The zonules pull the lens capsule outward. This pull is balanced only by the resilience of the lens capsule. In the case of an intraocular lens placed in the lens capsule, as shown in FIG. **16**, the only inward pressure acting on this lens is therefore provided by the resilience of the lens capsule. It may be that the capsule, or what remains of it after the cataract has been removed, does not provide sufficient force to compress the haptics. In which case it will be necessary to provide the lens with its own inward acting force. This can be done with a relatively minor modification of the haptics. A series of hooks are attached at the outward edge of the haptics. These hooks fit around the periphery of the lens capsule, as shown in FIG. **17**. The haptics are maintained in a somewhat extended state by the outward pull provided by the zonules. This pull is counterbalanced by an inward pull provided by the resilience of the lens and haptics (and lens capsule). When the ciliary body contracts the tension in the zonules is relieved and the inward pull provided by the lens becomes larger than the outward pull provided by the zonules. The haptics will contract until a new equilibrium is established. As a result of this contraction the lens increases its power, that is to say, it accommodates.

This arrangement places the lens somewhat anterior to, rather than inside, the capsule. An advantage of having the lens be placed outside the lens capsule is that there is less danger that parts of the capsule may interfere with the operation of the lens. A further advantage of having the lens provide its own inward pull and not having to be reliant on the resilience of the lens capsule, is that laser capsulotomy of the posterior capsule can be performed with minimal effect on the operation of the lens. Placing the lens anterior to the capsule facilitate such laser treatment as it provides spatial separation between lens and capsule.

SUMMARY, RAMIFICATIONS, AND SCOPE

The reader will see that this invention of an accommodating intraocular lens can be made to alter its power in response to the tension in the ciliary muscle. The lens has the following advantages in that:

- it is simple in design making it relatively easy to manufacture.
- it can be filled with air which is relatively easy to sterilize by filtering and which is non-toxic to the intraocular environment.
- it can be manufactured so as to be very light and have little mass.
- it has few moving parts.
- it can be manufactured so as to have no sharp edges which can irritate the delicate tissue in the eye.
- it is compatible with standard extracapsular lens extraction or phacoemulsification surgery.
- it is robust in design and its various optical elements can not easily be misaligned as a result of handling.
- it is compatible with capsulectomy of an extensive portion of the anterior capsule.
- it can easily be modified so as not to be dependent on the resilience of the lens capsule.

Although the description above contains many specificities, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred embodiments of this invention. For example the exact shapes of the haptics may be different from the ones shown in the figures. Also, in the descriptions above both transparent membranes were made from resilient materials; in order for the present lens to work only one of these membranes needs to be resilient. Thus the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the examples given.

I claim:

1. A lens for implantation in the human eye, said lens is so constructed so as to be thinner at its center than at its periphery said lens comprising two refractive surfaces, at least one of the two refractive surfaces of said lens has a concave shape and at least one of said refractive surfaces is formed by a membrane made from a resilient material allowing said at least surface to alter its shape in response to changes in tension in the ciliary muscle, contained between said surfaces is a fluid medium of refractive index smaller that of aqueous of the eye thereby giving the lens a variable amount of positive power.

2. A lens such as described in claim **1**, further comprising for the tension in the ciliary muscle of the eye to alter the shape of at least one of the refractive surfaces in such a way that higher tension in the ciliary muscle makes at least one of said refractive surfaces be more concave thereby increasing the positive power of said lens.

3. A lens as described in claim **1** further comprising haptics to fit in a lens capsule of the eye after the natural lens has been extracted as part of cataract surgery, said haptics are connected in such a manner that compression of said haptics causes reduced pressure in the interior of said lens so as to make at least one of said refractive surfaces of said lens be more concave thereby increasing the positive power of said lens.

4. A lens as described in claim **1** further comprising a sidewall extending between said two refractive surfaces and haptics to fit in a lens capsule as of the eye after the natural lens has been extracted as part of cataract surgery, said haptics are connected in such a manner that compression of said haptics causes sections of the side wall of said lens to be deflected outward thereby reducing pressure in the inside of said lens in such a manner as to make at least one of said refractive surfaces of said lens be more concave thereby increasing the positive power of said lens.

5. A lens as described in claim **1** further comprising haptics to fit in a lens capsule of the eye after the natural lens has been extracted as part of cataract surgery, said haptics are connected in such a manner that compression of said haptics causes the distance separating the two refractive surfaces of said lens to increase, thereby increasing the volume of said lens which in turn reduces the pressure in the inside of said lens, thereby increasing the concave shape of at least one of said refractive surfaces in such a manner as to increase the positive power of said lens.

6. A lens as described in claim **1** further comprising a sidewall extending between said two refractive surfaces and haptics having hooks so as to grip around outer edges of a lens capsule of the eye after the natural lens has been extracted as part of cataract surgery, said haptics are connected in such a manner that reduced tension in the zonules causes sections of the side wall of said lens to be deflected outward thereby reducing pressure in the interior of said lens in such a manner as to make at least one of said refractive surfaces be more concave thereby increasing the positive power of said lens.

7. A lens as described in claim **1** further comprising haptics having hooks so as to grip around outer edges of a lens capsule of the eye after the natural lens has been extracted as part of cataract surgery, said haptics are connected in such a manner that decreased tension in the zonules causes the distance separating the two refractive