A. WOLLENSAK.

IRIS DIAPHRAGM.

APPLICATION FILED OCT. 8, 1910.

985,311.

Patented Feb. 28, 1911.

Fig. 1.

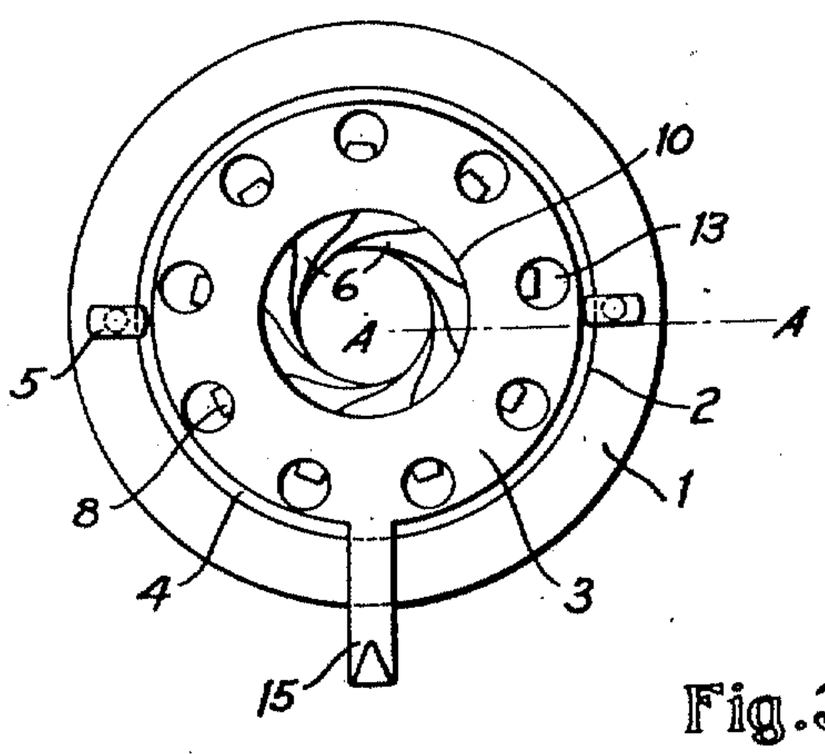


Fig. 2.

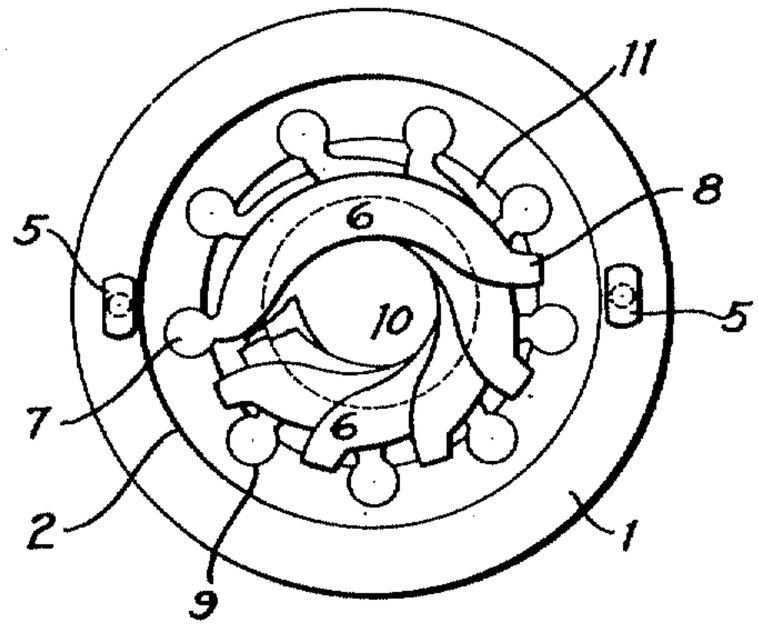


Fig. 3.

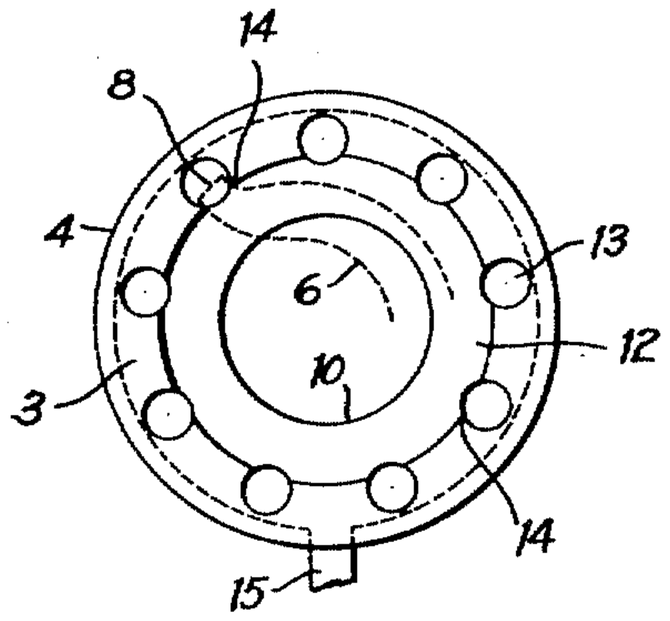
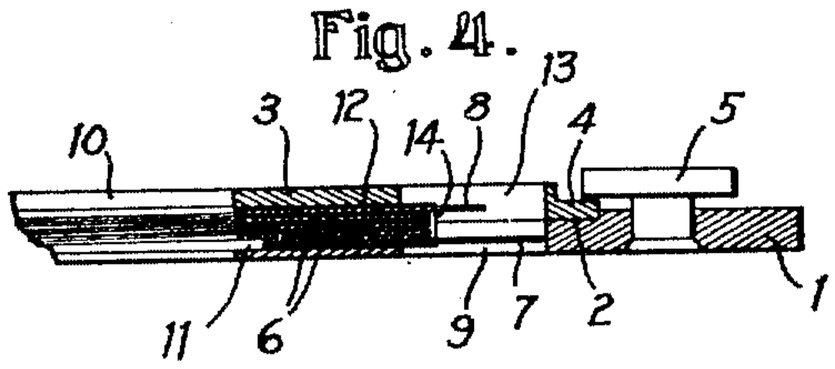


Fig. 4.



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UNITED STATES PATENT OFFICE.

ANDREW WOLLENSAK, OF ROCHESTER, NEW YORK, ASSIGNOR TO WOLLENSAK OPTICAL COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

IRIS-DIAPHRAGM.

985,311. Specification of Letters Patent. Patented Feb. 28, 1911.

Application filed October 8, 1910. Serial No. 586,036.

To all whom it may concern:

Be it known that I, ANDREW WOLLENSAK, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Iris-Diaphragms, of which the following is a specification.

This invention relates to diaphragms, such as are used in connection with cameras and other optical instruments, of the type in which a substantially-circular opening of variable size is produced by a series of overlapping thin blades, each blade being pivotally mounted, at one end, and being engaged, at the other end, by an annular rotary member by which all of the blades are swung simultaneously toward or from the center of the aperture.

In diaphragms of the construction above referred to, as heretofore constructed, each blade is provided at each end with a pivot-pin projecting laterally from the surface of the blade, and these pivot-pins are seated in holes or recesses in the two relatively-rotatable annular members by which the necessary movements are imparted to the blades. Owing to the overlapping position of the blades, and to the necessity for compactness in devices of this character, it is necessary to use very thin, flexible sheet-material for the blades, and consequently it is a matter of some difficulty and expense to secure the pivots to or from them on the blades, and, furthermore, this construction has the disadvantage that the pressure against the pivot-pins in opening and closing the diaphragm is not transmitted in the plane of the blades, so that the pivot-pins have a tendency to twist the blades.

The object of the present invention is to simplify and improve the iris diaphragm by the elimination from the blades of the pivot-pins, and of the disadvantages resulting from their use, and to this end the invention consists in a diaphragm in which the ends of the blades themselves are employed as elements of the connections between the blades and the annular actuating and supporting members, these ends having no lateral projections but being engaged by suitable abutments on the actuating members, said abutments being arranged to engage the blades in the planes of the blades, so as to have no twisting effect on the blades. In the preferred embodiment of the invention the ends of the blades are seated in suitably-formed recesses in the opposing faces of said members.

The construction of the preferred embodiment of the invention may be clearly understood by reference to the drawings forming part of this application, in which—

Figure 1 is a front-elevation of the complete diaphragm, with the blades partly open; Fig. 2 is a similar elevation with the annular actuating member removed; Fig. 3 is a rear elevation of the annular actuating member, detached from the stationary member; and Fig. 4 is an enlarged cross-section on the line A—A of Fig. 1, with the blades fully open.

The stationary member of the diaphragm is shown in the form of a circular disk 1, having a concentric recess 2 in its front face. This recess is adapted to receive the rotary actuating member 3, the latter being provided with an overhanging annular flange 4. Buttons or clips 5, 5, that are rotatably supported in the disk 1 (Fig. 4), afford convenient means for holding the disk 3 within the recess 2, which the clips are adapted to do when turned over the flange 4, as shown in Fig. 1, but when the clips are turned to the position indicated in Fig. 2, the actuating member 3 may be lifted free from the supporting member 1, exposing the iris blades 6.

The blades 6 are substantially crescent-shaped (Fig. 2), and are all of the same size. One end of each is in the form of a circular head 7, while at the opposite end 8 there is no projection whatever. The heads 7 rest in holes 9 that are spaced equidistant around the recess 2, and are sufficiently free in the holes 9 to permit the blades to be swung toward or from the center of the disk 1, thus covering or uncovering the aperture 10. The body portions of the blades 6 lie within the space formed by a recess 11 in the front of the disk 1, and a similar recess 12 in the back of the actuating disk 3.

A series of circular holes 13 in the disk 3 constitute sockets to receive the plain ends 8 on the blades 6. These holes are so placed as to intersect the periphery of the recess 12, thus forming shoulders 14 that engage the ends 8 when the disk 3 is rotated, and

so swing the blades upon the heads 7, which serve as pivots. A lever or arm 15 of the usual form, secured to the disk 3, is indicated as a convenient means for actuating it.

I claim:—

1. An iris diaphragm comprising two concentric, relatively-rotative annular members, one of said members being provided with circular series of sockets, and a series of overlapping blades, each blade being an integral piece of thin, flat, sheet material without lateral projections, pivotally connected with said member by having one end seated in one of said sockets, the other rotative member being provided with means for engaging said blades to swing them about their pivots.

2. An iris diaphragm comprising two concentric, relatively-rotative annular members provided with circular series of sockets in their opposing faces, and a series of overlapping blades, each blade being an integral piece of thin, flat, sheet material without lateral projections, and having one end seated in a socket in one of said members and its other end seated in a socket in the other of said members.

3. An iris diaphragm comprising two concentric, relatively-rotative annular members provided with circular series of shallow, radially-extending sockets in their contiguous faces, and a series of flat overlapping blades, each blade having one end seated in a socket in one of said members and its other end seated in the socket in the other of said members.

4. An iris diaphragm comprising an annular member having, on its inner face, a series of sockets, each socket comprising a narrow neck and a wider portion radially outside of the neck, a series of overlapping flat blades, each having one end in the form of an enlarged head seated in one of said sockets and rotative therein, whereby said blades are pivotally connected with said member and held against radial movement, and a second annular member concentric with the first annular member and connected therewith, with provision for relative rotation of said members, the second annular member being connected with an end of each blade, so as to swing the blades about their pivotal connections when said members are relatively rotated.

5. An iris diaphragm comprising a series of overlapping blades, each blade consisting of an integral piece of thin, flat, sheet material without lateral projections; and two concentric, relatively-rotative annular members provided with abutments engaging the blades at their ends and in the planes of the blades so as to swing the blades without twisting action thereon.

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