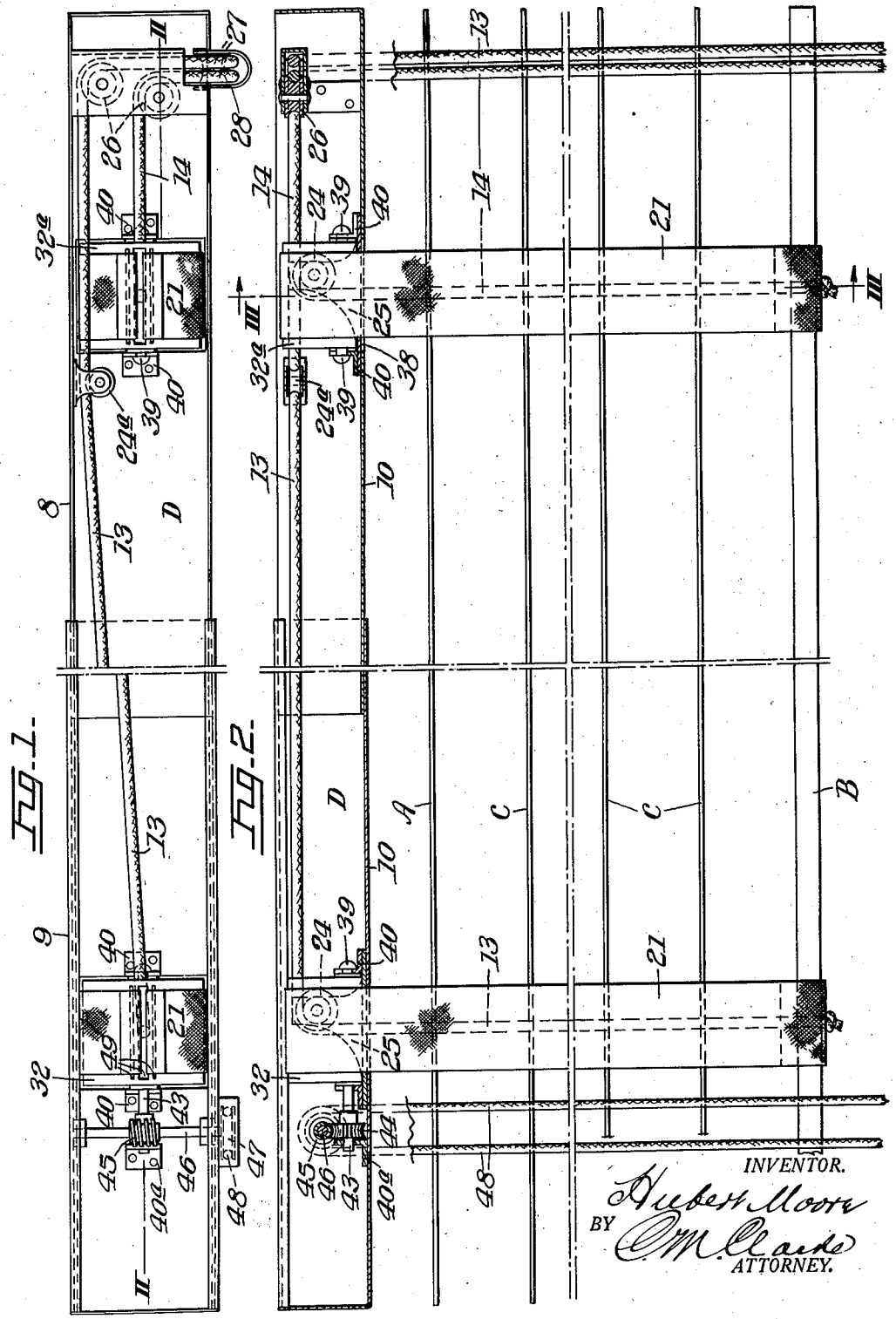
Dec. 15, 1936. H. MOORE 2,064,443

VENETIAN BLIND

Filed April 25, 1935 2 Sheets-Sheet 1



Dec. 15, 1936. H. MOORE 2,064,443

VENETIAN BLIND

Filed April 25, 1935 2 Sheets-Sheet 2

Fig. 3.

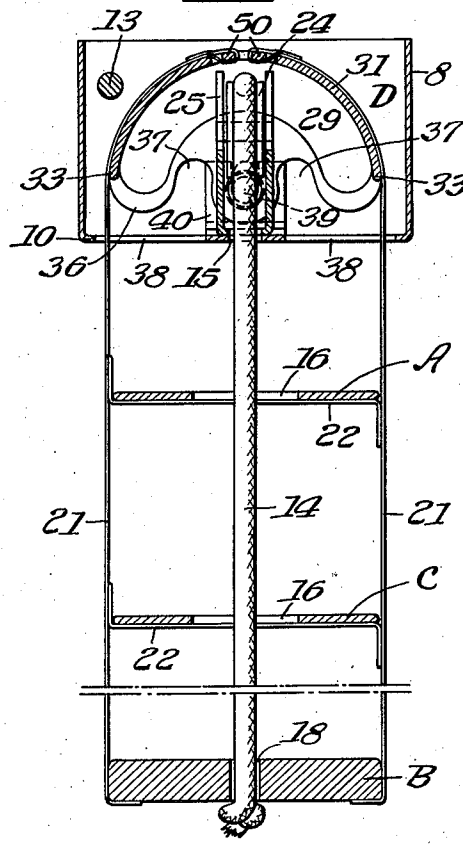


Fig. 4.

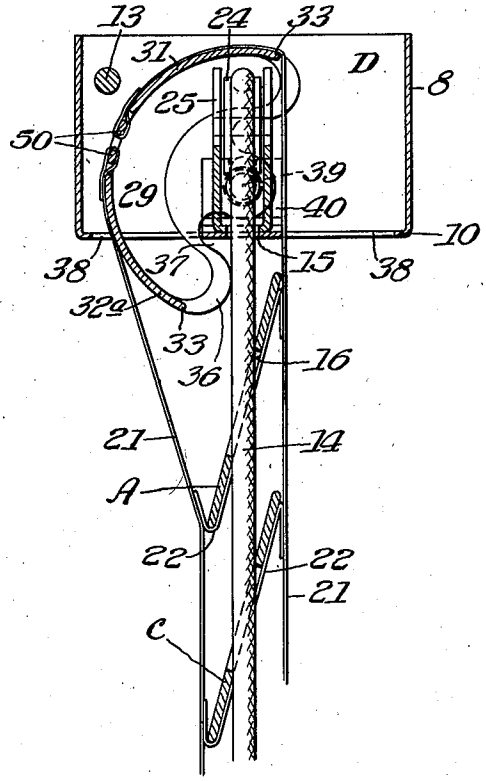


Fig. 5.

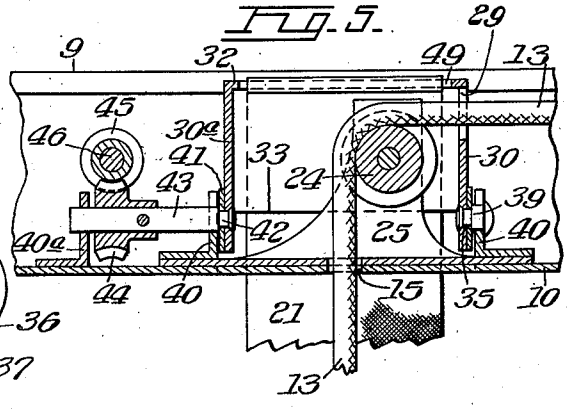


Fig. 6.

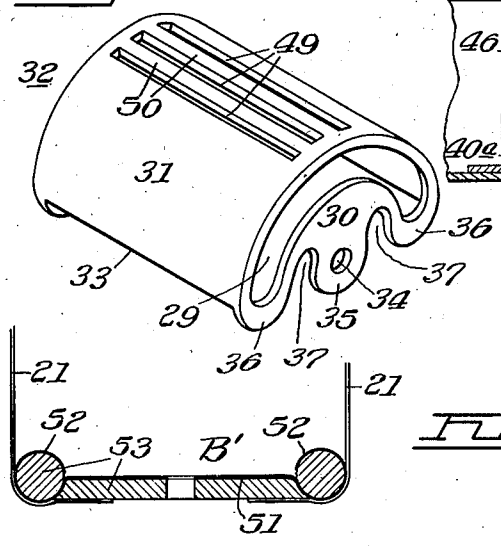


Fig. 7.

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2,064,443

VENETIAN BLIND

Hubert Moore, Sewickley, Pa., assignor to Rolscreen Company, Pella, Iowa

Application April 25, 1935, Serial No. 18,196

18 Claims. (Cl. 156—17)

My invention is an improvement in the art of Venetian blinds. Such blinds ordinarily consist of a series of spaced apart slats, usually of wood or other suitable thin material.

The slats are usually mounted and assembled for raising, lowering and tilting by means of manipulating cords or the like, and are connected in series by the usual so-called ladder tapes, disposed vertically in edge engagement with the several slats.

The construction of the present invention is generally similar to that of my prior Patent No. 1,949,653, issued March 6, 1934, and relates principally to the tilting mechanism.

In my co-pending application Ser. No. 705,205, filed January 4, 1934, transmission of tilting movement to the slats is effected by rotation of a controlling shaft in the head bar flexibly connected with the uppermost slat and therefrom to the several slats of the series by and through the usual conventional ladder tapes.

In the present improvement I have dispensed with the controlling shaft and utilize a pair of partly annular or partly cylindrical rocker elements directly connected with the ladder tapes or extensions thereof, and means for actuating one of said rockers, as hereinafter described.

Referring to the drawings showing one preferred embodiment of the invention:—

Fig. 1 is a plan view, partly broken away, showing the operative mechanism mounted in the head bar;

Fig. 2 is a vertical part sectional view on the line II—II of Fig. 1, partly broken away, and showing the upper and lower slats, ladder tapes, etc. in front elevation;

Fig. 3 is an enlarged or substantially full size vertical section on the line III—III of Fig. 2, showing the slats in normal horizontal position;

Fig. 4 is a similar view showing the slats in tilted position;

Fig. 5 is an enlarged vertical section of the left side end of Fig. 1 on the partial line II—II thereof;

Fig. 6 is a perspective detail view of one of the rocker elements;

Fig. 7 is a detail cross section showing a modified construction of bottom slat or bar.

The main operative elements of the blind proper consist of an uppermost slat A, generally corresponding to the conventional tilting bar, a lowermost slat B, generally corresponding to the conventional bottom bar, and a series of intervening co-operating tilting slats C. These may be made of wood, or of thin sheet metal as aluminum, steel, or the like.

These several main elements of the blind are so suspended, arranged and combined with the raising, lowering and tilting means of the uppermost head bar D as to provide for their several desired operations and positions. The head bar comprises a trough shaped box, preferably made of two telescoping sections for longitudinal lengthening or shortening adjustment to varying widths of window openings. To this end it is composed of an inner channel member 8 and an outer similar channel member 9 of light sheet metal, each having a bottom wall 10, one section interengaging slidably with the other, as shown.

The head bar is adapted to be mounted underneath the head jamb of a window frame in any suitable way, as by the use of endmost supporting brackets of suitable construction, not shown.

The operative mechanism is mounted within the hollow interior of the head bar, and comprises lifting and lowering cords, supporting and tilting ladder tape extensions, rotatable rockers for the ladder tape extensions, and operative means for one of the rockers with an actuating element therefor.

The lifting and lowering cords 13 and 14 extend downwardly through openings 15 in the lower wall 10 of the head bar and through transverse slots 16 of the several slats A and C. The cords are secured through openings 18 of the lowermost slat or bottom bar B by any suitable terminals, as shown.

By such construction and arrangement, upon removal or loosening of such terminals and withdrawal upwardly of the cords 13 and 14, the several slat members A and C may be bodily removed for cleaning, repair, repainting, or the like.

As is customary in ordinary Venetian blinds, the several slat members are supported by the usual ladder tapes 21 and transverse connecting ladder tape rungs 22, operatively connected with the ladder tapes by their terminals. The slats rest loosely thereon and are retained in longitudinal position by the lifting cords extending through openings 16. Lifting cords 13 and 14 pass over rollers 24 carried in brackets 25 and then around guiding rollers 26 and outwardly through the front of the head bar, at one end thereof. A guide roller 24a is preferable mounted in a suitable bracket secured to the side wall of the head bar section as in Fig. 1 and leads the cord 13 to its roller 26 for clearance at one side of rocker 32a as in Fig. 3. Guiding rollers

27 are mounted in a supporting bracket 28 provided with any suitable automatic lifting cord lock, the lifting cords 13, 14 depending from the rollers a sufficient distance downward for convenient grasping by the operator. Otherwise, if no automatic lock is provided, the lifting cords may be held by a cleat or the like on the window frame.

The tilting of the several slat members of the blind is effected by means of an actively actuated rocker member 32 and a co-operating balancing, or if preferred, an idler rocker 32*a*, each directly connected with the rocker tapes 21, or extensions thereof. Each rocker is of generally semi-cylindrical form, pivotally mounted for simultaenous tilting in either direction, for effecting alternate raising and lowering of the opposite ladder tape members to an equal degree or extent from their normal horizontal position.

The rockers 32 and 32*a* are preferably made of light pressed sheet or cast metal, having a hollow interior for clearance of rollers 24 and brackets 25, with one end wall 30 at the leading-off side of cords 13 and 14 provided with an annular clearance slot 29.

The opposite end wall 30*a* may be solid as shown, or both ends may be thus slotted if preferred. The semi-cylindrical wall 31 over which the tape extensions are laid terminates in edges 33 corresponding or approximating in their lateral spaced dimension to the normal distance between the ladder tapes, as in Fig. 3. Each pivoting central portion of the rocker is provided at each end with a shaft or stud opening 34 and a surrounding hub 35. The end walls 30 and 30*a* are rounded outwardly as at 36 and then reversely concavely rounded or recessed inwardly as at 37 for clearance of the middle section of the head bar bottom wall and roller brackets, when tilted to their limit, as in Fig. 4. The head bar bottom wall is also cut out for such tilting clearance, as at 38.

Both hub portions 35 of rocker 32*a* and the inner hub portion of rocker 32 are pivotally mounted by studs 39 to brackets 40 secured to the middle portion of the head bar bottom. The opposite pivoting hub of rocker 32 is preferably reinforced, as by a welded on washer 41, and is fixedly secured as at 42, to the inner end of an operating rock shaft 43. Said shaft is journalled in bracket 40 and an outer bracket 40*a* and provided with a worm gear 44 engaged by a worm pinion 45 of shaft 46.

Shaft 46 is journalled transversely of the head bar as in Fig. 1 and is provided with an outer grooved wheel 47, preferably within a housing, around which wheel passes the double operating cord 48. Each rocker is so constructed as to provide for attachment of the upper terminals of the ladder tape extensions, as by slots 49 providing alternating rods 50 around which the tape extension terminals are secured, as shown in Figs. 3 and 4.

The tape extension terminals may be secured to the middle top portion of the rocker in any other suitable manner, leaving approximately 90° contact around the annular surface of the rocker at each side, when in the normal position of Fig. 3. By pulling on one side or the other, rocker 30*a* may be tilted in either direction, transmitting through the ladder tapes a corresponding tilt, either for partial or entire closing of the slats as in Fig. 4. By reason of the worm gearing ample tilting power may be exerted by pulling on either of the side-by-side members of cord 48, and the gearing will hold and lock the rocker against undesired movement.

When rocker 32 is thus tilted, its companion rocker 32*a* will be correspondingly tilted by the several slats, reacting through their attached ladder tapes 21, so that both rockers will at all times be in corresponding positions, either normal or tilted.

Due to the ample dimensions and extent of throw of the rockers the lift of the slats at one side and drop at the other, with either direction of throw, will be amply sufficient for all desired slat adjustment. Also, that "bundling" of the slats, or raising or lowering of any proportion of their lower series, may be easily effected by manipulation of cords 13, 14 together.

By making the rockers in approximately semi-cylindrical form and substantially co-extensive with the width of the slats, they are capable of being mounted in a comparatively shallow head bar. Also, that ample clearance for either rounded edge portion of the rocker below its bottom is provided at either lowering side of the slats, as in Fig. 4.

It will be noted that the bottom bar B is shown as of desirable increased thickness and weight, facilitating straight depending tendency of the series of slats. I show in Fig. 7 a modified construction of bottom bar B′ in which the bar is formed of thin sheet metal 51 rounded or turned upwardly at its edges, as at 52, and combined with any suitable weighting material 53, as lead. Such construction provides ample strength and weight, and may be utilized when desired.

The construction and operation of the invention will be readily understood from the foregoing description. The reverse rotation of the single rocker when lowered at one side exerts an easy and gradual lever-like lifting action, with the tape extension following up and around the annular rocker surface, while the opposite tape is correspondingly lowered.

While the elevated tape extension will assume an inward swing at the top, and the lowered tape extension will assume a slight inclination at the opposite side, the several slats will retain their continuous middle positions at all times, due to the centralizing control of the lifting cords.

The construction is highly efficient under all conditions, it is comparatively simple and cheap, not liable to get out of order, and dispenses with the necessity of shafting and other unnecessary details. It may be made in various sizes or dimensions to suit different window or other openings, and may be changed or modified by the skilled mechanic to adapt it to varying conditions of application or use, within the scope of the following claims.

What I claim is:—

1. In a Venetian blind structure, a part-cylindrical rotatable rocker, supporting tapes secured to the rocker and extending around over its outer surface and freely downwardly from opposite sides thereof, means for rotating said rocker, and a supporting and enclosing casing therefor entirely supporting the blind having rocker clearance openings in its bottom, said rocker having portions insertable through said openings when tilted downwardly at either side.

2. In a Venetian blind structure, a pivotally mounted rotatable part-cylindrical rocker, sup-

porting ladder tape extensions, one extension being disposed over one side edge of the rocker and the other extension being disposed over its other side edge and both secured to its middle portion, and means for rotating the rocker.

3. A sheet metal tipping device for Venetian blinds consisting of a rotatable support for attachment of ladder tape extensions and having an annular bearing face of constant radius terminating in opposite terminal edge portions and provided with a plurality of integral strips and alternate spaces.

4. A tipping device for Venetian blinds consisting of a pivoted support for attachment of ladder tape extensions and having an annular bearing face terminating in opposite terminal edge portions co-extensive with the width of the ladder tape extensions and having interior and endmost clearance openings for a lifting cord.

5. A tilting rocker for operating a Venetian blind consisting of a hollow part-cylindrical shell having means for connection with ladder tape extensions between opposite terminal edge portions, and end walls provided with journalling hubs and clearance openings, substantially as set forth.

6. In combination with a housing support having a bottom wall, a tilting rocker pivotally mounted thereon having a part annular face for supporting attachment of flexible connections of a Venetian blind, a pivoting shaft connected with one end of the rocker, and actuating gearing therefor.

7. A tipping device for Venetian blinds consisting of a support and a rotatable hollow shell-like member, said shell-like member having a clearance space for an operating cord, with a portion of its periphery provided with an alternating series of longitudinal strips and spaces.

8. A tipping device for Venetian blinds consisting of a support and a rotatable hollow shell-like member, said shell-like member having a clearance space for an operating cord and having an annular winding surface and integral spaced bars for ladder tape extensions.

9. A tipping device for Venetian blinds consisting of a support and a rotatable hollow shell-like member, said shell-like member having a clearance space for an operating cord and having a terminal supporting portion provided with an endmost clearance opening.

10. In combination with an uppermost head bar, having rocker clearance openings through its bottom and a part-cylindrical rocker pivotally mounted thereon and having an annular surface for variably and constantly engaging ladder tape extensions, annularly spaced longitudinal holding rods in the rocker periphery, and means for actuating the rocker.

11. In a ventilating blind having a longitudinally extensible two-piece telescoping head bar having clearance openings through its bottom, a series of slats, and ladder tapes engaging opposite sides of the several slats, a pivotally mounted part-cylindrical rocker in the head bar having an annular supporting surface of a uniform radius from the pivotal mounting, integral tape connecting rods in the rocker periphery, and tilting means connecting the uppermost slat with said rods on the rocker.

12. In a tipping device for Venetian blinds, supporting bearing means provided therefor, and a hollow thin metal shell-like annular member mounted on said means and having a clearance space for an operating cord and having transverse openings through the shell and an endmost opening in non-interfering relation to said bearing means.

13. A tipping device for Venetian blinds consisting of a rotatable hollow open end thin metal shell having a clearance space for an operating cord and having an annular surface interrupted by alternating spaced apart openings so positioned as to variably determine the operating position of ladder tapes secured to the shell and depending from its opposite annular sides, supporting means therefor, and gearing for rotatably moving the shell thereon.

14. In a Venetian blind, the combination with supporting ladder tapes, of a tipping device consisting of an open ended semi-cylindrical rotatable hollow shell-like member having a clearance space for an operating cord and having a terminal supporting portion and means for securing the ladder tapes to said shell-like members.

15. In a Venetian blind structure, the combination with a hollow uppermost head bar having a bottom wall and front and back walls and having lifting rope and ladder tape openings in the bottom wall thereof, of means for supporting and tilting a Venetian blind comprising rocker elements and bearings therefor located between the front and back walls of said head bar, said rocker elements being spaced above said bearings and having end members extending downwardly to the bearings and pivotally connected therewith, a pair of ladder tape extensions of a Venetian blind being operatively connected with each rocker element to be adjusted thereby for tilting the slats of a Venetian blind and lifting rope pulleys for the lifting ropes of a Venetian blind located beneath said rocker elements.

16. In a Venetian blind structure, the combination with a hollow uppermost head bar having a bottom wall and front and back walls and having lifting rope and ladder tape openings in the bottom wall thereof, of means for supporting and tilting a Venetian blind comprising rocker elements and bearings therefor located between the front and back walls of said head bar, said rocker elements being spaced above said bearings and having end members extending downwardly to the bearings and pivotally connected therewith, a pair of ladder tape extensions of a Venetian blind being operatively connected with each rocker element to be adjusted thereby for tilting the slats of a Venetian blind and lifting rope pulleys for the lifting ropes of a Venetian blind located beneath said rocker elements, said end members of said rocker elements having clearance spaces to permit said lifting ropes to pass therethrough and past said bearings without interference of the rocker elements with the lifting ropes in any position to which the rocker elements are tilted.

17. In a Venetian blind structure, the combination with a channel shaped, sheet metal head bar having a bottom wall provided with ladder tape extension and raising rope openings, of means for supporting and tilting a Venetian blind comprising hollow, arched, stamped sheet metal rocker members, bearings therefor intermediate the ends of said head bar and adjacent said openings, Venetian blind ladder tape extensions operatively connected with said rocker members and depending from opposite sides of said rocker members and through said ladder tape extension openings and raising rope pulleys mounted stationary relative to said head

bar and located below the mid portions of said arched rocker members.

18. In a Venetian blind structure, the combination with a channel shaped, sheet metal head bar having a bottom wall provided with ladder tape extension and raising rope openings, of means for supporting and tilting a Venetian blind comprising stamped sheet metal rocker members, bearings therefor intermediate the ends of said head bar and adjacent said openings, said rocker members having Venetian blind ladder tape extension operating portions located on opposite sides of said bearings, said operating portions being operable to raise one ladder tape and simultaneously therewith lower its companion ladder tape upon said rocker members being tilted, said ladder tapes depending from opposite sides of said rocker members and through said ladder tape extension openings and raising rope pulleys mounted stationary relative to said head bar and located below the mid portions of said rocker members.

HUBERT MOORE.