methacrylate, which is sold by Du Pont under the trademark "Lucite" and by Rohm & Haas under the trademark "Plexiglas." If desired, the lens may be made in a single molding operation in a heated press of conventional type having die or cavity parts of the proper size and formed with the desired curvatures, so that when the blank comes out of the press, it will not be necessary to grind either the outside or the inside face of the lens to the desired curvature. In some cases, it may be advantageous to form a blank having only the outer bi-focal surfaces of the desired final curvature, in which case the blank is subsequently ground on the inside in order to form an inner face having a spherical curvature fitting the cornea, it being understood that the outer curvatures of the lens will be properly coordinated with the curvature of the interior surface so that the finished lens will have the required optical properties.

In FIGURES 3 and 4 of the drawings, there is shown a method of constructing a lens similar to that shown in FIGURES 1 and 2, by forming two parts, a lower part **25** for reading purposes, and an upper part **26** for distance. In this case, the two parts **25** and **26** abut each other in a horizontal plane **27**, and are united together by some suitable cementing agent which will provide the required bond between the two portions of the lens, and at the same time will not have any toxic effects, or other disadvantages. The radii **17**, **19**, **21** and the centers **18**, **20**, **22** of the lens are the same as those of the lens shown in FIGURE 1. Consequently, the optical properties of the lens shown in FIGURE 3 are the same as those of the lens shown in FIGURE 1, and it will orient itself in the same manner. As is shown in the drawing, the lower part **25** is completely formed of the same material as is the upper part **26**.

In FIGURES 5, 6 and 7 of the drawings, there is illustrated a lens having the same final characteristics as the lens shown in the preceding examples, but in which the bi-focal characteristics of the lens is imparted to it by performing a grinding operation on that portion of the lens blank which is to become the distance viewing part **28**. The entire outer surface of the lens is first ground or otherwise provided with a single sperical curvature, represented by the numeral **29**. This curve **29** is the close-up or reading portion of the lens. Subsequently, the upper part **30** of the blank is re-ground in the manner indicated somewhat diagrammatically in FIGURE 7.

Referring to FIGURE 7, the numeral **31** represents a vertical spindle which is rotated by a suitable means, not shown, and on the upper end of this spindle, the lens blank **32** is securely attached by a suitable adhesive **33**. As the spindle **31** is rotated, the grinding element **34** is rocked back and forth from its solid line position to its dotted line position shown at **35**, so that at the conclusion of the operation, the outer surface **30** of the distance portion of the lens has been reduced in thickness, as shown at **28**, and to the required curvature to fit the distance-seeing requirement of the prescription.

As in the other cases described, the interior face **36** of the blank or lens has been, or is then, ground to the proper spherical curvature to fit the cornea.

In FIGURES 8 and 9 of the drawings, there is disclosed a method of using an extra weight applied to the bottom of the reading portion of the lens so as to increase somewhat the self-orienting properties of a lens made by any of the methods previously described. In the present instance, it is shown as being applied to the lens made in the manner set forth in FIGURE 1, in which the outer curvature of the lens is made by a molding operation.

As shown in FIGURES 8 and 9, near the bottom edge of the lens there is drilled a small aperture **37**, preferably made as close to the bottom of the lens as is feasible, in order to locate the extra weight as far down as possible on the lens. Within this aperture **37**, there is inserted a small cylindrical plug **38** of a relatively heavy metal such as lead, silver or gold. The opening on either side of the plug **38** is then filled with suitable, nontoxic cement having such characteristics as are compatible with those of the material of which the body of the lens blank is made. Any extra cement is then removed, and the seals are then polished off to fit the contour of the adjacent surfaces. This additional weighting just described may be used in cases where it is unusually difficult to obtain and maintain effective orientation of the contact lens.

The posterior surface of the lens of all of the embodiments has its outer peripheral portion formed to provide clearance between the lens edge and the cornea, as shown in the drawings.

Various of the features of the invention believed to be new are set forth in the appended claims.

I claim:

1. A bi-focal corneal contact lens of generally concavo-convex cross section adapted to be retained on the cornea of the eye by capillary attraction produced by a lachrymal layer between the lens and the cornea, said lens having a posterior surface curved to fit the cornea of a patient to which the lens is applied with a tendency to remain centered thereon and having a single base curve in at least the optical area thereof, said lens having a maximum external dimension greater than the normal pupil size and less than the limbal area of the eye, said posterior surface having its outer peripheral portion formed to provide clearance between the lens edge and the cornea, said lens having an upper optical zone and a lower optical zone, said upper optical zone being powered on the anterior surface for distance vision thereof with respect to the cornea of the patient, said lower optical zone being powered also on the anterior surface thereof for near vision with respect to such cornea, the anterior surface of said upper optical zone having a radius of curvature flatter than the radius of curvature of the anterior surface of said lower optical zone to provide the respective distance and near vision powers, with the center of curvature of the anterior surface of said upper optical zone being displaced downwardly relative to the axis of the lens and the curvature itself lying within the spherical extension of the anterior surface of said lower optical zone, the line of intersection of the two anterior curves on the vertical center line of the lens being below the mid point of said center line, the thickest portion of said lens being below said line of intersection and thereby heavier to restrain the lens from rotating on the cornea and to effect substantially constant positioning of said lower optical zone below said upper optical zone.

2. A bi-focal corneal contact lens of generally concavo-convex cross section adapted to be retained on the cornea of the eye by capillary attraction produced by a lachrymal layer between the lens and the cornea, said lens having a posterior surface curved to fit the cornea of a patient to which the lens is applied with a tendency to remain centered thereon and having a single base curve in at least the optical area thereof, said lens having a maximum external dimension greater than the normal pupil size and less than the limbal area of the eye, said lens having an upper optical zone and a lower optical zone, said upper optical zone being powered on the anterior surface for distance vision thereof with respect to the cornea of the patient, said lower optical zone being powered also on the anterior surface thereof for near vision with respect to such cornea, the anterior surface of said upper optical zone having a radius of curvature flatter than the radius of curvature of the anterior surface of said lower optical zone to provide the respective distance and near vision powers, with the center of curvature of the anterior surface of said upper optical zone being displaced downwardly relative to the axis of the lens and the curvature itself lying within the spherical extension of the anterior surface of said lower optical zone, the line of intersection of the two anterior curves on the vertical center line of the lens being below the mid point of said center line, the thickest portion of said lens being below said