VENETIAN BLIND AND INSTALLATION

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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
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 bars 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 slidable 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 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 journaled 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 head 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 journaled 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. The 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 frag-
mentarily, and an anchor for the lift cords is shown dia-
grammatically. 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 frag-
ment 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 af-
fixed 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 tilt 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 por-
tions 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 con-
stitutes one of the jambs of metal window framing, e.g.,
the framing of the sash. The plane of the section is per-
pendicular 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
fragments 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 indi-
cated 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 con-
ected to the tilt-cord and lift-cord spool-members; these
spool members are shown in position to be in-
serted 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 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 47a of the cord-guide-unit body being against the bottom 45a of the head channel and the sides 47b and 47c of the cord-guide-unit body being against the sides 45b and 45c of the head channel. The bottom 47a of the body of each of the guide units 46 is attached to the bottom 45a 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 47a of the cord-guide body and thence through the bottom 45a 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 47b and 47c 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 47b and 47c of the cord-guide-unit body 47. To facilitate free turning of the rollers 51, 52, and 53, four annular beads 47d are pressed out from the sides 47b and 47c 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 45b of the head channel. The body 57 of the cord-guide unit 56 has six walls, viz., a bottom wall 57a which is against the bottom wall 45a of the head channel, side walls 57b and 57c which are against the side walls 45b and 45c of the head channel, an end wall 57d which extends across the end of the head channel, a top wall 57e which is spaced upwardly from the bottom wall 57a and a small vertical-wall 57f which depends from the top wall 57e and is laterally spaced from the end wall 57d as is best seen in FIG. 2. A sleevelike cylindrical roller 58 is on a horizontal shaft which extends between the side walls 57b and 57c. Sleevelike cylindrical rollers 59 and 60 are on vertical shafts
which extend between the bottom wall 57a and the top wall 57e. A nonrotating cylindrical guide 61 is on a horizontal rivet which extends between the end wall 58d and the small vertical wall 57f. 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 47d 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 57a of the cord-guide unit and thence through the bottom 45a of the head channel. The eyelet 67, however, is a long tubular eyelet which also passes through the top wall 57e.

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 68a, a front horizontal-run 68b within the head channel 45, a rear horizontal run 68c within the head channel 45, and another vertical run 68d. Between the vertical run 68a and the front horizontal run 68b the tilt cord is guided through two 90° turns by guide 61 and roller 59. Between the front and rear horizontal-runs 68b and 68c 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 45a of the head channel and is rotatable on a fixedly-positioned vertical axis. Between the rear horizontal-run 68c and the vertical run 68d the tilt cord is guided through two 90° turns by roller 60 and guide 61.

Affixed to the front horizontal run 68b 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 68c, 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 42a and the rear sidepiece being designated 42b. The slots 41 rest on crosspieces or rungs 42c which extend between the side-pieces 42a and 42b. The sidepieces 42a and 42b of each ladder extend upwardly into the cord-guide unit 46 that is above the ladder. The front sidepiece 42a 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 42b 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 74a of the barb is tubular, and the right-hand half 74b is channel-shaped. The tubular half 74a is crimped around the end portion of the cordlike sidepiece 42a or 42b of the ladders and is also provided with a pair of sharp indentations as at 75c which augment the attachment of the barb to the sidepiece 42a or 42b. The upper ends of the ladder sidepieces 42a and 42b 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 42a of the ladders are connected to the front horizontal run 68b of the tilt cord, and the rear sidepieces 42b of the ladders are connected to the rear horizontal run 68c of the tilt cord, all as seen in FIGS. 1 and 2. When the tassel 69 is pulled downwardly the front horizontal-run 68b of the tilt cord is shifted to the right and the rear horizontal-run 68c is shifted to the left, whereby the front sidepieces 42a of the ladders are lowered and the rear sidepieces 42b 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 76a. The rear run 68c of the tilt cord is shown in place in the slot 76a, 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 68c. 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 win-
dow. As seen in FIG. 1, the left-hand end of the head
has a hole 45d 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 45e through which attaching screw may be in-
serted to attach the right-hand end of the head to the
lintel. The hole 45e extends through the bottom 45f of
the head channel and also through the bottom and top
walls 57a and 57e of the body 57 of the cord-guide
fitting 56.

In FIGS. 1 and 2 the framing and glazings of a dou-
ble-glazed window with which the blind may be com-
bined are indicated diagrammatically in dot-dash line.
The lintel of the framing is a channel 81 having its open
side directed downwardly, and the jams 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 45f and
45e, as has been explained. The window has inside and
outside glazings which are indicated diagrammatically,
the inside glazing being designated by 85 and the out-
side glazing being designated by 86. The anchor 80 for
the tilt cords, which has already been referred to, is at-
tached to the jambs 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 consist-
ing essentially of a sheet-metal head-channel and the
thereto-attached 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 as-
sembly (not shown) is suspended beneath a horizon-
tally 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 145a and side walls 145b
and 145c.

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 com-
mon 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
designated from FIGS. 2 and 3 to FIGS. 9 and 10 to
designate the same parts as regards the side-pieces of the
ladders. The heads proceed directly from the eyelets
48 and 50 to the eyelets 72 and 71. Reference charac-
ters 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 for-
mation being composed of a horizontal flange 156a and
a vertical flange 156b. The cord-guide unit 156 also in-
cudes a cylindrical boss 156c which projects to the
right from the vertical flange as viewed in FIGS. 9, 10,
and 12. The flanges 156a and 156b and the boss 156c
may be fabricated from sheet metal, may be diecast in
one piece of metal, or be molded in one piece of suita-
ble plastic. The cord-guide unit 156 also includes one
or more eyelets or tubular rivets 156d (one shown) by
which it is attached to the right-hand end of the head
channel 145, the flange 156a being beneath the head
channel and the attaching eyelets or rivets passing
through the flange 156c and the bottom wall 145a of
the head channel.

The vertical flange 156b extends upwardly and
downwardly from the horizontal flange 156a, 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 156b and thence longitudi-

nal through the boss 156c, 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 156b; 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 156c and 156f. At a somewhat higher level there is a guideway passage 156g. As these three guideway passages proceed toward the free end of the boss 156c, 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 156h which leads from the free end of the boss 156c and extends longitudinally through the boss and thence through the vertical flange 156b. The bore 156h is counterbored at 156i, the counterbore extending through the vertical flange 156h and for a distance into the boss 156c.

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 cramped 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 168b and the rear horizontal run being designated by 168c. By virtue of the tilt-cord element 168' the tilt cord 168, in the front and rear horizontal runs 168b and 168c, is a double cord with side-by-side cord-branches.

The eyelets 71 and 72, at which the upper ends of the ladder sidepieces 42a and 42b are connected to the horizontal runs of the tilt cord, are cramped about the side-by-side cord-branches of the double cord in the front and rear horizontal runs 168b and 168c. 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 168c are shown in place in the two diametrically disposed slots 76a in the sleeve 76. Between the two slots 76a each of the two branches of the rear horizontal run 168c is shown passing in a semicircle around the tubular portion of the eyelet, 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 cramped about the two side-by-side cord-branches, one-half of the periphery being cramped about one of the side-by-side cord-branches and the other half of the periphery being cramped about the other of the side-by-side cord-branches; see FIG. 14 which shows a cramped 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 169a that is movable along the longitudinal slot 145f in the bottom of the head channel. Suitable clamping means, which is operable from beneath the head channel, serves to clamp the shaft 169a in adjusted position along the slot 145f. The clamping means shown includes a clamping screw 169b which passes through the slot 145f and is threaded into an axial bore in the shaft 169a. Upon being tightened, the screw 169b pulls the lower end of the shaft 169a tightly against the bottom of the head channel, thereby clamping the shaft in adjusted position along the slot 145f. The screw 169b may be kept centered with respect to the width of the slot 145f by means of an interposed washer 169c that is provided with a rectangular protuberance 169d which fits into the slot 145f and has a height somewhat less than the thickness of the bottom wall 145c of the head channel.

From the pulley 169 the front and rear horizontal runs 168b and 168c 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 168b extends through the guideway passage 156f (FIGS. 11 and 17) and hangs down from the free end of the cylindrical boss 156c for a short distance as shown in FIGS. 9, 10 and 17. The rear horizontal run 168c of the tilt cord extends similarly to the right-hand end of the head, where it extends through the guideway passage 156f (FIGS. 11 and 17) and hangs down from the free end of the cylindrical boss 156c 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 156f (FIGS. 11 and 17) in the boss 156c, 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 178a (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 178a 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 88a which is vertically movable beneath the boss 156c. Either before or after the bight 178a is formed, the two lift cords 178 are passed under the pulley 88 as shown; then the bight 178a is passed back Warder than the boss 156c, being inserted through bore 156b (FIGS. 17 and 12) and thence through the counterbore 156i. A two-legged equalizer 89 is passed between the two lift cords 178 and placed astride of the bight 178a as indicated in FIG. 16. Then the two lift cords 178 are pulled through the bore 156b, whereupon the equalizer 89 nests in the counterbore 156i and the bight-adjacent ends of the two lift cords 178a are anchored to the head-bar-attached fitting 156. A cord 178b, which is part of the lift-cord means, is attached as shown to the pulley frame 88a and extends downwardly therefrom. When the cord 178b 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 178b 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 131a of the channel-formation of each jamb channel 131 is toward 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 131d has been provided through the bottom wall 131a of the channel-formation of the jamb channel. The boss 156c which projects from one end of the head channel 145, the right-hand end in FIGS. 9 and 10, makes a sliding fit within the hole 131d 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 145d (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 92 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 91a and 91b 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 91a as the slot stands in FIG. 19 the cord 168'' is wound one or two convolutions about the spool member 91, proceeding counterclockwise as indicated by the arrow 91c. From the upper end of slot 91b the cord is wound one or two convolutions about the spool member 91, proceeding counterclockwise as indicated by the arrow 91d. When the slats of the blind are unlit 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 94a 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 91e 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 91e and 91f 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 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 unlabeled 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 178b is reeled in or payed out by the tilt-cord spool-member 92 which is part of the shaft 93. Full tilting of the slats is effected by a relatively small amount of rotational 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 178b 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-cord 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 95a and 96a that are provided by the discs 95 and 96. Adjacent the cheek surface 95a the spool member 92 has a diame-trical hole 92a (FIG. 26) which has counterbores 92b and 92c 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-portions of the cord 178b through the hole 92a and then providing the cord with an end knot 178d as indicated in FIG. 22. In attaching the cord 178b to the spool member 92 it may be passed in either direction through the hole 92a. Upon the cord being knotted and then retracted as indicated by the arrow 178e in FIG. 22, the knot 178d will enter one or the other of the counterbores 92b and 92c (FIG. 26). Withdrawal of the cord from the hole 92a is prevented by the knot 178d engaging the bottom of the counter bore 92b or 92c (see FIG. 17).

As the cord 178b is wound on the spool member 92 it can be expected to move closely adjacent to cheek surface 95a at some times and closely adjacent to cheek surface 96a at other times. These cheek surfaces are provided with hemispherical projections 95b and 96b which, when the cord 178b 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 95b; note the phantom showing of cord 178b 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 131b 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 100a which projects through a circular hole 131g that has been provided previously through the front wall 131b of the jamb channel 131. The bearing block 100 is attached to the front wall 131b 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 100a, 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 friction 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 extent 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 110b 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 103a and 110a 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 131g 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 131g is made at a lower level in the front wall 131 of the right-hand jamb-channel of the window framing; and companion holes 131e and 131f are made to receive the screws 101 and 102 (FIG. 17). If the screws aren't to be self-tapping, the holes 131e and 131f will be tapped. Near the top end of the jamb channel the hole 131d (FIG. 17) is made in the bottom wall 131a of the channel formation. The hole 131d is so spaced from the lintel 130 that, when it receives the boss 156c 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 145d (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 131d (FIG. 17, top) and allowed to hang down within the channel 131 as indicated in phantom lines in FIG. 20. The boss 156c, which projects from the right-hand end of the head channel 145 of the blind, is telescoped into the hole 131d; and the left-hand end of the head channel 145 is attached to the lintel by a screw inserted through hole 145d (FIG. 10, left) as has been explained. If desired a small block or bracket can be placed 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 145d should loosen.

With the aid of a wire hook the depending cords 168' and 178b are pulled through the hole 131g 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 169b (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 131d near the top of the jamb channel or after the cord 168' has been brought out through the lower-level hole 131g, 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 91a and 91b 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 unsplittable 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 178b 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 131g 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 131b 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 169b (FIG. 10) to the left, and with it pulley 169 to the left, and then tightening the screw 169b. 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 410a 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 178b of the lift-cord means. These
limitations are overcome in the cord-operating unit 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 500a is much longer than the boss 100a (FIG. 17); and the boss 500a 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 500b that is secured against the front face of the jambock by screws inserted through holes 500c and 500d; 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 500a. 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 500a. Against the front face of the bearing block 500b 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 178b 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 500a. 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 503a. The hub 510b 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 510a.

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 190/191 in Sweets Architectural 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 631a, a channel 631b, and a channel 631c which are directed away from the space between the glazings, the walls 631b and 631c 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 156c extending through the upper level hole 131d in the bottom wall 631a 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
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 145a, a front wall that is designated by 145b and a rear wall that is designated by 145c. 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 88a, and the cord that is designated by 178b.

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 256a, a front wall 256b, and a rear wall 256c. The bottom wall 256e of the cord-guide unit is against the bottom wall 145a of the head channel and is secured thereto by an eyelet 256d. At its right-hand end, the bottom wall 256a 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 256b and 256c of the cord-guide unit.

The cord-guide unit 256 has a stamped sheet-steel cover-member 256e which is horizontally disposed at a level adjacent to the upper edges of the front and rear walls 256b and 256c. This cover member is mounted and secured as shown in FIG. 34; rivetlike posts 256e and 256f pass through the cover plate 256e and the bottom wall 256a, and have annular shoulders against the cover member 256e and the bottom wall 256a. The ends of the posts 256f and 256g are swaged into holding engagement with the cover plate 256e and the bottom wall 256a; and the bottom wall 256a 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 chaffing of the two lift cords 278 by the left-hand and right-hand edges of the cover member 256e, the edge portions of the cover member are bent upwardly somewhat as seen at 256j and 256k, the bent-up portions spacing the space between the front and rear walls 256b and 256c of the cord-guide unit. A central hole 256m in the cover member 256e permits the insertion of an eyelet-setting tool when setting the eyelet 256d to secure the cord-guide unit to the head channel.

Longitudinally of the head channel 145, the front and rear walls 256b and 256c 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 256b and 256c and positioned beyond the end of the head channel 145, there is an axle 256n. The ends of the axle are affixed to the walls 256b and 256c. Rotatably mounted on the axle there are cylindrical sleeves 256p and 256r and an intervening washer 256q. The two lift cords 278 extend under the cover member 256e between the posts 256f and 256g; they then pass over the rotatable sleeve 256r, 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 256p and then the ends of the two lift cords be fastened together as by a metal fastener 278'. As the cord 178b 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 178b, the same as with the two lift cords 178 in FIGS. 12 and 17.

The front horizontal run 168b of the tilt cord passes between the front wall 256b of the cord-guide unit and the post 256f (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 168c of the tilt cord passes between the rear wall 256c of the cord-guide unit and the post 256g, 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 substitutted 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 131d (FIGS. 30 and 17) which receives the circular boss 156c (FIGS. 9, 12, 17, and 30), the bottom wall 631a of the channel formation of the jamb channel is provided with an upper level rectangular hole 131d' 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 256d 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
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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 256d 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 145d (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 journaled 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 ob-
viates 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 chan-
nel, 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 im-
provement additionally comprises:
the two spool members are insertable through a hole
in the front wall of the framing channel that ex-
tends along a vertical edge of the space between
the glazings,
and the shaft is journalled in a block which is at-
tached to the front wall of such framing channel.
10. A Venetian blind having a ladder-and-slat as-
sembly suspended beneath a support, having the lad-
ers connected to a horizontal tilt cord which is shifted
lengthwise of itself to tilt the slats, and having tilt-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 in-
dividual 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 com-
prises:
the tilt-cord and lift-cord spool-members being in
non-slip relationship to the tilt and lift cords,
the common operator being in continuous torque-
impacting relationship to both of the spool mem-
bers,
a friction drive being operatively interposed be-
tween 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 inter-
posed 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 operat-
ing-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-impacting
relationship to the tilt-cord spool-member for
tilting the slats of the blind,
and the shaft also being in continuous torque-im-
parting 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 com-
prising: tilt-cord and lift-cord spool-members,
a shaft for rotating these two spool-members,
the shaft being in continuous torque-impacting
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 sur-
face and thereby inhibit the cord from piling up
against the cheek surface.
17. A Venetian blind having an operating unit com-
prising:
tilt-cord and lift-cord spool-members,
a shaft for rotating these two spool-members,
the shaft being in continuous torque-impacting
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 sur-
face and thereby inhibit the cord from piling up
against the cheek surface.
18. A Venetian blind having an operating unit com-
prising: tilt-cord and lift-cord spool-members,
a shaft for rotating these two spool-members, the
shaft being in continuous torque-impacting rela-
tionship to each of these spool members,
a bearing block in which the shaft is journalled,
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27. said bearing block being adapted to be mounted on framing of, or associated with, the window at which the Venetian blind is mounted,

28. a tilt-cord spool-member, a shaft for rotating the tilt-cord spool-member, the shaft being in continuous torque-impacting relationship to such spool-member,
a bearing block in which the shaft is journaled, said bearing block being adapted to be mounted on framing of, or associated with, the window at which the Venetian blind is mounted,
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.

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-impacting relationship to each of these spool members,
a bearing block in which the shaft is journaled, 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-impacting 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 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:

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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