

April 30, 1940.

C. M. STITT

2,199,014

LAMP

Filed Aug. 7, 1937

2 Sheets-Sheet 1

FIG. 1.

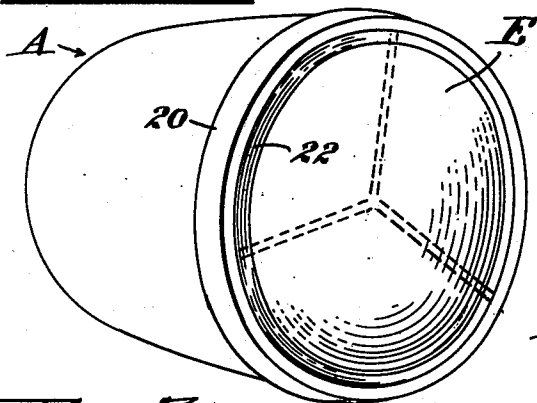


FIG. 2.

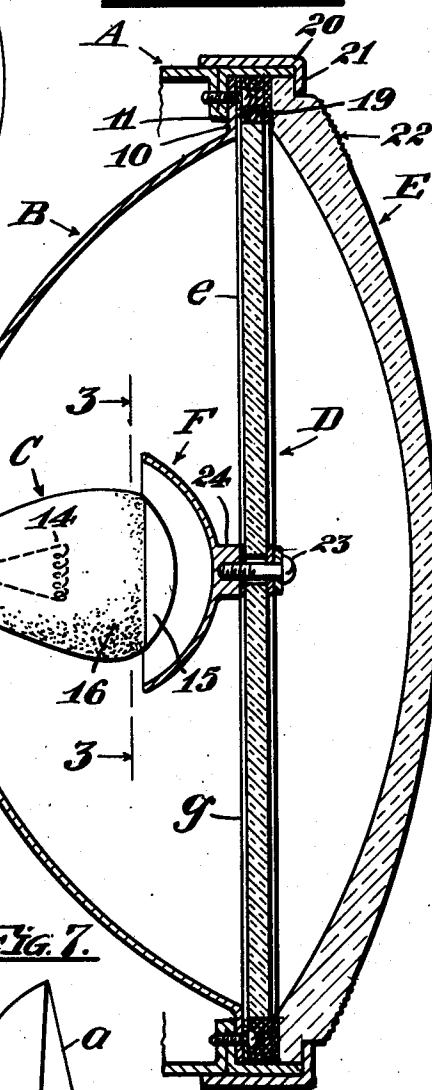


FIG. 3.

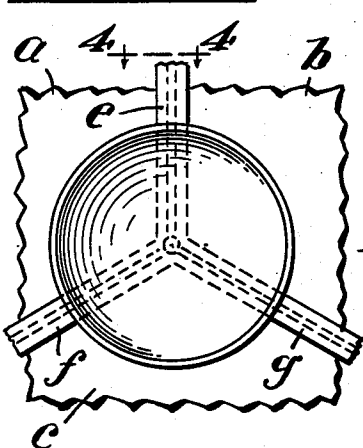


FIG. 4.



FIG. 5.

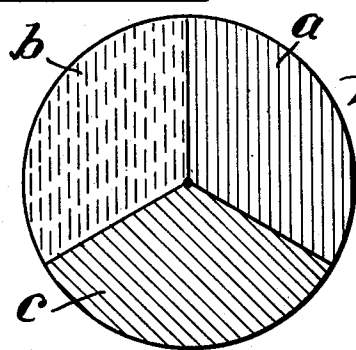


FIG. 6.



FIG. 7.



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FIG. 8.

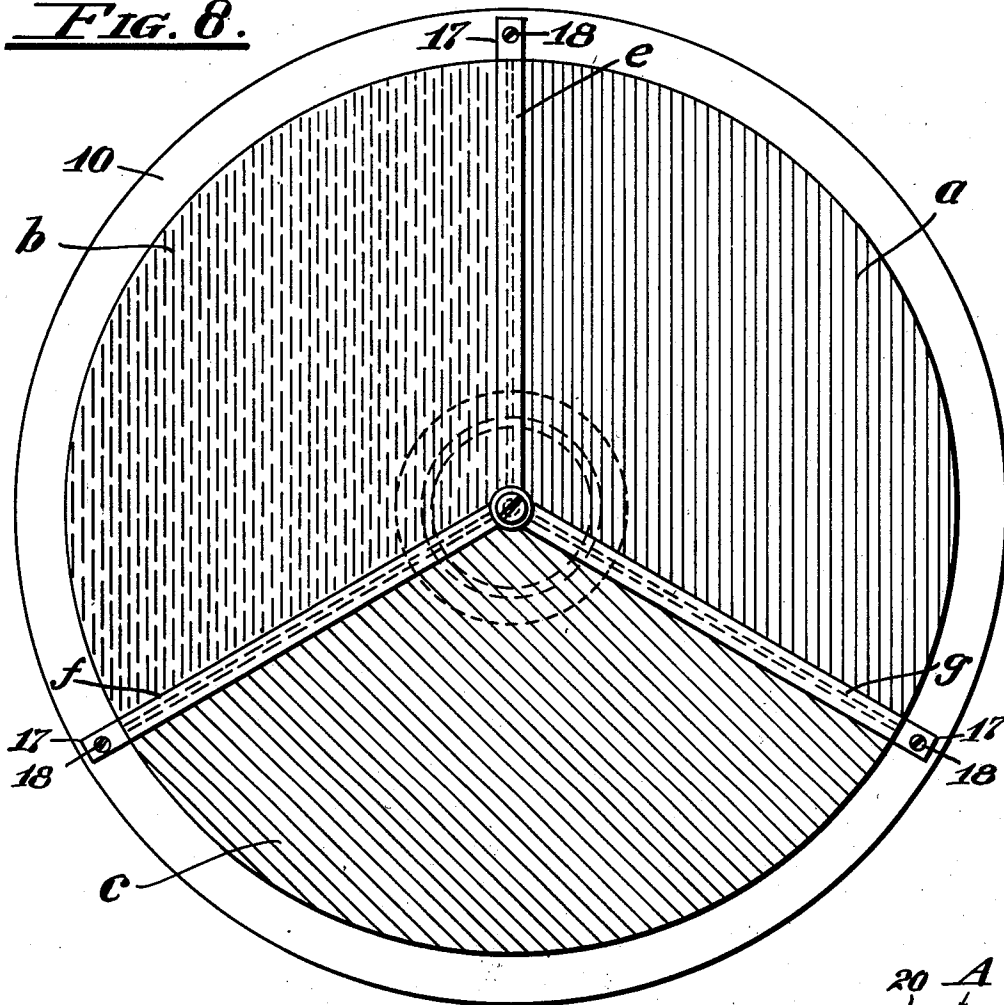
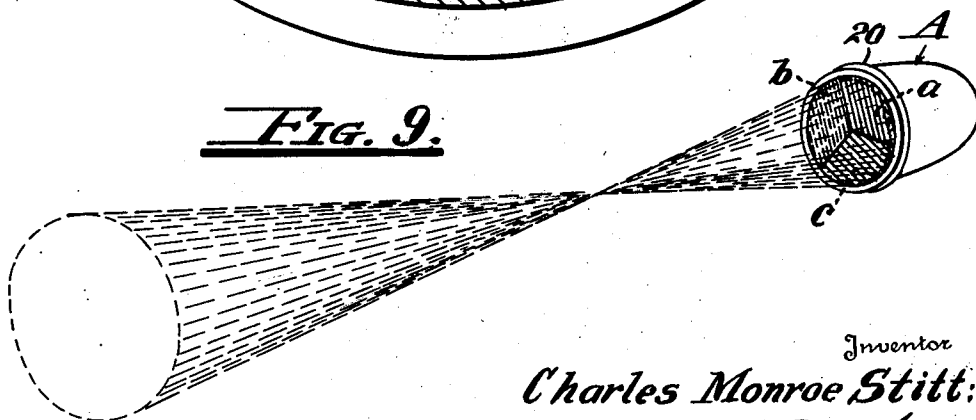


FIG. 9.



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UNITED STATES PATENT OFFICE

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LAMP

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Application August 7, 1937, Serial No. 157,902

2 Claims. (Cl. 240—48.4)

This invention relates to lamps and more particularly pertains to electric lamps of the character employed in the production of illuminating beams, flood lights, and other illuminators for producing white light or substantially white light.

An object of the invention is to provide a lamp which is especially applicable for use as a head light for vehicles where it is desired to obtain effective illumination without excessive glare.

Another object is to provide a lamp which, while projecting a beam of white or near white light, is so constructed and operated that when viewed from the front thereof and proximate thereto and particularly from points forward of but to either side thereof will present to the observer an illuminated field comprising areas composed of a plurality of colors and with the absence of blinding glare, but which when viewed from points remote from the lamp will appear as a white or near white light free of excessive glare.

A further object is to provide a lamp of the above character which is simple in construction and in which the parts may be readily assembled.

With the foregoing objects in view, together with such other objects and advantages as may subsequently appear, the invention is carried into effect as illustrated by way of example in the accompanying drawings in which:

Fig. 1 is a perspective view of the lamp as viewed from the front and to one side thereof;

Fig. 2 is a detail in vertical section of the lamp with parts of the housing broken away;

Fig. 3 is a detail in elevation as viewed on the line 3—3 of Fig. 2;

Fig. 4 is a sectional view as seen on the line 4—4 of Fig. 3;

Fig. 5 is a diagrammatic view in elevation of one form of color screen employed in the lamp;

Fig. 6 is a view in side elevation of the screen shown in Fig. 5;

Fig. 7 is a perspective view of one of the screen segments employed in the construction shown in Figs. 5 and 6;

Fig. 8 is a view in elevation of the front of the lamp shown in Fig. 2 with the cover lens removed showing another form of the screen;

Fig. 9 is a diagram in perspective depicting the mode of operation of the invention.

Referring to the drawings more specifically,

A indicates generally a lamp housing having an open end fitted with a reflector B having a rim

10 which seats on an internal shoulder 11 on the housing. The reflector may be of any suitable type; being here shown as comprising the ordinary parabolic reflector employed in motor vehicle head lights having a central sleeve 12 carrying a socket 13. An electric lamp C fitted with an illuminating filament 14 is mounted in the socket and is adapted to be adjusted to proper focus by shifting the socket 13 longitudinally in the sleeve 12.

While various types of lamps may be employed as a source of light or light generating means I have found that highly satisfactory results are obtained by the use of an electric lamp having a glass bulb formed with a transparent area 15 on its outer end wall 5 and having translucent side walls 16.

A color screen D is disposed across the reflector B in front of the lamp C which screen embodies at least three sections *a*, *b*, and *c* formed to transmit light rays of different colors such as red, violet and green respectively; so as to propagate red, violet and green rays which when co-mingled with and superimposed upon each other will produce a beam of white or near white light.

The formation of the sections *a*, *b* and *c* to have the desired color screening and colored ray producing properties may be effected either by forming the sections of glass embodying the requisite pigmentation, or by the employment of any other transparent or translucent sheet material such as the phenol-resin products or "Cellophane" and similar materials, or by the use of transparent or translucent material applied upon plates of glass.

The sections *a*, *b*, and *c*, may be formed in one piece or may comprise separate segments. Where segmental sections are employed as shown in Figs. 2, 3, 4 and 8 they are carried on interconnected radiating channeled members *e*, *f*, and *g* interposed between the contiguous edges of the segmental sections with the latter seated in the channels thereof as particularly shown in Fig. 4. The outer ends of the members *e*, *f*, and *g* are formed with tongues 17 which overlie the margin 10 of the reflector B and are engaged collectively with the latter to the shoulder 11 by screws 18 and whereby the color screen assembly is held in place in front of the reflector.

A refraction lens E is here shown as extending over the screen D, which refraction lens is preferably convexo-concave with the margin of its concave face opposite and concentric with the margin of the reflector B. The lens E seats

on a cushion washer 19 encircling the screen D and bearing on the margin 10 of the reflector, and is held in place by a ring 20 demountably carried on the rim of the housing A; the ring 20 having an intumed marginal flange 21 engageable with the rim of the lens. The lens E is transparent but is preferably formed with a translucent marginal portion 22.

Interposed between the screen D and the lamp C is a concave reflector F which overlies the transparent outer end portion 15 of the lamp bulb in slightly spaced relation thereto and which reflector F is connected to the interconnected portion of the members e, f and g by a screw 23 which passes through the intersecting portion of the members and is threaded into engagement with a hub 24 on the reflector. The purpose of the reflector F is to direct rays emitted from the transparent end 15 of the lamp bulb back through the translucent wall 16 thereof so as to augment the intensity of the light beam projected by the reflector B.

The reflectors B and F and the lens E are disposed with their principal axes in axial alignment with each other and with the center of the filament 14, and the color screen segments a, b and c extend radially from the axial line of the reflector.

The color screen sections a, b and c are formed of practically corresponding light absorptive properties so that the intensity of light propagated by the sections will be equal or at least nearly equal.

In the operation of the invention as illustrated in Figs. 2 and 9 on illuminating the lamp C by directing electrical current through the filament 14, a portion of the resultant rays pass directly through the translucent side wall 16 of the lamp bulb, while another portion of the rays pass through the transparent end portion 15 of the bulb and are reflected by the reflector F back through the translucent wall 16 of the bulb. In this fashion all the rays emitted from the lamp are scattered and diffused and directed against the reflector B so as to be reflected in most part by the latter and directed through the screens a, b and c and through the refraction lens E thus propagating a beam of light which diverges according to the designed contours of the reflector B and lens E.

By disposing the lamp C in proper focal position relative to the reflector B the propagated beam, by reason of its being composed of red, violet and green rays superimposed and mingled, will be white or near white, and will effect illumination of bodies accordingly.

Inasmuch as it is difficult to form the reflector B as to avoid the formation of a fringe of colored rays around the major beam, such fringe is eliminated at least in most part by the provision of the formation of the translucent margin 22 on the lens E which acts to scatter and diffuse the color rays of the fringe.

In the modified form of the color screen shown in Figs. 5, 6 and 7, the segments a, b and c are prismatic so as to effect refraction of the screened rays in a fashion to cause superimposing of the groups of rays propagated by the several segments and thereby produce the desired white or near white light free of excessive glare. By thus forming the screen segments to have the refractive properties of prisms they may be employed either with or without a supplemental refracting lens E.

An important feature of the invention resides

in the fact that while a beam of light is propagated to produce sight sensation of whiteness when viewing a body on which the beam is incident, the rays emitted from the lamp incident on the retina of the eye produce color sensations so that a person viewing the lamp from the front or diagonally from the front thereof will discern within limits the luminous colored segments a, b and c. In other words, an observer viewing the illuminated lamp will observe the luminous red, violet and green segments a, b and c free of blinding glare. However, such condition prevails within limits of distance or remoteness, since the lamp when viewed from in front thereof at a considerable distance will appear white or nearly white though free of glare but on decreasing the distance between the observer and the lamp the color sensations develop with gradually increasing intensity to a maximum at close proximity to the lamp.

In order to produce a beam of white or near white light by means of the present invention it is essential that the color screen sections collectively transmit light of various wave lengths ranging from low to high value, and accordingly it is necessary that the screen include at least one red section for propagation of light of long wave length, at least one violet section for propagation of light of short wave length, and at least one section capable of propagating light of intermediate wave lengths, which latter section is preferably green since it transmits composite rays of intermediate wave lengths. It is manifest, however, that in some instances it may be desirable to produce a beam which is slightly tinged with color, such as to have, for example, a reddish-yellow tinge, or greenish tinge, or bluish tinge, in which event the color screen will be formed with a section or sections of a character to afford the desired excess of color constituent, as by varying the shade of the green section to render it capable of transmitting an excess of yellow rays, or an excess of blue rays.

Where it is desired to produce a beam which is clear white or having a bluish tinge, it is necessary that the source of light C be clear white, that is, one which emits light containing waves of all wave lengths with their relative intensity such that the color sensation produced by their incidence on the retina is that of whiteness. However, though electrically operated filament or glow lamps are defective in blue, such does not preclude their use in my lamp, since such deficiency does not sufficiently detract from the whiteness of the beam as to affect the practicability of the lamp for general purposes of illumination, as for example in the head lights of vehicles, and flood lights on aircraft landing fields, and in general for any transmitted light of whatever character or purpose as may be required.

While I have set forth specific embodiments of my invention I do not limit myself to the constructions shown, and the invention embraces such modifications as come within the purview of the accompanying claims. For example, while I have shown the lamp as equipped with a refracting cover lens E there are occasions where such lens may be dispensed with; it having been found in practice that in applying the lamps as headlights for a vehicle sufficient intermingling of the colored rays as directed through the screens a, b and c is effected as to produce a satisfactory beam of the character set forth.

I claim:

1. In a lamp, an electric filament lamp including a bulb having a translucent side wall portion and a transparent end wall portion, a color screen adjacent said electric lamp extending in front of the transparent end wall portion thereof, said color screen embodying a plurality of segmental sections of different colors including a red section, a violet section and a section for transmitting light rays intermediate red and violet rays; a reflector for projecting light emanating from said electric lamp through said screen, a second reflector extending over the transparent end portion of said bulb for reflecting rays from said electric lamp onto said first named reflector through the translucent side walls of said bulb, a refracting lens extending over said screen, said refracting lens and first named reflector cooperating to effect superimposition and commingling of colored rays emitted from said screen to produce a white or near white illumination, and means on said refracting lens for diffusing fringe rays.

2. In a lamp, the combination of an electric filament lamp including a bulb having a translucent light diffusing side wall portion and a

transparent end wall portion, a color screen adjacent said electric lamp extending in front of the transparent end wall portion thereof, said color screen embodying a plurality of sections of different colors including a red section, a violet section and a section for transmitting light rays intermediate red and violet rays; said screen sections having similar or like light absorptive properties to propagate rays of similar or like intensity; a parabolic reflector encompassing said bulb and arranged to project light emanating from said bulb coincidentally through the several sections of said screen to form a beam, a second reflector extending over the transparent end portion of said bulb arranged to reflect rays emitted from the outer end of said electric bulb back onto said first named reflector through the translucent side walls of said bulb, and a refracting lens extending over said screen cooperating with said first named reflector to effect superimposition and commingling of colored rays emitted from said screen to produce a white or near white illumination.

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