

A. J. CROSS.

EYE TESTING DEVICE.

APPLICATION FILED APR. 9, 1910.

978,277.

Patented Dec. 13, 1910.

2 SHEETS-SHEET 1.

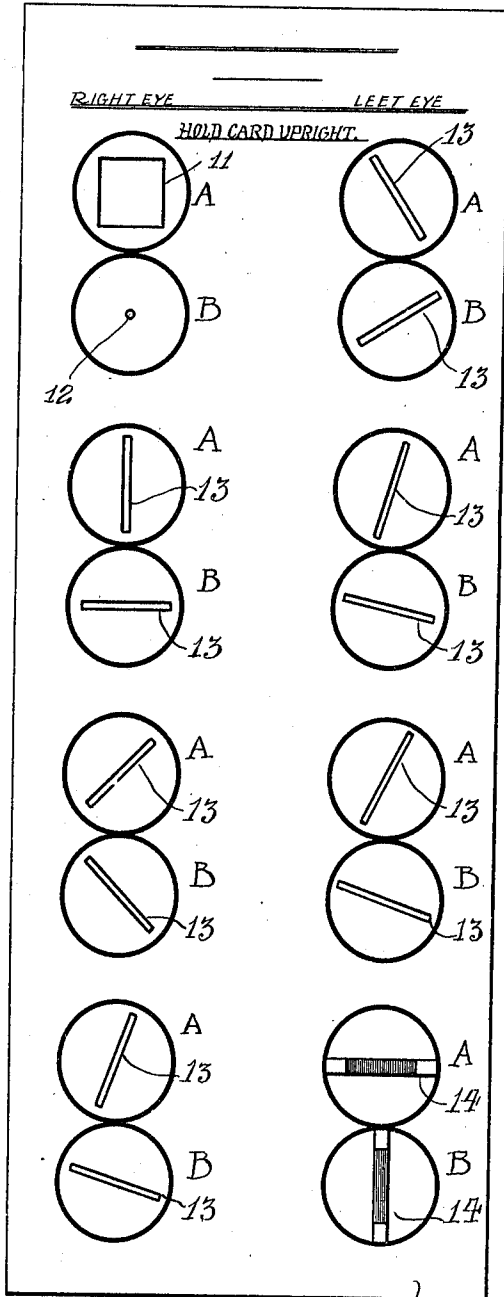


Fig. 1

10

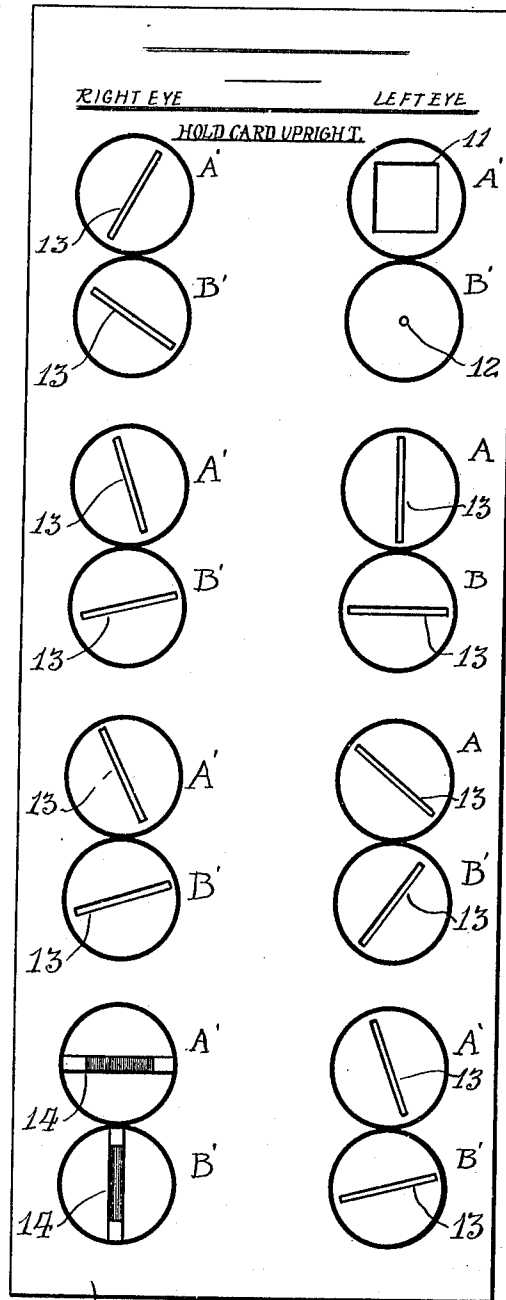


Fig. 2

10

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By his Attorneys,
W. D. Hutchinson.

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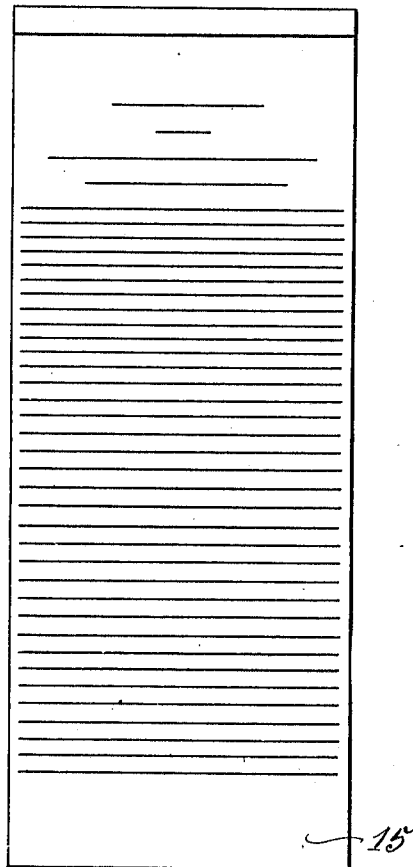


Fig. 3

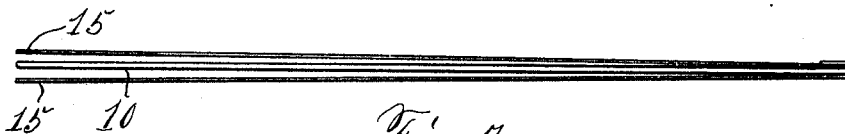


Fig. 4

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UNITED STATES PATENT OFFICE.

ANDREW JAY CROSS, OF NEW YORK, N. Y.

EYE-TESTING DEVICE.

978,277.

Specification of Letters Patent.

Patented Dec. 13, 1910.

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To all whom it may concern:

Be it known that I, ANDREW JAY CROSS, of the city, county, and State of New York, have invented a new and useful Improvement in Eye-Testing Devices, of which the following is a full, clear, and exact description.

My invention relates to improvements in eye testing instruments and devices, and the object of my invention is to produce an extremely simple device which will enable an unskilled person to determine quickly and certainly whether or not his eyes are subject to any defects either muscular or optical. It very often happens that a person may be suffering from eye defects without knowing it, and such a person will often think that the trouble comes from some other cause; but with my simple apparatus one can easily and at once find out in a general way and with sufficient accuracy, whether or not there is any eye difficulty of the more common sort, and if he find that such difficulties exist, he can then consult a specialist. In carrying this idea into effect I use the principle long known of employing the opaque disk with a peep-hole therethrough, the disk with the stenopaic slit, and the opaque disk with the colored, usually red, rod. These, however, are used by the oculist or optician, and are used in succession and by turning them in various ways, whereas my invention combines the functions of these several disks on a single card or plate, and instead of its being necessary to turn the successive disks, one can hold the card or plate in an upright position and apply the eye to the successive eye openings and ascertain easily and at once whether or not any eye strain or optical defects are present. Furthermore, this device can be easily and cheaply made so that a person can use it in connection with ordinary printed matter such as a newspaper, for making the desired tests, as will hereinafter appear, and the device can because of its construction, shape, and adaptability, be readily used as an advertising medium.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate corresponding parts in all the views.

Figure 1 is a face view of the card or plate in which the several openings are produced.

Fig. 2 is a similar view but of the opposite side of the card. Fig. 3 is a face view of the card and its cover, and Fig. 4 is an edge view of the card or plate and the covers thereof.

The card or plate 10 is preferably of rectangular shape but not necessarily so, and it can be of any suitable material, ordinary cardboard answering the purpose very well. On it are arranged vertically in parallel columns and near opposite edges, groups of disks corresponding to the individual disks hereinabove referred to, and I have for convenience marked the upper and lower disks of each pair A and B on one side of the card and the opposite side shows the corresponding disks marked A¹ and B¹. As a matter of fact it is only the eye holes, slits and rods in the card which are important, but the disks help to locate these parts and in practice are usually colored black or of a dark color which will accentuate the beam of light which passes through the card. One row of these sight perforations on each side of the card or plate is adapted for use on the right eye and the other for the left eye, as indicated, and in the first pair the upper disk A is shown with a large rectangular sight opening 11 through which a large beam of light may enter, while at the next disk B of the group is a small peep hole 12 which permits a small beam of light to pass and shuts out peripheral rays. In the next six groups or pairs of disks are the stenopaic slits 13 which are arranged at right angles to each other at A and B, but the inclination varies successively as the drawing shows so that in applying the eye to the several slits, quick changes occur with the effect of applying a single instrument with the slit therein and then turning the slit in various ways. In my device, however, the card can be kept constantly upright, and the manner of using it will be fully explained below. The last group of disks A and B on the lower right hand corner in Fig. 1 and the lower left hand corner in Fig. 2 show the ordinary red glass rods 14 which like the slits 13 are arranged at right angles to each other.

In practice I prefer to provide the plate or card 10 with covers 15, thus making the device in booklet form, and the covers on the several sides can be provided with optical definitions of the more common kind with instructions for using the device and

with advertising matter, if desired, while the latter can also be produced directly on the card or plate 10.

In using the device the advertising page
 5 of any newspaper containing letters at least one-half inch in size can be used in connection with the group of sight holes. Place the printed matter from ten to twenty feet away in a good strong light, close the eye
 10 not in use by holding the hand over it. Begin the test for the right eye with the aperture 11 in disk A of the first group, and for the left eye in the corresponding aperture A¹, holding the plate or card with the numbers
 15 on next to the face while testing either eye. Ascertain which aperture 11 or 12 gives the best vision. If 12, then it indicates one of the three so-called optical errors technically termed "myopia", "hypermetropia", or
 20 "astigmia", and if it is desired to ascertain which one of these three errors is present, it will be necessary to proceed by elimination as follows, with the aperture 11 before the eye, if by approaching the large
 25 letters on the newspaper vision is greatly improved, then the error is "myopia", and if it is not "myopia" then it must be either "hypermetropia" or "astigmia", so the
 30 apertures 13 in the several groups A and B are to be compared while the card is held in an upright position. If in any aperture A is found to be plainer than B, or B more distinct than A, then "astigmia" simple or compound is present, and if no "myopia"
 35 or "astigmia" is found, then the error must be "hypermetropia". In applying these tests to ordinary newspaper reading type held from ten to twelve inches away, if improvement is made it indicates "astigmia,"
 40 "hypermetropia" or "presbyopia." Any or all of these defects can be aided with properly adapted glasses. When poor sight is caused by disease, then none of these apertures will aid vision, and when the eyes are
 45 optically perfect vision will be best with apertures 11 indicated at A and A¹.

In using the groups A and B through the colored rods 14, look at a gas, electric or oil lamp flame situated from ten to twenty feet
 50 away, and then hold the rod of A before either the right or left eye, keeping both eyes open. This will cause a vertical streak of red light to apparently pass through the flame of whatever lamp is used, provided,
 55 however, that the muscle balance between the two eyes is perfect. If imbalance is present then the red streak will seem either to the right or to the left of the lamp flame. In device B, or B¹ where the red rod is vertically arranged, the red streak will appear
 60 horizontal, and if no muscle imbalance is present this streak will pass directly through the lamp flame. Where muscle imbalance does exist then the red streak will appear
 65 either above or below the lamp flame.

From the foregoing description it will be seen that the arrangement of the sight apertures and red rods is such as to permit any of the ordinary tests to be made, and that instead of using at least three instruments as
 70 is generally the case, the apertures are presented on a single device and that the successive shapes are such that the same results can be had as by taking up successive instruments and turning them to various angles.
 75 In fact the result is rather better because the confusion caused by shifting the instruments and continued turning is apt to distort the sight. Another reason why the arrangement of stenopaic slits, as here shown, is an improvement on the old style single disk is because of the abrupt or quick changes possible from one meridian of the eye to another at right angles to it, thus permitting of maximum and minimum comparisons in so-called "astigmatic" eyes and enabling a person to detect the finer distinctions indicative of weaker "errors."

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

1. A device of the kind described, comprising a card or plate having successive groups of sight apertures therein, the apertures being such as are used for eye testing.
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2. As an improved article of manufacture, a card or plate having a series of sight apertures therein, the apertures being such as are used for eye testing.

3. As an improved article of manufacture, 100 a card or plate having rows of sight apertures therein, the apertures being spaced apart and similar to the apertures of eye testing disks.

4. A device of the kind described comprising 105 a card having sight openings or slits therein, the slits being grouped and those of each group arranged at right angles to each other.

5. A device of the kind described comprising 110 a card or plate having a series of sight apertures arranged in groups thereon, each group comprising a pair, and a portion of the apertures being in the form of slits with the slits of each pair at right angles to each other.
 115

6. A device of the kind described, comprising a card or plate having rows of sight apertures grouped in pairs therein, a portion of the apertures being in the form of 120 slits with the slits of each pair at right angles to each other.

7. A device of the kind described comprising 125 a card or plate having pairs of sight apertures therein, a portion of the apertures being in the form of slits with the slits of each pair arranged at angles to each other, and some of the slits being provided with colored light permeable rods.

8. A device of the kind described comprising 130

ing a card or plate having a series of sight apertures therein, the apertures being arranged in pairs and successive pairs having the apertures in the form of slits at right angles to each other, the slits of each pair being pitched differently from those of the other pairs.

9. A device of the kind described comprising a card or plate having a series of disks produced thereon, the disks being grouped in pairs and provided with sight apertures similar to those used in eye testing instruments.

10. A device of the kind described comprising a card or plate having a series of

disks produced in pairs thereon, the disks being provided with sight apertures, a portion of the apertures being in the form of slits with the slits of each pair arranged at right angles to each other.

11. A device of the kind described comprising a card or plate having groups of sight apertures therethrough, said apertures corresponding to the apertures of eye testing instruments, and covers for the plate.

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Witnesses:

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