Jan. 13, 1942. P. H. KUYPER 2,269,854

VENETIAN BLIND

Filed June 30, 1941 2 Sheets-Sheet 1

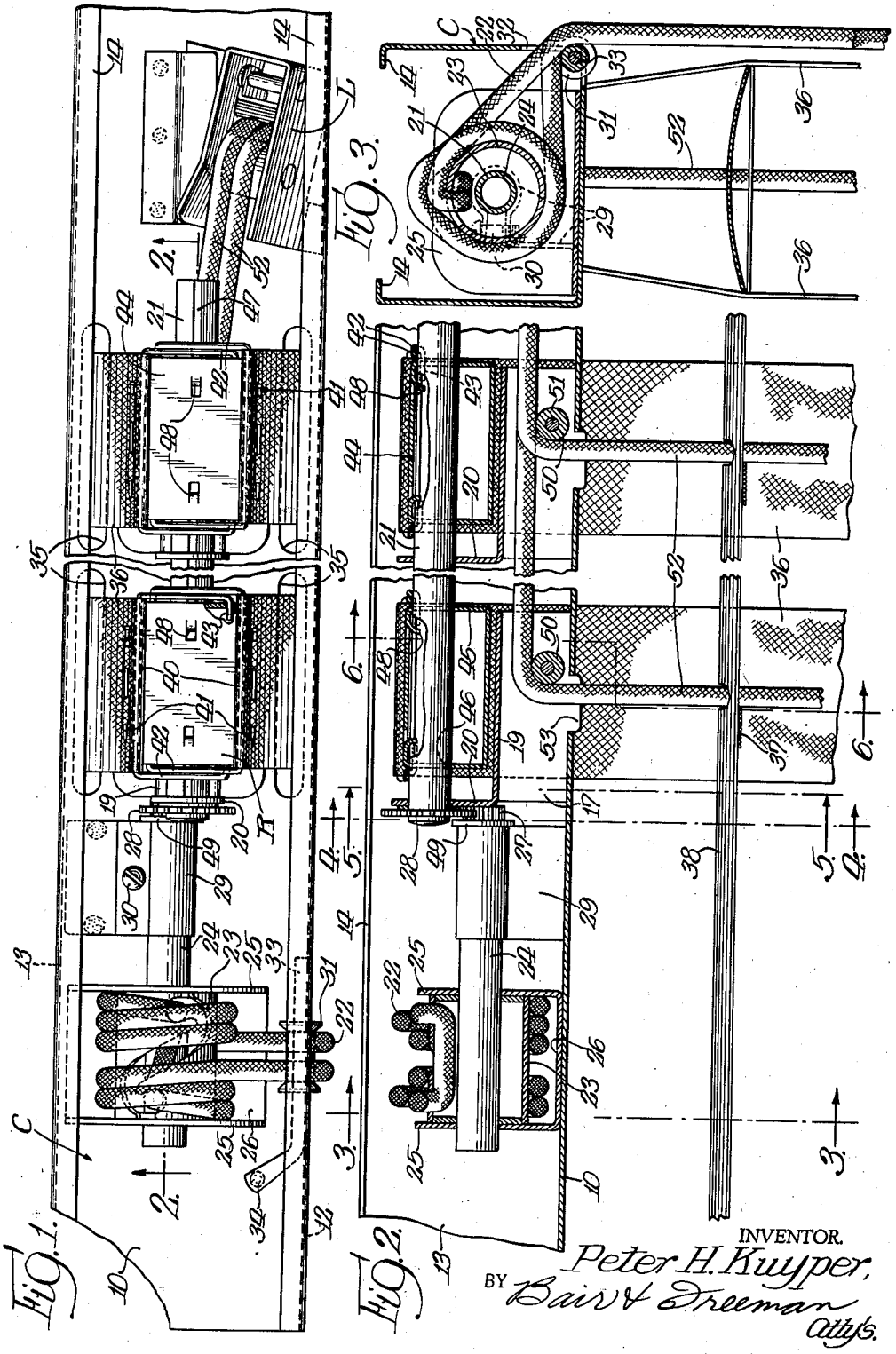


FIG. 1.

FIG. 2.

FIG. 3.

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VENETIAN BLIND

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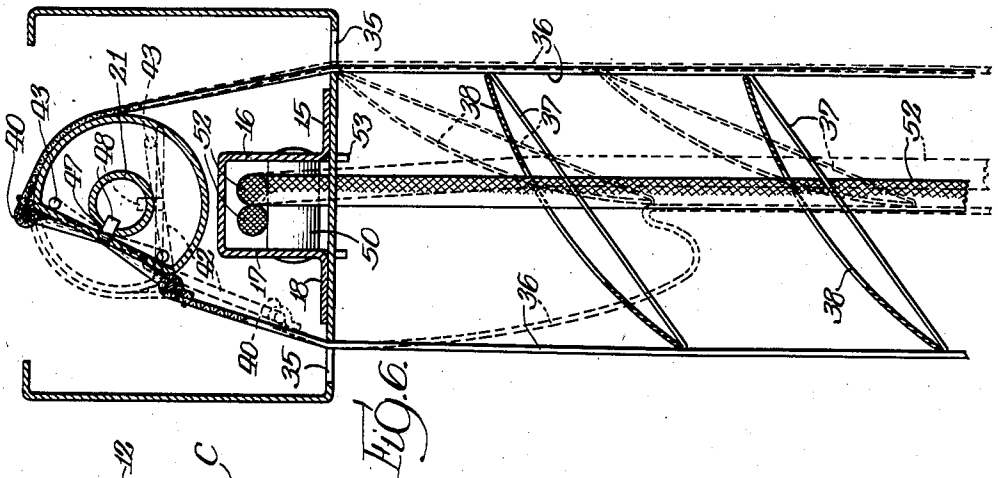


FIG. 6.

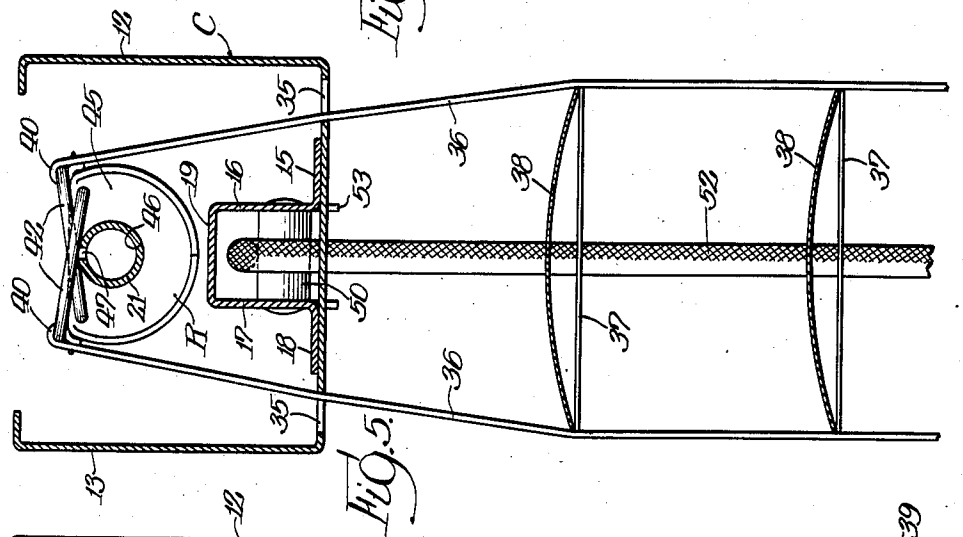


FIG. 5.

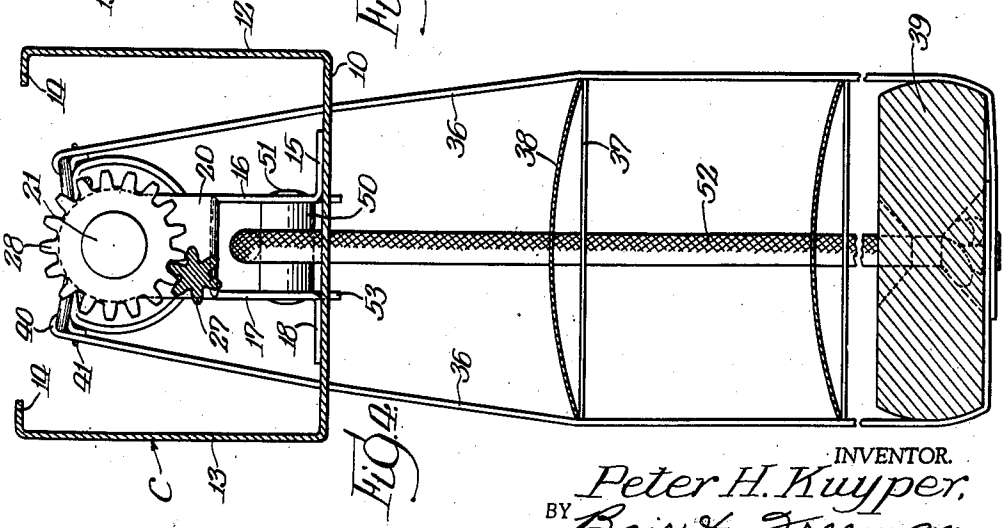


FIG. 4.

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Patented Jan. 13, 1942 2,269,854

# UNITED STATES PATENT OFFICE

2,269,854

## VENETIAN BLIND

Peter H. Kuyper, Pella, Iowa, assignor to Rolscreen Company, Pella, Iowa, a corporation of Iowa

Application June 30, 1941, Serial No. 400,448

18 Claims. (Cl. 156—17)

My present invention relates to a Venetian blind of the type having a sheet metal casing.

One object of the invention is to provide a rock shaft and rockers thereon for adjusting the ladder tapes of a Venetian blind, the arrangement being such that but small vertical space is required to secure considerable movement of the tapes.

More specifically, it is my object to provide overlapping bail means associated with a rock shaft in such manner that pivoting of one bail is effected when the rock shaft is rocked rearwardly, and pivoting of the other bail is permitted when the rock shaft is rocked forwardly, to thereby permit more tilting movement of the ladder tapes than can be secured by attaching them to rollers or the like, which would have to be of considerably larger diameter than the type of rockers I provide to secure the desired degree of tilting movement.

A further object is to provide a tilting arrangement which minimizes the vertical dimension of the casing for the mechanism and does so with a mechanism that is comparatively inexpensive to manufacture and extremely simple to assemble.

Still a further object is to provide a rock shaft and rockers thereon, both of which may be inexpensively manufactured of sheet metal, with a novel means of operative connection between the two.

Another object is to provide a relatively low head bar in the form of a sheet metal casing of less height than width, with tilting mechanism therein capable of tilting the blind to extreme positions where the slats are tightly closed, due to suspending the slats on one tape out of alignment with the center of the casing, with the other tape loose, the excessive movement necessary for such operation being provided by overlapping bail connections between the rocker members and the tapes.

With these and other objects in view, my invention with respect to its features which I believe to be novel and patentable will be pointed out in the claims appended hereto. For a better detailed understanding of the invention, and further objects relating to details of economy of my invention, reference is made to the following drawings wherein such further objects will definitely appear, and in which

Figure 1 is a plan view of a Venetian blind assembly embodying my invention, with the central portion of the structure cut away to conserve space on the drawings;

Figure 2 is a vertical sectional view thereof on the line 2—2 of Figure 1;

Figure 3 is a sectional view on the line 3—3 of Figure 2 to show the mechanism for rotating the tilting shaft;

Figure 4 is a sectional view on the line 4—4 of Figure 2 to show the connection between a pair of shafts of the tilting mechanism;

Figure 5 is a sectional view on the line 5—5 of Figure 2, to show one of the rocker devices in its intermediate position, and

Figure 6 is a similar sectional view on the line 6—6 of Figure 2 to show it in different tilted positions.

On the accompanying drawings, I have used the reference character C to indicate generally a casing. The casing C has a bottom wall 10, a front wall 12 and a rear wall 13. Reenforcing flanges 14 are formed along the tops of the walls 12 and 13.

In the casing C and secured to the bottom wall 10 thereof are bearing brackets formed of sheet metal having flanges 15, 16, 17 and 18 and a web 19, perhaps best shown in Figure 5. Each of these brackets has an upstanding perforated flange 20 at one end of the web 19 (see Figure 2) serving as a bearing for a rock shaft 21. The rock shaft 21 is adapted to be manually rocked by a tilting cord 22 wound on a drum 23 which is secured to a stub shaft 24. The stub shaft 24 is rotatable in a pair of perforated flanges 25, having a web at 26 secured to the bottom wall 10 for support. The rock shaft 21 and the stub shaft 24 are geared together by a pinion 27 and a gear 28. A friction clamp 29 of sheet metal is provided for the stub shaft 24 and the frictional engagement may be adjusted by a screw 30. The cross section of the clamp 29 is shown by dotted lines in Figure 3.

The tilting cord 22 has its center secured to the drum 23 and its ends extending over a pulley 31 and through an opening 32 to the front of the casing C, as in Figure 3. The pulley 31 is journaled in a pin 33 secured as by spot welding 34 to the casing bottom 10. The bottom 10 of the casing C is provided with tape receiving openings 35 and the tapes 36 of the Venetian blind extend upwardly therethrough as illustrated. The rungs of the ladder tapes are indicated at 37 and the slats at 38. The slats 38 are shown as of thin sheet metal construction, with the exception of the lower slat 39 shown in Figure 4 which may be of wood or heavy sheet metal.

The tapes 36 are folded at their upper ends as

indicated at 40, and a quick detachable means is provided for the fold in the form of a common pin 41 extended therethrough. The loop thus formed is pivoted to the cross member of a bail 42 and the two bails for the two tapes are arranged to cross each other as illustrated. The ends of their arms are bent to form pintles 43 which are pivoted in rocker members R.

Each rocker member R consists of a sheet metal stamping formed of semi-cylindrical, hollow shape. Each rocker consists of a flat or chord portion 44 having at its ends downturned perforated end members 45 of semi-disc shape. The perforations are indicated at 46 and receive the rock shaft 21. The rock shaft 21 may be inexpensively formed of a strip of sheet metal rolled into tube form, providing a slot at 47. The chord portions 44 have instruck tongues 48 entering the slot 47 whereby to cause simultaneous movement of the rockers R with the rock shaft. The tongues 48 are pushed into the slots after the rockers are located on the rock shaft and fit the slot tightly, so that end movement of the rockers relative to the shaft is thereafter prevented.

The rock shaft 21 has the gear 28 secured to one end thereof and the rock shaft is held against longitudinal movement in one direction by the adjacent bearing 20, and from movement in the other direction by a washer 49 on the stub shaft 24 and engaging the clamp bracket 29, thus preventing movement of the gear 28 toward the left, in Figures 1 and 2.

In each bracket having the gearings 20, I provide a guide roller 50 rotatable on a pin 51. These are for the raising ropes 52 which extend upwardly through openings 53 in the casing bottom 10 and then through a locking mechanism L to depend from the casing C in the usual manner.

*Practical operation*

In the operation of my Venetian blind structure, the blind may be raised or lowered in the usual manner by manipulating the raising ropes 52. The blind may be tilted by manipulating the rope 22, which effects rocking of the rock shaft 21. The intermediate position with the slats level or horizontal is shown in Figure 5. The rocker members may be tilted to the full line position of Figure 6, much the same as an ordinary drum type rocker which has the ladder tape secured to it. Tilting beyond this position, however, will effect an unfolding action of one of the bails 42, as shown by dotted lines, and this gives considerable additional movement that could be otherwise secured only by having a rocker of large diameter. The unfolding bail action is accordingly important from the standpoint of securing all the motion desired and at the same time keeping the height of the casing C at a minimum. It will be noted that when the extreme tilted position of Figure 6 is secured, the blind slats are tightly closed, with one of the tapes loose and the other one tight, to such an extent that this tape only supports the blind, thus securing a maximum of closing action. Similarly, when the blind is tilted to an opposite position, the other tape will suspend the blind slats in their fully closed positions.

Some changes may be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope without sacrificing any of the advantages thereof.

I claim as my invention:

1. In a Venetian blind, a head casing, openings in the bottom thereof for the tapes of a tape ladder to extend upwardly into said casing, a shaft journaled between said openings, a rocker on said shaft, and means for connecting the tapes of a tape ladder thereto comprising a front bail and a rear bail, said front bail having one side connected to the front tape and its other side pivoted to said rocker back of the shaft when the rocker is in intermediate position, said rear bail having its rear side connected to the rear tape and its front side pivoted to said rocker in front of the shaft when the rocker is in intermediate position, said bails overlapping each other whereby when the rocker is tipped rearwardly the rear bail will pivot away from the rocker to permit excess movement of the rear tape and when the rocker is tipped forwardly the front bail will pivot away from the rocker to permit excess movement of the front tape.

2. In a Venetian blind, a head casing, openings in the bottom thereof for the tapes of a tape ladder to extend upwardly into said casing, a shaft journaled in said casing, a rocker on said shaft, and means for connecting the tapes of a tape ladder thereto comprising a pair of crossed bails, one of said bails having one side connected to the front tape and its other side pivoted to said rocker back of the shaft, and the other bail having its rear side connected to the rear tape and its front side pivoted to said rocker in front of the shaft.

3. In a Venetian blind, a hollow boxlike head bar, a series of spaced apart slats, ladder tapes engaging opposite edge portions of the several slats and extending through the head bar and connected with actuating means therefor, whereby all of the several slats may be tilted, raising and lowering cords extending downwardly through the head bar and the several slats and connected to the lowermost one thereof, said actuating means comprising a rock shaft, rockers thereon, and overlapping bail connections from opposite sides of said rockers to the upper ends of said tapes, said rock shaft comprising a tube split along one side thereof and said rockers being formed of sheet metal from which tongues are struck to extend into the slot formed by said split.

4. In a Venetian blind structure, a hollow head bar, a series of spaced apart slats, ladder tapes engaging opposite edge portions of the several slats and extending through the head bar and connected with actuating means therefor whereby all of the several slats may be tilted, raising and lowering cords extending downwardly through the head bar and the several slats and connected to the lowermost one thereof, said actuating means comprising a rock shaft, rockers thereon, and overlapping bail connections from opposite sides of said rockers to the upper ends of said tapes.

5. In a Venetian blind structure, a rocker element, a ladder tape, one strap of which extends upwardly along one side of said rocker element and the other strap of which extends upwardly along the opposite side of said rocker element, means for rocking said rocker element, and an operative connection between said rocker element and the upper ends of said straps comprising crossed bail elements, each pivoted at one

side to the rocker element and at the other side to the strap.

6. In a Venetian blind, a rocker member, a ladder tape, the straps of which extend upwardly along opposite sides of said rocker member, means for rocking said rocker member, and an operative connection between said rocker member and the upper ends of said tapes comprising crossed bail elements pivoted at one side to the rocker member and at the other side to said straps.

7. A Venetian blind comprising a support in the form of a housing, means carried by said support and concealed therein for suspending a Venetian blind therefrom, said means comprising a rock shaft, rockets thereon, means for varying the angle of inclination for the Venetian blind by rocking said rock shaft and rockers, and connections between said rockers and the upper ends of the straps of the ladder tapes comprising bail elements extending through loops of the tapes, having their arms crossing each other and having terminal ends pivoted each to the rocker adjacent the side thereof opposite that for the strap of the respective bail.

8. A Venetian blind head member and a Venetian blind supported therefrom, said head member comprising a channel shaped sheet metal support, a shaft carried by and within said support and concealed by said support for suspending the blind therefrom, a plurality of rockers connected with said shaft and having the tapes of the blind extending upwardly adjacent opposite sides thereof, and bail members from the upper ends of the tapes to the upper edges of the rocker members, said bail members crossing each other whereby to increase the possible travel of the tapes by unfolding action of the bails relative to the rockers.

9. An all-metal Venetian blind head construction for supporting and concealing the operating mechanism of a blind, said construction comprising a sheet metal casing bent to form an upwardly opening channel shaped housing of greater width than height, a shaft journaled in said casing above the center thereof, pulleys within said housing for the raising ropes of a Venetian blind, said pulleys being located below said shaft, rocker members on said shaft comprising cylinder segments having the chord at the top of the segment in the intermediate position of the rockers, and bails pivoted at one of their ends to said rockers adjacent the intersection of the circumference and chord of the rocker and connected at their opposite ends with the tapes of a Venetian blind, said bails crossing each other to effect additional movement of said tapes in the extreme positions of tilt of the rockers.

10. An all-metal Venetian blind head construction for supporting and concealing the operating mechanism of a blind, a sheet metal casing bent to form an upwardly opening channel shaped housing of greater width than height, a shaft journaled in said casing above the center thereof, rocker members on said shaft comprising cylinder segments having the chord at the top of the segment in the intermediate position of the rocker, and bails pivoted to said rockers adjacent the intersection of the circumference and chord of the rockers and connected with the tapes of a Venetian blind, said bails being arranged to cross each other.

11. An all-metal Venetian blind head unit construction for receiving, supporting and concealing the operating mechanism of a blind having slats, ladder tapes and raising ropes, said head unit construction comprising a sheet metal casing bent to form an upwardly opening channel-shaped housing and support, a shaft carried by said housing and concealed between the walls thereof, bearing members for said shaft, said housing having spaced openings in its bottom through which the ladder tapes may vertically extend and having other openings through which the raising ropes may vertically extend, means of connection between said rock shaft and said tapes to cause movement of one side of the ladder tapes upwardly while the other side simultaneously therewith moves downwardly, means supported within said housing for guiding the raising ropes, means for effecting rotation of said rock shaft, said means of connection comprising rocker members having the tapes extended to points above their centers when the rockers are in intermediate positions, overlapping means of connection between said tape ends and the opposite sides of said rocker, and pulleys for said raising ropes below said rockers.

12. A tipping device for Venetian blinds consisting of a support and a rotatable hollow shell-like member, a rock shaft for supporting said shell-like member, said shell-like member having a cylindrical part and a flat part forming a chord of the circle defining the cylinder, and bail connections from the intersections of the circumference and chord of the shell-like member to the upper ends of the tapes of a tape ladder, said connections crossing each other for unfolding action in the extreme tipped positions.

13. A tipping device for Venetian blinds consisting of a support and a rotatable hollow shell-like member, a rock shaft for supporting said shell-like member, said shell-like member having a cylindrical part and a flat part forming a chord of the circle defining the cylinder, bail connections between the intersections of the circumference and chord of said shell-like member to the upper ends of the tapes of a tape ladder, said bail connections crossing each other for unfolding action in the extreme tipped positions, said rock shaft being longitudinally slotted, and a tongue from said shell-like member into the slot to fix the member against rotation relative to the shaft.

14. A tilting device for Venetian blinds consisting of a rotatable hollow thin metal shell having a substantially cylindrical part, a chord part and perforated end parts bent from the chord parts to form supports, a rock shaft extending through said supports, a housing, said rock shaft being journaled therein, and ladder tapes of a Venetian blind connected by overlapping bail means with said shell.

15. In a Venetian blind structure, the combination with a channel-shaped sheet metal head bar having a bottom wall provided with ladder tape and raising rope openings, of means for supporting and tilting a Venetian blind comprising stamped sheet metal rocker members, a rock shaft therefor, bearings for said rock shaft intermediate the ends of said head bar and adjacent said openings, said rocker members having Venetian blind ladder tapes located on opposite sides thereof and having flattened portions at the top in the intermediate tilting position, crossed bail members connecting said tapes with opposite edges of said flat portions, said rocker members being operable to raise one ladder tape and simultaneously therewith lower its companion ladder tape upon said rock shaft being tilted, and rais-

ing rope pulleys mounted stationary relative to said head bar and located below said rocker members.

16. In a Venetian blind, a casing, means within said casing for suspending a Venetian blind comprising plural ladder tapes and slats and means within said casing for tipping said slats, said last means comprising cylinder segment-shaped rockers, and means of connection between said rockers and said tapes comprising overlapping bail connections, said rocker members being adjustable to one position supporting one tape of the ladder tape loosely and the other side thereof taut whereby the slats will assume a position of suspension adjacent the side of the casing from which the tape member that is taut extends to effect maximum closure of the slats.

17. In a Venetian blind support for a Venetian blind having ladder tapes and slats, a casing, means therein for suspending the two sides of said ladder tapes for either holding the blind slats in a horizontal plane or raising one side of the ladder tapes and lowering the other side thereof to effect tipping of said slats, said blind when said means is adjusted to position for closure thereof being suspended in a position out of the normal vertical plane of the blind and by one side only of said ladder tapes, said means comprising semicylindrical rocker members, and overlapping bail connections between opposite edges of the chord portion of the rocker and the upper ends of the ladder tapes.

18. A tilting device for Venetian blinds consisting of a rotatable hollow thin metal shell having a substantially cylindrical part, a rock shaft extending through said shell, a housing, said rock shaft being journaled therein, and ladder tapes of a Venetian blind extending in contact with said cylindrical part on opposite sides of said shell and having their upper ends connected by overlapping bail means with said shell.

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