-273

Search Room

April 6, 1948. O. J. ZANDER 2,439,330

SIGNAL AND SEARCHLIGHT SHUTTER

Filed July 1, 1947 2 Sheets-Sheet 1

T 2569

Fig. 1.

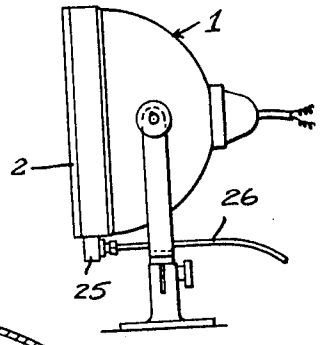


Fig. 2.

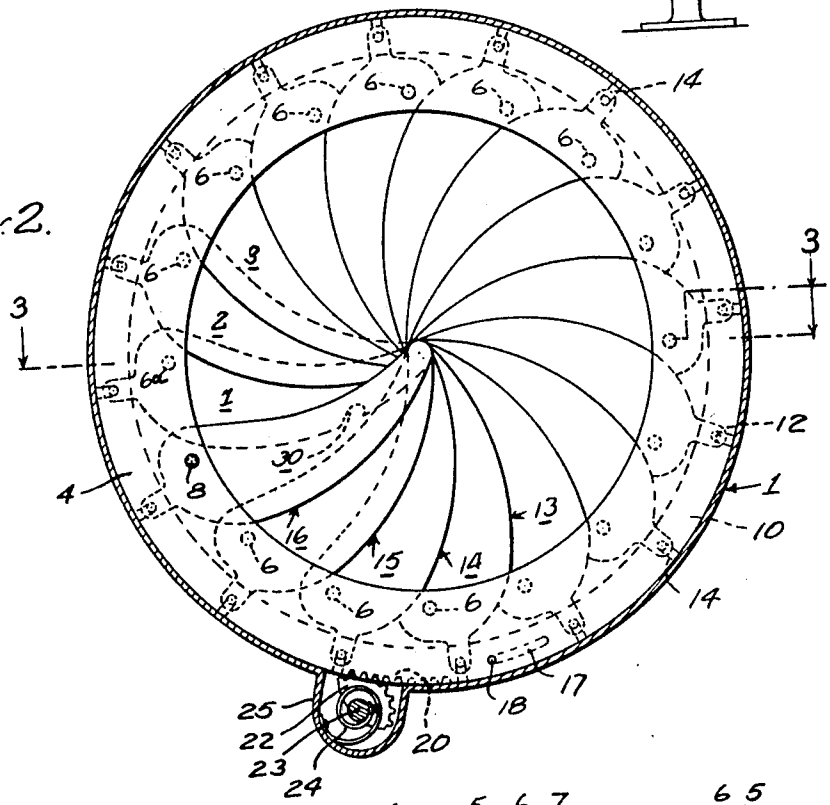
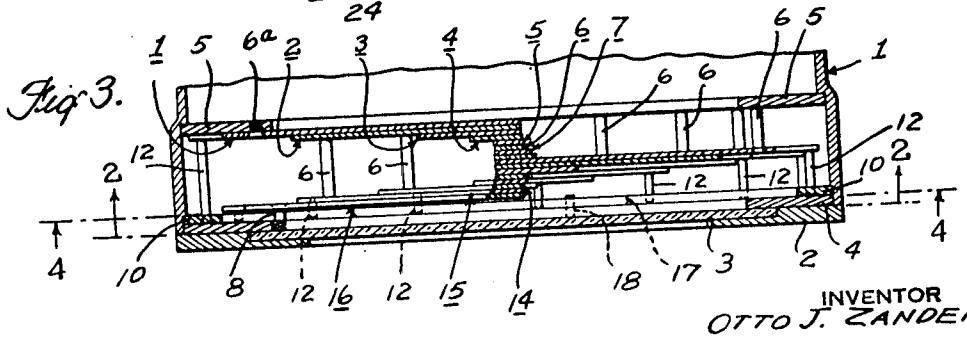


Fig. 3.



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Fig. 4.

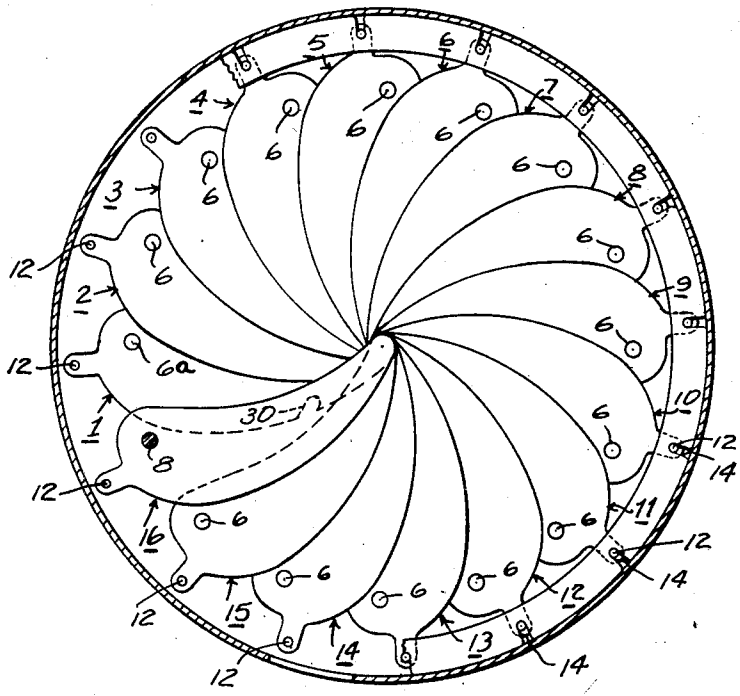
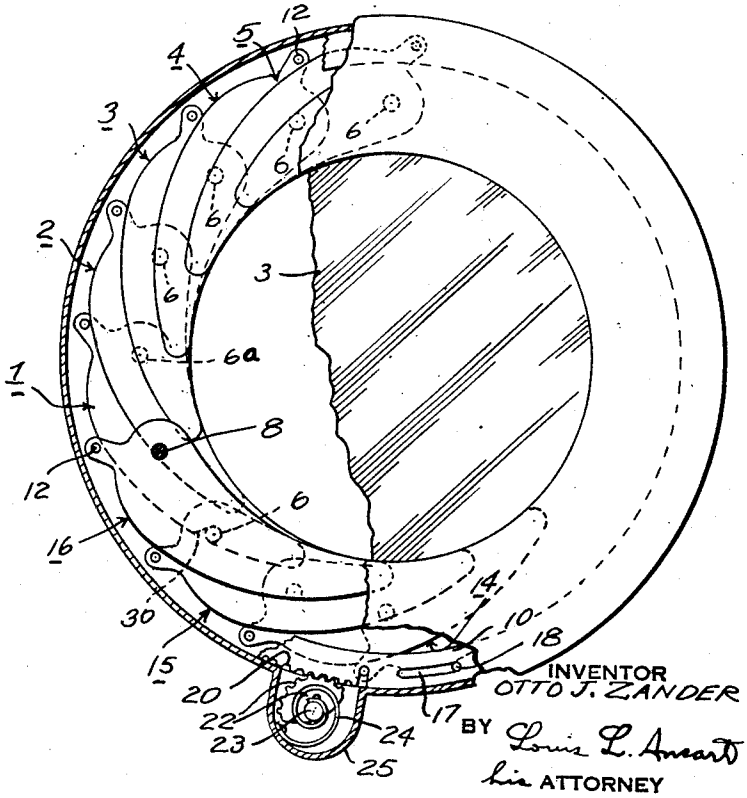


Fig. 5.



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SIGNAL AND SEARCHLIGHT SHUTTER

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Substituted for abandoned application Serial No. 490,287, June 10, 1943. This application July 1, 1947, Serial No. 758,344

4 Claims. (Cl. 177—329)

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The present invention relates to a signal and searchlight shutter construction and more particularly to searchlights of relatively large size. This application is a substitute of my prior abandoned application Ser. No. 490,287, filed June 10, 1943.

An object of the invention is to so arrange the shutter that there will be no obstruction to the light beams by the operating mechanism of the shutter itself. In searchlight signalling shutters with which I am aware, it has been customary to use a shutter generally known as the Venetian blind type. In such a shutter, however, there is considerable obscuration of light due to the fact that the shutters, even though in open position, interfere somewhat with the light beams and the operating mechanism also contributes to this end.

The present invention provides a shutter which may be completely closed, or opened to any desired extent, and in which nothing in connection with the shutter operating means interferes in any way with the light beams.

Shutters such as are used in cameras and known generally as iris diaphragm shutters are not suitable for signalling because a shutter of this type cannot be closed completely.

According to the present invention, the vanes or blades composing the shutter each move in its own plane towards the center of the aperture to be closed. The first vane overlaps the one next adjacent. The second overlaps the third and moves in a plane between the planes of movement of the first and third vane. The last vane of the series, however, moves in a plane outside the plane of movement of all the rest. That is to say, the last vane overlaps the vanes adjacent thereto and does not pass under any.

In the drawings which show one embodiment of the invention:

Fig. 1 is a side elevation showing a searchlight in which the invention may be embodied;

Fig. 2 is a section on line 2—2, Fig. 3, and on a much larger scale than Fig. 1;

Fig. 3 is a section on line 3—3 of Fig. 2;

Fig. 4 is a section on line 4—4, Fig. 3; and

Fig. 5 is a view similar to Fig. 4 but showing the vane in open position.

Referring to the drawings, the searchlight itself may be of any known construction and includes an apertured casing 1 having an apertured front plate 2 and a glass plate 3 (Fig. 3). Just back of the plate 2 is an apertured plate 4 and spaced from this plate is a similar plate 5. The plates 4 and 5 support the vanes of which

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16 are shown in the present embodiment of the invention.

The vanes are arranged in a circular series and the first three vanes are numbered *1*, *2* and *3*; the last three are numbered *14*, *15* and *16*. In order that the numbers applied to the vanes may not be confused with reference characters applied to other parts, the vane numbers are italicized. Each of the vanes *1* to *15* is pivotally supported in the plate 5. The pivots 6 which support vanes *2* to *15* are each rigidly connected with each vane as by welding or by other suitable means, and pivotally supported in plate 5. The pivot 6*a* for vane *1* is fixed in plate 5.

As shown in Figs. 2 and 3, the vane *1* is nearest the plate 5 and may oscillate on its fixed pivot 6*a* from the position shown in Fig. 5 to the position shown in Fig. 4 in which latter position all of the vanes have been moved to the center of the aperture in the casing, thereby completely closing said aperture.

All of the vanes move in their own planes as they are swung from open to closed position and vice versa.

Vane No. *2* swings in the plane between the planes of movement of vanes *1* and *3*. Also, vane *15* moves in a plane between vanes *14* and *16*.

Vane *16* is pivoted to plate 4 as clearly shown in Fig. 3 and moves in a plane outside of all of the other vanes and overlaps vane *15* and vane *1*. The pivot for vane *16* is indicated by the reference character 8. It should be noted that pivots 6*a*, 6 and 8 are arranged in a circle at regular intervals.

All of the vanes are swung about their pivots by means of a ring 10 shown in section in Fig. 3 and in dotted lines in Fig. 1. This ring is between plates 4 and 5 and is mounted for oscillating movement within the casing 1. Pins 12 connect each vane to the ring 10, the ring being slotted at points 14 to receive the pins 12 and permit inward and outward movement in the slots due to the different radii of curvature. The pins 12 decrease in length from vane *1* to vane *16*.

The ring 10 is also slotted at 17, Fig. 2, and a pin 18 secured in plate 4 engages in the slot 17 to limit the movement of the ring 10.

The ring 10 may be moved in any suitable manner and as herein disclosed is provided with a number of peripheral teeth 20, Fig. 2, engaged by a toothed sector 22 secured to a shaft 23. A spring 24 has one end thereof secured to a housing 25 and normally tends to rotate the sector 22 in a clockwise direction thereby tending to move the ring 10 to the position shown in Fig. 2

whereby all of the vanes are in closed position. The shaft **23** may be rotated in an anti-clockwise direction against the action of the spring **24** to move the vanes to open position which position is shown in Fig. 5. In Fig. 1, a flexible shaft **26** is shown and such shaft is suitably connected to the shaft **23**. Any other suitable means of course may be provided for moving the shaft **23**.

Since the pivots **6** for all of the vanes *2* to *15* are pivotally connected to the plate **5**, and vary in length in accordance with the distances of the corresponding vanes from plate **5**, the pivots **6** do not interfere with the free movement of the vanes from closed to open position.

In the case of the pivot **8** for the vane *16*, however, since this pivot is secured in the plate **4**, there is also no interference by this pivot with any of the vanes. The pivot **6**, however, for the vane *15* would interfere with the free movement of the vane *1* unless provision were made to prevent such interference. Therefore, the vane *1* is provided with a small recess **30** which permits the full movement of the vane *1* without interference by the pivot **6** of the vane *15*.

With the construction above described it is apparent that the vanes when occupying the position shown in Fig. 2, completely close the aperture and when moved to the position shown in Fig. 5 give an unobstructed passage for the light which is situated in the back of the casing. The shutter, therefore, consisting of a series of vanes as herein disclosed is entirely free from any parts that would interfere with the free passage of the light beams when the vanes are swung towards open position.

Variations may be resorted to within the scope of the invention without departing from the spirit thereof.

What is claimed is:

1. A signal and searchlight shutter comprising a casing having parallel front and rear plates with aligned circular apertures, a plurality of flat vanes pivotally mounted at points spaced at regular intervals around said casing and close to the edges of said circular apertures, the rearmost vane being pivoted on said rear plate, the foremost vane being pivoted on the front plate, pivot pins mounted at their rear ends to turn in the rear plate and gradually increasing in length from the second to the next to last by increments corresponding to the thickness of a vane, all of such vanes being fixed on the forward ends of said pins and each overlapping the vane to the rear, the vane pivoted on the front plate overlying the front vane on a pin, and means for actuating said vanes to closed and open positions.

2. A signal and searchlight shutter comprising a casing having parallel front and rear plates with aligned circular apertures, a plurality of flat vanes pivotally mounted at points spaced at regular intervals around said casing and adjacent the edges of said circular apertures, the rearmost vane being pivoted on said rear plate, the foremost vane being pivoted on the front plate, the pivotal mountings of said vanes between the first and the last including members projecting from the plate and increasing in length for successive vanes to hold such vanes at the proper positions from rear to front with respect to each other, and means for actuating the vanes to closed and open positions.

3. A signal and searchlight shutter comprising a casing having parallel front and rear plates with aligned circular apertures, a plurality of flat vanes pivotally mounted at points spaced at regular intervals around said casing and adjacent the edges of said circular apertures, the rearmost vane being pivoted on said rear plate, the foremost vane being pivoted on the front plate, the pivotal mountings of said vanes between the first and the last including members projecting from the rear plate and increasing in length for successive vanes to hold such vanes at the proper positions from rear to front with respect to each other, and means for actuating the vanes to closed and open positions including a ring at the rear of the front plate provided with radial slots arranged at regular intervals and of the same number as said vanes, and pins of different but suitable lengths projecting from the outer ends of said vanes into said radial slots.

4. A signal and searchlight shutter comprising a casing having parallel front and rear plates with aligned circular apertures, a plurality of flat vanes pivotally mounted at points spaced at regular intervals around said casing and adjacent the edges of said circular apertures, the rearmost vane being pivoted on said rear plate, the foremost vane being pivoted on the front plate, the pivotal mountings of said vanes between the first and the last including members projecting from the rear plate and increasing in length for successive vanes to hold such vanes at the proper positions from rear to front with respect to each other, and means for actuating the vanes to closed and open positions including a ring in a plane parallel to those of the front and rear plates and having slots corresponding in position to said vanes and pins projecting from the outer ends of said vanes into said slots.

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