

(No Model.)

2 Sheets—Sheet 1.

D. D. CLARK & W. G. KING.

OPTOMETER.

No. 342,682.

Patented May 25, 1886.

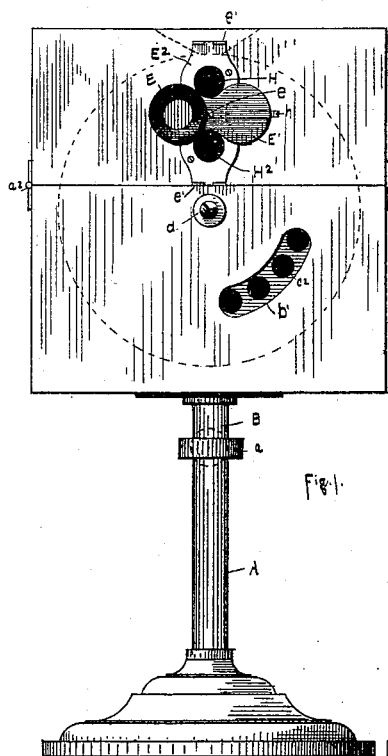


Fig. 1.

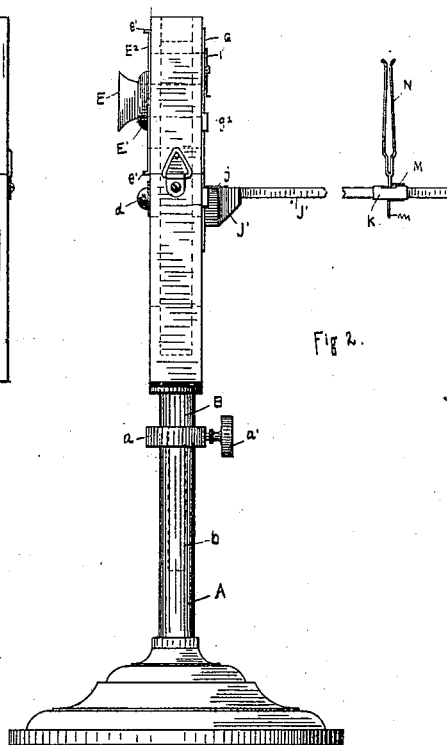


Fig. 2.

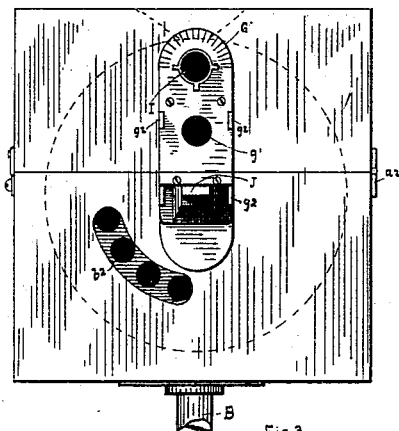


Fig. 3.

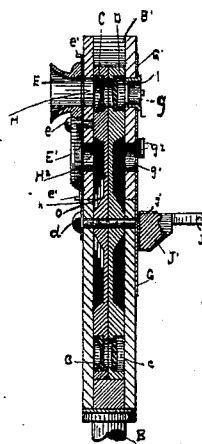


Fig. 4.

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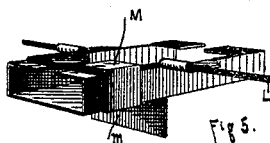


Fig. 5.

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Fig. 6.

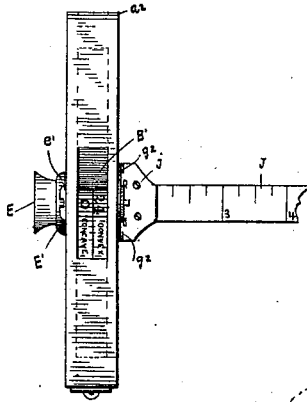


Fig. 7.

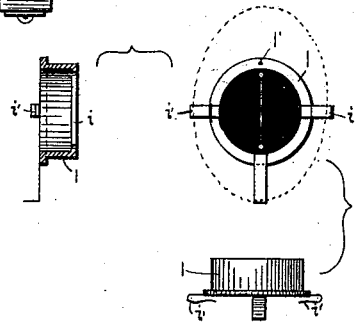
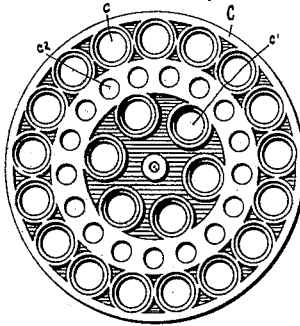


Fig. 8.

Fig. 11.

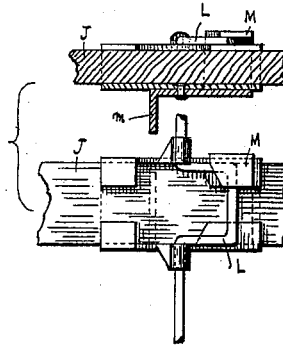


Fig. 9.

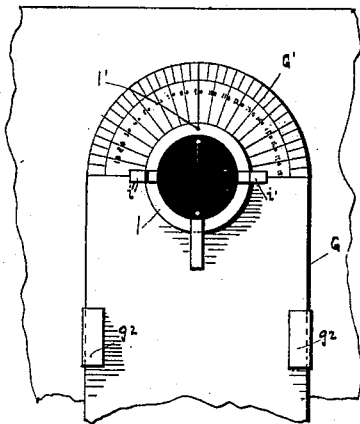


Fig. 10.

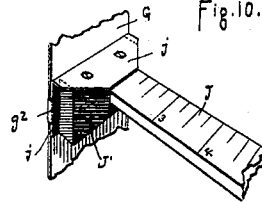


Fig. 12.



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UNITED STATES PATENT OFFICE.

DANIEL D. CLARK, OF OBERLIN, AND WALTER G. KING, OF CLEVELAND,
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OPTOMETER.

SPECIFICATION forming part of Letters Patent No. 342,682, dated May 25, 1886.

Application filed December 26, 1885. Serial No. 186,742. (No model.)

To all whom it may concern:

Be it known that we, DANIEL D. CLARK, of Oberlin, in the county of Lorain and State of Ohio, and WALTER G. KING, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Optometers; and we 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 the same.

Our invention relates to improvements in optometers; and it consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a front side elevation of our improved optometer. Fig. 2 is an edge view in elevation. Fig. 3 is a rear side elevation. Fig. 4 is an elevation in transverse section through the center of the optometer. Fig. 5 is a view in perspective of the sliding frame for holding the test-types. Fig. 6 is a top plan of the optometer. Fig. 7 is a side elevation of one of the revolving disks detached. Fig. 8 is an elevation, seen from the rear, of the stenopaic tube, with a section and plan of the same. Fig. 9 is an enlarged elevation of that portion of the rear side of the optometer where the stenopaic tube is inserted. Fig. 10 is a view in perspective of a portion of the distance-rod, showing the manner of attaching the same to the casing of the optometer. Fig. 11 is a plan and section of the frame K. Fig. 12 is an elevation of the spring O.

A represents a standard, having a vertical bore, in which fits the depending arm *b* of the casing B. A collar, *a*, also fits the arm *b* and rests on top of the standard. The collar is provided with a thumb-screw, *a'*, for holding the arm *b* in the desired vertical position, and when thus secured the arm and attached frame may be revolved in a horizontal plane without losing the vertical adjustment. The upper part of the casing is hinged to the lower part, as shown at *a''*, by means of which the casing may be opened to give access to the internal mechanism. Inside the casing are the disks C and D, that revolve on a common pivot, *d*. These disks are fac similes of each

other, and a description of one would answer for both.

Each disk has a series of openings, *c*, near the periphery, and an inner series, *c'*, and an intermediate series of finger-holes, *c''*, each series being arranged concentric with the axis of the disk. In the opening *c* of one disk are set concaved lenses of different powers of refraction, the power of each lens being indicated by numbers marked on the periphery of the disk opposite the respective lenses, the numbers being viewed from the outside of the casing through an opening, *B'*, in the top of the casing. (See Fig. 6.) In the opening *c'* are set stronger lenses, sometimes called "cataract-lenses." The other said disk is provided with convex lenses arranged in the manner just described. A curved slot, *b'*, in the front side of the casing, and a similar slot, *b''*, in the rear, will give access to the finger-holes of the respective disks, so that each may be revolved to bring the desired lenses in front of the eye-piece E. This eye piece or tube is mounted on one end of the plate E', the latter being pivoted in the center, at *e*, midway between the openings H and H', that are had through both walls of the casing. The opening H registers with the respective openings *c* in the disks as the latter are rotated, and the opening H' with the openings *c'*. The eye-piece may be turned up in front of the opening H, or may be turned down in front of the opening H', the plate E' covering the opening opposite the eye-piece. Slight springs *h*, with notches, engage a projection, *e'*, of the plate E', and hold the eye-piece in position in front of the respective openings H and H'.

On the rear side of the casing is attached a plate, G, with openings *g* and *g'*, that register with the openings H and H'. In the opening *g* fits the tube I, that may be rotated with the fingers, the latter having a slot, *i*, in the end thereof, known as a "stenopaic slot." The plate G has a scale, G', marked in degrees from 0 to 180, and the tube I has a pointer, I', that sweeps over the scale, by means of which the inclination of the slot *i* may be ascertained with accuracy. The tube on the outer end has flat springs *i'*, bent in the form of a hook, (see Fig. 8,) for holding an extra lens, when required. The plate G has ears *g''*, that

are turned back outside parallel with the plate for supporting the distance-rod J. This rod has a scale of inches marked thereon, as shown in Figs. 6 and 10. The head J' of the rod has attached a plate, j, that is bent down at right angles to the rod and enters behind the ears g', to support the distance-rod. By raising the rod the plate j is disengaged from the ears, so that the rod may be removed at pleasure. On the distance-rod is a sliding frame, K, made of tin or other thin sheet metal. A bail, L, extends across the frame and distance-rod. This bail is pivoted to the frame, and is held in the position shown in Fig. 5 by a catch, M, the latter being a thin plate pivoted to the frame underneath, and bent up over the frame so as to engage the bail, as shown. The catch has a thumb-piece, m, for turning the catch and for sliding the frame on the distance-rod.

Fingers N are connected with either end of the bail, and when the latter is in the horizontal position shown in Fig. 2 the fingers stand upright, and are for holding the test-types in line with the eye-piece. By drawing back the catch M the bail is left free, and the fingers may be turned down out of the way.

One opening in each series c and c' in each disk is left without a lens, so that any lens in either disk may be brought singly before the eye-piece; or any two lenses in corresponding series may be brought together before the eye-piece. In testing the eye to determine the axis of astigmatism, the tube I may be used with or without the lenses in the disk, when, by turning the tube until the axis of astigmatism is determined by means of the scale and pointer, the angle of such axis is read on the scale.

A spiral spring, O, may be arranged between the front of the casing and the front disk, to press the two disks together and serve as a brake to prevent the disks from revolving too easily.

What we claim is—

1. In an optometer, the combination, with revolving disks mounted in a suitable frame on a common axis, each disk having two series of openings, each series being arranged concentric with the axis of the disk, and lenses

mounted in said openings, of a revolving eye-piece pivoted to the casing and so arranged that it may be used in connection with either series of lenses in the disk, substantially as set forth.

2. In an optometer, the combination, with revolving disks each having two series of lenses, of a casing supporting the disks and openings through the casing to correspond with the respective series of lenses of the disks, substantially as set forth.

3. In an optometer, the combination, with the casing and revolving disks mounted therein, substantially as shown, of a tube mounted in the casing in line with the eye-piece, said tube having a stenopaic slit in the inner end thereof, said tube fitting loosely, so that it may be revolved by the fingers, substantially as set forth.

4. In an optometer, the combination, with a casing, a plate secured thereto and having a scale marked thereon, and revolving disks located within the casing, of a tube journaled in said casing, and having a stenopaic slot formed in the inner end thereof, and a pointer on said tube for ascertaining the inclination of said stenopaic slot, substantially as set forth.

5. The combination, with an optometer and distance-rod connected therewith and a sliding frame arranged on the rod, of a bail pivoted on the sliding frame, a catch for holding the bail in a horizontal position, and fingers connected with the bail and set at right angles thereto, with the arrangement of parts such as described, whereby, by turning the bail, the fingers are depressed.

6. The combination, with revolving disks mounted in a suitable frame, said disks having two sets of lenses each, of finger-holes in said disks and openings in the front and rear of the casing giving access to said finger-holes, the parts being arranged substantially as set forth.

In testimony whereof we sign this specification, in the presence of two witnesses, this 16th day of December, 1885.

DANIEL D. CLARK.
WALTER G. KING.

Witnesses:

FRANK N. WILCOX,
N. S. AMSTUTZ.