

(No Model.)

R. LEACH.
KALEIDOSCOPE.

No. 314,586.

Patented Mar. 31, 1885.

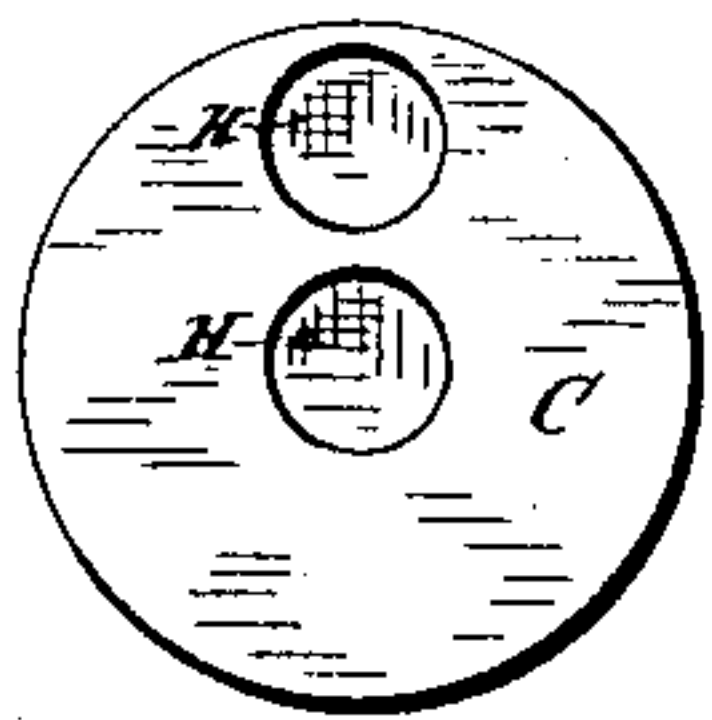


Fig. 9.

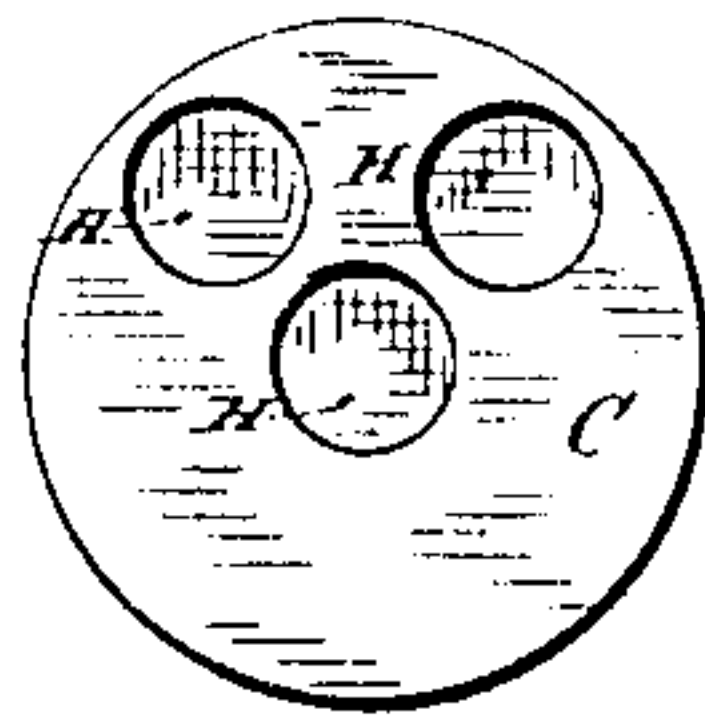


Fig. 10.

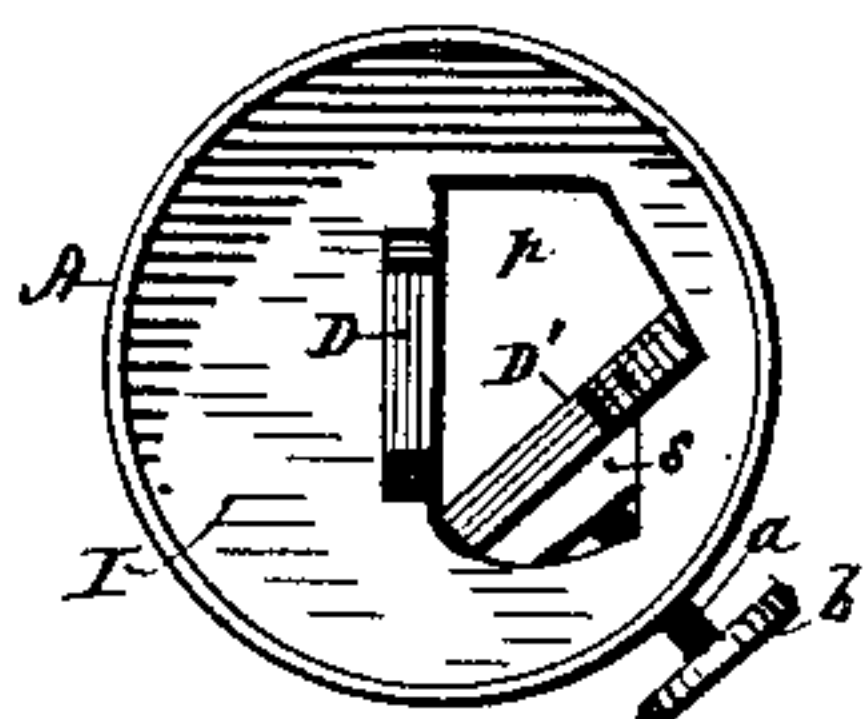


Fig. 5.

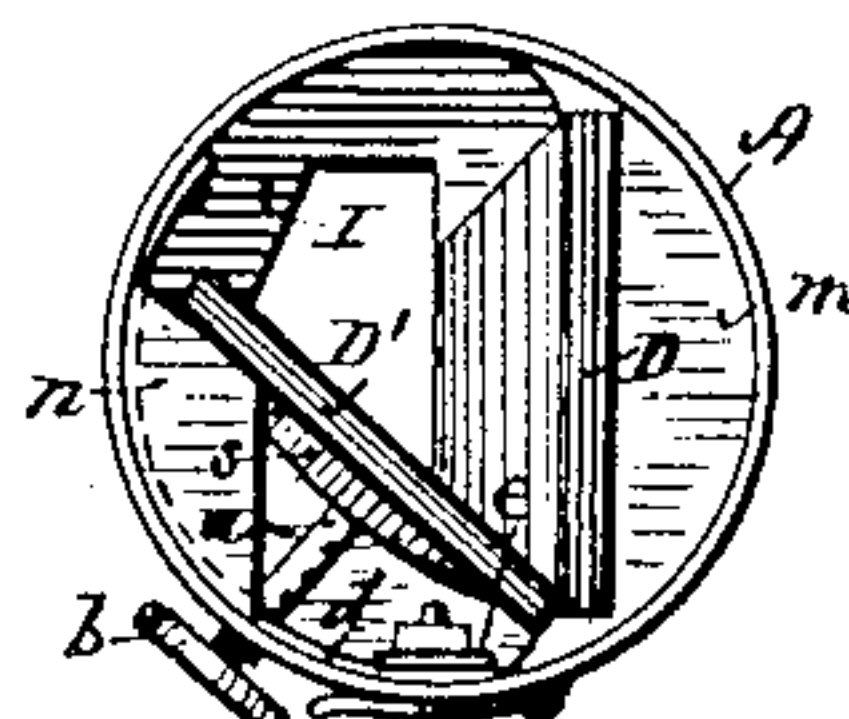


Fig. 6.

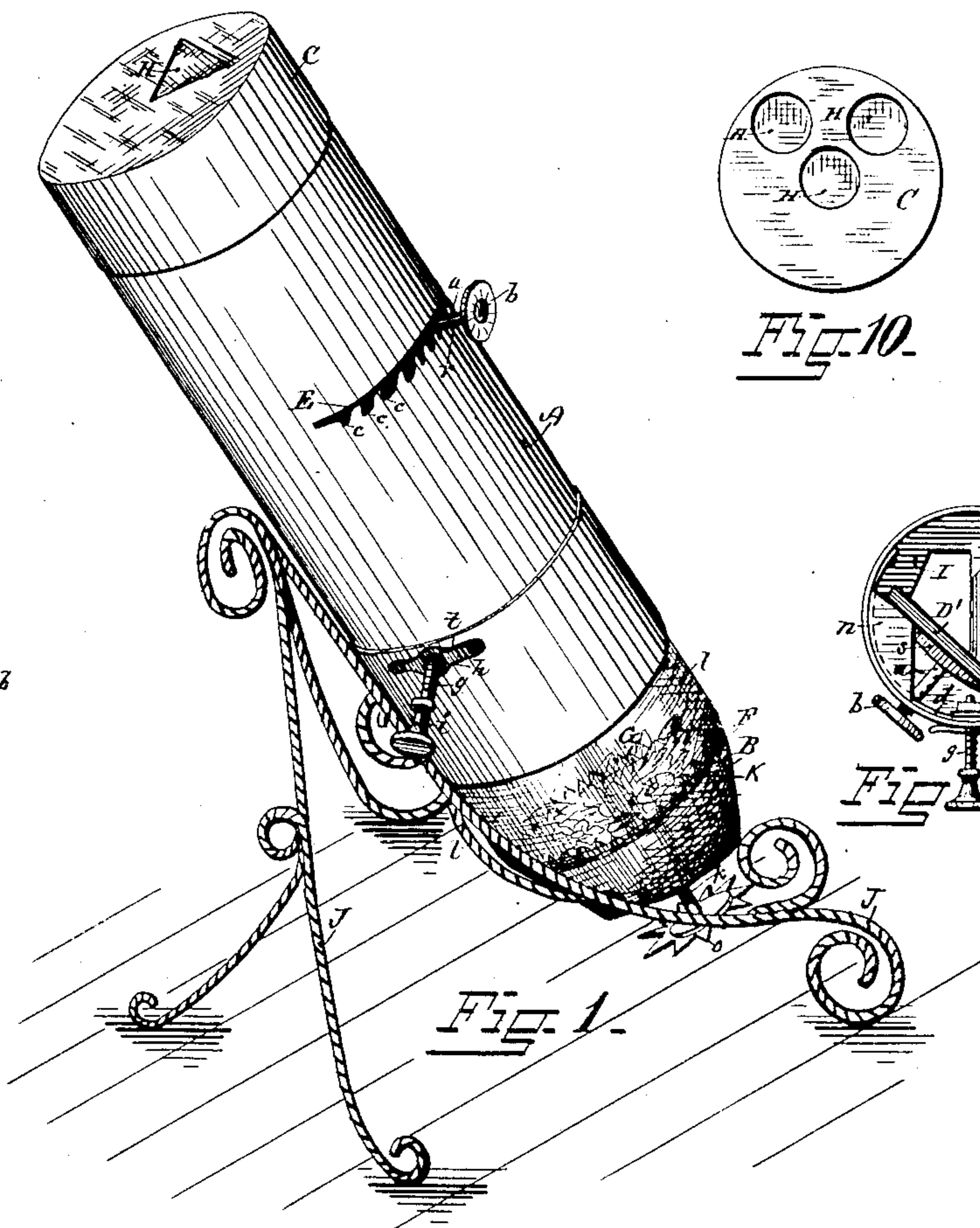


Fig. 1.

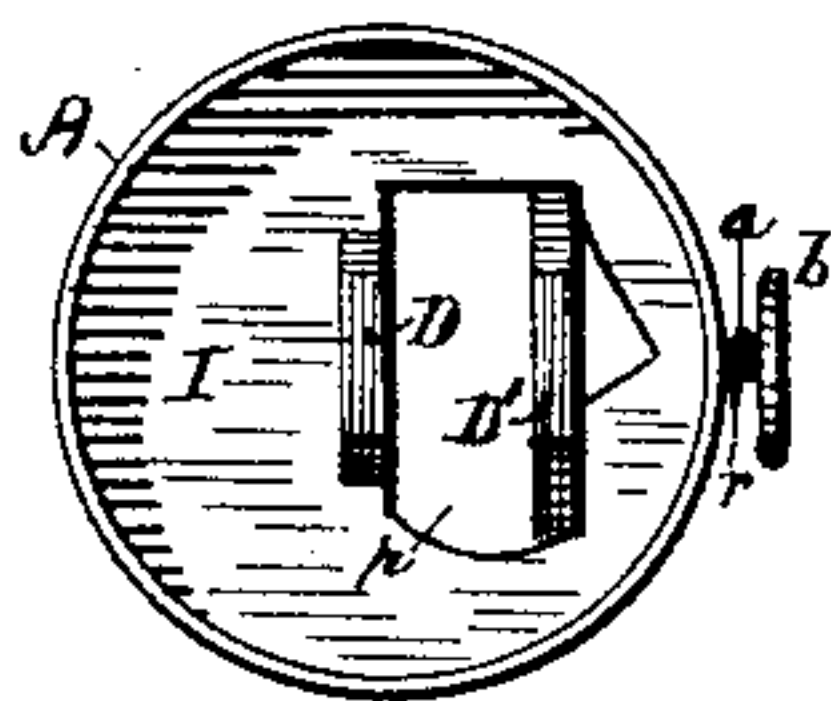


Fig. 3.

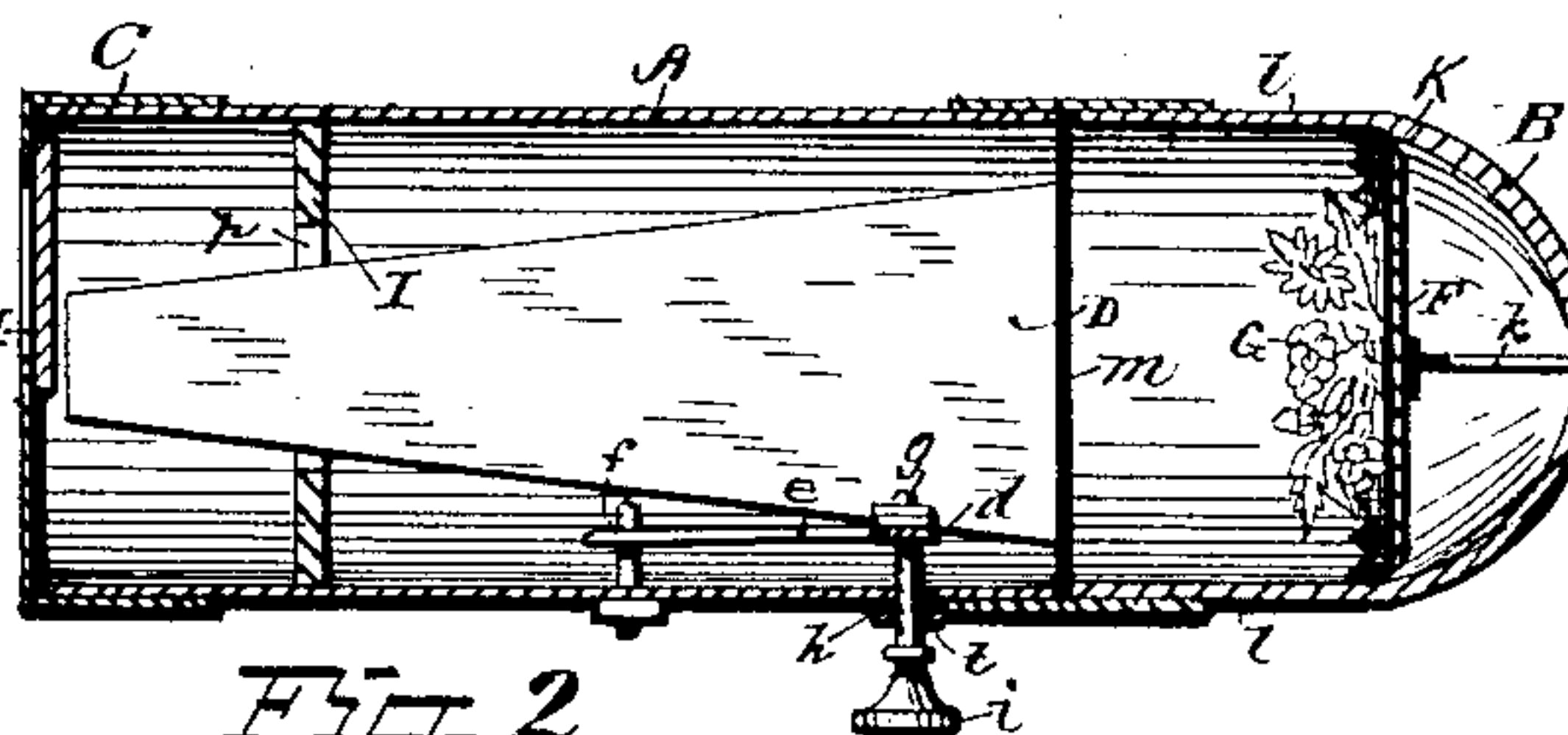


Fig. 2.

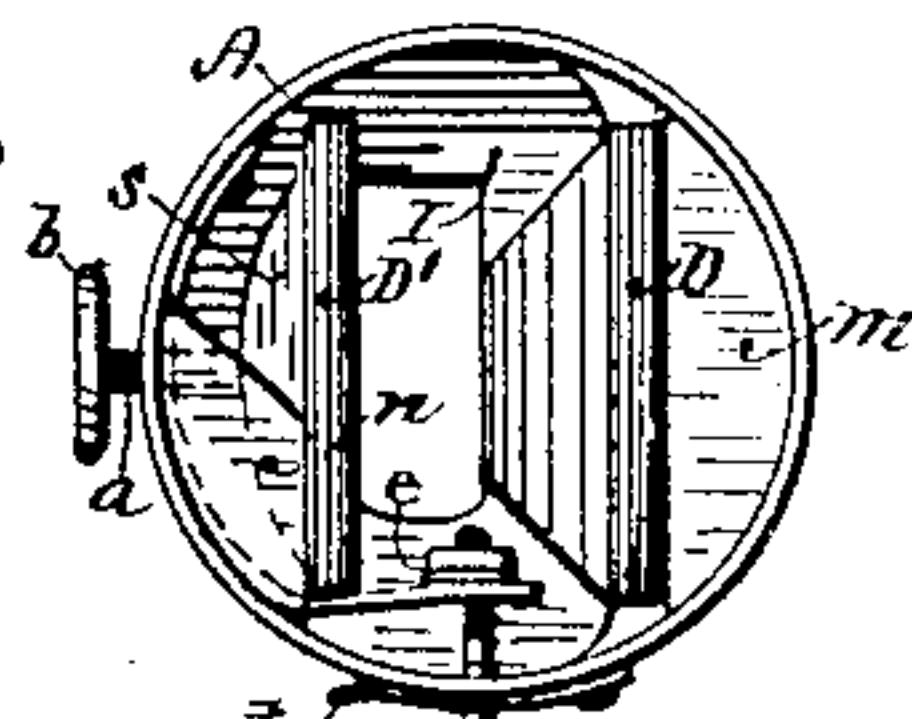


Fig. 4.

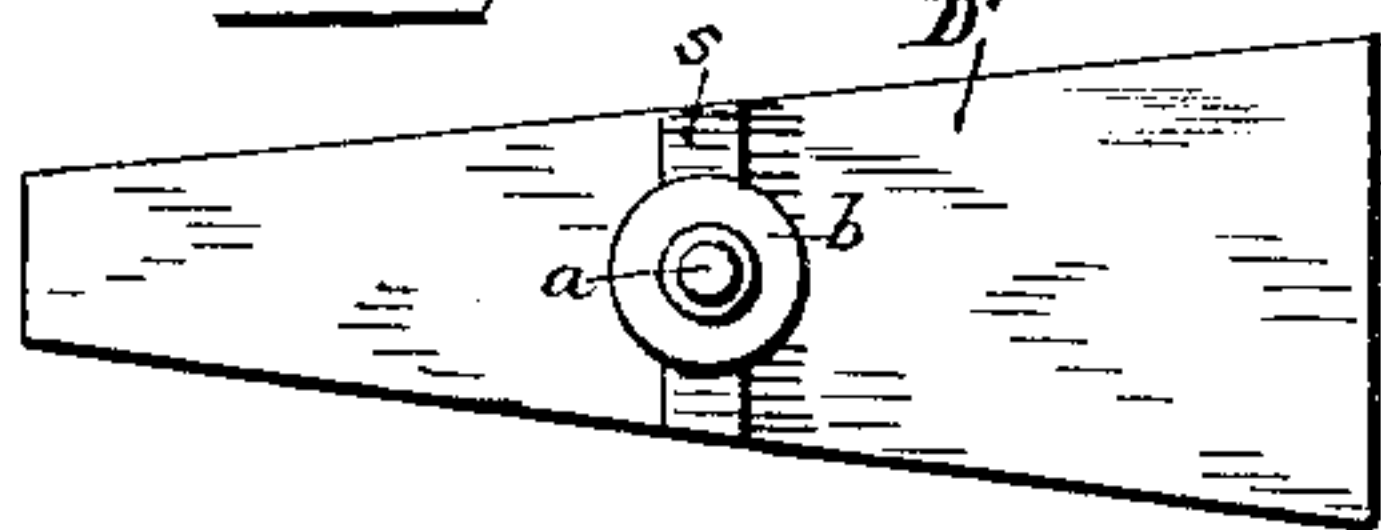


Fig. 7.

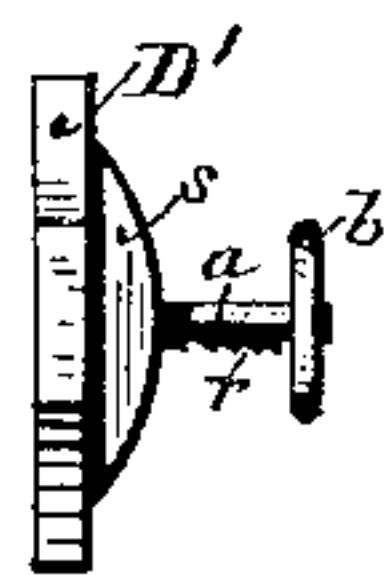


Fig. 8.

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KALEIDOSCOPE.

SPECIFICATION forming part of Letters Patent No. 314,586, dated March 31, 1885.

Application filed June 11, 1884. (No model.)

To all whom it may concern:

Be it known that I, ROBERT LEACH, of Providence, in the State of Rhode Island, have invented an Improvement in Kaleidoscopes, of which the following is a specification.

The nature of my invention consists in the improved construction and arrangement of the several parts, whereby the kaleidoscope is made capable of a variety of changes, and is adapted for the convenient exhibition of opaque objects, as hereinafter set forth.

Figure 1 is a perspective view of my improved kaleidoscope supported by a wire stand for exhibition. Fig. 2 is a longitudinal section of the same. Fig. 3 represents a front end elevation with the forward cap carrying the lens removed, and showing the reflectors held in a parallel position. Fig. 4 represents a rear end elevation with the transparent object-holder removed, and showing the reflectors in a parallel position, as in Fig. 3. Fig. 5 represents a front elevation with the forward cap removed, and showing the reflectors in an angular position. Fig. 6 represents a rear elevation with the transparent object-holder removed, and showing the reflectors in an inclined position, as in Fig. 5. Fig. 7 is a plan view of the movable reflector. Fig. 8 is a front end elevation of the same. Figs. 9 and 10 are end views of the cap provided with double or triple eyeglasses.

In the accompanying drawings, A is the outer case or barrel; B, the removable glass object-holder; C, the removable cap for holding the lens; D, the fixed reflector, and D' the movable reflector, made of plate glass, and provided at about midway of its back with a rigidly-attached block, s, to which is secured the notched wire a, provided with a head, b, adapted for the convenient manipulation of the reflector within the case A. A transverse slot, E, provided at one side with notches c c, is made in the side of the case A, and adapted to receive the notched wire a, thus serving to hold the reflector D' in any required position intermediate between the extreme positions shown in Figs. 4 and 5.

Transversely within the cavity of the case A is secured the flexible clamping-strip d, one end of which is secured to the longitudinally-arranged downward-acting spring e, fastened at one end to the stud f, and to the free end of

the spring e is secured the notched wire g, which passes loosely through the orifice h, made in the outer case, and to the outer end of which is secured the head i, adapted for the convenient manipulation of the clamping-strip d, and exteriorly of the case A is placed the pivoted locking-catch t, which serves to lock the notched wire g in any required position. The glass object-holder B is provided with a perforation, j, at its hemispherical end, adapted to receive the shaft k, to the inner end of which is secured the turn-table F, upon which are to be placed the opaque objects G which are to be viewed through the lens H, the objects being suitably illuminated by light which passes from the exterior directly through the cylindrical sides l l of the object-holder B, and also by light reflected from the fixed mirrors m and n, arranged within the case A at the rear end of the reflectors D and D', as shown in Figs. 4 and 6, sufficient vacant space being left between the mirrors m and n for the proper movement of the reflector D' in making the required changes for producing the desired optical effects, the light being reflected from the mirrors m and n directly upon the surface of the objects G. The outer end of the table-shaft k is provided with a milled head or spur-wheel, o, for the convenient manipulation of the object-table F, which at its inner side is covered with a textile material, K, preferably of velvet, the outer edges of which are serrated, as shown in Fig. 2, the velvet surface being adapted to produce the required degree of friction to cause the objects G to revolve when the table is being turned, and the points of the serrations will operate mechanically upon the objects to produce the required degree of displacement and rearrangement of the several objects G. The case A is provided with a partition, I, which is provided with an opening, p, adapted to form a guide or stop for the reflector D' when at its two extreme positions, as shown in Figs. 3 and 5, and the mirror n also serves to form a similar guide or stop to the outer end of the reflector D', as shown in Figs. 4 and 6.

The instrument is held in an inclined elevated position by means of the stand J, so that the table F may be rotated by means of the head o, and the notches c in the slot E, in conjunction with the notches r of the wire a, pro-

vide a convenient means for placing the reflector D' in any desired position relatively to the plane of the fixed reflector D, and the clamping-strap *d*, which is adjustably held by means of the notched wire *g* and pivoted locking-catch *t*, serves to clamp the reflector D' in the desired position relatively to the plane of the fixed reflector D.

In Fig. 9 two eyeglasses or lenses, H, are shown, thus adapting the instrument for binocular vision, by which a desirable solidity of appearance will be imparted to the objects within the illuminated chamber, and in Fig. 10 an arrangement of three eyeglasses is shown, any two of which may be used at a time, thus securing the desired appearance of solidity from different points of view.

The mirrors *m* and *n*, which are arranged transversely of the holding-case, are made to occupy the otherwise vacant space at the rear end of the reflectors, thus utilizing the said space for the purpose of increasing the light thrown upon the objects to be viewed, and the transverse arrangement of the mirrors in the space between the reflectors and the outer case constitutes a valuable improvement.

I claim as my invention—

1. In a kaleidoscope, the combination of the transparent object-holder having a hemispherical end with the revoluble object-holding table inclosed within the transparent object-holder, substantially as described.

2. The combination of the object-holder having transparent sides with the revoluble table provided with a frictional covering serrated at its edges, substantially as described.

3. The combination of the object-holder hav-

ing transparent sides, the revoluble table for holding the objects, and the mirrors for reflecting the light upon the face of the objects, substantially as described.

4. The combination of the fixed reflector and the movable reflector, provided at its back with the notched adjusting-wire, with the outer case provided transversely with a notched slot adapted to receive the notched wire of the movable reflector, substantially as described.

5. The combination of the fixed reflector, the movable reflector, and the outer case provided with the transverse partition adapted to form a stop or guide for the extreme positions of the movable reflector, substantially as described.

6. The combination of the fixed reflector, the movable reflector, and the transverse clamping-strip adapted to hold the movable reflector in its required positions, substantially as described.

7. The combination of the object-holder having transparent sides, the revoluble table within the object-holder, the fixed reflector, the movable reflector, and the end cap provided with the lenses for binocular vision, substantially as described.

8. The combination of the fixed reflector, the movable reflector, the transverse clamping-strip adapted to hold the movable reflector in its required positions, the downward-acting spring, the notched holding-wire, and the pivoted catch, substantially as described.

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Witnesses:

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