Dec. 12, 1939. H. R. HAASE 2,183,290

VENETIAN BLIND

Filed Dec. 2, 1938

Fig. 1

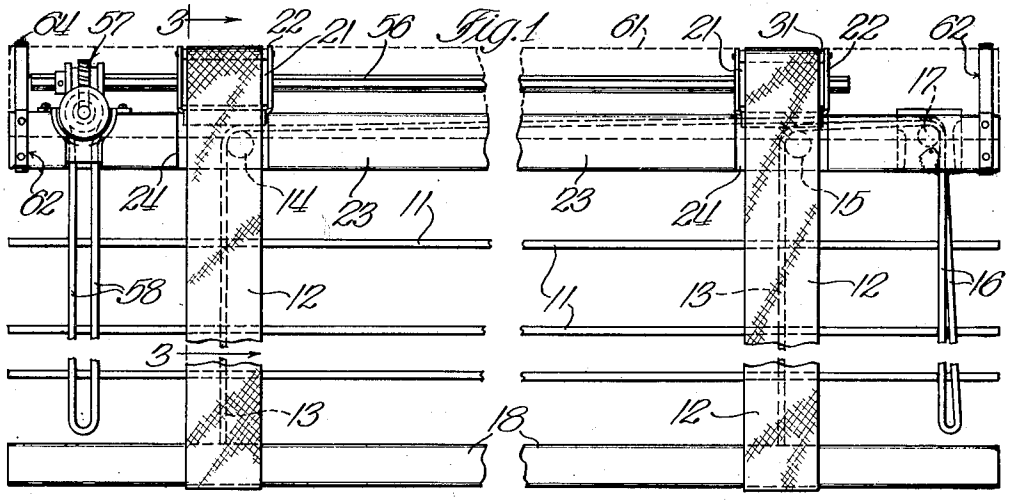


Fig. 2

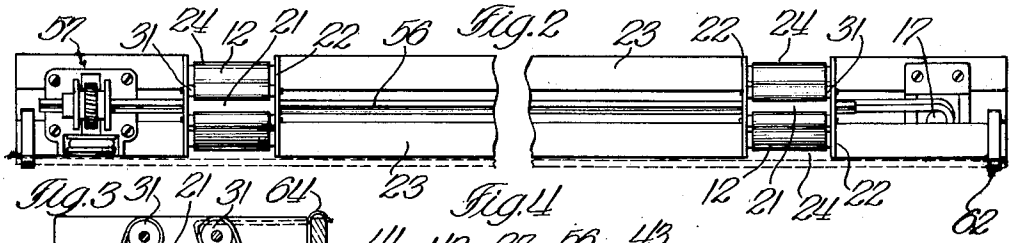


Fig. 3

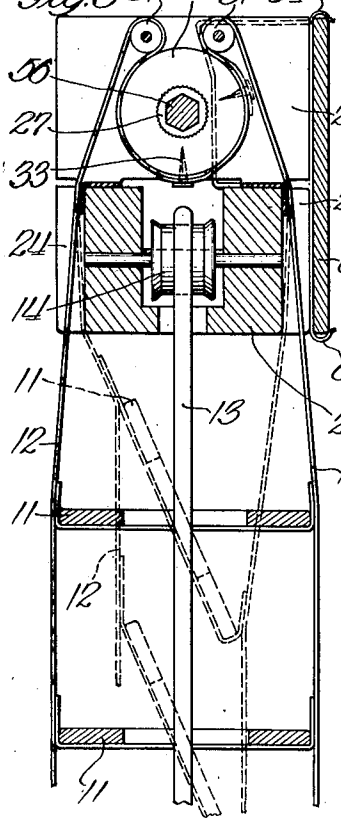


Fig. 4

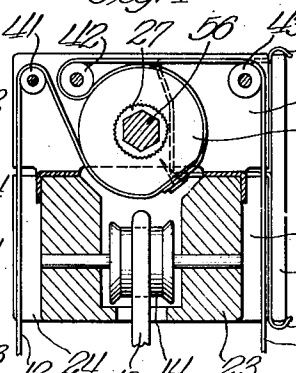


Fig. 7

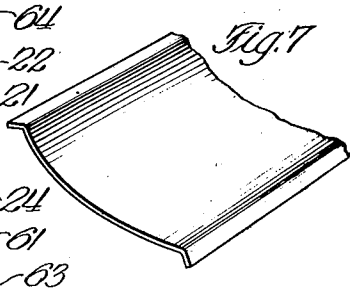


Fig. 6

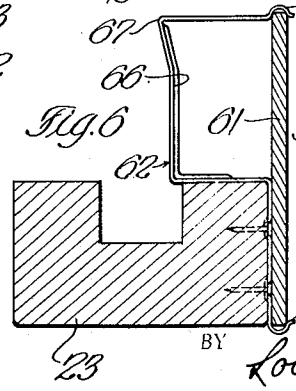
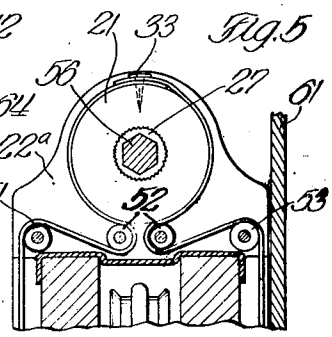


Fig. 5



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VENETIAN BLIND

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12 Claims. (Cl. 156—17)

In the modern era of windows without draperies or with draperies at the sides of the windows only, Venetian blinds in which the operating mechanism of the blind is completely hidden in the head structure thereof have become very popular in order to provide a neat appearance for the exposed blind. In such a blind it is desirable to have the head structure reasonably low in its over-all height for the sake of neatness. A head structure, the height of which is no greater than the width of the slats of the blind, is generally considered satisfactory from the standpoint of artistic proportioning, although in some instances it may be desirable to have a head structure as low as possible while in other instances it may be entirely satisfactory for the head structure to be slightly higher. There have been various suggestions for constructions which would permit the use of a low head structure or control head, some of which have been very satisfactory although rather expensive to manufacture. The desirable characteristics of such a control head are: adequate strength, dependability and ease of operation, and low cost.

Prior to a recent invention of mine, the control heads of low height have usually used a metallic housing in order to make use of the strength of the thin walls of the housing for support and also to make use of the relatively great space within these thin walls. According to the recent invention mentioned, however, the tilt mechanism was so compressed that it could be applied over a wooden head rail of the conventional general configuration without unduly enlarging the over-all height of the control head.

One aid in obtaining this compactness was the use of the principle of using a stationary guide roller within the control head and separate means for drawing the tilt tape or an extension thereof around the guide roller in such manner that the guide roller elongated the length of tilt tape within the head or increased the distance that the tilt tape could be moved in a satisfactory manner.

An object of the present invention is to provide additional and preferably more simple forms of control head which will be satisfactory from the standpoints of low height, dependability and ease of operation, and low initial cost. In accomplishing this object the same principle of providing a stationary guide roller for increasing the length of movement of the tape is utilized, although it is utilized in a different relationship, namely in connection with a control roller to which the tapes are tacked or otherwise secured at one point thereon.

Control rollers with the tapes secured at a given point thereon have been utilized before but the difficulty is that in order to get adequate tape movement the diameter of the control roller has had to be excessively large, thus unduly increasing the height of the control head. This would be especially true if the roller were used above a support rail with the tapes going through narrow openings near the sides thereof because the amount that the roller can move the tape is only approximately the length of contact between the roller and the tape. In other words, since the tape would normally hang down from the roller in approximately a vertical direction or even in a direction inclined downwardly and outwardly from the center line, the securing point of the tape on the roller could only be rotated approximately half a revolution before it would begin carrying one tape out of a straight line and thus raising both tapes at once instead of raising one while lowering the other. According to the present invention the guide rollers are so utilized as to keep the tilt tapes in contact with the control roller through a greater portion of the periphery of the control roller and in fact through nearly the entire periphery thereof. In this way the roller can raise one side of the tape while lowering the other side during almost an entire revolution of the securing point. This in turn permits the use of a much smaller roller and a control head of lower over-all height.

Additional objects and advantages will become evident from the following description and from the drawing, in which:

Fig. 1 is a front elevation of a blind chosen for illustration of this invention, partly broken away and with the face board removed.

Fig. 2 is a plan view of the structure shown in Fig. 1.

Fig. 3 is a fragmentary vertical sectional view taken approximately on the line 3—3 of Fig. 1.

Figs. 4 and 5 are fragmentary views corresponding to Fig. 3 but showing other modifications of the invention.

Fig. 6 is a vertical sectional view showing particularly a preferred form of bracket for securing the cover in place.

Fig. 7 is a fragmentary perspective view showing a preferred shape of metallic slat suitable for use in Venetian blinds.

Although this invention may take numerous forms, only a few have been chosen for illustration. In all of them the blind has been illus-

trated as including a plurality of slats 11 normally held in spaced-apart relationship by ladder tapes 12 but adapted to be drawn together from the bottom upwardly by raising cords 13 extending around pulleys 14 and 15 to hang down from the control head as seen best at 16. Any suitable cord lock, indicated diagrammatically at 17, may be provided for holding the slats raised to any desired height. It will be understood that the raising cords 13 extend freely through the slats 11 and are secured to a bottom rail 18 so that the cords raise the bottom rail 18 and pick up the slats in turn as it reaches them.

According to the well known practice in Venetian blinds, the ladder tapes 12 or any substitutes therefor are so mounted that they may be manipulated by raising one side of each ladder tape while lowering the other side so that the slats may be tilted to any desired angle. Thus, as seen in full lines in Fig. 3, the slats are in horizontal position, while, as seen in dotted lines in the same figure, one side of the tilt tape has been raised and the other lowered to shift the slats to a steeply inclined position, thus in effect closing the blind. According to the present invention the manipulating means may assume any one of various forms. In all of the forms chosen for illustration, the manipulating means includes a control roller 21 which manipulates the tilt tapes which are secured thereto, the tilt tapes extending partially around the control roller.

One of the forms of the invention is shown in Figs. 1 to 3. In this form the control roller 21 is rotatably carried by a bracket 22 of generally U-shape which is secured on top of a head rail 23. The use of the head rail 23 as the support means is often preferred because of the fact that this is a stock piece of lumber which can be readily secured by any small Venetian blind manufacturer and can easily be fitted to the blind. According to the form of the inventions of Figs. 1 to 3 a pair of relatively shallow slots 24 are cut in the front and back faces of the head rail 23 at each tilt tape position for the two sides of the tilt tape to pass through. Of course, the raising cord pulleys 14 will be mounted at the same points in the usual way so that the raising cord 13 extending down through the slots will be hidden by the tilt tapes 12. The roller 21 is preferably formed of wood and may be mounted with a driving fit on a metallic sleeve 27 which may be externally ribbed to grip the wooden roller 21.

It will be obvious of course that the two sides of the tilt tape could be simply brought up to the top of this roller and tacked to it at this point so that the tapes would be suspended directly from this roller. In that event, however, the roller 21 would have a useful rotation of only approximately one-half of a revolution. During this revolution it would move the securing point from the point of tangency of the tape on one side of the roller up and around to the point of tangency of the other tape on the other side of the roller. Such simple control rollers with the tapes secured thereto have been proposed heretofore for use in metal casings where the tapes could move laterally with respect to the bottom of the casing so that the roller could rotate somewhat further. Furthermore, the greater space within the housing permitted the use of a roller with larger diameter. In using the wooden head rail 23 for support from spaced points it is necessary to maintain a large part of its cross section intact and hence the tapes are carried up through the relatively shallow slots 24. It follows that if the tapes were simply draped over the roller 21 and secured thereto and if the securing point were moved down below the point of tangency, it would draw in the tape which it was supposed to let out and hence cease to tilt the slats any further. In order to get the necessary movement of the tapes to provide full tilting of the slats, it would therefore be necessary to have an extremely large roller and this in turn would require an objectionably large head structure.

According to the present invention, a small roller and a small head structure are utilized and adequate movement of the tape is obtained by using a pair of guide rollers 31 which maintain the tape in contact with the control roller 21 through much more than half the circumference thereof. Thus, as seen in Fig. 3, the two control rollers 21 are positioned fairly close together at approximately the top of the control roller 21 and each side of the tape therefore extends over one of the guide rollers 31 and then down around the control roller 21 to the securing point, where the two tapes are secured by any suitable means such as a row of tacks 33. Thus, the control roller has an effective movement of nearly a complete revolution with the securing point moving from one guide roller 31 down around and up to the other guide roller 31. It will be observed that the guide rollers 31 take up some of the available height within the housing, and therefore if these rollers were omitted, the control roller 21 could be of larger diameter within the same housing. It might seem, therefore, that everything that was gained by using the rollers 31 would be lost by the reduction in size of the roller 21. I have found, however, that this is not true and that the rollers 31 together with a smaller roller 21 cause the tape to be moved further than would a single control roller 21 of a diameter equal to the total vertical space used by the roller 21 and the rollers 31.

In the form shown in Fig. 4, however, still greater compactness has been obtained by positioning the guide rollers 41 and 42 somewhat at one side of the control roller 21. A third guide roller 43 is provided for keeping the tape out of contact with the roller 21 as it passes beyond the right-hand roller 42 therefrom. It will be observed that the rollers 41 and 43 are positioned over the slots 24 in the head rail 23 so that they tend to minimize the friction of the tapes against the head rail. These rollers can be positioned a little further out and the slots 24 omitted. The tapes 12 will then hang on the outside of the head structure and the face board 61 will be notched to receive the roller 43.

With this construction the vertical space required by the control roller 21 and the various guide rollers is only slightly more than that which would be required by the roller 21 alone, namely the thickness of the tilt tape 12 preferably with a slight clearance between it and the tilt tape on the roller 21. Furthermore, it is seen that this construction makes useful an even larger proportion of one revolution of the control roller 21. The flattening of the control roller shown in Fig. 4 may be used in the other forms also.

In Fig. 5 a similar arrangement has been illustrated, in which the guide rollers 51, 52 and 53 are positioned below the control roller 21 instead of above. These guide rollers correspond in function to the guide rollers 41, 42 and 43

and hence need not be described further. One of the rollers 52 may be omitted and the other moved to the far side as in Fig. 4. In this form the tapes may be tacked to the roller after assembly, but the arrangement is not quite as compact for a given length of tape movement as the arrangement of Fig. 4.

In all of the forms of the invention the control roller 21 is driven by a shaft 56 which may preferably be formed of octagonal shape and pass through a correspondingly shaped opening in the roller 21 or the sleeve 27 thereof. The shaft 56 is in turn driven by a worm gear mechanism 57 which is in turn operated manually by the tilt cords 58.

In all of these forms it is preferred that the operating mechanism be hidden by a face board 61 which preferably comprises ordinary slat stock. This face board may be secured to the head rail 23 in any desirable manner, that seen most clearly in Fig. 6 being preferred. According to this feature of the invention, a clip 62 is provided which has a bottom hook portion 63 and an upper hook portion 64 and which preferably has an offset or hump portion 66. The offset portion 66 is of course shaped so as not to interfere with the operating mechanism. The purpose of this offset portion is to cause the upper nook 64 to flex mainly from the corner 67 of the offset portion so that its movement will be mainly vertical. Of course, the clip will be fairly satisfactory even if the offset portion 66 is omitted and the clip extends straight up along the rear surface of the face board 61, but in that event the clip 64 is not sprung upwardly as easily for insertion or removal of the face board 61.

Although the invention has been illustrated with conventional ladder tapes 12, it should of course be realized that any substitute therefor may be utilized and likewise any form of an extension may be provided for such tapes or the substitute therefor for engagement with the control roller 21.

Any form of slats may be used, but a metallic slat of the special shape shown in Fig. 7 is preferred. This slat combines the features of thinness, strength and a desirable shape. The thinness is desirable from the standpoint of reduction of weight and from the standpoint of permitting maximum passage of air through the blind. The strength is obviously desirable to prevent drooping of the slat between ladder tapes. In this connection it may be mentioned that one advantage of the metal slat is that it makes possible both the thinness and the strength and of course is completely free from warping.

The special shape shown is especially advantageous from the standpoint of strength and rigidity since the combination of the large bow and the small flanges along the edges is admirable for this purpose. The flanges along the edges keep the edges relatively rigid, and this in turn is not only advantageous in itself but increases the rigidity of the whole slat.

The shape is also very advantageous for three reasons. One is that the wide single curve of the main portion of the slats makes them nest together well and stay centered as the blind is raised. Another is in providing a shape which, except possibly for a flat shape, gives the minimum opposition to the flow of air therethrough, particularly as compared to a corrugated slat. Another advantage of the shape is that it provides what might be called a two-faced blind. With the slats tilted in one direction the appearance is quite different than when the slats are tilted in the other direction. In one case the concave faces of the slats are visible from the inside of the room, whereas in the other case the convex sides of the slats are visible. Not only is this desirable from the standpoint of variety in appearance but the two sides also have different lighting effects. Furthermore, the slats can be assembled into the blind with either side up and the lighting effects are different for the light coming through the blind.

For some purposes it is preferred that the slat be formed of a metal such as aluminum or any other suitable lustrous metal, with a substantially transparent coating thereover. Such coating may of course be the oxide film normally formed on aluminum or a special oxide film of greater protective qualities and perhaps slightly dulled for the sake of appearance. A slat made of such a metal is especially advantageous because of the effects of light thereon. In the first place it transmits light exceptionally well when light is coming into the room from the outside with the slats open. It should be noted, incidentally, that the shape of the slats makes the blind very effective in shutting out light when the slats are tilted to either of the closed positions. Another advantage of the metalic or lustrous nature of the slats is that they tend to take on the colors of the surrounding furnishings and decorations so that such a blind will blend in with any color scheme.

Although the control mechanism has been illustrated as mounted on a wooden head rail 23 and although this is preferred for reasons of economy and the ease of manufacture by small organizations, yet it should be understood that the same control mechanism can be used within a metal housing if preferred. This will permit a slight reduction in height, and in fact in that event the control roller 21 may be moved to one side as far as it will go so that the raising cord pulley 14 will not be directly below the roller 21. This will permit a little more vertical compactness of the assembly.

From the foregoing it is seen that a construction has been provided in which a control roller has an effective movement of nearly a complete revolution, even though the utmost dependability of operation is provided by securing the tilt tapes positively to the control roller.

The disclosures of this application are illustrative and the invention is not to be limited by them. In fact, if modifications or improvements are not at once obvious, they may be devised in the course of time to make additional use of the broad ideas taught and covered by this application. The claims are intended to point out novel features and not to limit the invention except as may be required by prior art.

I claim:

1. A control head for Venetian blinds, including support means, a large roller carried by said support means, slat-control means secured at a given point to the large roller, and a plurality of guide rollers positioned close together with the slat-control means between them extending approximately around the large roller to permit said large roller to move said slat-control means a distance approximately equal to the circumference of said large roller.

2. A control head for Venetian blinds, including support means, a control roller carried by said support means, flexible slat-control means secured to said roller and extending therefrom

to opposite sides of the slats, and a plurality of guide rollers maintaining said flexible slat-control means in contact with the control roller through a larger portion of the periphery thereof than would be contacted by it if said guide rollers were omitted.

3. A tilt unit for Venetian blinds, including a control roller adapted to have tilt tapes from opposite sides of the blind secured thereto, and guide means for holding the tilt tape partially wrapped around the roller to increase the proportion of the periphery of the roller contacted by the tilt tape at one time.

4. A tilt unit for Venetian blinds, including a control roller adapted to have flexible tilt means from opposite sides of the blind secured thereto, and guide means for holding the tilt means partially wrapped around the roller to increase the proportion of the periphery of the roller contacted by the tilt means at one time.

5. A control head for Venetian blinds, including a support means having passages therethrough near the front and back edges thereof, a control roller positioned over said support means and adapted to have tilt means extending upwardly through said passages secured thereto, and guide rollers one of which holds the tilt means wrapped partially around the control roller to increase the proportion of the periphery of the control roller which said tilt means contacts, one of said rollers being positioned with its outer side aproximately above each of said passages whereby the friction of the tilt means on the walls of the passage is reduced.

6. A Venetian blind including a plurality of slats, flexible tilt means extending upwardly from opposite sides of the slats, support means above the slats, a control roller carried by the support means and having the tapes secured thereto, a pair of guide rollers positioned close together at one side of the control roller and holding the tilt means wrapped approximately around the roller, and a third guide roller positioned on the opposite side of the control roller and holding the tilt means extending away from one of the first named guide rollers substantially out of contact with the portion of the tilt means wrapped around the control roller.

7. A low height control head for Venetian blinds, including support means, a raising cord pulley carried near the bottom of the support means, a control roller positioned sufficiently above the raising cord pulley to allow clearance for the raising cords therebetween, a guide roller spaced from the control roller at one side thereof, tilt tapes secured to said control roller and one of which extends over said guide roller and the other of which extends away from said control roller at the opposite side of the control roller, and a second guide roller positioned mainly on said opposite side of said control roller and approximately level with a portion thereof for guiding the tape from said first named guide roller to said opposite side of said control roller before it contacts said control roller and for increasing the proportion of the periphery of said control roller which is engaged by said tilt means.

8. A Venetian blind head structure including a wooden head rail having slots in its front and back faces, a control roller positioned above said head rail, tilt means extending through each of said slots and secured to said control roller at substantially a common point, and guide means for the tilt means including at least one guide roller positioned above one of said slots to guide the tilt means therethrough and at least one additional roller positioned adjacent to the control roller for guiding one of said tilt means into proximity with the other whereby the proportion of the periphery of said control roller contacted by said tilt means is increased, and a face member secured to said head rail and concealing said slots and the mechanism thereover.

9. A Venetian blind head structure including a wooden head rail having slots in its front and back faces, a control roller positioned above said head rail, tilt means extending through each of said slots and secured to said control roller at substantially a common point, and guide means for the tilt means including at least one guide roller positioned above one of said slots to guide the tilt means therethrough and at least one additional roller positioned adjacent to the control roller for guiding one of said tilt means into proximity with the other whereby the proportion of the periphery of said control roller contacted by said tilt means is increased.

10. A clip for securing a face slat to a head rail of a Venetian blind, including a generally vertical securing portion adapted to be secured to the head rail, an extension extending rearwardly and vertically from one end of the securing portion and then forwardly, and claws carried by the other end of the securing portion and by the free end of the extension, and positioned approximately in alignment with the securing portion for engaging the edges of a slat.

11. A clip for securing a face slat to a head rail of a Venetian blind and closely adjacent thereto, including a securing portion adapted to be secured on the front of the head rail, a rearward extension from one end thereof, a spring portion extending from the rear end of the rearward extension and in part at least extending horizontally, and claws carried by the other end of the securing portion and by the free end of the spring portion and positioned approximately in alignment with the securing portion for engaging the edges of a slat.

12. A control head for a Venetian blind, including a wooden head rail tilt control means carried above the head rail, and a face slat secured to the head rail closely adjacent thereto, said face slat being secured by a clip including a generally vertical securing portion secured on the front of the head rail, an extension extending rearwardly and vertically from one end of the securing portion and then forwardly, and claws carried by the other end of the securing portion and by the free end of the extension, and positioned approximately in alignment with the securing portion for engaging the edges of a slat.

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