July 30, 1940. L. G. BROWN 2,209,384

EXTERIOR VENETIAN BLIND

Filed Sept. 6, 1938 2 Sheets-Sheet 1

Fig. 1.

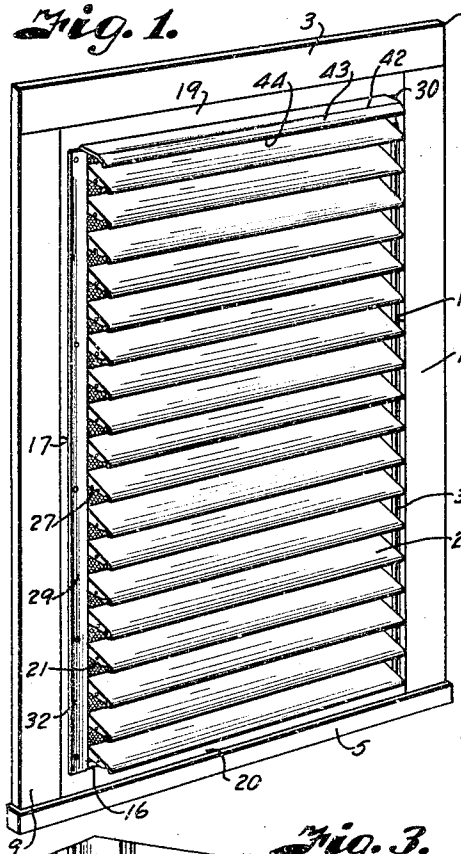


Fig. 2.

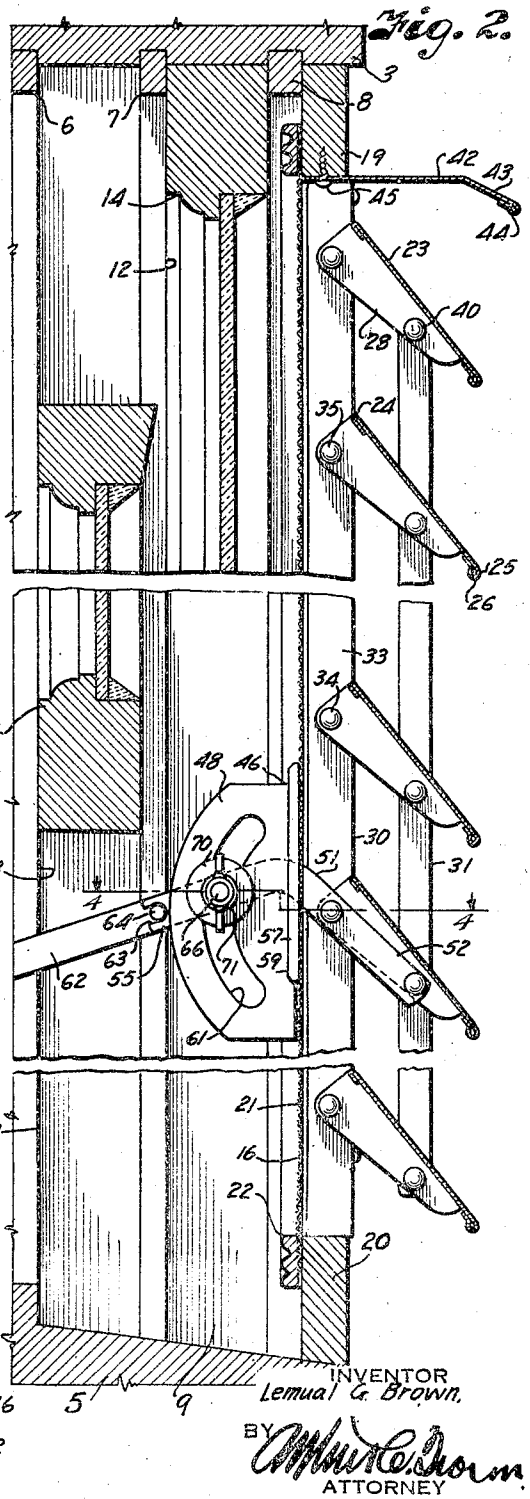
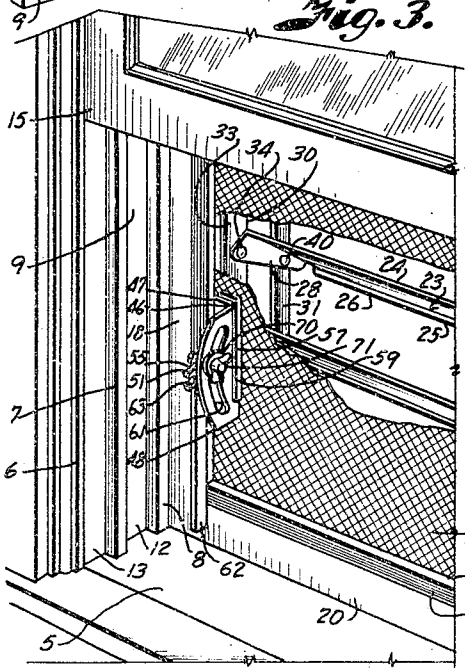


Fig. 3.



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Filed Sept. 6, 1938 2 Sheets-Sheet 2

Fig. 4.

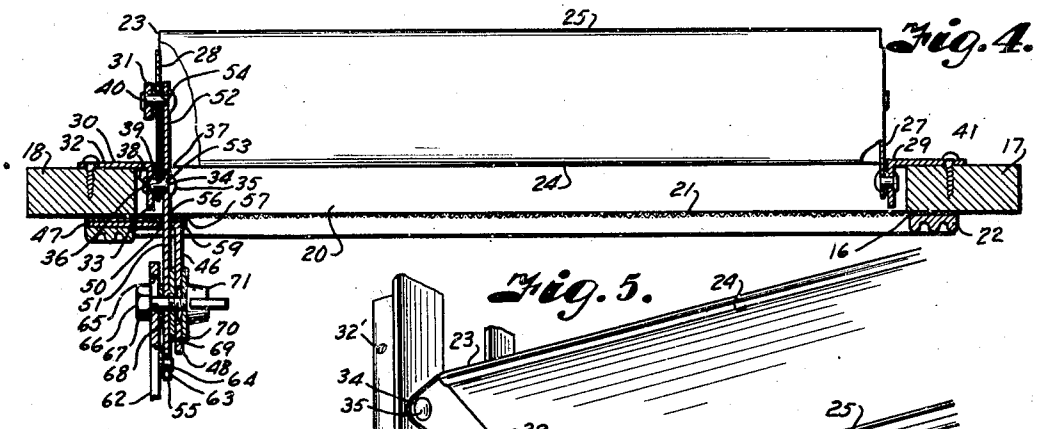


Fig. 5.

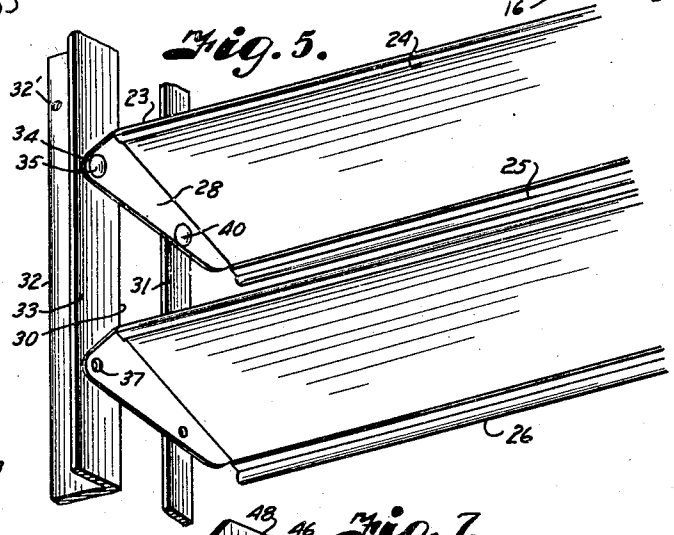


Fig. 6.

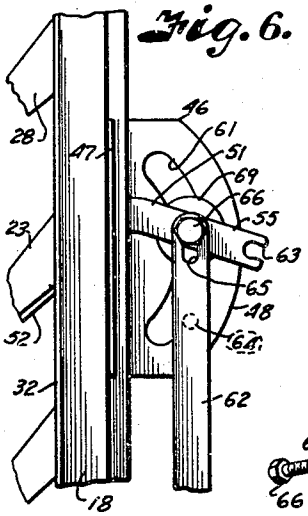


Fig. 7.

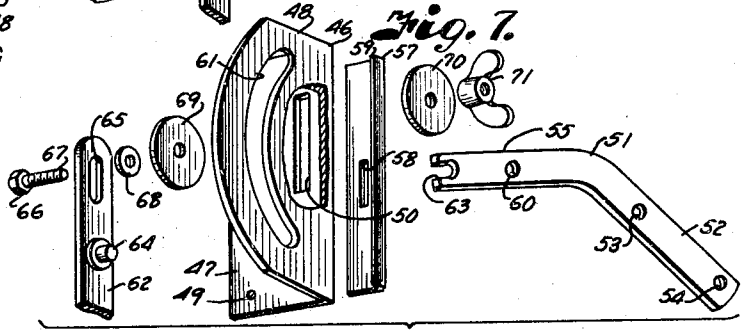


Fig. 8.

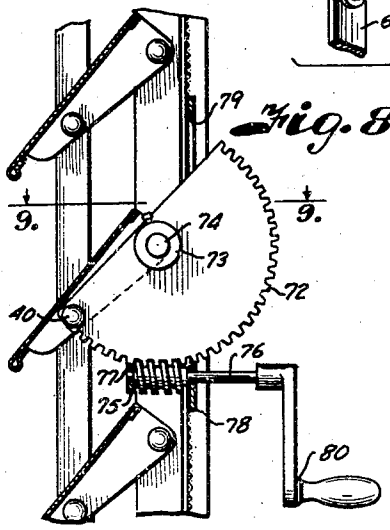
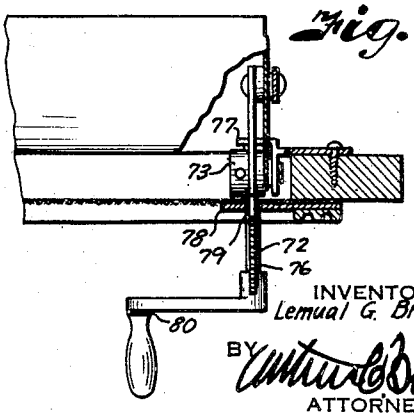


Fig. 9.



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Patented July 30, 1940 2,209,384

UNITED STATES PATENT OFFICE

2,209,384

EXTERIOR VENETIAN BLIND

Lemual G. Brown, Oklahoma City, Okla., assignor to Pioneer Manufacturing Company, Oklahoma City, Okla., a corporation of Oklahoma

Application September 6, 1938, Serial No. 228,529

4 Claims. (Cl. 189—62)

This invention relates to Venetian blinds particularly adapted for mounting on the exterior side of a window. It is known that blinds when so mounted reflect heat of the sun away from the window and that the interior of the room may be kept cooler without excluding the light and ventilation, however, such mounting of Venetian blinds has not been popular because of lack of installation space, interference thereof with the usual window-screens, inconvenience of window washing, annoyances caused by rattling and banging thereof in the wind, insecure mounting methods, difficult and inefficient lever control mechanisms, and many other reasons.

The principal objects of the present invention are, therefore, to provide an exterior Venetian blind especially contrived to overcome these difficulties and which is easily and securely installed as a unit within the frame of a window-screen; to provide a louver control mechanism that securely and efficiently retains the louvers in adjusted position without interference of the window-sash and which is easily operated from the interior side of the screen; and to provide a control mechanism that cannot be operated from the outer side of the building.

A further object of the invention is to provide a window-blind structure equipped with a mounting that compensates for variation in size and any off-alignment or out of squareness of the window-screen frame.

In accomplishing these and other objects of the invention, as hereinafter described, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of the exterior side of a window equipped with a Venetian blind structure embodying the features of the present invention.

Fig. 2 is a vertical section through the window and the Venetian blind structure showing the operating lever extension for the louver control mechanism in functional position.

Fig. 3 is a fragmentary perspective view from the interior side of the window showing the extension lever out of operative position to clear the window-sash, a portion of the wire screening being broken away to show the louvers.

Fig. 4 is a horizontal section through the window-screen and Venetian blind structure on the line 4—4 of Fig. 2.

Fig. 5 is a detail fragmentary view of one end of adjacent louvers and their mounting strip by which they are attached to the stiles of a window-screen.

Fig. 6 is an enlarged fragmentary detail view of the louver control mechanism showing the operating lever in inoperative position.

Fig. 7 is a detail perspective view of the parts of the control mechanism shown in disassembled spaced relation.

Fig. 8 is a fragmentary vertical section showing a modified form of louver control mechanism.

Fig. 9 is a horizontal section on the line 9—9 of Fig. 8.

Referring more in detail to the drawings:

1 designates a standard window-frame including side and header jambs 2 and 3, and a sill 5, the jambs being provided with the usual window and parting stops 6—7 and a blind stop 8 that is interposed between the exterior side edges of the jambs and outer casings 9 and 10. Slidable in the ways 12 and 13 formed between the respective stops are the upper and lower window-sash 14—15. The outer side of the blind stop 8 usually seats the frame of a window-screen 16 and is inset within the outer casing as shown in Fig. 2. The frame of the screen consists of side stiles 17 and 18 connected at their upper and lower ends by cross rails 19 and 20, to which the wire screening 21 is attached and the edges covered by a moulding 22.

In carrying out the present invention the Venetian blind structure is mounted as a unit and is attached to the frame of the window-screen. For this reason the window-screen is placed within the window-frame with the screen side facing the sash, as shown in Fig. 2, whereby the Venetian blind structure may be partly inset within the confines of the frame thereby limiting projection of the louvers.

The Venetian blind structure includes a plurality of transversely arranged louvers 23, preferably of sheet metal, and formed of strips substantially conforming in width to a standard Venetian blind louver and having their upper and lower edges bent retractively on their inner side faces, as indicated at 24 and 25, the bending of the lower edge 25 being such as to provide a drip bead 26. The ends of the strips are flanged laterally on the lower or inner faces thereof to form substantially angular wings 27 and 28 for pivotal attachment to mounting strips 29 and 30 and for connection by a bar 31.

The mounting strips 29 and 30 are preferably angles arranged with one flange 32 adapted to overlap the outer faces of the stiles 17 and 18 and their other flanges 33 extending inwardly in

overlapping relation with the inner side edges of the stiles to provide right angular flange portions on which the louvers are pivotally mounted as best shown in Fig. 4.

The angular or lateral wings 27 of the respective louvers are positioned closely to the inner faces of the flange portions and are pivotally secured thereto by rivets or similar trunnioning devices 34 having heads 35 engaging against the wings and shanks 36 extending through openings 37 therein and through registering openings 38 of the flanges 33. The shanks of the fastening devices may be of sufficient length to accommodate relatively thin washers 39, between the faces of the wings and flanges 33, and to project so that the ends thereof may be riveted over the faces of the flanges. The fastening devices are drawn sufficiently tight to eliminate play but are loose enough to allow free tilting movement of the louvers responsive to reciprocation of the bar 31.

The connecting bar 31 is attached to the wings at one end of the louvers by pivotal fastening devices 40 in the same manner as the pivots just described at points spaced from the adjacent flange portion 33 when the louvers are horizontal to accommodate movement of the bar when the louvers are shifted, since the bar, when thus attached, is substantially in the plane of the flange portion 33.

In order to avoid necessity of providing a greater variety of louver lengths to accommodate every size of screen opening, the louvers for a given size window are sufficiently short to fit the smallest screen opening, and the attaching flanges 32 of the mounting strips are sufficiently wide to compensate for any variation in the width of the window-frame opening for a given size window. A louver structure is, therefore, selected having such width that the flanges 33 freely enter the frame opening and any spacing between the flanges and the adjacent inner edges of the frame or any irregularity or out of squareness of the frame is taken care of and covered by the attaching flange of the mounting strips, as shown at 41 in Fig. 4. To accommodate variation in height of the screen opening, the mounting strips are made of ample length so that an end thereof may be cut off according to the height of the frame opening.

A weather-shield 42 is attached to the lower edge of the upper cross rail of the screen frame as shown in Fig. 2. The weather-shield is also preferably formed of sheet metal and projects outwardly from the frame and terminates in a downwardly inclined outer portion 43 having a drip edge 44. The weather-shield may be attached by fastening devices such as screws 45 threaded through openings in the edges thereof and into the edge of the frame.

The louver control and adjusting mechanism constitutes an essential part of the present invention and renders the louver structure just described feasible for exterior installation as now to be described.

A preferred form of control mechanism is illustrated in Figs. 4 to 7 inclusive and includes an angle-shaped bracket 46 having one flange 47 extending under the screen moulding and secured at the lower end to the inner side of one of the side stiles of the screen frame, the attaching flange 47 being of ample width so that the other flange 48 extends outwardly over the window-screen slightly beyond the plane of the louver wings at that side of the window. The attaching flange 47 may be secured by fastening devices driven through the screen moulding, through openings 49 into the body of the screen frame. The attaching flange 47 has a slotted opening 50 of ample dimensions so that a lever arm 51 will operate freely therein.

The lever 51 includes an arm portion 52 having spaced openings 53 and 54 through which the shanks of the fastening devices 34 and 40 of an adjacent louver are projected, the fastening devices 34 forming a fulcrum on which the lever pivots whereby the outer end of the lever causes the louvers to pivot in changing the angular positions thereof. The lever also includes an arm 55 extending at an angle with respect to the arm 52 and which projects through a slot 56 formed in the screen in registry with the slotted opening 50 of the bracket 46.

In order to close the slotted openings 50 and 56, a cover strip 57, having an opening 58 therein, is carried on the inwardly projecting arm of the lever and slides freely between the screen and the adjacent face of the bracket upon movement of the lever. The closure strip 57 is preferably moved in guided relation with the bracket by means of a lateral flange 59 thereon engaging against the flange 48. The arm 55 of the lever has an opening 60 registering with an arcuate slot 61 in the flange 48 to accommodate a clamping mechanism whereby the lever is anchored to retain the louvers in a selected position.

If the arm 55 of the lever were constructed of sufficient length to provide for ease of operation it would interfere with raising and lowering of the lower sash. I therefore provide a lever extension 62 which has lost motion connection with the clamping device and is adapted for removable coupling engagement with the terminal end of the arm 55. For this reason the terminal end of the arm 55 has a notch 63 adapted to be engaged by a stud 64 on the adjacent face of the lever extension 62, the stud 64 being spaced from a slot 65 in the lever extension. The clamping device includes a bolt 66 having a shank 67 extending through the slot 65 of the lever extension, through a spacing washer 68, through the opening 60, through clamping washers 69 and 70 respectively engaging the opposite sides of the flange 48 of the bracket and a wing nut 71 whereby the parts are drawn into rigid assembly when the louvers are to be retained in selected adjusted position.

The modified form of control mechanism shown in Figs. 8 and 9 includes a gear segment 72 having a hub 73 fixed to a trunnion 74 replacing one of the fastening devices 34. The periphery of the gear segment is attached by the fastening devices 40 to the louver flange and is adapted for oscillation on the trunnion in effecting adjustment of the louvers by a worm 75. The worm 75 is fixed to a shaft 76 that is journalled in an ear 77 on the mounting strip and in an escutcheon plate 78. The plate 78 has a slot 79 to accommodate the gear segment and is of sufficient size to cover up the screen slit necessary in passing the periphery of the segment to connect with the pivot 40. The inner end of the shaft 76 carries a crank 80 by which the worm is rotated to effect adjustment. In this structure the pitch of the worm is sufficient to retain the louvers in adjusted position.

In assembling the Venetian blind structure, the louvers are attached to the mounting strips and connected at one of their ends by the bar 31, the operating lever 51 being attached to the

fastening devices securing one of the lowermost louvers. The unit is then packaged with a weather-shield 42, and the various fittings composing the raising and lowering mechanism.

In installing the device, a unit will be selected having a width nearest the width of the window-screen opening. The weather-shield 42 is cut off according to the width of the window-screen frame opening and attached to the upper rail thereof by the fastening devices 45, as shown in Fig. 2.

The mounting strips, having been constructed of ample length, are then cut to correspond with the height of the window-screen opening. The assembled unit is then applied to the window-screen frame so that the attaching flanges 32 overlie the outer faces of the side stiles 17—18 and the flanges 33 project in the direction of the window-screen, a slot having just been provided through the wire screen to pass the notched end of the operating lever 51. Fastening devices, such as screws or nails are then driven through openings 32' in the attaching flanges and into the stiles of the frame. The closure strip 57 is then sleeved over the operating lever, followed by the bracket 46 which is attached in proper position on the adjacent stile of the screen frame. The extension arm 62 of the lever, spacing washers 68, and clamping washers 69 and 70, are then placed in the proper position with the openings therein registering with the slot 61 and opening 60 of the lever arm. The shank 67 of the bolt 66 is then passed through the respective openings and the wing nut applied to the projecting end thereof, completing the assembly.

In inoperative position the extension arm 62 will be in vertical position as shown in Fig. 6. Therefore, to adjust the louvers the wing nut 71 will be loosened so that the lever arm extension may be swung on the shank of the bolt 66 to bring the stud 64 into registery with the notch 63, the slot 65 being of sufficient length to allow the stud 64 to clear the notched end of the operating lever. When the stud is in registry with the notch the lever arm extension is moved retractively to cause the stud to enter the notch. The lever arm extension is then operatively connected with the lever 51 so that the lever may be swung on its pivot 34 to adjust angular position of the louvers. When the louvers are in desired position the lever arm extension is shifted to withdraw the stud 64, whereupon the extension arm is dropped to perpendicular position, as shown in Fig. 6, after which the wing nut 71 is retightened to draw the clamping washers into contact with the respective side faces of the flange 48. When the louvers are thus retained they are rigidly supported so that they are not affected by the wind blowing thereagainst. Since the louvers are mounted on the exterior side of the window-screen they reflect heat of the sun's rays and keep them from passing into the interior of the building. The louvers, however, when opened, allow free circulation of the air therebetween to provide the desired ventilation. This movement of the air also keeps the louvers in cool condition and free of any accumulated heat that is not reflected therefrom.

From the foregoing it is obvious that I have provided an exterior Venetian blind structure which is readily assembled within a standard window-screen and which is removable with the screen as a unit for washing of the windows and other purposes. It is also obvious that the louver control mechanism does not interfere with sliding movement of the sash, and that there is sufficient leverage to provide facile adjustment of the louvers.

Attention is directed to the fact that since the clamping nut 71 is on the inner side of the screen, it cannot be reached by an unauthorized person from the exterior side of the building. Therefore, when the louvers are once set and the nut 71 tightened, adjustment thereof cannot be changed from the louver side of the screen. It is obvious that when the louvers are moved to closed position the flanges at the ends thereof close any space which may occur at the ends of the louvers and that the drip beads 26 of one louver will overlap the edge 24 of an adjacent louver to exclude dust, snow and other elements.

What I claim and desire to secure by Letters Patent is:

1. An exterior Venetian blind including side stiles adapted for attachment to opposite sides of an opening in a supporting frame, said side stiles having flanges arranged at substantially right angles to the plane of said frame, a plurality of vertically spaced louvers bridging the opening between said flanges and each having a rear marginal edge and a front edge forming a drip adapted to close against the rear marginal edge of an adjacent louver, wings extending laterally from inner faces of said louvers substantially across the width of the louvers at the respective ends thereof and in close relation with the facing sides of said flanges, an actuating bar extending across the flange side of the louvers at one side of the frame and in substantially the plane of the flange at that side of the frame, trunnions connected with the wings at points spaced from said inner faces of the louvers in substantial registry with said rear marginal edges and having connection with the flanges at points spaced inwardly from the front of said flanges a distance less than the spacing of the trunnions from said inner faces of the louvers whereby said louvers are offset outwardly from said frame to accommodate said bar when the louvers are in closed position with the front edge of one louver overlapping the rear marginal edge of an adjacent louver, pivot members connecting said wings with the bar, and means for reciprocating the bar to simultaneously pivot all of said louvers on the trunnions.

2. An exterior Venetian blind including a frame having side stiles, angle-shaped strips having lateral flanges overlapping outer faces of the side stiles and having right angularly projecting flange portions, a plurality of louvers arranged between said flanges and each having a rear marginal edge and a front edge forming a drip adapted to close against the rear marginal edge of an adjacent louver in closed position of the louvers, wings extending laterally from inner faces of said louvers substantially across the width of the louvers at the respective ends thereof and in close relation with the facing sides of said flanges, an actuating bar extending across the flange side of the louvers at one side of the frame and in substantially the plane of the flange at that side of the frame, trunnions connected with the wings at points spaced from said inner faces of the louvers in substantial registry with said rear marginal edges and having connection with the flanges at points spaced inwardly from the front of said flanges a distance less than the spacing of the trunnions from said inner faces of the louvers whereby said louvers are offset outwardly from said frame to accommodate said bar when

the louvers are in closed position with the front edge of one louver overlapping the rear marginal edge of an adjacent louver, pivot members connecting said wings with the bar, and means for reciprocating the bar to pivot all of the connected louvers on their respective trunnions.

3. An exterior Venetian blind including side stiles adapted for attachment to opposite sides of an opening in a supporting frame, said side stiles having louver supporting flanges arranged at substantially right angles to the plane of said frame and lateral attaching flanges for attachment to the supporting frame, a plurality of louvers bridging the opening between said supporting flanges and each having a rear marginal edge and a front edge forming a drip adapted to close against the rear marginal edge of an adjacent louver, wings extending laterally from inner faces of said louvers substantially across the width of the louvers at the respective ends thereof and in close relation with the facing sides of said supporting flanges, an actuating bar extending across the flange side of the louvers at one side of the frame and in substantially the plane of the supporting flange at that side of the frame, trunnions connected with the wings at points spaced from said inner faces of the louvers in substantial registry with said rear marginal edges and having connection with said supporting flanges at points spaced inwardly from the front of said supporting flanges a distance less than the spacing of the trunnions from said inner faces of the louvers whereby said louvers are offset outwardly from said frame to accommodate said bar when the louvers are in closed position with the front edge of one louver overlapping the rear marginal edge of an adjacent louver, pivot members connecting said wings with the bar, and means for reciprocating the bar to pivot all of said louvers, said lateral wings being of sufficient depth to close the space between the louvers and flanges when the louvers are in closed position.

4. An exterior Venetian blind including side stiles adapted for attachment to opposite sides of an opening in a supporting frame, said side stiles having flanges arranged at substantially right angles to the plane of said frame, a plurality of louvers bridging the opening between said flanges and each having a rear marginal edge and a front edge forming a drip adapted to close against the rear marginal edge of an adjacent louver, wings extending laterally from inner faces of said louvers substantially across the width of the louvers at the respective ends thereof and in close relation with the facing sides of said flanges, an actuating bar extending across the flange side of the louvers at one side of the frame and in substantially the plane of the flange at that side of the frame, trunnions connected with the wings at points spaced from said inner faces of the louvers in substantial registry with said rear marginal edges and having connection with the flanges at points spaced inwardly from the front of said flanges a distance less than the spacing of the trunnions from said inner faces of the louvers whereby said louvers are offset outwardly from said frame to accommodate said bar when the louvers are in closed position with the front edge of one louver overlapping the rear marginal edge of an adjacent louver, pivot members connecting said wings with the bar whereby all of said louvers are simultaneously pivoted on said trunnions responsive to reciprocation of the bar, means for reciprocating the bar, and an operating lever having fulcrum support on one of said trunnions and pivotal connection with a corresponding pivot member for effecting reciprocation of said bar.

LEMUAL G. BROWN.