Jan. 9, 1923. 1,441,884.

J. T. ROFFY.

FLASH LIGHT.

FILED JAN. 3, 1920.

Fig. 1.

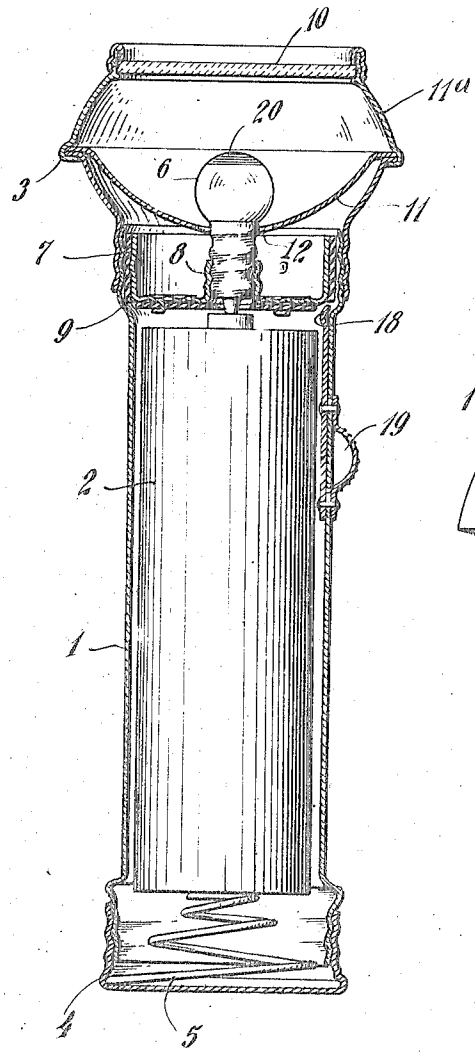
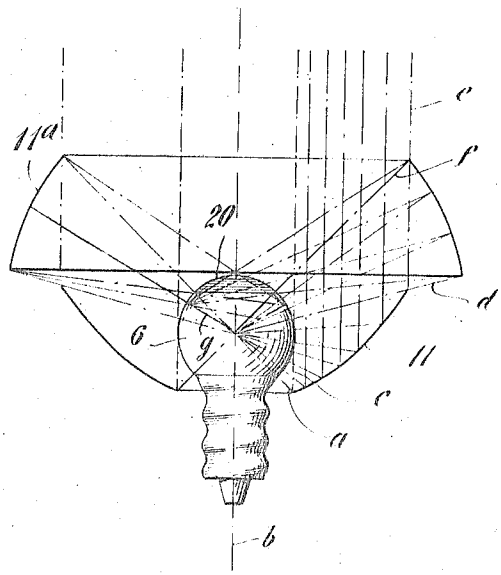


Fig. 2.



Joseph T. Roffy Inventor

By his Attorneys

Williamson & Cuteland

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UNITED STATES PATENT OFFICE.

JOSEPH T. ROFFY, OF BROOKLYN, NEW YORK.

FLASH LIGHT.

Application filed January 3, 1920. Serial No. 349,177.

To all whom it may concern:

Be it known that I, JOSEPH T. ROFFY, a citizen of Hungary, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Flash Lights, of which the following is a specification.

This invention relates to improvements in flashlights and one object is to improve the general diffused illumination and to increase the lighting efficiency. Other objects will be set forth in the accompanying description and claims. One manner of accomplishing the objects of this invention will be set forth in the following specification, reference being had to the accompanying drawing, wherein:—

Figure 1 is a sectional view of a flashlight embodying my improvement, and

Figure 2 is a diagrammatic representation of the reflector elements showing the optical relations.

The form of flashlight herein selected for illustrating my improvement consists of a casing 1 constructed to retain a battery 2 of the usual variety. Threaded upon one end of the casing is the rotatable head 3 and upon the other end is the threaded cap 4 carrying the usual spring 5 for pressing the battery into contact with the bulb. The bulb 6 is carried by a holder or support 7 and is threaded into the socket 8 thereon. The holder 7 is insulated from the shell or casing by the bushing 9 of non-conducting material. As will be evident the head 3 is adapted to be rotated spirally for shifting it in the direction of the axis of the casing in order to properly focus the flashlight. The head 3 carries a front glass 10 and a concave rear reflector 11, the latter being provided with a central opening 12 permitting of the removal of the head independently of the bulb. To close the electrical circuit when it is desired to use the flashlight, I employ a switch mechanism consisting of a sliding circuit closer 18 operated in the usual manner by the button 19.

Referring now to Figure 2, the bulb 6 is arranged with its center in proper focal relation to the parabolic concave reflector 11, the latter being developed from the intersection of a line a, 45° from the axis b, with a tangent c parallel to the axis. This parabolic reflector extends forward 105° from the axis to line d, where the angle of incidence of the light becomes 52½°, the approximate limit of efficient reflection without aberration. The bulb tip, which as shown is of generally spherical contour, may be provided with a frosted opalescent screen portion 20 extending over a zone from the axis for a space of 45° to prevent direct rays from the filament from passing out of the flashlight. The forward return reflector 11^a carried by the head 3 is developed rearwardly from the intersection of a line e, drawn from the front aperture of the reflector 11 with a line f passing from the center of the lamp 6 at 135° from the axis, or passing through the edge of the screen portion 20. In order that this return reflector may uniformly distribute its light over the outer surface of the screen 20, the curvature of the return reflector is developed from a center g located midway between the lamp center and its circumference on a line bisecting the 30° angle, through which such light passes from the source to the return reflector 11^a. On this curvature the said reflector is developed to the 105° angle at which the main reflector 11 terminates.

As will be understood the illumination is in the form of a powerful main parallel beam from the reflector 11 supplemented by a relatively weaker general diffused illumination from the screen 20. I desire it to be understood, however, that if desired the opalescent surface of the screen 20 may be dispensed with and that a transparent bulb may be used.

It will be evident that the light flux between the angles of 45° and 135° from the axis is relatively great compared with the flux within 45° of the axis of the bulb, so that the actual quantity of light striking the screen from the forward return reflector 11^a will exceed by far the quantity of light transmitted directly to the screen from the filament. Thus two distinct images will be thrown out by the rear reflector, namely the usual filament image, and the secondary image of the luminous bulb tip. In practice, the two luminous effects above mentioned are superposed one upon the other upon the screen, resulting in a more efficient and more uniformly distributed light characterized by entire freedom from "rings" in the beam of light.

It is desired to emphasize the fact that this invention can be applied and prac-

ticed in various other ways, different from the illustrated example within the general principles and scope of the invention.

I claim:

1. In a battery hand lamp, a casing, a bulb socket located at one end of the casing and insulated therefrom, a lamp bulb within said socket, a battery within the casing and having one terminal in electrical connection with said lamp bulb, means for establishing electrical connection from the other terminal of said battery to said lamp bulb and a unitary structure threaded to the casing end adjacent said lamp bulb and comprising a threaded reflector housing, a reflector secured within the housing and removable with said housing without disturbing the operative relation of said lamp to said battery.

2. In a battery hand lamp, a casing having enlarged threaded ends, a bulb socket mounted within one of said enlarged ends and insulated from the casing, a lamp bulb within said socket, a battery within the casing and having one terminal in electrical connection with said lamp bulb, means for establishing electrical connection from the other terminal of said battery to said lamp bulb, a threaded end carrying a spring for holding said battery in position and a unitary structure secured to the casing end adjacent said lamp bulb and movable longitudinally thereof and comprising a threaded reflector housing, a reflector secured within the housing and removable with said housing without disturbing the operative relation of said lamp to said battery.

3. In a battery hand lamp, a casing, a bulb holder located adjacent one end of said casing and insulated therefrom, a lamp in said bulb holder, a battery in electrical connection with one terminal of said lamp, means for completing the electrical circuit through said lamp, a reflector insulated from said lamp socket and having a central opening through which said lamp bulb will pass and means for supporting said reflector from said casing and for moving the same to focus said lamp therein.

In testimony whereof, I have affixed my signature to this specification.

JOSEPH T. ROFFY.