

June 15, 1943.

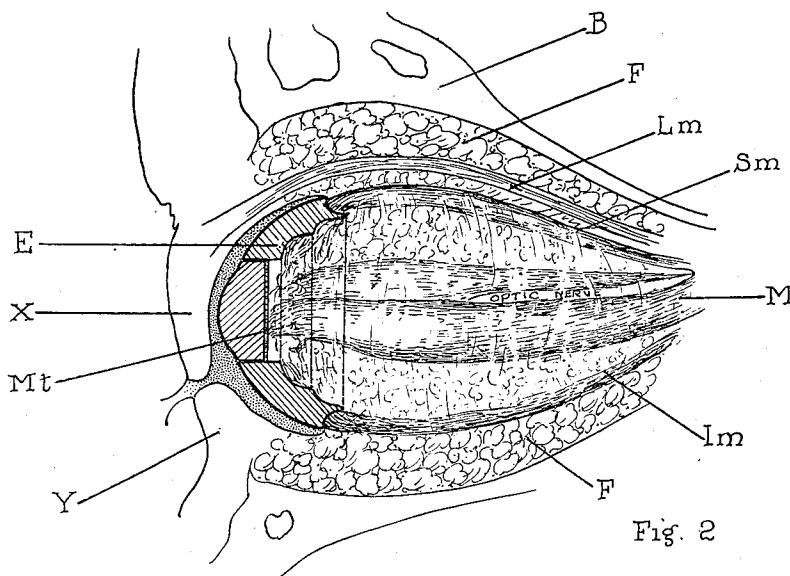
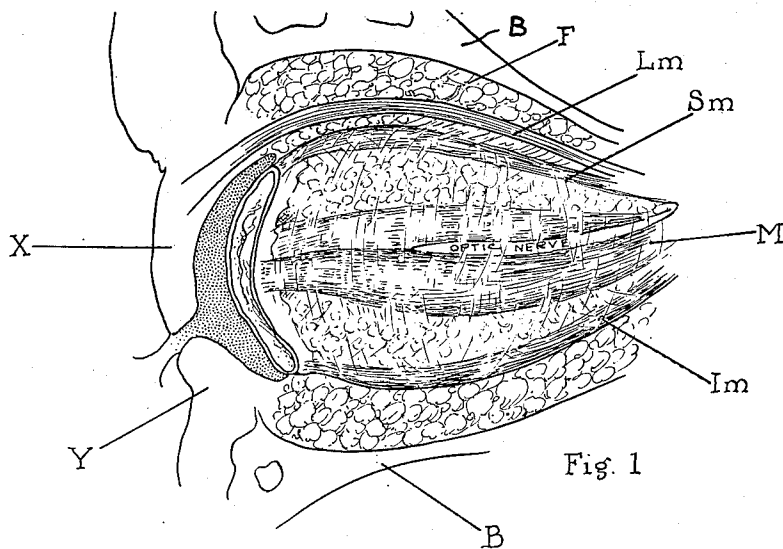
T. J. DIMITRY

2,322,117

ARTIFICIAL EYE

Filed April 18, 1942

2 Sheets-Sheet 1



INVENTOR.

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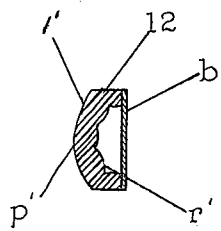
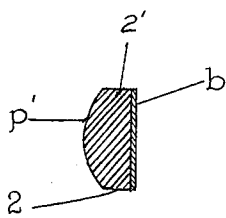
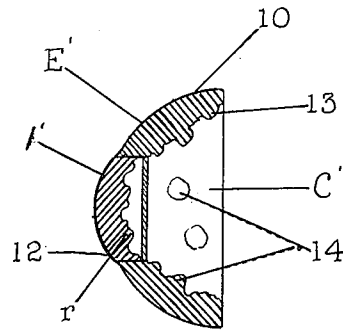
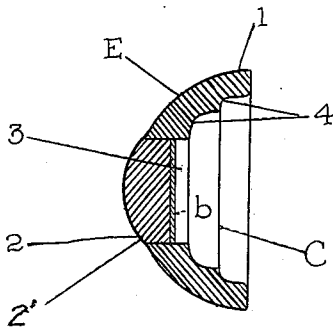
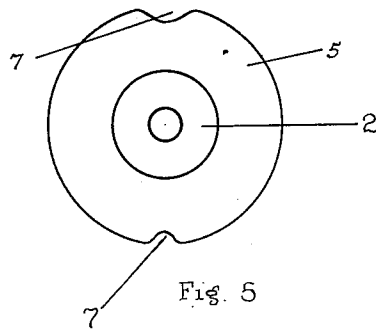
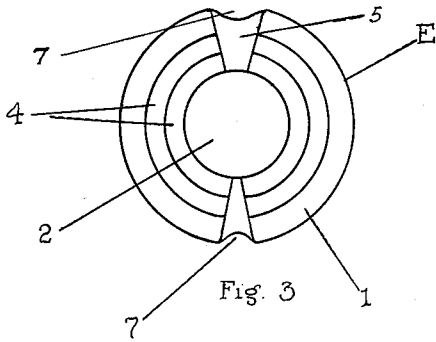
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,322,117

ARTIFICIAL EYE

Theodore J. Dimitry, New Orleans, La.

Application April 18, 1942, Serial No. 439,477

10 Claims. (Cl. 3—13)

My invention relates to artificial eyes.

Ever since anesthesia has permitted the development of skillful ophthalmic surgery and therefore enucleation of the eye and substitute operations for the same, the surgeon, the artisan, and the patient have sought a prosthesis, or as it is commonly called by the layman an artificial eye, that would not only match the remaining good eye but would move in harmony with it. Even after an eyeball has been removed the muscles that control the eye still live on and may be put to use to move an artificial eye. To avoid chances of infection being retained in the eye, it is considered the very best practice to remove the eyeball entirely. After the eyeball is removed, the ends of the muscles fold over one another and intergrow into a mass to fill the base of the void left by the removal of the eyeball. This intergrown, overlapping portion of eye muscles is an integral part of the eye muscles and is consequently under their control. This mass of intergrown muscles is moved by the eye muscles in unison with the motions of the good eye in the same manner that the eyeball was formerly moved.

An object of my invention is to provide an artificial eye in the nature of a cap adapted to cap intergrown muscle tissue and to take on the motion of such tissue. It is to be understood that while the best practice in ophthalmic surgery dictates the mounting of my artificial eye on the intergrown muscle tissue, variations of my artificial eye to adapt it to cap an eyeball or portion of the same is within the scope of my invention.

Another object of my invention is to provide an artificial eye in the nature of a cap that is designed to adhere directly to or be placed onto the muscle tissue or eyeball portion it is designed to cap.

Another object of my invention is to provide means in an artificial eye adapted to adhere to or be placed upon the muscle tissue or portion of eyeball it is designed to cap to prevent it from sliding over the muscle tissue or eyeball portion, as the case may be.

Another object of my invention is to provide a means in an artificial eye in the nature of a cap to prevent it from turning on the muscle tissue or portion of an eyeball to which it adheres or onto which it is placed.

Other objects and advantages of my invention will appear in the course of my detailed description of an artificial eye embodying my invention illustrated in the accompanying drawings forming part of my disclosure.

In the drawings:

Figure 1 is a cross sectional view of a human eye socket and a human eye organization of muscles and fatty tissues with the eyeball itself removed.

Figure 2 is a view in part cross section of the eye socket and eye organization of muscles and fatty tissues illustrated in Figure 1 showing my improved artificial eye mounted in the operating position on the muscle formation of the eye organization.

Figure 3 is a rear plan view of my artificial eye.

Figure 4 is a cross sectional view of the artificial eye illustrated in Figure 3.

Figure 5 is a front plan view of the artificial eye illustrated by Figure 3.

Figure 6 is a cross sectional view of a modification of the artificial eye illustrated in Figures 3, 4, and 5.

Figure 7 is a cross sectional view of the iris forming a part of the artificial eyes illustrated by Figures 3 to 5, and

Figure 8 is a cross sectional view of a modified form of the iris illustrated by Figure 7 that may be used in place of the iris illustrated by Figure 7 in the artificial eye constructions illustrated by Figures 3 to 5.

Referring to Figure 1 and Figure 2, B designates the skull bone that defines the eye socket which is filled by fatty tissue F and muscular tissues M. One of the muscles we are most interested in in this disclosure is the levator of the lid L_m leading to the upper eye lid X and lying over the superior rectus S_m over which a notched portion of my artificial eye E is shown to straddle, as see Figure 2. The lower notch of my artificial eye E straddles the companion muscle, inferior rectus I_m. The upper lid X presses down on the artificial eye E to keep it urged onto its footing, the intergrown muscle tissue M_t earlier described. The lower lid Y functions in a similar manner but to a less degree than the upper lid X. The anchoring features of my artificial eye E hereinafter described are sufficiently efficient to hold my artificial eye E onto the intergrown muscle tissue M_t to retain it on the same without assistance of the eyelids X and Y and sufficient to permit my artificial eye E to be moved under the pressure of the lids X and Y and against the friction drag of the lids X and Y on my artificial eye E.

My artificial eye E is comprised of two portions: the main body portion 1 simulating the white of the eye which is provided with a cavity C extending through the same, and the iris plug 2

adapted to fit into a bored extension of the cavity C. The bored portion of the cavity C left unfilled by the iris plug 2 will hereafter be referred to as the pit 3. The pit 3 serves as a space for excess eye tissues to extend into, as see Figure 2.

My anchoring features above mentioned are comprised of the peripheral groove formations 4 in the wall of the cavity C into which intergrown eye muscle tissue M_t forms to raise obstructions to prevent my artificial eye E from sliding off the muscle tissue M_t and the transverse groove 5 into which the intergrown muscle tissues M_t also form themselves to raise a transverse ridge to prevent my artificial eye E from revolving on the intergrown muscle tissue M_t encased in the cavity C of my artificial eye E. The notches 7 might also be included among the anchoring features of my artificial eye E. One of the notches 7 straddles the superior rectus S_m while the other notch 7 straddles the inferior rectus I_m . While these notches 7 provide room for these muscles, the superior rectus S_m and the inferior rectus I_m , to work through, the portions of the notches 7 contacting the sides of these muscles greatly assist the transverse groove 5 in preventing my artificial eye E from turning on the intergrown muscle tissue M_t .

In the modification of my artificial eye illustrated in Figure 6, 10 represents the main body portion of the eye, 12 designates the iris portion of the eye which is a modified iris illustrated in Figure 8. In this modification of my artificial eye, I rely upon a series of dimples 13 and pimples 14 formed in the wall of the cavity C' of my modified artificial eye E' as anchoring means for holding my artificial eye E' on the intergrown muscle tissue M_t . The intergrown muscle tissue M_t when my modified artificial eye E' is used will grow into the dimples 13 and around the pimples 14 to form obstructions to prevent the modified artificial eye E' from both sliding over and turning on the encased intergrown muscle tissue M_t . If desired, a transverse groove and notch construction of the kind designated by numerals 5 and 7 in my preferred embodiment of an artificial eye may be incorporated in the modified artificial eye E'. The modified iris plug 12 illustrated by Figure 8 has a lens 1' varying from the lens 1 of the plug 2 illustrated by Figure 7 in having a circular prism like recess r extended into its back for the purpose of shining reflected light through the pupil p' of the iris plug 12 to give the pupil p' a life like appearance. The color backing plate b' is the same as the color backing plate b of the iris plug 2. The color backing plates b and b' are to be decorated by painting or other methods of decoration known to the prior art of artificial eyes and kindred arts. It is to be understood that the modified iris plug 12 may be substituted for the iris plug 2 of the preferred embodiment E of my invention in artificial eyes and vice versa if desired without departing from the scope of my invention.

While all of the principles of my invention are not understood at the present time, I am of the opinion that the stickiness of the eye tissue M_t plays a part in holding on my artificial eye E or its modification E'. Due to the fact that the eye tissue M_t does not completely fill the pit, it is possible that a slight vacuum pull may be assisting to hold my artificial eye E or the modification E' in place. When either the eye E or the eye E' is forced down securely onto the muscle tissue M_t , as when the eye is bound up with bandages, the pit is almost completely filled with excess intergrown

muscle tissue M_t , a part of which recedes when the bandage is removed and creates a partial vacuum.

My artificial eye may be made out of glass and other vitreous substances in accordance with the prior art practices in making artificial eyes such as molding the eye into proper shape and the methods of blowing the eye in a form to give it the proper shape. I prefer, however, to make my artificial eye out of a plastic material for the reason that an artificial eye made out of a plastic material can be more easily decorated than the prior art glass eyes or their equivalents. I prefer to make my artificial eye out of a plastic material also for the reason that it may be slightly reshaped and carved to make it fit better in difficult cases.

Having thus described my invention, I claim:

1. An artificial eye in the nature of a cap simulating a spherical segment of an eyeball and provided with a cavity in its rear face into which eye tissue is adapted to snugly fit and hold the artificial eye away from the inner wall of an eye socket to permit the artificial eye to rotate in the socket, said cavity extending through an edge portion of the artificial eye on the vertical axis of the eye to form a notch in the periphery of the eye adapted to straddle an eyelid muscle, about which the eye may rotate.

2. An artificial eye in the nature of a cap provided with a cavity in its rear face into which eye tissue is adapted to snugly fit said cavity including a transverse groove adapted to prevent the artificial eye from turning on the eye tissue encased within the cavity, said cavity also including a circular groove to prevent the artificial eye from sliding over the eye tissue encased within this cavity.

3. An artificial eye in the nature of a cap simulating a spherical segment of an eyeball provided with a cavity in its rear face into which eye tissue is adapted to snugly fit and hold the artificial eye away from the inner wall of an eye socket to permit the artificial eye to rotate in the socket, said cavity extending through opposite portions of the edge of the artificial eye on the vertical axis of the eye to provide a pair of notches adapted to straddle eyelid muscles about which the eye may rotate to facilitate the anchoring of the artificial eye on the eye tissue it caps.

4. The device as claimed in claim 2 wherein the said transverse groove is extended through an edge portion of the artificial eye to form a notch in the edge of the artificial eye adapted to straddle an eye muscle to facilitate the anchoring of the artificial eye on the eye tissue it caps.

5. An artificial eye in the nature of a cap provided with a cavity in its rear face into which eye tissue is adapted to be formed, said cavity including circumferentially placed grooves adapted to prevent the artificial eye from sliding over the eye tissue formed in the cavity, said cavity terminating in a pit at its bottom into which excess eye tissue may extend.

6. The device as claimed in claim 5 wherein the said cavity includes a transversely extending groove communicating with the pit adapted to prevent the artificial eye from turning on the eye tissue formed in the cavity.

7. The device as claimed in claim 5 wherein the said cavity includes a transversely extending groove communicating with the said pit and extending through a portion of the edge of the artificial eye forming a notch in the edge of the said artificial eye which is adapted to straddle an

eye muscle to facilitate the anchoring of the artificial eye on the eye tissue formed in the said cavity.

8. An artificial eye in the nature of a cap provided with a cavity in its rear face into which eye tissue may be formed, said cavity including a pit at its bottom into which excess eye tissue may extend, said cavity including a transversely extending groove communicating with the pit and extending through an edge of the artificial eye to form a notch in the same adapted to straddle an eye muscle to facilitate the anchoring of the artificial eye on the eye tissue formed in its cavity.

9. An artificial eye in the nature of a cap provided with a cavity in its rear face into which eye tissue is adapted to snugly fit, said cavity including a circular groove formation adapted to prevent the artificial eye from sliding over the eye tissue encased within the cavity.

10. An artificial eye in the nature of a cap provided with a cavity in its rear face into which eye tissue is adapted to snugly fit, said cavity including a pit at its bottom into which excess eye tissue may extend.

THEODORE J. DIMITRY.