United States Patent

Debs

[15] **3,703,920**

[45] **Nov. 28, 1972**

[54] **VENETIAN BLIND AND INSTALLATION**

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[73] Assignee: **Levolor Lorentzen, Inc.**, Hoboken, N.J.

[22] Filed: **Jan. 28, 1970**

[21] Appl. No.: **6,395**

[52] **U.S. Cl.** **160/107**, 160/168, 160/176

[51] **Int. Cl.** **E06b 9/02**

[58] **Field of Search**.....160/107, 168–178

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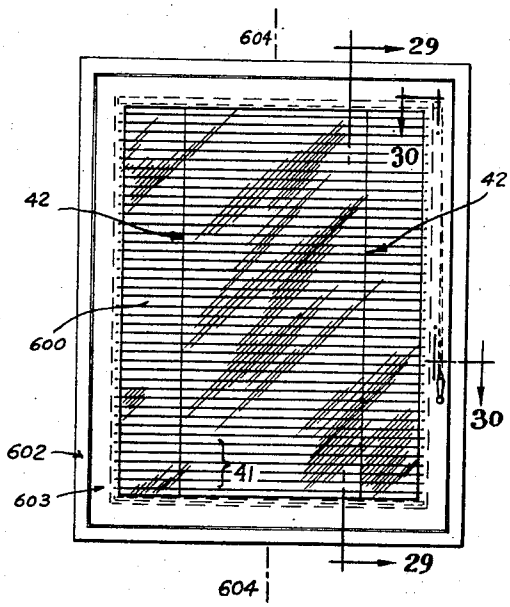
Primary Examiner—Peter M. Caun

Attorney—Charles F. Chisholm

[57] **ABSTRACT**

The front and rear sidepieces of the ladders are connected to front and rear horizontal runs of a tilt cord at eyelets which are spaced along the horizontal runs. The tilt and lift cords are connected to individual spool members of a cord-operating unit. The blind is adapted to be combined with a window having metal framing and, where the window has spaced glazings, the ladder-and-slat assembly is adapted to be located between the glazings. The spool members of the operating unit are adapted to be located in a channel of the window framing.

25 Claims, 35 Drawing Figures



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SHEET 1 OF 6

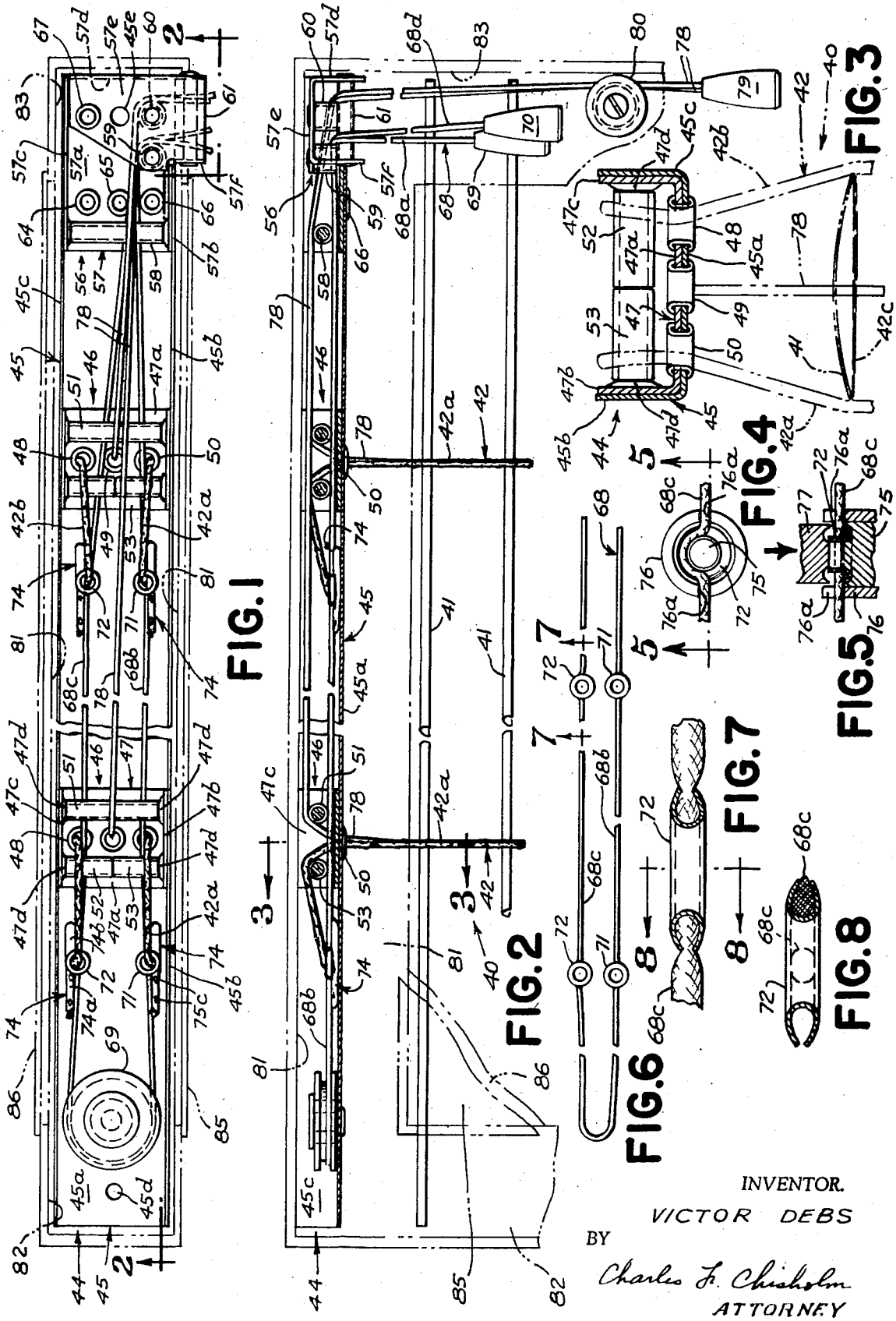


FIG.1

FIG.2

FIG.3

FIG.4

FIG.5

FIG.6

FIG.7

FIG.8

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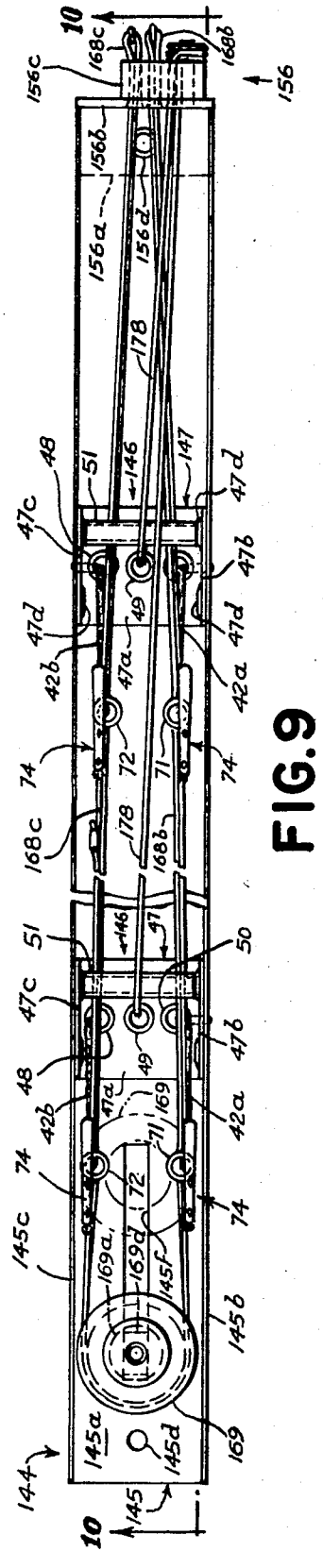


FIG. 9

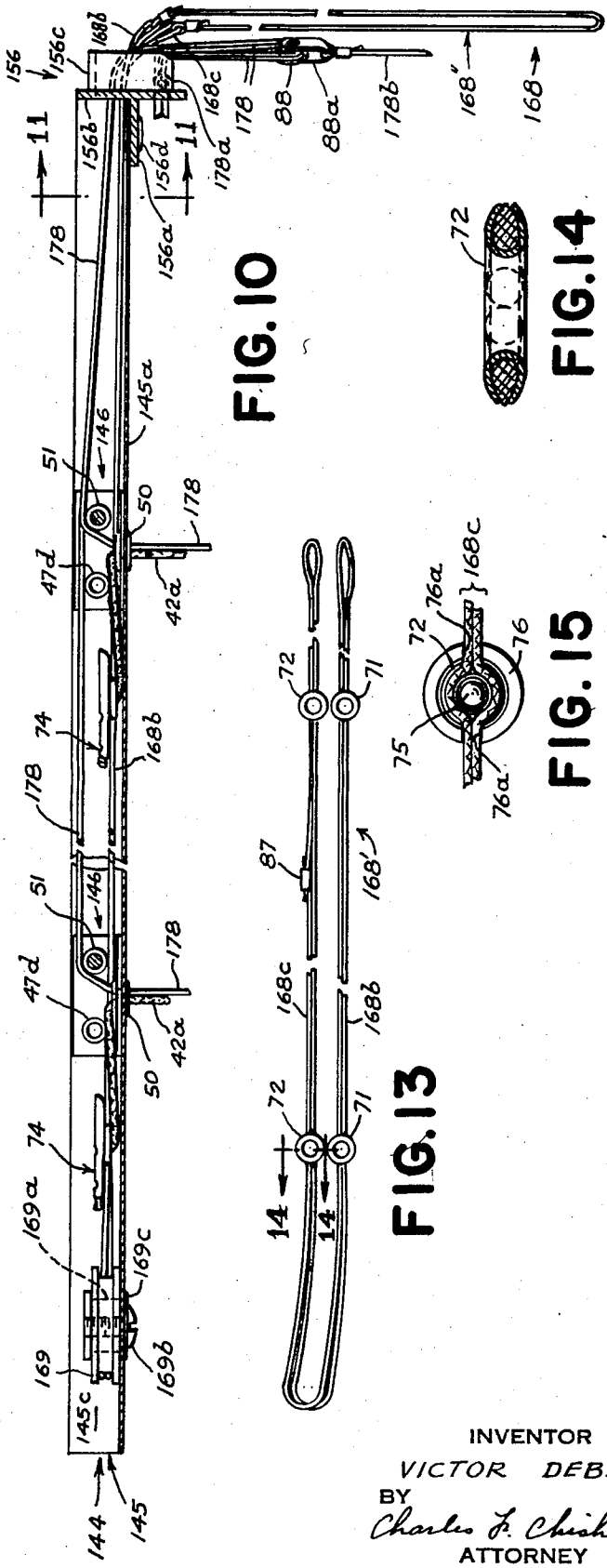


FIG. 10

FIG. 14

FIG. 13

FIG. 15

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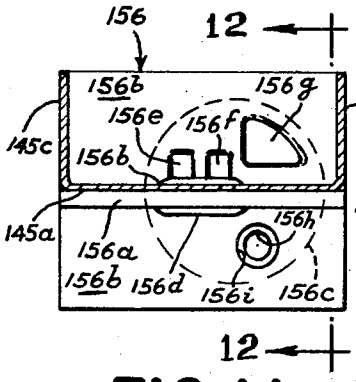


FIG. 11

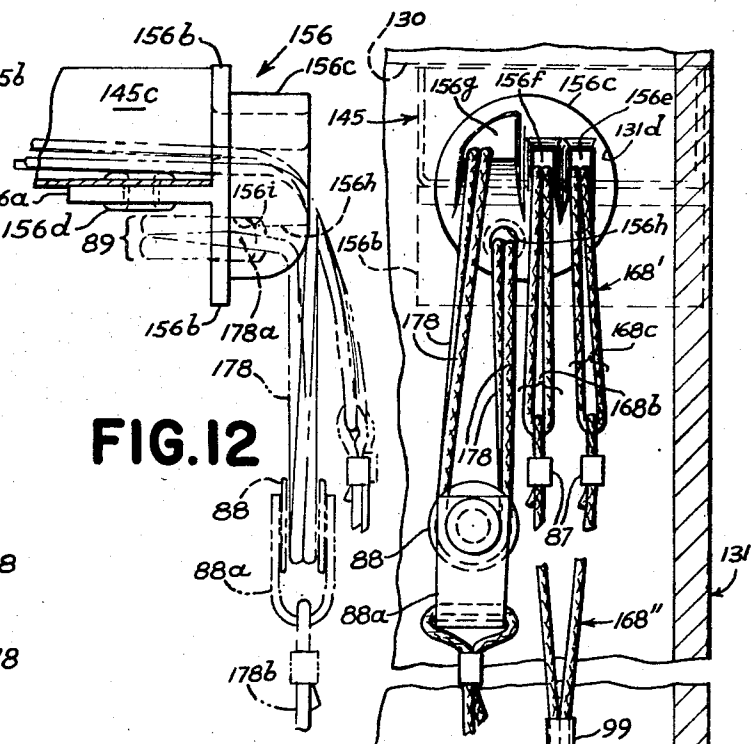


FIG. 12

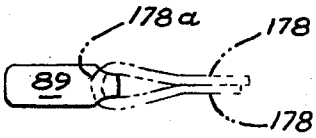


FIG. 16

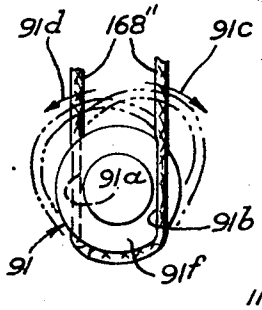


FIG. 19

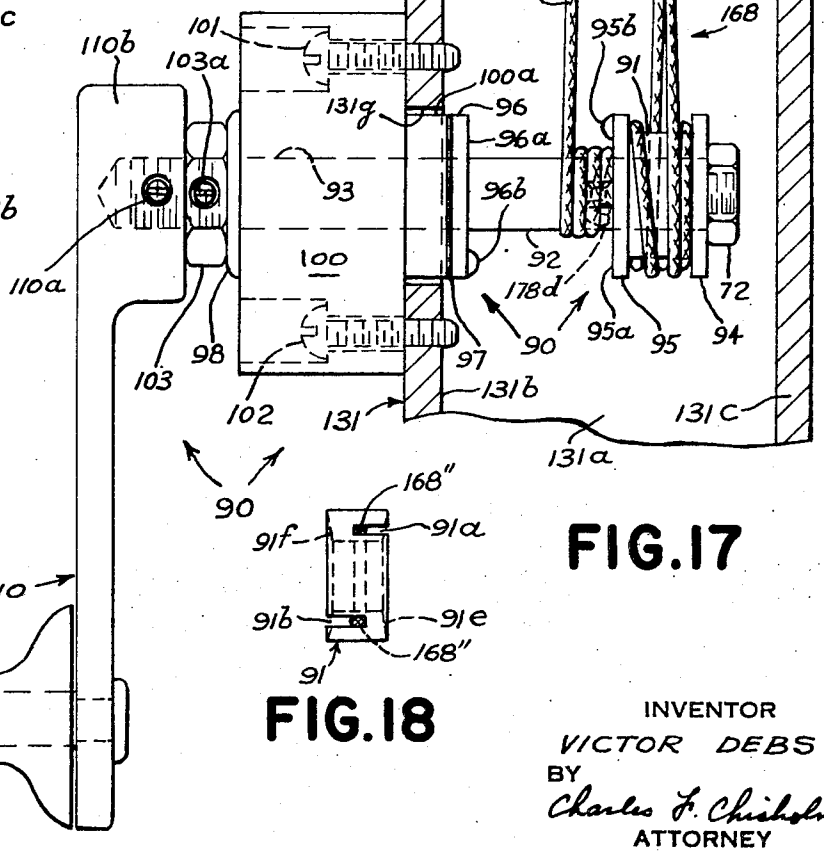


FIG. 17

FIG. 18

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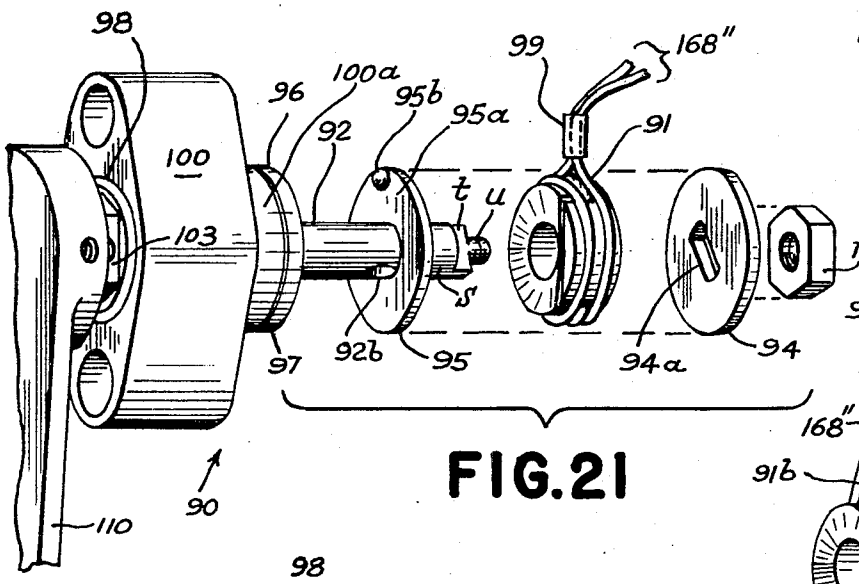


FIG.21

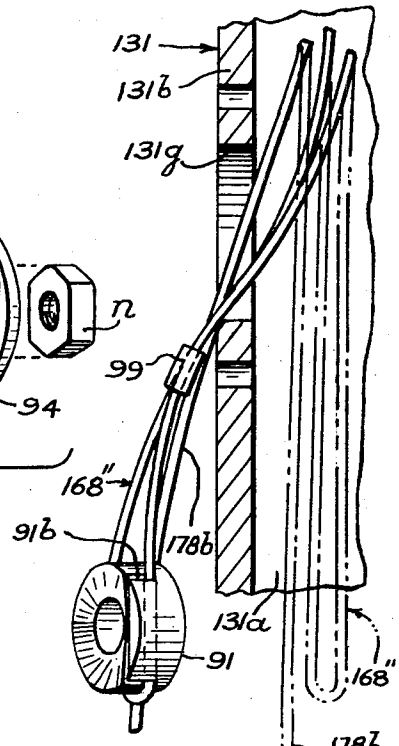


FIG.20

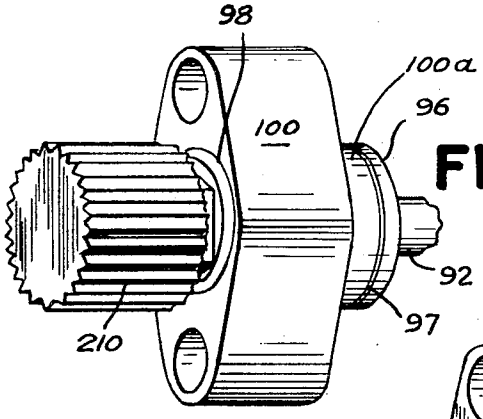


FIG.23

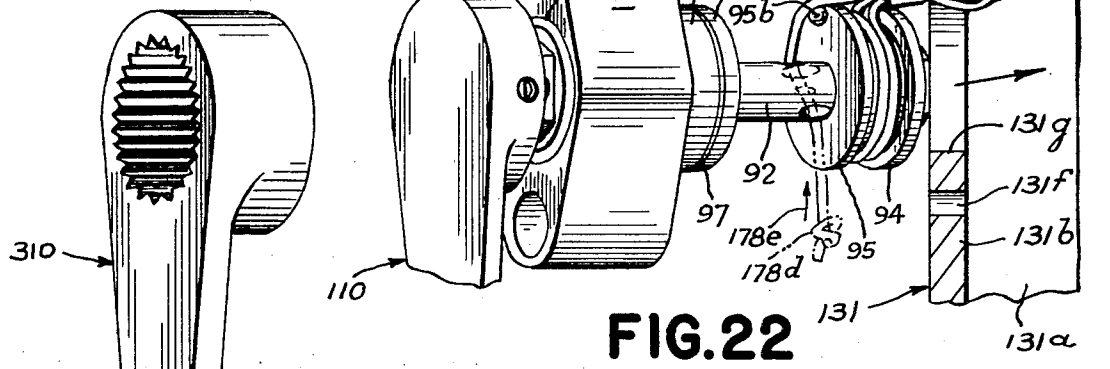


FIG.22

FIG.24

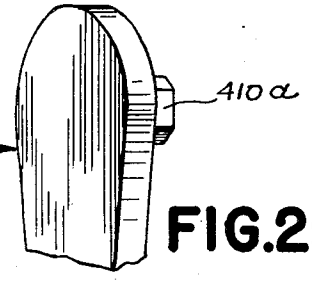


FIG.25

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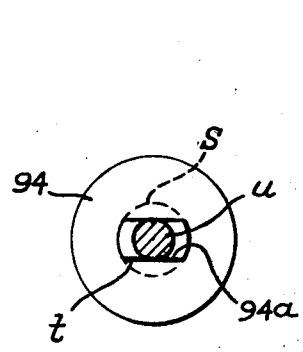


FIG. 27

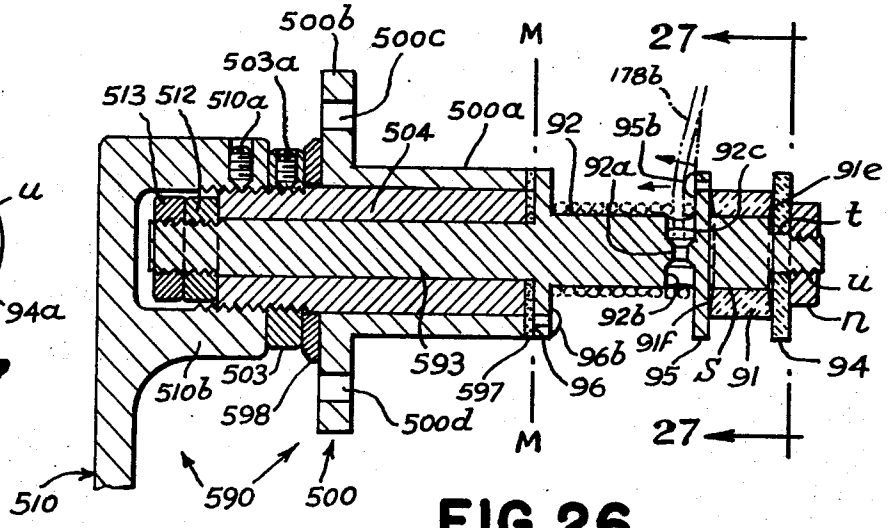


FIG. 26

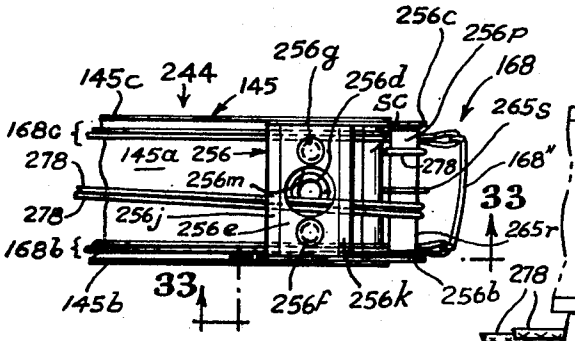


FIG. 32

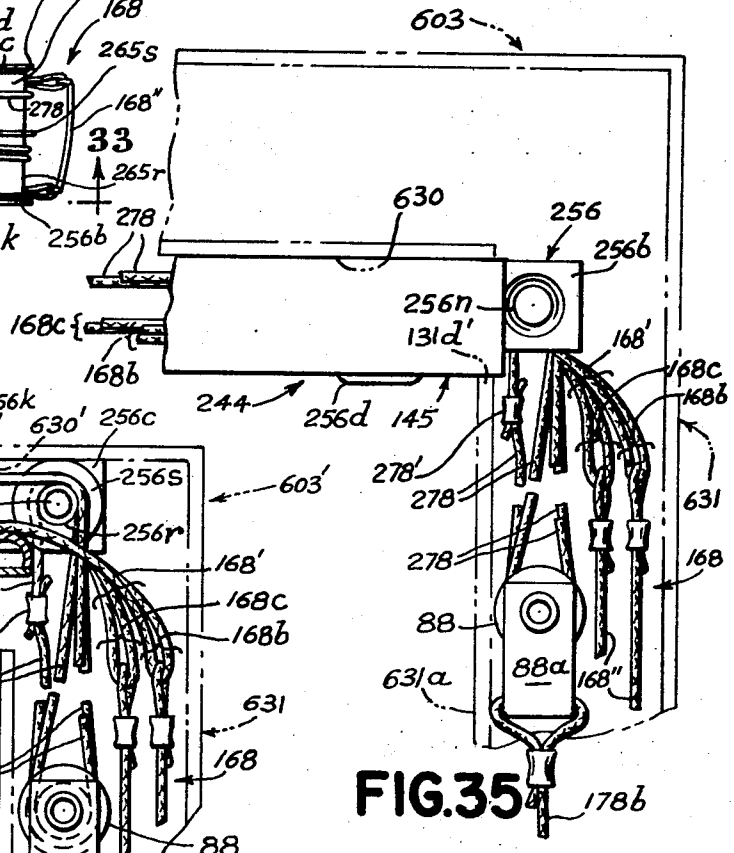


FIG. 35

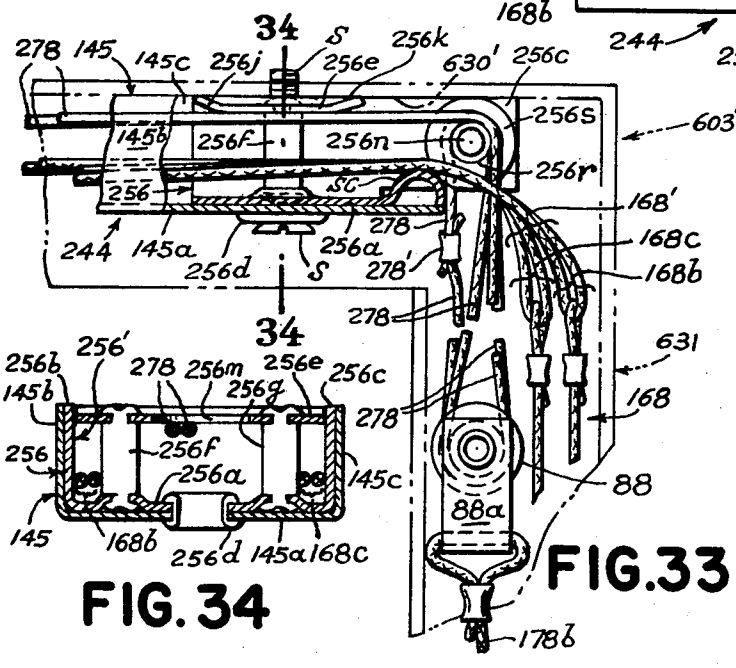


FIG. 34

FIG. 33

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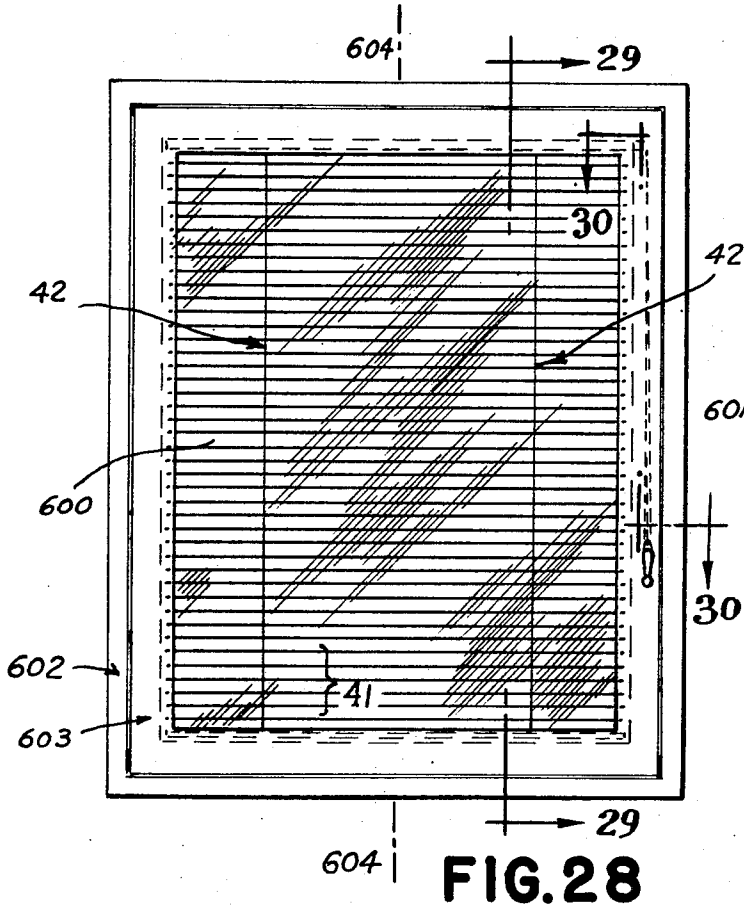


FIG. 28

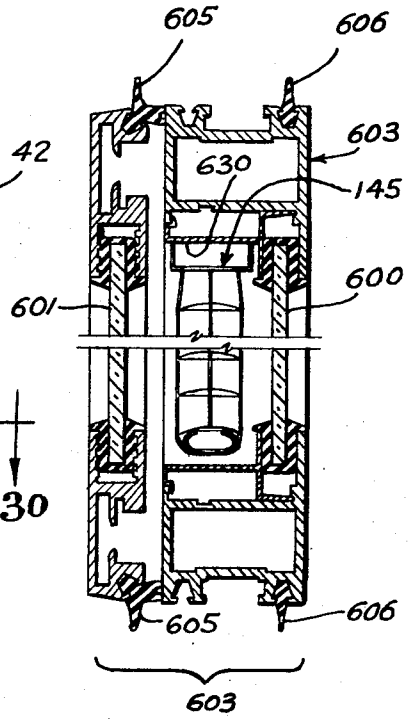


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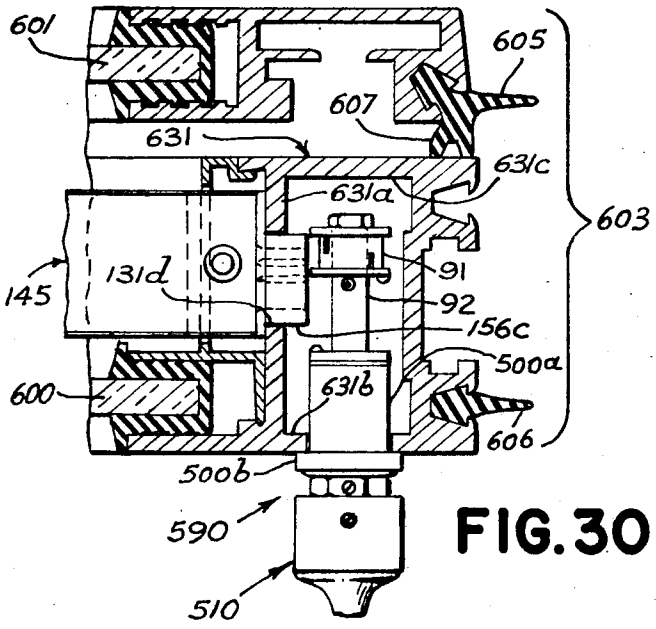


FIG. 30

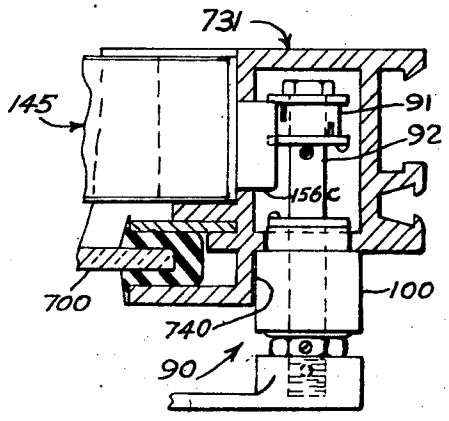


FIG. 31

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VENETIAN BLIND AND INSTALLATION

BACKGROUND OF THE INVENTION

Although Venetian blinds are now highly developed, the cost of various component parts has been higher than is desirable, and the space required for the more reliable and durable blinds has been greater than is desirable. Also most Venetian blinds and particularly the more reliable and satisfactory ones, have not been well-adapted for being combined with windows having metal framing, particularly if these windows were double-glazed and it was desired to locate the ladder-and-slat assembly of the blind between the glazings.

SUMMARY OF THE INVENTION

The Venetian blind of the present invention can be manufactured and installed at low cost, having in mind the reliability and operating characteristics that the blind affords. Moreover the blind of the present invention can readily be combined with a window having metal framing, the ladder-and-slat assembly of the blind being placed between the glazings if the window has double glazings. The invention contemplates an expeditious method of combining a Venetian blind with a window that has a channel extending along an edge of the blind-receiving space.

In accordance with certain features of the invention: The slat-tilting means includes a tilt cord which has one or two horizontal runs to which eyelets are affixed and the upper ends of the ladder sidepieces are provided with barbs which are inserted through the eyelets to connect the ladder sidepieces to the tilt cord. The tilt cord, for at least a portion of its length, is a double cord with side-by-side cord-branches and the eyelets are crimped about both of the cord-branches. Cord-operating means is operatively connected to the double-cord portion of the tilt-cord to shift the double-cord portion longitudinally of itself to tilt the slats of the blind. The cord-operating means is located at a distance from the horizontal runs of the tilt cord and a length of cord, which constitutes part of the tilt cord, connects the double-cord portion of the tilt cord to the cord-operating means. In the head channel the tilt cord passes around a cord guide which is slidably mounted for slackening the lift cord while the cord-operating means is being mounted.

In accordance with other features of the invention: The cord-operating means is operative for manipulating the lift cords as well as the tilt cord. The tilt cord and the lift cords are operatively connected to individual spool-members of the cord-operating unit, these spool members are in nonslip relationship to the tilt and lift cords, a common operator is in continuous torque-imparting relationship to both of these spool members, and a friction drive is operatively interposed between the common operator and the tilt-cord spool members. A second friction drive may be operatively interposed between the common operator and both the tilt-cord spool-member and the lift-cord spool-members. Additionally, braking means imposes a drag and obviates fortuitous lowering of the slats due to their weight. The connection of the tilt cord to the tilt-cord spool-member is a connection in which a length of cord is secured to the spool member at an intermediate location along the functioning length of such cord, and the connection of the lift cords to the lift-cord spool-member is a connection in which a length of cord is secured to the spool member at the end of the functioning length of such cord. The two spool members are rotated by a shaft which is in continuous torque-imparting relationship to each of the spool members, and the shaft is journalled in a bearing block which is adapted to be mounted on the framing of the window.

In accordance with an additional feature of the invention: There is a cheek surface at one or both ends of the lift-cord spool-member and one or both of these cheek surfaces have a projection which strikes cord being wound on the spool member when the cord is closely adjacent to the cheek surface and thereby inhibits the cord from piling up against the cheek surface.

In accordance with further features of the invention: The sheet-metal head-channel of the blind has a fitting which provides a boss that projects longitudinally from one end of the had channel and is adapted for entry into a hole in the window-frame structure for support of the end of the head channel, and this boss has one or more passages through which the tilt and lift cords extend. The tilt and lift cords hang down from the end of the boss. Below the boss there is a movable pulley-frame and pulley, and the down-hanging lift-cords pass around the pulley and have their ends secured to the head-channel-attached fitting.

In accordance with still further features of the invention: The blind is combined with a double-glazed window and the tilt-cord and lift-cord spool-members are in a framing channel which extends along an edge of the space between the glazings. The two spool members are carried by a shaft, and they are inserted into the framing channel through a hole in the front wall of the channel. The shaft then projects forwardly through the front wall of the framing channel, and a common operator for the two spool members is in front of the channel on the projecting portion of the shaft. The shaft is journalled in a block which is attached to the front wall of the framing channel.

In accordance with other features of the invention: The framing channel that is at the edge of the space between the glazings is a vertical channel having the bottom wall of the channel-formation toward such space, and the projecting boss of the head-channel of the blind is telescoped into an upper-level hole in such bottom wall for supporting the end of the head channel of the blind. The tilt and lift cords extend downwardly within the framing channel, and means for manipulating them are at a lower level in the framing channel.

The invention contemplates a method of combining a Venetian blind with a window by means of steps which include mounting the head of the blind at the top of the window, providing slack in the lift cord, providing at a location removed from the head of the blind a hole in the front wall of a framing channel of the window, extending the tilt cord and the lift-cord means from the head of the blind into the framing channel and thence out through the hole in the framing-channel front-wall, operatively connecting the tilt cord and the lift-cord means to the cord-manipulating portion of the cord-operating unit, inserting the cord-manipulating portion of the cord-operating unit into framing channel by passing the cord-manipulating portion through the hole in the framing-channel front-wall, mounting the block of the cord-operating unit adjacent to the fram-

ing-channel front-wall, and eliminating the slack from the tilt cord.

BRIEF DESCRIPTION OF THE DRAWINGS, WHICH SHOW THE PRESENTLY PREFERRED EMBODIMENTS OF THE INVENTION

FIG. 1 is a top plan view, with portions broken away, of a first Venetian blind in accordance with the invention. The tassels for the tilt cord and the tassel and anchor for the lift cord are omitted; for these see FIG. 2. Window-frame structure and glazings with which the blind may be associated are indicated diagrammatically in dot-dash lines.

FIG. 2 is a view, with portions broken away, taken generally on the line 2—2 of FIG. 1. visible portions which hang from the head of the blind are shown fragmentarily, and an anchor for the lift cords is shown diagrammatically. Window-frame structure and glazings with which the Venetian blind may be associated are indicated diagrammatically in dot-dash lines.

FIG. 3 is an enlarged vertical section on the line 3—3 of FIG. 2 showing the head channel and also showing the cord-guide unit through which the line3—3 passes. A lift-cord fragment and a fragment of the ladder-and-slat assembling are indicated in dot-dash lines.

FIG. 4 is a plan view, to a larger scale than FIGS. 1 and 2, showing the lower die of an eyelet-setting tool with an eyelet in position for setting and with a fragment of a single tilt cord in position to receive the eyelet as it is set.

FIG. 5 is a vertical section on the line 5—5 of FIG. 4, with the upper die of the setting-tool added.

FIG. 6 is a plan view, with portions broken away, showing a looped single-tilt-cord with four eyelets affixed thereto as prepared for incorporation into the first Venetian blind as shown in FIGS. 1 and 2.

FIG. 7 is an enlarged vertical section on the line 7—7 of FIG. 6, showing the eyelet clinched to the single tilt cord of FIGS. 1, 2, and 6.

FIG. 8 is a vertical section on line 8—8 of FIG. 7.

FIG. 9 is a top plan view, with portions broken away, of a second Venetian blind in accordance with the invention. The means for manipulating the tilt and lift cords are omitted.

FIG. 10 is a view, with portions broken away, taken generally on the line 10—10 of FIG. 9. The ladder-and-slat assembly of the blind is omitted, but depending fragments of the ladders and the associated lift cords are shown. The means for manipulating the tilt and lift cords are omitted.

FIG. 11 (Sheet 3) is an enlarged cross section on the line 11—11 of FIG. 10, the lift and tilt cords being omitted.

FIG. 12 (Sheet 3) is a fragmentary view on the line 12—12 of FIG. 11, portions of the tilt cord and portions of the lift-cord means being indicated in dot-dash lines.

FIG. 13 is a plan view, with portions broken away, showing a looped double-tilt-cord element with four eyelets affixed thereto as prepared for incorporation into the second Venetian blind as shown in FIGS. 9 and 10.

FIG. 14 is an enlarged section on the line 14—14 of FIG. 13, showing the eyelet clinched to the double tilt-cord-element of FIG. 13.

FIG. 15 is a top plan view, corresponding to FIG. 4, showing a fragment of the double-tilt-cord element of FIG. 13 in position to have an eyelet clinched to both of the branches of the double tilt-cord element.

FIG. 16 is a top plan view of the lift-cord equalizer, a cord fragment being indicated in dot-dash lines.

FIG. 17 is a sectional elevation showing in vertical section a fragment of a metal-channel which constitutes one of the jambs of metal window framing, e.g., the framing of the sash. The plane of the section is perpendicular to the expanse of the window opening. The tilt cord of FIGS. 9 and 10 and also the lift-cord means of FIGS. 9 and 10 are shown extending downwardly in the channel and operatively connected to a cord-operating unit which is attached to the channel.

FIG. 18 is a top plan view of the tilt-cord spool-member, to which the tilt cord is shown connected in FIG. 17, a fragment of the tilt cord being included in FIG. 18.

FIG. 19 is an elevation looking from the left of FIG. 18, with a diagram added to indicate the manner in which the tilt cord is wound about the tilt-cord spool-member before that spool member is put in place in the cord-operating unit.

FIG. 20 shows, in vertical section corresponding to FIG. 17, a fragment of the metal jamb-channel that is shown in FIG. 17. The initial positions of the relevant portions of the tilt cords and the lift-cord means are indicated in dot-dash lines. In full lines, these portions are shown extended through a hole in the front wall of the channel, the tilt-cord spool-member being shown added to the tilt-cord.

FIG. 21 is a partially-exploded view of the cord-operating unit shown in FIG. 17, the tilt cord being shown connected to the tilt-cord spool-member and wound about that spool member in the manner indicated in FIG. 19.

FIG. 22 shows the cord-operating unit of FIG. 17 in perspective, a portion of the crank being broken away. The tilt cord and the lift-cord means are shown connected to the tilt-cord and lift-cord spool-members; these spool members are shown in position to be inserted through the hole in the front wall of the jamb-channel, which is shown in vertical section.

FIG. 23 is a fragmentary perspective view showing a modified operator for the cord-operating unit, the modified operator being one which is adapted to be supplemented with a hand crank.

FIG. 24 is a fragmentary perspective view showing the hand crank for supplementing the operator shown in FIG. 23.

FIG. 25 is a fragmentary perspective view showing a detachable hand crank for which the cord-operating unit may be adapted, this crank then serving as a detachable operator for the cord-operating unit.

FIG. 26 is a central longitudinal-section, with parts broken away, showing a modified cord-operating unit. The plane of the section is considered to be vertical. The part of the unit which lies to the right of the line M—M is taken unchanged from the cord-operating unit of FIGS. 17, 21, and 22.

FIG. 27 is a detail view, taken on the line 27—27 of FIG. 26, showing the friction disc and shaft-shoulder which are adjacent to the line 27—27.

FIG. 28 is a small-scale front elevation showing a blind of the present invention incorporated in a known double-glazed window having aluminum framing. The particular window is one that has been manufactured by Hope's Windows, Inc. of Jamestown, New York, being shown on page 7 of that company's insert in Sweets Architectural Catalog File for 1968 (Copyright 1967). The cord-operating unit is the cord-operating unit of FIGS. 26 and 27; otherwise the blind is the blind of FIGS. 9–12 and 17.

FIG. 29 is a vertical section taken generally on the line 29—29 of FIG. 28, the outer framing of the window being omitted and the blind being shown largely diagrammatically with details omitted. The scale of FIG. 29 is much larger than the scale of FIG. 28 and, to keep FIG 29 to a reasonable size, the major portion of the height of the structure is broken away in the center of the figure.

FIG. 30 is a fragmentary view, to a much larger scale than FIG. 28, taken generally on the line 30—30 of FIG. 28. The outer framing of the window is omitted. The tilt cords and the lift-cord means are omitted also.

FIG. 31 is a view similar to FIG. 30 showing a blind of the present invention incorporated in a different window that has aluminum framing also. The blind is the blind of FIGS. 9–12 and 17, the cord-operating unit being the unit of FIGS. 17, 21, and 22. The outer framing of the window is omitted. The tilt cords and the lift-cord means are omitted also.

FIGS. 32–35 (Sheet 5) taken collectively show, among other things, a cord-guide unit 256 which may be substituted for the cord-guide unit 156 that is shown in FIGS. 9, 10, 11, 12, and 17.

FIG. 32 is a fragmentary top plan view showing the cord-guide unit 256 incorporated in the second Venetian blind. FIG. 32 corresponds to the right-hand portion of FIG. 9 and, as in FIG. 9, the means for manipulating the tilt and lift cords are omitted.

FIG. 33 is a view, to a larger scale than FIG. 32, taken generally on the line 33—33 of FIG. 32. The full-line showing in FIG. 33 corresponds with the right-hand portion of FIG. 10 and, as in FIG. 10, the means for manipulating the tilt and lift cords are omitted. In FIG. 33 window-framing structure is indicated in phantom lines.

FIG. 34 is a vertical section showing the head channel, the cord-guide unit 256, and the tilt and lift cords, all at line 34—34 of FIG. 33.

FIG. 35 is a view similar to FIG. 33. In FIG. 35 the full-line showing is looking from the bottom of FIG. 32. Window-framing structure is indicated in phantom lines, this window-framing structure structure being different from the window-framing structure indicated in FIG. 33.

DESCRIPTION OF THE EMBODIMENTS THAT ARE PRESENTLY PREFERRED

The presently preferred embodiments of the invention, taken collectively, afford all of the features set forth in the summary of the invention and afford additional features which will be apparent from the disclosure. Except as may be otherwise indicated, the description hereinafter that is prior to the claims refers to one or more of the particular forms of the invention that are shown in the drawings; it does not necessarily refer to any other form or forms in which the invention may be embodied. The claims, however, do embrace other forms in which the invention may be embodied. The best modes thus far contemplated of carrying out the invention are disclosed. Nevertheless the disclosure is by way of illustration and example, since other specific modes are possible and it is left to the manufacturer and/or the user to dispense with any feature or features that are not needed for his purposes.

Reference will now be had to FIGS. 1–8, which deal with the first Venetian blind that is disclosed. A ladder-and-slat assembly is designated as a whole by 40 and includes sheet-metal slats 41 which are supported by two "string" ladders each of which is designated as a whole by 42. The ladder-and-slat assembly is suspended beneath a horizontally-extending support or head that is designated as whole by 44. The head that is shown may be considered as consisting of the sheet-metal channel 45 and the thereto-attached units and elements which guide the tilt cord and the lift cords.

Above the ladders 42 the head 44 has duplicate cord-guide units, each designated as a whole by 46. Space on the drawing being limited, the reference characters for the units 46 are divided between the two units to some extent. Each cord-guide unit 46 has a U-shaped sheet-metal body 47 that is nested as shown within the head channel 45, the bottom 47*a* of the cord-guide-unit body being against the bottom 45*a* of the head channel and the sides 47*b* and 47*c* of the cord-guide-unit body being against the sides 45*b* and 45*c* of the head channel. The bottom 47*a* of the body of each of the guide units 46 is attached to the bottom 45*a* of the head channel by three conventional metal eyelets 48, 49, and 50. These eyelets, which may be considered as part of the cord-guide unit 46, pass through the bottom 47*a* of the cord-guide body and thence through the bottom 45*a* of the head channel. The eyelets 48, 49, and 50 also do cord guiding, as will be explained. A sleevelike cylindrical roller 51 is on a shaft which extends between the sides 47*b* and 47*c* of the U-shaped cord-guide-unit body 47. Two sleevelike cylindrical rollers 52 and 53, each about half the length of roller 51, are end-to-end on another shaft which extends between the two sides 47*b* and 47*c* of the cord-guide-unit body 47. To facilitate free turning of the rollers 51, 52, and 53, four annular beads 47*d* are pressed out from the sides 47*b* and 47*c* and loosely confront the adjacent ends of the rollers.

At its right-hand end in FIGS. 1 and 2 the head 44 had a cord-guide unit which is designated as a whole by 56. The cord-guide unit 56 has a sheet-metal body 57 which is nested within the head channel but a portion of which projects forwardly through a cut-out in the front wall 45*b* of the head channel. The body 57 of the cord-guide unit 56 has six walls, viz., a bottom wall 57*a* which is against the bottom wall 45*a* of the head channel, side walls 57*b* and 57*c* which are against the side walls 45*b* and 45*c* of the head channel, an end wall 57*d* which extends across the end of the head channel, a top wall 57*e* which is spaced upwardly from the bottom wall 57*a* and a small vertical-wall 57*f* which depends from the top wall 57*e* and is laterally spaced from the end wall 57*d* as is best seen in FIG. 2. A sleevelike cylindrical roller 58 is on a horizontal shaft which extends between the side walls 57*b* and 57*c*. Sleevelike cylindrical rollers 59 and 60 are on vertical shafts

which extend between the bottom wall 57*a* and the top wall 57*e*. A nonrotating cylindrical guide 61 is on a horizontal rivet which extends between the end wall 58*d* and the small vertical wall 57*f*. To facilitate free turning of the rollers 58, 59, and 60 their ends may be loosely confronted by pressed-out annular beads similar to the beads 47*d* of the cord-guide units 46. The cord-guide unit 56 is secured to the head channel by eyelets 64, 65, 66, and 67 which pass through the bottom wall 57*a* of the cord-guide unit and thence through the bottom 45*a* of the head channel. The eyelet 67, however, is a long tubular eyelet which also passes through the top wall 57*e*.

A tilt cord is designated as a whole by 68. It is shiftable longitudinally of itself by pulling on one or the other of tassels 69 and 70 which are on the two ends of the tilt cord. The tilt cord has a vertical run 68*a*, a front horizontal-run 68*b* within the head channel 45, a rear horizontal run 68*c* within the head channel 45, and another vertical run 68*d*. Between the vertical run 68*a* and the front horizontal run 68*b* the tilt cord is guided through two 90° turns by guide 61 and roller 59. Between the front and rear horizontal-runs 68*b* and 68*c* the tilt cord is guided through a 180° turn by pulley 69, whereby the front and rear horizontal runs are movable in opposite directions. The pulley 69 is mounted on the bottom 45*a* of the head channel and is rotatable on a fixedly-positioned vertical axis. Between the rear horizontal-run 68*c* and the vertical run 68*d* the tilt cord is guided through two 90° turns by roller 60 and guide 61.

Affixed to the front horizontal run 68*b* of the tilt cord there are two conventional sheet-metal eyelets 71 which are spaced apart by a distance approximately equal to the distance between the two ladders 42. Like eyelets are affixed to the rear horizontal run 68*c*, being designated by 72 and being spaced apart by approximately the same distance. The manner of affixing the eyelets 71 and 72 to the tilt cord will be explained.

Each ladder 42 (see particularly FIG. 3) has cordlike sidepieces, the front sidepiece being designated 42*a* and the rear sidepiece being designated 42*b*. The slats 41 rest on crosspieces or rungs 42*c* which extend between the side-pieces 42*a* and 42*b*. The sidepieces 42*a* and 42*b* of each ladder extend upwardly into the cord-guide unit 46 that is above the ladder. The front sidepiece 42*a* passes through the eyelet 50 and is guided thereby, after which it passes over the top of roller 53 and thence toward the nearby eyelet 71. The rear sidepiece 42*b* of the ladder passes upwardly through the eyelet 48 and is guided thereby, after which it passes over the roller 52 and extends toward the nearby eyelet 72.

The upper end of each ladder sidepiece is provided with a sheet-metal fitting 74 which will be called a barb. Viewed as in FIG. 1, the left-hand half 74*a* of the barb is tubular, and the right-hand half 74*b* is channel-shaped. The tubular half 74*a* is crimped around the end portion of the cordlike sidepiece 42*a* or 42*b* of the ladders and is also provided with a pair of sharp indentations as at 75*c* which augment the attachment of the barb to the sidepiece 42*a* or 42*b*. The upper ends of the ladder sidepieces 42*a* and 42*b* are connected to the horizontal runs of the tilt cord by inserting the barbs 74 lengthwise through the tilt-cord-affixed eyelets. Once the barb has been passed completely through the eyelet, pull on the sidepiece is at the center of the length of the barb, whereby the barb positions itself crosswise of the eyelet as seen in FIG. 1 and secures the end of the ladder sidepiece to the tilt cord.

The front sidepieces 42*a* of the ladders are connected to the front horizontal run 68*b* of the tilt cord, and the rear sidepieces 42*b* of the ladders are connected to the rear horizontal run 68*c* of the tilt cord, all as seen in FIGS. 1 and 2. When the tassel 69 is pulled downwardly the front horizontal-run 68*b* of the tilt cord is shifted to the right and the rear horizontal-run 68*c* is shifted to the left, whereby the front sidepieces 42*a* of the ladders are lowered and the rear sidepieces 42*b* of the ladders are raised thereby tilting the slats 41 forwardly. When the tassel 70 is pulled downwardly, the tilt cord is shifted in the opposite direction and the slats 41 are tilted rearwardly.

The eyelets 71 and 72 are conventional sheet-metal eyelets, all of which are alike and all of which are affixed to the tilt cord in like manner before the cord is installed; see FIG. 6. As the eyelet is "set" or crimped, a semicircumference of the eyelet is crimped about the tilt cord. The crimping is done with a conventional eyelet-setting tool having a lower eyelet-receiving die and having an upper die which is brought down against the small end of the eyelet. To the conventional lower die there is added a sleeve which embraces that die, the sleeve being diametrically slotted to receive and position the tilt cord for the crimping of the eyelet about the tilt cord. In FIGS. 4 and 5 one of the eyelets 72 is in position on the lower eyelet-receiving die 75. The die 75 has been supplemented by a metal sleeve 76 which embraces the die 75 and is provided with two diametrically opposite slots 76*a*. The rear run 68*c* of the tilt cord is shown in place in the slot 76*a*, passing in a semicircle around the tubular portion of the eyelet as shown in FIG. 4. The eyelet is crimped in conventional manner by bringing down the upper die 77, thereby "-setting" or crimping the eyelet with a semicircumference of the eyelet crimped about the cord branch 68*c*. In FIG. 7 the crimped eyelet is seen in section taken longitudinally of the cord. In FIG. 8 the eyelet is seen in section taken transversely of the cord.

The ladder-and-slat assembly 40 of the blind will ordinarily have a suitable bottom bar at the bottom, from which two lift cords extend upwardly through the slats for raising and lowering the slats. The two lift cords may be, and usually are, provided by a continuous length of cord having two branches extending from a bight. Each branch is ordinarily referred to as a lift cord, and it will be convenient to consider that there are two lift cords even though the two cords may be provided by two branches of a continuous cord.

Associated with each ladder 42 there is a lift cord 78 which extends upwardly into the cord-guide fitting 46 that is above the ladder. Each lift cord 78 passes through eyelet 49 and is guided thereby, after which it passes over the roller 51 of the associated cord-guide unit 46. The lift-cord 78 which comes up into the left-hand cord-guide unit 46 (FIGS. 1 and 2) continues to the right and also passes over the roller 51 of the right-hand cord-guide unit 46. From the roller 51 of the right-hand cord-guide unit 46 the two lift cords 78 continue to the right, pass over the roller 58, make a 90°

bend about the roller **60**, make another 90° bend about the cord guide **61**, and then hang down in the front of the blind where the two lift cords are jointly attached to a tassel **79** by which the lift cords are pulled in and payed out to raise and lower the slats of the blind. When the slats are raised or partially raised, the lift cords can be secured by any suitable means. One securing means that may be used is a cord-gripping anchor, shown diagrammatically at **80**, which is attached to the framing of the window and about which the lift cords may be wound.

The term "window" will be used as embracing the opening in the building wall proper, the framing which lines such opening, the glazing or glazings, and the framing (if any) which is interposed between the glazings and the framing which lines the opening in the building wall.

The blind of FIGS. **1–3** is adapted to be combined with a window by securing the head **44** to a lintel of the framing, the expanse of the ladder-and-slat assembly confronting the glazing in the case of a single-glazed window, and the ladder-and-slat assembly being between the glazings in the case of a double-glazed window. As seen in FIG. **1**, the left-hand end of the head has a hole **45***d* in the bottom of the head channel through which an attaching screw may be inserted to attach the left-hand end of the head to the lintel. As also seen in FIG. **1**, the right-hand end of the head has a hole **45***e* through which attaching screw may be inserted to attach the right-hand end of the head to the lintel. The hole **45***e* extends through the bottom **45***a* of the head channel and also through the bottom and top walls **57***a* and **57***e* of the body **57** of the cord-guide fitting **56**.

In FIGS. **1** and **2** the framing and glazings of a double-glazed window with which the blind may be combined are indicated diagrammatically in dot-dash line. The lintel of the framing is a channel **81** having its open side directed downwardly, and the jambs of the framing are channels **82** and **83** having their open sides directed toward one another. The head **44** of the blind is nested within the lintel-channel **81**; it is attached thereto by means of screws inserted through the holes **45***d* and **45***e*, as has been explained. The window has inside and outside glazings which are indicated diagrammatically, the inside glazing being designated by **85** and the outside glazing being designated by **86**. The anchor **80** for the tilt cords, which has already been referred to, is attached to the jamb **83**.

Reference will now be had to FIGS. **9–16** which deal with the second Venetian blind that is disclosed, these figures being on Sheet **2** except for FIGS. **11**, **12**, and **16** which are on Sheet **3**. The cord-operating unit of the second blind isn't shown in any of these figures and will be described after FIGS. **9–16** have been discussed.

The second Venetian blind has features in common with the first Venetian blind. Both have a head consisting essentially of a sheet-metal head-channel and the thereto-attacked units and elements which guide the tilt cord and the lift cords. Both have the same ladder-and-slat assembly, both have a head channel made from the same channel stock, both have a tilt cord with front and rear horizontal runs in the head channel, both have the sidepieces of the ladders connected in the same way to the horizontal runs of the tilt cord, and in both the head has similar cord-guide units above the ladders. Some reference characters used for the first Venetian blind are applied to identical parts shown in figures relating to the second Venetian blind.

In the second Venetian blind the ladder-and-slat assembly (not shown) is suspended beneath a horizontally extending support or head that is designated as a whole by **144**. The head **144** consists essentially of the sheet-metal channel **145** and the thereto-attached units and elements which guide the tilt cord and the lift cord. The channel has bottom wall **145***a* and side walls **145***b* and **145***c*.

Above the ladders (not shown) the head **144** has duplicate cord-guide units each designated as a whole by **146**. These cord-guide units are the same as the cord-guide units **46** shown in FIGS. **1**, **2**, and **3** except for the omission of the rollers **52** and **53** and their common shaft. Reference characters have been carried over from FIGS. **1**, **2**, and **3** to FIGS. **9** and **10** to designate the parts of the cord-guide unit **146** which are the same as the parts of the cord-guide unit **146** which are the same as the parts of the cord-guide unit **46** including the eyelets which attach the bodies of the cord-guide units to the bottom of the head channel.

In FIGS. **9** and **10** the front and rear horizontal runs of the tilt cord, though double cords instead of single cords, are provided with the same eyelets as in FIGS. **1** and **2**. In FIGS. **9** and **10** the front and rear sidepieces of the ladders come up through the eyelets in the bottoms of the cord-guide units and are connected to the front and rear horizontal runs of the tilt cords in the same way as in FIGS. **1** and **2**, even though the rollers **52** and **53** of FIGS. **1** and **2** are missing and the sidepieces of the ladders proceed directly from the eyelets **48** and **50** to the eyelets **72** and **71**. Reference characters from FIGS. **1** and **2** have been carried over to FIGS. **9** and **10** to designate the same parts as regards the side-pieces of the ladders and their connection to the horizontal runs of the tilt cord.

As its right-hand end in FIGS. **9** and **10** the head **144** has a cord-guide unit which is designated as a whole by **156**; see also FIGS. **11** and **12** (Sheet **3**). As viewed in FIG. **10** the cord-guide unit **156** includes a formation which is T-shaped but turned on its right side, this formation being composed of a horizontal flange **156***a* and a vertical flange **156***b*. The cord-guide unit **156** also includes a cylindrical boss **156***c* which projects to the right from the vertical flange as viewed in FIGS. **9**, **10**, and **12**. The flanges **156***a* and **156***b* and the boss **156***c* may be fabricated from sheet metal, may be diecast in one piece of metal, or be molded in one piece of suitable plastic. The cord-guide unit **156** also includes one or more eyelets or tubular rivets **156***d* (one shown) by which it is attached to the right-hand end of the head channel **145**, the flange **156***a* being beneath the head channel and the attaching eyelets or rivets passing through the flange **156***a* and the bottom wall **145***a* of the head channel.

The vertical flange **156***b* extends upwardly and downwardly from the horizontal flange **156***a*, closing the end of the head channel and also depending beneath the head channel. The cord-guide unit **156** is formed with guideway passages for the passage of cords through the vertical flange **156***b* and thence longitudinally through the boss **156***c*, so that the cords can ex-

tend outwardly and downwardly from the free end of the boss. In FIG. **11** these guideway passages are seen endwise, looking down the length of the head channel toward the vertical flange **156***b*; in FIG. **17** these guideway passages are seen endwise, looking in the opposite direction. Close to the bottom of the head channel there are two guideway passages **156***e* and **156***f*. At a somewhat higher level there is a guideway passage **156***g*. As these three guideway passages proceed toward the free end of the boss **156***c*, their bottom surfaces curve downwardly to provide smooth downward-and-outward exits for the cords coming from the head channel and extending through the guideway passages.

Below the head channel the cord-guide fitting **156** is provided with a horizontal bore **156***h* which leads from the free end of the boss **156***c* and extends longitudinally through the boss and thence through the vertical flange **156***b*. The bore **156***h* is counterbored at **156***i*, the counterbore extending through the vertical flange **156***b* and for a distance into the boss **156***c*.

The tilt cord is designated as a whole by the reference character **168** which is in the lower-right corner of FIG. **10**. The tilt cord **168** is a composite, which is composed of two tilt-cord elements that are connected together end-to-end. One of the tilt-cord elements is shown separately in FIG. **13** and is designated as a whole by **168'**. The other tilt-cord element is the loop that is hanging down at the right edge of FIG. **10** and is designated as a whole by **168''**. The tilt-cord element **168'** is formed from a single length of cord that is doubled and looped as shown in FIG. **13**. The two ends of the single length of cord are fastened together in any suitable manner as by being passed through a tubular sheet-metal fastener **87** that is crimped about the overlapped end-portions of the cord. When installed in the head **144** the tilt-cord element **168'** makes a 180° turn around pulley **169** and has front and rear horizontal runs in the head channel, the front horizontal run being designated by **168***b* and the rear horizontal run being designated by **168***c*. By virtue of the tilt-cord element **168'** the tilt cord **168**, in the front and rear horizontal runs **168***b* and **168***c*, is a double cord with side-by-side cord-branches.

The eyelets **71** and **72**, at which the upper ends of the ladder sidepieces **42***a* and **42***b* are connected to the horizontal runs of the tilt cord, are crimped about the side-by-side cord-branches of the double cord in the front and rear horizontal runs **168***b* and **168***c*. The eyelets **71** and **72** are all alike, and they are affixed in the same manner by the eyelet-setting tool that is shown in FIGS. **4** and **5**. FIG. **15**, which corresponds with FIG. **4**, shows one of the eyelets **72** in position on the lower eyelet-receiving die **75**. The two side-by-side cord-branches of the rear horizontal run **168***c* are shown in place in the two diametrically disposed slots **76***a* in the sleeve **76**. Between the two slots **76***a* each of the two branches of the rear horizontal run **168***c* is shown passing in a semicircle around the tubular portion of the eyelet **72**, one cord branch passing around one-half of the tubular portion of the eyelet and the other cord branch passing around the other half of the tubular portion of the eyelet. When the eyelet is set by bringing down the upper die **77** (FIG. **5**), substantially the entire periphery of the eyelet is crimped about the two side-by-side cord-branches, one-half of the periphery being crimped about one of the side-by-side cord-branches and the other half of the periphery being crimped about the other of the side-by-side cord-branches; see FIG. **14** which shows a crimped eyelet and the two cord-branches, all in section on the line **14—14** of FIG. **13**.

The cord-guide pulley **169** is slidably mounted on the head channel **145** so that the pulley can be shifted between the full-line position and phantom-line position shown in FIG. **9**. This affords slackening and tightening of the tilt cord for a purpose that will be explained. The pulley **169** is captive on a vertically-disposed headed-shaft **169***a* that is movable along the longitudinal slot **145***f* in the bottom of the head channel. Suitable clamping means, which is operable from beneath the head channel, serves to clamp the shaft **169***a* in adjusted position along the slot **145***f*. The clamping means shown includes a clamping screw **169***b* which passes through the slot **145***f* and is threaded into an axial bore in the shaft **169***a*. Upon being tightened, the screw **169***b* pulls the lower end of the shaft **169***a* tightly against the bottom of the head channel, thereby clamping the shaft in adjusted position along the slot **145***f*. The screw **169***b* may be kept centered with respect to the width of the slot **145***f* by means of an interposed washer **169***c* that is provided with a rectangular protuberance **169***d* which fits into the slot **145***f* and has a height somewhat less than the thickness of the bottom wall **145***a* of the head channel.

From the pulley **169** the front and rear horizontal runs **168***b* and **168***c* of the tilt cord extend lengthwise of the head **144**, passing under the rollers **51** of the cord-guide units **146**. At the right-hand end of the head, as viewed in FIGS. **9** and **10**, the front horizontal run **168***b* extends through the guideway passage **156***f* (FIGS. **11** and **17**) and hangs down from the free end of the cylindrical boss **156***c* for a short distance as shown in FIGS. **9**, **10** and **17**. The rear horizontal run **168***c* of the tilt cord extends similarly to the right-hand end of the head, where it extends through the guideway passage **156***e* (FIGS. **11** and **17**) and hangs down from the free end of the cylindrical boss **156***c* for a short distance as shown in FIGS. **9**, **10** and **17**. The two ends of the tilt-cord element **168''** are connected to the two ends of the double tilt-cord element **168'** in any suitable manner, e.g., in the manner shown in FIG. **17** with the aid of tubular sheet-metal fasteners **87**.

The Venetian blind of FIGS. **9** and **10** has lift-cord means including two lift cords **178** which are shiftable lengthwise of themselves to raise and lower the slats. The two lift cords **178** extend from the bottom bar of the ladder-and-slat assembly (not shown), upwardly through the slats (not shown), through the eyelets **49** into the head **144**, over one or both of the rollers **51**, through the guideway passage **156***g* (FIGS. **11** and **17**) in the boss **156***c*, and then hang down from the boss. The two lift cords **178** are provided by a continuous length of cord having two branches extending from a bight **178***a* (see also FIGS. **12** and **16**). With the ladder-and-slat assembly of the blind fully lowered before the blind is installed, the two lift cords **178** are pulled slack-free and the bight **178***a* formed at the point along the length of cord which provides equalization of the two lift cords **178** for horizontal suspension of the bottom bar of the ladder-and-slat assembly.

A pulley **88** (FIGS. **10**, **12** and **17**) is rotatably mounted in a frame **88***a* which is vertically movable beneath the boss **156***c*. Either before or after the bight **178***a* is formed, the two lift cords **178** are passed under the pulley **88** as shown; then the bight **178***a* is passed backwardly through the boss **156***c*, being inserted through bore **156***h* (FIGS. **17** and **12**) and thence through the counterbore **156***i*. A two-legged equalizer **89** is passed between the two lift cords **178** and placed astride of the bight **178***a* as indicated in FIG. **16**. Then the two lift cords **178** are pulled through the bore **156***h*, whereupon the equalizer **89** nests in the counterbore **156***i* and the bight-adjacent ends of the two lift cords **178***a* are anchored to the head-bar-attached fitting **156**. A cord **178***b*, which is part of the lift-cord means, is attached as shown to the pulley frame **88***a* and extends downwardly therefrom. When the cord **178***b* is pulled downwardly the bottom bar of the blind is raised in 2:1 ratio, i.e., the bottom bar is raised two inches for each inch that the cord **178***b* is pulled down.

The second Venetian blind that is disclosed is illustrated in FIGS. **9** and **10**, which figures omit the means for manipulating the tilt and lift cords. The tilt and lift cords are manipulated by a cord-operating unit which is located at a distance from the horizontal runs of these cords in the head **144** of the blind. Such cord-operating unit is attached to framing of the window with which the Venetian blind is combined; see FIG. **17**, where the cord-operating unit, designated as a whole by **90**, is attached to such framing. The cord-operating unit **90** is also dealt with in FIGS. **18–22**; it is further dealt with in FIG. **27** and the portion of FIG. **26** which lies to the right of the line M—M.

The two Venetian blinds herein disclosed are adapted to be combined with existing single and double-glazed windows—including single and double-glazed windows in which fabricated metal framing lines the opening in the building wall, with or without framing interposed between the glazings and the framing which lines the opening in the building wall. Many of the fabricated metal framings are made of aluminum; and many have a lintel and have jamb-channels which extend vertically downwardly from the ends of the lintel, the bottom walls of the channel-formations of the two jamb-channels being toward each other. The second Venetian blind herein disclosed is particularly well-suited for combining with such a window; the framing of the window need not be disturbed except for making in it two round holes of reasonable size for receiving parts of the blind, plus three small holes for receiving attaching screws.

In FIG. **17** the blind of FIGS. **9** and **10** is combined with a window having fabricated metal framing which provides a horizontal lintel at **130** and vertical jamb-channels **131** (one shown) which extend downwardly from the ends of the lintel. The head channel **145** of the head **144** (FIGS. **9** and **10**) extends along the length of the lintel **130**, being closely adjacent to the bottom face of the lintel. The ladder-and-slat assembly (not shown) hangs beneath the head channel **145**. The bottom wall **131***a* of the channel-formation of each jamb channel **131** is toward the edge of the space which receives the ladder-and-slat assembly, while the front and rear side walls **131***b* and **131***c* of the channel-formation of each jamb channel are directed away from the edge of the space which receives the ladder-and-slat assembly. Close to the upper end of the jamb channel **131** shown in FIG. **17** a hole **131***d* has been provided through the bottom wall **131***a* of the channel-formation of the jamb channel. The boss **156***c* which projects from one end of the head channel **145**, the right-hand end in FIGS. **9** and **10**, makes a sliding fit with the hole **131***d* and is telescoped therein, whereby the end of the head channel is supported. The opposite end of the head channel **145** is supported by an attaching screw (not shown) which is inserted through the hole **145***d* (FIG. **9**, left-hand end) and threaded into the lintel **130**.

The cord-operating unit **90** is considered to be part of the Venetian blind; it has a tilt-cord spool-member **91** which is individual to the tilt cord **168**, and a lift-cord spool-member **92** which is individual to the lift cords **178**. These two spool members, which are cylindrical, are rotatable with a cylindrical shaft **93**; however, there is slippage between the shaft **93** and the tilt-cord spool-member **91** while the ladder-and-slat assembly of the blind is being raised or lowered. The tilt-cord spool-member **91** is a separate member which is mounted on the shaft **93**. The lift-cord spool-member **92** is part of the shaft itself. Spool member **91** spans the space between the discs **94** and **95**, which have confronting planar faces. Spool member **92** spans the space between discs **95** and **96**, which also have confronting planar faces. The discs **94**, **95** and **96** rotate with the shaft **93**, each disc being in non-slip relation to the shaft.

The tilt cord **168** includes the double-cord portion **168'** (see also FIG. **13**) and the single-cord portion **168''** (see also FIG. **10**, lower right-hand corner). The double-cord portion **168'** is connected to the tilt-cord spool-member **91** by the length of cord which constitutes the single-cord portion **168''**. The spool member **91** has parallel chordal slots **91***a* and **91***b* with which the cord **168''** makes a tight fit (FIGS. **18** and **19**). Before the tilt-cord spool-member **91** is mounted on the shaft **93**, an intermediate portion of the cord **168''** is connected to the spool-member **91** by forcing short lengths of the cord **168''** sidewise into the slots and placing the intervening length of the cord against the cylindrical surface of the spool member **91** (FIGS. **18** and **19**). From the upper end of slot **91***a* as the slot stands in FIG. **19** the cord **168''** is wound one or two convolutions about the spool member **91**, proceeding clockwise as indicated by the arrow **91***c*. From the upper end of slot **91***b* the cord is wound one or two convolutions about the spool member **91**, proceeding counterclockwise as indicated by the arrow **91***d*. When the slats of the blind are untilted the tilt-cord spool-member **91** is in the rotative position of FIG. **17** and approximately equal amounts of cord **168''** are wound, in opposite directions, on the tilt-cord spool-member **91**.

Referring to FIGS. **21**, **26** and **27**, the portion of the cord-operating-unit shaft which lies to the right of disc **95** is composed of a cylindrical portion *s*, a flat-sided portion *t* and a threaded stem *u*. The tilt-cord spool-member **91**, with the cord **168''** connected to it and wound around it as has been explained, is telescoped onto the cylindrical shaft-portion *s* and placed against the disc **95**. The disc **94** has a flat-sided central-opening **94***a* which fits the flat-sided shaft-portion *t*. The disc **94** is telescoped onto the shaft-portion *t* and brought

against the spool member **91** as is perhaps best seen in FIG. **26**. The disc **94** is resilient, and a nut *n* on the threaded stem *u* biases the disc **94** against the end face **91***e* of the spool member **91**. As shown in FIG. **26**, the over-all axial dimension of the spool member **91** is somewhat greater than the axial length of the shaft portion *s*, which insures that the spool member will be frictionally engaged by the disc **94**. The end faces **91***e* and **91***f* of the spool member **91** are concave as is seen in FIGS. **18** and **26**. Thus the contact between the spool member **91** and the planar-faced discs **94** and **95** is localized adjacent to the periphery of the spool member.

The disc **94**, which functions in conjunction with the disc **95**, is a friction drive which is operatively interposed between the tilt-cord spool-member **91** and the shaft **93** and its crank **110**. Upon rotation of the crank **110** in either direction the tilt-cord spool-member **91** is driven through the friction drive (disc **94**) and the tilt cord **168** is shifted longitudinally of itself and tilts the slats of the blind. The slats having been fully tilted in either direction, the movement of the the tilt cord **168** and tilt-cord spool-member **91** are brought to a halt. Any continued movement of the tilt cord **168** will be brief; it will raise the ladder-and-slat assembly until the top slat **41**, now fully tilted though shown untilted in FIG. **2**, will strike the bottom of the head channel **145** (FIG. **10**) and prevent any further movement of the tilt cord **168** and tilt-cord spool-member **91**.

In addition to serving as a friction drive, the disc **94** serves as a brake also. The slats having been tilted to any desired position and the crank **110** released, fortuitous rotation of the crank **110** and shaft **93** is obviated by a brake disc **97** as will be explained. The disc **94** now serves as a brake; it prevents fortuitous rotation of the tilt-cord spool-member **91** on the portion *s* of shaft **93**, thereby preventing fortuitous tilting movement of the slats.

To raise or lower the slats of the blind, the cord **178***b* is reeled in or payed out by the lift-cord spool-member **92** which is part of the shaft **93**. Full tilting of the slats is effected by a relatively small amount of rotative movement of the tilt-cord spool-member **91**, and thereupon the rotation of the tile-cord spool-member **91** is automatically brought to a halt as has been explained. During such full tilting of the slats the lift-cord spool-member **92** effects only insignificant raising or lowering of the slats as a result of the rotation of the crank **110** and shaft **93** to tilt the slats. Sufficient continued rotation of the crank **110** and shaft **93** effects the reeling in or paying out of cord **178***b* which is needed for whatever raising or lowering of the slats is desired. The crank **110** is a common operator for rotating the tilt-cord and lift-spool-members **91** and **92**, and the crank is in continuous torque-imparting relationship to both of these spool members. The tilt and lift cord spool-members are in nonslip relationship to the tilt and lift cords.

At the opposite ends of the lift-cord spool-member **92** there are cheek surfaces **95***a* and **96***a* that are provided by the discs **95** and **96**. Adjacent the cheek surface **95***a* the spool member **92** has a diametrical hole **92***a* (FIG. **26**) which has counterbores **92***b* and **92***c* leading from its opposite ends. The lift-cord means of the blind is connected to the lift-cord spool-member **92** by passing the lower end-portion of the cord **178***b* through the hole **92***a* and then providing the cord with an end knot **178***d* as indicated in FIG. **22**. In attaching the cord **178***b* to the spool member **92** it may be passed in either direction through the hole **92***a*. Upon the cord being knotted and then retracted as indicated by the arrow **178***e* in FIG. **22**, the knot **178***d* will enter one or the other of the counterbores **92***b* and **92***c* (FIG. **26**). Withdrawal of the cord from the hole **92***a* is prevented by the knot **178***d* engaging the bottom of the counterbore **92***b* or **93***c* (see FIG. **17**).

As the cord **178***b* is wound on the spool member **92** it can be expected to move closely adjacent to cheek surface **95***a* at some times and closely adjacent to cheek surface **96***a* at other times. These cheek surfaces are provided with hemispherical projections **95***b* and **96***b* which, when the cord **178***b* is closely adjacent to the cheek surface, strike the cord and push it away and thereby inhibit the cord from piling up against the cheek surface. In FIG. **26** this action is indicated in connection with projection **95***b*; note the phantom showing of cord **178***b* and the two arrows that are associated therewith.

The shaft **93** of the cord-operating unit extends from in front of the vertical jamb-channel **131**, through the front wall **131***b* of the jamb channel, and to the spool members **91** and **92** –the crank **110** being attached to the portion of the shaft which is in front of the jamb channel **131**. In extending from the crank **110** to within the jamb channel **131** the shaft **93** passes through a bearing block **100** in which it is journalled. The bearing block **100** has a cylindrical boss **100***a* which projects through a circular hole **131***g* that has been provided previously through the front wall **131***b* of the jamb channel **131**. The bearing block **100** is attached to the front wall **131***b* of the jamb channel by screws **101** and **102**.

The disc **96** is integral with the shaft **93**, as is the disc **95**. The outward face of the disc **96** is flat and it confronts the flat end-face of the bearing-block-boss **100***a*, being separated therefrom by a friction disc or washer **97** that is on the shaft **93** and is shown diagrammatically. A flat-faced clamping nut **103** is threaded onto the outer end of the shaft **93** and confronts the flat outer face of the bearing block **100**, being separated therefrom by a frinction disc or washer **98** which is on the shaft **93** and is shown diagrammatically. The friction discs or washers **97** and **98** are braking means which impose a drag upon the rotation of the crank **110**. When the crank is released after raising the blind, i.e., raising the slats thereof, the drag imposed by the friction discs or washers **97** and **98** prevents reverse rotation of the crank **110** and thereby obviates fortuitous lowering of the slats due to their weight.

The friction discs or washers **97** and **98** are of suitable type and are made of suitable material. At least one of these washers, e.g., the washer **98**, is of a type which affords resilient yielding in an axial direction to a marked extend when the washer is axially loaded. By tightening the clamping nut **103** the discs or washers **97** and **98** are axially loaded to the extend needed to cause the drag which they exert to be sufficient to obviate fortuitous lowering of the heaviest ladder-and-slat assembly, when fully raised, with which the cord-operating unit **90** is to be used. With the nut **103** thus tightened, and then held with a wrench against rota-

tion, the hub **110***b* of the crank is forcibly tightened against the nut **103** after the manner of a jamming lock nut. Thereby both the crank **110** and the nut **103** are made fast to the shaft **93**. If desired, set screws **103***a* and **110***a* may be provided to further lock the nut **103** and the crank **110** against movement relative to shaft **93**.

The cord-manipulating portion of the cord-operating unit **90** is the same as what is shown to the right of the line M—M in FIG. **26**. The cord-manipulating portion, which includes the spool members **91** and **92**, is insertable through the hole **131***g* as indicated in FIG. **22**. Preparatory to combining the Venetian blind of FIGS. **9** and **10** with an existing window having metal framing of suitable construction, the necessary holes are made in the framing. Referring to FIG. **22**, the hole **131***g* is made at a lower level in the front wall **131** of the right-hand jamb-channel of the window framing; and companion holes **131***e* and **131***f* are made to receive the screws **101** and **102** (FIG. **17**). If the screws aren't to be self-tapping, the holes **131***e* and **131***f* will be tapped. Near the top end of the jamb channel the hole **131***d* (FIG. **17**) is made in the bottom wall **131***a* of the channel formation. The hole **131***d* is so spaced from the lintel **130** that, when it receives the boss **156***c* which projects from the right-hand end of the head channel **145** of the blind (FIGS. **9** and **10**), the right-hand end of the head channel will be closely adjacent to the lintel **130** (see FIG. **17**, top). The head channel **145** will extend to the opposite end of the lintel, or very close thereto. Near the opposite end, a hole (not shown) is made in the lintel to receive an attaching screw which is inserted through hole **145***d* (FIG. **9**, left) to attach the left-hand end of the head channel **145** to the lintel. If the attaching screw isn't to be self-tapping, the hole in the lintel will be tapped.

The portions of the tilt cord and the lift-cord means that are seen hanging down at the right edge of FIG. **10** are inserted through the hole **131***d* (FIG. **17**, top) and allowed to hang down within the channel **131** as indicated in phantom lines in FIG. **20**. The boss **156***c*, which projects from the right-hand end of the head channel **145** of the blind, is telescoped into the hole **131***d;* and the left-hand end of the head channel **145** is attached to the lintel by a screw inserted through hole **145***d* (FIG. **10**, left) as has been explained. If desired a small block or bracket can be place immediately beneath the left-hand end of the head channel **145** and be secured to the left-hand jamb, to support the left-hand end of the head channel in case the screw through hole **145***d* should loosen.

With the aid of a wire hook the depending cords **168''** and **178***b* are pulled through the hole **131***g* and brought outside of the jamb channel **131** as seen in full lines in FIG. **20**. The slack needed in the tilt cord for this step is provided by loosening screw **169***b* (FIG. **10**, left) and allowing pulley **169** to move to the right, as has been explained. The slack needed in the lift-cord means is obtained by temporarily propping up the bottom bar. Either before the cord **168''** is inserted through the hole **131***d* near the top of the jamb channel or after the cord **168''** has been brought out through the lower-level hole **131***g*, the bight-adjacent portion of the cord **168''** is connected to the tilt-cord spool-member **91** by forcing the cord into the chordal slots **91***a* and **91***b* as has been explained in connection with FIGS. **18** and **19**. The cord **168''** is to be wrapped in opposite directions about the tilt-cord spool-member **91** as has been explained in connection with FIG. **19**. A sleeve **99**, of metal or plastic, loosely embraces the two branches of cord **168''**. This may be an unsplit sleeve that is applied before the cord is connected to the spool member **91**, or it may be a split sleeve which can be applied after the cord has been connected to the spool member **91**. With the cord **168''** pulled snug around the spool member **91**, the sleeve **99** is moved to the position shown in FIGS. **21** and **22** to hold the cord **168''** snug around the spool member during ensuing assembly and installation.

The tilt-cord spool-member **91** and associated parts are now assembled with the rest of the cord-operating unit **90**, as indicated in FIG. **21** and seen in assembled relation in FIG. **22**. Either before or afterwards, the cord **178***b* is connected to the lift-cord spool-member **92** as has been explained. The cord-manipulating portion of the cord-operating unit is inserted through the hole **131***g* as indicated in FIG. **22**, thereby placing the lift-cord and tilt-cord spool-members **91** and **92** within the jamb channel **131** as shown in FIG. **17**. The bearing block **100** is now attached to the front wall **131***b* of the jamb channel by means of the screws **101** and **102**, completing the installation of the cord-operating unit **90** as shown in FIG. **17**. The slack is removed from the tilt cord by pushing screw **169***b* (FIG. **10**) to the left, and with it pulley **169** to the left, and then tightening the screw **169***b*. The slack is removed from the tilt-cord means by removing the prop from beneath the bottom bar of the blind. Upon rotation of the crank **110** with resultant shifting of cord **168''**, the sleeve **99** quickly moves away from the spool member **91** and into a position such as shown in FIG. **17**. In this position it doesn't interfere with free longitudinal movement of the two branches of cord **168'**.

Some institutions desire that a patient be able to tilt the slats of a Venetian blind without being able to raise the slats. In FIG. **23** the crank **110** of FIGS. **17**, **21** and **22** is replaced by a serrated knob **210** which is the operator for the tilt-cord and lift-cord spool members **91** and **92**. Most ambulatory patients can rotate knob **210** and tilt the slats, but few will be able to exert enough torque to raise the slats. For raising the slats, a nurse or attendant can supplement the knob **210** with the crank **310** that is shown fragmentarily in FIG. **24**.

In some instances it is desired that a patient be unable to even tilt the slats. In such instances the knob **210** will be eliminated and the detachable hand crank **410** of FIG. **25** will be used by a nurse or attendant. The shaft **93** (FIG. **17**) will have no operator affixed to its end which extends into the room. Instead, the shaft **93** will have a hexagonal socket in its end to receive the hexagonal projection **410***a* of the crank **410**.

With the mounted cord-operating unit **90** the bearing block **100** thereof has a relatively large axial dimension outside of the jamb channel (see FIG. **17**). This is undesirable when the blind is to be combined with some of the existing windows. A further limitation of the cord-operating unit **90** is that an inattentive or dull person may possible continue to rotate the crank **110**, forcibly, after the slats have been fully raised; this could break the cord **178***b* of the lift-cord means. These

limitations are overcome in the cord-operating unit **590** shown in FIG. **26**.

Reference will now be had to FIG. **26** and certain comparisons will be made with FIG. **17**. The bearing block **500** has substantially the same over-all axial-length as the bearing block **100**. However, the cylindrical bearing-block-boss **500***a* is much longer than the boss **100***a* (FIG. **17**); and the boss **500***a* occupies most of the over-all axial-length of the bearing block **500**. The rest of the bearing block **500** is reduced to a flange **500***b* that is secured against the front face of the jamb-channel by screws inserted through holes **500***c* and **500***d*; cf screws **101** and **102** in FIG. **17**. A thick-wall cylindrical-sleeve **504** is interposed between the shaft **593** and the bearing block **500**. The right-hand end of the sleeve **504** is planar and is flush with the planar end of the boss **500***a*. The confronting face of the disc **96** is planar, and a friction disc or washer **597** is interposed between the face of disc **96** and the end faces of sleeve **504** and boss **500***a*. Against the front face of the bearing block **500** there is a friction washer **598** which is shown diagrammatically. The washer **598** is of a type which affords resilient yielding in an axial direction to a marked extent when the washer is axially loaded.

Threaded onto the left-hand end of the shaft **593** there is a nut **512** and a jamming nut **513**. When the nut **512** is tightened the inner portion of the friction washer **597** is axially loaded; the disc **96** applies pressure to one side of the washer **597** and the confronting end of the sleeve **504** applies pressure to the opposite side of the washer **597**. The inner portion of the friction washer **597**, which functions in conjunction with the end of sleeve **504** and the confronting face of disc **96**, constitutes a friction drive; and the driving torque for shaft **593** is transmitted by this drive when the sleeve **504** is rotated by the crank **510**. It will be seen that this drive is operatively interposed between the crank **510** and both the lift-cord spool-member **92** and the tilt-cord spool-member **91**. The purpose of this drive is to afford slippage between the crank **510** and the lift-cord spool-member **92** when the slats of the blind have been fully raised. This protects the cord **178***b* against breakage if rotation of the crank **510** is continued, forcibly, after the slats of the blind have been fully raised. By tightening the nut **512** the drive at the washer **597** is given a slipping torque which is substantially higher than the slipping torque of the drive at **94** and sufficiently high to insure that the slats of the blind can be fully raised without slippage of the drive that is at the washer **597**. Then jamming nut **513** is tightened against nut **512** to maintain the adjustment.

When nut **503** is tightened it axially loads washer **598** and the outer portion of washer **597**, the outer portion of washer **597** being squeezed between disc **96** and the end of boss **500***a*. The washer **598** and the outer portion of washer **597** constitute braking means which impose a drag upon the rotation of the crank **510**. Nut **503** is tightened sufficiently to cause this braking means to impose a drag which is high enough to prevent counterrotation of the crank **510** and lowering of the slats under their own weight when the crank is released after the slats have been fully raised. The nut **503** may be held in adjusted position by a set screw **503***a*. The hub **510***b* of the crank **510** is screwed onto the end of the sleeve **504** and tightened against the nut **503**. The hub may be further held by a set screw **510***a*.

In FIGS. **28**, **29** and **30** the blind of FIGS. **9** and **10**, using the cord-operating unit of FIG. **26**, is combined with a commercial window. The window is a "Hope's" window shown on page 7 of Hope's Windows, Inc.'s insert at **19***a*/Ho in Sweets Architechural Catalog File for **1968**. In FIGS. **28**, **29** and **30** the window is taken from Hope's illustrations in Sweets Architectural Catalog File.

Hope's window is double-glazed and has fabricated aluminum framing. It has inner glazing **600** and outer glazing **601**. Outer framing **602** is provided to line the opening in the building wall. Sash framing **603** is interposed between the outer framing **602** and the glazings **600** and **601**. The sash framing **603** may be pivotally connected to the outer framing **602** on either a vertical or a horizontal axis, a vertical axis **604—604** being indicated in FIG. **28**. Sealing strips **605** and **606** seal the sash framing **603** to the outer framing **602**. The space between the glazings **600** and **601** is accessible by swinging the glazing **601** and its individual frame away from the balance of the sash framing; the joint at the plane of separation is sealed by a sealing strip **607**.

The sash framing **603** has a lintel **630** (FIG. **29**). Jamb channels extend downward from the ends of the lintel, along the vertical edges of the space between the glazings. The right-hand jamb-channel is shown in section in FIG. **30** where it is designated as a whole by **631**. The channel formation of the channel **631** has a bottom wall **631***a* which is toward the space between the glazings, and has front and rear walls **631***b* and **631***c* which are directed away from the space between the glazings, the walls **631***b* and **631***c* being generally parallel to the glazing **600** and **601**.

The blind is combined with the window in the manner that has been described. The blind is shown diagrammatically in FIG. **29**, where the head channel **145** is shown against the lintel **630**. The right-hand end of the head channel **145** (FIG. **30**) is supported by the boss **156***c* extending through the upper level hole **131***d* in the bottom wall **631***a* of the channel formation of the jamb channel **631**. The opposite end of the head channel is supported as has been explained. The tilt cords and the lift-cord means are as in FIGS. **9**, **10**, **12** and **17**, extending downwardly within the jamb-channel **631** and being connected to the tilt-cord spool-member **91** and the lift-cord spool-member **92** as has been explained.

In FIG. **31** the outer glazing and its individual frame are omitted, being the same as in FIG. **30**. The inner glazing is designated by **700** and the individual framing therefor differs from FIG. **30**. In FIG. **31** there is a recess at **740** and the front-to-rear space within the jamb channel **731** is less than in FIG. **30**. With this jamb channel of FIG. **31** the cord-operating unit **90** of FIG. **17** is used. The major portion of the axial length of the bearing block **100** is outside of the jamb-channel **731**, and less front-to-rear space is needed within the channel **731**.

FIGS. **32–35** illustrate the second Venetian blind modified by a different cord-guide unit at the right-hand end of the head and a different arrangement for anchoring the two lift cords to the cord-guide unit. In the unmodified second-Venetian-blind illustrated in FIGS. **9–22**, the head is designated as a whole by **144**, the cord-guide unit at the right-hand end of the head is designated as a whole by **156** and each of the two lift

cords is designated by **178**. In the modified second-Venetian-blind illustrated in FIGS. **32–35**, the head is designated as a whole by **244**, the cord-guide unit at the right-hand end of the head is designated as a whole by **256** and each of the two lift cords is designated by **278**.

In the unmodified second-Venetian-blind (FIGS. **9–22**) and the modified second-Venetian-blind (FIGS. **32–35**) the same parts are designated by the same reference characters viz: The head channel is designated as a whole by **145**; it has a bottom wall that is designated by **145***a*, a front wall that is designated by **145***b* and a rear wall that is designated by **145***c*. The tilt cord is designated as a whole by **168** and is a composite, which is composed of two tilt-cord elements that are connected together end-to-end. One of the tilt-cord elements is designated as a whole by **168′** and is formed from a single length of cord that is doubled and looped as shown in FIG. **13**. The other tilt-cord element is designated as a whole by **168″** and is the loop that depends from the right-hand end of the head. The lift-cord means includes the pulley that is designated by **88**, the pulley frame that is designated by **88***a*, and the cord that is designated by **178***b*.

The cord-guide unit **256** fits into and is nested within the head channel **145** as is best seen in FIG. **34**. The body of the cord-guide unit is designated as a whole by **256′** and is a U-shaped sheet-steel stamping having a bottom wall **256***a*, a front wall **256***b*, and a rear wall **256***c*. The bottom wall **256***a* of the cord-guide unit is against the bottom wall **145***a* of the head channel and is secured thereto by an eyelet **256***d*. At its right-hand end, the bottom wall **256***a* of the cord-guide unit (FIGS. **32** and **33**) terminates in the vertical plane of the right-hand end of the head channel **145**; but before terminating it is formed to provide a convex semicylindrical cord-guiding surface SC that spans the space between the front and rear walls **256***b* and **256***c* of the cord-guide unit.

The cord-guide unit **256** has a stamped sheet-steel cover-member **256***e* which is horizontally disposed at a level adjacent to the upper edges of the front and rear walls **256***b* and **256***c*. This cover member is mounted and secured as shown in FIG. **34**; rivetlike posts **256***f* and **256***g* pass through the cover plate **256***e* and the bottom wall **256***a*, and have annular shoulders against the cover member **256***e* and the bottom wall **256***a*. The ends of the posts **256***f* and **256***g* are swaged into holding engagement with the cover plate **256***e* and the bottom wall **256***a*; and the bottom wall **256***a* is dimpled upwardly where the posts pass through it so that the swaged lower ends of the posts will not prevent the cord-guide unit from nesting fully into the head channel **145**. To obviate chafing of the two lift cords **278** by the left-hand and right-hand edges of the cover member **256***e*, the edge portions of the cover member are bent upwardly somewhat as seen at **256***j* and **256***k*, the bent-up portions spanning the space between the front and rear walls **256***b* and **256***c* of the cord-guide unit. A central hole **256***m* in the cover member **256***e* permits the insertion of an eyelet-setting tool when setting the eyelet **256***d* to secure the cord-guide unit to the head channel.

Longitudinally of the head channel **145**, the front and rear walls **256***b* and **256***c* of the cord-guide unit extend well beyond the end of the head channel; see FIGS. **32**, **33**, and **35**. Spanning the space between the front and rear walls **256***b* and **256***c* and positioned beyond the end of the head channel **145**, there is an axle **256***n*. The ends of the axle are affixed to the walls **256***b* and **256***c*. Rotatably mounted on the axle there are cylindrical sleeves **256***p* and **256***r* and an intervening washer **256***s*.

The two lift cords **278** extend under the cover member **256***e* between the posts **256***f* and **256***g*; they then pass over the rotatable sleeve **256***r*, downwardly to the pulley **88**, about half way around the pulley, and then back upwardly toward the cord-guide fitting **256** —all as best seen in FIG. **33**. The two lift cords **278** are "equalized", i.e. adjusted to suspend the bottom bar of the blind horizontally as is well-understood. The ends of the equalized lift-cords **278** coming up from the pulley **88** are then anchored to the head **244** in any suitable manner, e.g. similarly to the anchoring of the lift-cords **178** in FIG. **10**. Alternatively, one of the lift cords **278** ascending from the pulley **88** may be passed reversely over the rotatable sleeve **256***p* and then the ends of the two lift cords be fastened together as by a metal fastener **278′**. As the cord **178***b* is pulled downwardly or allowed to move upwardly, the two lift cords **278** are pulled in or payed out and have double the movement of cord **178***b*, the same as with the two lift cords **178** in FIGS. **12** and **17**.

The front horizontal run **168***b* of the tilt cord passes between the front wall **256***b* of the cord-guide unit and the post **256***f* (see FIG. **34**), after which it passes over the cord-guiding surface SC and extends downwardly as seen in FIG. **33**. Similarly the rear horizontal run **168***c* of the tilt cord passes between the rear wall **256***c* of the cord-guide unit and the post **256***g*, thence over the cord-guiding surface SC, and downwardly as seen in FIGS. **33** and **35**.

As has been explained previously, FIGS. **28–30** show the unmodified second Venetian blind of FIGS. **9** and **10** combined with a "Hope's" commercial window. FIG. **35** illustrates the modified second Venetian blind of FIGS. **32–35** substituted for the unmodified second Venetian blind of FIGS. **9** and **10**. In FIG. **35** the upper right-hand corner-portion of the Hope's sash framing **603** of FIGS. **28–30** is indicated diagrammatically in phantom lines, including the lintel **630** and the right-hand jamb-channel **631**. In lieu of the upper-level circular hole **131***d* (FIGS. **30** and **17**) which receives the circular boss **156***c* (FIGS. **9–12**, **17** and **30**), the bottom wall **631***a* of the channel formation of the jamb channel is provided with an upper level rectangular hole **131***d′* which receives the right-hand end of the head channel and supports it closely adjacent to the lintel **630** as is shown in FIG. **35**. If desired a vertical attaching screw can also be used at the right-hand end of the head **244**, being inserted through the eyelet **256***d* and threaded into the lintel **630**.

FIG. **33** shows the modified second Venetian blind of FIGS. **32** and **35** combined with a window which is a slight modification of the "Hope's" commercial window of FIGS. **28–30**. The window is the same as in FIGS. **28–30** except that it has modified sash-framing which is indicated diagrammatically in phantom lines in FIG. **33** and is designated as a whole by **603′**. This sash-framing has the same right-hand jamb-channel **631**. However, the horizontal channel across the top has

only a top wall and front and rear walls; there is no bottom wall toward the space between the glazings. As shown in FIG. 33, the head **244** of the blind is nested within the horizontal framing channel at the top of the sash; the top wall of this channel becomes the lintel, which is designated by **630'**. The cord-guide fitting **256** projects into vertical alignment with the interior of the jamb channel **631**, and the tilt cords and the lift-cord means pass downwardly within the jamb channel and are operatively connected to the spool members **91** and **92** of the cord-operating unit **590** that is shown in FIGS. **30** and **26**. The right-hand end of the head channel **145** is secured to the lintel **630'** by a vertical screw S which is inserted through the eyelet **256***d* and threaded into the lintel **630'**. The left-hand end of the head channel **145** is similarly secured to the lintel by a screw inserted through the hole **145***d* (FIG. **9**), as has been explained.

The blind is thin, and it is well-suited for combination with a double-glazed window. The slats may be 1 inch wide and the head channel may be 1 inch wide and three-eighths inch high. The cord for the tilt cords and the lift-cord means is strong braided cord of small diameter and no troublesome stretch. There are fishing-line cords, of high breaking strength, which are suitable. Suitable known materials are used throughout. Rolled aluminum slats are presently preferred for the blind. Extruded aluminum is presently preferred for the window framing. Rolled sheet steel is presently preferred for the head channel. Stamped sheet steel is presently preferred for the bodies of the cord-guide units. Standard components are used there applicable.

I claim:

1. A venetian blind having a ladder-and-slat assembly suspended beneath a support, having the ladders connected to a tilt cord which extends horizontally adjacent to the support and is shifted lengthwise of itself to tilt the slats, and having lift-cord means including lift cords which are shifted lengthwise of themselves to raise and lower the slats, the shifting of the tilt and lift cords being in response to rotation of tilt-cord and lift-cord spool-members that are individual to the tilt and lift cords and to which the tilt and lift cords are operatively connected, and the tilt-cord and lift-cord spool-members being rotated by a common operator—wherein the improvement comprises:

the tilt-cord and lift-cord spool-members having the tilt and lift cords fixedly attached thereto,

the common operator being a hand-grasped rotatable-member that is in continuous torque-imparting relationship to both the tilt-cord spool-member and the lift-cord spool-member,

the hand-grasped rotatable-member being continuously operable to afford full tilting of the slats,

and a friction drive being operatively interposed between the hand-grasped rotatable-member and the tilt-cord spool-member,

the friction drive affording slippage between the hand-grasped rotatable-member and the tilt-cord spool-member when the slats of the blind are fully tilted.

2. A Venetian-blind as in claim **8** wherein the improvement additionally comprises:

braking means which imposes a drag and obviates fortuitous lowering of the slats due to their weight.

3. A Venetian-blind as in claim **8** wherein the improvement additionally comprises:

the connection of the tilt cord to the tilt-cord spool-member being a connection in which a length of cord is secured to the spool member at an intermediate location along the functioning length of such cord,

and the connection of the lift cords to the lift-cord spool-member being a connection in which a length of cord is secured to the spool member at the end of the functioning length of such cord.

4. A Venetian blind as in claim **1** in combination with a double-glazed window which has a framing channel that extends along an edge of the space between the glazings—wherein the improvement additionally comprises:

the ladder-and-slat assembly is in the space between the glazings,

and the two spool members are in the framing channel which extends along an edge of the space between the glazings.

5. A Venetian blind as in claim **1** in combination with a double-glazed window which has a framing channel that extends along an edge of the space between the glazings, the channel having a front wall which is generally parallel to the glazings—wherein the improvement additionally comprises:

the ladder-and-slat assembly is in the space between the glazings,

the two spool members are in the framing channel which extends along an edge of the space between the glazings,

the two spool members are rotatable with a shaft which extends from in front wall of the framing channel, through the front wall of the framing channel, and to the spool members,

and the common operator for the two spool members is attached to the portion of the shaft which is in front of the framing channel.

6. The combination as in claim **5** in which the improvement additionally comprises:

the two spool members are insertable through a hole in the front wall of the framing channel that extends along an edge of the space between the glazings,

and the shaft is journalled in a block which is attached to the front wall of such framing channel.

7. A Venetian blind as in claim **1** in combination with a double-glazed window which has a framing channel that extends along a vertical edge of the space between the glazings—wherein the improvement additionally comprises:

the ladder-and-slat assembly is in the space between the glazings,

there is braking means which imposes a drag upon the movement of the common operator and obviates fortuitous lowering of the slats due to their weight,

and the two spool members are in the framing channel which extends along a vertical edge of the space between the glazings.

8. A Venetian blind as in claim **1** in combination with a double-glazed window which has a framing channel

that extends along a vertical edge of the space between the glazings, the framing-channel having a front wall which is generally parallel to the glazings—wherein the improvement additionally comprises:

the ladder-and-slat assembly is in the space between the glazings,

there is braking means which imposes a drag upon the movement of the common operator and obviates fortuitous lowering of the slats due to their weight,

the two spool members are in the framing channel which extends along a vertical edge of the space between the glazings,

the two spool members are rotatable with a shaft which extends from in front of the framing channel, through the front wall of the framing channel, and to the spool members,

and the common operator is on the portion of the shaft which is in front of the framing channel.

9. The combination as in claim **8** in which the improvement additionally comprises:

the two spool members are insertable through a hole in the front wall of the framing channel that extends along a vertical edge of the space between the glazings,

and the shaft is journalled in a block which is attached to the front wall of such framing channel.

10. A Venetian blind having a ladder-and-slat assembly suspended beneath a support, having the ladders connected to a horizontal tilt cord which is shifted lengthwise of itself to tilt the slats, and having lift-cord means including lift cords which are shifted lengthwise of themselves to raise and lower the slats, the shifting of the tilt and lift cords being in response to rotation of tilt-cord and lift-cord spool-members that are individual to the tilt and lift cords and to which the tilt and lift cords are operatively connected, and the tilt-cord and lift-cord spool-members being rotated by a common operator—wherein the improvement comprises:

the tilt-cord and lift-cord spool-members being in nonslip relationship to the tilt and lift cords,

the common operator being in continuous torque-imparting relationship to both of the spool members,

a friction drive being operatively interposed between the common operator and the tilt-cord spool-member to afford slippage between the common operator and the tilt-cord spool-member when the slats of the blind are fully tilted,

and a second friction drive being operatively interposed between the common operator and both of the spool members to afford slippage between the common operator and the lift-cord spool-member when the slats of the blind have been fully raised.

11. A Venetian blind having a self-contained operating-unit that is remote from the head of the blind, said self-contained unit comprising:

tilt-cord and lift-cord spool-members,

a shaft for rotating these two spool-members,

the shaft being in continuous torque-imparting relationship to the tilt-cord spool-member for tilting the slats of the blind,

and the shaft also being in continuous torque-imparting relationship to the lift-cord spool-member for raising and lowering the slats of the blind,

and a bearing block in which the shaft is journalled,

said bearing block being adapted to be mounted on framing of, or associated with, the window at which the Venetian blind is mounted.

12. A Venetian blind as in claim **11** in which the operating unit additionally comprises:

a friction drive which is operatively interposed between the shaft and the tilt-cord spool-member.

13. A Venetian blind as in claim **12** in which the operating unit additionally comprises:

an operator for rotating the shaft,

and a friction drive which is operatively interposed between the operator and the shaft.

14. A Venetian-blind as in claim **11** in which the operating unit additionally comprises:

braking means which imposes a drag upon rotation of the shaft relative to the bearing block.

15. A Venetian blind as in claim **11** in which the operating unit additionally comprises:

a friction drive which is operatively interposed between the shaft and the tilt-cord spool-member,

and braking means which imposes a drag upon the rotation of the shaft relative to the bearing block.

16. A Venetian blind having an operating unit comprising: tilt-cord and lift-cord spool-members,

a shaft for rotating these two spool-members,

the shaft being in continuous torque-imparting relationship to each of these spool-members,

a bearing block in which the shaft is journalled,

said bearing block being adapted to be mounted on framing of, or associated with, the window at which the Venetian blind is mounted,

a cheek surface at an end of the lift-cord spool-member,

and a projection extending from the cheek surface to strike cord being wound on the spool member when the cord is closely adjacent to the cheek surface and thereby inhibit the cord from piling up against the cheek surface.

17. A Venetian blind having an operating unit comprising:

tilt-cord and lift-cord spool-members,

a shaft for rotating these two spool-members,

the shaft being in continuous torque-imparting relationship to each of these spool-members,

a bearing block in which the shaft is journalled,

said bearing block being adapted to be mounted on framing of, or associated with, the window at which the Venetian blind is mounted,

cheek surfaces at the opposite ends of the lift-cord spool-member,

and a projection extending from each cheek surface to strike cord being wound on the spool member when the cord is closely adjacent to the cheek surface and thereby inhibit the cord from piling up against the cheek surface.

18. A Venetian blind having an operating unit comprising: tilt-cord and lift-cord spool-members,

a shaft for rotating these two spool members, the shaft being in continuous torque-imparting relationship to each of these spool members,

a bearing block in which the shaft is journalled,

said bearing block being adapted to be mounted on framing of, or associated with, the window at which the Venetian blind is mounted,

a cheek surface at an end of the lift-cord spool-member,

a projection extending from the cheek surface to strike cord being wound on the spool member when the cord is closely adjacent to the cheek surface and thereby inhibit the cord from piling up against the cheek surface,

and a friction drive which is operatively interposed between the shaft and the tilt-cord spool-member.

19. A Venetian blind having an operating unit comprising: tilt-cord and lift-cord spool-members,

a shaft for rotating these two spool-members, the shaft being in continuous torque-imparting relationship to each of these spool members,

a bearing block in which the shaft is journalled, said bearing block being adapted to be mounted on framing of, or associated with, the window at which the Venetian blind is mounted,

a cheek surface at an end of the lift-cord spool-member,

a projection extending from the cheek surface to strike cord being wound on the spool member when the cord is closely adjacent to the cheek surface and thereby inhibit the cord from piling up against the cheek surface,

a friction drive which is operatively interposed between the shaft and the tilt-cord spool-member,

and braking means which imposes a drag upon rotation of the shaft relative to the bearing block.

20. A Venetian blind having a ladder-and-slat assembly suspended beneath a support, and having ladders connected to a tilt cord which extends horizontally at the top of the blind and is shifted lengthwise of itself to tilt the slats, the shifting of the tilt cord being in response to rotation of a tilt-cord spool-member to which the tilt cord is operatively connected, and the tilt-cord spool-member being remote from the top of the blind and being rotated by a hand-grasped rotatable-member --wherein the improvement comprises:

the tilt-cord spool-member being in nonslip relationship to the tilt cord,

the hand-grasped rotatable-member being in continuous torque-imparting relationship to the tilt-cord spool-member,

and a friction drive being operatively interposed between the hand-grasped rotatable-member and the tilt-cord spool-member to afford slippage between the hand-grasped rotatable-member and the tilt-cord spool-member when the slats are fully tilted.

21. A Venetian blind having a head and an operating unit remote from the head, the operating unit comprising the following elements all of which are remote from the head:

a tilt-cord spool-member,

a shaft for rotating the tilt-cord spool-member, the shaft being in continuous torque-imparting relationship to such spool-member,

a bearing block in which the shaft is journalled, said bearing block being adapted to be mounted on framing of, or associated with, the window at which the Venetian blind is mounted,

and a friction drive which is operatively interposed between the shaft and the tilt-cord spool-member to afford slippage between the shaft and the tilt-cord spool-member when normal rotation of the tilt-cord spool-member is prevented.

22. A Venetian blind having an operating unit comprising:

a lift-cord spool-member,

a hand-grasped rotatable-member for rotating the lift-cord spool-member,

a cheek surface at an end of the lift-cord spool-member,

and a projection extending from the cheek surface to strike cord being wound on the spool member when the cord is closely adjacent to the cheek surface and thereby inhibit the cord from piling up against the check surface.

23. A Venetian blind having an operating unit as in claim **22** wherein:

there are cheek surfaces at the opposite ends of the lift-cord spool-member,

and there is a projection extending from each cheek surface to strike cord being wound on the spool member when the cord is closely adjacent to the cheek surface and thereby inhibit the cord from piling up against the cheek surface.

24. A Venetian blind having an operating unit as in claim **22** wherein:

a friction drive is operatively interposed between the hand-grasped rotatable-member and the lift-cord spool-member to afford slippage between the hand-grasped rotatable-member and the lift-cord spool-member when normal rotation of the lift-cord spool-member is prevented.

25. A venetian blind having an operating unit as in claim **22** wherein:

there are cheek surfaces at the opposite ends of the lift-cord spool-member,

there is a projection extending from each cheek surface to strike cord being wound on the spool member when the cord is closely adjacent to the cheek surface and thereby inhibit the cord from piling up against the cheek surface,

and a friction drive is operatively interposed between the hand-grasped rotatable-member and the lift-cord spool-member to afford slippage between the hand-grasped rotatable-member and the lift-cord spool-member when normal rotation of the lift-cord spool-member is prevented.

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