

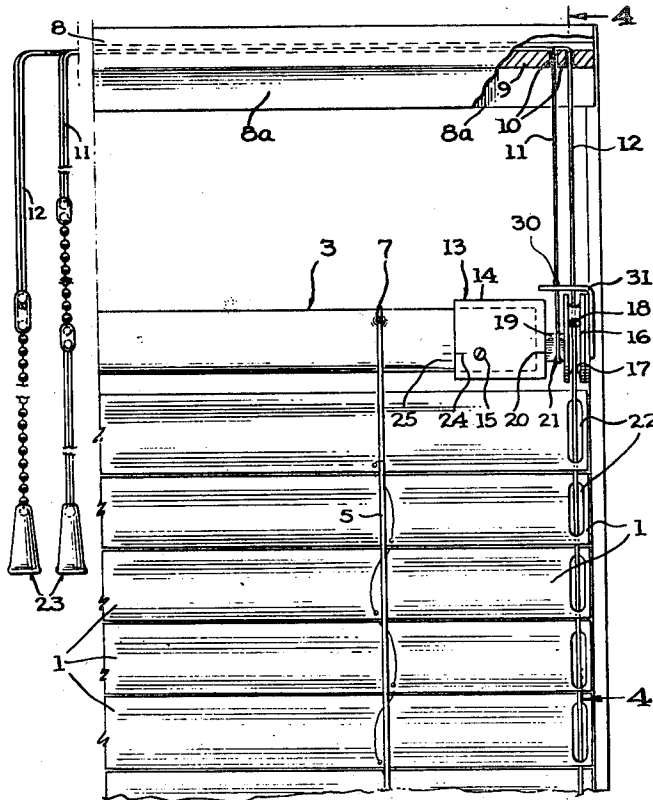
[72] Inventor **Bo Sven Olof Persson**
 6 Villavagen, 37040 Jamjoslatt, Ronneby,
 Sweden
 [21] Appl. No. **827,509**
 [22] Filed **May 26, 1969**
 [45] Patented **Jan. 5, 1971**
 Continuation-in-part of application Ser. No.
 612,899, Jan. 31, 1967, now abandoned.

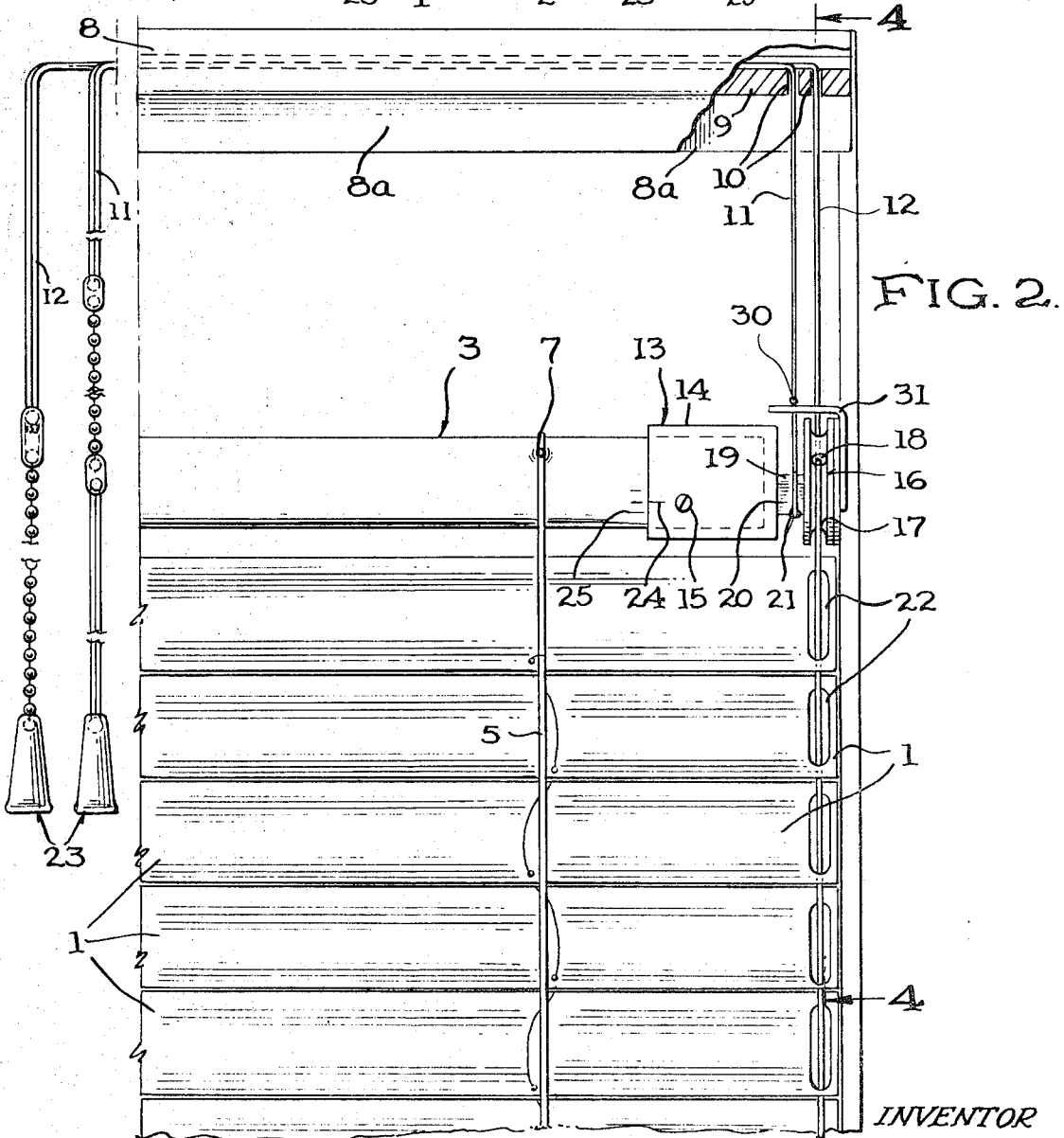
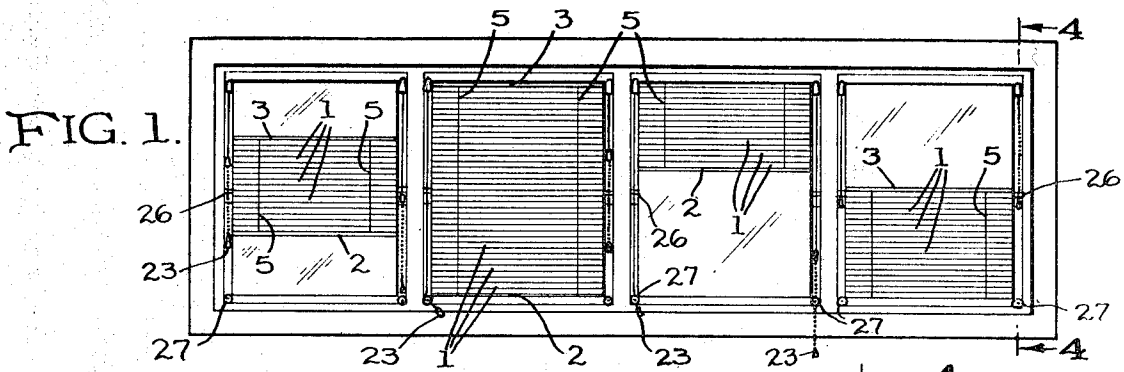
[54] **VENETIAN BLIND**
 9 Claims, 16 Drawing Figs.
 [52] U.S. Cl. **160/166,**
 160/107, 160/172, 160/176
 [51] Int. Cl. **E06b 09/26,**
 E06b 09/30
 [50] Field of Search **160/107,**
 166, 167-178

No References Cited

Primary Examiner—Peter M. Caun
 Attorney—Wenderoth, Lind & Ponack

ABSTRACT: The venetian blind comprises a case with essentially only two pull units constituted by two sets of control cords extending from the case. Each set consists of two cords connected with opposite sides of the blind and then running adjacently with one another where they extend from the case essentially as a single cord because the two cords of each set are joined together at their outer extremity for connection with and for concurrent operation by a pull handle or knob. An upper and a lower bar are provided with ladder tapes carrying a plurality of slats arranged between said bars. The blind may be lowered completely towards the lower edge of a window case by one set of control cords, or it may be lifted entirely towards the upper edge, by the other set of cords, each set acting in unison. The latter set constitute lifting cords to effect said pulling up of the lower bar and also for selectively inclining the slats; while the former set of two control cords, due to their mode of initial and eccentric attachment to the upper bar, are responsible for the initial predetermined angularity of the slats, usually in a fully closed position, in addition to serving as the combined support, and lowering and raising cords for the top or upper bar.





INVENTOR
BO SVEN OLAF PERSSON
BY
Wenderoth, Lind & Ponack
ATTORNEYS

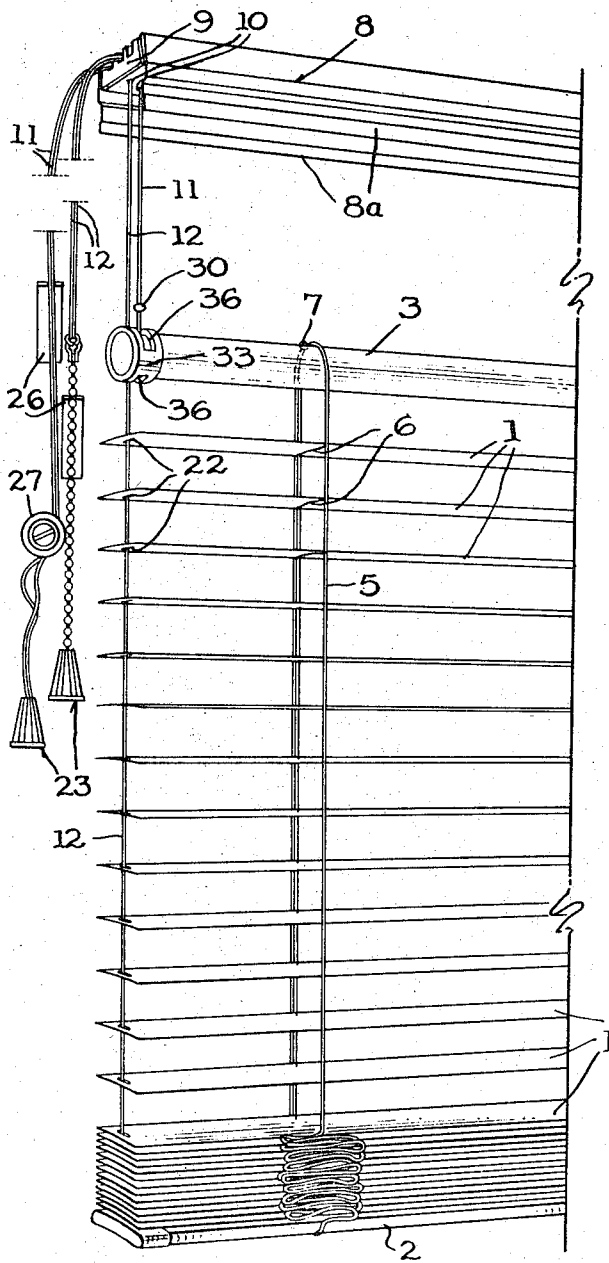


FIG. 3.

FIG. 11.

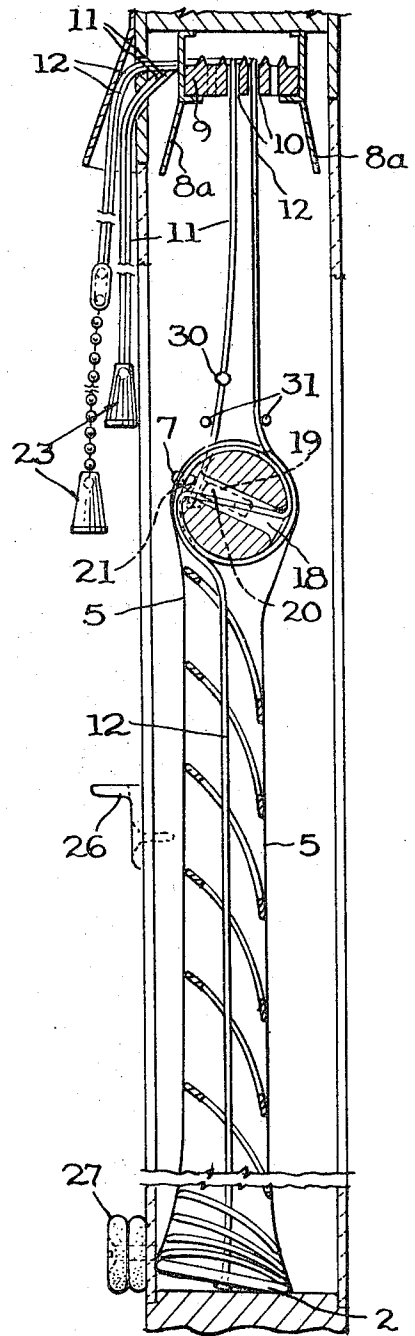
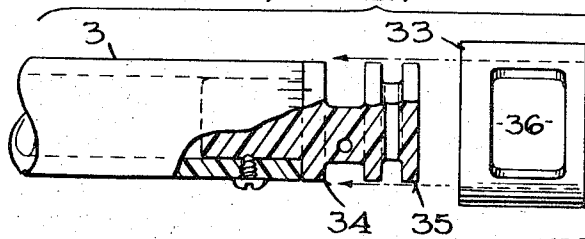


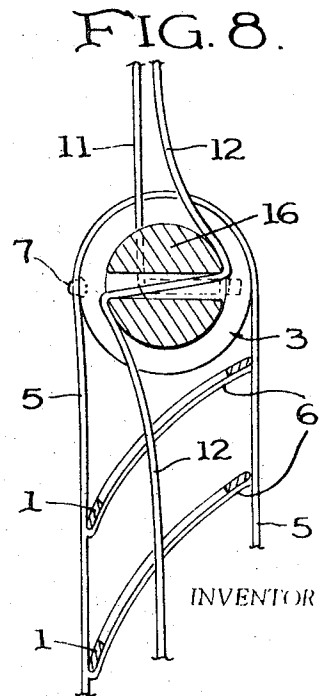
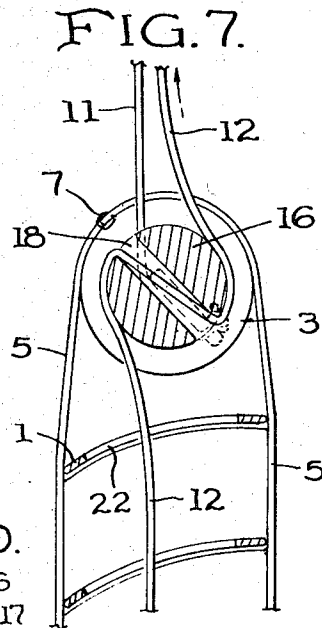
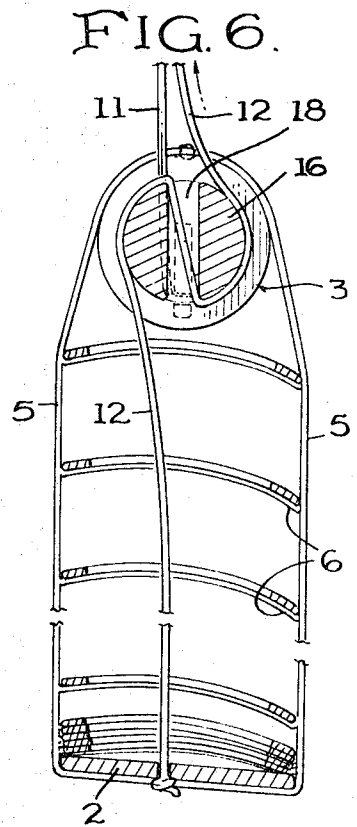
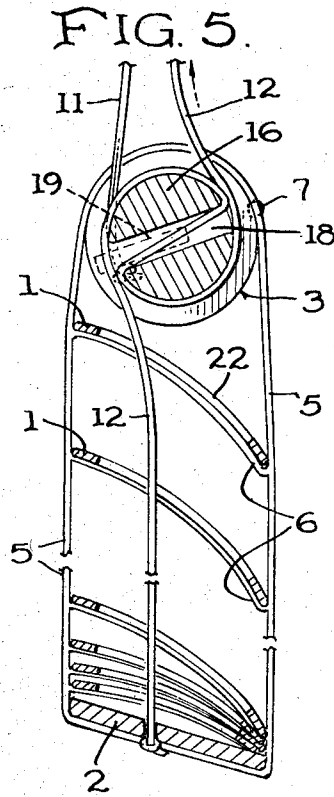
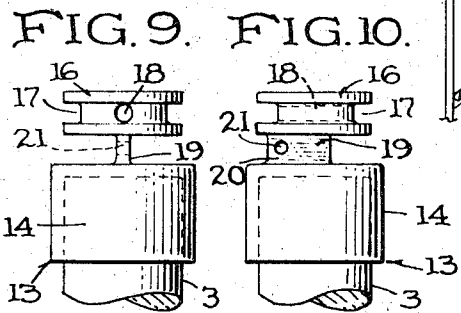
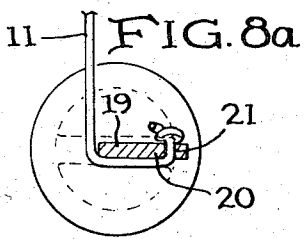
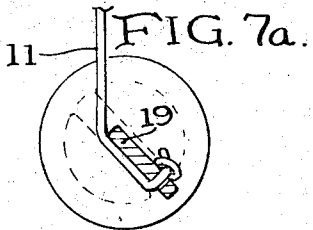
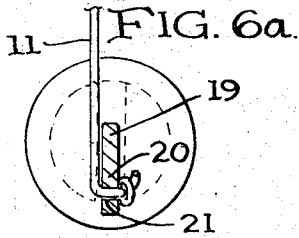
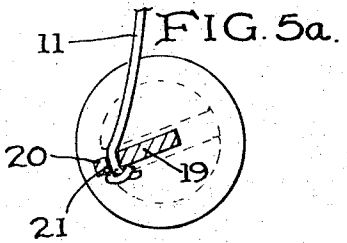
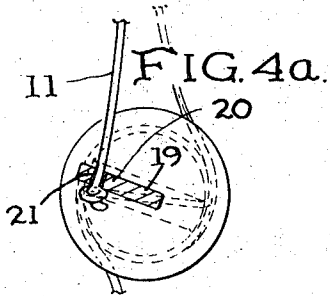
FIG. 4.



INVENTOR

BO SVEN OLAF PERSSON

BY
Wenderoth, Lind & Ponack
ATTORNEYS



INVENTOR

BO SVEN OLAF PERSSON
 BY
 Wenderoth, Lind & Ponack
 ATTORNEYS

VENETIAN BLIND

This application is a continuation-in-part of application Ser. No. 612,899, filed Jan. 31, 1967, and now abandoned.

This invention relates to venetian blinds and is particularly directed to a venetian blind which by the use of essentially only two pull units can be lifted fully to the upper portion of the window or the like and can also be lowered fully to the lower portion of the window.

Venetian blinds most usually are of the type adapted to be lifted only from the bottom to a partially raised or a completely raised condition at the upper portion of the window, and to be lowered again fully to its fully extended or intermediate lower condition. Such blinds have many advantages, but a serious disadvantage of these blinds is that they do not allow optimum entrance of daylight and at the same time prevent direct observation through the window from the outside.

Another known type of venetian blinds are those which are located in a collapsed state in the lower portion of the window and can be raised or lifted by the cords. This type, it is true, prevents direct observation from the street and at the same time renders possible optimum entrance of daylight, but lack the advantages of the first-mentioned type.

Therefore it is a primary object hereof to produce an improved blind of the first-mentioned type which may selectively preclude all observation from the outside, keep the window entirely free, is capable of being lowered from above either fully or any intermediate distance or is capable of being raised from below either fully or any intermediate distance, in which two latter cases the ribs can be inclined in the usual way.

The present invention solves the object in a simple and relatively inexpensive way by the provision of a venetian type blind comprising a case mounted within a window opening and having a support channel or beam mounted in the upper portion thereof. The channel is provided with appropriately placed openings having smooth slideways or cord bearing means at opposite ends through and/or over which the control cords are directed, and which cords are further directed and extended exteriorly of the case to the room side of the window. The blind further comprises spaced horizontal upper and lower bars between which bars ladder tapes carrying the slats are arranged with the vertical threads, or thin cords known as verticals, fastened each at the fore and aft side of each slat and then connected with each bar at laterally spaced places and preferably inwardly from the slat ends. The subject blind is characterized in that it can selectively be lowered entirely down to the lower edge of the window, or it can be lifted entirely up to the upper edge of the window by said pull units.

One of said pull units includes two lifting cords, each attached eccentrically to opposite ends of the upper bar for supporting and/or lowering the upper bar and, due to the eccentricity to facilitate or effect initial fully closed inclining of the slats which are hung from said upper bar. The cords are secured eccentrically with one end in a first space or annular groove in a slip-on end fitting provided at each end of said upper bar, and each of said fittings include a fixed, pulleylike member at the outer end thereof.

The second or other pull unit also consists of two control cords which are respectively attached to opposite ends of the lower bar, pass up through slots formed in the ends of the slats and then around and through diametrical passageways suitably bored or otherwise formed within and interconnecting smoothly with an annular peripheral groove of each pulleylike member. These cords then continue upward therefrom and pass through other suitable opening and/or cord-bearing means in the channel at the upper part of the window, said cords then running laterally to one side of the window and passing exteriorly of the blind channel or frame member to the room side of the window in a similar manner as those cords of the first-described pull unit. The said second set of cords, like the first, are joined together in a single pull knob, and said second pull unit serves to selectively incline the slats and to selectively raise or lower the lower bar of the blind.

The invention is described in greater detail in the following, reference being had to the accompanying drawings depicting an illustrative embodiment of the invention.

FIG. 1 shows a semidiagrammatic front view of a multiple window unit with venetian blinds associated therewith, according to the present invention, said blinds respectively being shown in the various selective positions;

FIG. 2 shows on an enlarged scale a detail view of the upper right-hand corner of one preferred form of blind construction;

FIG. 3 is a fragmentary perspective view from the opposite side and end of the general form of the blind hereof, but showing a slightly modified control cord guide and end fitting means on the end of the upper bar;

FIG. 4 shows a vertical sectional view taken substantially on line 4-4 of FIGS. 1 and 2.

FIG. 4, together with enlarged fragmentary FIGS. 5 and 6, depict the sequence of the blind slats being moved by the control cords which ultimately attach to the lower bar, as from a fully closed condition in FIG. 4 to a partial open condition in FIG. 5 and then to substantially a fully open condition as shown in FIG. 6, while respectively showing the relative position of the control cord-actuated pulleylike member for effecting inclination of the slats;

FIGS. 7 and 8 are views similar to FIGS. 5 and 6, and depict further sequence conditions of the blind slats as they commence to move to a partially reversely inclined position in FIG. 7, which is generally opposite to that of FIG. 5, and then to a substantially fully reversely closed condition in FIG. 8, which is about opposite to that shown in FIG. 4;

FIGS. 4a-8a, respectively, are sequential illustrations corresponding to FIGS. 4-8, and showing the relative sequence of the lifting cord as attached to the upper bar of the blind;

FIGS. 9 and 10 are fragmentary plan and side views, respectively, of one end of the upper bar showing the detail of the end fitting with pulleylike member thereon; and

FIG. 11 is an enlarged fragmentary detail view of a modified end fitting and cord guide shown partially in side elevation and partially in cross section, as disassembled.

Referring to the drawings, the blind has a lower bar 2 and an upper bar 3 with a plurality of spaced slats 4 suspended therebetween in a conventional way by means of ladder tapes 5, such that each tape includes a thin thread or cord 6 extending generally transversely between the opposite vertical portions, the latter of which serve to support the slats 1 and may be attached to the edge of said slats 1 at the junction with the vertical portions of the tape. The ladder tapes 5 are anchored at 7 to a medial top portion of the upper bar to provide for supporting the slats in a generally horizontal parallel spaced manner when the anchor point 7 is thusly disposed. The tapes 5 are further secured to the lower bar 2 in any conventional manner.

The upper bar 3 is supported from an elongated upper transverse beam or channel member 8 by the control cord units, said channel 8 being attached to the upper window frame or case. The channel includes a horizontal bar portion 9 having a plurality of cord-sliding means and/or bearing holes 10 through the opposite ends to accommodate the control cords 11 and 12, which are attached to opposite ends of said bars, respectively. The cords 11 serve as the main support for the upper bar 3 by attaching to an end fitting 13 (FIG. 2) in an eccentric manner to be described in more detail. Each end fitting 13 of the form shown in FIG. 2 includes a tubular portion 14 which preferably slips over the end of preferably a round end portion of upper bar 3 and is adjustably secured thereto by setscrew 15. Each fitting 13 further includes a fixed coaxially spaced pulleylike member 16 having a recessed annular cord-receiving groove 17 and a diametrical slot or channel 18 interconnecting smoothly with said annular groove 17. Pulleylike member 16 is spaced a small distance from the closed end of the sleeve or tubular portion 14 by means of a relatively small diameter or thin axial projection 19 having an eccentric radially offset portion 20 provided with a small aperture 21, and through which aperture the end of cord 11 may be knottedly attached. The projection 19 is relatively thin or small in order to assure that the upper bar 3 will move but a very small vertical distance when the lifting cord 11 is being wound on and off said eccentric projection. Due to the eccen-

tricity thereof and by releasing tension of the cords 12, the gravity or weight of the blind assembly will effect an unwinding of the cords 11, 12 with the connected end fitting 13 and bar 3 turning through approximately one half turn, thereby effecting shifting of the slats from one closed position to the other, as would be seen in a reversal of the illustrated sequence of drawing FIGS. 4—8 inclusive.

The other cord 12 is attached to the lower bar 2 and passes up through the conventional end slots 22 formed in the slats 1, which slots 22 and annular groove 17 of the pulleylike member 16, are substantially vertically aligned, and the cord 12 then threads up around the annular groove 17, on the room side thereof, as seen in FIG. 6 with the slats disposed in the substantially horizontal open condition, then passes downwardly, through the diametrical channel 18 and upward again, in a somewhat rotated S-shaped manner, around and within the outside of groove 17, and then vertically upward through the corresponding bearing aperture 10 in the bar 9 of the beam above. Cord 12 then passes horizontally across the top of the bar portion 9, where at the opposite side of the blind the other corresponding cord 12 is disposed in a side by side manner therewith and together they pass through an appropriate bearing means or aperture in the room side of the window or blind frame, whereupon said two cords 12 are connected to a common hand pull or knob 23 to act in unison as a single pull unit.

The end fitting 13 may be provided with an index mark 24 to be selectively aligned with and locked relative to one of a plurality of corresponding indicia marks 25 provided adjacent thereto on the upper bar 3, as seen in FIG. 2. If a certain inclined position is desired for a given frequent use, this position can then be set by means of said end fittings 13.

Referring to the sequence of drawing FIGS. 4, 5, 6, 7 and 8, there are shown the various relative positions of the control cords as they effect a change from one fully closed position of the blind slats to the other reverse fully closed position. For the sake of simplifying nomenclature or reference terms, the cords 11 will be termed lift or lifting cords while cords 12 will be termed control cords, although both serve dual functions to the extent previously described.

The lifting and control cords respectively are mounted so that when the blind is hanging loosely and directly from above without any tension on the control cords 12, the blind is suspended from the upper bar 3 by the lift cords 11 which run straight down and attach through the aperture of the eccentric portion of axial projection 19 as it is disposed uppermost with the flat web portion thereof in the slightly upwardly inclined from horizontal position, as shown in FIG. 4 and in FIG. 4a.

In this position with the blind slats fully closed, each control cord 12 extending up from the lower bar 2 is wound on the room side over, and within the groove 17 of the pulleylike member 16, circumferentially passing more than half a convolution of groove 17, then passing diametrically from the outside toward the room side through the center channel 18, whereupon exiting therefrom the cord continues its generally rotated S-shaped pattern and passes circumferentially in said groove 17 around the lower portion of member 16 and upwardly again, overlapping or disposed adjacent to the same cord as where it entered the diametrical slot 18, and then passing upward through its bearing aperture 10 in the beam 9 above, for its laterally and outwardly directed path for connection with the hand pull 23, as hereinabove described. FIGS. 5—8 show the other intermediate relative positions of the cords and blind slats during pulling of control cords by handle means 23 to effect rotation from the one fully closed FIG. 4 position to the other reverse fully closed position of FIG. 8. FIGS. 4a—8a inclusive represent corresponding views of the relative position of the axial extension 19 and the lift cord 11 as attached thereto, throughout the sequence.

The lifting cords 11 as coextended exteriorly of the blind mechanism on the room side thereof and when secured to either of the cord retainers 26 or 27, serve to hold the blind assembly with the upper bar 3 in a fully raised position up

against the beam 8. It is understood that the cords 11 act in unison both as lifting and lowering cords, for when the cords are released as a control unit from either of the retainers 26 or 27, and permitted to follow the pull of gravity on the upper bar and extended slats, the latter assembly will proceed to lower toward the bottom of the window or blind frame or case. And because of the eccentric attachment of cord 11 to the end fitting 13 of the bar 3, the foregoing action and mode of attachment effect the positioning of the slats 1 in the fully closed position of FIG. 4.

The slats can be positioned variously and releaseably locked in one of the cord-retaining means 26 or 27, shown in FIGS. 3 and 4. Each pair of cords 11 and 12, after extending a sufficient distance exteriorly of the casing or frame, are to be joined unitarily for combined uniform control thereof. This may be done by attaching the cords to a length of flexible ball chain or the like, the latter of which is provided with a hand pull such as 23. The chain portion is then easily engageable with a notched bracket, such as shown at 26; or if the control cords are retained as flexible cords throughout their length, or even it interfitted with an intermediate length of ball chain for cooperation with brackets 26, and then revert to and terminate in a length of flexible cord tied to a similar hand pull or knob 23, then these terminal ends of the cords may be wound about and frictionally retained between adjacent yieldable members comprising the other form of cord retainer designated 27.

The control cords 12, in addition to adjusting the angle of the slats, as is now apparent from the foregoing descriptions and illustrations, also serve to raise the blind from the bottom up, by raising the lower bar 2 responsive to continued pulling of the hand pull joining cords 12. Reverse action serves to lower the blind again, or it may be locked in any intermediate position.

A neutral or any intermediate inclination of the blind slats is achieved by applying the prerequisite tension on cords 12 and then engaging the chain portion with the retainer means 26, or the flexible cords with the other type retainer 27.

If the upper bar were to be raised fully by lift cords 11 to its abutment in the window case without the benefit of a stop or limiting means, it would be most difficult or impossible to change the inclination of the slats by means of the control cords 12, because this would require a slight lifting of the upper bar. For preventing such a locked position and for providing for the change of slat inclination, each lifting cord 11 is provided with a spacing or limit member 30 just slightly above bar 3. The said limit member 30 preferably may be a clamp, or a loop or knot formed in said lifting cord which abuts against the case or underside of beam 8 when the cord pull unit is fully pulled. In this stopped position, the upper bar 3 is retained at a small distance below the said case, which distance corresponds to that required for inclining the slats with the help of the control cords.

For preventing light from penetrating into the gap between the upper bar and the case, the beam 8 preferably is provided with longitudinal lateral depending flanges 8a which project down to about the center of the upper bar when the bar is in its uppermost position.

For preventing the lifting cords 11 or the control cords 12 from swinging or inadvertently jumping out of their respective recesses or grooves in the end fittings 13, on each of the outer ends of the end fitting 13, there is mounted with free or sliding fit a guide yoke 31 (FIG. 2) which comprises two laterally spaced parallel rods 32 projecting fork like in L-shape over the annular groove 17 and spaced between the pulleylike member 16 and the closed end of the tube portion 14. The yoke 31 preferably is fastened on a washer and/or otherwise mounted in the center at the outer end of the end fitting.

Another form of guide yoke to achieve the same purpose may be in the form of an annular sleeve 33 (FIGS. 3 and 11) which coaxially slips over a slightly modified form of end fitting in which the outer diameters of the coaxial tubular portion 14 and of the pulleylike member 16 are coextensive, or,

the portion 34 of an embodiment as shown in FIG. 11 corresponding to portion 14 includes an axial projection insertable within the end of tube 3 and its and the outer diameter of pulleylike member 35 are coextensive to facilitate a slip fit of the sleeve 33 thereon. Sleeve 33 is then provided with diametrically opposed, and limited circumferentially extended slots 36 to accommodate and limit the movement of the cords therein.

A venetian blind designed according to the present invention is particularly suitable for use in offices, hospitals, consultation rooms and the like where it is desired to have a maximum of daylight, but where no direct observation from the outside is wanted. This situation is, of course, also desirable in many instances in private homes, particularly in villas and apartments on a lower floor.

While one major embodiment of the invention has been shown and described, with alternative details, it is to be understood that other embodiments having different details can be devised within the scope of the inventive disclosure.

I claim:

1. Venetian blind comprising a case having a support channel 8 mounted in the upper portion of a window or the like; an upper 3 and a lower bar 2; a plurality of elongated slats 4 having transverse end slots 22 and located horizontally between said bars 3,2; support tapes 5 including vertical portions with slat support portions and extending between said bars 3,2 for carrying said slats 4 and mounted with their vertical portions on each side of the slats and bars, and secured to the top bar 3; lifting 11 and control 12 cord pull units including cords operatively connected with the respective ends of the respective bars 2,3 for effecting selective raising, lowering and angular slat control of the slats; said blind being adapted optionally to be lifted completely up to the upper portion of the window and to be lowered completely down to the lowest portion of the window, the upper 3 of said bars having an end fitting 13 or 34 at each of its ends, said end fitting 13 including means 14 for attaching it directly to the end of the associated bar 3; said end fitting 13 having a short shaft 19 projecting axially with and away from said bar 3 and having an eccentrically offset apertured 21 portion 20, and a cord pulleylike member 16 mounted coaxially with said top bar 3 on said shaft 19, said pulleylike member 16 having an annular peripheral groove 17 and a diametrical center channel or passageway 18 smoothly connecting opposite sides of the peripheral groove 17, said pulleylike member being spaced from said means for attaching the fitting 13 to said bar 3 to form a first space and the annular groove 17 in said member 16 constituting a second space; each of said cord pull units comprising two cords which extend coextensively from the case or support channel 8; one of said pull units including two lifting cords 11 each having one end fastened in said first space to the eccentric portion 2 relative to the shaft or axial projection 19 of the fitting on said upper bar 3, said cords 11 each then extending upwardly through cord-bearing means or aperture 10 in the support channel 8, and then traversing therein and extending coextensively through aperture-bearing means to the room or operator side of the blind and having means 23 to be operated together as a single pull unit; the other pull unit including two control cords 12, each of said control cords 12 having ends attached at spaced portions on the lower bar 2 and respectively running upward through said transverse slots 22 in the outer ends of the slats 4, then threading up around one side of the pulleylike member 16 and diametrically down through the center channel 18, when the blind slats are in the open substantially level position, and said cords 12 continuing to be wound in an S-shape manner back up and around the other side of the pulleylike member 16 and passing upward through the other cord-bearing means or apertures 10 in said support channel 8, and similarly traversing therein and extending

coextensively similar to the first cords 11 to the room side of said blind and also having means 23 to be operated as a single pull unit; whereby said first-described pull unit with lifting cords 11 can be used for supporting the upper bar 3 in any horizontal position between fully raised and fully lowered positions and for effecting the inclining of the slats in one direction to a fully closed condition due to the eccentric connection of the cords 11 to the end fittings 14 of the upper bar 3, the control cords 12 supporting the lower bar 2 to pull up and again lower the said lower bar 2 and the slats therewith and to also selectively incline the slats as a group in positions between the aforesaid fully closed position and other intermediate and varying degrees of slats open positions to a reversely fully closed position; and means 26 27 in association with said window and blind to releasably and selectively retain or lock said pull unit cords to position the slats in any desired position.

2. A venetian type blind as defined in claim 1 wherein the means for attaching said end fittings to said upper bar 3 include an open end tube portion 14 for fitting on said bar 3 and said bar 3 and said tube shape portion 14 have relatively rotatable indicia means, and means for relatively locking said bar 3 in different end positions relative to said fitting 13.

3. A venetian type blind as defined in claim 2 wherein said indicia means on said end fittings 13 are provided with an index mark or line 24 adapted to correspond to a given line of a plurality of indicia lines 25 on said bar 3 for obtaining a correct turning position of both end fittings.

4. A venetian type blind as defined in claim 11 wherein said lifting cords 11 are provided with stop limit means 30 disposed in spaced relation above said upper bar 3 thereby preventing the upper bar 3 from being lifted into tight abutment with said window case or support channel 8.

5. A venetian type blind as defined in claim 1 wherein each of said end fittings 13 is provided with a guide yoke 31 for guiding and retaining said lifting and control cord respectively in their grooves, said yoke 31 including means 32 projecting inwardly over said grooves and being mounted with a free fit in the outer end of the fitting.

6. A venetian type blind as defined in claim 1 wherein said upper bar 3 has open tubular opposite end portions and the means 34 for attaching said end fittings 13 to said upper bar 3 include axial projections for insertion within the opposite ends, and wherein said pulleylike members 35 and the means 34 for attaching said fittings to the bar 3 are of an outside diameter which substantially corresponds to the outside diameter of at least the end portions of said bar 3.

7. A venetian blind as defined in claim 6 further including cord guiding sleeve-like means 33 having a complemental formed annular inner periphery for a slip fit overlying the outer ends of said outer diameter of said bar 3 and pulleylike members 35 respectively, said cord guiding means further having oppositely disposed cutout portions to receive the respective cords passing therethrough as the cords are assembled with the related blind components.

8. A venetian blind as defined in claim 1 wherein one of said pull cords units, each of which comprises a set of combined control-and-lifting cords having terminal means 23 for collectively operating said cords in unison, is provided with means intermediate the terminal means 23 and that portion projection from the case 8 to the interior of the room, for interlocking cooperation with at least a part of said means 26 in association with said window and blind to releasably and selectively lock said pull cord unit and slats in a desired position.

9. A venetian type blind as defined in claim 1 wherein the means 26,27 in association with said window and blind are constituted in part by cord-retaining means 26 disposed at a position in association therewith intermediate the fully raised and fully lowered positions of the blind.