Jan. 8, 1957 K. SCHÖN 2,777,121

MULTICOLORED FLASHLIGHTS

Filed April 12, 1955

Fig. 1.

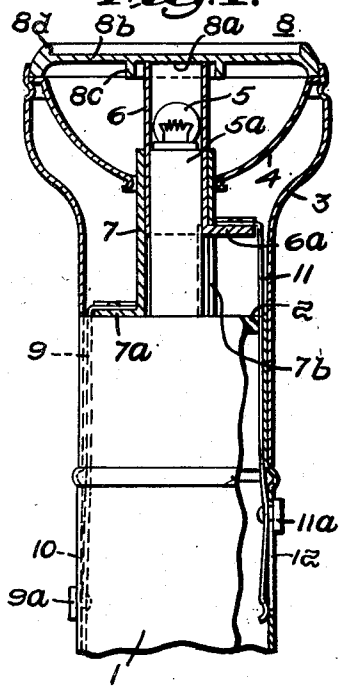


Fig. 2.

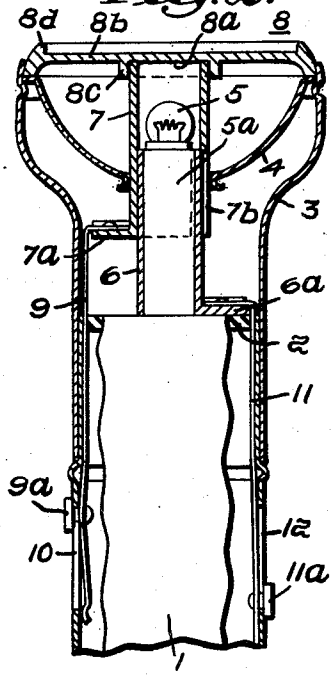


Fig. 3.

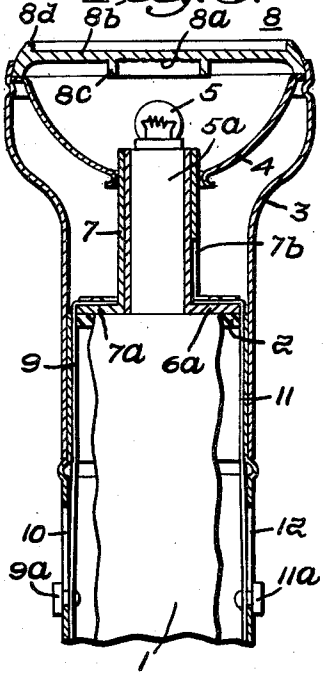


Fig. 4.

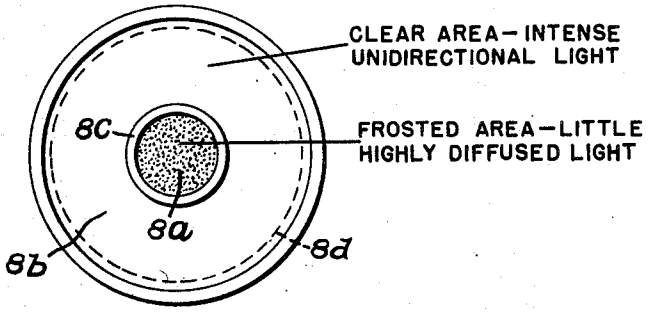
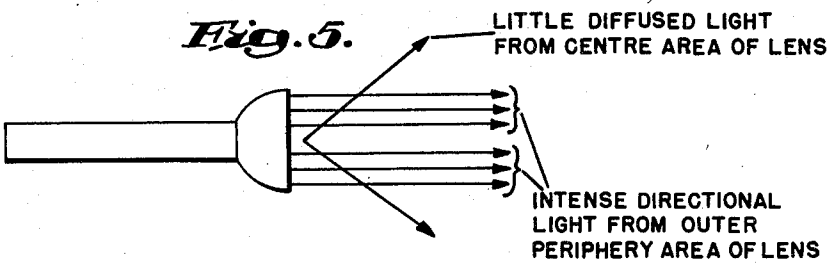


Fig. 5.



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MULTICOLORED FLASHLIGHTS

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3 Claims. (Cl. 340—321)

This invention relates to flashlights, and more particularly to flashlights adapted to emit directional beams of light of two different colors, in addition to directional beams of white light.

It is one object of this invention to provide a flashlight of the type comprising a pair of tubular light filters of different diameters and of different colors adapted to be used selectively, which flashlight emits directional beams of colored light of great purity as desired to signal over relatively long distances.

Another object of the invention is to provide a flashlight of the type comprising a pair of tubular light filters of different diameters and of different colors adapted to be used selectively, which flashlight has a lens made of a relatively thin sheet of a transparent plastic material which lens, in addition to being made relatively safe from breakage and being made relatively scratch-proof, is adapted to emit directional beams of colored lights of great purity.

Another object of the invention is to provide a flashlight which is relatively simple to manufacture having a lens which is in part clear and in part light diffusing.

The novel features that are considered characteristic of the invention are set forth in particular in the appended claims. The invention itself, however, both as to structure and operation together with additional objects and advantages thereof will best be understood from the following detailed description of a preferred embodiment thereof when read in connection with the accompanying drawing in which,

Fig. 1 is a longitudinal or axial section and in part a side elevation of a flashlight embodying the invention with the filters in position for emitting colored light of one of two predetermined colors.

Fig. 2 is a section of the same kind as Fig. 1 with the filters in position for emitting colored light of a different color;

Fig. 3 is a section of the same kind as Figs. 1 and 2 with the filters of the flashlight in position for emitting white or non-colored light;

Fig. 4 is a front view of the lens of the flashlight shown in Figs. 1 to 3, and

Fig. 5 is a diagram illustrating the mode of operation of the flashlight shown in Figs. 1 to 3, inclusive.

Referring now to the drawing and more particularly Figs. 1 to 3 thereof, reference numeral **1** has been applied to generally designate a casing of metal adapted to receive two superimposed serially connected dry cells. The upper end of the portion of casing **1** intended to receive dry cells is closed by a partition **2** of insulating material and the lower side thereof is closed by a cap (not shown). The cap **3** removably mounted on casing **1** has a flaring portion in which a reflector **4** is mounted. The incandescent electric lamp **5** is arranged within reflector **4** and supported by a lead-duct **5***a* which, in turn, is supported by insulating partition **2**. Lamp **5** can be switched on or off by a switch provided on casing **1** (not shown in the drawing). The two tubular light filters or color-selective light-transmitting elements **6**, **7** have different diameters and are arranged coaxially with respect to lamp **5** and casing **1**. One of the two light filters **6**, **7** may be red and the other green. Light filter **6** has a relatively small diameter, only slightly exceeding the diameter of lead-duct **5***a*, which it surrounds. Light filter **7** has a relatively large diameter, only slightly exceeding the diameter of filter **6**, which it surrounds. Both light filters **6**, **7** consist preferably of a length of colored plastic tubing and each has a radial projection or spur on the end thereof adjacent partition **2**. Reference characters **6***a* and **7***a* have been applied to indicate these radial projections or spurs. The outer light filter **7** is provided with rectangular cut out portion **7***b* through which the projection or spur **6***a* of the inner light filter **6** extends. An angularly bent strip **9** of metal attached to projection **7***a* of light filter **7** makes it possible to shift light filter **7** between a rear position shown in Figs. 1 and 3, and a foreward position, shown in Fig. 2. To facilitate shifting of metal strip **9** the latter is provided with an operating knob **9***a* which passes through a slot **10** in casing **1**. In a similar fashion angularly bent metal strip **11** attached to projections **6***a* of filter **6** and provided with an operating knob **11***a* extending through a slot **12** in casing **1** enables to readily shift filter **6** between a rear position shown in Figs. 2 and 3 and a foreward position shown in Fig. 1. Reflector **4** is closed by a lens **8** which is arranged substantially in the plane defined by the ends of filters **6**, **7** remote from casing **1** when in their axially outer positions shown in Figs. 1 and 2. Lens **8** has a circular frosted or matted area **8***a* in the center thereof substantially equal in diameter to the diameter of the wider filter **7**. The radially outer area **8***b* of lens **8** is clear. The frosted area **8***a* of lens **8** is recessed and surrounded by a circular narrow projection **8***c* situated on the inner surface of lens **13**. The outer surface of lens **8** is provided with a circular narrow projection **8***d* arranged coaxially with regard to the inner projection **8***c* and having a considerably larger diameter. Lens **8** is preferably made of a transparent plastic or synthetic resin which enables to achieve the relatively complex shape thereof at small cost.

The inner circular projection **8***c* of lens **8** provides lateral support for the light filters **6**, **7** when in their respective foreward position and suppresses the emission of white light through a gap that might form between lens **8** and the light filters **6**, **7** if projection **8***c* were not provided. The frosted area **8***a* of lens **8** reduces the emission of white light when either of the two filters **6**, **7** is in the foreward position thereof. Whatever amount of white light passes through the frosted area **8***a* of the lens **8** is highly diffused, whereas the colored light which passes through the clear area **8***b* of the lens is directional, it being specularly reflected from the parabolic surface of reflector **4**. Since the light passing through the area **8***b* is highly directional, and the light passing through the area **8***a* highly diffuse, the former is being concentrated to the point at which the flashlight is aimed, and the latter unnoticeable even a few yards away from the flashlight.

It appears from the foregoing that when the filters **6**, **7** are in their respective foreward position the effect of white light emitted axially outwardly from incandescent lamp **5** is suppressed without the need of resorting for that purpose to any opaque screen or the like. The effect of white light is suppressed by local scattering thereof, while the directional property of the colored light reflected from reflector **4** upon having passed either filter **6** or **7** is maintained.

Lens **8** may be relatively thin in spite of the recess

provided in it since the circular ridges or projections 8*c*, 8*d* tend to stiffen lens 8. Circular ridge or projection 8*d* tends also to preclude scratching of the front face of plastic lens 8 when the flashlight is placed on an object with the front face of lens 8 down.

Frosting of the central portion 8*a* of lens 8 can be achieved by any conventional roughening method.

While the invention has been disclosed in accordance with the provisions of the patent statutes, it is to be understood that various changes and modifications may be made without departing from the spirit and scope of the invention. It is desired, therefore, that the appended claims be given broadest reasonable construction permissible in the light of the prior art.

I claim as my invention:

1. A flashlight comprising in combination a casing, a concave reflector arranged at one end of said casing, an electric lamp arranged within said reflector, a pair of tubular color-selective light-transmitting elements of different diameter coaxially arranged with respect to said lamp, separate operating means for each of said pair of elements for selectively shifting each of said pair of elements in a direction longitudinally of said casing between a rear position and a foreward position, a lens closing said reflector arranged substantially in the plane defined by the ends remote from said casing of said pair of elements when in said foreward position thereof, said lens having a circular frosted area in the center thereof substantially equal in diameter to the diameter of the one of said pair of elements of larger diameter, and the area of said lens radially outwardly from said frosted area being clear, whereby whatever light is being emitted through said area in the center of said lens is caused to be highly diffused whereas light being emitted through said clear area of said lens retains the directional properties thereof imparted to it through the action of said reflector.

2. A flashlight comprising in combination a casing, a concave reflector arranged at one end of said casing, an electric lamp arranged within said reflector, a pair of tubular color-selective light-transmitting elements of different diameter coaxially arranged with respect to said lamp, separate operating means for each of said pair of

elements for selectively shifting each of said pair of elements from a rear position to a foreward position thereof in a direction longitudinally of said casing, a lens closing said reflector arranged substantially in the plane defined by the ends remote from said casing of said pair of elements when in said foreward position thereof, said lens consisting of a transparent plastic and having a circular recess therein coaxially arranged with respect to said pair of elements and substantially equal in diameter to the diameter of the one of said pair of elements of larger diameter, the area of said lens within said recess being frosted and the area of said lens outside of said recess being clear.

3. A flashlight comprising in combination a casing, a concave reflector arranged at one end of said casing, an electric lamp arranged within said reflector, a pair of tubular color-selective light-transmitting elements of different diameter coaxially arranged with respect to said lamp, separate operating means for each of said pair of elements for selectively shifting each of said pair of elements from a rear position to a foreward position in a direction longitudinally of said casing, a lens closing said reflector arranged substantially in the plane defined by the ends remote from said casing of said pair of elements when in said foreward position thereof, said lens consisting of a transparent plastic and having an outer circular narrow projection of relatively large diameter and an inner circular narrow projection of relatively small diameter, the area of said lens between said projection of relatively large diameter and said projection of relatively small diameter being clear and the area of said lens within said projection of relatively small diameter being frosted.

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