2 Sheets--Sheet 1.

C. D. GIBSON.

Reflector for Headlights.

No. 52,987. Patented March 6, 1866.

Fig. 2

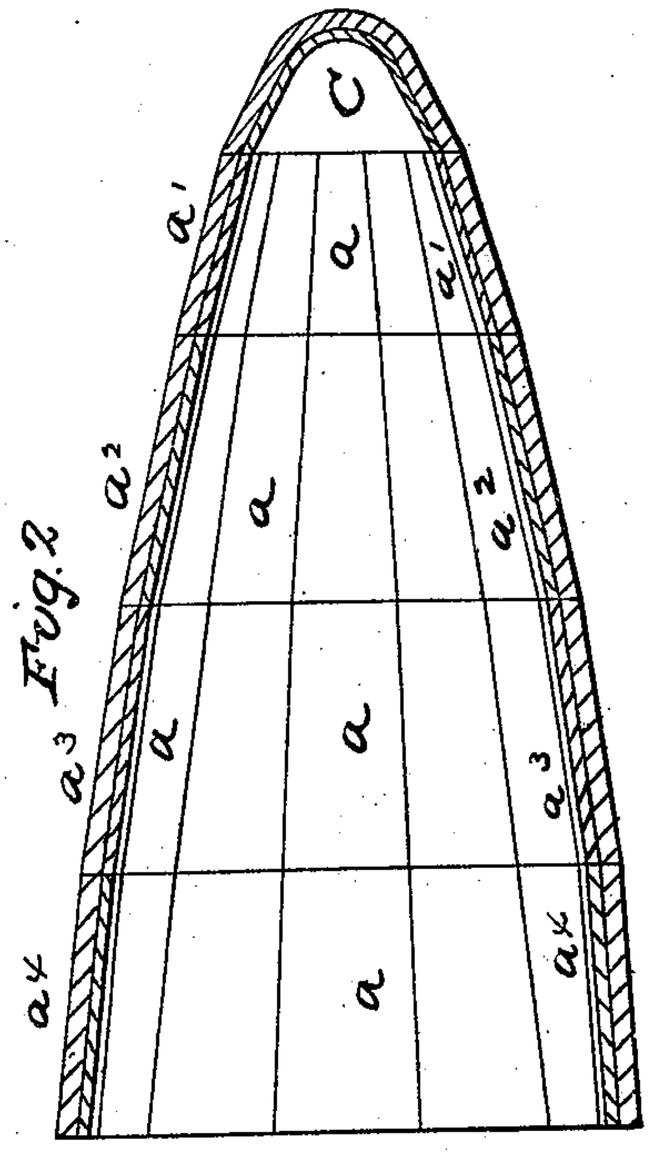


Fig. 4

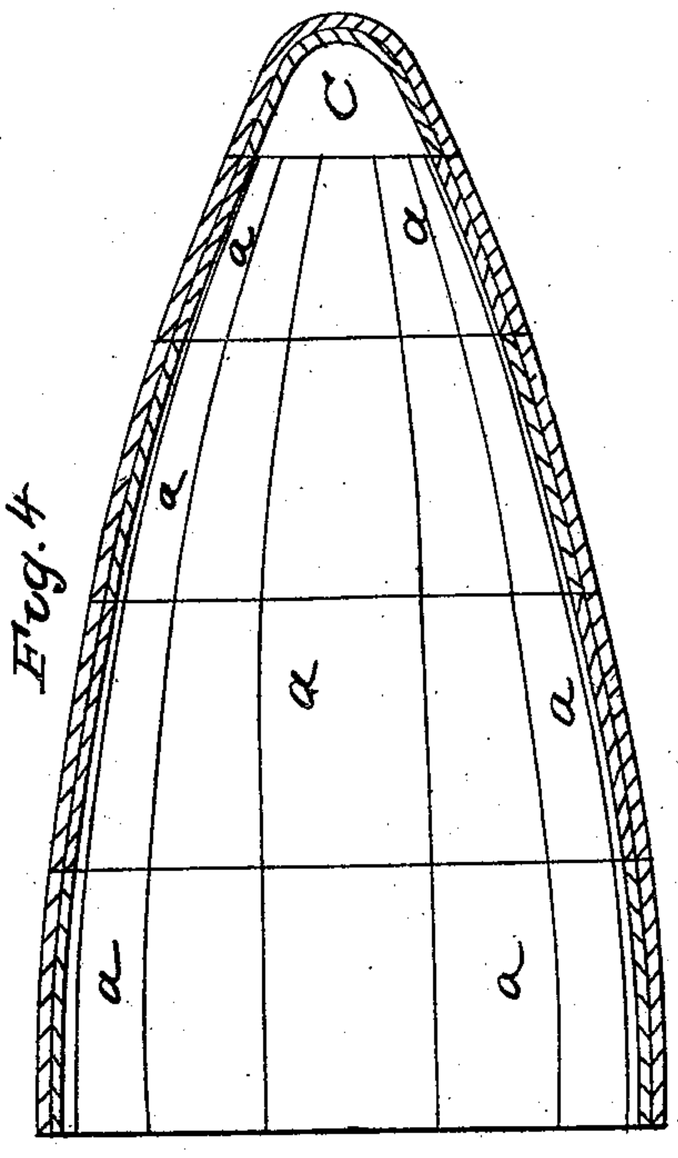


Fig. 1

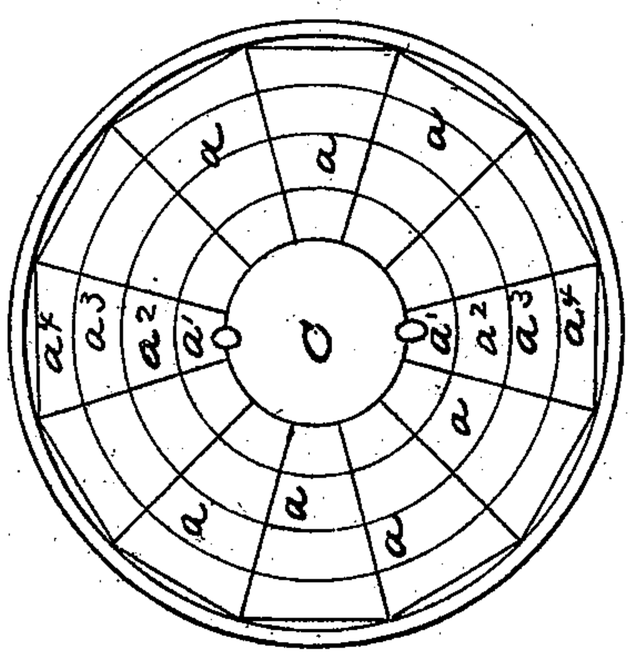
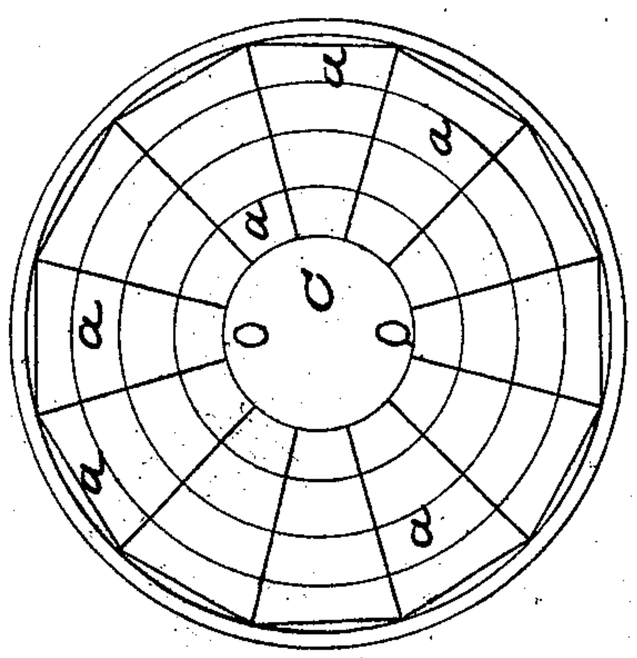


Fig. 3



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2 Sheets—Sheet 2.

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Reflector for Headlights.

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Fig. 6

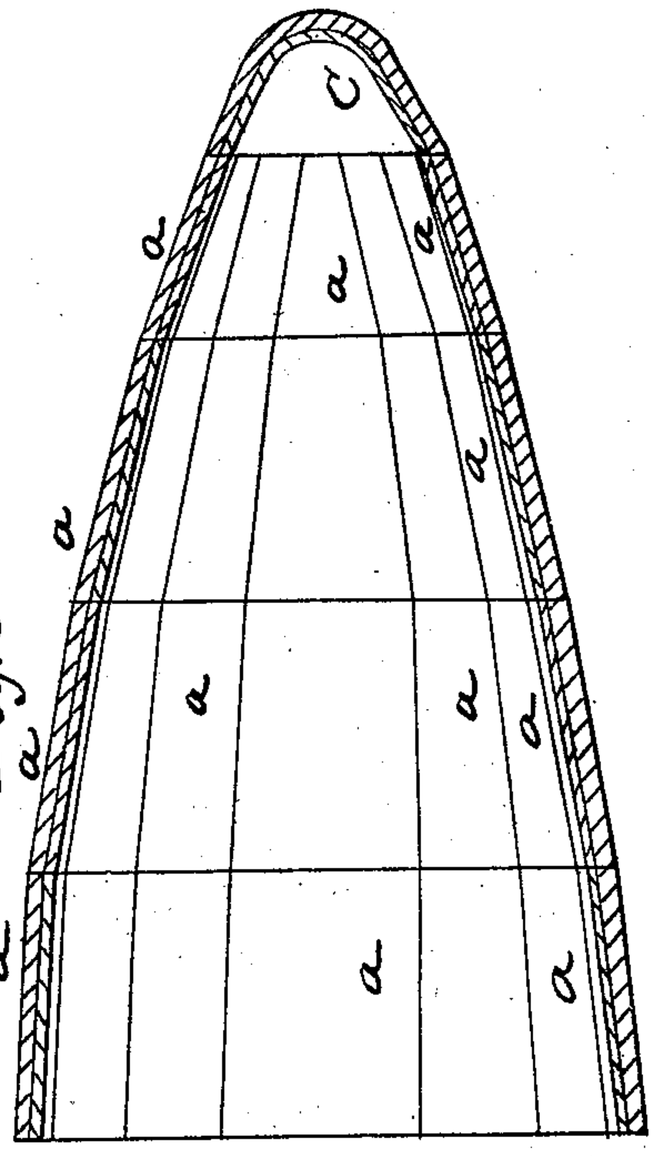


Fig. 5.

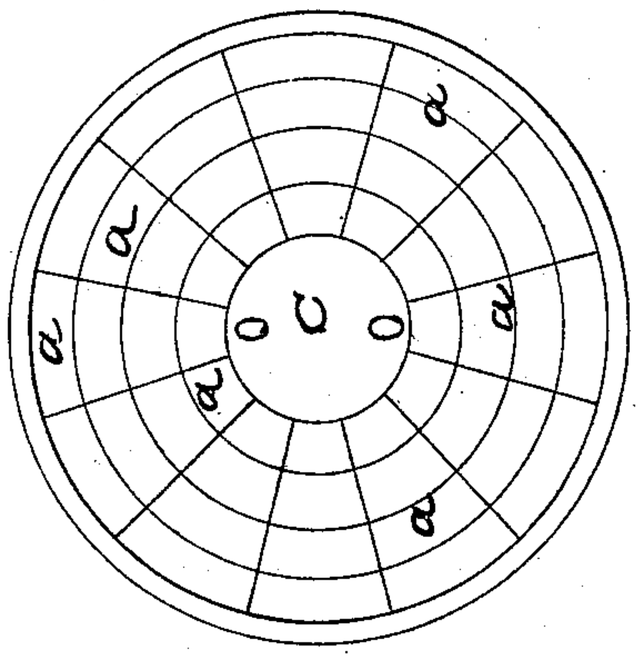


Fig. 10

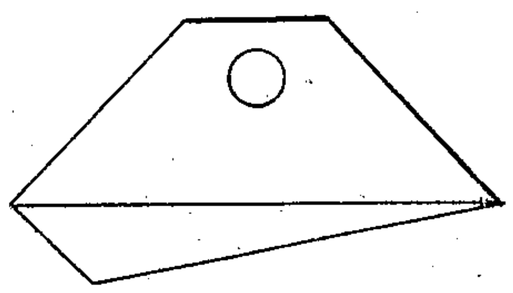


Fig. 9

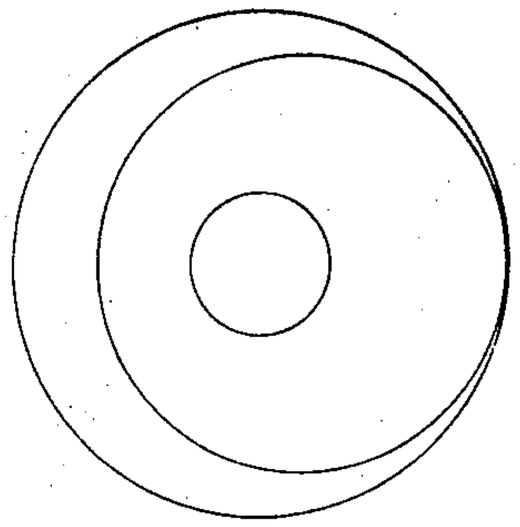


Fig. 8.

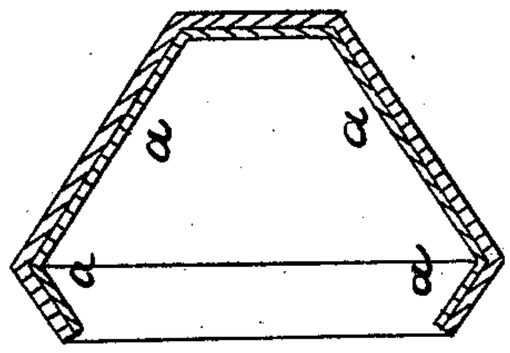
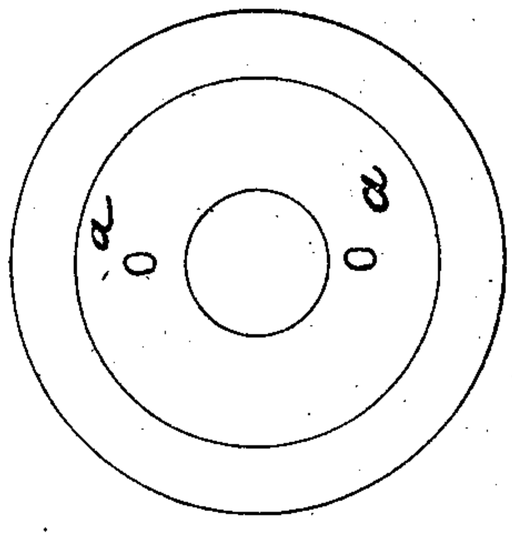


Fig. 7



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UNITED STATES PATENT OFFICE.

CHARLES D. GIBSON, OF NEW YORK, N. Y.

IMPROVED REFLECTOR FOR HEAD-LIGHTS.

Specification forming part of Letters Patent No. **52,987,** dated March 6, 1866.

To all whom it may concern:

Be it known that I, CHARLES D. GIBSON, of the city, county, and State of New York, have invented a new and useful Improvement in Reflectors for Head-Lights; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification.

The nature of my invention consists in the combination of distinct reflecting-surfaces in the construction of reflectors for head-lights, said surfaces being straight in at least one direction, (instead of being curved in all directions, as has heretofore been the plan,) and arranged in annular series, each of which presents a different angle to the rays of light falling from the burner at the focal point; also, in so disposing of the outer series of reflecting-surfaces as that they will return the outermost rays of light to the center of the reflector, to be thence reflected in a concentrated stream directly forward.

I have found after repeated and careful experiment that by the use of distinct reflecting-surfaces which present at least one right plane or flat surface to the rays of light falling thereon, arranged in regular series around the interior of a parabolic frame, the rays of a burner placed at the focal point are powerfully concentrated in a straightforward line therefrom, and are projected with far greater dynamic force and will reach a greater distance than by any other means.

The method of constructing my improved reflectors in accordance with my invention will fully appear by reference to the accompanying drawings.

Figure 1 is a front view, and Fig. 2 a longitudinal central section, of a reflector constructed of distinct perfectly flat reflecting-surfaces, *a a a a*, arranged in annular series $a' a^2 a^3 a^4$, each of which is placed at a greater inclination to a right line passing through the center or axis of the reflector than that preceding it. I prefer in practice a reflector thus made entirely of flat surfaces, rather than those which are only partially so, although the latter are also useful.

Fig. 3 is a front view, and Fig. 4 a longitudinal section, of a reflector constructed of a series of reflecting-surfaces curved in the direction of its length, but each of which is flat and straight in a direction at right angles thereto, and all arranged in annular rows along the interior of a properly-shaped frame, W, of wood or metal.

Fig. 5 is a front view, and Fig. 6 a longitudinal section, of a reflector whose distinct surfaces *a a a a* are each straight or flat in the direction of its length, although so curved as to coincide with the arc of its circumference.

Figs. 7 and 8 are respectively a front view and a central longitudinal section of my improved reflector when constructed with its rim or the outer row of its reflecting-surfaces inclined centrally at such an angle as to reflect the outermost rays from the light inwardly, so as to concentrate them powerfully at the center of the reflector, to be thence thrown out in a single stream of intense brilliancy.

By cutting away the inwardly-inclined reflecting-rim (illustrated in Fig. 9) in the manner shown by the view given in Fig. 10 a greater concentration of light may be obtained at one point of the reflector than at another, and a more intense reflection thereof be thus directed either upward, downward, or to one side or the other, without diminishing the brilliancy of the light reflected from the remainder of the reflecting-surfaces. This partial rim may be so arranged as to revolve around the edge of the reflector by mechanism at the command of the engineer, (if on a locomotive,) giving him the means of throwing the more intense rays thus obtained in such direction as he may desire—a device which would prove of great utility in passing around curves.

I contemplate leaving the sectional inwardly-reflecting rim, Figs. 9 and 10, of any shape, either rectangular or with the gradual taper shown in the drawings.

In each form hereinbefore described of my improved reflector I place a slightly-conical reflecting-plate, C, (see Figs. 2, 4, and 6,) in the rear of the light therein, turning the open end of the cone toward the light.

Having thus fully described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The combination of a series of small reflecting-planes, or of surfaces which are straight and flat in at least one direction, in the construction of reflectors for head-lights, when

said reflecting-surfaces are arranged in annular series or rows within the reflector, all substantially in the manner and for the purpose herein set forth.

2. A conical reflecting center plate in the base or rear end of a reflector, behind the lamps at the focal point thereof, in combination with a series of straight and flat reflecting-planes, when arranged substantially as herein described.

3. A centrally-inclined reflecting-rim, in combination with the front end or edge of a head-light reflector, constructed substantially in the manner and for the purpose herein set forth.

The foregoing specification of my improvements in reflectors for head-lights signed by me this 11th day of November, A. D. 1865.

CHARLES DANA GIBSON.

In presence of—
ARTHUR I. MUNDY,
R. R. WOOD.