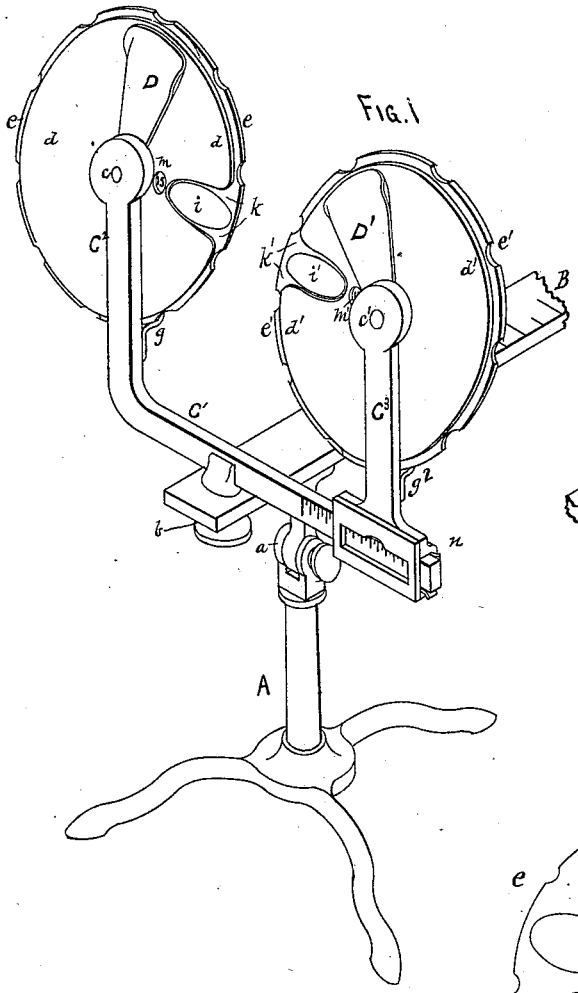
P. BOERINGER.

Optometer.

No. 212,536. Patented Feb. 25, 1879.

Fig. I



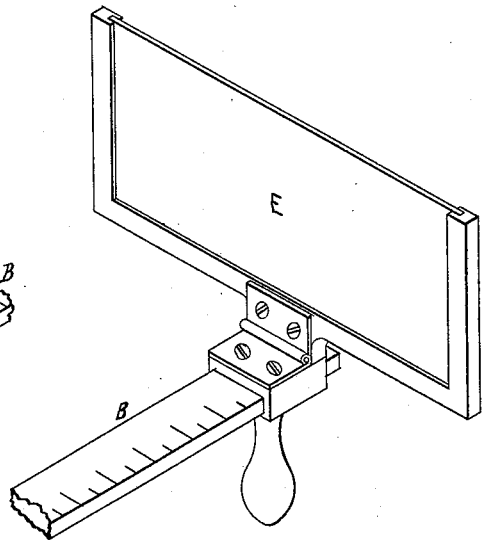


Fig. II

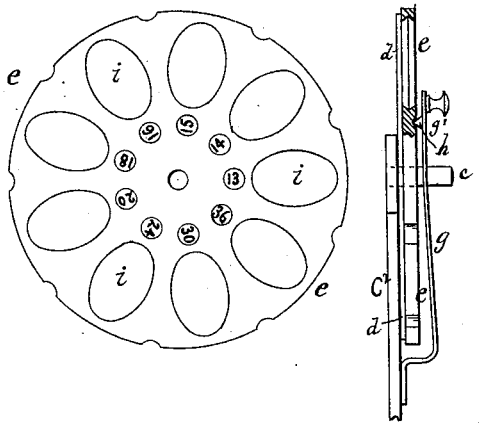
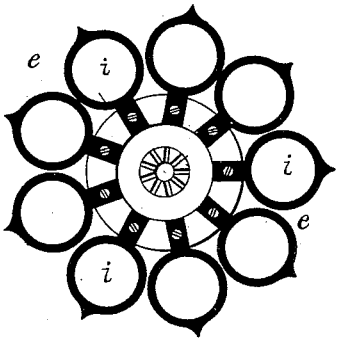
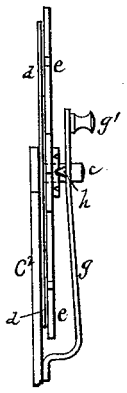


Fig. III





Witnesses,
C. H. Woodward
J. F. Orcutt.

Peter Boeringer,
Inventor, By
Louis Fesser & Co.
Attys

UNITED STATES PATENT OFFICE.

PETER BOERINGER, OF ST. PAUL, MINNESOTA.

IMPROVEMENT IN OPTOMETERS.

Specification forming part of Letters Patent No. **212,536**, dated February 25, 1879; application filed December 30, 1878.

To all whom it may concern:

Be it known that I, PETER BOERINGER, of St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Optometers, which improvements are fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a perspective view, and Figs. 2 and 3 detached detail views, of the glass-holding plates, showing variations in their construction.

This invention relates to optometers or instruments for adapting spectacle-glasses of any kind to different sights; and consists in a stand or frame, upon which are mounted two revolving disks, in which glasses of different focal power are held, as hereinafter set forth.

The invention further consists in making one or both of the disks adjustable, laterally, upon a graduated slide, whereby the glasses may be adapted to persons of different widths between the eyes, and to guide the optician in fitting up the spectacles, as hereinafter set forth.

The invention further consists in making the disks in which the glasses are held removable, so that the same frame or stand may be employed for different kinds of glasses, as hereinafter set forth.

The invention further consists in an adjustable graduated reading-tablet, whereby the desired focal length may be obtained, as hereinafter set forth.

A is the standard or foot, upon which a bar, B, is mounted in any suitable manner, but preferably by a swivel, *a*, so that it can be adjusted higher or lower, to give the instrument the proper inclination to the light. C^1 is a beam or bar running across the bar B, and connected thereto by a set-screw, *b*, so that it can be set at any desired angle. One end of this bar, C^1, is bent upward at right angles, as shown at C^2, and provided with a pin, *c*, upon which two disks or plates, *d e*, are mounted, the former being "fixed" upon the pin *c* and arm C^2, while the latter is free to revolve. *g* is a spring, which serves to hold the disk *e* upon the pin *c*, and is provided with an extension, g^1, having a point, *h*, which fits into small countersunk cavities at equal points in the face of the disk *e*, so that it may be held in position and yet be freely movable by the exertion of a slight degree of force. *i i* are a series of perforations cut through the disk *e* at equal distances apart, near the outer rim, and adapted to receive spectacle-glasses of increasing or decreasing degrees of focal power. *k* is an opening, cut in one side of the stationary disk *d*, of a shape to conform to one of the glasses, so that all the glasses will be covered except the one coming beneath this opening. *m* is a small perforation through the disk *d*, near the center, through which one of the numbers on the revolving disk *e* (see Figs. 2 and 3) may be seen, to indicate the number of the glass appearing before the opening *k*.

C^3 is an arm similar to C^2, and arranged to slide upon the arm C^1 by a slide, *n*, and provided with a pin, *c'*, and two disks, *d' e'*, precisely like disks *d e*, except that openings *k'* and perforation *m'* will be on the opposite side, or both sets toward the center, as shown. The glasses in both disks *e e'* will be counterparts of each other.

The bar C^1 will be graduated where the slide *n* passes over it, so that the optician may know at what distance the two disks are apart, to enable him to select a pair of frames of the right distance between the glasses, as hereinafter more fully explained.

D D' are two pivoted slides or covers, adapted to be turned down over the openings *k k'*, so that one of the exposed glasses may be covered. This is frequently necessary to test the power of or the effect upon one eye at a time, or when it is required to adapt two different kinds of glasses to one person.

The method of using this instrument is as follows: The two disks *e e'* will be supplied with glasses of increasing or decreasing power, and set upon the pins *c c'*, as described. The patient will then turn the disks *e* until the glasses which suit the eyes are brought before the openings *k*, and the reading-tablet E moved back and forth until the proper focus is found, or the reading-tablet set at some required distance, which will be ascertained by graduations upon the bar B, and then the disks *e* revolved until the proper pair of glasses is found.

If the patient, however, requires a different

glass for each eye, one of the slides D is turned down over the opening *k* and the opposite disk turned until the proper glass is found for that eye, and then the other cover D turned down to hide that glass, and the first cover D removed and the other disk revolved until a glass is found to suit the other eye. By this means the full effect of the glasses upon each eye can be obtained. The arm C^3 and slide *n* will be then moved to the right or left to adjust the glasses to correspond to the distance between the eyes. When these facts are ascertained, it is a very easy matter for the optician to select a pair of spectacles to suit the patient, both as to focal power and distance between the eyes.

Fig. 3 shows a slight variation in the method of forming the disk *e*, being a combination of hard rubber and metal; but the operation is the same.

The catches *g g'* may be applied in any suitable manner to accomplish the same result—viz., to hold the disks *e* in place, so that a certain degree of force is used to revolve them.

Set-screws may be attached to the instrument, so that it may be clamped rigidly after the glasses are adapted, to prevent accidental displacement before the optician has had an opportunity to select the spectacles.

The standard A may be made of a sufficient length to enable the patient to use it in a standing position; or it may be made adjustable, to be used either sitting or standing. It may also be mounted upon a folding base, so as to be folded up into a small compass for convenience in transportation, or for traveling opticians.

One great advantage gained by this arrangement is that in cases where a glass is required for one eye of a different power from that required for the other eye, the disks may be revolved independently of each other, and both eyes fitted with no more trouble than is required to fit glasses of the same power for both eyes.

This apparatus is adapted to any kind of glasses, concave, convex, cylindrical, prismatic, &c.

The lateral movement of the disks *e* may be accomplished by hinge, slide, or equivalen device.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an optometer, the arrangement of the spectacle-glasses radially upon or within revolving disks or carriers, which disks or carriers are adapted to rotate independently of each other, substantially as and for the purposes set forth.

2. The combination and arrangement of the disks *d e d' e'*, one fixed and the other movable, and provided with the perforations and numbers whereby only the required number of glass may be brought to view and the number ascertained, while the remainder of the glasses are covered, substantially as hereinbefore set forth.

3. The disks *d e d' e'*, arranged as described, and made movable, whereby they may be adjusted to fit the distances between the eyes of different patients, substantially as hereinbefore set forth.

4. The arrangement upon the beam C^1 of the graduations, whereby the distance apart of the disks *e e'* may be ascertained, in the manner and for the purpose hereinbefore set forth.

5. The combination and arrangement of the arms C^2 C^3, spring-catches *g* g^1, and disks *e e'*, whereby the latter may be made removable, substantially as hereinbefore set forth.

6. The bar B, provided with the graduations, in combination with the sliding and folding reading-tablet E, arranged and operating substantially as hereinbefore set forth.

7. The combination, with the disks *e e' d d'*, of the movable covers D D', in the manner and for the purpose substantially as hereinbefore set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

PETER BOERINGER.

Witnesses:
GEORGE BOERINGER,
C. N. WOODWARD.