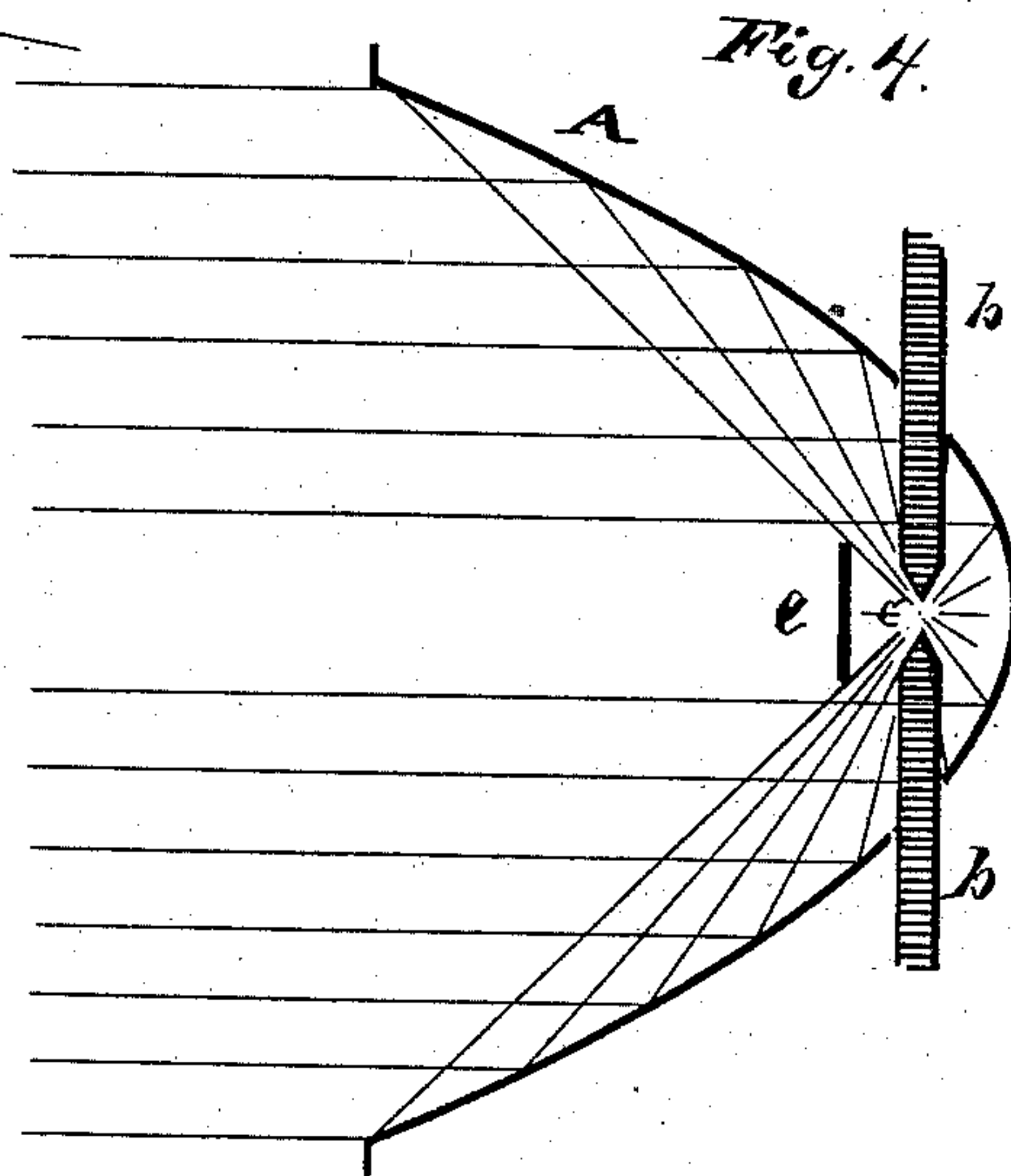
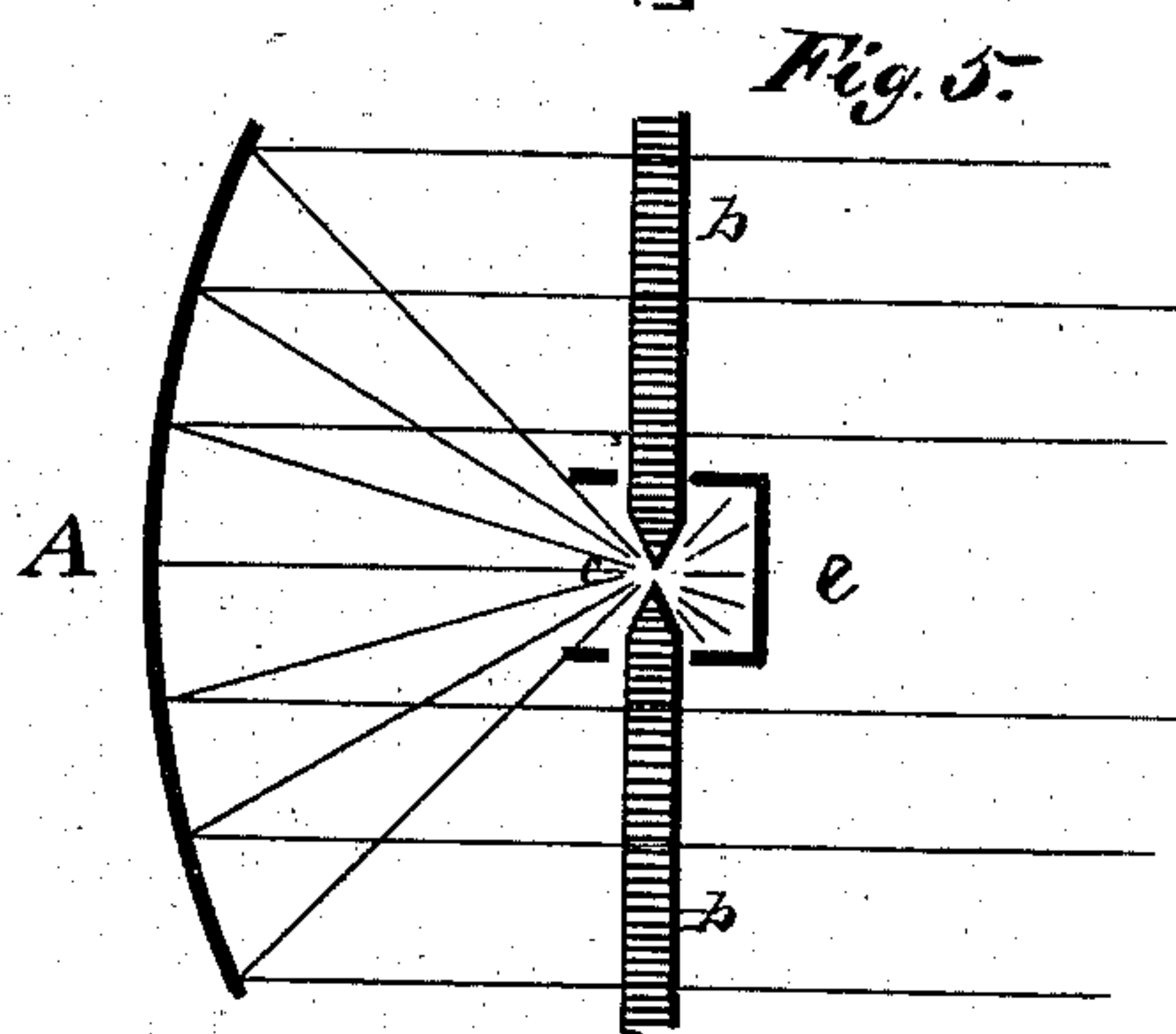
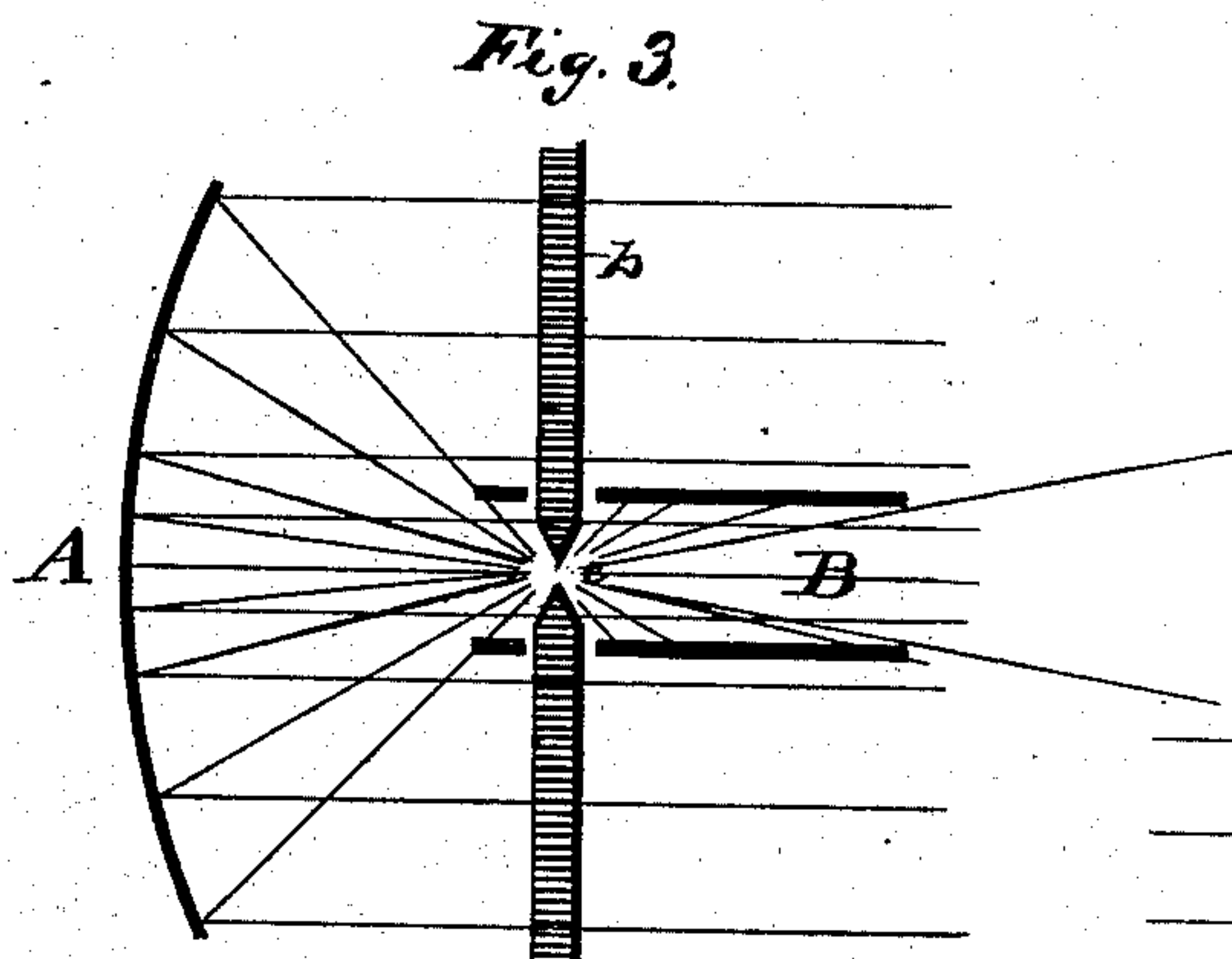
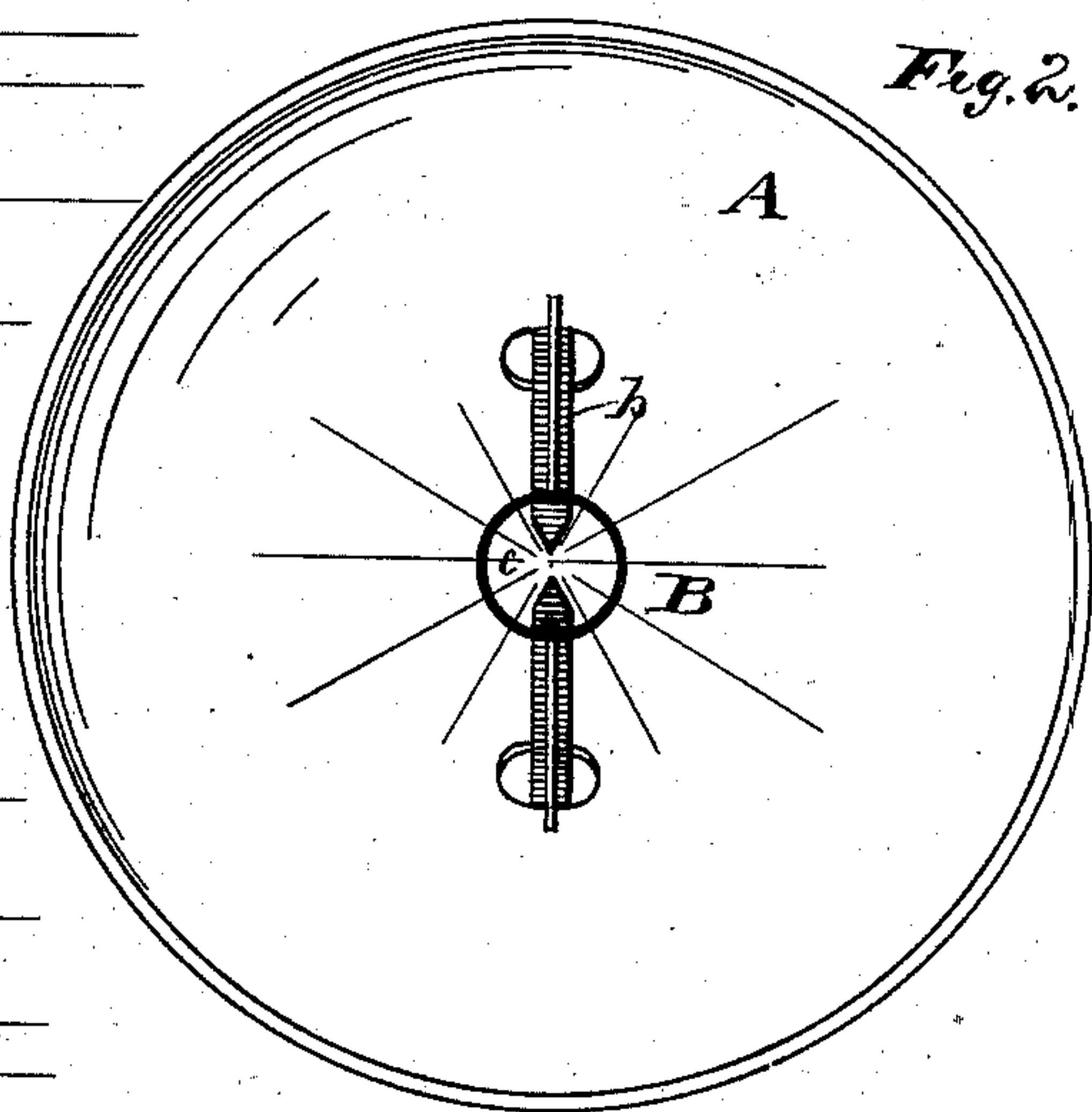
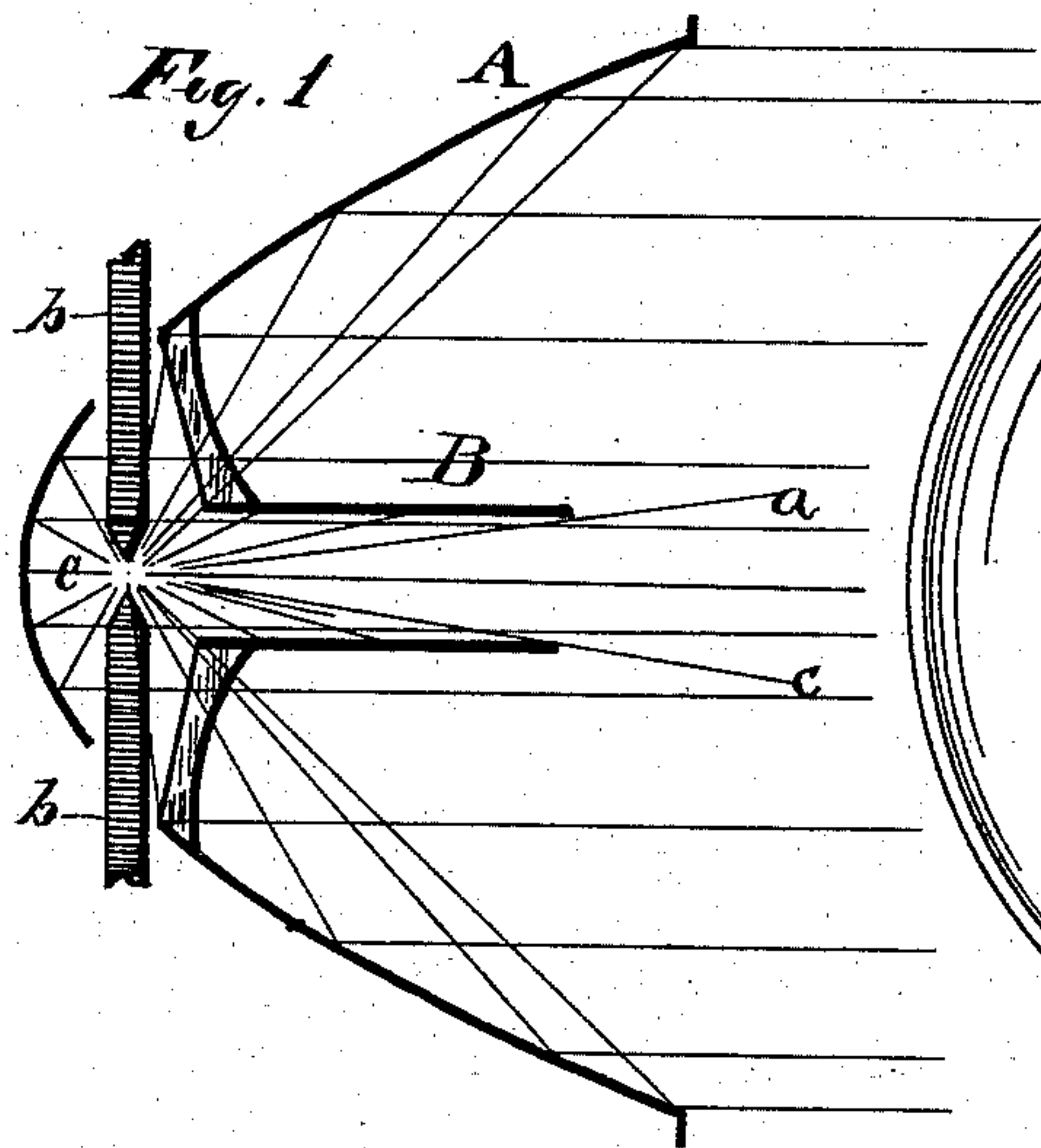


(No Model.)

C. F. BRUSH.  
Reflector.

No. 239,312.

Patented March 29, 1881.



WITNESSES

*F. M. Fabr.*

*Jos. Crowell Jr.*

INVENTOR

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*By Leggett & Leggett* ATTORNEYS



# UNITED STATES PATENT OFFICE.

CHARLES F. BRUSH, OF CLEVELAND, OHIO.

## REFLECTOR.

SPECIFICATION forming part of Letters Patent No. 239,312, dated March 29, 1881.

Application filed August 6, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES F. BRUSH, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and  
5 useful Improvements in Reflectors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being  
10 had to the accompanying drawings, which form part of this specification.

My invention relates to reflectors for electric and other lights, and has for its object the suppression of the direct or unreflected light issuing from the luminous source, without interfering materially with the reflected rays. The desirability of this suppression is very apparent when electric lights are used with parabolic or other reflectors on board ships. Here  
15 the object of the reflector and light is to illuminate distant objects while the ship remains in comparative darkness, so that the pilot may clearly see the distant objects illuminated without being himself blinded by the light. When  
20 an electric light is used with even a very deep parabolic reflector in the ordinary manner, the wide cone of unreflected light escaping from the mouth of the reflector illuminates the mist, which is always present in greater or less quantity in the atmosphere near the surface of water, so as to present the appearance of a luminous fog-bank of greater or less density and of large size. The water is also rendered distinctly  
25 luminous where the light strikes it, especially when rough. This luminosity of the water and atmosphere is very annoying to the pilot, often making the electric light an annoyance rather than a benefit; but when the cone of unreflected light is suppressed these evils disappear, and the great utility of the light becomes manifest. The unreflected light may  
30 evidently be suppressed by adapting a tube of suitable size (cylindrical or slightly conical) to the mouth of the reflector and extending it a sufficient distance forward; but it is equally  
35 evident that this method is impracticable.

I accomplish my object by placing a short tube of comparatively small diameter very near the light, with its axis coincident with  
40 that of the reflected beam.

In the drawings, Figure 1 shows a cross-section

through its axis of an ordinary parabolic reflector provided with my device. Fig. 2 shows a front view of the same. Fig. 3 shows a shallow spherical reflector provided with my  
45 device. Figs. 4 and 5 show disks substituted for the tubular device.

A, Figs. 1 and 2, is a parabolic reflector, provided with openings in the usual manner, through which the carbons *b b* of an electric  
50 lamp pass, uniting at or near the focus *c* of the reflector.

B is a tube of thin metal, open at both ends, and having its axis coincident with the axis of the reflector. This tube is placed sufficiently  
55 near the luminous point to obstruct the cone of light *a c* which would otherwise issue unreflected from the parabola, but not sufficiently near to intercept rays of light which would fall within the reflector. The tube B evidently  
60 does not interfere with the reflected light, since the latter may all pass through and outside of it. The unreflected light issuing from the tube is so slightly divergent as to be unobjectionable.  
65

The tube B may be supported in position by any suitable means, one method being shown in the figures. In practice I prefer to attach the tube to guides through which the carbons  
70 *b b* pass, so that the relative position of the tube and luminous center may remain constant, while the position of the light is changed backward or forward to make the reflected beam slightly divergent or parallel, as may be required.  
75

Fig. 3 shows my device adapted to a shallow reflector. Here the tube B necessarily extends slightly back of the carbons, and is provided with suitable openings through which  
80 the carbons pass, as shown.

The tube B should not have a reflecting surface inside, because, if reflecting, the cone of light entering it will, after several reflections, emerge as the same cone diminished in intensity, however, by the reflections it has undergone.  
85

Evidently a small disk suitably placed would oppose the unreflected cone of light, Figs. 1 and 2, as well as does the tube B; but it would also intercept more or less of the reflected light, according to its size. If made  
90 very small this loss of light would not be no-

ticeable, but the necessary proximity of the disk to the luminous point and the mal-adjustment attending a slight change in position of the latter render its use objectionable.

5 Fig. 4 shows a disk, *e*, substituted for the tube B, Fig. 1.

Fig. 5 shows a disk and tube, *e*, substituted for the tube B, Fig. 3. This disk *e*, while it may be employed as an inferior substitute for the tube, I do not consider to be an equivalent  
10 thereof. I have merely referred to the disk in this specification by way of explanation; but as it is my intention hereafter to make separate application for Letters Patent upon said  
15 disk, I do not intend, by anything disclosed in this specification, to waive any right of here-

after applying for and securing a patent upon the disk *e* referred to.

What I claim is—

The combination, with a concave reflector, 20 of a cut-off tube having a non-reflecting inner surface, said tube located in such proximity to the light or flame as to intercept and cut off the direct rays of light, substantially as shown and described.

25 In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES F. BRUSH.

Witnesses:

LEVERETT L. LEGGETT,  
JNO. CROWELL, Jr.