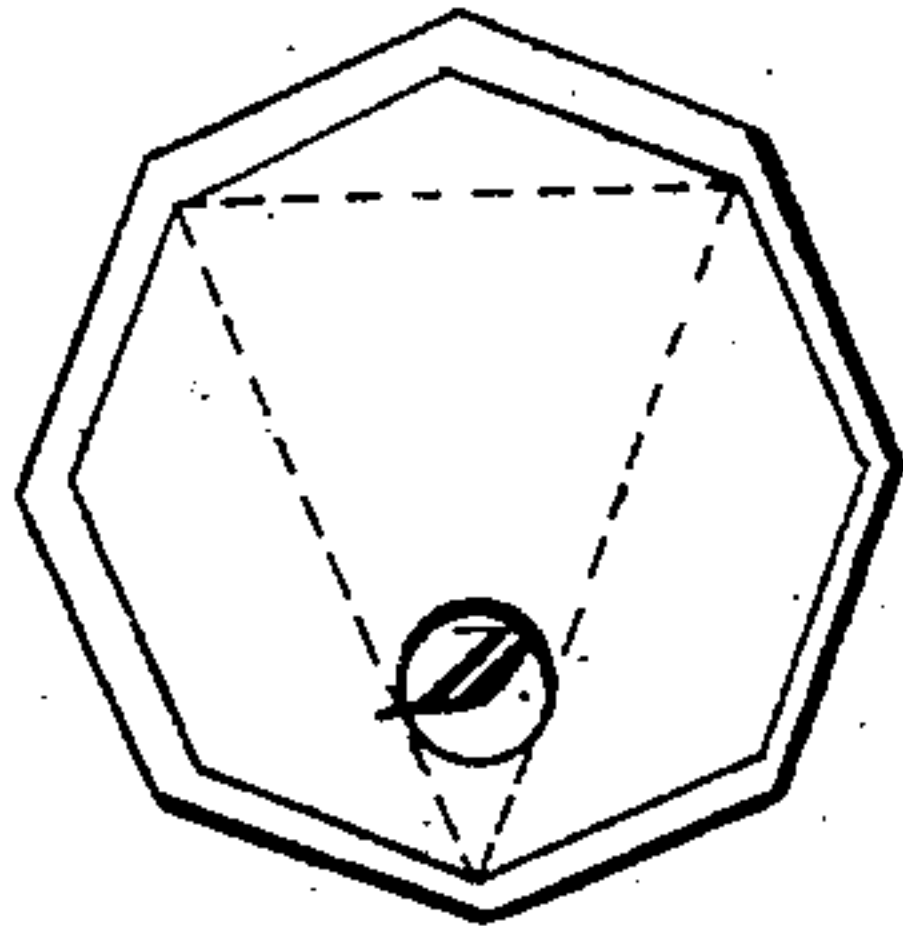


J. EARNSHAW.  
KALEIDOSCOPE.

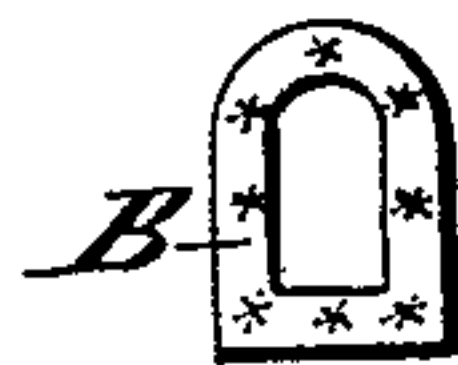
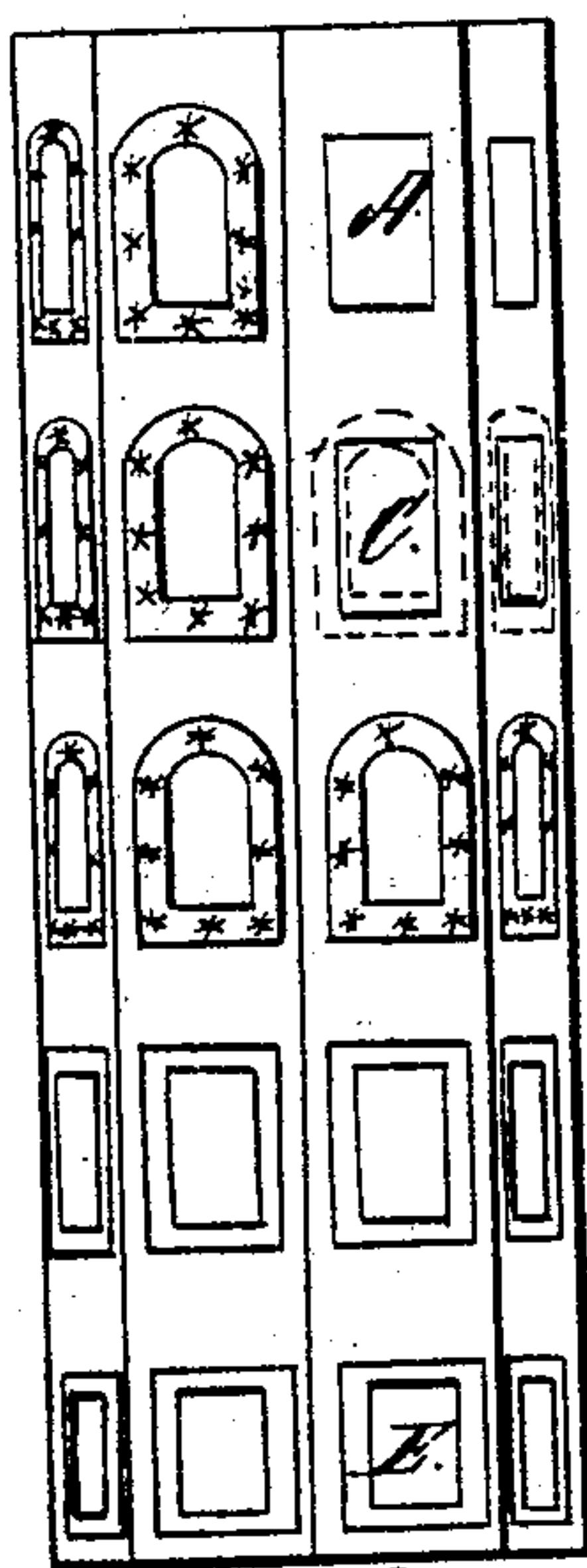
No. 66,134.

Patented June 25, 1867.

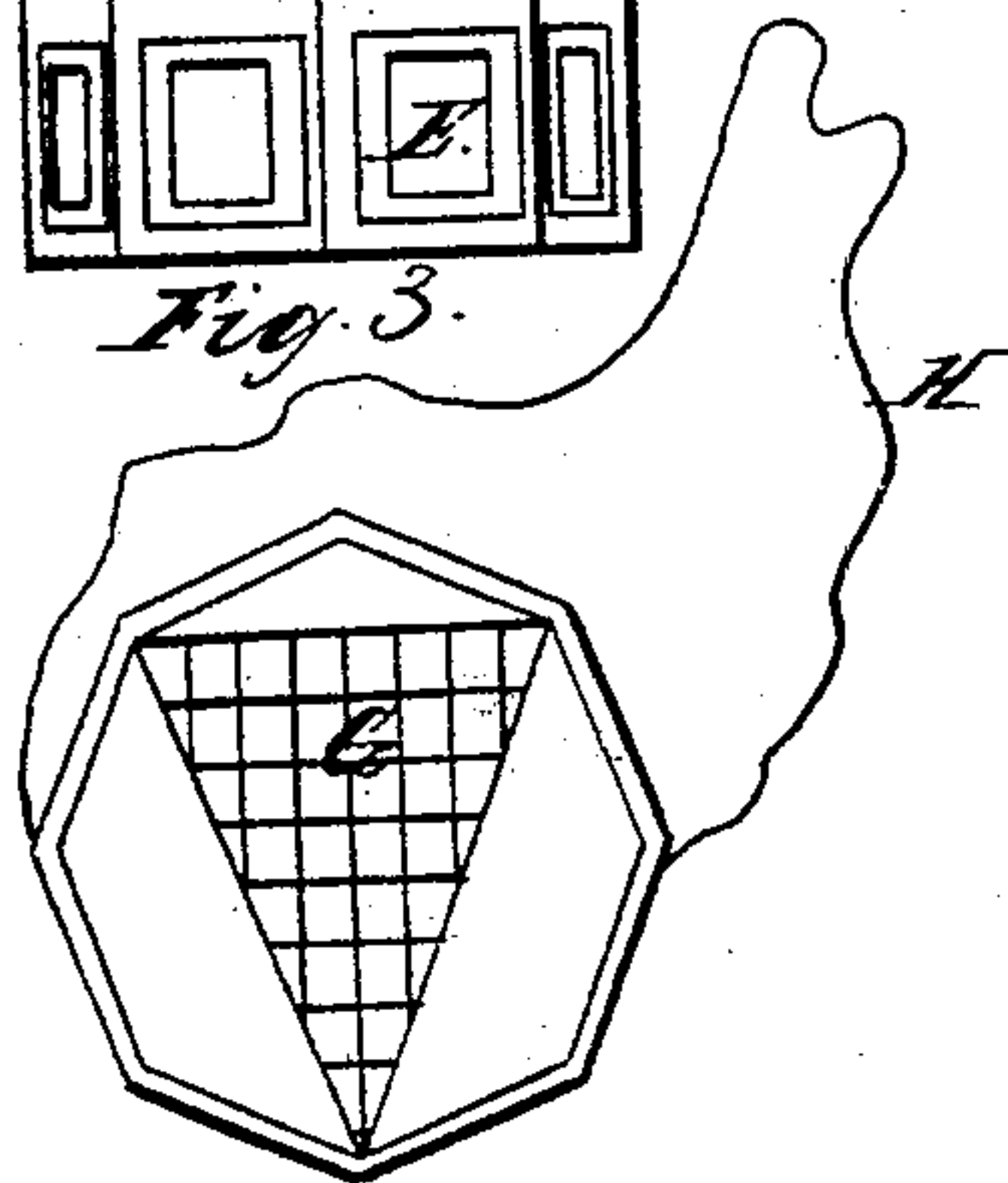
*Fig. 2.*



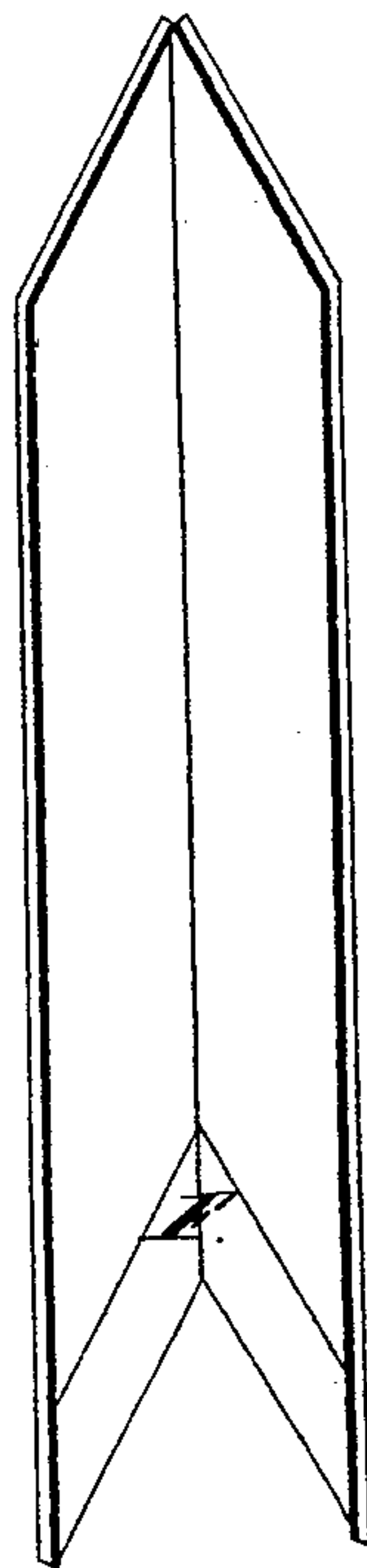
*Fig. 1.*



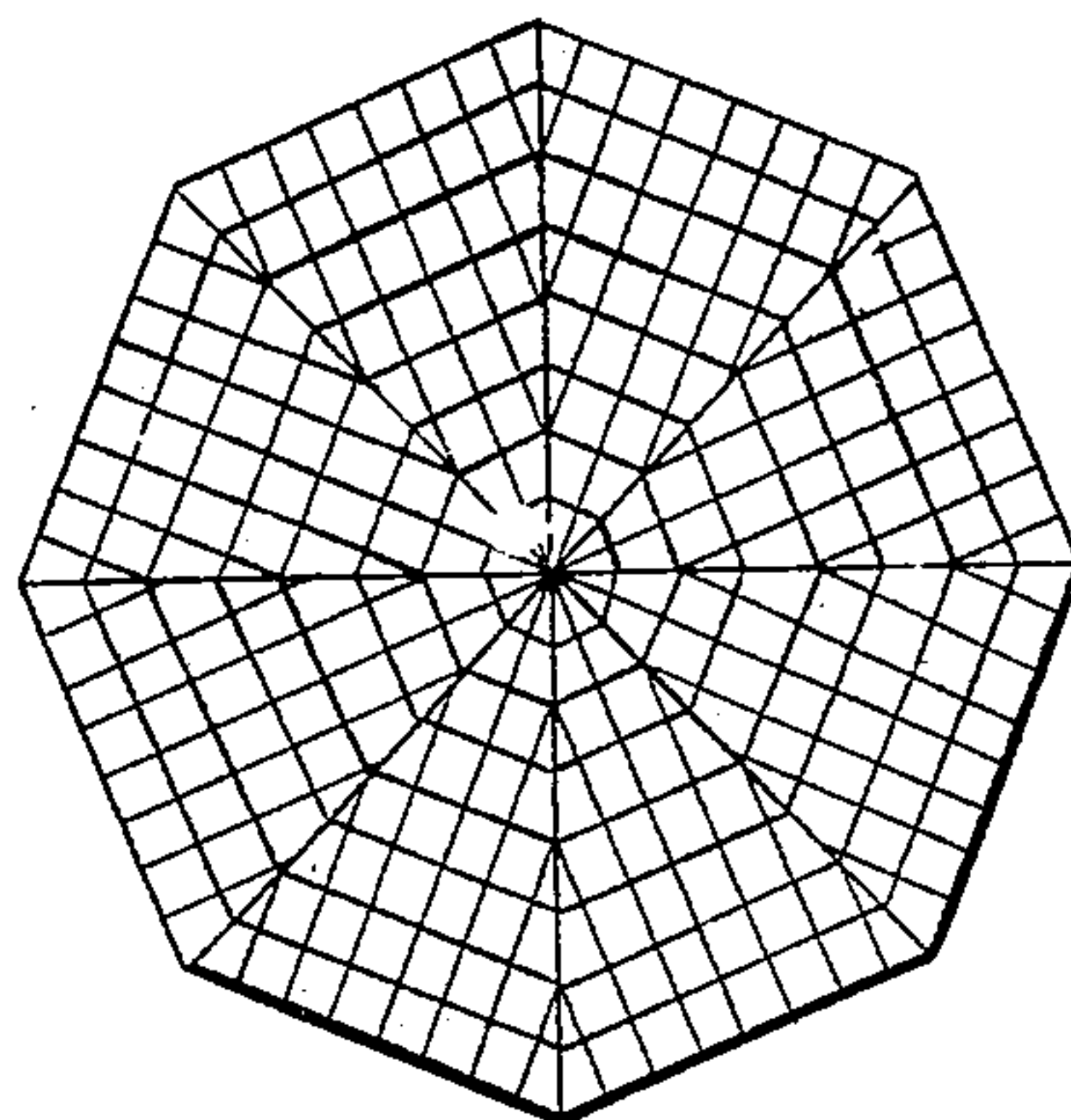
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



Witnesses:  
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Inventor:  
John Earnshaw

# United States Patent Office.

JOHN EARNSHAW, OF EAST GREENWICH, RHODE ISLAND.

*Letters Patent No. 66,134, dated June 25, 1867.*

## IMPROVEMENT IN KALEIDOSCOPES.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO WHOM IT MAY CONCERN:

Be it known that I, JOHN EARNSHAW, of East Greenwich, county of Kent, and State of Rhode Island, have invented certain new and useful Improvements in Kaleidoscopes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view.

Figure 2, an end view, or the object end when used as an ordinary kaleidoscope.

Figure 3, an end view, or the object end when used for designing.

Figure 4, a view of the reflectors.

Figure 5, a representation of the design paper.

My invention consists in so constructing the instrument that both ends may be alternately used as the object ends, that is, one end is adapted for transparent objects, as an ordinary kaleidoscope, and the other for opaque objects, for the purpose of reproducing designs in a multiplicity of forms, for patterns of embroidery, weaving, &c.; and further, in using object marks or lines permanently affixed to or placed in close proximity to the object-glass or end when in use for designing; and further, in providing the case or cover with suitable receptacles for pictures or designs, (which may be reproduced, as described, through the agency of the instrument,) by which means they are not only placed in a convenient position for use, but add to the beauty of finish of the exterior of the instrument itself.

In order to enable others to make and use my improvements, I will now proceed to describe the same.

The case of the instrument I construct, of any suitable material, in the usual form, that is, octagonal, or of any number of sides, and provide its interior with the usual reflectors, and at one end with the usual chamber for containing the pieces of glass or other transparent objects, the outer partition of which chamber is of ground glass, or of plain glass covered with perforated paper or cloth, which, if embossed with designs, adds to the effect of the instrument, and to its beauty of finish; and at the other end with an eye-glass, which also serves another purpose, as hereinafter explained. I have thus far described, with the exception of the perforated paper, an ordinary kaleidoscope, usually sold as a toy. In order to adapt it to a more useful purpose, *i. e.*, that of producing patterns for embroidery or weaving, such as are now designed by the eye at much expense of time and labor, I make the eye-glass, hereinbefore referred to, of a transparent plate of glass, omitting the usual covering which envelopes the whole end, except a small round "eye-hole," and thus leaving the whole surface corresponding to the space enclosed by the reflectors open to view and use. This eye-glass, when the instrument is used for designing, becomes the object-glass, the other end being used as the eye-glass or perspective point, and being provided with a clear unground spot, or having a portion of its covering of paper removed, as seen at D, fig. 2. A portion of the sides of the case, near this object-glass, is removed, as seen at E, fig. 1, thus forming windows to admit the rays of light upon the object-glass. That portion of the reflectors near this end of the instrument is also left transparent at F, fig. 4, for the purpose above named. This object-glass conforms in shape to the space enclosed by the reflectors, and has geometrical lines permanently affixed upon its surface, or (cord, if preferred) placed in close proximity thereto, and forms a segment of a circle, as seen in figs. 3 and 5. In fig. 3 is represented the object-glass with the lines marked upon it, and in fig. 5 is represented the design paper, which is composed of ordinary drawing paper, with the several sections of a circle, each having the geometrical lines traced upon it, and corresponding with the form, size, and lines of the object-glass itself. By placing the object end over any suitable design, whether it be a pattern of embroidery, leaves, flowers, pictures, or ornamental work of any kind, the very beautiful effect of a multiplicity of the designs or devices is produced, as in the ordinary kaleidoscope.

The production of designs, more especially the creation of new designs for weaving and embroidery, is effected in the following manner: A suitable design or group of designs is placed upon a flat surface in a strong light, and the instrument placed thereon and moved in various directions until a desired design is produced, which, by the known effect of the kaleidoscope, will be produced in a varied and symmetrical group and form; and, by looking through the opposite end of the instrument, it will be observed that the patterns form themselves into the several sections of a circle, the tracing or guiding lines being duplicated in like manner, as shown



in fig. 5, which represents the design paper made to correspond therewith in form, size, and lines. By the aid of a pencil or suitable tracing tool the design delineated on one of the sections (as viewed through the instrument) is transferred to a corresponding section of the design paper; and, as it is self evident that the several sections are but the repetition or reflection of one, this design, traced upon the corresponding sections, will reproduce the design as seen through the kaleidoscope. The lines may be omitted from the object-glass, (which may be, in this case, left plain and transparent,) and be placed upon, or in any suitable manner attached to, a framework, the aperture in which must correspond in size and form to the said object-glass. Fig. 3 represents the detached frame provided with the object-glass, with the lines G placed in proper position. This frame is also provided with an elastic cord, H, hereinafter referred to, and is, for convenience, made a little larger in circumference than the instrument itself. This frame is attached to the instrument by passing the elastic cord over the top of the kaleidoscope, which is then placed upon the pattern, as before described. When, by moving the instrument, the desired design is produced, the cord is released, and the frame and pattern are removed together, care being taken to preserve them in the same relative position to each other as when under the instrument; and, by being placed in a convenient position to the tracing or design paper, the design may be copied in the minutest detail with great facility and dispatch. It is obvious to all conversant with the operation of the kaleidoscope that many and varied forms, designs, &c., may be produced by its agency, and, by my improvement, transferred to paper and made available. When used for producing new figures and designs for weaving and embroidery a very useful result is accomplished, and as a means of producing pictures and designs from themselves, for drawing or amusement, its use as a toy is much enhanced. I indent upon the surface of the cover any suitable form and number of spaces for the reception of pictures, such as *cartes de visite*, which are attached by an adhesive substance, and surrounded, or not, by an embossed or other ornamented frame or border, as seen at A B C, fig. 1; or, these spaces may be surrounded by a slotted frame, into which the pictures may be made to slide, and hence changed at pleasure. In this latter case the pictures, being movable, may be placed under the kaleidoscope, and thus be reproduced or multiplied to the vision, as described in producing designs. One, or a portion of one, of the sides has a large slotted frame upon it, suitable for retaining a sheet of paper having upon it numerous designs, figures, &c., to be represented on or transferred to paper in varied figures and designs, as hereinbefore described. The exterior of the object end is, in the ordinary instrument, usually composed of ground glass, while in the present invention a plain glass, having paper, embossed and perforated, one or both, secured to its outer or inner surface, is used. This not only adds to its exterior beauty, but imparts an artistic and beautiful effect in addition to that formed by the particles of glass within, that is, forms a groundwork, upon which the various grouping of figures within seems to be placed. This end or glass is provided with an eye-hole, as seen at D, which is a necessity to my construction of this instrument, as this portion or end, when used for designing, is the perspective point.

What I claim as new and useful, and desire to secure by Letters Patent, is—

1. So constructing a kaleidoscope that both its ends may be used, as described.
2. The object-glass provided with lines G, substantially as described and for the purpose set forth.
3. Covering the object-glass, fig. 1, with figured paper or fabric, as and for the purpose described.
4. The object-glass, fig. 2, provided with hole D in its covering to adapt it for use as the eye-glass, substantially as described.
5. The windows E, arranged substantially as and for the purpose set forth.
6. The detached framework carrying the object-glass, fig. 1, as and for the purpose described.
7. As an article of manufacture, the design paper, adapted for use in conjunction with a kaleidoscope, as herein described and for the purpose set forth.
8. In combination with a kaleidoscope, the pictures or designs, and slotted receptacles therefor, substantially as described and for the purpose set forth.

JOHN EARNSHAW.

Witnesses:

BENJAMIN ARNOLD,  
JAMES E. ARNOLD.