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VENETIAN BLIND BOTTOM RAIL CONSTRUCTION AND HANGING

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Fig. 1.

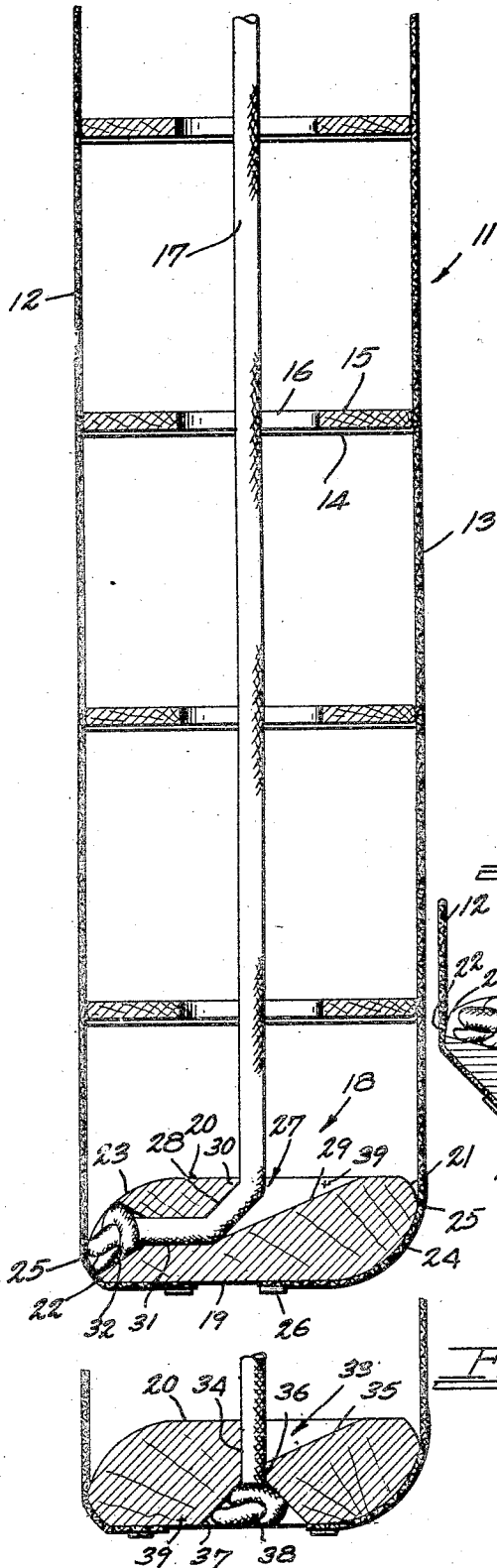


Fig. 2.

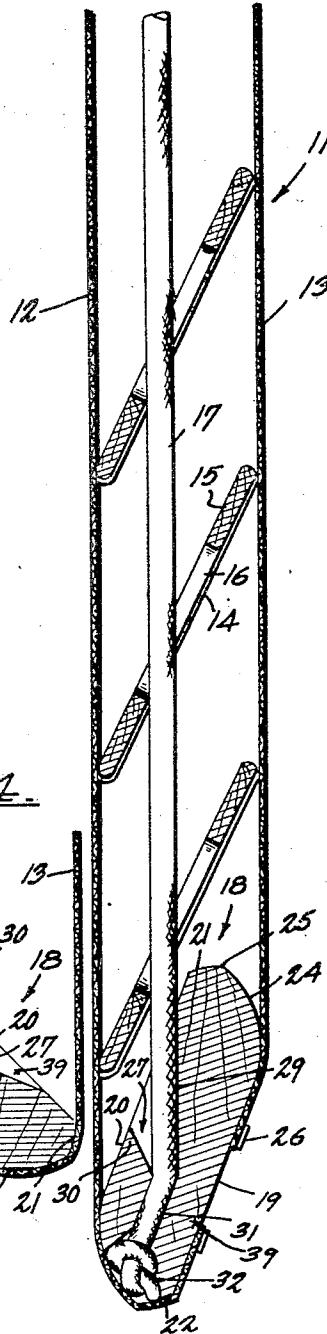


Fig. 4.

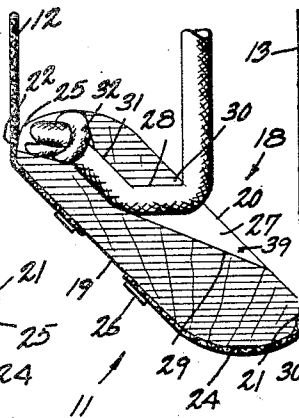
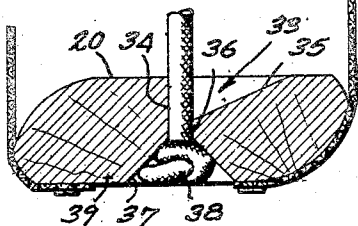


Fig. 3.



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## UNITED STATES PATENT OFFICE

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## VENETIAN BLIND BOTTOM RAIL CONSTRUCTION AND HANGING

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My invention relates to a construction of a bottom rail of a Venetian blind and the manner of hanging such rail by the webbing in order to obtain an improved tilt of this bottom rail on its axis during the tilting of the slats of the blind.

An object and feature of my invention in regard to the bottom rail and the hanging construction is, in part, in forming the rail with convexly curved surfaces over which the suspension tapes will pass. These surfaces on opposite edges of the bottom rail are symmetrical and cause the rail to tilt to a greater angle than in prior constructions and still maintain the tapes at the proper distance apart for such inclination.

Another feature of my invention as regards the hanging of the bottom rail is the construction of this rail with a flared slot at the top, the flare of the slot being transverse to the rail so that the elevating lifting cord in passing through this slot may operate through different portions of the flared slot in accordance with the tilt of the bottom rail. The slot has a decided flare toward the back of the rail in order that this rail may be tilted with the front downwardly at a decided angle.

My invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a vertical section through one form of my invention, showing the bottom rail and the slats in a horizontal position.

Fig. 2 is a vertical section with the bottom rail and slats tilted to incline downwardly and outwardly.

Fig. 3 is a transverse section through a modified form of bottom rail.

Fig. 4 is a transverse section showing the bottom rail tilted inwardly.

In my invention I employ a standard type of tape construction 11, which is illustrated as having outside vertical tapes 12 and inside vertical tapes 13. These are connected by transverse webs 14 on which rest the slats 15. Such slats have slots 16 therethrough for passage of the raising and lowering cords 17.

The bottom rail designated 18 is constructed with flat and parallel bottom and top surfaces 19 and 20. At one edge each of these

surfaces terminate in sharp angular portions 21 and 22. On the opposite side there are curved sections 23 and 24, these curves being substantially an arc of a circle to which the flat surfaces 19 and 20 are tangents. These circular or convex curves meet the sharply angled surfaces 21 and 22 at a relatively sharp angle, such angles being designated at 25. As seen in Fig. 1, the distances between these two opposite angles 25 gives the maximum width of the bottom rail. The vertical tapes 12 and 13 are secured to the bottom rail by means of nails 26 or the like.

In the construction of Figs. 1 and 2, there are slots 27 for the lifting cables. These slots are illustrated as having a forward end 28 which forms an acute angle to the top surface 20 of the rail, and a rearward end of the slots 29 which forms an acute angle of much lesser degree, therefore giving a widely diverging flare to these slots 27 in a front to rear direction. The angle 30 of the end 28 of the slot is substantially half the thickness of the lifting cable 17 from the vertical center through the bottom rail when this is in a horizontal position.

The means for fastening the cord as shown in Figs. 1 and 2 comprises a cord passage 31 which is practically transverse through the center portion of the bottom rail from the front edge, and there is an enlarged recess 32, the cable being continued through the slot 27, the passage 31, and knotted in the recess 32.

In the construction of Fig. 3, the peripheral shape of the bottom rail is the same as illustrated in Figs. 1 and 2. However, this has a flared slot 33 which is somewhat different from that of the slot 27. In this case the forward edge of the slot 34 is vertical when the bottom rail is horizontal and the back edge 35 has a slope forming an acute angle with the top surface 20 of the rail. There is a vertical perforation 36 through the rail in alignment with the edge 34 of the slot 33 and below this there is an enlarged recess 37 for the knot 38 of the lifting cord, the lifting cord passing through the slot 33 and perforation 36.

In the operation of the bottom rail, when

this rail and the slats are in their horizontal position, the tapes 12 and 13 have a touching connection with the bottom rail at the extreme angle points 25, this being at the place of maximum width of the rail, spreading the tapes furthest apart when this rail is in the horizontal position. When in this position the slats are also horizontal. The lifting cables are practically in the same plane as the center of gravity of the bottom rails and, hence, tend to cause the rails to hang in a horizontal position without tilting inwardly or outwardly, this being illustrated in Fig. 1. When the bottom rail is tilted by lowering the outer tape 12 and elevating the inner tape 13, the bottom rail is tilted from the position of Fig. 1 to that of Fig. 2. This allows the tape 12 to circle around the convex section 23 of the bottom rail. The tape 13 only contacts then with a small portion of the curve 24 at the inside of the bottom rail. At the same time the elevating cable is shifted in the slot 27 from the forward end of such slot to the inner end 29, allowing the bottom rail to tilt into the position of Fig. 2, in which case the plane of the cables is substantially the same plane as the center of gravity of the bottom rail. In this construction and tilting of the bottom rail the lifting cord or cable is not subject to any sharp angular bend.

In the construction of Fig. 3, when the bottom rail is suspended horizontally, the lifting cable practically passes through the plane of the center of gravity of the rail and is in alignment with the vertical section 34 of the slot 33, and in the tilting of the rail the cord or cable is brought into contact with the surface 35 of the slot 33. This allows tilting of the rail from a horizontal position to a position similar to that of Fig. 2.

In the specification the tape 12 is designated as being the outside tape, that is, the one on the outside of the window, and the tape 13 on the inside, hence, the curve 23 is on the outer and upper corner, and the curve 24 on the lower inner corner of the lower rail. On account of these curves being an arc of a circle, the bottom rail rolls on the tape when being tilted from the horizontal position of Figs. 1 and 3 to the outward and downward inclination of Fig. 2. The center of the circles is indicated at 39 which it will be seen is but slightly inside of the opposite flat side of the rail from that to which these arcuate curves are tangent. The relation, however, of the center of the curvature to the top and bottom of the rail is dependent on the thickness of the rail, a characteristic being, however, that the curves merge into the top and bottom of the rail by tangents. Another characteristic of the rail suspension is that when the rail is in the horizontal position of Figs. 1 or 3, the center line of the cords passes substantially through the plane of the

center of gravity of the rail and this is also the case when the rail is tilted at a downward and outward inclination as in Fig. 2. This causes the rails to have an even balance in the tapes and when pulled up or lowered to maintain the slats of the blind at the same constant inclination. The short curves 21 and 22 accommodate the tapes when the bottom rail is inclined inwardly and downwardly, as shown in Fig. 4. This inclination is sometimes given when it is desired to reflect light from the outside into a room by means of the inwardly and downwardly tilted slats.

Various changes may be made in the details of construction without departing from the scope of the invention as defined in the appended claims.

I claim:

1. In a Venetian blind, a bottom rail having curved corners positioned diagonally opposite, one corner merging into the lower surface and the other corner merging into the upper surface of the rail, tapes connected to the bottom of the rail, said tapes being adapted to contact with the curved corners during the horizontal position and tilting of the rail, and means to raise and lower the rail.

2. In a Venetian blind as claimed in claim 1, the means to raise and lower the rail comprising cords, the lower ends of each cord fitting in a slot in the rail, said slot being flared in a direction transverse to the rail.

3. In a Venetian blind construction, a bottom rail having convex diagonally opposite corners merging into the bottom and top of the rail, a tape extending over the opposite edges of the rail and secured to the bottom thereof, the tapes being adapted to contact with the convex corners when the rail is in a horizontal position and tilted at a downward inclination outwardly, and means to raise and lower the rail.

4. In a Venetian blind construction as claimed in claim 3, the rail having a plurality of slots transverse to the rail and flared outwardly in an upward direction, and an elevating cord connected to the rail and fitted in each slot, one end of the flared portion of each slot being adapted to contact with the cord in the slot when the rail is tilted in a downward and outward direction to its limit.

5. In a Venetian blind construction, a bottom rail having its front upper corner and its inside lower corner formed of similar convex curves, the curve on the front upper corner merging with the top of the rail and the curve on the inside lower corner merging with the bottom of the rail, a pair of parallel tapes passing over the front and the side edge of the rail and secured to the bottom, the inside tape contacting with the curve on the inside bottom corner when the rail is in a horizontal position, and the outside tape

contacting with the curve on the front upper corner when the rail is tilted, and means to raise and lower the rail.

6. In a Venetian blind construction as claimed in claim 5, each rail having a plurality of transverse slots flared outwardly at the top, a cord suspended vertically and fitted into each slot, the end of each slot when the top of the rail is in a horizontal position engaging the outside surface of the cord and the opposite end of the slot when the rail is tilted to its full extent engaging the inside surface of the cord.

7. In a Venetian blind construction, a bottom rail having parallel top and bottom surfaces with a convex outer and upper corner and a convex inner and lower corner, said convex corners being diagonally opposite and being of the same curvature, the top surface being a tangent to the curve on the outside corner and the bottom surface being tangent to the curve on the inside corner, an outside and an inside tape extending vertically downwardly and passing over the front and the rear edge of the rail, each tape being secured to the bottom of the rail whereby when the rail is in its horizontal position the inside tape engages the inside curve and when the rail is tilted to its full extent the outside tape engages the outside curve, and means to raise and lower the rail.

8. In a Venetian blind construction as claimed in claim 7, each rail having a plurality of transverse slots contracted at the bottom and flared outwardly at the top, the means to raise and lower the rail comprising a vertical cord extending into each slot, the rail having perforations with the cord extending therethrough and being knotted, the vertical line of the cords being substantially in the same plane as the center of gravity of the rail when the rail is horizontal and tilted with a downward and outward inclination.

9. In a Venetian blind construction, a bottom rail having parallel top and bottom surfaces, an outside upper curved corner and an inside lower curved corner, said corners being substantially arcs of a circle with the top and bottom being tangential respectively to the outside and inside curved corners, said curved corners being diagonally opposite, short corner sections diametrically opposite connecting the ends of the curves with the top and bottom of the rail, outside and inside vertical suspension tapes secured to the bottom of the rail, the inside tape following the curvature of the inside corners when the rail is horizontal, and the outside tape following the curve of the outside corner when the rail is tilted, and means for raising and lowering the rail.

10. In a Venetian blind construction as claimed in claim 9, the means for raising and lowering the rail comprising a plurality of vertical cords intermediate between the

tapes, the rail having a plurality of transverse slots, said slots at their upper surfaces being flared, with one end of the slots substantially in the center position of the top surface of the rail, each rail having a perforation at the slot with a cord extending therethrough and knotted at the end of the perforation, the ends of each slot being adapted on opposite sides of the cord when the rail is horizontal and tilted downwardly and outwardly.

11. In a bottom rail for a Venetian blind having a transverse slot flared outwardly at its top surface and having a passage therethrough extending from the outside edge inwardly to the base of the slot, and having a recess at the outside edge, and a lifting cord extending downwardly through the slot, the passage, and having a knot in the recess.

12. In a bottom rail for a Venetian blind, a slot flared outwardly at the top and contracted at the bottom, forming a small opening for passage of a vertical suspension cord, the bottom of the rail at the opening having a recess, the end of the cord being mounted in such recess, one end of the flared slot being vertical when the rail is in a horizontal position, and the other end of said slot meeting the top surface of the rail at a sharp acute angle.

13. In a Venetian blind construction, a bottom rail having parallel top and bottom surfaces, an outer arcuate upper corner and an inner arcuate lower corner, said corners being diametrically opposite and each formed of a similar arc of a circle, the top being tangential to the outer upper corner arc and the bottom being tangential to the lower inner corner arc, an outer and an inner tape connected to the bottom of the rail, and means to raise and lower the rail.

14. In a Venetian blind construction as claimed in claim 13, the means to raise and lower the rail comprising cords connected to the rail whereby the plane of the cords and of the center of gravity of the rail substantially coincide when the rail is horizontal or at a downward and outward inclination.

15. In a Venetian blind construction, a bottom rail having parallel top and bottom surfaces, an outer and upper arcuate corner tangential to the upper surface, a lower and inner arcuate corner tangential to the lower surface, said arcuate corners being arcs of a circle, a short curved section connecting the outer corner with the lower surface and the inner corner with the upper surface, vertically suspended tapes passing on the outside and inside edges of the rail and connected to the bottom of the rail, and means to raise and lower the rail.

16. In a bottom rail for a Venetian blind, a pair of tilting tapes passing over the outer and inner edge of the rail and connected to the bottom of such rail, a plurality of raising

and lowering cords connected to the rail, the vertical plane of said cords passing through substantially the vertical plane of the center of gravity of the rail when the rail is in a horizontal position or tilted downwardly and outwardly.

17. In a bottom rail for a Venetian blind as claimed in claim 16, the rail having arcuate outer and upper corners and lower and inner corners diagonally opposite, said tapes rolling on said arcuate corners when the rail is tilted downwardly and outwardly from a horizontal position.

In testimony whereof I have signed my name to this specification.

JESSE E. COOPER.

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