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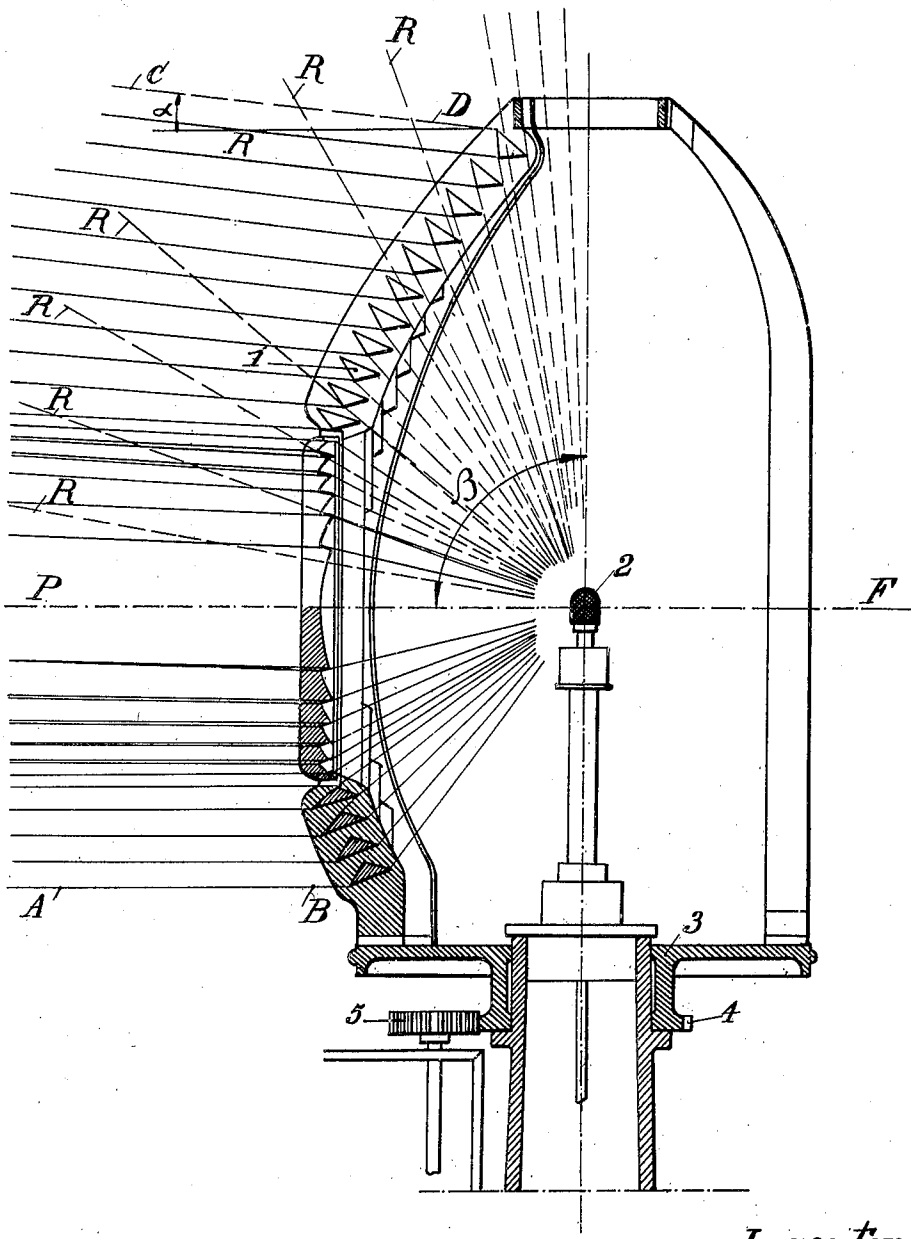
AERIAL SIGNAL LIGHT.

APPLICATION FILED MAY 23, 1919.

1,384,659. Patented July 12, 1921.

3 SHEETS—SHEET 1.

Fig.1



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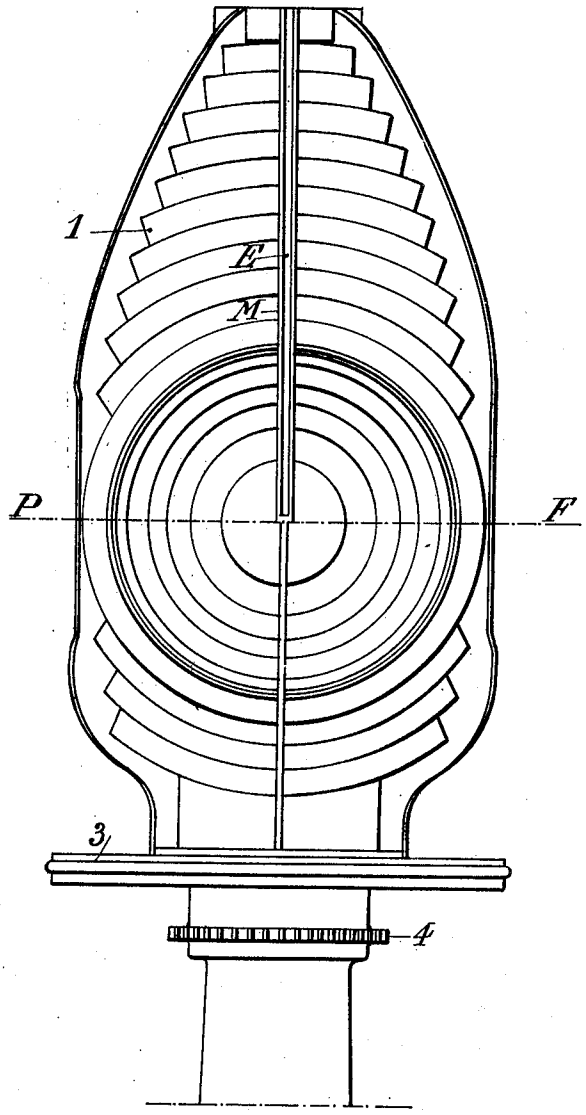
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3 SHEETS—SHEET 2.

Fig. 2



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3 SHEETS—SHEET 3.

Fig.3

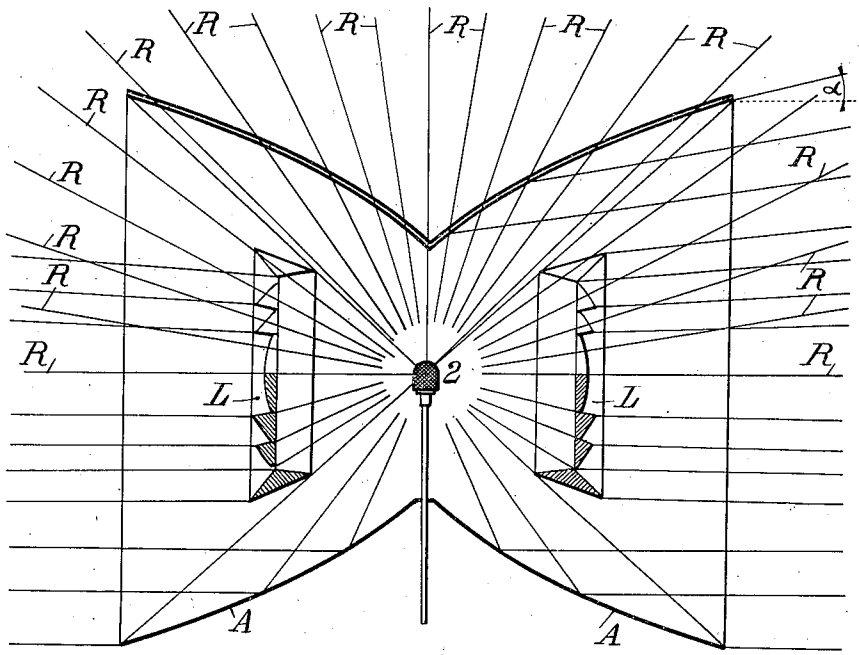
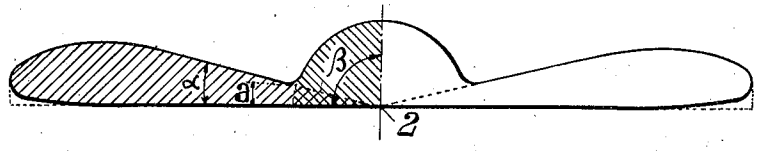


Fig.4



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UNITED STATES PATENT OFFICE.

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AERIAL SIGNAL-LIGHT.

1,384,659. Specification of Letters Patent. Patented July 12, 1921.

Application filed May 23, 1919. Serial No. 299,104.

To all whom it may concern:

Be it known that I, HENRI LUGLIEN MARIE JOSEPH BÉNARD, a citizen of the Republic of France, residing at 82 Rue Curial, Paris, France, have invented new and useful Improvements in Aerial Signal-Lights, of which the following is a specification.

It is known that, in order to meet the requirements of aerial navigation signal lights should be able to illuminate in a continuous manner, from the horizon to the zenith of the searchlight. It is not necessary that the intensity of the beam shall be equal in all parts of the vertical plane. Rationally speaking the beam of light should have its maximum intensity in the horizontal direction and this intensity should gradually decrease from the horizon to a point above the searchlight in which latter region it need only have sufficient intensity to enable the light to be visible at the greatest altitude which can be obtained by aircraft. As this altitude does not, in practice, exceed 4000 meters a very low intensity is sufficient for the light to be visible, the more so since at high elevations visibility is very good owing to the purity of the air.

The searchlight forming the subject of this invention complies in all respects with the above conditions.

In principle the invention is characterized by the provision, in connection with a searchlight, of an aperture or window by means of which it is possible to illuminate from the horizon to the zenith of the searchlight in a continuous manner and with a single source of light.

In the accompanying drawing, Figure 1 is a vertical section of a searchlight constructed according to the invention. Fig. 2 is a front view of the optical panel of the searchlight. Fig. 3 shows a modification and Fig. 4 is a curve showing the ranges of the beam of light of the searchlight.

Referring to Fig. 1, the searchlight consists essentially of an optical panel 1, composed of dioptric and catadioptric elements. 2 designates a source of light, in this case an incandescent mantle, but any other source of light could be employed. A table 3 supporting the optical system carries a crown wheel 4 meshing with the pinion 5 of a motor.

The prismatic elements are arranged so as to concentrate the luminous rays emitted by the source of light 2 into a very intense beam limited, on the one hand, by the line AB which is horizontal, and on the other hand by the line CD, which forms with the horizontal a certain angle α which is determined by practical considerations.

The light source is at the focus of the optical panel 1, and in the center of the portion of the panel situated above the horizontal plane PF passing through the light source, Fig. 2, the prisms are supported by a double standard M having an interval or gap E which forms an aperture or window in which there are no prisms. If reference is had to Fig. 1, it will be seen that the rays emitted by the source of light pass through this interval and give illumination from the horizontal up to the vertical line passing through the axis of the searchlight.

The interval E is dimensioned in such a manner that the pencil of light formed by the direct light emitted by the source is of horizontal amplitude equal to that of the pencil formed by the prisms and retains the same character in the whole vertical plane.

It should be noted that the horizontal amplitude of the pencil given by the prisms being very small, the interval E is very small and, consequently, the small quantity of prisms removed from the panel only inappreciably diminishes the intensity of the beam or pencil.

The total beam obtained stretches therefore in a vertical plane from the horizon to the vertical passing through the axis of the searchlight, and this without interruption of continuity.

If the curves of the ranges of the beam were traced, one would obtain, for the whole beam, the curve represented in Fig. 4 in which 2 represents the searchlight. The shaded zone included in the angle α corresponds to the intensity of the beam of light given out by the optical panel 1. The shaded zone included in the angle β corresponds to the intensity of the beam of light emitted directly by the source.

It will therefore be seen that, taking by way of example an altitude of 4000 meters to which an aeroplane can rise, this altitude being indicated by a the lowest point of the beam, the aviator will always be within the beam of light, subject of course to the condition that he is not situated at a distance from the searchlight which is superior to the horizontal range of this latter.

The apparatus shown in Figs. 1 and 2

gives a simple flash. It is obvious that it would be possible to construct searchlights having a plurality of regular panels or grouped around the source of light and thus to have either simple flashes or groups of flashes.

It would also be possible to construct a searchlight composed of reflectors alone or of reflectors and lenses, as shown in Fig. 3. In the upper portion of each reflector A and in the upper half of each lens L is formed a window which allows the light emitted by the source placed at the focus to escape directly, as in the device shown in Figs. 1 and 2.

Claims:

1. A signal light for use in aerial navigation, comprising in combination a source of light, an optical system for projecting the beam from said source, said optical system having a narrow central aperture extending from a horizontal plane passing through the light source to the zenith.

2. A signal light for use in aerial navigation comprising in combination a source of light, optical elements for projecting the beam from said source in substantially a horizontal direction, said optical elements having an aperture formed therein extending from the horizontal to the vertical axis of the signal light.

3. A signal light for use in aerial navigation comprising in combination a source of light, optical elements for projecting the beam from said source in a horizontal direction, a standard supporting said optical elements, said standard having an aperture devoid of optical elements extending from the horizon to the zenith.

4. A signal light for use in aerial navigation comprising in combination a source of light, means for projecting the beam from said source substantially horizontally, a central narrow window being provided extending from the horizon to the zenith for the passage of a portion of the light emitted by said source.

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