Nov. 17, 1936. G. F. BRENT ET AL 2,061,373

VENETIAN BLIND

Filed Oct. 4, 1935 2 Sheets-Sheet 1

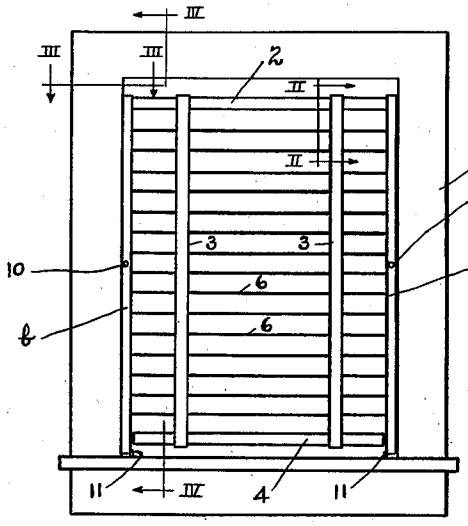


Fig. I.

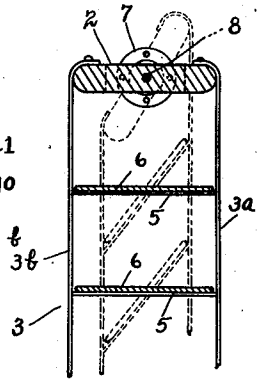


Fig. II.

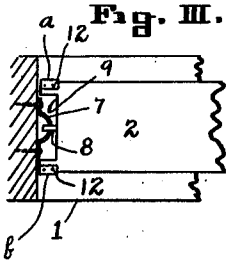


Fig. III.

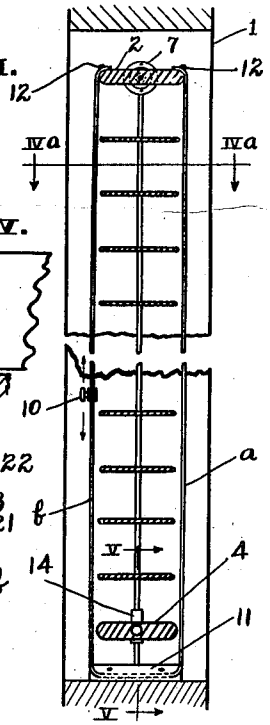


Fig. IV.

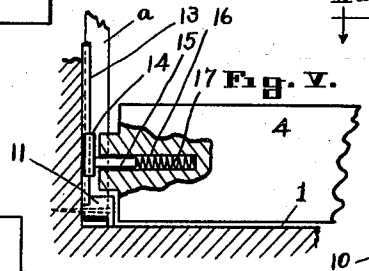


Fig. V.

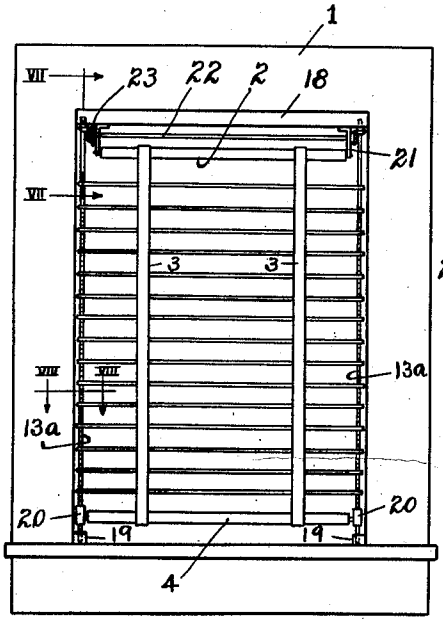


Fig. VI.

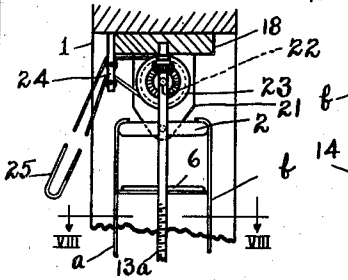


Fig. VII.

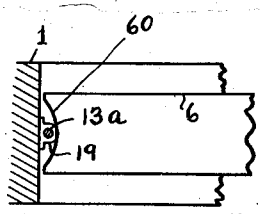


Fig. VIII.

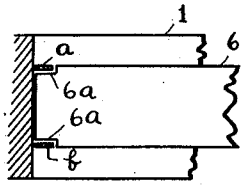


Fig. IVa.

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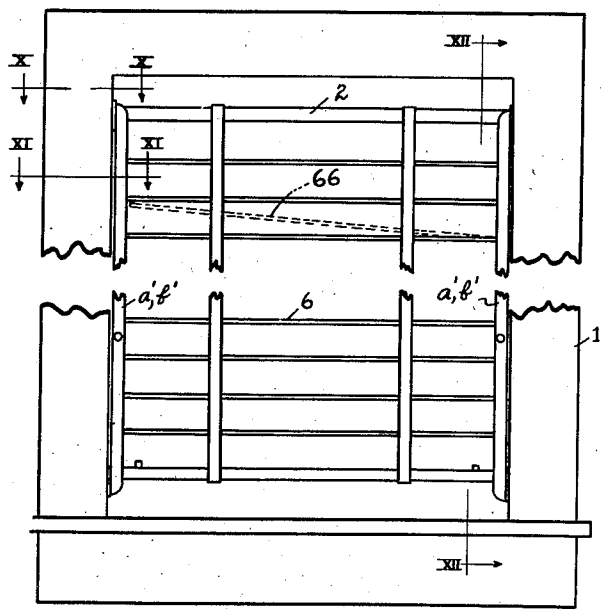


Fig. IX.

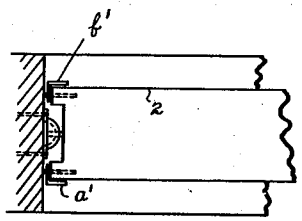


Fig. X.

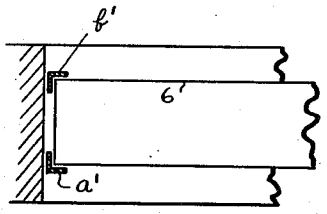
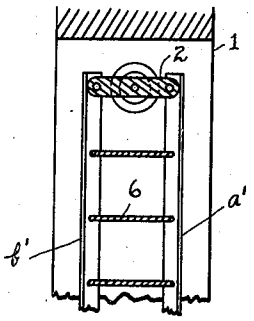


Fig. XI.



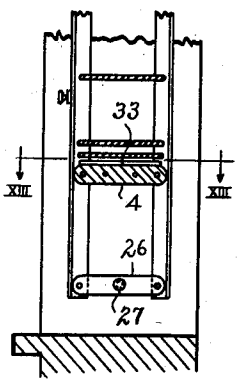


Fig. XII.

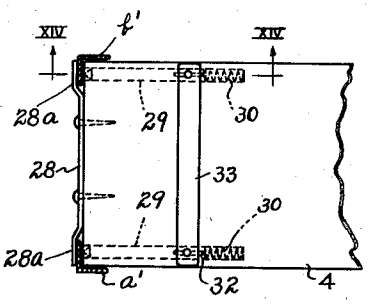


Fig. XIII.

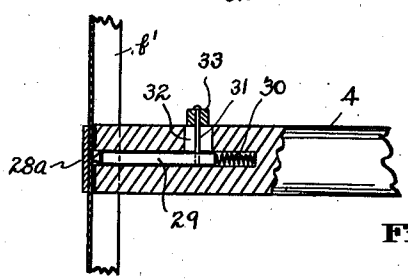


Fig. XIV.

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UNITED STATES PATENT OFFICE

2,061,373

VENETIAN BLIND

George F. Brent and James M. Guthrie, Pittsburgh, Pa.; said Guthrie assignor to said Brent

Application October 4, 1935, Serial No. 43,592

13 Claims. (Cl. 156—17)

Our invention relates to Venetian blinds, and consists in refinements and simplifications in the construction of such blinds.

A Venetian blind, characteristically, embodies a vertical series of horizontally extending slats, supported by means of two or more flexible hangers. The slats are adjustable in unison about their horizontal axes. The slats may be angularly adjusted to lie severally in vertically spaced-apart horizontal planes. Alternately, they may be angularly adjusted in such manner that successive slats overlap and provide a closed screen. Between these extreme positions of angular adjustment, the slats may be tilted to any desired degree, whereby the light-admitting spaces between the slats may be regulated as desired. Additionally, the slats may be adjusted relatively to one another in vertical direction, in such manner that the vertical extent of the blind may be regulated, and, if desired, the entire group of slats gathered or nested at the top of the window or other opening in which the blind is installed.

More particularly the invention relates to improved and simplified means for adjusting the slats of a Venetian blind.

In the more elaborate Venetian blinds on the market to-day, vertical guides are provided for the slats. These guides cooperate with the opposite ends of the slats, and serve to maintain them in vertical alignment. A structure of this sort is known as a guided blind, as distinguished from the well-known free-hanging type of blind.

We aim to provide a guided blind, in which the guiding means are serviceable in adjusting the slats. Our object is to provide a more economical and more durable guided blind, a blind which may be more readily installed, more readily demounted as a whole, and a blind in which the individual slats may be readily removed without demounting the entire structure.

In the accompanying drawings Fig. I is a view in front elevation of a blind embodying our invention; Fig. II is a fragmentary, sectional view of the structure, taken on the plane II—II of Fig. I, and shown on larger scale; Figs. III and IV are fragmentary, sectional views, taken, respectively, on the planes III—III and IV—IV of Fig. I; Fig. IV*a* is a fragmentary view, taken on the plane IV*a*—IV*a* of Fig. IV, and illustrating a modification ; Fig. V is a fragmentary view to still larger scale, showing the window casement in section, and the bottom slat of the blind, partly in elevation and partly in section, on the plane V—V of Fig. IV; Fig. VI is a view comparable with Fig. I, illustrating certain modifications in detail; Fig. VII is a fragmentary, sectional view, to larger scale, and taken on the plane VII—VII of Fig. VI and showing the guiding members; Fig. VIII is a fragmentary, sectional view of the modified structure, taken on the plane VIII—VIII of Fig. VI and on equal scale therewith; Fig. IX is a fragmentary view, showing our blind in front elevation with still other modifications; Figs. X, XI and XII are fragmentary, sectional views, of the last-mentioned structure, taken, respectively, on the planes X—X, XI—XI and XII—XII of Fig. IX; Fig. XIII is a fragmentary view, showing to larger scale the basal slat of the structure in elevation, on the plane XIII—XIII of Fig. XII; and Fig. XIV is a fragmentary view of the basal slat, partly in side elevation and partly in vertical section, on the plane XIV—XIV of Fig. XIII.

In the drawings the reference numeral 1 is applied to a window frame or casement in which our blind is installed. The blind consists of a head member 2, a basal slat or bar 4, and an intervening series of slats 6. The slats 6 may be formed of sheet metal, or of metal frames covered with fabric, or they may be formed in usual way of bass wood. In known manner two (or more) vertical hangers 3 are suspended from the head member 2, and are secured at their lower ends to the basal bar 4. The hangers 3 include each a pair of flexible straps 3*a* and 3*b* (Fig. II), between which cross-bands 5 extend at uniformly spaced-apart points vertically of the straps. The straps are flexible, and, conveniently, are formed of fabric tape, to which the cross-bands 5 are united. In this case the cross-bands also are formed of fabric, and they are united to the straps, by stitching, or interweaving in the manner well known to the art.

The head member 2 is pivotally supported adjacent the top of window frame 1, and, as shown in Figs. I to IV metal brackets 7 are nailed to the opposite sides of the frame, and are severally engaged by pivot pins 8 secured in the opposite ends of the head member. The ends of the head member 2 may be recessed, as shown at 9 in Fig. III, to provide clearance for the brackets 7. When the head member 2 lies in horizontal position, the hangers 3, depending therefrom, support the slats 6 in horizontal positions, and the light-admitting spaces between the slats are maximum. By turning the head member, the outer straps 3*b* of the hangers 3 move upward and the inner straps 3*a* move downward (or vice versa, depending upon the direction of turning of the head member), and the slat-supporting cross-bands 5 are moved into inclined positions. Thus, the slats are tilted

in unison and to equal degree, as indicated in dotted lines in Fig. II, and in such manner the effective spaces between the slats may be regulated as desired.

In accordance with our invention, we provide a pair of members *a*, *b* at each of the opposite sides of the slat assembly. The members *a* and *b* of each pair are severally connected at their upper ends to the front and rear edges of the head member **2**, and extend downward therefrom in parallel reaches adjacent the front and rear edges of the slats as shown in Fig. IV. The lower ends of the members *a*, *b* are secured (as will presently appear) to the window frame, and between the two pairs of members *a*, *b* the series of slats is laterally confined (cf. Fig. IV). The reaches *a* of the paired members *a*, *b* are movable in vertical direction relatively to the reaches *b*, in such manner that the head member **2** may be tilted and the angular adjustment of the slats effected. And the inner reaches *b* of the members *a*, *b* may be provided with hand-knobs **10** to facilitate such adjustment. Thus, the paired members *a*, *b*, in addition to laterally supporting or guiding the blind structure, provide means for effecting the angular adjustment of the slats.

The guiding and adjusting members *a*, *b* may be rigid, and may be so pivotally connected at their upper and lower ends to the head member **2** and the window frame **1** as to admit of the above-described operation. Alternately, the members *a*, *b* may be flexible elements, such as fabric tapes, wires, cords, or thin strips of metal.

In Figs. I to V, each pair of elements *a*, *b* organized with the opposite sides of the blind structure is shown as comprising a continuous length of strip metal passing beneath a block **11** and extending upward therefrom in parallel reaches, as shown in Fig. IV. The blocks **11** are secured to a support, in this case to the lower corners of the window frame, as shown, and the companion reaches *a* and *b* of each continuous strip of metal are drawn taut and secured at their upper ends, say by tacks **12**, to the front and rear edges of head member **2**, as shown in Figs. III and IV. When the knobs **10** are grasped, and the reaches *b* of the members *a*, *b* moved upward or downward, the two metal strips, of which such members are formed, slide upon the nether faces of the blocks **11**. Thus, the reaches *b* are vertically shifted in opposite direction to the reaches *a*, and head member **2** is tilted in the manner already described.

The basal bar or slat **4** is movable vertically in the ways provided between the paired reaches *a*, *b* secured adjacent the opposite sides of the window frame **1**. As the basal slat is moved upward the flexible hangers **3** progressively fold in known manner, and the slats **6** gather or nest successively, one upon another. In such manner the vertical extent of the blind may be regulated. In smaller blinds, the sizes normally used in dwellings, we have found that the vertical adjustment of the blind may be effected by manually pushing the basal slat **4** upward or downward, as the case may be, and we provide means for vertically supporting the opposite ends of basal slat in adjusted position. Advantageously, such means include a metal rod **13** secured vertically to each side of the window frame **1**. The opposite ends of the basal slat **4** carry grooved slides **14** that severally engage the metal rods **13** with sliding fit. As indicated in Fig. V, each slide **14** is provided with a shank **15** that extends into a bore **16** formed centrally in the end of the basal slat, and in such bore a compressed spring **17** acts upon the shank **15**, urging the slide **14** into snug engagement with the vertical rod or rail **13**. Thus, the basal slat **4** is frictionally secured to the rods **13**. Under hand pressure the basal slat may be moved upward or downward, whereby the slides **14** are forced along the rods **13**, but, when adjusting pressure is relieved, the engagement of the slides **14** with the rods **13** is adequate to sustain the elevated slats in adjusted position.

It will be observed that the pin-and-socket connections **15**, **16** of the slides **14** with the opposite ends of the basal slat **4** permits of axial turning of the basal slat. Thus, the slats of the structure may be tilted in the manner described.

In further refinement the vertical side rods may be threaded, as shown at **13***a* in Figs. VI to VIII, and the threaded rods may be rotatably supported at their upper ends in a bearing block **18** and at their lower ends in blocks **19**. The ends of basal slat **4** are severally connected to nuts **20** upon the threaded rods **13***a*, and the connection of the nuts to the basal slat is a pivotal connection of the sort indicated in Fig. V. In this case the head member **2** of the blind is pivotally mounted on brackets **21** carried by block **18** that is secured to the window frame, and a cross-shaft **22** is rotatably borne in brackets **21** above the head member **2**. The cross-shaft **22** is connected to the upper ends of threaded rods **13***a*, by means of intermeshing bevel gears (cf. Fig. VII). A pulley **23** is fixed on said cross-shaft, and an endless cord **25** is trained over the pulley, and, guided by wheels **24**, the cord extends downward in closed loop along one side of the structure. By pulling upon one side of the looped cord or the other, the pulley **23** is rotated and effects the rotation of cross-shaft **22** in one direction or the other, and manifestly, the two threaded rods **13***a* are thereby caused to rotate in unison, in such manner that the nuts **20** are caused to travel upward or downward. In such manner the vertical adjustment of the blind may be effected, and it will be understood that the inherent mechanical friction of the nuts on the rods **13***a* and the intermeshing of the bevel gears between rods **13***a* and cross-shaft **22** serve to secure the parts in adjusted positions. By virtue of this structure, we dispense with the objectionable automatic stops that cooperate with the adjusting cords in the usual Venetian blind, to secure the slats in elevated or raised positions of adjustment. And it will be understood that the nuts **20** always remain in horizontal alignment and prevent the basal bar or slat **4** from tilting from end to end.

For the sake of clarity, the members *a*, *b* are not illustrated in Fig. VI but are shown in Fig. VII, but their organization in the assembly will be understood from the foregoing description. It is contemplated that the slats **6** (and the head member **2** and the basal slat **4** too) may be notched at their four corners, as indicated at **6***a* in Fig. IV*a*, and that the guiding and adjusting members *a*, *b* may lie in the vertically aligned notches of the slats, to provide a more compact assembly.

A still further modification, which may be utilized to advantage in some installations, is shown in Fig. VIII. The opposite ends of the slats **6** are recessed, as indicated at **60**, and the vertical rods **13***a*, lying within the vertically aligned recesses **60** of the slats, serve to secure and guide the struc-

ture in the desired manner, without the use of other guiding means.

In Figs. IX to XIV we illustrate that the paired guiding and adjusting members (*a'*, *b'*) for the slats may comprise angle members, conveniently fashioned of thin sheet metal. An arm **26** (Fig. XII) is by a screw **27** pivotally secured to each of the opposite sides of the window frame **1**, and the companion reaches *a'* and *b'* of each pair of guiding members are pivotally secured in parallelogram arrangement to the head member **2** and arm **26**. Manifestly, such organization of members *a'*, *b'* at each of the opposite sides of the blind structure is effective to guide the slats **6** in the manner already described, and manifestly the angular position of the head member **2**, and of the slats **6**, may be adjusted by vertically shifting the members *b'* relatively to the members *a'*.

The guiding and adjusting members *a'*, *b'* are adapted to function in still another capacity—they afford means for supporting the basal slat **4** in any desired vertical position of adjustment. In exemplary way means to this end are indicated in Figs. XIII and XIV.

Each end of the basal slat carries a metal plate **28** that includes portions **28***a* slideably engaging the outer surfaces of vertical members *a'* and *b'*, note particularly Fig. XIII. Within each corner portion of the basal slat **4** a pointed pin **29** is installed, and the pins are backed by springs **30** that normally force the points of the pins severally into contact with the inner surface of the members *a'* and *b'*. Thus, the members *a'* and *b'* are engaged between plates **28** and the points of pins **29** at each of the four corners of the basal slat, and by such means the basal slat is normally secured to and finds support in the members *a'*, *b'*. It is noteworthy that the elements **28***a*, **29** provide in effect pivotal connection of the four corners of the basal slat with the four vertical members *a'* and *b'*, and, while the basal slat is vertically secured, as described, it may be tilted in response to the vertical shifting of the members *b'* relatively to members *a'*.

The two pins **29** at each end of the basal slat **4** carry rigid fingers **31** that project upward through slots **32** in the body of the basal slat, and the projecting ends of the fingers are interconnected by means of a sliding bar **33**. By moving the sliding bars **33** at each end of the basal slat toward one another, the four pins **29** are moved, against the pressure of springs **30**, from engagement with the vertical members *a'*, *b'*, and, while the pins **29** are held in disengaging positions, the basal slat **4** may be vertically adjusted to desired position; that is, the vertical extent of the blind may be regulated. Then the sliding bars **33** are released; the pins again engage the members *a'*, *b'*, and the basal slat is secured in vertically adjusted position.

It will be understood that the structure dispenses with the cords which in the usual Venetian blind structure extend through orifices formed in the slats. The slats of our blind may be individually and readily removed, it being merely necessary to tilt the slat to be removed to the position indicated in dotted lines **66** in Fig. IX, and then to swing the tilted end of the slat laterally of the adjacent guiding members *a'*, *b'*, and draw it longitudinally from between the hangers **3**. And manifestly the operation is reversed in reintroducing the slats into the assembly.

We claim as our invention:

1. In a Venetian blind installation, the combination of an angularly movable head member, a series of tiltably supported slats extending downward from said head member, means connected to said head member and extending in companion reaches downward therefrom and adjacent the front and rear edges of said slats, a support, and a device on said support for securing said means adjacent the bottom of the series of slats, the companion reaches of said means being relatively movable for tilting the slats, while confining the series of slats in substantially vertical position.

2. In a Venetian blind installation, the combination of an angularly movable head member, a series of tiltably supported slats extending downward from said head member, means connected to said head member and extending downward therefrom in companion reaches adjacent the front and rear edges of said slats, a support, a device on said support for movably securing said means adjacent the bottom of the series of slats, whereby said companion reaches provide a guide for the slats, as described, and said companion reaches being relatively movable in vertical direction for effecting the tilting of the slats.

3. In a Venetian blind including an angularly movable head member and a series of tiltably supported slats extending downward from said head member, the combination of guiding members mounted at each of the opposite sides of the blind structure, said guiding members extending in companion vertical reaches adjacent the front and rear edges of said slats and being connected at their upper ends to said head member, and means for securing said guiding members at their lower ends, while admitting of relative vertical movement of the companion members for turning said head member and tilting said slats.

4. The structure of claim 3 in which each of said guiding members comprises a continuous flexible element drawn taut and providing said companion reaches.

5. In a Venetian blind including an angularly movable head member, a vertically adjustable basal member, and a vertical series of tiltably supported slats extending between said members, the combination of a guiding means mounted at each of the opposite sides of the blind structure, said guiding means including companion elements providing vertical reaches adjacent the front and rear edges of said slats, and means cooperating with said elements and said basal member for securing the basal member in vertically adjusted position.

6. In a Venetian blind including an angularly movable head member, a vertically adjustable basal member, and a series of tiltable slats extending between said members and supported from said head member, the combination of guiding means mounted at each of the opposite sides of the blind structure, said guiding means being movable for angularly adjusting said head member and tilting said slats.

7. In a Venetian blind including an angularly movable head member, a vertically adjustable basal member, and a series of tiltable slats extending between said members and supported from said head member, the combination of guiding means mounted at each of the opposite sides of the blind structure, said guiding means being movable for angularly adjusting said head member and tilting said slats, and means cooperating with said guiding means for supporting said basal member in vertically adjusted position.

8. In a Venetian blind including an angularly movable head member, a vertically adjustable basal member, and a series of tiltable slats extending between said members and supported from said head member, the combination of guiding means mounted at each of the opposite sides of the blind structure, said guiding means being movable for angularly adjusting said head member and tilting said slats, and means engaging said guiding means for supporting said basal member in vertically adjusted position, while providing for said tilting ajustment of the slats.

9. In a Venetian blind including an angularly movable head member, a vertically adjustable basal member, and a series of tiltable slats extending between said members and supported from said head member, the combination of vertically extending means mounted at each of the opposite sides of the blind structure, and devices carried by said basal member and cooperating with said means in securing such basal member in vertically adjusted position, said vertically extending means being movable for angularly adjusting said head member and tilting said slats.

10. In a Venetian blind including an angularly movable head member, a vertically adjustable basal member, and a series of tiltably supported slats extending between said members, the combination of a pair of guiding members extending adjacent the front and rear edges of the slats at each of the opposite sides of the blind structure, a vertical rail mounted between each pair of guiding members, and means pivotally secured to said basal member and engaging said rails to support said basal member in vertically adjusted position.

11. In a Venetian blind including an angularly movable head member, a vertically adjustable basal member, and a series of tiltable slats extending between said members and supported from said head member, the combination of a pair of guiding members extending adjacent the front and rear edges of the slats at each of the opposite sides of the blind structure, said guiding members being relatively movable for tilting said slats, a threaded rod rotatably mounted and extending vertically between each pair of guiding members, and nut members pivotally secured to said basal member and severally engaging said threaded rods, and means for rotating said rods in unison, whereby said nuts are caused to travel on said rods and said basal member is vertically adjusted.

12. In a Venetian blind including an angularly movable head member, a vertically adjustable basal member, and a series of tiltably supported slats extending between said members, the combination of a threaded rod rotatably mounted in vertical position adjacent each of the opposite sides of the blind structure, a nut member on each of said rods, means for connecting said nut members to said basal member, and means for effecting the joint rotation of said threaded rods, whereby said nuts are caused to travel in unison upon said rods and said basal member is vertically adjusted.

13. The structure of claim 12, in which the connection of said nuts to said basal member includes pivotal means, whereby the slat assembly may be tilted, as described.

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