize said lamp.

3. In a portable electric lamp, the combination with a cylindrical tubular casing; of a reflecting diaphragm in coaxial relation with said casing; an incandescent lamp bulb, detachably mounted in coaxial position in said diaphragm and casing; an electric generator in said casing, having a rotor in coaxial relation therewith; a spring motor having a driving shaft in coaxial relation with said casing and connected to said rotor; a winding handle for said motor, in coaxial position in said casing; a centrifugal governor for said motor, having a rotary arbor in coaxial position in said casing; and a push button device, operable from the exterior of said casing, arranged to normally hold said motor stationary, but manually movable to release said motor and thereby energize said lamp.

4. In a portable electric lamp, the combination with a cylindrical tubular casing; of a reflecting diaphragm in coaxial relation with said casing; an incandescent lamp bulb, in coaxial position in said casing; an electric generator in said casing, having a rotor

in coaxial relation therewith; a spring motor having a driving shaft in coaxial relation with said casing and connected to said rotor; a governor for said motor; and a push button device arranged to normally hold said motor stationary, but manually movable to release said motor and thereby energize said lamp.

In testimony whereof, I have hereunto signed my name at Bordentown, New Jersey, this 5th day of January, 1920.

JOSEPH W. HIGGINS.

Witnesses:
E. B. FANTENA,
GEORGE C. ZELLER.