

No. 842,860.

PATENTED FEB. 5, 1907.

P. L. CLARK.  
LUMINOUS SIGN.

APPLICATION FILED MAY 23, 1905.

2 SHEETS—SHEET 1.

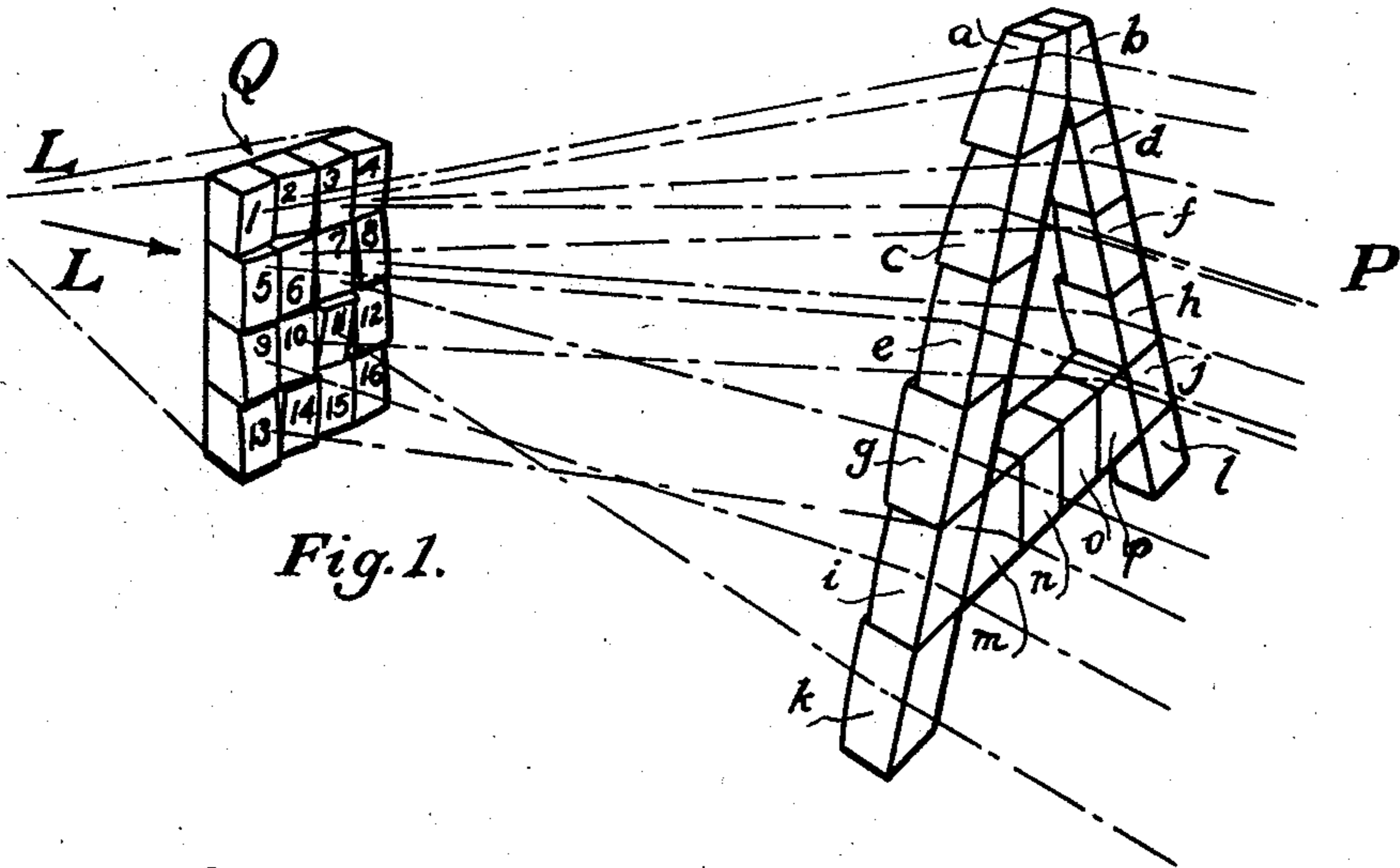


Fig. 1.

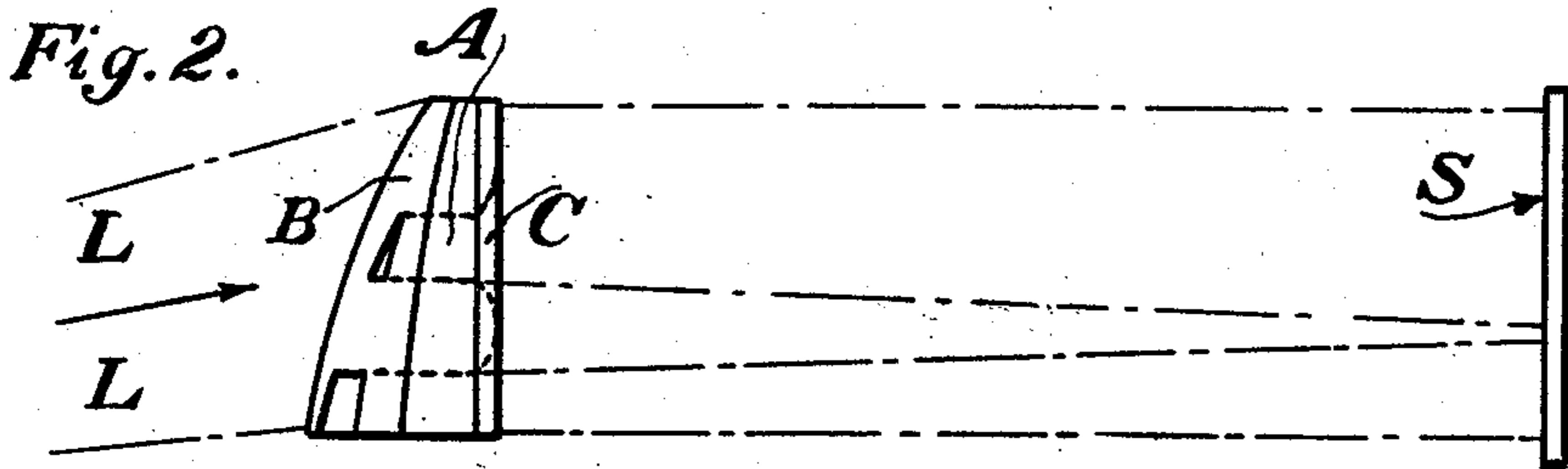


Fig. 2.

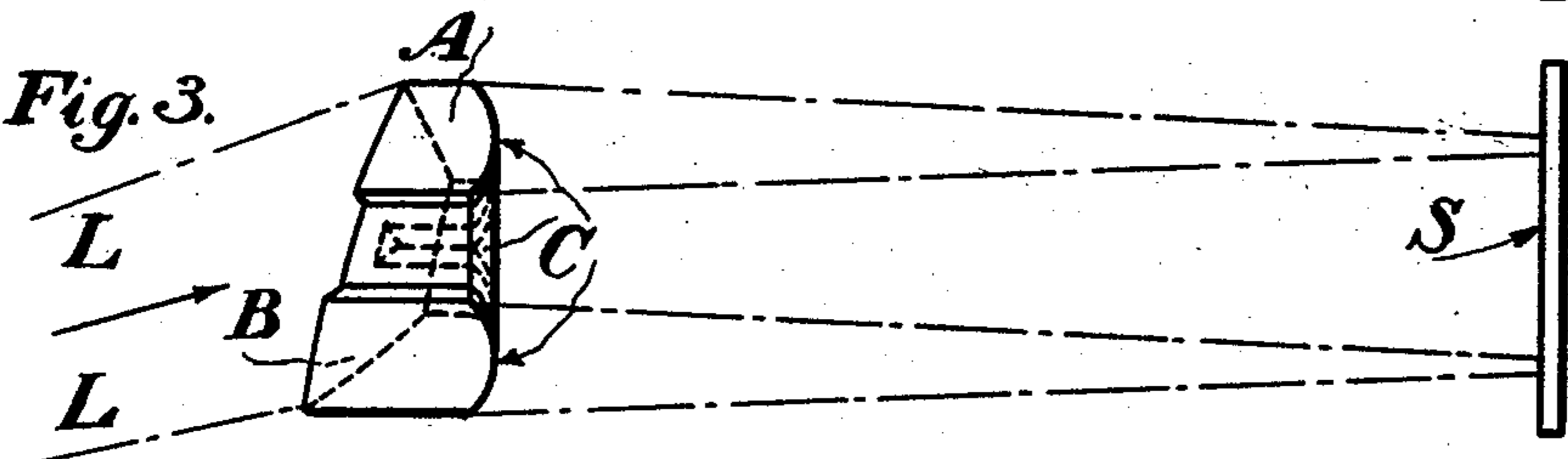


Fig. 3.

Fig. 5.

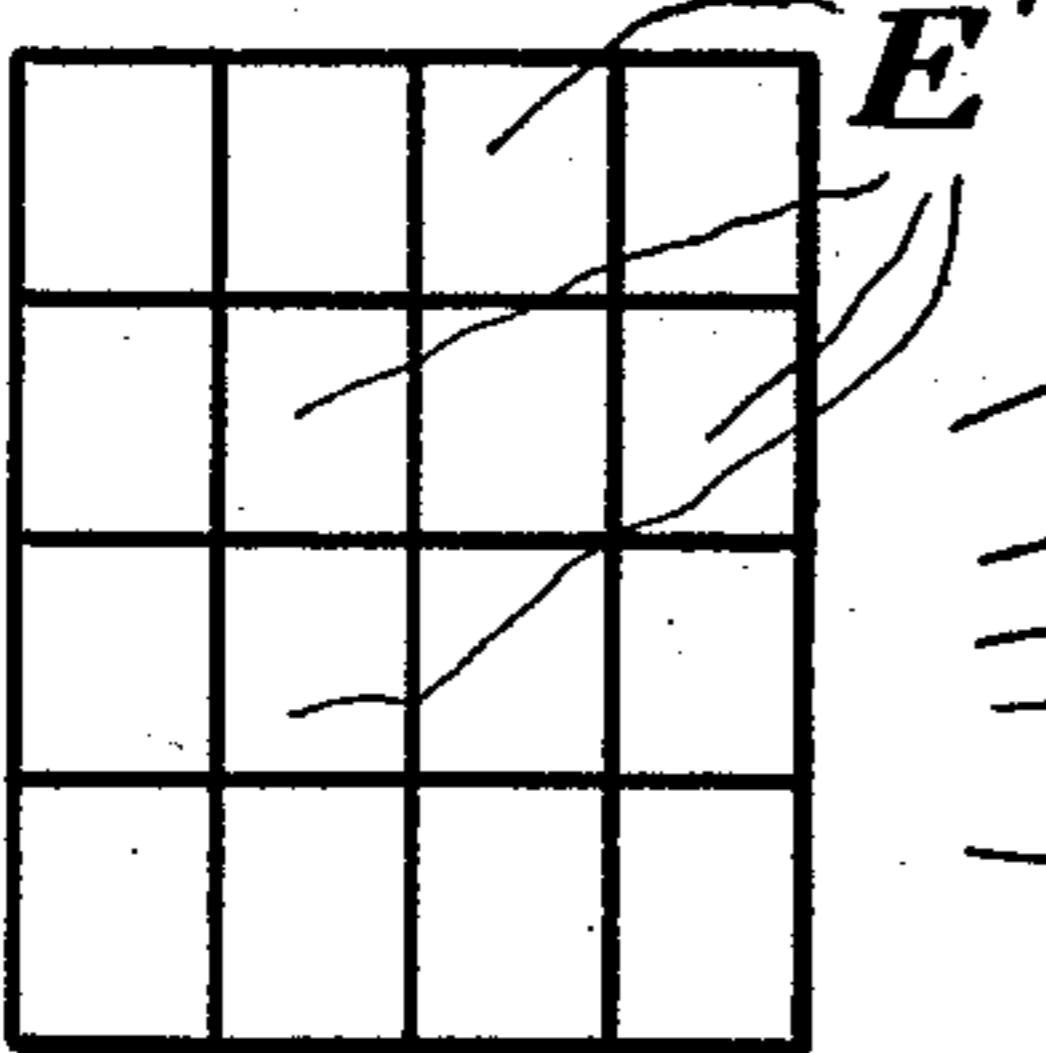


Fig. 4.

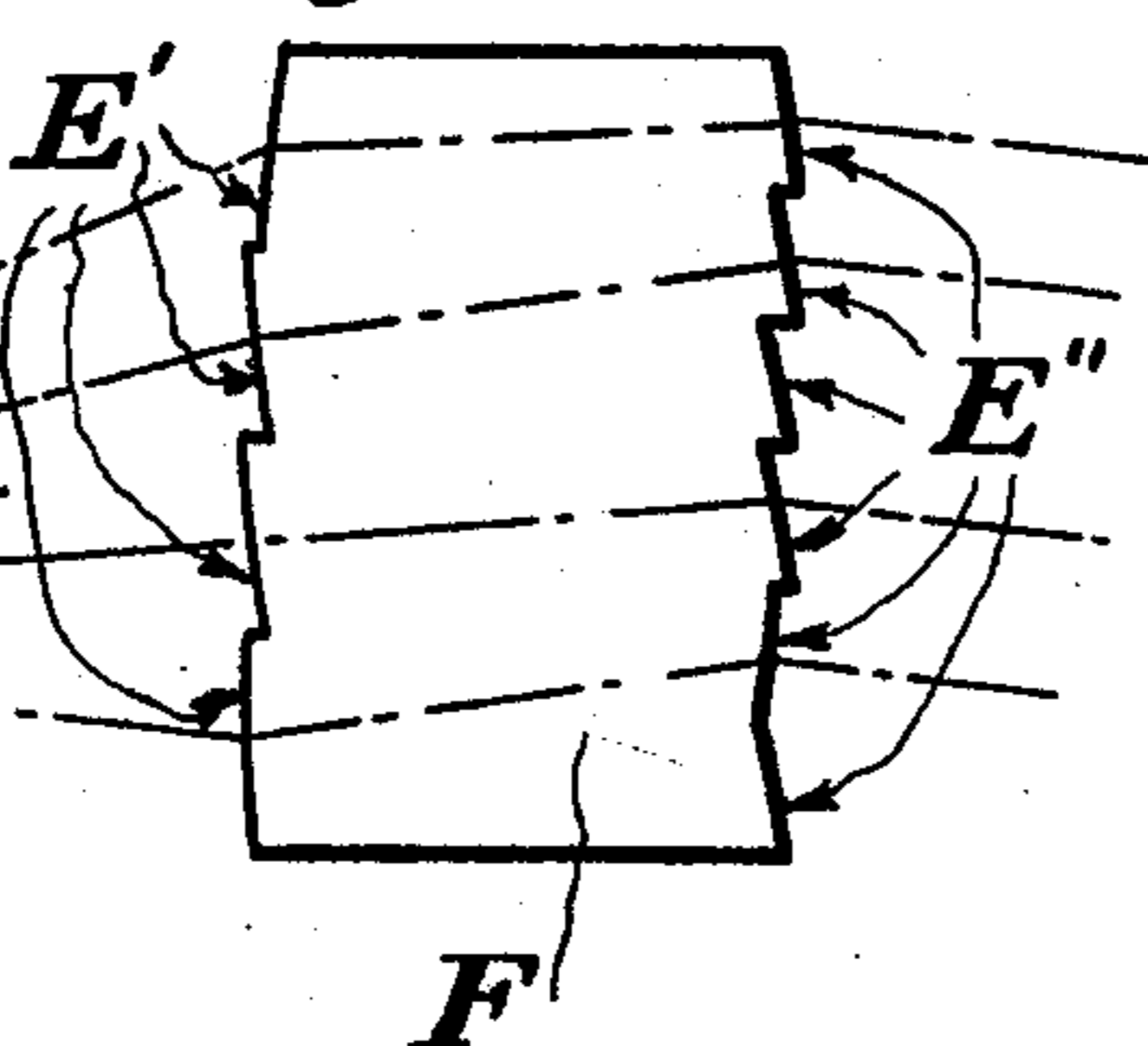
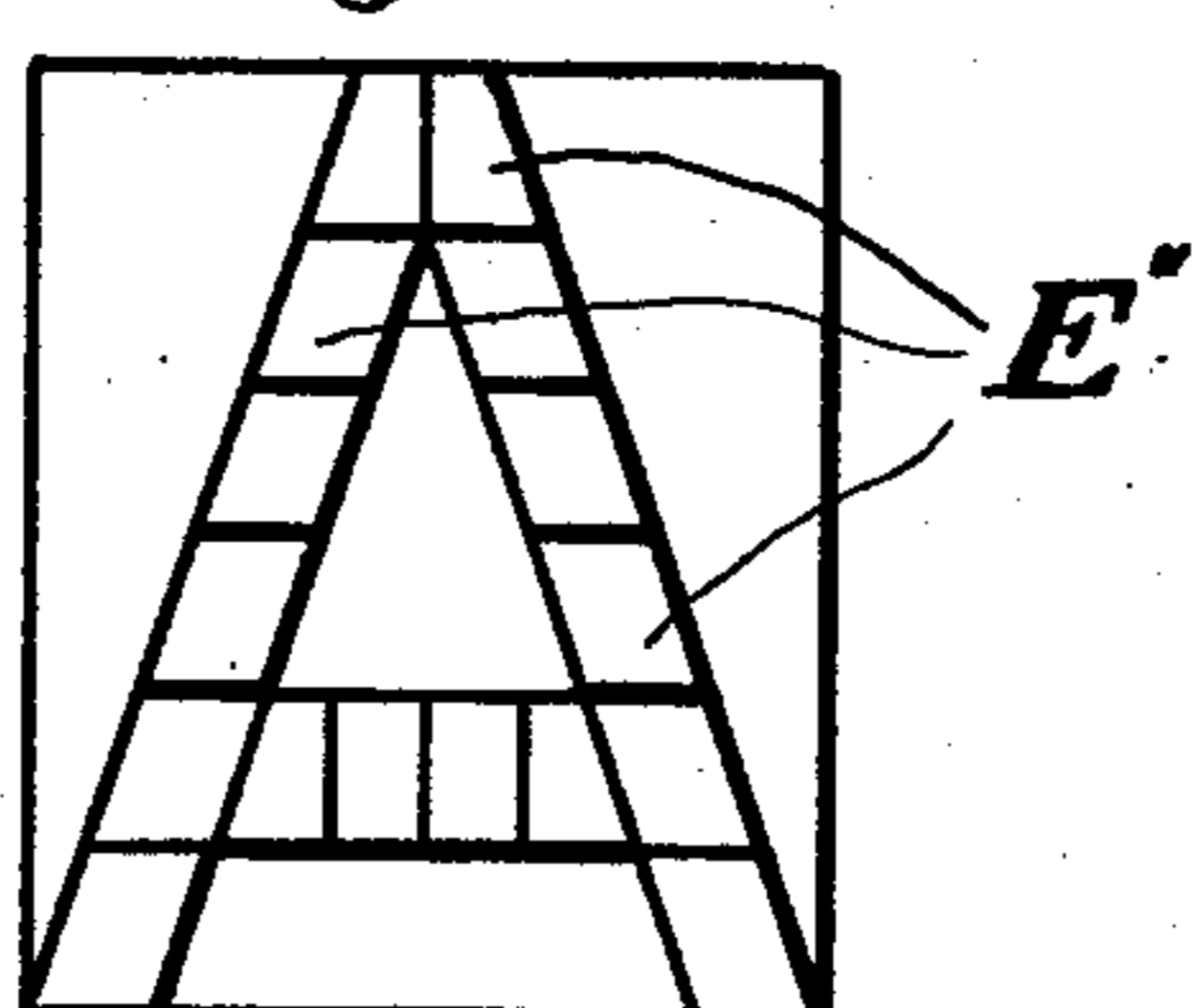


Fig. 6.



Witnesses.

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2 SHEETS—SHEET 2.

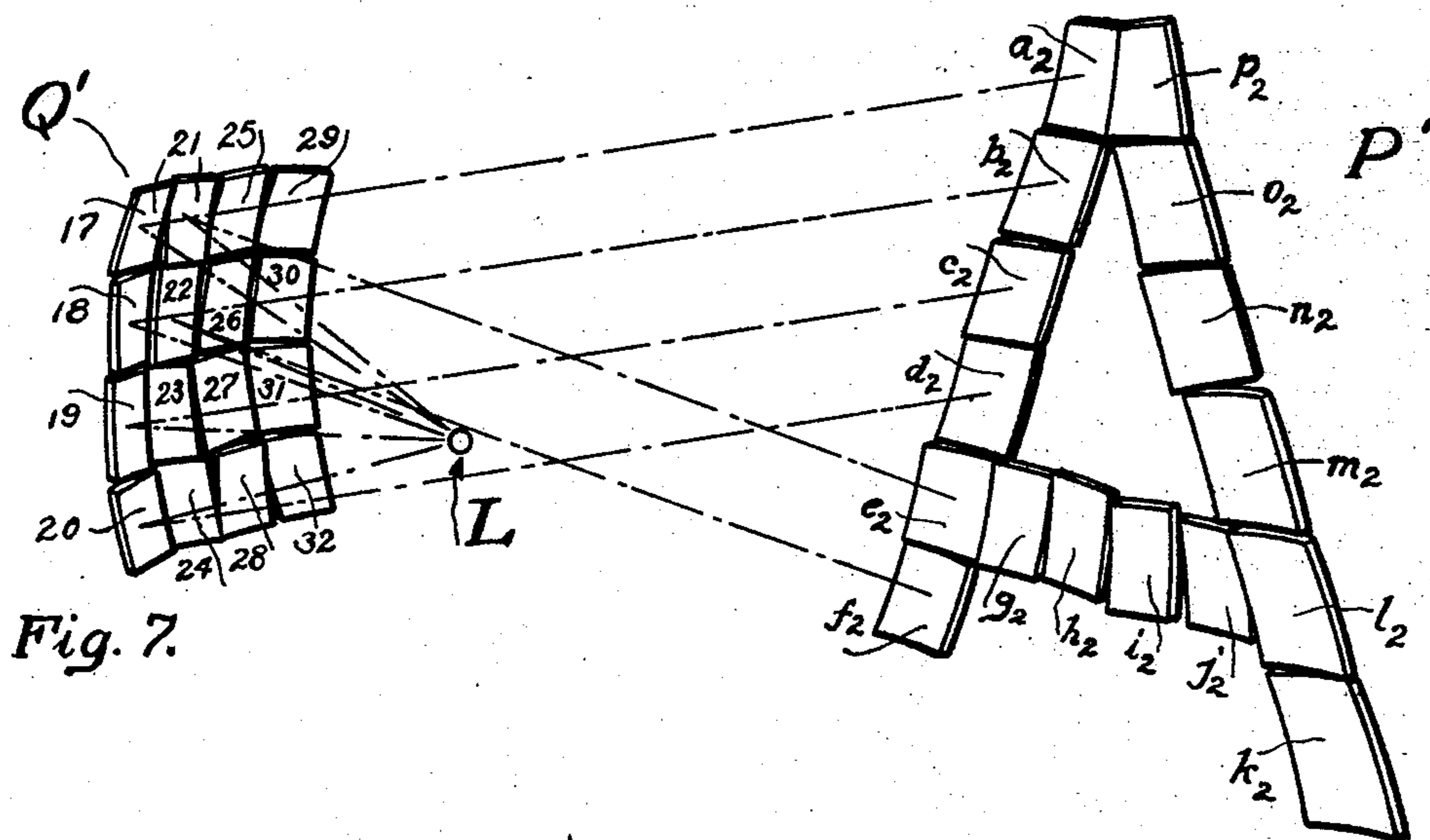


Fig. 7.

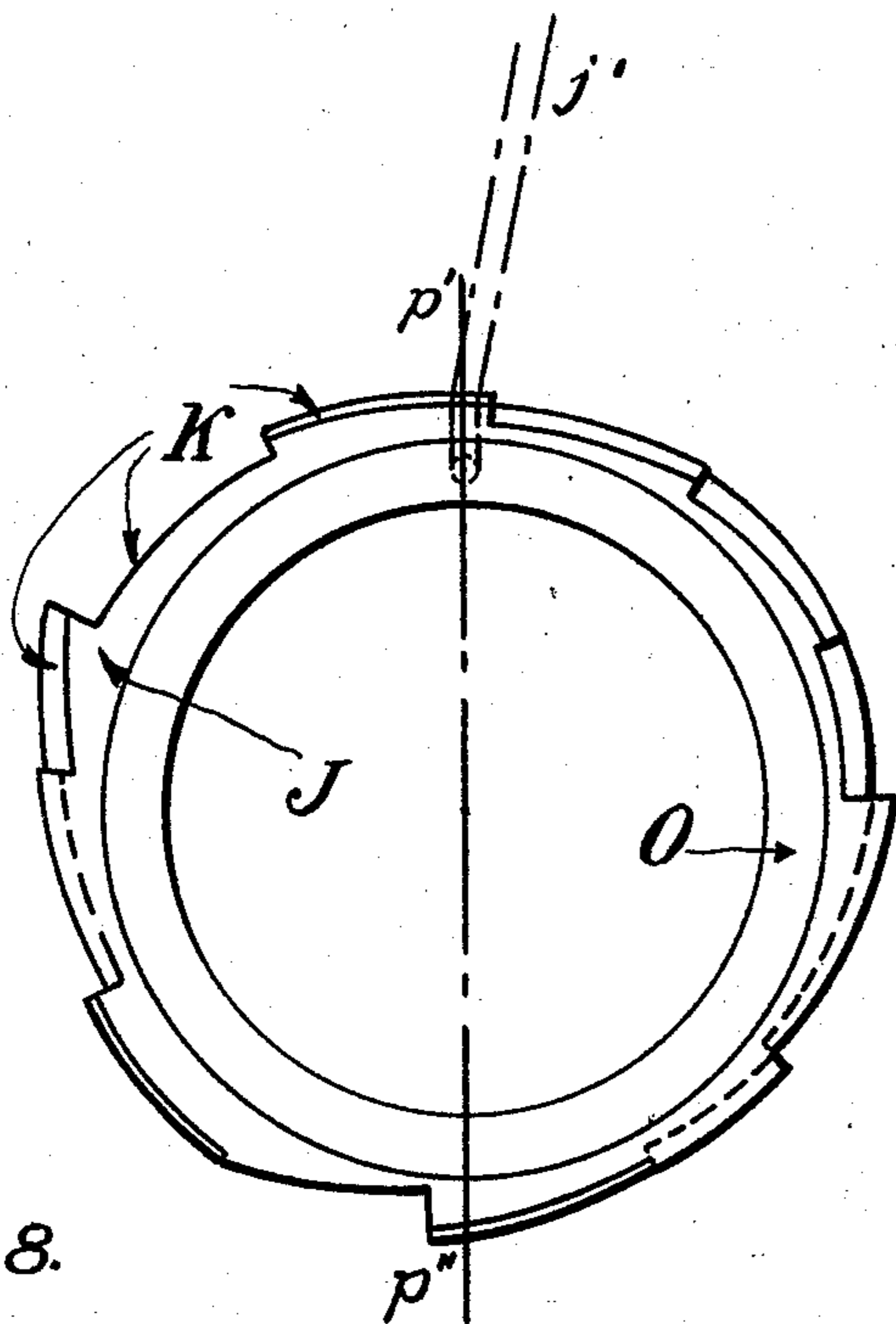


Fig. 8.

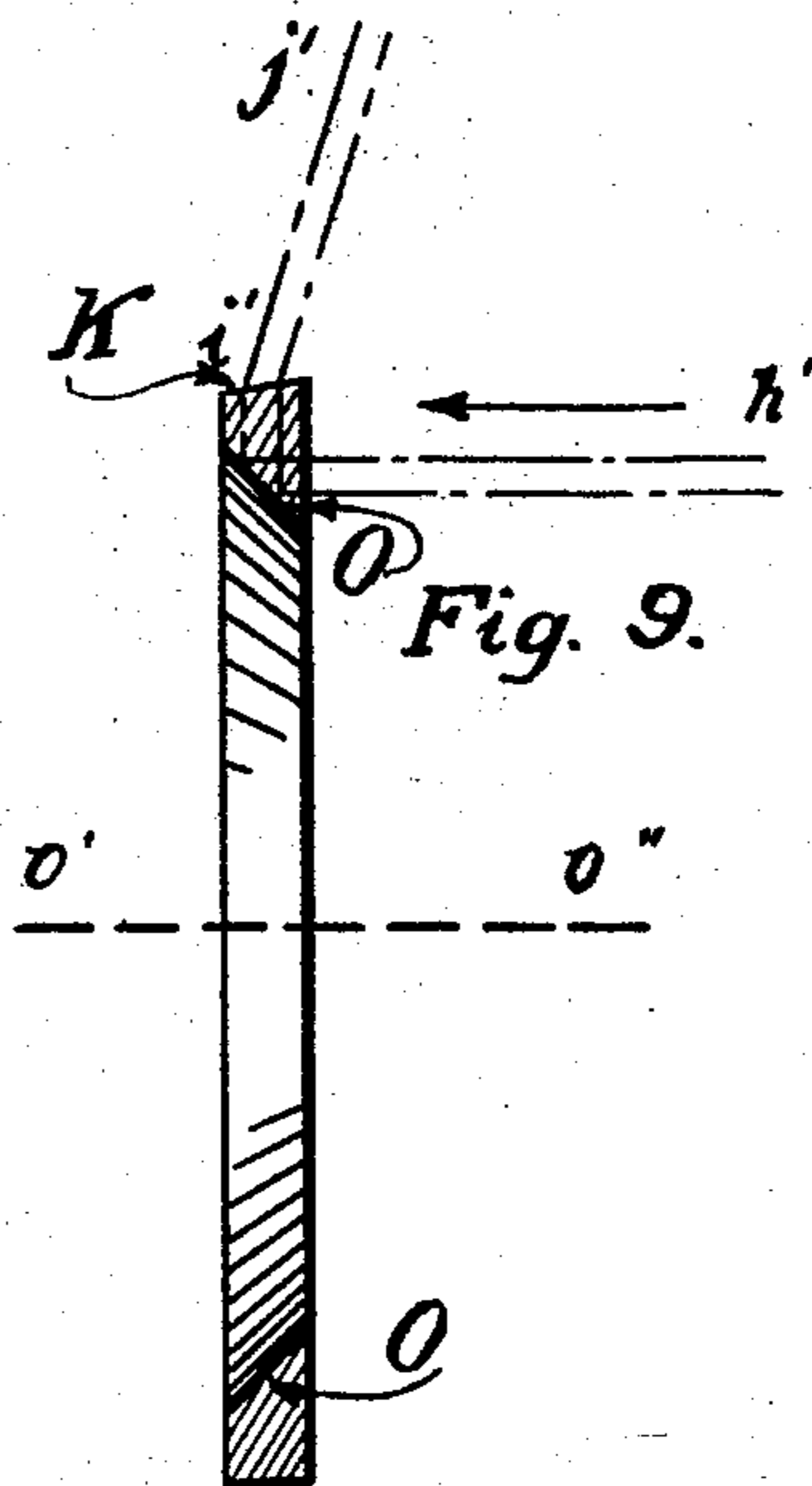


Fig. 9.

Witnesses.

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# UNITED STATES PATENT OFFICE.

PAUL L. CLARK, OF NEW YORK, N. Y.

## LUMINOUS SIGN.

No. 842,860.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed May 23, 1905. Serial No. 261,915.

*To all whom it may concern:*

Be it known that I, PAUL L. CLARK, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Luminous Signs, of which the following is a specification.

This invention relates to luminous signs.

The object of the present invention is to provide a luminous sign in which a maximum of effective illumination will be obtained from the available light for the illumination.

Another object is the provision of novel means for collecting rays emanating from a source of light and directing them in an improved manner to project upon a sign or screen images or designs of any desired character, whereby the images of desired designs will appear intensely brilliant and the surrounding parts will be practically devoid of light, and in this connection the invention aims to direct the rays of light to the exact points desired on the screen and prevent wasteful scattering or diffusion of the light.

The invention can be carried out in several ways by the use of refractors of peculiar and improved construction and arranged in a novel manner, as will appear more fully from the following detailed disclosure, while the novel features of the invention are set forth in the appended claims.

In the accompanying drawings, Figure 1 is a perspective view illustrating an arrangement of refractors for initially receiving the rays from the source of light and directing them to desired parts or areas of other refractors arranged in the form of the character or design intended to be illuminated; Fig. 2, a side view, and Fig. 3 a bottom view illustrating another form of the invention where each character intended to be projected on the sign or screen is made separately and receives the light and refracts it to the screen. Fig. 4 is an edge view of a transparent medium having prisms on opposite faces, one set for receiving and the other for diffusing the rays of light. Fig. 5 is a front view of the same. Fig. 6 is a rear view thereof. Fig. 7 is a perspective view of a set of reflecting elements accomplishing the same purpose as the prisms shown in Fig. 1. Fig. 8 is a front view of another modification where the refractors are arranged to be rotated; and Fig. 9 is a section of the same on the line  $p'p''$ , Fig. 8.

Referring first to Fig. 1, there will be seen a bank Q of refractors, which I have numbered from 1 to 16, inclusive, arranged in rows or tiers and located to receive the light-rays L at the back thereof. The light may emanate from any luminous object. P represents a series of refractors, which I have indicated as running from  $a$  to  $p$ , inclusive, arranged in the form of a letter or other character or design which it is desired to project for observation, the letter "A" being chosen for illustration. It will be seen that there are as many refractors (sixteen) in the character P as there are in the mass of refractors Q, each refractor in Q being adapted to direct light to a corresponding refractor in P. For instance, the refractor 1 receives the light-rays L at the back, and the face of said refractor is so cut as to refract said light-rays to the refractor  $a$ , which diffuses the light for observation. In like manner each remaining refractor of Q controls the light directed to a corresponding refractor of P. For instance, refractor 2 controls the light to refractor  $b$ , refractor 3 controls the light to refractor  $c$ , refractor 4 controls the light to refractor  $d$ , &c. It will be understood that the light L is collected by the refractor Q and directed to the respective controlled refractor areas of the character P and from thence is diffused in the contour of the character "A," and thus the character can be viewed from any angle within the limiting-beams of light refracted from the refractors composing P. I do not limit myself to the use of refractors arranged in the form shown at Q nor to those arranged in the form shown at P, as the characters or designs P can be of any desired form and the refractors Q cut and arranged correspondingly to control the different refractor areas of the character or design P which may be used.

Referring now to Figs. 2 and 3, I employ a character "A" of the design intended to be projected on the screen S. In the drawings, the letter "A" is shown; but it will be understood that any other letter or number or any design or character could be used. The light L, coming from the direction of the arrow, is directly received by the transparent character "A" whose image is to be projected. The face B of the character is convex and spherical, while the face C is composed of lenticular surfaces, each forming

one branch of the letter "A." The resulting image on the screen S sharply follows the outline of the character "A," but is much narrower or thinner, and characters having fine parts are very clearly delineated.

In Figs. 4, 5, and 6 the light comes from the direction of the arrow and is received by the prismatic faces  $E'$  of the solid transparent block F and bent to the prismatic faces  $E''$ , which constitute the character or design itself and diffuse the light for observation of such design or character. This device may be positioned between the point where the light is first refracted and the resulting appearance or image of the character, as is the case with the arrangement shown in Fig. 1. This arrangement is identical with Fig. 1, except that it shows the whole unit made into one transparent block.

In Fig. 7 the letter Q' indicates a plurality of light-reflecting elements, such as small mirrors, grouped together and receiving light from a common source L. The mirrors are arranged at different angles, so that the light-rays falling on them are deflected to the set of mirrors P', which are arranged in the shape of the letter or design to be illuminated. Preferably there are the same number of mirrors in each device, so that the light from the mirror 17, for instance, will be deflected to the mirror  $a^2$ , that from the mirror 18 to the mirror  $b^2$ , and so on. An observer stationed at the proper distance and in the proper line of sight will see the large design P' brilliantly illuminated, all the light-rays from the source L being utilized for this purpose.

In Figs. 8 and 9 I have shown how the invention can be applied to a wheel K, rotated rapidly on an axis, (indicated by the line  $o'o''$ .) The prisms J of predetermined angles are cut on the periphery of the wheel. The inner face of the wheel O is cut at an angle of forty-five degrees, and the light  $h'i'$  coming in the direction of the arrow is reflected by the face O to  $j'$ , and as the wheel revolves is refracted successively over adjacent areas of a design upon a screen. (Not shown.) As the wheel rapidly revolves the beam of light traces the complete design upon the screen, and through the persistence of vision the design appears to be continuously illuminated.

In the different modifications of the invention all parallel rays from the sign are of substantially equal intensity. For long-distance signs with a given consumption of light letters with very slender branches will be even more brilliant than those with heavy or wide ones.

The characters or letters may be of ground glass, opal glass, or of other substance. Two or more sets of lenses may be used, or reflectors may take the place of the prisms, as shown in Fig. 7. The source of light may be an arc-lamp, window-light, or other desired

luminous object. Ordinary signs used by day may be illuminated at night by the application of my invention thereto.

In the use of the invention the image is defined doubly clear, as not only are all the light-rays utilized upon portions which should be made bright, but there are no side lights to detract from the sharpness of definition of the sign, all light otherwise wasted being concentrated upon the bright parts of the sign.

Such changes and modifications may be made as fall within the scope of the appended claims, and I have only illustrated and described those forms which at the present time appear as the most perfect embodiments of the invention.

Having thus described my invention, what I claim is—

1. In a luminous sign, the combination with a source of light, of means for deflecting and collecting beams of light derived from said source, whereby a predetermined image or design will be produced, different in outline from said means, and in which the collected light-rays are directed to the illuminated portions only, leaving the non-illuminated portions dark by the deflection therefrom of the rays which would otherwise have fallen upon them.

2. In a luminous sign, a light-deflecting medium adapted to receive light from a given source and composed of a group of closely-adjacent light-deflecting parts respectively controlling the direction of light at differing angles to adjacent parts of a predetermined character or design differing in outline from said group and composed of illuminated and non-illuminated portions.

3. In a luminous sign, a plurality of refractors arranged in a given shape and adapted to receive rays or beams of light from a common source and refract them as an image in the form or outline of an illuminated character or design of a different shape from that of the refractors to the exclusion of light on surrounding parts by reason of the diversion of light therefrom to the illuminated portions.

4. In a luminous sign, a transparent group of refractors adapted to receive light from a common source and project for observation an image of a predetermined character or design differing in outline from said group.

5. In a luminous sign, a character or design for projecting an image for observation, and a light-refracting medium differing in outline from said character or design and adapted to receive light from a common source, and having independent light-refracting parts respectively controlling the direction of light to corresponding parts of the character or design aforesaid.

6. In a luminous sign, a character or design having a plurality of refractors for inde-

pendently transmitting light to project the image or design of the character for observation, and a light-refracting medium different in outline from said character adapted to receive light from a common source and having a plurality of independent refractors respectively controlling the transmission of light to corresponding refractors of the character or design.

10 7. In a luminous sign, a light-deflecting medium adapted to receive light from a given source and composed of independent light-

deflecting parts respectively controlling the direction of light to adjacent parts of a predetermined character or design differing in 15 outline from the said medium.

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

PAUL L. CLARK.

Witnesses:

GEORGE INNES,  
ERNEST KEIR.