May 28, 1946. L. C. WILLIAMS 2,401,283

VENETIAN BLIND

Filed Jan. 9, 1945 2 Sheets-Sheet 1

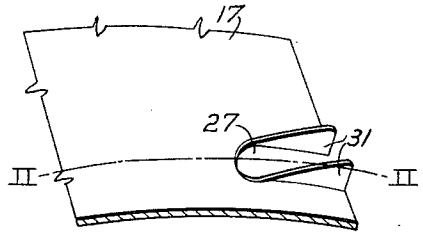


Fig. 1.

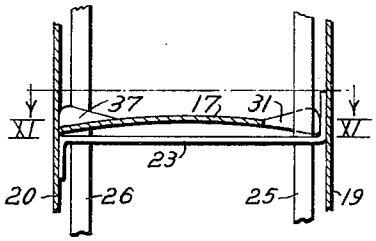


Fig. 2.

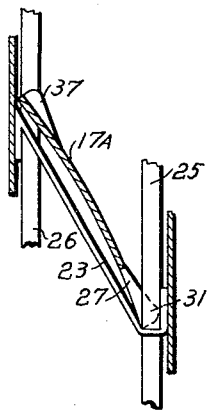


Fig. 3.

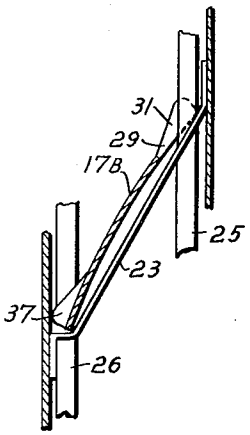


Fig. 4.

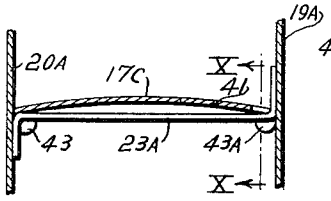


Fig. 5.

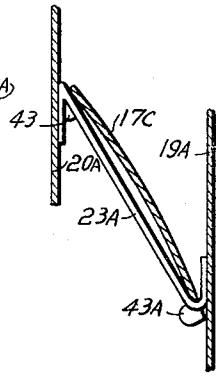


Fig. 6.

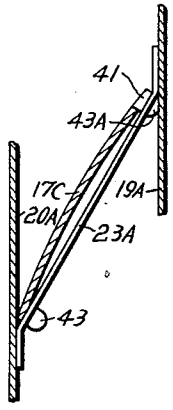


Fig. 7.

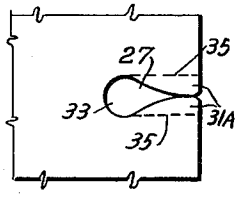


Fig. 8.

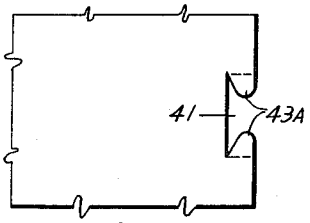


Fig. 9.

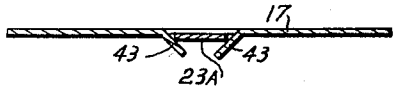


Fig. 10.

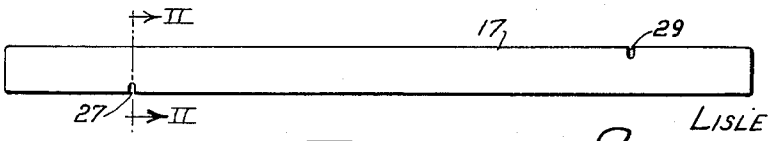


Fig. 11.

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VENETIAN BLIND

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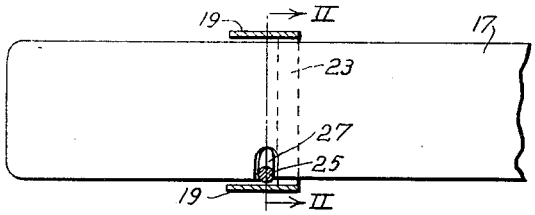


Fig. 12.

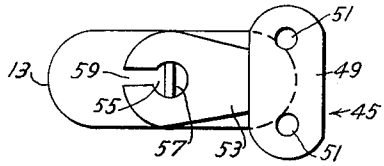


Fig. 17.

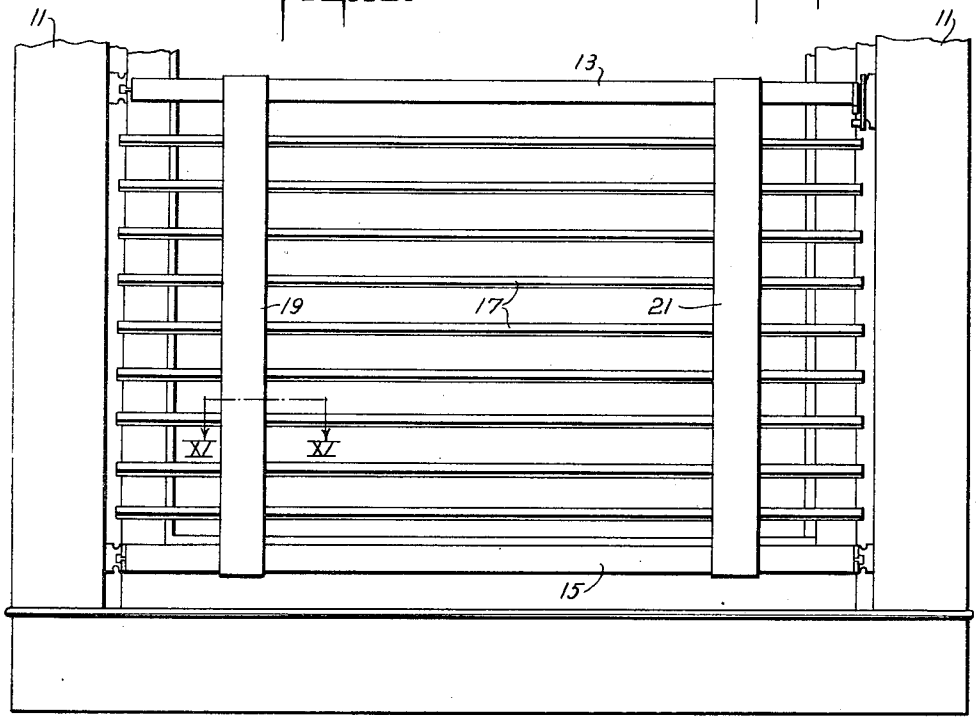


Fig. 13.

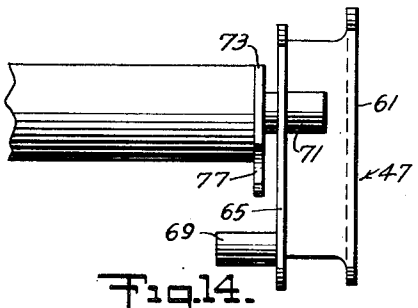


Fig. 14.

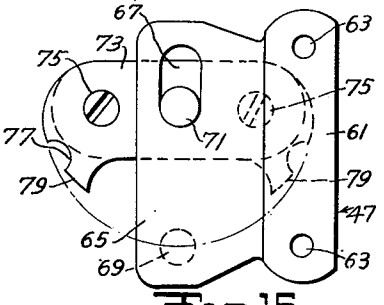


Fig. 15.

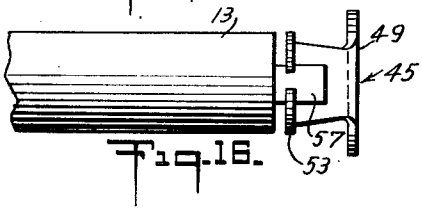


Fig. 16.

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UNITED STATES PATENT OFFICE

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VENETIAN BLIND

Lisle C. Williams, Memphis, Tenn.

Application January 9, 1945, Serial No. 572,020

7 Claims. (Cl. 160—173)

This invention relates to improvements in Venetian blinds, and particularly to a blind of the type which is adapted to be positioned, as in a window frame, with its upper and lower edges in fixed position and operated by turning movement only, as distinguished from those blinds which are also collapsible.

It has particular reference to a blind of this type which preferably is adapted to be positioned to cover a portion only of the window.

Venetian blinds with their numerous slat surfaces present a cleaning problem which is quite vexatious. As ordinarily made, with central holes in the slats they must either be laboriously cleaned in place, or dismantled, which may be an even more troublesome operation. Removal of the individual slats has, therefore, been given much attention and various devices have been attempted which will permit such removal. Edge notches have been tried, but these, while effective with the slats in horizontal position, are usually ineffective in closed position, particularly with the extremely thin slats now much used.

The objects of the invention are, primarily to solve this slat positioning and removal problem, and include:

Providing in a Venetian blind which includes a structure for shiftably supporting a plurality of slats, individual slats which when in place and in any and all positions of shift, engage the structure to substantially prevent their displacement longitudinally, and which are so constituted that they may be individually removed, as for cleaning, and replaced without disturbing or dismantling the supporting structure;

Providing novel means through which the slat supporting structure and the blind as a whole may be expeditiously and firmly supported in position, as in a window, yet may be readily removed therefrom, and which will permit manual operation of the blind to turn the slats from fully open to closed, or substantially closed position, and will accomplish the latching of the blind in closed position.

The means by which these and other objects are accomplished, and the method of their accomplishment, will readily be understood from the following specification upon reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a fragmentary portion of a slat showing the manner in which the slat is formed to accomplish the prevention of longitudinal displacement.

Fig. 2 is a corresponding cross section of the blind, taken as on the line II—II of Figs. 1, 11 and 12, showing a typical slat in horizontal and fully open position.

Figs. 3 and 4 are views, taken on the same line, respectively showing the slat turned in opposite direction to closed position.

Figs. 5, 6 and 7 are views corresponding to Figs. 2, 3, and 4, showing a modified form of slat which cooperates with the supporting cross tape to accomplish positioning.

Fig. 8 is a view of a fragmentary portion of a slat showing the cut made in the blind preparatory to forming ears thereon; and

Fig. 9 a corresponding fragmentary view showing a modified form of the cut and tongues.

Fig. 10 is a fragmentary section taken on the line X—X of Fig. 5.

Fig. 11 is a plan view of one of the slats.

Fig. 12 is a plan view on a larger scale, taken as on the line XII—XII of Figs. 2 and 13, showing an end portion of a slat.

Fig. 13 is a front view of the completed blind in place.

Fig. 14 is an enlarged view of an end portion of the top member of the blind and a supporting bracket and latch member therefor.

Fig. 15 is a corresponding end view.

Fig. 16 is a view similar to Fig. 14 of the corresponding end portion of the lower bar and a supporting bracket therefor; and

Fig. 17 the corresponding end view, this latter bracket and bar end being typical of all the supporting brackets except the latching bracket.

Referring now to the drawings in which the various parts are indicated by numerals:

11 is a window frame in which is disposed a typical Venetian blind comprising primarily upper and lower bars 13 and 15, slats 17, and slat supporting side tapes 19, 21, in pairs, which are attached securely to the upper and under sides of the upper and lower bars respectively.

23 are the usual staggered cross tapes which extend from side tape to side tape and support the slats 17. 25 and 26 are cords which also extend from top bar to bottom bar and are secured respectively to the upper and lower surfaces of these bars, the cord 25 underlying one of the tapes 19 along one edge of the slat and the cord 26 underlying the opposite one of the tapes 20 along the opposite edge of the slat. The slats 17 are of thin sheet metal, plastic, or other suitable material, arcuately curved in cross section to secure stiffness longitudinally, and are each provided with a notch 27 extending inwardly from one edge and positioned to lie behind one of the side tapes 19 in engagement with the

cord 26 therebehind, and adjacent the opposite end of the slat with a notch 29 extending inwardly from the opposite edge of the slat and adapted to engage the cord 26 underlying the opposite one of the side tapes 21.

The notches, as the notch 27, are upwardly flanged on their opposite sides, the flanges 31 being preferably formed by making a hole 33 in the slat, as shown in Figs. 8 and 9, and cutting or slitting outwardly from such hole preferably along curved lines, and bending upward the flange blanks 31A about the dotted lines 35 in these views. The notch 29 adjacent the other end of the slot is provided with similar flanges 37, the idea and intent of the flanges being that when the slats are turned toward vertical position, as to the position 17A, of Fig. 3, dislodgement of the cord 25 from the notch 27, which would eventually be accomplished by the curvature of the slat, is prevented by the flanges 31, and when oppositely turned, as in Fig. 4, to the position 17B, dislodgement of the cord 26 from the opposite notch 29 is prevented by the flanges 37.

Figs. 5, 6 and 7 disclose a modified form of the structure, in which the cords may be omitted and are not shown, and in which notches 41 are formed which are located relatively to the ends and edges of the slats 17C, as before, but the flanges 43, 43A thereof are downwardly turned for engagement with the cross tapes 23A. In this form of the device, the notches, as the notch 41, Fig. 9, are of the width of the cross tapes, the flanges extending straight downward if desired, but preferably, as in Fig. 10, they are inwardly inclined to effect tape engagement.

In both forms shown, the slats are shown turned with their centers transversely arching upward, but it will readily be understood that, though not usually done, the slats might instead be downwardly arched, in which case the flanges would, however, be oppositely formed with reference to their arching, but would in use still extend upwardly or downwardly, as the case might be.

The brackets 45 each include a seat portion 49, having screw holes 51 permitting attachment to the window frame, and an outwardly extending portion 53, and may be of Z shape with the portion 53 off-set from the base portion and parallel therewith. Portion 53 is provided with a circular hole 55 which is adapted to receive and oscillatably mount a pin 57 secured in and extending from the end of the bar, as the bar 13. Extending portion of pin 57 is flat and turned transversely to the bar, so that when the bar lies flat the flattened pin is vertical. Extending from the hole 55 is a horizontal slot 59 of size to allow the pin when turned to horizontal to be slid into the hole.

The bracket 47, similarly includes a seat portion 61, having screw holes 63, permitting attachment to the window frame, and an outwardly extending portion 65, and may be of Z shape with the portion 65 off-set from the base portion and parallel therewith. Portion 65 is provided with a vertically disposed substantially round hole 67, and below and spaced from said hole, carries a projecting latch pin 69.

Projecting from the bar end is a pivot pin 71 which is oscillatably journalled in the hole 67. This pin may project through, or be carried by and project from a latch plate 73 secured to the bar end as by screws 75. Plate 73, below and outward from the sides of the bar, has arcuate notches 77 adapted for latching engagement with the latch pin 69 when the bar is oscillated on the pivot pin 71. 79 are camming approaches to the notches 77 which raise the bar, and the pivot pin 71 in the slot 67, as the bar is turned toward latching engagement.

To install the blind, brackets 45 are secured to opposite sides of the window frame at the desired bottom level of the blind and one each of brackets 45 and 47 spaced thereabove to conform to the blind height, care being taken to make the spacing such that when the blind is installed the tapes 19 and 21 will be taut, the cords 25 and 26, if used, also being taut.

Pin 71 of the top bar 13 is engaged with bracket 47 and pin 57 with top bracket 45, and if the slats 17 are in place, the pins 57 of the lower bar 15 are engaged with the lower brackets 45. If slats 17 are not in place, the engagement of the top bar only is made, the blind is allowed to hang down, and the bars are turned to level. The slats, preferably beginning with the bottom slat, are inserted, one by one between the side tapes 19 and 21, with each slat supported by a pair of cross tapes and thereafter, the bottom bar engagement with the brackets is made. With the side tapes taut the slats are shifted until the notches 27 and 29, and their flanges 31, 37, if upwardly turned, engage the cords 25 and 26, or if the flanges 43 are turned downward, engage the cross tapes 23, in either case completing the installation.

In use, the upper bar 13 or lower bar 15, as most convenient, is turned to level position if blind is to be open, or tilted in either direction to effect closure. When tilted almost to closure, one or the other of the approach cams 79 engages latch pin 69, raising the bar 13 sufficiently to allow engagement of the related notch 77 with the pin and effect latching engagement.

In the form shown in Figs. 2, 3 and 4, tilting in one direction causes the upwardly extending flanges 31 to turn outward, as in Fig. 3, and maintain notch engagement with the cord 25, preventing longitudinal displacement of the slat, or if oppositely shifted, as in Fig. 4, causes outward projection of the flanges 37, maintaining similar engagement with the cord 26.

In the forms shown in Figs. 5, 6 and 7, the downwardly extending flanges 43 maintain engagement of the slat with the cross tapes 23, in level position and with one or the other thereof in shifted position, similarly preventing longitudinal displacement.

I claim:

1. A Venetian blind which includes top and bottom bars, means oscillatably supporting said bars at fixed distance apart, a pair of ladders attached at their upper and lower ends to said bars, and a plurality of slats carried by said ladders and oscillatable with said bars; each said slat comprising a thin sheet-like strip of elastic material, as metal, arcuately curved in cross section to effect longitudinal stiffness, and spanning from ladder to ladder, said slats at one said ladder being inwardly cut from one side edge and at the other said ladder from the opposite side edge to outline at each cut a pair of substantially identical flange blanks, and said blanks bent with respect to one surface of said slat about parallel lines at right angles to the edges of said slat to establish notches having flanged edges adapted to cooperate with said ladders to restrain longitudinal displacement of said slats in any position of oscillation.

2. A Venetian blind which includes top and bottom bars, means oscillatably supporting said bars at a fixed distance apart, a pair of ladders attached at their upper and lower ends to said bars, each ladder including a pair of side tapes and a plurality of rung tapes, a pair of cords attached at their upper and lower ends to said bars on opposite sides thereof and each underlying one of said side tapes, and a plurality of slats carried by the rungs of said ladders and oscillatable with said bars; each said slat comprising a thin sheet-like strip of elastic material, as metal, arcuately curved in cross section to effect longitudinal stiffness, and spanning from ladder to ladder, said slats at one said tape and cord being inwardly cut from one side edge, and at the other said end cord, from the opposite side edge to outline at each cut a pair of substantially identical flange blanks, and said blanks bent upward with respect to the surfaces of the associated slats about parallel lines at right angles to the edges of said slats to establish notches having flanged edges adapted to engage said cords and restrain longitudinal displacement of said slats in any position of oscillation.

3. A Venetian blind which includes top and bottom bars, means oscillatably supporting said bars at a fixed distance apart, a pair of ladders attached at their upper and lower ends to said bars, said ladders including cross rungs, and a plurality of slats carried by the cross rungs of said ladders and oscillatable with said bars; each said slat comprising a thin sheet-like strip of elastic material, as metal, arcuately curved in cross section to effect longitudinal stiffness, and spanning from ladder tape to ladder tape, said slats at one said ladder being inwardly cut from one side edge and at the other said ladder from the opposite side edge to outline at each cut a pair of substantially identical flange blanks, and said blanks bent downward with respect to the surfaces of the associated slats about parallel lines at right angles to the edges of said slats to establish notches having flanged edges adapted to engage said cross rungs and restrain longitudinal displacement of said slats in any position of oscillation.

4. In a Venetian blind having a pair of ladders including slat supporting rungs, a strip-like slat of thin sheet metal arcuately curved in cross section to provide longitudinal stiffness, said slat at said rungs being inwardly and oppositely cut from opposite side edges thereof, to outline at each said rung, a facing pair of flange blanks, said blanks being bent downward from the surface of said slat along lines at right angles to said edges to establish flanged notches adapted for engagement with said rungs.

5. In a Venetian blind having a pair of ladders including slat supporting rungs, a strip-like slat of thin sheet metal arcuately curved in cross section to provide longitudinal stiffness, said slat a said rungs being inwardly and oppositely cut fron opposite side edges thereof, to outline at eacl said rung a facing pair of flange blanks, saic blanks being bent downward at an angle substantially less than a right angle to the surfaces of said slat, along lines at right angles to said edges, spaced to establish notches having integral flanges along its opposite sides for engagement along and under said rungs.

6. In a Venetian blind whcih includes top and bottom bars, having pivot pins projecting respectively from opposite ends thereof, and ladders attached at their upper and lower ends to said bars, brackets oscillatably journalling the pins of said bars, one said bracket for said top bar having a vertically disposed oblong hole forming the pin journal therein and carrying below and spaced from said hole, a rigidly mounted latch pin extending into underlying relation with the adjacent end of said bar; said bar end having secured thereon a flat member notched adjacent the side edges of said bar for latching engagement with said latch pin on oscillation of said bar, and approach surfaces on said member adjacent said notches in the approach path to said latch pin effective to upwardly displace said bar end and its pivot pin during the approach oscillation.

7. In a Venetian blind which includes top and bottom bars, having pivot pins projecting respectively from opposite ends thereof, and ladders attached at their upper and lower ends to said bars, brackets each having a hole therein oscillatably journalling a said pin, the said hole of one said bracket for said top bar being oblong and vertically disposed, and said bracket carrying below and spaced from said hole, a rigidly mounted latch pin extending into and underlying relation with the adjacent end of said bar, said bar end having secured thereon a flat member notched adjacent the side edges of said bar for latching engagement with said latch pin on oscillation of said bar, and approach surfaces on said member adjacent said notches in the approach path to said latch pin effective to upwardly displace said bar end and its pivot pin during the approach oscillation, the opposite end of said top bar and one end of said bottom bar having flattened pivot pins and the related said brackets therefor, having each a slot adapted to permit insertion of its said pin edgewise leading into its said hole substantially at right angles to the position said pin occupies when said top and bottom bars are horizontally disposed.

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