Feb. 18, 1936. C. R. ESSICK 2,031,530

MOUNTING FOR RIMLESS LENSES

Filed Oct. 19, 1933

Fig. 1.

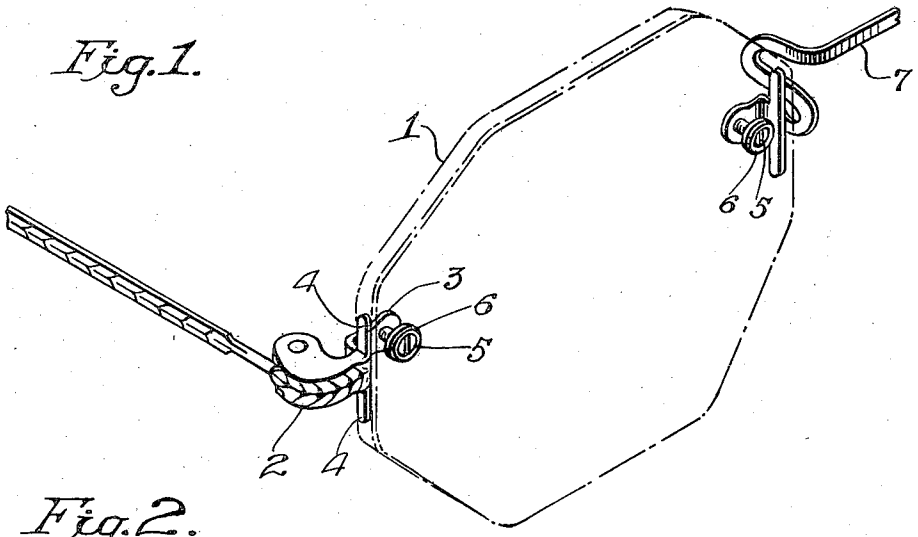


Fig. 2.

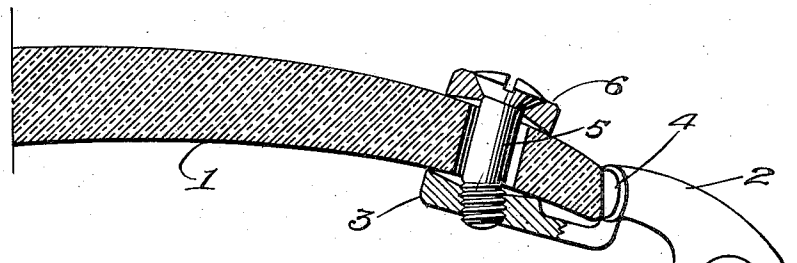
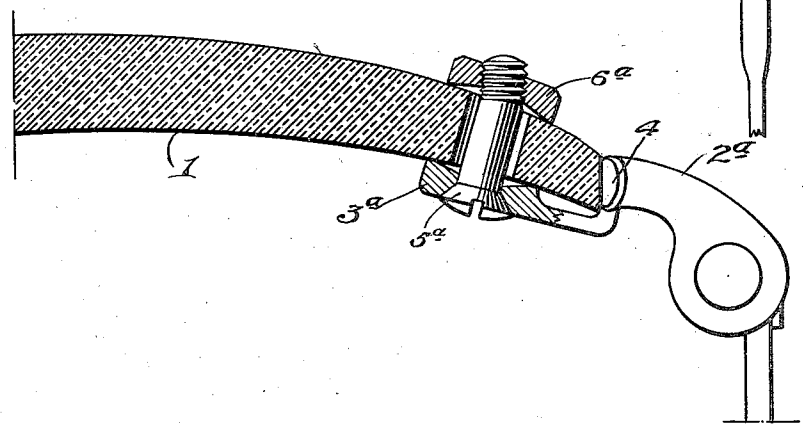


Fig. 3.



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MOUNTING FOR RIMLESS LENSES

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7 Claims. (Cl. 88—47)

This invention relates to improvements in mountings for ophthalmic lenses, and while applicable in principle to many types of mounting, the invention has a particular importance in relation to mountings of the rimless type.

While it has been recognized that the single-ear strap type of rimless mountings for ophthalmic lenses has material advantages over the double-ear strap type commonly used, the former type of mounting has never been found entirely practical for reasons hereinafter set forth, and a principal object of my invention is to provide novel means rendering this desirable type of mounting entirely practical.

To this general end, another object of the invention is to provide a mounting which shall be free from any tendency to loosen and which may be readily released to free the lens from the strap if necessity requires.

A further object of the invention is to provide an improved mounting permitting a firmer union between the strap and the lens than heretofore has been found practicable.

Still more specifically, an object of the invention is to provide a mounting employing a screw as the securing element wherein a materially heavier pressure may be applied to bind the strap to the lens than heretofore has been found practical without destruction of the screw or the lens, and wherein means is provided for positively preventing the screw from backing away or becoming loose with resultant development of play between the strap and the lens.

The invention further resides in certain structural features and details hereinafter described and illustrated in the attached drawing, in which:

Figure 1 is a view in perspective of a lens with a mounting made in accordance with my invention;

Fig. 2 is a sectional view showing a preferred form of mount, and

Fig. 3 is a view corresponding to that of Fig. 2 and illustrating a modification within the scope of the invention.

The single-ear strap rimless mounting has certain material commercial advantages over the double-ear strap mounting. One of these advantages arises from the fact that whereas different sizes of the double-ear mounting are required for lenses of different shapes and thicknesses, the single-ear mounting will fit substantially any lens, and whereas with the double-ear type it becomes necessary to maintain a relatively large stock of different sizes, this is unnecessary where the single-ear is employed. It has also been found impracticable to form the straps of the double-ear type integral with the end-piece of the mounting, so that a soldering operation is required, whereas it is entirely practicable to form the strap in the single-ear type integral with the end-piece, thereby avoiding the soldering operation. While these advantages have been well recognized in the industry, the single-ear type of mounting has never gone into extensive use owing to inability to maintain the necessary firm union between the lens and the strap. It has been proposed to form the lens-engaging faces of the clamping elements of the mounting concave to thereby relieve the lens at the edges of the drilled aperture through which the clamping screw extends of the heavy strains applied when the screw is tightened, but while this construction permitted an extremely firm union between the lens and mounting, there was a continual tendency for the screw to loosen, with the result that the commercial success of this type of mounting, in spite of its obvious advantages, has been very limited. Heretofore stability in this type of mounting has been obtainable only by riveting, which is undesirable by reason of the requirement for use of special tools in mounting the lens and when the lens must be detached. By the present invention, I have overcome all of these prior undesirable features of the single-ear rimless mounting and have rendered this highly desirable mounting generally available to the trade. My invention further constitutes a material improvement over the prior mountings of all types in that it makes possible a firmer union between the mounting and the lens than has heretofore been obtainable.

In Fig. 1 of the drawing, 1 is the lens of a spectacle and 2 is an end-piece having integrally formed therewith an ear 3 and including the usual strap arms 4, 4, which form a seat or an extended bearing for the edge of the lens. A screw 5 passes through an aperture in the lens and is threaded into a tapped hole in the ear 3 to clamp the end-piece 2 to the lens, and a washer 6 is interposed between the head of the screw 5 and the lens 1. Insofar as described, the mounting conforms in general to those heretofore proposed but not widely used by reason of inability to prevent loosening of the retaining screw.

In accordance with my invention and as illustrated in Fig. 2, I form the tapped hole in the ear 3 which receives the retaining screw 5 at an angle to the axis of the lens aperture and to the normal of the lens-engaging face of the ear, and preferably this angle is not less than 15°. I also preferably form the lens-engaging faces both of the

ear 3 and the washer 6 concave so that the points at which these elements engage the lens are remote from the edges of the aperture in the lens through which the screw 5 extends, thus preventing the exertion of pressure against the lens in the area immediately adjacent to the lens aperture. In applying this mounting, the straight screw is passed through the lens aperture and is entered into the oblique threaded opening in the ear 3, and is thereafter tightened in the usual manner. As the ear 3 and washer 6 are drawn against the surfaces of the lens and into the final positions in which they are illustrated in Fig. 2, that portion of the screw which enters the ear is bent from the line of the body of the screw and eventually assumes an angle with respect to the said body which corresponds substantially to the angularity of the threaded hole in the ear 3 with respect to that face of the ear which engages the lens. In practice I have found that the major bend in the screw 5 occurs substantially where the screw enters the ear.

This bending of the outer end of the screw does not interfere with the tightening operation and, in fact, makes possible a material increase in the pressure with which the lens may be clamped between the clamping elements. I have found in other words that a materially greater tightening force may be applied before the threads of the screw are stripped or the screw is otherwise damaged than was possible in the prior mountings of this general character, with the result that the joint between the strap and the lens is correspondingly more secure. The concave formation of the lens-engaging faces of the ear 3 and of the washer 6 makes possible a realization to the fullest extent of the advantages of my invention, in that they permit application of the increased clamping pressure upon the lens without danger of cracking the latter at the relatively weak points around the edges of the drilled aperture. When the tightening operation is completed, the bent end of the screw precludes any possibility of the screw loosening in the mounting, so that the extremely firm union between the strap and the lens is maintained unchanged. It will be noted further that this method of mounting does not interfere with removal of the strap from the lens by the usual method of backing out the screw 5. The same principle is applicable to the attachment of the bridge 7, as will be readily understood.

It will be apparent from the foregoing that my invention provides a mounting having in marked degree all the essential characteristics of a device of this character, and overcomes all the inherent disadvantages previously attached to the single ear type of strap illustrated. Also, the mounting, in the use of screws of standard form and material (which I have found entirely practicable), conforms to the present mounting methods, and while possessing material advantages over the latter, still retains all the advantages of the prior mountings as to simplicity of form and assembly and ready release if it becomes necessary to detach the strap from the lens. The device involves no additional expense of manufacture.

While I prefer to thread the screw as illustrated in Figs. 1 and 2 into the ear 3, I may without departure from the invention employ the reverse construction illustrated in Fig. 3 wherein the ear 3*a* of the end-piece 2*a* is formed for reception of the head of the screw 5*a*, a nut 6*a* corresponding to the washer 6 being provided for reception of the threaded end of the screw. The threaded opening of the nut 6*a* is formed in accordance with my invention on a line extending at an angle to that face of the nut which engages the lens whereby the screw 5 is distorted as previously set forth with the attendant beneficial results.

I claim:

1. An ophthalmic mounting having, in combination, a lens having two oppositely disposed faces an an aperture extending through the lens from one of the faces to the other face, two members between which the lens is received, one of the members having a face positioned adjacent to one of the lens faces and the other member having a face positioned adjacent to the other lens face, the members each being provided with an opening extending therethrough, the openings and the lens aperture being disposed along substantially a straight line, the opening in one of the members being substantially cylindrical and screw threaded, and a correspondingly substantially cylindrical, threaded post received in the openings and the lens aperture and being threaded in the threaded opening to secure the lens and the members together, the axis of the cylindrical, threaded opening being inclined at a substantial angle to the said straight line and to the normal to the said face of the member provided with the threaded opening, whereby the portion of the post threaded in the threaded opening is bent out of said line to prevent accidental turning movement of the post.

2. An ophthalmic mounting having, in combination, a lens having two oppositely disposed faces and an aperture extending through the lens from one of the faces to the other face, two members between which the lens is received, one of the members having a concave face positioned adjacent to one of the lens faces and the other member having a concave face positioned adjacent to the other lens face, the members each being provided with an opening extending therethrough at substantially the central portions of the concave faces, the openings and the lens aperture being disposed along substantially a straight line, the opening in one of the members being substantially cylindrical and screw threaded, and a correspondingly substantially cylindrical, threaded post received in the openings and the lens aperture and being threaded in the threaded opening to secure the lens and the members together, the axis of the cylindrical, threaded opening being inclined at a substantial angle to the said straight line and to the normal to the said face of the member provided with the threaded opening, whereby the portion of the post threaded in the threaded opening is bent out of the said line to prevent accidental turning movement of the post, and whereby the concave faces of the members prevent exertion of pressure against that area of the lens immediately adjacent the lens aperture.

3. An ophthalmic mounting having, in combination, a lens having two oppositely disposed faces and a substantially cylindrical aperture extending through the lens from one of the faces to the other face, two members between which the lens is received, one of the members having a face positioned adjacent to one of the lens faces and the other member having a face positioned adjacent to the other lens face, the members each being provided with an opening extending therethrough, the openings being disposed substantially along the axis of the cylindrical lens aperture, the opening in one of the mem-

bers being substantially cylindrical and screw threaded, and a correspondingly substantially cylindrical, threaded post received in the openings and the lens aperture and being threaded in the threaded opening to secure the lens and the members together, the axis of the cylindrical, threaded opening being inclined at a substantial angle to the axis of the cylindrical lens aperture and to the normal to the said face of the member provided with the threaded opening, whereby the portion of the post threaded in the threaded opening is bent away out of alinement with the axis of the cylindrical lens aperture to prevent accidental turning movement of the post.

4. An ophthalmic mounting having, in combination, a lens having two oppositely disposed faces and an aperture extending through the lens from one of the faces to the other face, two members between which the lens is received, one of the members comprising a lens strap having a lens seat and a single ear, and the other member comprising a washer, the edge of the lens being positioned adjacent to the seat, the ear having a face positioned adjacent to one of the lens faces and the washer having a face positioned adjacent to the other lens face, the ear and the washer each being provided with an opening extending therethrough, the openings and the lens aperture being disposed along substantially a straight line, one of the openings being substantially cylindrical and screw threaded, and a correspondingly substantially cylindrical, threaded post received in the openings and the lens aperture and being threaded in the threaded opening to secure the lens and the members together, the axis of the cylindrical, threaded opening being inclined at a substantial angle to the said straight line and to the normal to the said face of the member provided with the threaded opening, whereby the portion of the post threaded in the threaded opening is bent out of the said line to prevent accidental turning movement of the post.

5. An ophthalmic mounting having, in combination, a lens having two oppositely disposed faces and an aperture extending through the lens from one of the faces to the other face, a lens strap having a seat engaging the edge of the lens and an ear having a face positioned adjacent to one of the lens faces, the said ear being provided with an opening extending therethrough and said opening and the lens aperture being disposed along substantially a straight line, said opening being substantially cylindrical and screw threaded, and a correspondingly substantially cylindrical threaded post extending through said lens aperture and threaded into the opening in said ear to secure the lens and said member together, the axis of the cylindrical threaded opening being inclined at a substantial angle to the said straight line and to the normal to the said face of said ear whereby the portion of the post threaded in the threaded opening is bent out of said line to prevent accidental turning movement of the post.

6. An ophthalmic mounting having, in combination, a lens having two oppositely disposed faces and an aperture extending through the lens from one of the faces to the other face, two members between which the lens is received, one of the members comprising a lens strap having a face positioned adjacent to one of the lens faces, and the other member comprising a washer having a face positioned adjacent to the other lens face, the lens strap and the washer each being provided with an opening extending therethrough, the openings and the lens aperture being disposed along substantially a straight line, the opening in the washer being substantially cylindrical and screw-threaded, and a correspondingly substantially cylindrical threaded post extending through said strap and lens aperture and threaded into the opening in said washer to secure the lens and said members together, the axis of the cylindrical threaded opening in the washer being inclined at a substantial angle to the said straight line and to the normal to the said adjacent face of said washer, whereby the portion of the post threaded in the threaded opening in the washer is bent out of said line to prevent accidental turning movement of the post.

7. An ophthalmic mounting having, in combination, a lens having two oppositely disposed faces and an aperture extending through the lens from one of the faces to the other face, two members between which the lens is received, one of the members having a face positioned adjacent to one of the lens faces, and the other member having a face positioned adjacent to the other lens face, and one of said members being provided with a threaded opening extending therethrough and disposed on a substantially straight line with said lens aperture, and a correspondingly substantially cylindrical threaded post extending through said lens aperture and threaded into said opening to secure the lens and said members together, the axis of the said threaded opening being inclined at a substantial angle to the said straight line and to the normal to the said face of the member provided with the threaded opening whereby the portion of the post threaded in the threaded opening is bent out of said line to prevent accidental turning movement of the post.

CHARLES R. ESSICK.