Aug. 19, 1958 D. L. BENNETT 2,848,045

VERTICAL VENETIAN BLIND

Filed June 13, 1956 3 Sheets-Sheet 1

FIG. 1

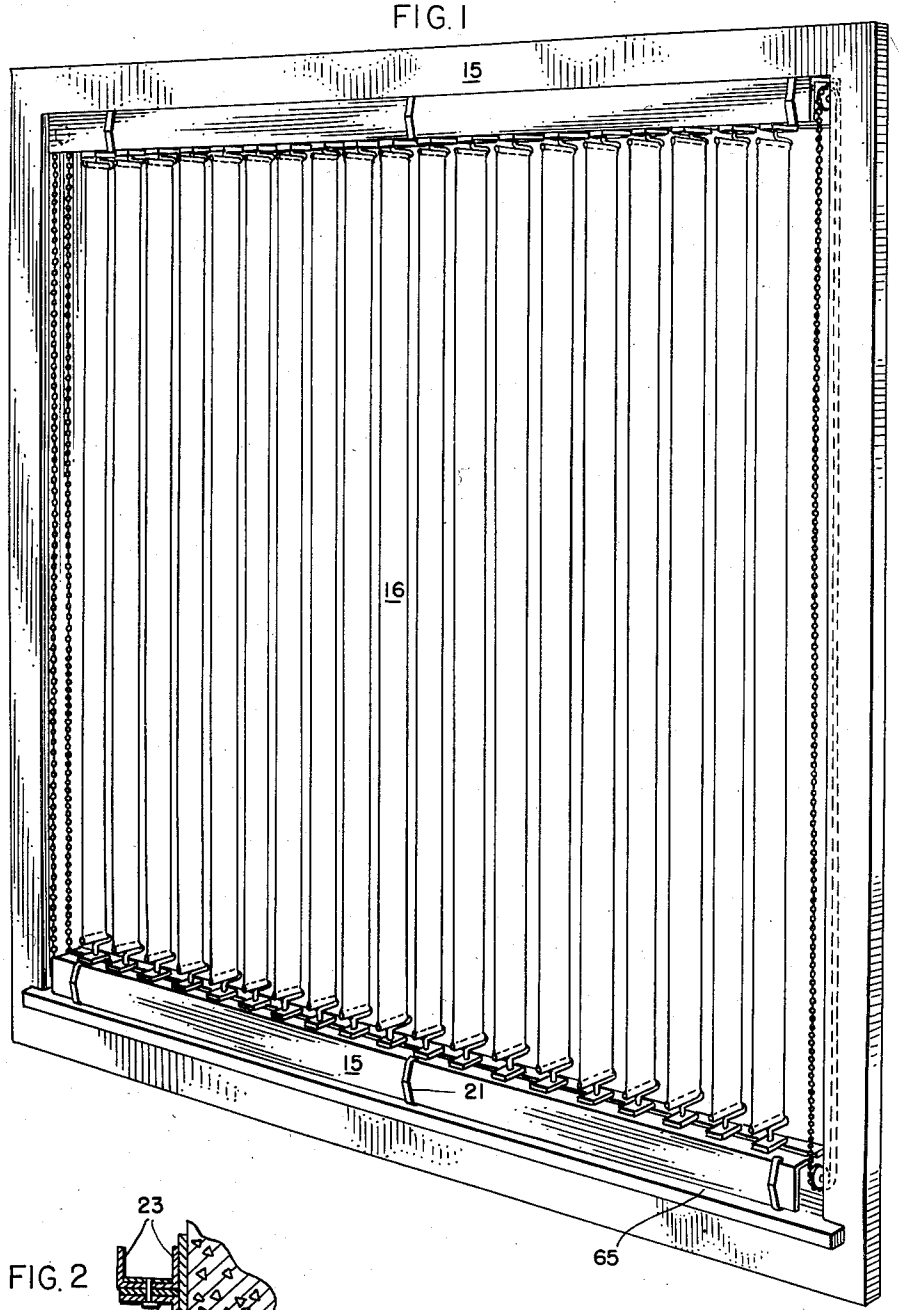
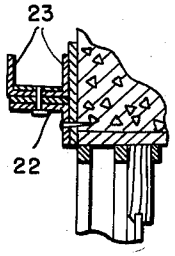


FIG. 2



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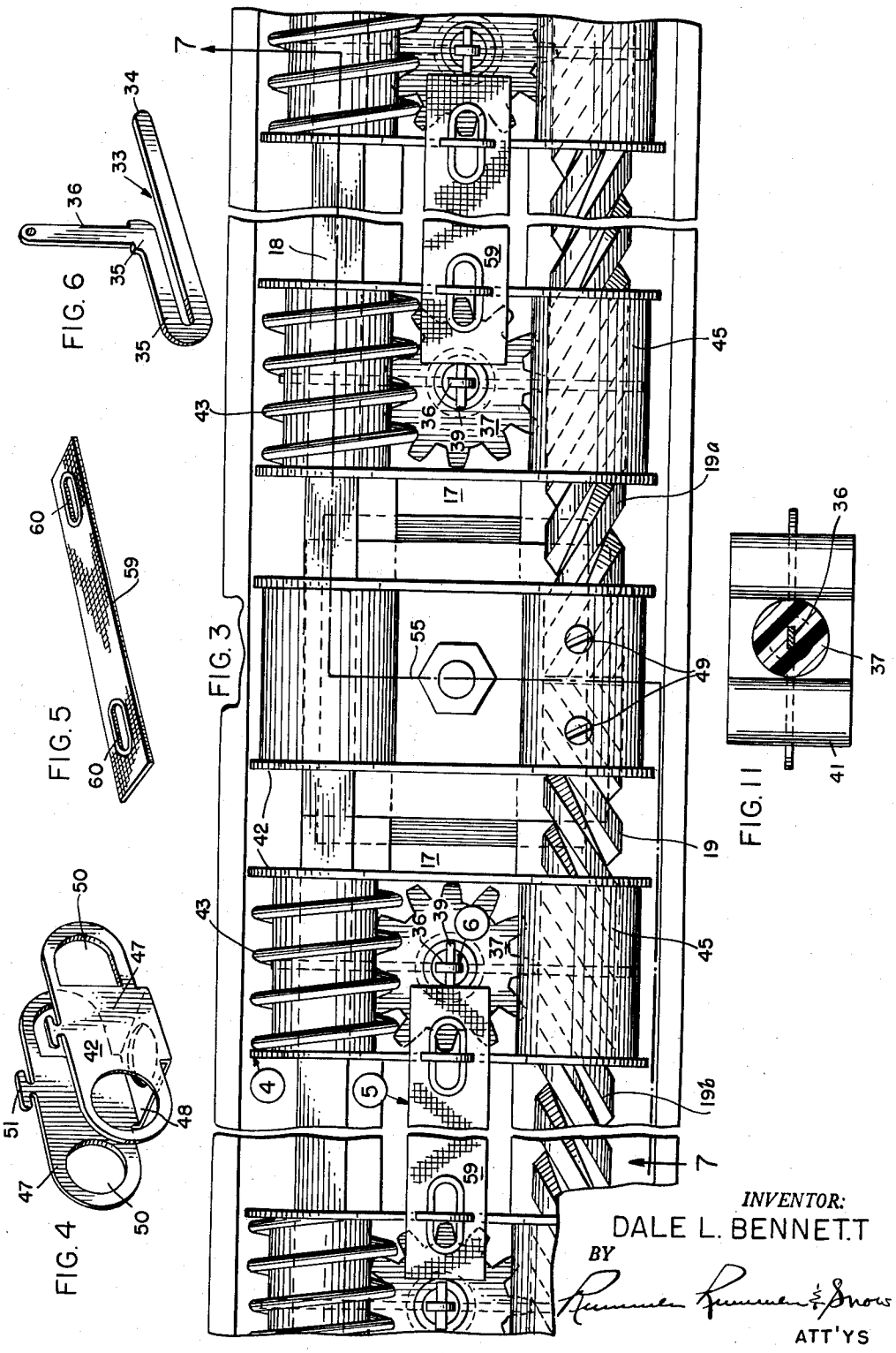
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Aug. 19, 1958 D. L. BENNETT 2,848,045

VERTICAL VENETIAN BLIND

Filed June 13, 1956 3 Sheets-Sheet 2



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Aug. 19, 1958 D. L. BENNETT 2,848,045

VERTICAL VENETIAN BLIND

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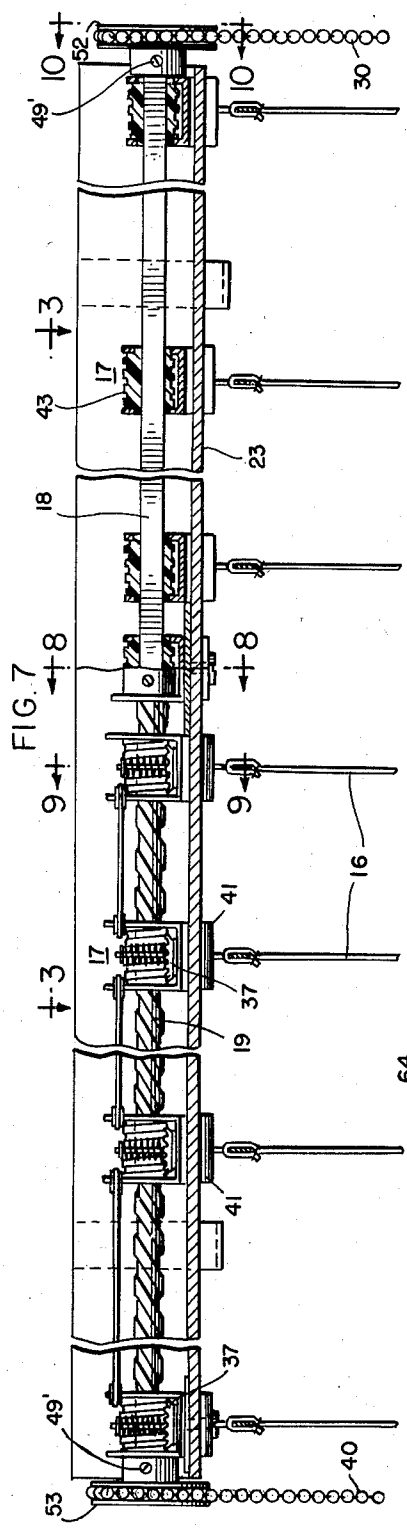


FIG. 7

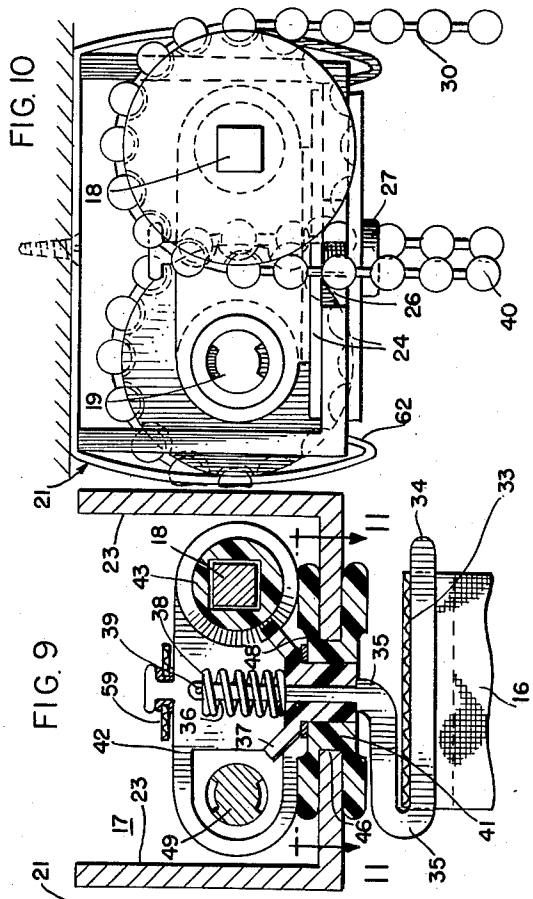


FIG. 10

FIG. 9

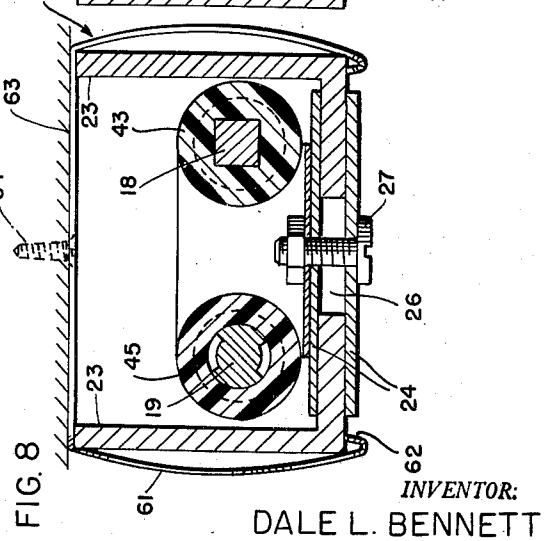


FIG. 8

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VERTICAL VENETIAN BLIND

Dale L. Bennett, La Grange, Ill.

Application June 13, 1956, Serial No. 591,234

3 Claims. (Cl. 160—172)

This invention relates to Venetian-type window blinds and particularly where the vanes are vertically disposed.

The main objects of this invention are to provide an improved Venetian-type window blind wherein the vanes are both rotated about their logitudinal axes and oppositely shifted from and toward a vertical median parallel to the vanes; to provide a window blind of this type having improved mechanism for effecting the rotation and the transverse shifting of the vanes; and to provide an improved mounting and vane-operating mechanism which is simple in construction, hence economical to manufacture, easy to install either within or outwardly of a window frame, and which has a negligible incident of operation failure.

In the adaptation shown in the accompanying drawings,

Figure 1 is a perspective view of a Venetian-type window blind constructed in accordance with this invention, and mounted inside a window frame with the vanes disposed vertically;

Fig. 2 is a fragmentary, sectional view of the upper portion of a window frame showing an alternative mounting means for this improved type of blind;

Fig. 3 is an enlarged, top plan of the upper support and associated vane-operating mechanism, common to both upper and lower window supports;

Fig. 4 is a perspective view of one of the cradles which is a part of the vane-supporting and operating mechanism;

Fig. 5 is a perspective view of one of the web links which connect adjacent cradles;

Fig. 6 is a perspective view of one of the brackets, oppositely-alined pairs of which are spanned by and support the vanes;

Fig. 7 is a reduced size, longitudinal sectional view of the upper support and vane-suspending and -operating mechanism taken on the plane of the line 7—7 of Fig. 3, the line 3—3 of this figure indicating the plane of the view shown in Fig. 3;

Fig. 8 is an enlarged, transverse, sectional detail taken on the plane of the line 8—8 of Fig. 7;

Fig. 9 is an enlarged, transverse, sectional detail taken on the plane of the line 9—9 of Fig. 7;

Fig. 10 is an enlarged, right hand end view taken on the plane of the line 10—10 of Fig. 7; and

Fig. 11 is a fragmentary, sectional detail taken on the plane of the line 11—11 of Fig. 9.

The essential concept of this invention involves a plurality of parallel vanes individually attached at their opposite ends to alined, spring-tensioned brackets individually secured to gears each journaled in a cradle-bearing which, except for the two end ones, is slidable on supports attachable to the top and bottom parts of a window frame, each gear meshing with a cradle-journaled worm slidable on a manually-rotatable shaft, the cradles adjacent the transverse vertical median parallel to the vanes being connected to oppositely-threaded, axially-alined shafts, and all cradles on opposite sides of the median being interconnected by flexible links.

A Venetian-type window blind embodying the foregoing concept comprises channel-shaped support members 15 between opposed pairs of which a plurality of flexible vanes 16 are extended on vane-operating units 17 whereby the vanes 16 may be rotated simultaneously by the manual actuation of a shaft 18 and the vanes on opposite sides of a vertical median may be oppositely shifted on the support members 15 by the manual actuation of a shaft 19, the mounting members 15 being adapted for attachment to the inside or the front of a window frame W by brackets 21 or 22.

The support members 15, as here shown, comprise pairs of right angle parts 23 opposedly arranged and secured together by clamping plates 24 in channel-shaped relationship to provide a slot 26 between the opposed flanges of the respective parts 23 and extending longitudinally of the support member 15. Pairs of the upper and lower plates 24 embrace the angle parts 23 adjacent the ends and at a transverse median point and are clamped together by screws 27.

The vanes 16, as so clearly shown in the drawings, are in the form of comparatively narrow strips of flexible material, such as, for example, fabric or plastic. The ends of the strips are looped over and stitched to form end pockets 33 (see Fig. 9) to receive the transverse and extended ends 34 of brackets 35. The stem 36 of each bracket 35 extends through a gear 37, forming a part of each vane-operating unit 17. These brackets 35 are flat, metal stampings. Since the stem 36 extends through a gear 37, the bracket 35 is fixed to rotate with the gear 37 but is axially slidable thereon. The exposed end of the stem 36 is embraced by a compression spring 38 retained between the gear 37 and a pin 39, so that the vane 16 is yieldingly tensioned.

The vane-operating units 17, of which there is one for each vane 16, each comprises a cradle 42 mounting the gear 37, a worm 43, and a sleeve 45. The two latter are slidably supported on the respective shafts 18 and 19.

The cradles 42 (see Fig. 4) are sheet-metal stampings, comprising a pair of parallel arms 47 upstanding from a base 48. The arms 47 are formed with comparatively large holes 50 adjacent the respective ends and with T-shaped prongs 51 on the upper middle edges of the arms 47.

Each cradle 42, except the two end ones, is secured between a gear 37 and a slide element 41, as most clearly shown in Fig. 9. These slide elements 41 are flat, rectangular pieces formed with recesses 46 along opposite edges to receive the opposed-flanges of the angle parts 23 of the support member 15. Thus these elements 41 are adapted to slide back and forth on the respective members 15, along the slot 26, so as to move two groups of the vanes 16 toward and away from each other by the action of a pull chain 40, as presently will be described more fully. The elements 41, as well as the gears 37, the worms 43, and sleeves 45, as here indicated are made of a non-metallic material, preferably nylon.

The worms 43 are journaled in one pair of the alined holes 50 of each cradle 42 and mesh with the respective gears 37. These worms 43 are slidable on the shaft 18, as presently will be described.

The sleeves 45 are seated in the other pair of alined holes 50 in each cradle 42. The sleeves 45 in the two medially-adjacent cradles 42 are internally threaded for movement along the shaft 19, as presently will be described.

The shafts 18 and 19 extend parallel to each other through the respective worms 43 and sleeves 45 on opposite sides of the cradles 42. Both shafts are journaled at their ends and medially by cradles 42 fixed to the support members by the plates 23 and clamping screws 27 (see Figs. 7, 8 and 10).

The shaft 18 is rectangular in cross section and extends

axially through and rotatively and slidably supports the worms **43**. One end of the shaft **18** mounts a sprocket **52** over which runs the pull chain **30**. By pulling this chain one way or the other the above-described operating units **17** effect the swinging of the vanes **16** on their longitudinal axes through arcs of practically 180 degrees from opposite and nearly-alined positioning to the window sash. Obviously, by the operation of this pull chain **30** the vanes **16** may be set at any desired angular position between being substantially parallel to the window sash and positions at right angles to the sash.

The shaft **19**, as most clearly shown in Figs. 3 and 7, is formed of two oppositely-threaded, axially-alined, abutting sections **19***a* and **19***b*. At their abutting ends, the sections **19***a* and **19***b* are keyed by screws **49** to the sleeve **45** journaled in the fixed medial cradle **42**. At their respective ends, the shaft sections **19***a* and **19***b* are keyed by similar screws **49'** to the sleeves **45** in the end cradles **42**. The sleeves **45** for the cradles **42** between the fixed end and medial cradles **42**, slide on the respective shaft sections **19***a* and **19***b* when the vanes are shifted back and forth.

The right hand end of the shaft **19** mounts a sprocket **53** over which runs the pull chain **40**. The opposite pulling of the chain **40** effects the opposite horizontal shifting of the vanes **16** on the upper and lower support members **15**.

The inward movement of the vanes **16**, between the medially-adjacent ones and the end ones is effected by links **59** of webbing (see Fig. 5) formed with elongated slots **60** to fit over the prongs **51** on adjacent cradles **42**. Thus when the innermost opposed vane-operating units **17**, and their respective vanes **16**, are being drawn back to a juxtaposed relationship at the median **55**, the other vane-operating units **17** and their respective vanes **16** are drawn along the members **15** into proper spaced relationship.

Alternate forms of mounting brackets **21** and **22** are shown for positioning the blind on either the inside of the window frame W or out in front of the frame.

The brackets **21** (see Figs. 1, 8 and 10), for mounting the blinds on the inside of the window frame, are of U-shaped resilient metal form whereby the parallel arms **61** are adapted to yieldingly embrace the mounting members **15** and support and retain them on the inwardly-disposed shoulders **62**. Two or three of these brackets **21** are secured to the upper horizontal plate **63** of the window frame by screws **64**. Two other such brackets **21** are similarly secured on the window sill **65**. With this type of bracket, the mounting members **15**, with their assembled vane-operating units **17**, are adapted to be readily inserted in between the arms **61** of the brackets **21** or removed therefrom as occasion requires.

The brackets **22** (see Fig. 2) are in the form of angle plates and are secured to the clamping plates **24** by suitable screws. These brackets permit the mounting units **15** to be attached to the top and bottom vertical trim plates of the window frame W.

The quite obvious operation of this improved Venetian-type blind mechanism may be summarized as follows:

The pulling of the chain **30** effects a rotation of the shaft **18** and causes the worms **43** in the several respective cradles **42** to actuate the gears **37** and simultaneously alter the angularity of all the vanes **16** to whatever position desired, within a range of approximately 180 degrees.

Pulling the chain **40** effects a rotation of the shaft **19** so that the rotation of the sections **19***a* and **19***b*, relative to the sleeves **45** in the medially-adjacent cradles **42**, causes a horizontal separation of the medially-adjacent vanes **16**. As the cradles **42**, beginning with the medially-adjacent ones, successively abut one another they shift the respective vanes toward the opposite sides of the window frame W. An opposite pulling of the chain **40** causes the respective shaft sections **19***a* and **19***b* to move the normally medially-adjacent cradles **42** toward each other until they abut the ends of the plate **24** of the centrally-fixed cradle **42**.

As the respective cradles **42** move away from each other the limit of the space permitted by the web links **59** the vanes **16** become spaced uniformly across the window.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of the invention as defined by the following claims.

I claim:

1. A Venetian-type window blind comprising, a pair of support members, means for opposedly mounting the members on a window frame, a pair of parallel shafts journaled on each support member one of which shafts is threaded, a plurality of cradle elements slidable along the respective members, a gear journaled on each cradle element and mounting a vane-supporting bracket, a worm journaled on each cradle element and slidably keyed to the other shaft and meshing with the respective gear whereby the turning of the other shaft effects the simultaneous rotation of the vane brackets, a second gear journaled on one of the cradle elements and meshing with the threaded shaft to shift the cradle element longitudinally of the one shaft, and means for manually rotating the respective shafts independently of each other.

2. A Venetian-type window blind comprising, a pair of support members, means for opposedly mounting the members on a window frame, a non-circular shaft and an oppositely threaded shaft journaled on each of the members in parallel relationship, a plurality of cradles slidable along the respective members, a gear journaled on each cradle and mounting a vane-supporting bracket, a worm journaled on each cradle and slidable on the non-circular shaft and meshing with the respective gear whereby the rotation of the non-circular shaft effects the simultaneous rotation of the vane brackets, a second gear journaled on the medially-adjacent cradles and meshing with the opposite threads on the threaded shaft whereby the rotation of the threaded shaft effects the opposite shifting of the medially-adjacent cradles, links connecting other cradles to the respective medially-adjacent cradles, and means for effecting the manual rotation of the respective shafts independently of each other.

3. A Venetian-type window blind comprising, a pair of support members, means for opposedly mounting the members on a window frame, a plurality of U-shaped cradles secured by their respective bases to slide along each of the members, the parallel arms of each cradle having alined holes in the opposite ends thereof, a non-circular shaft journaled on each member and extending through one pair of alined holes in the several cradles, an oppositely threaded shaft journaled on the members parallel to the non-circular shaft and extending through the other pair of alined holes in the several cradles, a worm journaled in the first pair of alined arm holes in each cradle and slidable on the non-circular shaft, a gear journaled on each cradle to mesh with the respective worm and mounting a vane-supporting bracket whereby the turning of the non-circular shaft effects the simultaneous rotation of the vane brackets, a threaded sleeve journaled in the other alined arm holes of the medially-adjacent cradles whereby the rotation of the threaded shaft effects the opposite shifting of the medially-adjacent cradles on the respective members, links connecting the other cradles on opposite sides of the medially-adjacent cradles, and means for effecting the manual rotation of the respective shafts independently of each other.

References Cited in the file of this patent

UNITED STATES PATENTS

2,135,647	Streby	Nov. 8, 1938
2,591,775	Bopp et al.	Apr. 8, 1952