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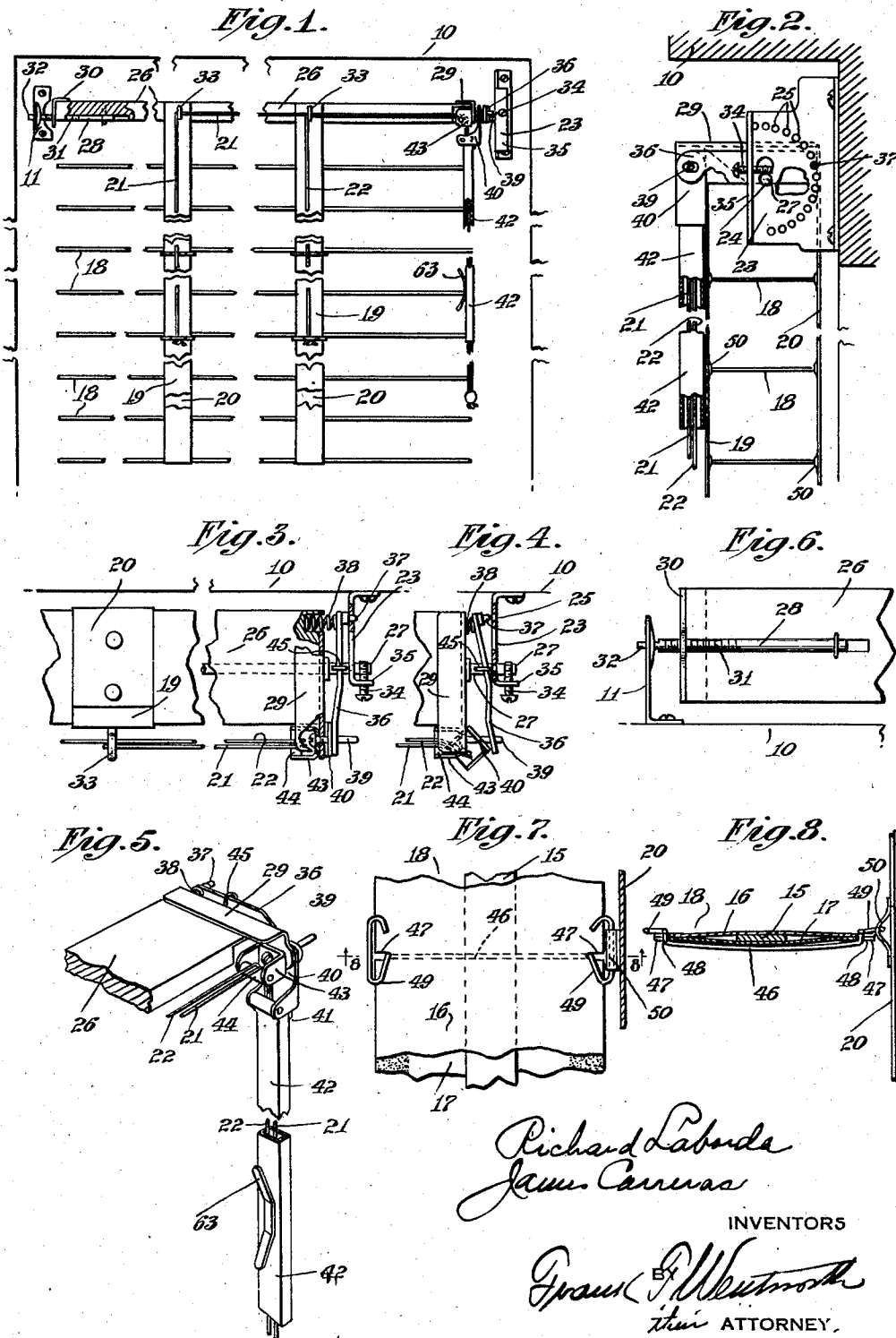
R. LABORDA ET AL

2,116,357

VENETIAN BLIND

Filed July 23, 1937

2 Sheets-Sheet 1



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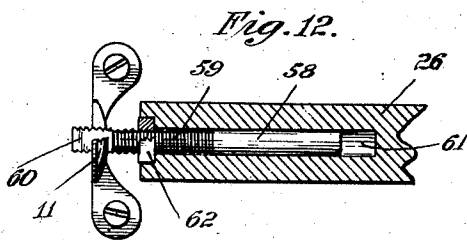
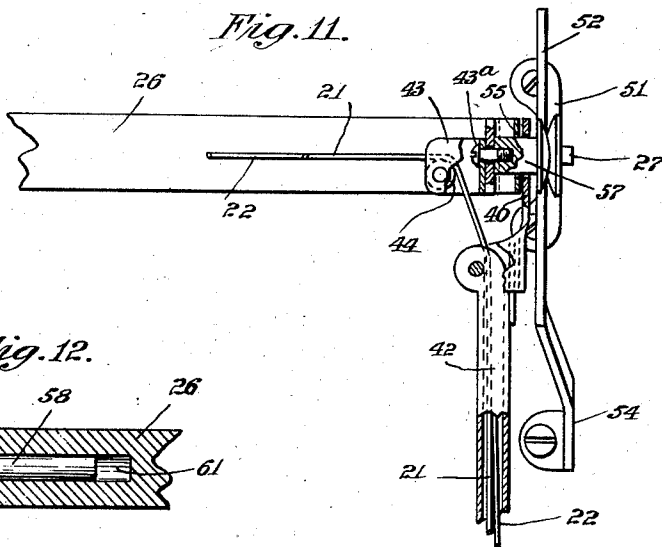
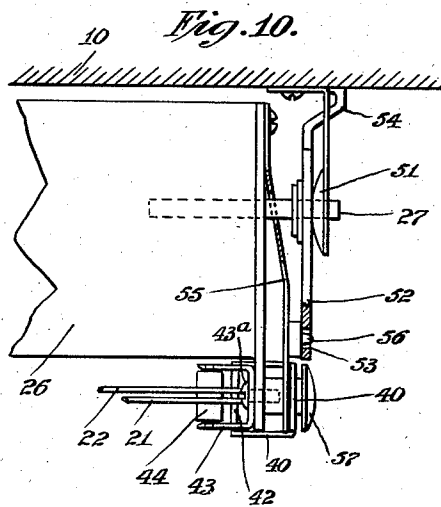
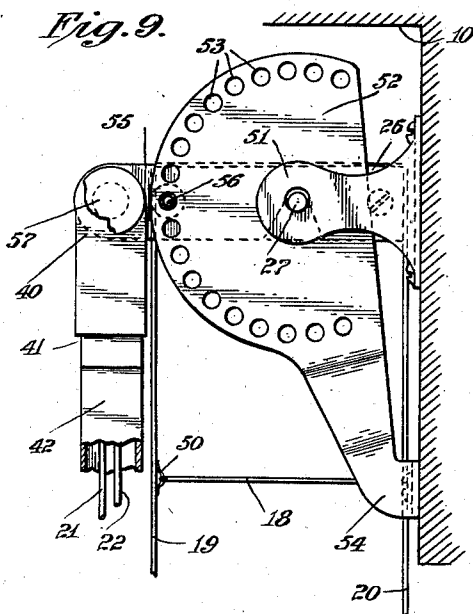
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VENETIAN BLIND

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2 Sheets-Sheet 2



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# UNITED STATES PATENT OFFICE

2,116,357

## VENETIAN BLIND

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11 Claims. (Cl. 156—17)

The invention relates to Venetian blinds, and more particularly to the mechanisms for supporting and actuating the louvers.

The invention is particularly applicable to the type of Venetian blinds shown in our co-pending application Serial No. 149,053, filed June 19th, 1937, wherein in raising and lowering the blind, the louvers are moved in groups and brought into parallel relation adjacent the top of the blind, and wherein different groups of louvers, when the blind is lowered, may be differentially actuated to secure varying lighting and ventilating effects.

In the type of blind for which the invention is particularly adapted for use, the blind structure is mounted in relation to a window opening by means of brackets such as are commonly used for roller shades, so that the blind may be quickly placed in position or removed.

In the blind disclosed in our aforesaid application, the louvers are raised and lowered by cords engaging one of the tapes of each pair of ladder tapes, these cords being positioned at one end of the louvers. The louvers are turned by means of cords positioned at the other end of the louvers. Friction is relied upon to hold the louvers in any adjusted position to which they may be turned to secure the desired lighting and ventilating effect.

By means of the structure of our present invention, the separate means for raising and lowering a blind and for turning the louvers are positioned at the same side of the window frame, and positive locking means, controlled by a rigid member, are provided so as to avoid possibility of accidental shifting of the louvers when they have once received the desired setting. The locking means are so constructed as to permit the setting of the louvers at any desired angle. Preferably, said rigid member is utilized as a guide and housing for the cords used in raising and lowering the blind.

The mechanism used for tilting the louvers is so constructed that it may be compactly nested with the other parts of the blind structure to facilitate transportation and storage of blinds in compact space.

In the preferred form of the invention, part of the locking mechanism serves as a bearing bracket for a trunnion at one end of the louver supporting rod, although this locking member may be made as a separate piece and used in conjunction with an ordinary roller shade bracket.

The movable locking member is spring pressed into engagement with its co-operating fixed locking member, either, as will more fully appear

hereinafter, by means of a spring acting upon said movable locking member, or by forming said movable locking member of spring metal, the two structures being one merely a reversal of the other.

Our invention is also particularly adapted for use with louvers of the type generally referred to in our aforesaid application, but differing therefrom in the provision of a particular form of attachment between each louver and the opposite tapes of each pair of tapes supporting the louver, a construction affording a more rigid support for the louver at the point of attachment to the tapes and a more reliable and less expensive means of attachment of the louvers to the tapes.

The invention consists primarily in a Venetian blind embodying therein the novel features of construction and combination of parts hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the drawings,

Fig. 1 is a vertically and laterally condensed view, from the room side of a window, of a blind embodying the invention;

Fig. 2 is an end view thereof, from the right of Fig. 1, upon a larger scale;

Fig. 3 is a laterally condensed plan view of the portion of the blind shown in Fig. 2 with the louvers locked in position;

Fig. 4 is a view of the locking mechanism in the released position, preparatory to tilting of the louvers;

Fig. 5 is a perspective view of the actuating mechanisms for the louvers;

Fig. 6 is a bottom plan view of the louver head bar at the left of the blind;

Fig. 7 is a plan view of a fragmentary portion of one of the louvers, showing at one side thereof the manner of attaching the ladder tapes thereto;

Fig. 8 is a section on the line 8—8 of Fig. 7;

Fig. 9 is a view similar to Fig. 2 upon an enlarged scale showing a construction of controlling mechanism for the blind in which the fixed locking member is independent of the window bracket;

Fig. 10 is a plan view of Fig. 9;

Fig. 11 is a detail view, partly broken away, of the actuating mechanism for the blind; and

Fig. 12 is a detail view of the head bar trunnion mechanism at the end opposite to that carrying the locking mechanism.

Like numerals refer to like parts throughout the several views.

In the accompanying drawings, a window frame

is shown conventionally at 10, at one side of which, Figs. 1 to 6 and 12, is an ordinary open socket window shade bracket 11. The louvers shown at 18 in Figs. 1, 7 and 8 are, except as to the means of attaching them to the ladder tapes 13 and 14 of each pair of such tapes, of the same detailed construction as those described in our aforesaid application. Such louvers are composed of a reinforcing core 15 composed of a wooden slat having, upon opposite sides thereof, elongated sheets of paper 16 and 17 which may be suitably colored or decorated and have their edges and ends cemented together.

These louvers, generally designated by the numeral 18, are supported between the tapes 19 and 20, two pairs of such tapes preferably being used. The louvers are raised and lowered by means of cords 21 and 22 attached to the louvers, as described in our aforesaid pending application, and by means of these cords and of a mechanism for simultaneously raising the corresponding tapes of one pair and lowering the other tapes of said pair, the louvers may be tilted and, in conjunction with the cords 21 and 22, set so as to secure variable lighting and ventilating effects.

The present invention is restricted more particularly to the mechanisms for imparting tilting movement to the louvers, and incidentally to the control of the cords 21 and 22 and the manner of attaching the louvers 18 to the tapes 19 and 20.

Mounted on the window frame at the opposite side of the opening of the bracket 11 is a bracket 23 having a bearing opening 24 about and concentric with which is a sequence of socket openings 25. Extending from the bracket 11 to the bracket 23 is a head bar 26, preferably formed of wood, the opposite ends of this bar being provided with trunnions 27 and 28 adapted to engage said brackets 11 and 23.

Carried by the ends of the bar 26 are metal plates 29 and 30. The trunnion 27 is firmly connected with the bar and turns therewith. While the trunnion 28 is loosely mounted upon the bar, it is provided with a screw threaded section 31 co-operating with screw threads in the end plate 30 so as to permit turning movement of the bar about said trunnion 28. This trunnion has a squared end 32 fitting in the angular opening in the bracket 11.

While this construction may result in longitudinal movement of the bar when tilting the louvers, the amount of this movement may be limited to a few thousandths of an inch, so that it does not in any way interfere with the free operation of the blind.

While, in the form of the invention shown in Figs. 1 to 6, the trunnion pins are mounted in grooves in the bottom of the bar 26, the manner of mounting these pins is immaterial to the invention.

One edge of the bar 26 is provided with suitable guides such as eye-screws 33 in which the cords 21 and 22 run when raising or lowering the blind or any part thereof.

The opening 24 in the bracket 23 is in the form of a keyhole slot, and a screw or other device 34, passing through a screw threaded opening in the flange 35 of said bracket is used to prevent accidental lifting of the trunnion 27.

Carried by and rotatable with the trunnion 27 is a laterally movable lock strip 36, one end of which carries a stud 37 adapted to enter any of the openings 25 in the bracket 23. Acting upon the strip 36 adjacent the stud 37 is a spring 38 having a normal tendency to so rock said strip

as to cause said stud to enter any opening 25 opposite which it may be positioned. Clearance is provided between the strip 36 and the trunnion 27 and the means connecting said strip to said trunnion, so that said strip may have free, but limited turning movement about an axis perpendicular to the axis of the trunnion.

Carried by the end plate 29 and connected therewith by means of a screw thread is a guide pin 39 passing through an elongated opening in the strip 36, as shown more particularly in Fig. 2 of the drawings.

Suspended from the guide pin 39 is a plate 40 positioned between a vertical flange of the end plate 29 and the strip 36. By the turning of the plate 40 about a vertical axis, the strip 36 may be so rocked as to disengage the stud 37 from an opening 25 in the bracket 23 and thus permit the head bar 26 to be rocked about a horizontal axis by a downward pull or upward push upon said plate 40.

The plate 40 is provided with lugs 41 between which is pivotally mounted an elongated operating handle 42, preferably in the form of a tube, through which the lift cords 21 and 22 may be passed. To guide these cords, the guide pin 39 has pivotally mounted thereon a pulley housing 43 having a roller 44 mounted therein and positioned above the open upper end of the tube 42. The lift cords 21 and 22 pass over this roller in their run from the guides 33 to said tube.

By pivotally connecting the tube 42 to the plate 40 in the manner described, this tube may be folded to a position substantially parallel with the head bar 26, and be nested with the louvers so as to permit the packaging of the blind in compact space.

The tension of the spring 38 is restrained by a staple or other confining means 45 carried by the trunnion 27 and inclosing the upper portion of the strip 36. This staple connects the strip with the trunnion 27 so as to permit turning of the head bar 26 by vertical movement of the strip by the operating handle.

As shown more particularly in Figs. 7 and 8 of the drawings, the several louvers are attached to the tapes 19 and 20 by means of a wire fitting consisting of a wire cross bar 46 of a length less than the width of the louvers, the edges of the paper strips 16 and 17 of said louvers being notched, as shown at 47, for the reception of an angular portion 48 adjacent each end of the bar 46. This angular portion is provided with an open looped head 49 projecting over or under the louver. Each of the tapes 19 and 20 has attached thereto small fabric loops, one of which is shown at 50 in Figs. 7 and 8 of the drawings, adapted to pass over and enter the head 49. Said loops are positioned along the longitudinal center line of the tapes.

By this construction it is not only possible to quickly and accurately apply the tapes to the louvers, but the stresses, when moving the louvers through the tapes, are applied to a metallic reinforcing member, overcoming any tendency to tear the edges of the louvers.

Referring to the embodiment of the invention shown in Figs. 9 to 12, the construction is identical with that heretofore described, with the exception that an ordinary roller shade bracket 51 is used to support the end of the head bar, and a stop plate 52 having openings 53 concentric with the axis of the trunnion 27 is used, this plate being attached to the window frame by means of a lug 54. The locking strip, in this

embodiment of the invention, consists of a spring metal arm 55 secured to the end plate 29 in the manner shown in the drawings. This plate 55 is provided with a lock stud 56, remote from the point of pivotal support of the strip, the end of this strip being secured between the plate 40 and the end plate 29.

A headed stud 57 pivotally supports the plate 40, and acts as a stop, so that with the turning of the plate 40, the spring strip 55 will be flexed in a manner to disengage the stud 56 from an opening 53 in the plate 52. This headed stud 57 serves the same function as the guide pin 39 and also serves as a point of pivotal attachment of the housing 43, by means of a pivot screw 43a, carrying the roller 44, so as to permit turning of this housing with actuation of the plate and the tube 42.

In the form of the invention shown in Figs. 9 to 12, the end of the head bar 26, opposite to that adjacent the lock plate 52, is provided with a trunnion pin 58 having a screw threaded portion 59 and a squared end 60 co-operating with the open slot in the bracket fitting 11. Instead of using an end plate having the threads with which the screw threaded portion 59 co-operates, as in the form of the invention shown in Fig. 6, the said trunnion pin is rotatably mounted in a socket 61 in the head bar 26, and the end of said bar is provided with an angular recess for the reception of a nut 62, which preferably has a drive fit in said opening.

To hold the blind in the partially open position, we provide the operating handle 42 with a side cleat 63 adjacent the lower end thereof. Since the cords 21 and 22 pass through and beyond the lower end of said tube 42, they may be readily engaged with the cleat 63.

The operation of the herein described Venetian blind, so far as the operating mechanisms therefor herein described are concerned, is substantially as follows:—

The manner of adjusting different groups of louvers to secure varying lighting and ventilating effects is the same as in our co-pending application, the turning of the louvers by the pairs of tapes 19 and 20 and the raising and lowering of the louvers by the pull cords 21 and 22 attached to said tapes in securing these effects, being the same as in our co-pending application.

With the construction herein described, a positive setting of the louvers may be had by the actuation of mechanisms associated with each other adjacent the same jamb of a window frame.

If it be desired to merely raise or lower the blind, it is merely necessary to use the lift cords 21 and 22 in the usual manner and secure said cords by means of the cleat 63. It will be noted that the guides 33 for these cords are carried by the head bar 26.

When it is desired, however, to turn the louvers or a particular group of louvers, this is done by means of the operating handle 42. Normally, the stud 37 or 56 is engaged with one of the openings 25 or 53, so that the head bar 26 is locked against turning movement from any cause whatever.

When it is desired to turn the louvers, it is merely necessary to turn the operating handle 42 about a vertical axis, imparting a rocking movement to the strip 36 or 55 to an extent to disengage the locking stud 37 or 56 from the opening 25 or 53 with which it may be engaged at the moment, and exert a downward pull or upward pressure upon said handle 42.

Since the strips 36 and 55 are so connected with the head bar 26 as to impart turning movement thereto in either direction, either by being connected with the trunnion 27 as to the former, or directly to the bar 26 as to the latter, said strip is capable of movement with the bar about the axis of movement of said bar, and also has a substantially straight line movement toward and from the bracket 23 or plate 52, irrespective of the position of said head bar.

When the various louvers have been tilted to the desired extent in either direction, it is merely necessary to release the torque upon the operating handle 42, whereupon the spring 38, or the resiliency inherent to the spring plate 55, will engage the stud 37 or 56 with an opening 25 or 53, although it may be necessary to impart slight rotary movement to said strip to properly position the stud in relation to an opening.

When raising and lowering the blinds, they may be positively held in the desired position by merely forming bights in the lift cords 21 and 22 about the cleat 63.

By using a rectangular tube 42, greater ease in turning this tube about a vertical axis is secured.

While, as stated, the screw threaded portion 31 or 59 upon the trunnion pin having the squared end permits free turning of the head bar, this movement will impart a minute longitudinal component of movement thereto, but this is immaterial since this movement will be very slight.

The purpose of hinging the operating handle 42 to the plate 40 for actuating the lock strip has been heretofore referred to.

By pivotally mounting the pulley housing 43 upon the end plate 29, the said pulley structure is permitted to turn with tilting of the head bar 26, and thus always maintains the same conditions effecting the run of the lift cords 21 and 22.

By using the wire fitting including the bar 46, the offset portions 48 seated in the slots 47 and the open looped heads 49 at opposite ends of said bar, overlying and projecting beyond the edge of the louver, all tendency toward the bending of the louvers at the edges, adjacent the tapes 19 and 20, is avoided.

It will be noted that such wire fittings are concealed at all times by the tapes, irrespective of the position of the louvers.

It is not our intention to limit the invention to the precise details of construction shown in the accompanying drawings, it being apparent that such may be varied without departing from the spirit and scope of the invention.

Having described the invention, what we claim as new and desire to have protected by Letters Patent, is:—

1: A Venetian blind embodying therein the combination with a pivotally supported head bar, a pair of tapes connected therewith, a plurality of louvers, connections between said tapes and said louvers respectively, and lift cords for raising or lowering said louvers, of locking members, one of which is fixedly mounted adjacent one end of said bar, and the other of which is rotatable with said bar and movable toward and from the other member, co-operating interlocking means upon said members, those upon one member being concentric with the axis of said bar, a pendant operating handle movable about a vertical axis, and means actuated thereby and engageable with said movable member, whereby said interlocking means may be disengaged to permit turning movement of said bar, or are permitted to engage

each other to lock said bar in any adjusted position.

2. A Venetian blind embodying therein the combination with a pivotally supported head bar, a pair of tapes connected therewith, a plurality of louvers, connections between said tapes and said louvers respectively, and lift cords for raising or lowering said louvers, of a strip adjacent one end of, and secured to and rotatable with said head bar, and movable longitudinally thereof, a stud carried by said strip, a fixed member having a plurality of openings concentric with said bar and adapted to be engaged by said stud, a pendant operating handle movable about a vertical axis, and means actuated by said handle and engageable with said strip, whereby said strip may be moved to disengage said stud from said fixed member to permit turning movement of said bar, or may have movement toward said fixed member to engage said stud with one of said openings to lock said bar in any adjusted position.

3. A Venetian blind embodying therein the combination with a pivotally supported head bar, a pair of tapes connected therewith, a plurality of louvers, connections between said tapes and said louvers respectively, and lift cords for raising or lowering said louvers, of a strip adjacent one end of, and secured to and rotatable with said head bar, and movable longitudinally thereof, a stud carried by said strip, a fixed member having a plurality of openings concentric with said bar and adapted to be engaged by said stud, a spring acting upon said strip to normally engage said stud with one of said openings, a pendant operating handle movable about a vertical axis, and means actuated by said handle and engageable with said strip, whereby said strip may be moved to disengage said stud from said fixed member to permit turning movement of said bar, or may have movement toward said fixed member to engage said stud with one of said openings to lock said bar in any adjusted position.

4. A Venetian blind embodying therein the combination with a pivotally supported head bar, a pair of tapes connected therewith, a plurality of louvers, connections between said tapes and said louvers respectively, and lift cords for raising or lowering said louvers, of a trunnion upon which one end of said bar has movement, a trunnion secured to the opposite end of said bar, an end plate upon said bar, a bracket having a bearing therein for the trunnion carried by said bar, said bracket having a sequence of openings concentric with said bearing, a lock strip, means securing said strip to said trunnion, movable with said bar while permitting movement thereof toward or from said bracket, a stud carried by said strip adapted to enter any of said openings in said bracket, a spring acting upon said strip to normally engage said stud with an opening in said bracket, a guide pin carried by said end plate, a plate pendant from said guide pin and engageable with said end plate and said strip, said plate being capable of movement about a vertical axis, and an operating handle secured to and pendant from said plate, whereby said strip may be moved to disengage said stud from said bracket to permit turning movement of said bar, or may have movement toward said bracket to engage said stud with one of said openings to lock said bar in any adjusted position.

5. A Venetian blind embodying therein the combination with a pivotally supported head bar, a pair of tapes connected therewith, a plurality

of louvers, connections between said tapes and said louvers respectively, and lift cords for raising or lowering said louvers, of a trunnion upon which one end of said bar has movement, an end plate having a screw threaded opening therein, said trunnion having a screw threaded portion engaging the screw threads in the opening in said plate and an angular end, a trunnion secured to the opposite end of said bar, an end plate upon said bar, a bracket having a bearing therein for the trunnion carried by said bar, said bracket having a sequence of openings concentric with said bearing, a lock strip, means securing said strip to said trunnion, movable with said bar while permitting movement thereof toward or from said bracket, a stud carried by said strip adapted to enter any of said openings in said bracket, a spring acting upon said strip to normally engage said stud with an opening in said bracket, a guide pin carried by said end plate, a plate pendant from said guide pin and engageable with said end plate and said strip, said plate being capable of movement about a vertical axis, and an operating handle secured to and pendant from said plate, whereby said strip may be moved to disengage said stud from said bracket to permit turning movement of said bar, or may have movement toward said bracket to engage said stud with one of said openings to lock said bar in any adjusted position.

6. A Venetian blind embodying therein the combination with a pivotally supported head bar, a pair of tapes connected therewith, a plurality of louvers, connections between said tapes and said louvers respectively, and lift cords for raising or lowering said louvers, of a strip adjacent one end of, and secured to and rotatable with said head bar, and movable longitudinally thereof, a stud carried by said strip, a fixed member having a plurality of openings concentric with said bar and adapted to be engaged by said stud, a pendant operating handle movable about a vertical axis, means actuated by said handle and engageable with said strip, whereby said strip may be moved to disengage said stud from said fixed member to permit turning movement of said bar, or may have movement toward said fixed member to engage said stud with one of said openings to lock said bar in any adjusted position, a pulley pivotally mounted upon said head bar about which said lift cords pass, and means carried by said operating handle to which said cords may be secured.

7. A Venetian blind embodying therein the combination with a pivotally supported head bar, a pair of tapes connected therewith, a plurality of louvers, connections between said tapes and said louvers respectively, and lift cords for raising or lowering said louvers, of a strip adjacent one end of, and secured to and rotatable with said head bar, and movable longitudinally thereof, a stud carried by said strip, a fixed member having a plurality of openings concentric with said bar and adapted to be engaged by said stud, a tubular pendant operating handle movable about a vertical axis, means actuated by said handle and engageable with said strip, whereby said strip may be moved to disengage said stud from said fixed member to permit turning movement of said bar, or may have movement toward said fixed member to engage said stud with one of said openings to lock said bar in any adjusted position, a pulley pivotally mounted upon said head bar about which said lift cords pass, and means carried by said operating handle to which said

5 cords may be secured after passing through said tubular operating handle.

8. A Venetian blind embodying therein the combination with a pivotally supported head bar, a pair of tapes connected therewith, a plurality of louvers, connections between said tapes and said louvers respectively, and lift cords for raising or lowering said louvers, of a trunnion upon which one end of said bar has movement, a trunnion secured to the opposite end of said bar, an end plate upon said bar, a bracket having a bearing therein for the trunnion carried by said bar, said bracket having a sequence of openings concentric with said bearing, a lock strip, means securing said strip to said trunnion, movable with said bar while permitting movement thereof toward or from said bracket, a stud carried by said strip adapted to enter any of said openings in said bracket, a spring acting upon said strip to normally engage said stud with an opening in said bracket, a guide pin carried by said end plate, a plate pendant from said guide pin and engageable with said end plate and said strip, said plate being capable of movement about a vertical axis, and an operating handle pivotally connected with and pendant from said plate, whereby said strip may be moved to disengage said stud from said bracket to permit turning movement of said bar, or may have movement toward said bracket to engage said stud with one of said openings to lock said bar in any adjusted position.

9. A Venetian blind embodying therein the combination with a pivotally supported head bar, a pair of tapes connected therewith, a plurality of louvers, connections between said tapes and said louvers respectively, and lift cords for raising or lowering said louvers, of a plate adapted to be fixedly secured adjacent a bracket and having an opening therethrough, and a plurality of openings concentric with said first named opening, a spring strip secured to said head bar, a stud carried thereby adapted to co-operate with any of said concentric openings, a headed stud carried by said head bar, a plate pendant from said headed stud and engageable between same and said spring strip, said plate having a loose

bearing with said stud, whereby said plate may have limited movement about a vertical axis, and a pendant operating handle connected with said plate, whereby said spring strip may be flexed to disengage said stud from an opening, or may be released to permit said stud to engage an opening.

10. A Venetian blind embodying therein the combination with a pivotally supported head bar, a pair of tapes connected therewith, a plurality of louvers, connections between said tapes and said louvers respectively, and lift cords for raising or lowering said louvers, of a plate adapted to be fixedly secured adjacent a bracket and having an opening therethrough, and a plurality of openings concentric with said first named opening, a spring strip secured to said head bar, a stud carried thereby adapted to co-operate with any of said concentric openings, a headed stud carried by said head bar, a plate pendant from said headed stud and engageable between same and said spring strip, said plate having a loose bearing with said stud, whereby said plate may have limited movement about a vertical axis, a pendant operating handle connected with said plate, whereby said spring strip may be flexed to disengage said stud from an opening, or may be released to permit said stud to engage an opening, a trunnion pin having a squared end and an adjacent screw threaded portion loosely mounted in the end of said head bar opposite that adjacent said plate having the openings therethrough, and a nut carried by said bar cooperating with the screw threaded portion of said trunnion pin.

11. In a Venetian blind a louver having opposite notches in the edges thereof, a wire fitting having a cross bar of a length less than the width of the louvers, an angular portion at each end thereof adapted to pass through said notches, and an open looped head adjacent each angular portion, and tapes having fabric loops secured along substantially the center line thereof adapted to enter and be retained by said looped heads respectively.

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