A. WILHELM.

Reflectors.

No. 149,555. Patented April 7, 1874.

Fig. 1.

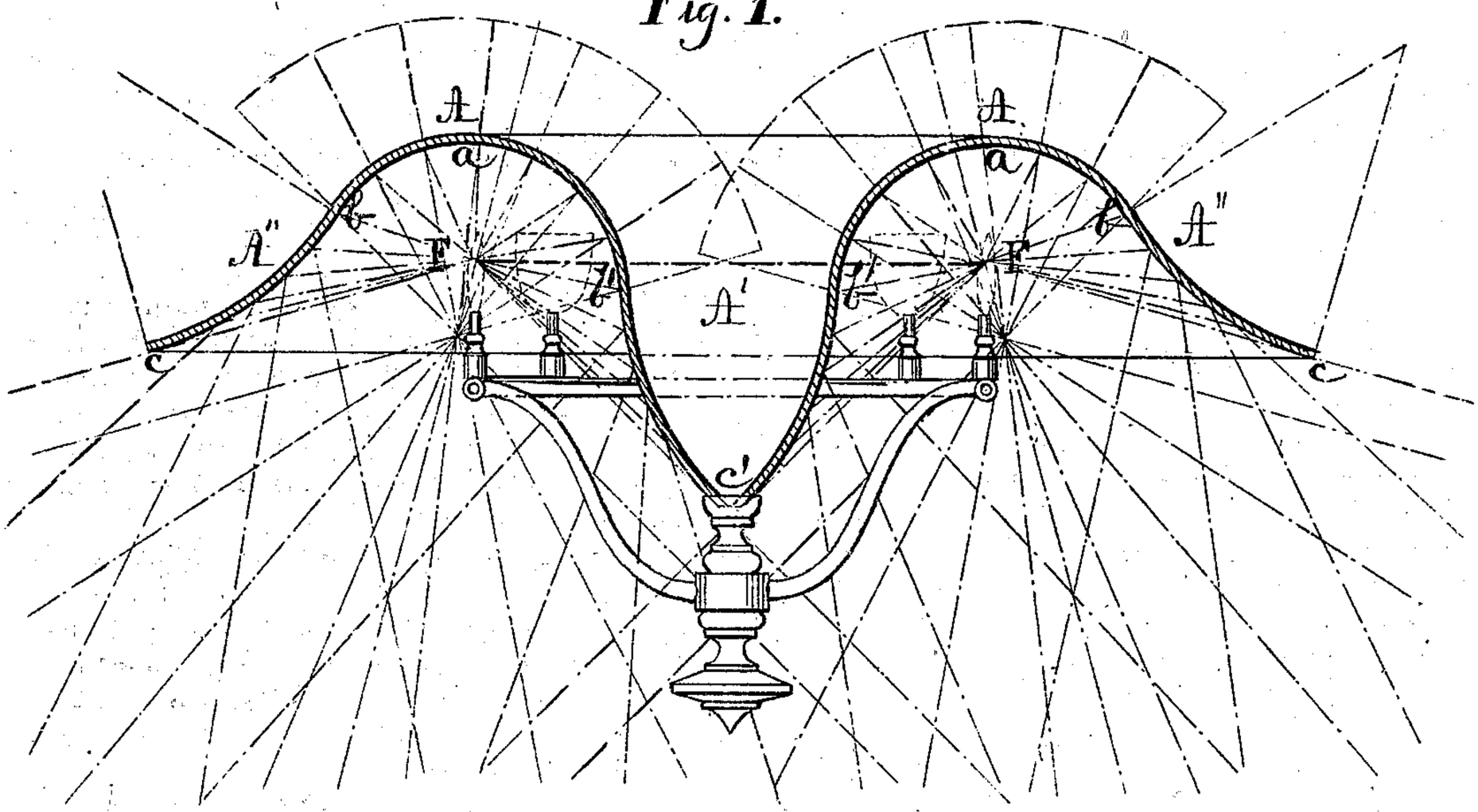
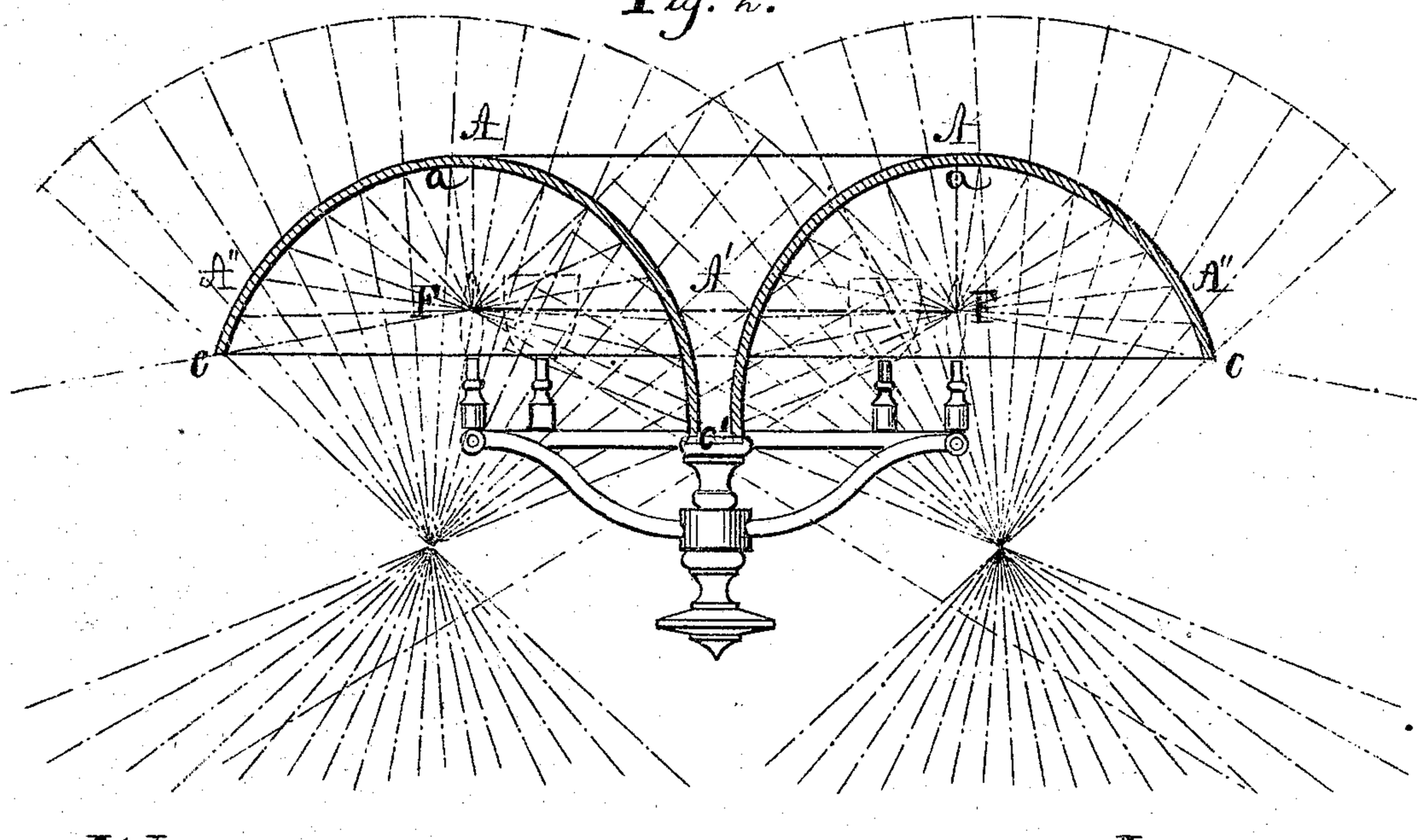


Fig. 2.



Witnesses.

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AUGUST WILHELM, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN REFLECTORS.

Specification forming part of Letters Patent No. **149,555**, dated April 7, 1874; application filed December 2, 1873.

To all whom it may concern:

Be it known that I, AUGUST WILHELM, of the city and county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Reflectors; and I do hereby declare the following to be a clear and exact description of the nature thereof, sufficient to enable others skilled in the art to which my invention appertains to fully understand, make, and use the same, reference being had to the accompanying drawings making part of this specification, in which—

Figures 1 and 2 are vertical sections through the center of the reflector.

Similar letters of reference indicate corresponding parts in the two figures.

The object of the invention is to improve that class of light-reflectors which are suspended horizontally from the ceilings of churches, halls, depots, places of amusement, &c., and are designed to reflect and diffuse the rays of light coming from a series of burners downward and outward, so as to perfectly illuminate these places.

The form of reflector generally employed is that of a frustum of a cone inserted into the ceiling, or a cone suspended in the center of the frustum. These reflectors are the so-styled double-cone reflectors. They have two serious defects, which, by my improvement, I design to remedy, besides producing a more perfect and stronger reflector than heretofore made.

The first defect of the so-called double-cone reflector is, that the frustum and inner cone are two distinct parts, their reflecting surfaces being separated, leaving an open space around the upper part of the reflector. The reflector may be suspended from the inner cone, or from the circumference of the frustum; but in either case it necessitates the connection of the frustum with the inner cone by strong braces of wire or strips of metal. The opening caused by the separation of the two reflecting-surfaces around the top of the reflector causes a greater loss of light than is absolutely necessary.

The second defect of the so-called double-cone reflector is, that the form of the reflector does not give the constructer sufficient control over the rays of light to illuminate a given space evenly, or obtain the best results with a given number of burners, as he would have if the reflecting-surfaces were so curved as to positively reflect the light where it is needed, and thus overcome the before-named second defect of the old-style reflector, thereby producing a correctly-formed and strongly-constructed light-reflector.

Referring to the drawings, A′ represents the inner pendant; A A, the central basin, and A″ A″ the outer rim. The dotted lines show the manner of constructing the reflecting-surfaces, and the resultant direction of the reflected rays of light coming from lights placed on the focus-line F F.

In Fig. 1 I construct the reflector of the inner pendant A′, the central basin A A, and the outer rim A″ A″. The inner pendant A′ is formed of the convex curves *c′ b′ c′ b′*. At *b′ b′* begins the central basin A A, which is formed of the concave elliptic curves *b′ a b b′ a b*, and at *b b* begins the outer rim A″ A″, which is formed of the convex curves *b c b c*, and is pendent toward and below the ring of lights placed on the focus-line F F of the basin part A A. All the curves forming the different parts of the body of the reflector are continuous of each other. The convex curves are segments of circles, and the concave curves are segments of ellipses. F F is the focus-line of the basin part A A of the reflector. The rays of light (represented in the drawing by the dotted lines) falling on the convex curves *c b c b c′ b′ c′ b′* are divergingly reflected downward, and those rays falling on the concave elliptic curves *b a b′ b a b′* are reflected convergingly to the other focuses of the ellipses, and, passing through those focuses, diverge downwardly.

It will be seen by the direction of the dotted lines, representing the reflected rays of light coming from lights placed on the focus-line F F of the basin part A A, that all the light is reflected downwardly within the angles *c* F *c′ c* F *c′*; consequently all the light is utilized and reflected in the space which is to be illuminated.

It will also be seen that by making the inner pendant A′, the central basin A A, and the outer rim A″ A″ continuous of each other, a strong structure is produced, and the reflector can, therefore, be suspended either from the inner pendant without extra support on the

circumference, or from the outer rim or circumference without extra support for the inner pendant.

Various modifications may be made. In Fig. 2 the inner pendant or projection A′, the central basin A A, and the outer rim A″ A″, pendent below the focus-line F F of the basin part A A, are formed of the concave elliptic curves *c′ a c′ c′ a c*. As these parts are formed of a single curve, the distinctive features of the different parts is not so defined, as shown in Fig. 1. Yet the principle of a continuous reflecting curved surface, forming parts A′, A A, and A″ A″, is also plainly demonstrated in Fig. 2.

It will also be seen that by the dotted lines, representing rays falling on the reflecting-surfaces *c′ a c c′ a c* of the reflector, they are converging to the other focuses of the ellipses of which the curves are segments, and, passing through the focuses, diverge downwardly. Thus the light is utilized in the same manner as shown in Fig. 1, and the general structure of the reflector is equally as strong, and the same in principle.

The contour of the reflector may be circular, oblong, oval, or polygonal.

I am aware that reflectors have been constructed of an outer and inner part, as shown in the double-cone reflector, or in the reflector constructed for a light-house; but in both of these reflectors the inner and outer parts are separated and not continuous. In the light-house reflector the reflecting-surfaces of the outer and inner parts are formed of the parabolic curve, and all the rays reflected from it are reflected in parallel lines downward; but by the construction of my reflecting-surfaces the light will be diffused downward and outward.

Having shown and described the particular advantages of my improved form and construction for a reflector, what I claim as my invention, and desire to secure by Letters Patent, is—

A ceiling-reflector having a continuous curved reflecting-surface, the same consisting of an inner pendant or projection, a central basin of elliptical form in vertical section, and an outer rim pendent toward or below the lights, in combination with the ring of lights placed on the focus-line of the basin portion of the reflector, for the purpose herein set forth.

Witnesses: AUGUST WILHELM.

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