No. 750,237. PATENTED JAN. 19, 1904.

E. BAUSCH & G. HOMMEL.

IRIS DIAPHRAGM.

APPLICATION FILED JUNE 18, 1903.

NO MODEL.

Fig. 1.

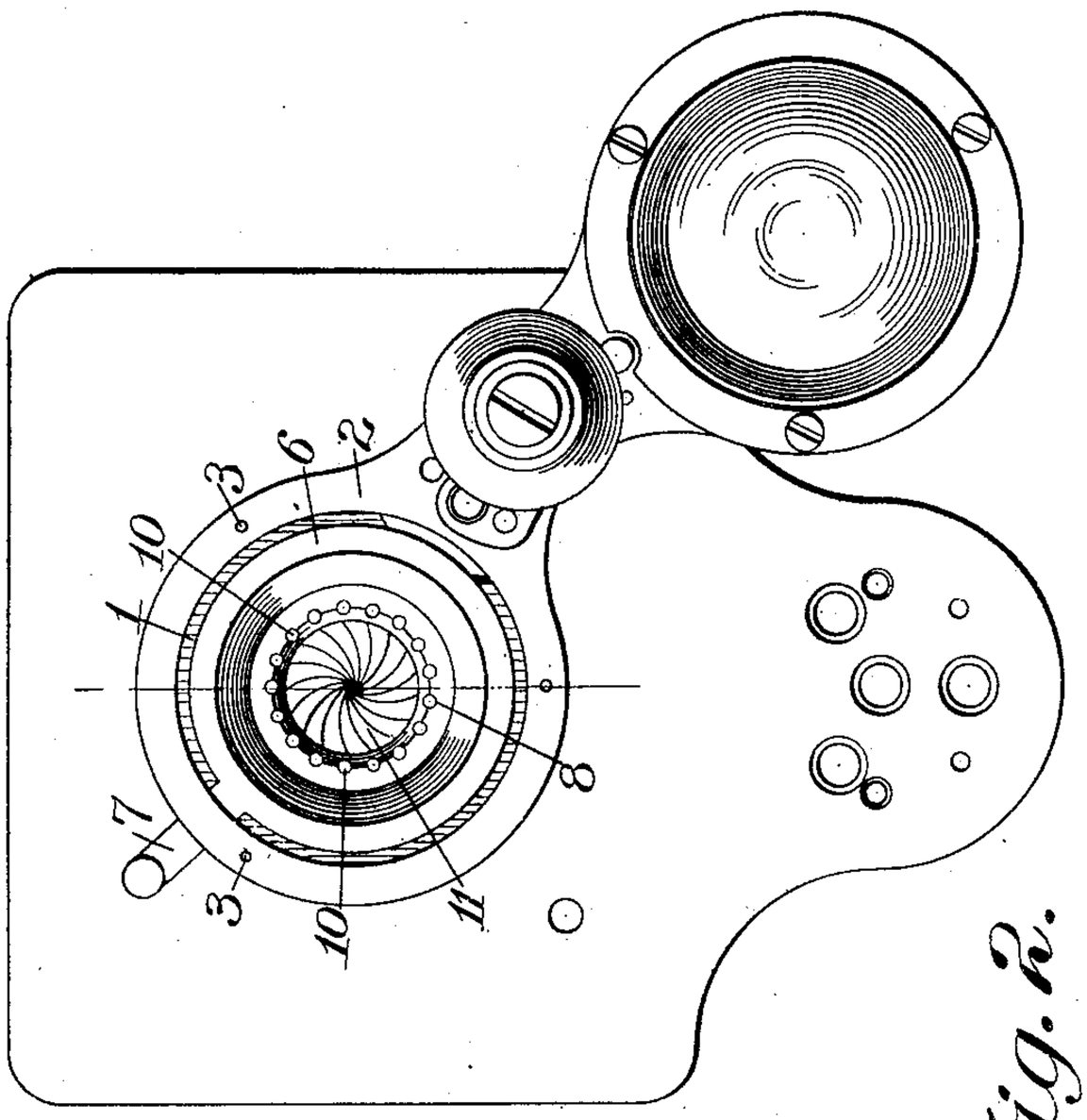


Fig. 2.

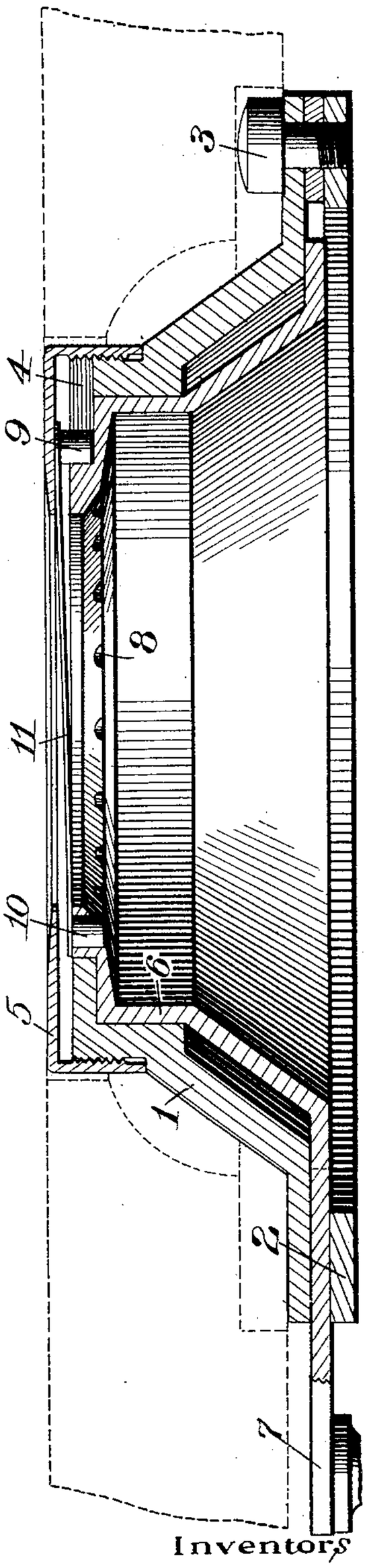
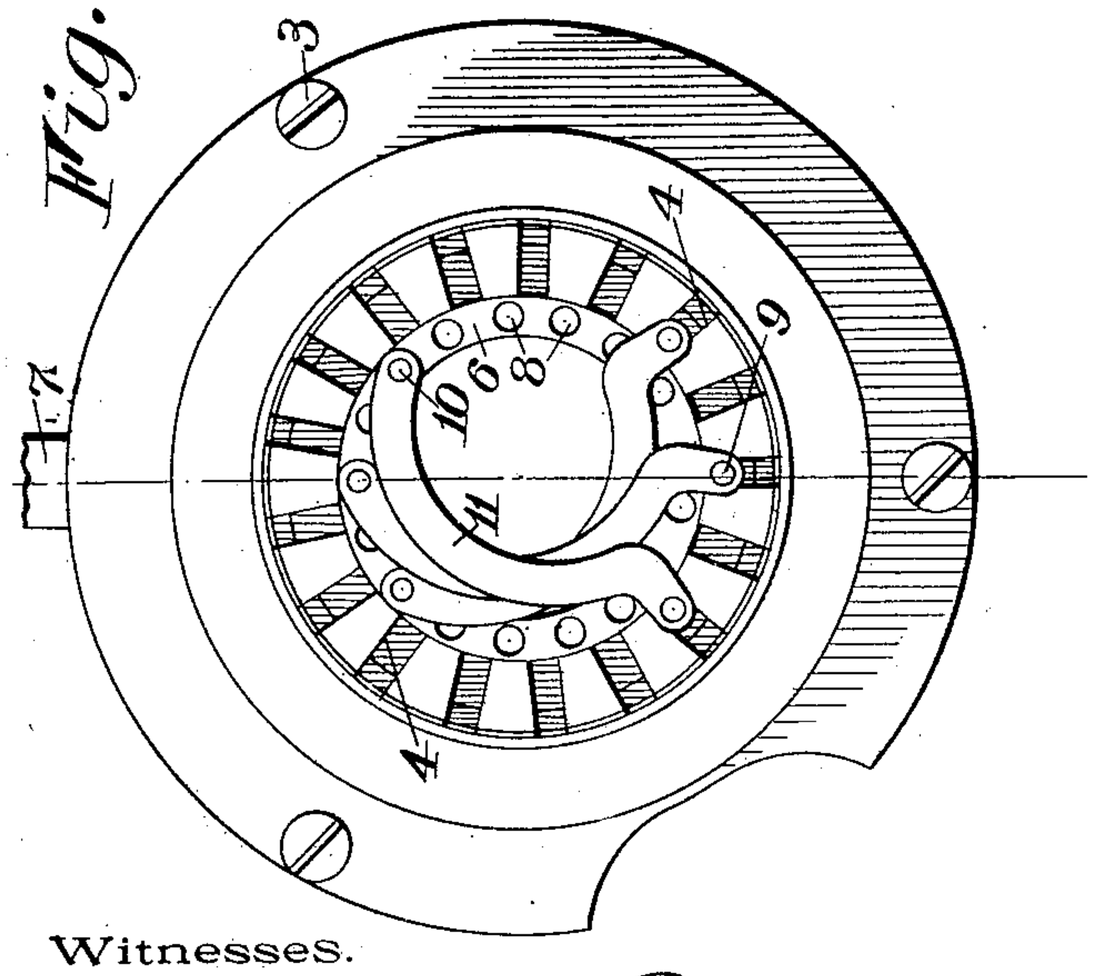


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

EDWARD BAUSCH AND GEORGE HOMMEL, OF ROCHESTER, NEW YORK, ASSIGNORS TO BAUSCH & LOMB OPTICAL COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

IRIS-DIAPHRAGM.

SPECIFICATION forming part of Letters Patent No. 750,237, dated January 19, 1904.

Original application filed December 3, 1900, Serial No. 38,415. Divided and this application filed June 18, 1903. Serial No. 162,089. (No model.)

To all whom it may concern:

Be it known that we, EDWARD BAUSCH and GEORGE HOMMEL, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Iris-Diaphragms; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

Our present invention relates to iris-diaphragms particularly adapted for use as a substage attachment for microscopes such as shown in our application filed December 3, 1900, Serial No. 38,415, of which this is a division, but which diaphragms are capable of use in other connections—as, for instance, in photographic cameras.

The invention has for its objects to provide a device the parts of which are readily made and assembled and are not liable to be displaced by pressure upon the blades—as, for instance, by the engagement of the objective of a microscope.

To these and other ends the invention consists in certain improvements hereinafter described, the novel features being pointed out particularly in the claims at the end of this specification.

In the drawings, Figure 1 is a bottom plan view of a diaphragm embodying our invention applied beneath the stage of a microscope. Fig. 2 is an enlarged sectional view, and Fig. 3 a top plan view with the covering or cap removed.

Similar reference-numerals in the three figures indicate similar parts.

A diaphragm constructed in accordance with our invention embodies an outer ring-plate 1, suitably secured to a support 2, forming a part of a microscope-substage, as by screws 3, having its upper portion provided with the radial slots 4 and its upper exterior portion provided with screw-threads for the engagement of corresponding threads upon a flange on the cover plate or ring 5. Operating within the ring 1 is another ring 6, having at its lower portion the lateral extension or handle 7 and its inner upper portion, which extends in substantially the same horizontal plane as the upper portion of the ring 1, provided with apertures 8, corresponding in number and relative arrangement with the slots 4. The diaphragm plates or leaves 11 are formed of thin material curved, as shown in Fig. 3, and having upon their lower sides and at opposite ends the projecting pins or studs 9 and 10, the former adapted to engage the slots 4 in the ring 1 and the latter the apertures 8 in the ring 6, said leaves being held down with their pins in engagement with the parts by the cap or cover 5. It will be understood that by rotating the ring 6 the diaphragm-leaves may be opened and closed at the center in the usual manner. The principal object of this construction aside from its simplicity is that the movement of the ends of the leaves toward the center is limited, so that there is no possibility of causing a disengagement of the pins on the leaves by a pressure upon said leaves between their ends—as, for instance, by moving the objective of the microscope below the stage when the diaphragm is in uppermost position and with the leaves closed, as in this instance the inner sides of the pins 9 on the leaves will engage the outer edge of the top of the ring 6, preventing the withdrawal of said pins from their slots 4, and the pins 10, being confined within the apertures 8, would of course be prevented from inward movement. Another feature of this construction is that by forming the slots 4 in the extreme upper end of the stationary ring-plate 1 and the latter being a relatively large piece the part may be readily steadied during the formation of the slots therein by suitable machinery.

This diaphragm, while particularly adapted for the substages of microscopes, can be well used for other purposes, and we do not, therefore, desire to be confined to its use in connection with a microscope.

We claim as our invention—

1. In a diaphragm, the combination of the

outer ring-frame having the radial slots therein, the relatively movable rotary ring arranged inside the ring-frame having the apertures therein, and the overlapping leaves or blades having the pins at opposite ends and on the same side or face entering the slots and apertures respectively.

2. In a diaphragm, the combination of the outer ring-frame having the radial slots therein, the relatively movable rotary ring arranged inside the ring-frame having the apertures therein, the overlapping leaves or blades having the pins at opposite ends and on the same side or face entering the slots and apertures respectively, and the ring cover-plate secured upon the outer ring-frame and extending over the ends of the blades or leaves.

3. In a diaphragm, the combination of the threaded ring-frame having the radial slots in its upper end open at both ends, the inner ring rotarily movable relatively to the outer ring-frame and having the apertures therein, the overlapping leaves or blades having the pins at opposite ends projecting from the same side or face and adapted to enter the slots and apertures respectively, and the cover-ring extending over the top and outer ends of the slots and having the threaded portions engaging the ring-frame.

4. In a diaphragm, the combination with the relatively movable rings, one having the radial slots closed at both ends and the other having apertures, of the blades or leaves having the pins projecting from opposite ends of the same side or face of the blades and entering the slots and recesses respectively in the rings.

5. In a diaphragm, the combination with the relatively movable rings one having the radial slots on one face or edge and the other extending across the inner ends of the slots and having the apertures, of the overlapping blades or leaves having the pins projecting from opposite ends of the same faces or sides of the leaves and operating in the slots and apertures respectively.

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Witnesses:
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