Nov. 21, 1933. H. ROSENBAUM 1,935,729

BEACON OR SEARCHLIGHT

Filed March 17, 1932 2 Sheets-Sheet 1

Fig. 1

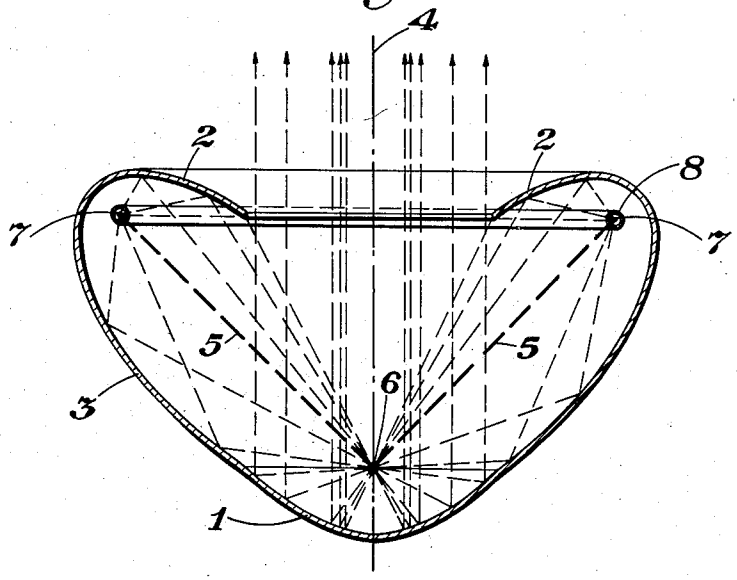
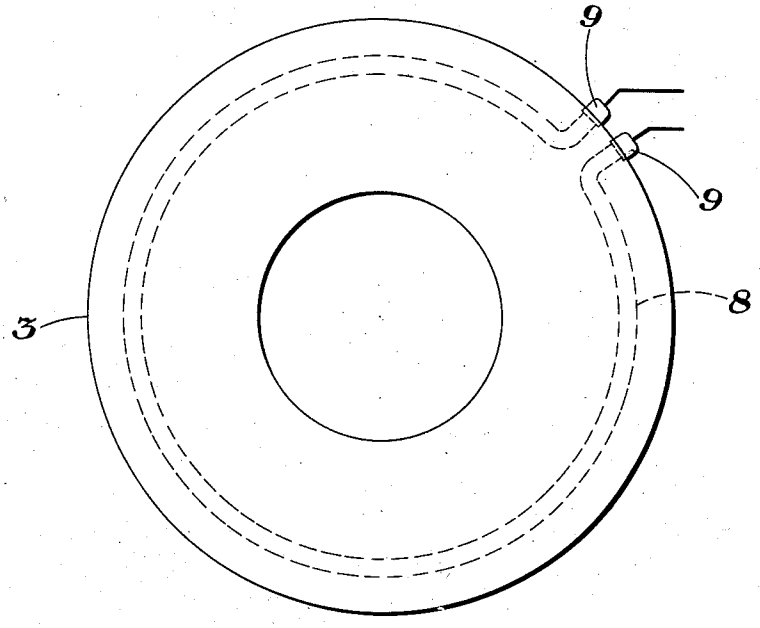


Fig. 2



INVENTOR
Hugo Rosenbaum
BY Charles O'Neill
ATTORNEY

Nov. 21, 1933. H. ROSENBAUM 1,935,729

BEACON OR SEARCHLIGHT

Filed March 17, 1932 2 Sheets-Sheet 2

Fig. 3

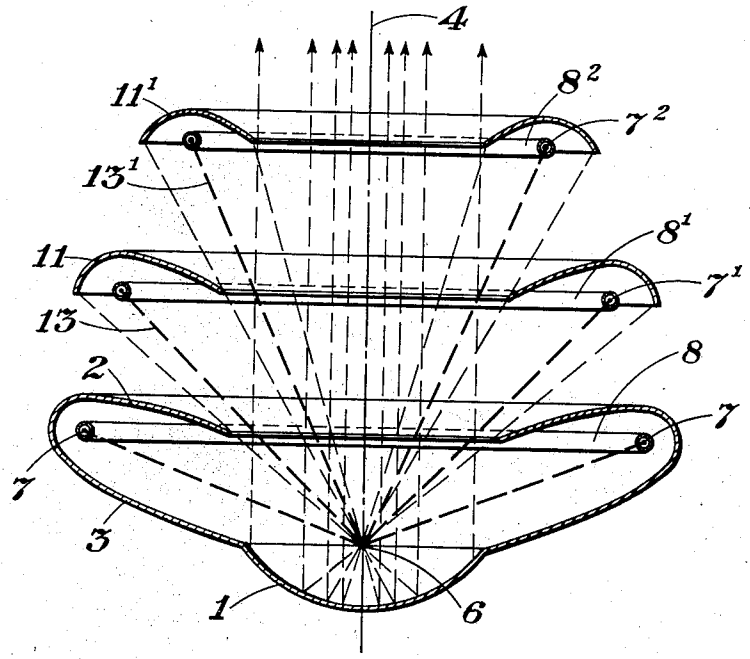


Fig. 4

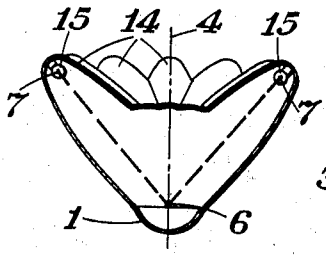


Fig. 6

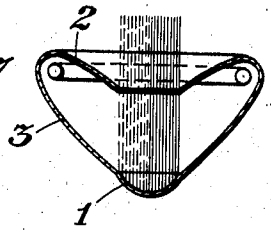


Fig. 8

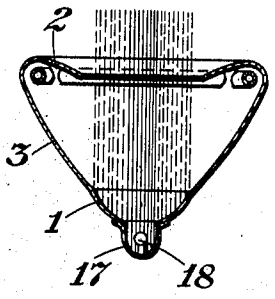


Fig. 5

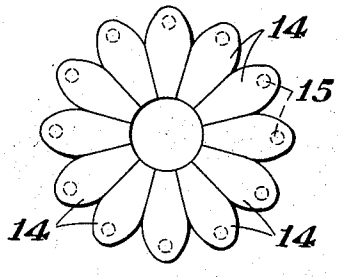
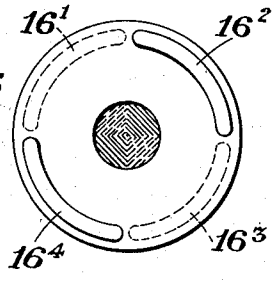


Fig. 7



INVENTOR
Hugo Rosenbaum
BY
ATTORNEY

Patented Nov. 21, 1933 1,935,729

UNITED STATES PATENT OFFICE

1,935,729

BEACON OR SEARCHLIGHT

Hugo Rosenbaum, Berlin, Germany, assignor to General Electric Company, a corporation of New York

Application March 17, 1932, Serial No. 599,539, and in Germany March 27, 1931

3 Claims. (Cl. 240—41.1)

The present invention relates to beacons or search lights generally and more particularly the invention relates to such devices in which practically all the light emitted by the light source is sent out in a beam of parallel rays.

It is well known in the art that a parabolic reflector sends out the light emitted by a light source located at the focal point of said parabolic reflector in a beam of parallel rays. It has been found impractical heretofore to use other than a point light source in a parabolic reflector; an elongated light source, for example, a luminescent gaseous electric discharge device, in a parabolic reflector was inefficient and unsatisfactory since such a light source could not be compressed into a point light source in the focal point of said reflector.

The object of the present invention is to adapt an elongated light source, for example, a luminescent electric discharge device to a parabolic reflector. Still further objects and advantages attaching to the device and to its use and operation will be apparent to those skilled in the art from the following particular description and from the appended claims.

In accordance with this object the invention comprises a circular light source and a reflector consisting of a parabolic reflecting surface and another reflecting surface surrounding said parabolic surface and in operative relation thereto. Said last named reflecting surface is generated by rotating about the axis of said parabolic surface part of an ellipse having one of the focal points thereof coincident with the focal point of said parabolic surface and the major axis thereof at an angle to the axis of the parabolic surface, the circular light source is in the locus of the other focal points of said last named reflecting surface. By virtue of this construction practically all the light emanating from said ring shaped light source is directed to the focal point of the parabolic reflector and thence sent out in a concentrated beam of light.

In the drawings accompanying and forming part of this specification several embodiments of the invention are shown in which,

Fig. 1 is a sectional view of the new and novel reflector,

Fig. 2 is a top view of the reflector shown in Fig. 1,

Fig. 3 is a sectional view of another embodiment of the invention,

Fig. 4 is a sectional view of another embodiment of the invention,

Fig. 5 is a top view of Fig. 4,

Fig. 6 is a sectional view of another embodiment of the invention,

Fig. 7 is a top view of Fig. 6, and

Fig. 8 is a sectional view of another embodiment of the invention.

Like numbers denote like parts in all views of the device.

Referring to Figs. 1 and 2 of the drawings, the new and novel reflector consists of a parabolic mid-section 1 and rim parts 2, 3, said rim parts 2, 3 are generated by revolving around the axis 4 of the parabolic section 1 part of an ellipse having focal points 6, 7. Said focal point 6 is in the focal point of the parabolic part 1 and the major axis 5 of said ellipse is at an acute angle to the axis 4 of said parabolic part 1. The locus of the focal points 7 of said reflector part 2, 3 is a circle surrounding said axis 4 and said circle is in a plane perpendicular to said axis 4. A ring-shaped gaseous electric discharge device 8 is located in the locus of said focal points 7. The electrodes 9, 9 of said electric discharge device 8 are located outside said reflector part 2, 3, as shown in Fig. 2, or when desired said electrodes 9, 9 are located inside said reflector part 2, 3. By virtue of this construction the light rays emitted by said gaseous discharge device 8 are directed to said focal point 6 common to the reflector part 2, 3 and the parabolic reflector part 1 and are then directed in a beam of parallel rays by said parabolic reflector part 1 as shown in dotted lines in Fig. 1.

The embodiment of the invention shown in Fig. 3 illustrates a method of adapting a plurality of circular gaseous electric discharge devices 8, 8^1, 8^2 to a single parabolic reflector 1 to make available for use in the arts generally a beam of light of greater intensity than is possible to produce with the embodiment shown in Fig. 1. The reflector 1, 2, 3 is similar to that shown in Fig. 1 except that in this embodiment the axis 5 of the reflector part 2, 3 forms a less acute angle with respect to the axis 4 of the parabolic reflector part 1. Two additional reflector parts 11 and 11^1 are provided, said parts 11 and 11^1 are generated by the same method as part 2, 3 and the major axis 13 and 13^1 thereof are each at a more acute angle with respect to the axis 4 than the major axis 5 of said reflector part 2, 3. Circular light tubes 8^1 and 8^2 are located in the locus of the other focal points 7^1, 7^2 of each of said reflectors 11 and 11^1. The light rays from each of said luminous gaseous electric discharge devices 8, 8^1 and 8^2 are directed, by the reflector parts 2, 3; 11 and 11^1, to the focal point 6 of

the parabolic reflector 1 and are directed in a beam of parallel rays by said parabolic reflector 1 as illustrated in dotted lines in the drawings.

In the embodiment of the invention shown in Figs. 4 and 5 the reflector comprises a plurality of reflectors 14, generated by revolving part of an ellipse around its major axis, and arranged around the axis 4 of the parabolic reflector part 1. The major axis of each of said reflectors 14 is at the same angle with respect to said axis 4. The focal point 7 of each of said reflectors 14 lies in a circle concentric with and in a plane perpendicular to said axis 4 and the other focal point of each of said reflectors 14 coincides with the focal point 6 of said parabolic reflector 1. A point light source 15, an incandescent lamp, for example, is arranged in each focal point 7 to form a discontinuous circular light source and the light emitted thereby is directed to the focal point 6 of the parabolic reflector 1 and is sent out in a beam of parallel rays as described heretofore.

The embodiment of the invention shown in Figs. 6 and 7 is similar in construction with that shown in Fig. 1 but in this embodiment the luminous circular light source consists of four gaseous electric discharge devices 16^1, 16^2, 16^3, 16^4 each of which is a quarter of a circle. Each of said electric discharge devices may be filled with a different gaseous atmosphere to give a different colored light. A beam of light of various colors is projected by such a device and various color combinations are produced by operating different lamps at different times.

The embodiment of the invention shown in Fig. 8 is similar to that shown in Fig. 1 except that the parabolic part 1 has a smaller parabolic reflector 17 recessed therein, the focal point 18 thereof being in the axis of said reflector 17. A point light source, such as an incandescent lamp, is located in the focal point 18 of said reflector 17 and when desired the bulb of the incandescent lamp is of clear glass and the luminous electric discharge device emits a red light to project a beam of light from said device having a red rim and a white center.

While I have shown and described and have pointed out in the annexed claims certain novel features of the invention, it will be understood that various omissions, substitutions and changes in the forms and details of the device illustrated and in its use and operation may be made by those skilled in the art without departing from the spirit and scope of the invention, for example, the light source and the locus of the focal points 7 are not restricted in shape to a circle; when desired they may describe an eccentric path about the axis 4 of the parabolic reflector 1 provided the focal point 6 of the ellipse or ellipses generating the reflector parts 2, 3 or 14 is coincident with the focal point of the parabolic reflector 1 and the major axis or axes of said ellipse or ellipses is at the same angle with respect to the axis of the parabolic reflector at all positions thereof.

What I claim as new and desire to secure by Letters Patent of the United States is:—

1. A beacon comprising a circular light source and a reflector therefor, said reflector having a parabolic reflecting surface and another reflecting surface in operative relation to said parabolic surface, said second named surface being generated by rotating around the axis of said parabolic surface a portion of an ellipse having one of the focal points thereof coincident with the focal point of said parabolic surface and the major axis thereof at an angle to the axis of said parabolic surface, said circular light source being in the locus of the other focal points of said second named reflecting surface.

2. A beacon comprising a circular light source and a reflector therefor, said circular light source comprising a plurality of electric discharge devices emitting different colored light, said reflector having a parabolic reflecting surface and another reflecting surface in operative relation to said parabolic surface, said second named surface being generated by rotating around the axis of said parabolic surface a portion of an ellipse having one of the focal points thereof coinciding with the focal point of said parabolic surface and the major axis thereof at an angle to the axis of said parabolic surface, said circular light source being in the locus of the other focal points of said second named reflecting surface.

3. A beacon comprising a circular light source, a point light source, and a reflector therefor, said reflector having a plurality of parabolic reflecting surfaces one recessed within the other and having a common axis and another reflecting surface in operative relation to one of said parabolic surfaces, said second named reflecting surface being generated by rotating around the axis of said parabolic surfaces a portion of an ellipse having one of the focal points thereof coinciding with the focal point of one of said parabolic surfaces and the major axis thereof at an angle to the axis of said parabolic surfaces, said circular light source being in the locus of the other focal points of said second named reflecting surface and said point light source being in the focal point of said recessed parabolic surface.

HUGO ROSENBAUM.