Feb. 11, 1936. J. VILLALOBOS 2,030,234

BLIND

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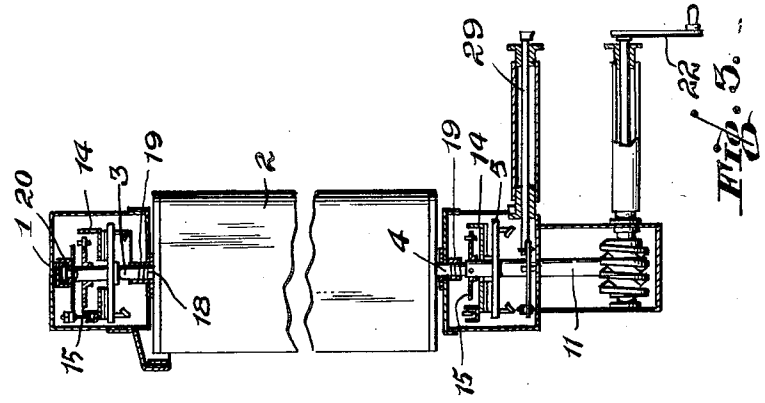


Fig. 5.

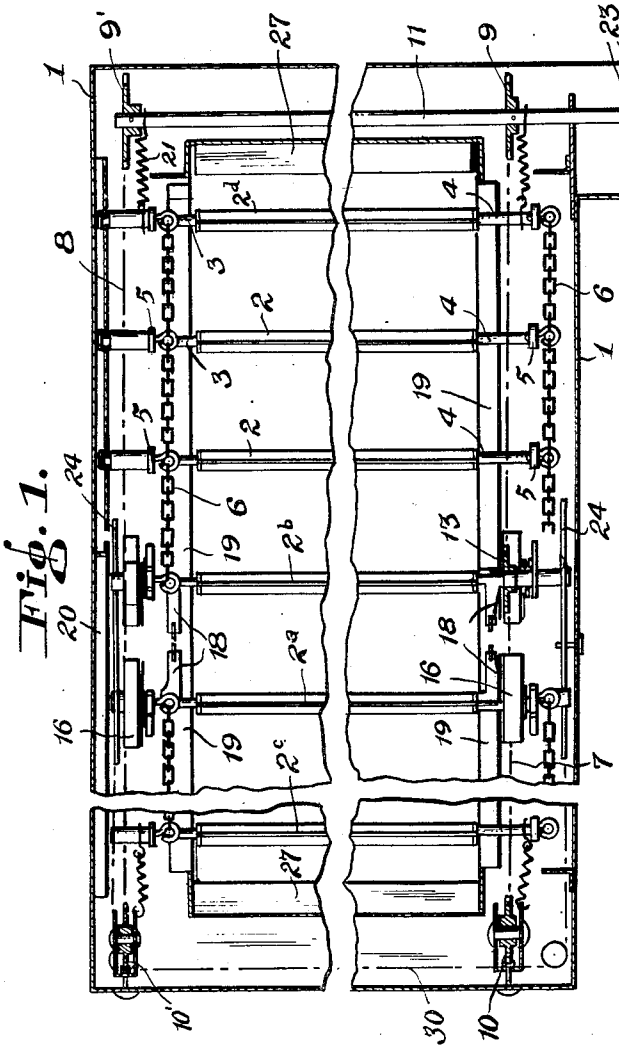


Fig. 1.

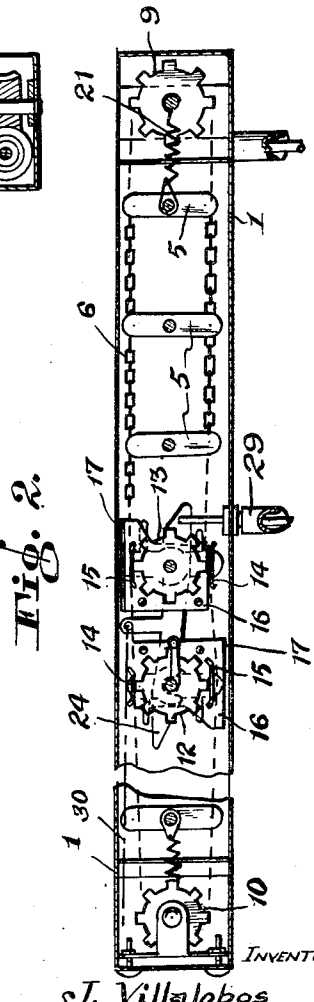


Fig. 2.

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Fig. 4.

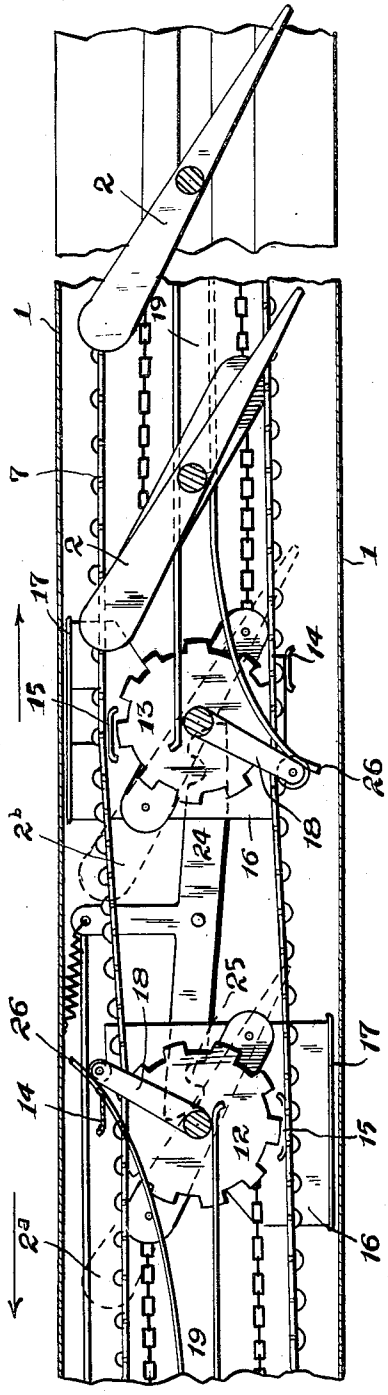
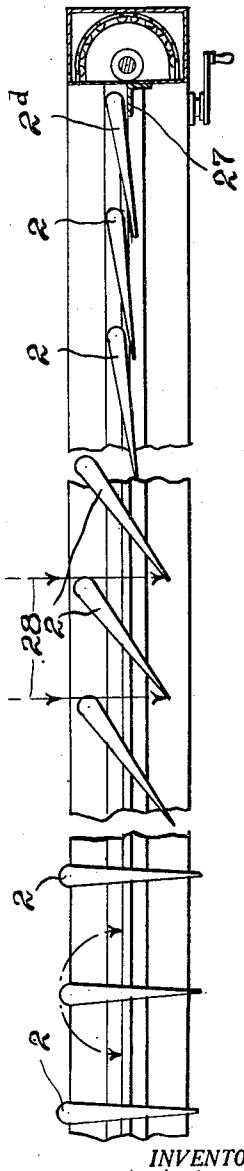



Fig. 5.




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# UNITED STATES PATENT OFFICE

2,030,234

## BLIND

Julio Villalobos, Buenos Aires, Argentina

Application May 25, 1934, Serial No. 727,554

9 Claims. (Cl. 156—17)

This invention relates to a new type of blind, and has for its main object the provision of a rigid blind having vertical leaves arranged in such a manner that all of said leaves may rotate together each about its own axis, in order to graduate at will the passage of direct sun rays entering according to the vertical planes thereof, or the degree of diffused light, thus enabling a change in the internal illumination of the premises, from full light to darkness.

Due to the rigidness of the leaves, the new type of blind also constitutes an efficient protection grating.

This type of blind is provided with a mechanism which, apart from the rotation of the leaves, produces the movement thereof in halves, either towards the sides of the window, to open the blind-grating or towards the center of the window to close same, both motions of rotation and translation being operated by the same crank-handle.

This mechanism also allows the installation of the blind grating on the outside of a window, the operation thereof being effected from the inside the room, without necessitating the opening of the interposed glass windows.

This invention also contemplates other objects which will become apparent from the following specification and will be particularly pointed out in the appended claims.

In order that the invention may be clearly understood and easily carried into practice, same has been illustrated by way of example and in a preferred embodiment in the accompanying drawings, wherein:—

Figure 1 is a partial longitudinal section of the new type of blind according to the present invention.

Figure 2 is a partial plan view thereof.

Figure 3 is a partial cross-section of same.

Figure 4 shows a detail of the mechanism for the movement of the conducting leaves; and

Figure 5 illustrates said leaves in different positions.

The same reference characters indicate like or corresponding parts or elements throughout the different drawings.

With reference to Figure 1, the new type of blind-grating of the present invention comprises a frame 1 formed by a continuous hollow box which maintains the leaves 2 in alignment and from which they are suspended; said leaves 2 are mounted in such a manner that they may slide laterally and, when extended, remain equidistant and in spaced relation so as to rotate on their respective axes.

As will be seen in Figures 1 and 3, and in the sections of Figures 4 and 5, the leaves 2 of the blind assume, in section, an essentially wedge shaped profile, for the purpose of allowing, for a given thickness, the passage of the largest possible amount of light and permit maximum visibility from the interior of the room, without producing shadows, and without sacrificing the rigidness of the leaves.

Each of the leaves 2 is suspended by an upper pivot 3, which also permits the rotation and translation thereof, and is provided with a lower pivot 4 for the rotation and translation of same, both pivots being provided with crossheads 5 and corresponding pivots being joined to each other by means of small chains 6. The central leaves 2(*a*) and 2(*b*) operate as conductors or leaders of the left and right halves, respectively, of the leaves forming the blind-grating, carrying them symmetrically towards the center of said blind or else to the respective sides.

The mechanical device for operating the blind is housed and protected within the frame 1, said device comprising two endless transmission chains 7 and 8, forming two like and parallel circuits, which extend between the corresponding pairs of gears 9—9′ and 10—10′. The former gears are mounted on the actuating axle 11.

The lower chain 7 moves the toothed wheels 12 and 13 mounted respectively on the axles of the leaves 2(*a*) and 2(*b*) in opposite directions. Each of these wheels engages the chain on one side only, by means of the clamp 14; on the opposite sides of said wheels, engagement is prevented by the guides 15 mounted in alternate positions on horizontal plates 16. It will also be seen in Figure 4 that said plates 16 are mounted freely on the axles of the respective leaves, but in their normal positions they cannot rotate due to the rectilinear guides 17, and are only able to slide in a longitudinal direction. Also, the leaves 2(*a*) and 2(*b*) carry, fixed on the axles thereof, skids 18 which, in turn, slide on slides 19 (see also Figure 1).

As will be readily understood, when the chain 7 is actuated the rotation of the toothed wheels 12 and 13 is prevented by the skid 18, but they may be moved along the slides 19, said chain exerting a traction effort on the teeth meshed in front of the clamps 14. As the gears corresponding to the leaves 2(*a*) and 2(*b*) are meshed with the chains on alternate sides, the translation of said leaves is effected in opposite directions.

The suspension pivots of the conducting leaves 2(*a*) and 2(*b*) as well as the remaining leaves, present each a small recess which receives the edges of the bevelled support 20. On the other hand, said leaves 2(*a*) and 2(*b*) when moved produce a similar movement of the remaining leaves through the chains 6 joining the cross-heads 5 fixed on the ends of each leaf. In turn, the two end leaves 2(*c*) and 2(*d*) of the sides are held in position by small springs 21.

The displacement for the opening and closing of the leaves is effected by a crank 22 which actuates the worm-and-wheel gearing 23, the wheel being fixed to the rotation axle 11. Said worm-and-wheel gearing shown as located at the lower end of the axle and housed in a box attached to the frame, may be adapted to some other part of said axle, depending on whether the blind is applied to doors, windows or other types of openings.

When the leaves have been moved towards the center through the total extension thereof, the conducting leaves 2(*a*) and 2(*b*) are held by the upper and lower hooks 24, which are provided with grooves 25 forming a catch and bearing for the pivots of said leaves. In this position, the skids 18 are free to rotate in a semicircle, since the slides 19 are spaced in the central portion of the frame, and present alternate curvings 26 (see Figure 4). The skids 18 abut in these curvings 26 each time traction is exerted on the wheels by the chain in the direction for gathering the leaves towards the sides. Due to the skids 18 being compelled to rotate and slide, maintaining their fulcrum against said curvings of the slides, they will cause the rotation of the leaves, to which they are fixedly joined, in such a manner that said leaves are placed in a position, relatively transverse to the slides, before the translation movement begins. Figure 1 shows a position of the system, immediately after the pivots have left their catches in the hooks. Upon then actuating the crank 22 in a direction opposite to the previous one, the conducting leaves 2(*a*) and 2(*b*) turn towards the center, carrying in the same manner the remaining leaves, which remain extended and equidistant when the conducting leaves 2(*a*) and 2(*b*) reach their respective catches in the hooks, wherein they are maintained in tension by the springs 21.

The simultaneous rotary movement of all the leaves, once they are extended, is effected through the same transmission chains 7 and 8.

The pivots 3 and 4 of the leaves being held by the hooks 24, and the skids 18 remaining free to rotate in a semi-circle, the transmission chains 7 and 8 will allow the gears 12 and 13 to be rotated; the extent of this rotation is determined by the fact that the width of the leaves is greater than the distance separating them say, one fourth greater; after the end leaves 2(*c*) and 2(*d*) abut against the blades 27 (see Figure 5) the leaves remain in a plane row. The main object of the greater width of the leaves over the distance separating the leaves is to be able to leave sufficient opening for the passage of reflected light, but stopping the sun's rays 28, even when these fall in a plane perpendicular to the window. This excess in width also serves to enable a complete closing of the window, as shown on the right-hand side of Figure 5, for the purpose of darkening the room or to obtain greater protection against the access of persons, projectiles, against storms, etc.

It is obvious that the rotary movement of the conducting leaves is transmitted to the other leaves, by means of the chains 6 joining them to each other, as already stated.

Completing the device, a pull knob 29 is shown in Figures 2 and 3, for the purpose of unlocking the lower hook 24, the same effect being transmitted to the upper hook by means of the cable 30. Said pull knob may also be placed far away from the lower hook and be actuated, in such case, by a cable and sheave or also by a lever.

This new type of blind of vertical rotary leaves is applicable to any type of window or door, and may be easily operated from the inside of the room, to take advantage of the maximum degree of diffused light and even graduate same at will, also excluding the passage of direct sun rays. On the other hand, due to the features thereof, it constitutes an element of protection and also may be entirely shifted, leaving the opening of the door or window to which it is applied completely open.

What is claimed is:—

1. A new type of blind characterized in that it is constituted by two series of rigid opaque leaves mounted in a rotary manner and in vertical position, said blinds being provided with a device operated from the interior to rotate and move said leaves.

2. A new type of blind according to claim 1 characterized in that the device for the operation of the leaves thereof comprises two series of endless transmission chains mounted in parallel relationship for actuating each series of leaves, toothed wheels mounted above and below the central leaf of each series, whereby the chains mesh with the toothed wheels and cause the rotation and shifting of each series of leaves, and a single crank for actuating said transmission chains.

3. A new type of blind according to claim 1 characterized in that the device for rotating and shifting the leaves thereof comprises two series of endless transmission chains mounted in parallel relationship, and includes plates disposed above and beneath the central leaves, each of said plates including a clamp and a guard member, toothed wheels mounted above and below the central leaf of each series, said clamps insuring on one side the meshing of said endless transmission chains with the toothed wheels, and said guard member preventing the meshing of the transmission chains and the toothed wheels on the opposite side, and guiding means provided on said plates for holding said plates in position.

4. A new type of blind according to claim 1 characterized in that skids are provided on the lower ends of the central leaves and slides for operating with said skids, whereby the leaves are maintained in their transversal position during displacement thereof.

5. A new type of blind according to claim 1 characterized in that a catch device is provided between the series of leaves, said catch device being provided with grooves which retain the leaves in a fixed position after displacement thereof but permit the free rotation of leaves about their vertical axes.

6. A blind of the character described including two sections, each composed of a series of vertically disposed leaves mounted for oscillatory movement, and flexibly connected together and normally disposed in nested relation on opposite sides of a window and transversely thereof, and a single means for actuating the two sections whereby to simultaneously move the same into

an extended position and to also rotate the leaves about their vertical axes so that the leaves lie substantially parallel to the window.

7. A blind as claimed in claim 6, wherein a catch device is provided for releasably retaining the sections in an extended position and at the same time allowing rotary movement of the leaves.

8. A blind as claimed in claim 6, wherein a catch device is provided for releasably retaining the sections in an extended position and at the same time allowing rotary movement of the leaves, and manually operable means for releasing the catch device when it is desired to move the sections to a nested position.

9. A new type of blind characterized in that it is constituted by two series of rigid opaque leaves mounted in a rotary manner and in vertical position on windows, doors and the like, and externally of their glass portions, said blinds being provided with a device operated from the interior to rotate and move said leaves.

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