Nov. 24, 1959 P. J. CADE ET AL 2,913,972

IRIS DIAPHRAGM

Filed May 2, 1955

FIG. 1

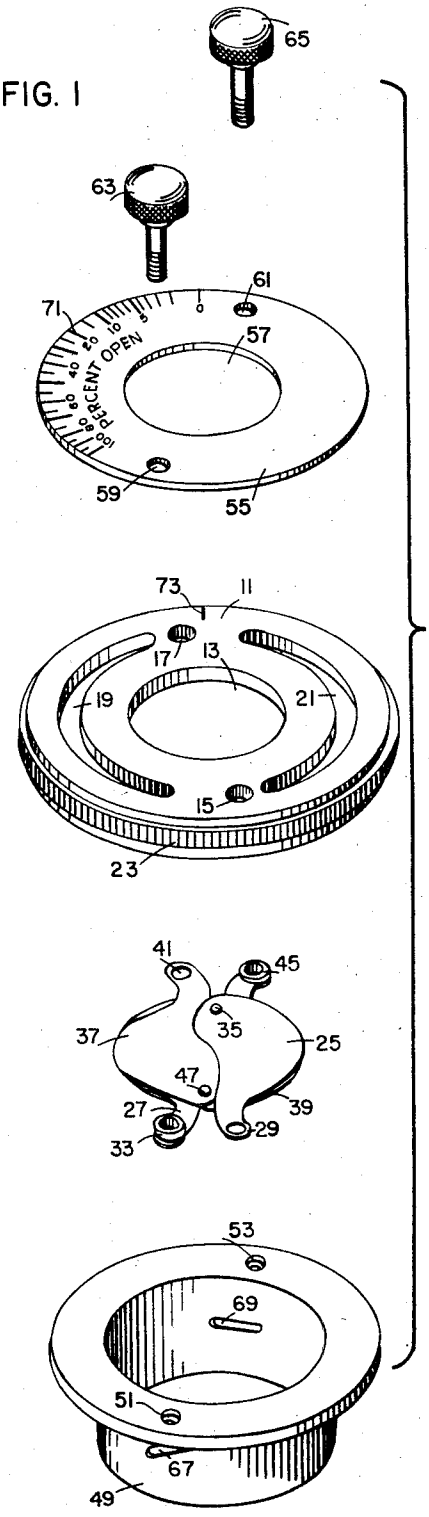


FIG. 2

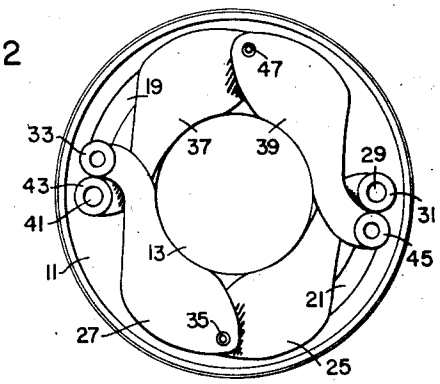


FIG. 3

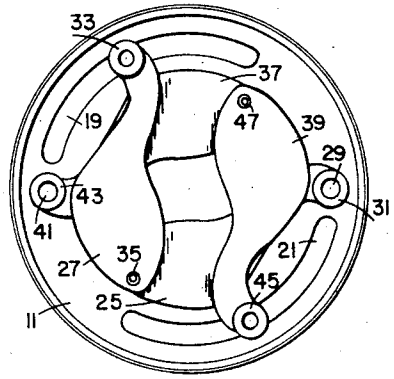


FIG. 4

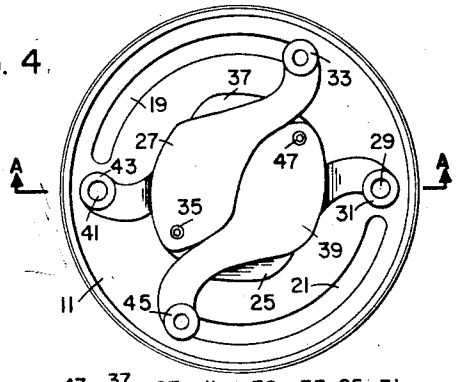
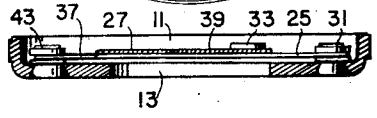


FIG. 5



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IRIS DIAPHRAGM

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3 Claims. (Cl. 95—64)

This invention relates to iris diaphragms. Iris diaphragms usually comprise thin opaque blades which can be moved by means of a ring so as to change the diameter of a central opening and thus regulate the aperture of an optical system.

It is the principal object of this invention to provide an iris diaphragm which is simple, rugged, and cheap to manufacture.

Other and incidental objects of the present invention will be apparent to those skilled in the art from a reading of the following specification and an inspection of the accompanying drawings in which:

Figure 1 is an exploded view of an assembly comprising an iris diaphragm in accordance with this invention;

Figure 2 is a view of an iris diaphragm in accordance with this invention, shown in the fully-open position;

Figure 3 is a view of an iris diaphragm in accordance with this invention, shown partly open;

Figure 4 is a view of an iris diaphragm in accordance with the present invention, shown in the closed position; and

Figure 5 is a sectional view along lines AA of the iris diaphragm of Figure 4.

Referring to Figure 1, the iris diaphragm assembly comprises a plate 11 having a central aperture 13 therein. Two diametrically opposed holes 15 and 17 and two diametrically opposed channels 19 and 21 are located near the periphery of plate 11 which is also provided with a knurled rim 23.

The iris diaphragm assembly of Figure 1 further comprises a first and a second pair of blades. The first pair comprises blades 25 and 27. One end of blade 25 has a hole 29 which is fixed into hole 15 of plate 11 by means of a hollow rivet 31. One end of blade 27 has affixed thereto a hollow rivet 33. The other ends of blades 25 and 27 are rotatably mounted together about a pin 35. The second pair comprises blades 37 and 39. One end of blade 37 has a hole 41 which is fixed into hole 17 of plate 11 by means of a hollow rivet 43. One end of blade 39 has affixed thereto a hollow rivet 45. The other end of blades 37 and 39 are rotatably mounted together about a pin 47.

The iris diaphragm assembly of Figure 1 also comprises a flanged base 49 which is provided with two threaded holes 51 and 53, an indexed plate 55 having a central aperture 57 and two holes 59 and 61, and two thumbscrews 63 and 65. To put together the iris diaphragm assembly of Figure 1, thumbscrew 63 is passed through hole 59, channel 19, hollow rivet 33, and hole 51; and thumbscrew 65 is passed through hole 61, channel 21, hollow rivet 45, and hole 53.

The aperture of the iris diaphragm is varied by the relative rotation of plate 11 and base 49. When this relative motion occurs, blades 25 and 37 rotate about an axis perpendicular to plate 11 and passing through holes 29 and 41 respectively; blades 27 and 39 rotate about an axis perpendicular to plate 11 and passing through pins 35 and 47 respectively; and the hollow rivets 33 and 45 (at the free ends of blades 27 and 39) move with respect to plate 11 along arcs delimited by the channels 19 and 21, respectively. Thumbscrews 63 and 65 keep rivets 33 and 45 diametrically opposed at all times.

The effect of the relative motions of plate 11 and base 49 is shown in Figures 2, 3, and 4, which show the iris diaphragm in the fully open, partially open, and closed positions. It can be seen that the opposite edges of blades 25 and 37 match to effect a closure. The same is true of the edges of blades 27 and 39.

The indexed plate 55 is provided with a scale 71. The position of the notch 73 (located on plate 11) on the scale 71 indicates percentage of opening. The thumbscrews 63 and 65 may be tightened when a constant opening of the diaphragm is desired, and loosened when the opening is to be changed.

The blades 25, 27, 37, and 39 are all identical in shape and may be punched out of sheet metal. These blades may, however, assume shapes other than that shown.

We claim:

1. An iris diaphragm comprising a plate having an aperture therein, two pairs of blades, each pair of blades comprising a first blade rotatably mounted near one end thereof about an axis which is perpendicular to said plate and which has a fixed position with respect to said plate, and a second blade rotatably mounted near one end thereof about another axis which is perpendicular to said plate and which goes through said first mentioned blade and is positioned near the other end thereof, the first blades of each of said pairs being positioned in a first plane and having edges which when juxtaposed form a closure of said aperture, the second blades of each of said pairs being positioned in a second plane parallel to said first plane and having edges which when juxtaposed form a closure of said aperture, and means for actuating said diaphragm to a closed position, said last-named means comprising means to move the other ends of said second blades with respect to said plate along a path such that the edges of said blades form a closure of said aperture.

2. An iris diaphragm according to claim 1 wherein said blades are identical in shape.

3. An iris diaphragm according to claim 1 wherein the axes having a fixed position with respect to said plate are diametrically opposed across said aperture.

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