L. W. BUGBEE.

MAGNIFIER.

APPLICATION FILED NOV. 24, 1917.

1,264,267. Patented Apr. 30, 1918.

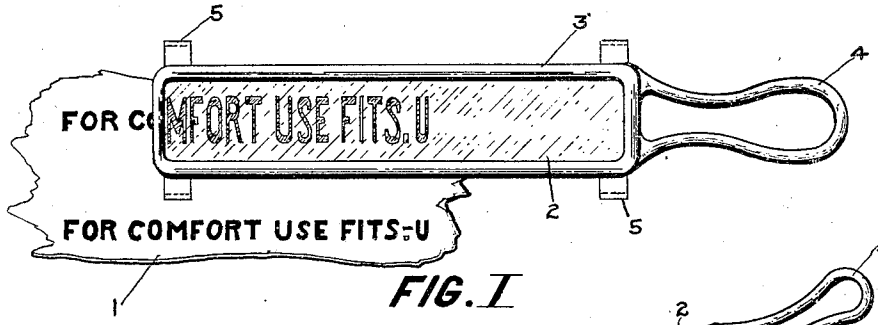


FIG. I

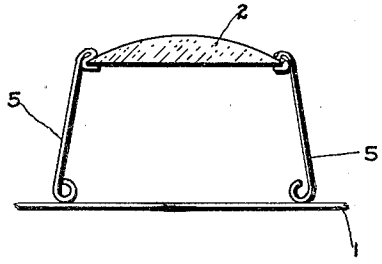


FIG. II

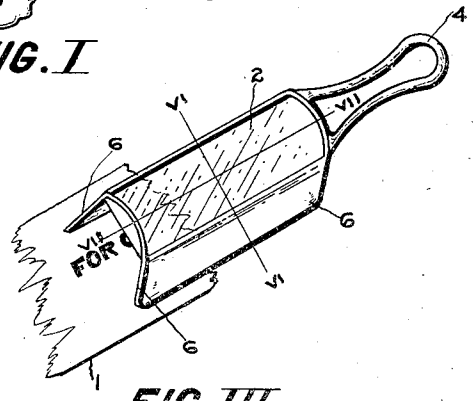


FIG. III

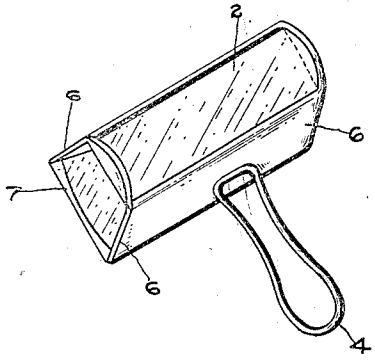


FIG. IV

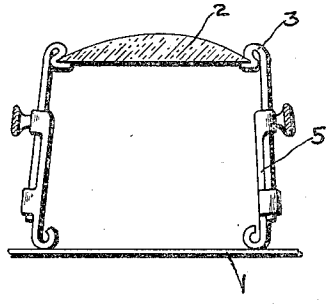


FIG. V



FIG. VII



FIG. VI

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MAGNIFIER.

1,264,267. Specification of Letters Patent. Patented Apr. 30, 1918.

Application filed November 24, 1917. Serial No. 203,835.

To all whom it may concern:

Be it known that I, LUCIAN W. BUGBEE, a citizen of the United States, residing at Southbridge, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Magnifiers, of which the following is a specification.

This invention relates to improvements in magnifiers and has particular reference to an improved construction of reading glass which will enable the user to read an entire line satisfactorily without shifting of the lens, and will at the same time give considerable magnification of the reading matter in question.

A further object of the present invention is the provision of an improved reader which shall be properly retained at the necessary focal distance, which shall serve to hold the work in satisfactory reading position, and which will produce the desired magnification without noticeable distortion or aberration, and will consequently prove extremely efficient for the desired purpose.

Other objects and advantages of my improved construction should be readily apparent by reference to the following specification taken in connection with the accompanying drawings, and it will be understood that I may make any modifications in the specific details of construction shown and described within the scope of the appended claims without departing from or exceeding the spirit of my invention.

Figure I represents a plan view of one form of my improved reader illustrating the magnification attained by its use.

Fig. II represents a sectional view thereof.

Fig. III represents a perspective view of one form of modified construction.

Fig. IV is a similar view of another modification thereof.

Fig. V represents a view of an adjustable form of my magnifier.

Fig. VI represents a transverse sectional view of the lens taken on the line VI—VI of Fig. III.

Fig. VII represents a similar sectional view taken on the line VII—VII of Fig. III.

In the drawings, the numeral 1 designates the sheet of printed matter which it is desired to enlarge through the use of my improved reader, while the numeral 2 designates the lens of my reader which is in the form of a plano cylinder or double cylinder lens, that is to say, a lens having power in one meridian but not in the other. The particular advantage of this type of lens is that by its use a long lens of any desired length may be formed which will have a constant magnification in one meridian along its entire length, with an absence of magnification in the other meridian and consequent lack of distortion or aberration near its edges so that the entire length of the magnifier may be employed in place of only the central portion as is the case with those types of magnifiers hitherto known in the art.

In Fig. I, I have illustrated the result of the magnification attained, from which it will be seen that the letters shown as visible through the magnifier are nearly three times the height of the letters shown outside the magnifier, although of the same width, the magnification being in direction of height of the letters. This enlargement of letters to render their reading more easy is a feature well known in the printing art and its advantages are clearly understood by printers.

Printing type is ordinarly classified or measured by a unit termed the point, and the size of the type referred to as 10 point or the like, according to the number of points in the height of the letter. While the heights remain the same, however, the widths are frequently varied according to the form desired, the narrower type being usually referred to as condensed, special condensed or the like.

As a result of the use of my magnifier, therefore, in place for example of a 10 point ordinary letter being seen looking through the magnifier a considerably larger letter corrospounding possibly to a 25 point extra condensed letter will be seen, or, in other words, a letter for practical purposes, nearly three times as high as the other, this magnification of the height being sufficient to enable a person to readily read a letter which might previously be unrecognizable, the result being a great efficiency as respects my improved magnifier, while the cylindrical in place of usual spherical form of the curves of the magnifier render it possible for the person to place the magnifier over a line and read the entire length of the line without having to shift the magnifier along the line, in place

of having to shift it or else see parts of the line distorted, as is the case with the usual spherical magnifier.

To further increase the desirability and efficiency of my improved magnifier, I may if desired inclose it within the frame 3 bearing the handle 4 and having the plurality of depending legs 5 adapted to rest on the sheet 1, the length of the legs being sufficient to hold the magnifier the proper distance above the sheets so that the letters will be correctly focused through the magnifier and thus clearly readable.

In Fig. III, I have illustrated a slightly modified form of my invention, in which in place of the independent legs 5 shown in Figs I and II, I have shown the runner like members 6 depending from the lens and disposed at opposite sides thereof and adapted to slide over the paper, these members aiding in holding the paper exactly flat beneath the magnifier, holding the lens at the proper magnifying distance thereabove.

In Fig. IV, I have shown a further modification of my invention which makes use of members similar to the runner 6, but having secured therebetween a second plate or member 7 which may if desired be in the form of a concave or convex cylinder, and which will be so held relative to the lens 2 by the support 6 that the combined effect of the members 2 and 7 will produce the desired magnification, while the member 7 having a plain under surface and resting flat upon the paper will hold the paper absolutely flat and prevent any wrinkling or curling up of the same as might occur between the members 6 of Fig. III.

In Fig. V, I have illustrated another modified form of my invention in which the lens 2 in place of being a plain cylinder is of sphero cylinder form, that is to say it has a weak spherical curve longitudinally and a stronger spherical curve transversely, and in this way produces a certain amount of magnification as regards the width of the letters and a considerably greater amount of magnification as regards their length, in this way producing much better results and more efficient less distorted magnification than is possible with an ordinary spherical magnifier.

I would in addition invite attention to the fact that I have shown the legs 5 in Fig. V as adjustable so that the distance from the lens to the page may be varied as desired, the particular advantage of this possible variation residing in the fact that the magnifier may be adjusted according to the requirements of the individual wearer, as with a near sighted person the lens will be placed at less than its focal length from the matter to be magnified when the eye of the person will make up the difference and normally magnified vision be secured, while similarly with a far sighted person the lens will be placed at a distance greater than its length from the matter to be magnified, thus making up for the deficiency in the eye of the user.

It will further be understood that if desired the sphero cylinder lens may be ground with special curves to comp nsate for the particular defect or defect a particular meridian of the eye of the wearer, so that the magnifier can be used without other glasses and the matter will be magnified in such a manner that the eye of the wearer will take care of unequal magnification and receive the same impression as would a normal eye with a plain magnifier.

From the foregoing description the construction, use and advantages of my improved magnifier should be readily apparent and it will be seen that I have provided a satisfactory magnifier which will hold the work entirely flat, which will hold the lens at the proper distance thereabove, which will secure magnification in the plane required and without any distortion, in which a supplemental lens may be readily employed if desired either to correct the image produced by the regular lens or to supplement its action, which may have a high magnification and at the same time be always disposed at the proper focus on account of the depending supports, and which may be inexpensively constructed and will produce a flat field, as distinguished from the expensive manner of constructing present day magnifiers with cross cylinders, corrected double spherical lenses or the like, in the attempt to get rid of some of the marginal distortion.

I claim:

1. A magnifier for reading purposes, comprising an elongated member having a power in the one meridian and an absence of power in the other meridian, and means depending from the sides of said member for retaining the member in correct spaced relation from the matter to be magnified.

2. In a magnifier of the character set forth, the combination with a transparent basal member adapted to rest on the matter to be magnified, of supports rising therefrom, a frame carried by the supports, and a cylindrical magnifier mounted in the frame and operating through the transparent base to magnify the matter therebeneath.

3. A magnifier for reading purposes, comprising an upper magnifier having a transverse power and no longitudinal power, supports depending therefrom, and a transparent base member secured to the supports for engaging the matter to be magnified, and formed to supplement the action of the main cylindrical magnifier, substantially as and for the purpose described.

4. In a magnifier, the combination with a pair of guide runners, of a cylindrical mag-

nifier carried thereby and held in correct spaced relation from the matter to be magnified by the runners, said runners serving to hold the matter flat beneath the magnifier.

5. In a device of the character described, the combination with a frame, of a lens having a cylindrical power mounted in the frame, and adjustable legs carried by the frame for varying the distance between the lens mounted therein and the matter to be magnified, substantially as described.

6. A magnifier of the character set forth, including a lens having greater transverse than longitudinal magnifying powers, means for holding the lens in predetermined relation to the matter to be magnified, the lens having a special ground surface to normally distort the matter being magnified in a way which will be compensated for by the visual defect of the user to produce the image seen by the normal eye in a defective eye without other glasses.

In testimony whereof I have affixed my signature, in presence of two witnesses.

LUCIAN W. BUGBEE.

Witnesses:

A. S. CANN,

H. E. COLEMAN.