

Jan. 31, 1950

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2,495,973

VENETIAN BLIND

Filed April 12, 1946

FIG. 1.

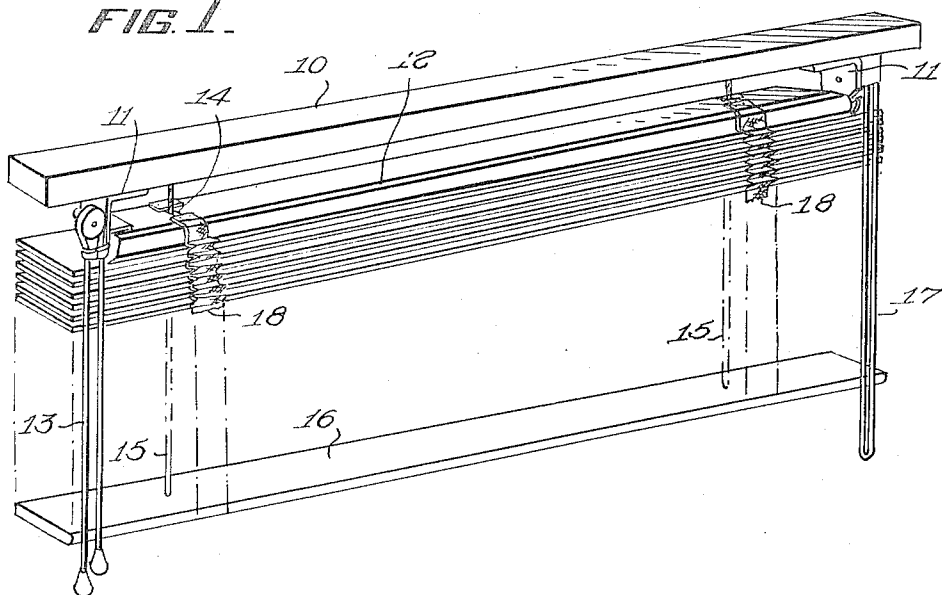


FIG. 2

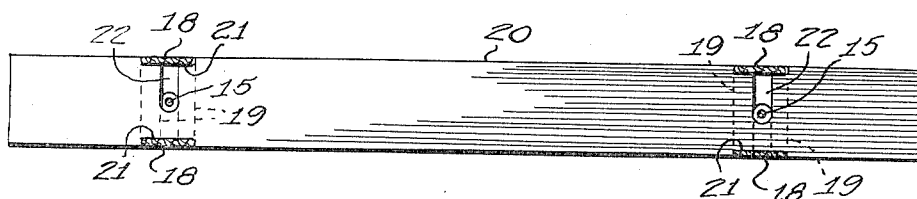


FIG. 3.

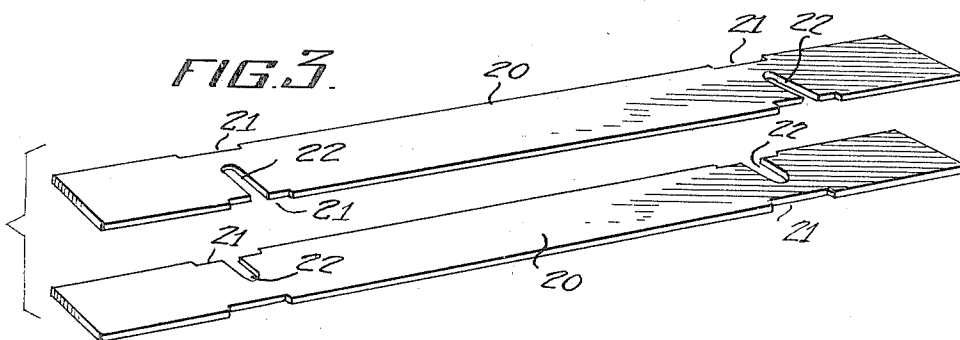
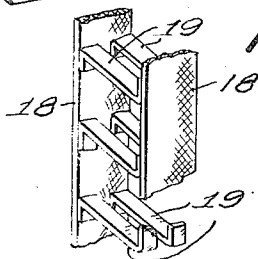


FIG. 4.



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2,495,973

VENETIAN BLIND

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Application April 12, 1946, Serial No. 661,787

1 Claim. (Cl. 160—173)

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This invention relates to window shades of the type having a series of horizontal slats and commonly known as "Venetian blinds."

One important object of the invention is to improve the general construction of devices of this description.

A second important object of the invention is to provide a novel device of this character wherein the slats may be easily removed and replaced individually as for cleaning or for substitution of a new slat for a broken one.

A third important object of the invention is to support each slat in the blind without the use of screws, hooks or other fastenings, the slats being in natural flat or inclined positions without danger of displacement.

With the above and other objects in view the invention consists in general of certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawings and particularly claimed.

In the accompanying drawings like characters of reference indicate like parts in the several views, and:

Figure 1 is a perspective view of a Venetian blind constructed in accordance with this invention,

Figure 2 is a horizontal section therethrough,

Figure 3 is a perspective view of an adjacent pair of the slats used herein, and

Figure 4 is a fragmentary perspective view showing certain slat supports used in this invention.

By reference particularly to Figure 1 it will be seen that the construction embodies an upper member 10 by means of which the device may be secured in a window frame. Adjacent each end of the member a bracket 11 depends from the top member and pivoted in these brackets is a tilting member 12. The ordinary tilting cord arrangement common to such blinds is indicated at 13 and is used to hold the member 12 in a horizontal or tilted position as desired. Through openings 14 in the member 12 pass cords 15 which extend down and have their lower ends fixed to a bottom member 16. These cords are used, as in most such devices, to effect opening and closing of the blind by movement of the bottom member 16 vertically. To this end the member 16 is usually hollow so that the cords 15 may pass through it to one side of the blind and there depend as at 17 for manipulation. What has now been described are fasteners quite common in Venetian blinds.

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now be described. Adjacent each end of the member 12 a pair of oppositely disposed tapes 18 have their upper ends fixed to the member 12 and their lower ends fixed to the member 16. At intervals along their lengths the tapes of each pair are connected by a pair of spaced ties 19, the ties being all of equal lengths. The cords 15 pass between the ties of the several pairs and the tapes thus being opposite said cords. Each of the slats 20 used in this device consists of a thin strip of suitable rigid material such as wood, metal, plastic or the like. Each of these strips has a width equal to at least the length of a tie 19 plus double the thickness of a tape 18 and each slat 20 is provided with a pair of notches 21 adjacent each end, the distance between the notches of a pair being equal to the length of a tie 19. By this means the tapes are held in the notches and the slats cannot become detached. Further, each slat has a pair of slots 22 running from about its center line and opening into the notches 21 at one side of the slat. The cords 15 pass through these slots.

Due to this construction, when the member 16 is in lowered position the slats will be supported in vertically spaced relation by the ties 19 and, if the tilting member 12 be horizontally disposed the slats will also lie horizontally. To remove a slat it is then merely necessary to tilt one longitudinal edge upwardly until the cords 15 are free from the slots 22 whereupon the slat may be slid longitudinally and freed from the remainder of the blind. The slat may be replaced by a simple reversal of the foregoing operation.

As indicated in Figures 2 and 3, the slats are assembled in such manner that the open ends of slots 22, which extend between the intermediate zone of the slat through which the lifting cords 15 extend to one edge of the slat, are found on opposite sides of the blind in adjacent slats, as clearly seen in Figure 3 and as indicated in the showing of Figure 2. As a result, the open ends of the slots of alternate slats extend to the same side of the blind. This arrangement provides several important advantages.

For instance, in blinds in which the opening for the lifting cord is in the form of a lateral slot with closed ends, a standard form of structure, the tilted slat will contact with both ends of the slot in maximum tilted position, the slat portion between the slot end and the slat edge contacting with the cord at the slot end. Hence, the angle of inclination of the slat is controlled by the slot end walls, assuming that the lifting cord retains its straight linear form, and with

Those features peculiar to this invention will

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adjacent slats spaced a distance equal to the thickness of the cord, and thus completely out of contact. With extra pull on the tilting cords, the slats may be moved to an angle more closely approaching the vertical, but in such case the lifting cord will be slightly canted within the slot zone, but the spacing between slats will not be materially changed, due to the presence of the cord between the slat unslotted portions. Normally, this canted condition of the cord is not present, since the weight of the lower member will tend to keep the cord in its taut form. With the closed end slots, the slat is not individually removable.

While it has been contemplated to render the slat removable by providing the slot with one end open and with the open ends at the same side of the blind, such change does not materially alter the above conditions, since each slat has the closed end of its slot in contact with the cord. And since such slot end is in the same position, up or down, depending upon the direction of tilt, the spacing between the slats is substantially as above. The ladder structure would prevent free swinging of a slat with the cord within the open slot portion. The distinction comes through the fact that contact between cord and slat is at but one end of the slot instead of at both ends, as in the form in which the slot is closed at both ends.

This condition is changed in the present invention, although the individual slat presents the open-ended slot referred to. This is due to the fact that owing to the reversal relation between adjacent slats, the latter, in tilted position, no longer presents the closed end of the slot in the same position relative to the width of the slat, either up or down dependent upon the direction of tilt. Due to the reversal, one of the slats of the pair will have the closed end up while the adjacent slat will have its closed end down. In other words, the slots do not extend from their closed ends in the same direction, as in the practice referred to, but extend in opposite directions. For instance, assuming that the two slats of Figure 3 are tilted clockwise, with the lifting cord extending through the slots, the closed end of the slot of the upper slat will be above the mid-width point of the slat, while the closed end of the slot of the lower slat will be below the mid-width point of the latter slat. In such position, the cord is completely free from contact between the two closed ends. Since the distance between the two closed ends is greater than the distance between the two mid-width points, with the closed ends carried by different slats, the closed ends will be on opposite sides of the lifting cord and present a major distance effect between points of contact. However, if a third slat is added above the upper slat shown, its slot arrangement would be similar to that of the lower slat in the figure, with the result that the contact points of the upper slat shown and of the added slat would be spaced a distance less than the distance between the mid-width points of the two slats, thus providing a minor distance effect as between the two contact points. With the major spacing distance the length of the slots of both slats of the pair lies between the points of contact. With the minor distance spacing, the length of the slots is absent between the points of contact, this distance being provided by the slat connecting zone between the closed end of the slot and the adjacent edge of the slat.

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This change does not materially change conditions as to the spacing between the two slats in the minor distance zone in which the cord is not within both slots. But the conditions are changed in the major distance zone in which the cord is within both slots. In such case, both slats are capable of movement toward each other without cord interference, with the result that the space at such edges could be decreased, thus tending to reduce the area of the opening between slats at such point.

Another important advantage resulting from this arrangement is illustrated in Figure 2; the closed end of the slot can be located materially closer to the mid-width of the slat. This is made clear in Figure 2 through the fact that the opening through which the lifting cord 15 extends is shown as of circular contour (half shown by the closed end of the upper slat and the other half by the closed end of the slot of the slat beneath). Under prior practice the closed end of the slot has been positioned materially closer to the edge of the slat, indicated by the fact that where the slot is a closed slot the slot is always of the elongated type, and the spacing of the end from the edge has been considered standard, even where slat removal has been contemplated through leaving one end of the slot open. In the present arrangement the closed end is closer to the mid-width point than to the slat edge.

The advantage referred to comes through the fact that the change in position so increases the distance between the closed end of the slot and the edge of the slat as to permit the location of the tape notches 21 and still leave the usual width of slat between the slot end and the edge, thus preserving the strength of the slat against breakage and at the same time providing the recesses or notches for receiving the tape 18. The location of the tapes in the notches serves to provide an aid in preventing longitudinal shift of the slat additional to the location of the cord 15 within the slot. The cord is small with respect to slot width and would permit slat creeping but the tapes have a width to fit in the notches and prevent such slat creeping, and at the same time tend to prevent binding of cord 15 through contact of the latter with a side wall of the slot. This positioning of the slot end is made possible through the particular arrangement of the slats referred to. The unequal spacing of the points of contact enables the slats to assume the desired tilted position even when the closed end of the slot is brought closer to the mid-width of the slat as indicated in Figure 2.

In other words, through the arrangement shown it is possible to provide in the same blind the advantages of the individual positioning and removal of the slats, through the open-ended slots, and the advantage of placing the lifting tapes within notches, to prevent creeping of slats. Both of these advantages have been present in blind structures of this type but only as individual advantages in individual blind structures. The present invention enables both advantages to be secured in a single blind structure.

What is claimed is:

1. In Venetian blind assemblies, wherein an upper tilting member and a lower lifting member are connected by tapes connected by cross tie formations to form supports for slats, wherein the assembly includes lifting cords for controlling the vertical movement of the lower lifting member

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and independent means for controlling the tilting activities of the upper member, and wherein the lifting cords pass through intermediate zones in the width of the slats, an assembly of such type having each of its slats formed with an open-ended laterally-extending slot for each lifting cord with each slot extending from the intermediate zone to an edge of the slat to permit individual positioning and removal of slats relative to supporting cross-ties, the assembly of slats presenting the slot open ends of adjacent slats as located on opposite side faces of the blind, each slot additionally having its opposite side edges formed with tape-receiving notches, the cross-tie formations each including a pair of spaced-apart cross-ties with the lifting cords extending through the space between the adjacent ties of the formation to thereby place the slot of the slat

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as substantially aligned with the space between the pair of ties and present the slat support as underlying the slat in the immediate vicinity of the opposite side walls of the slot.

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