

March 6, 1973

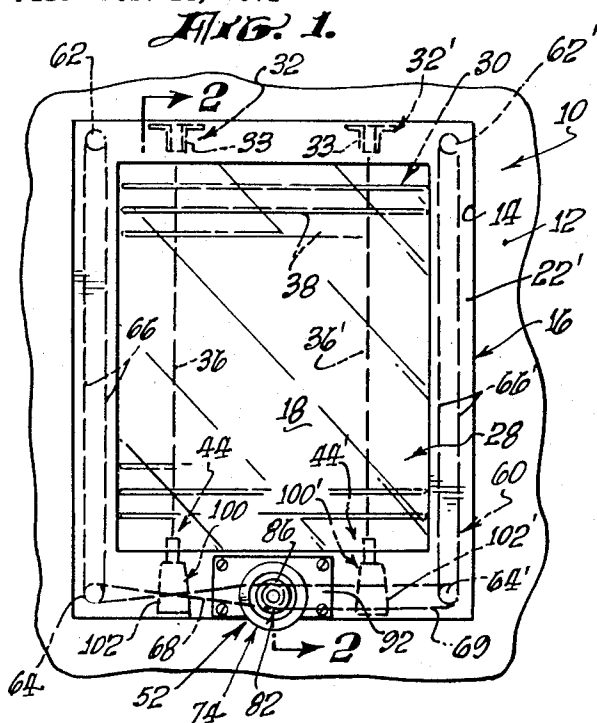
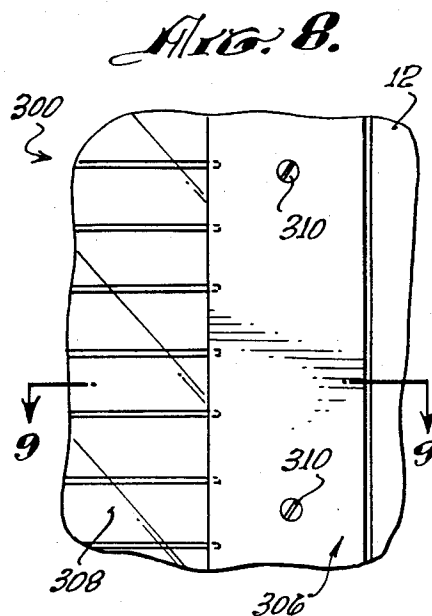
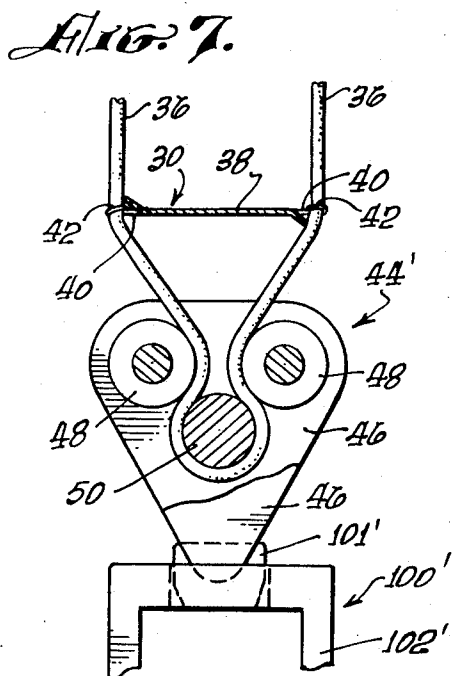
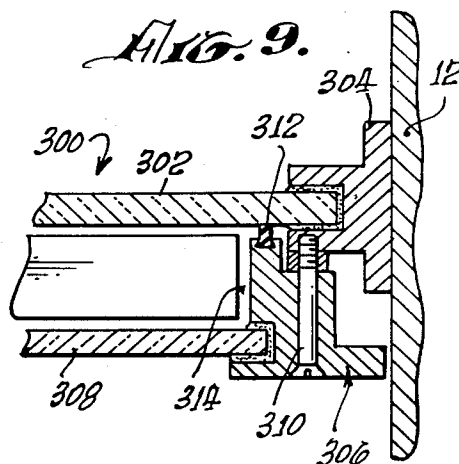
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VENETIAN BLIND WINDOW ASSEMBLY

Filed Feb. 11, 1971

6 Sheets-Sheet 1



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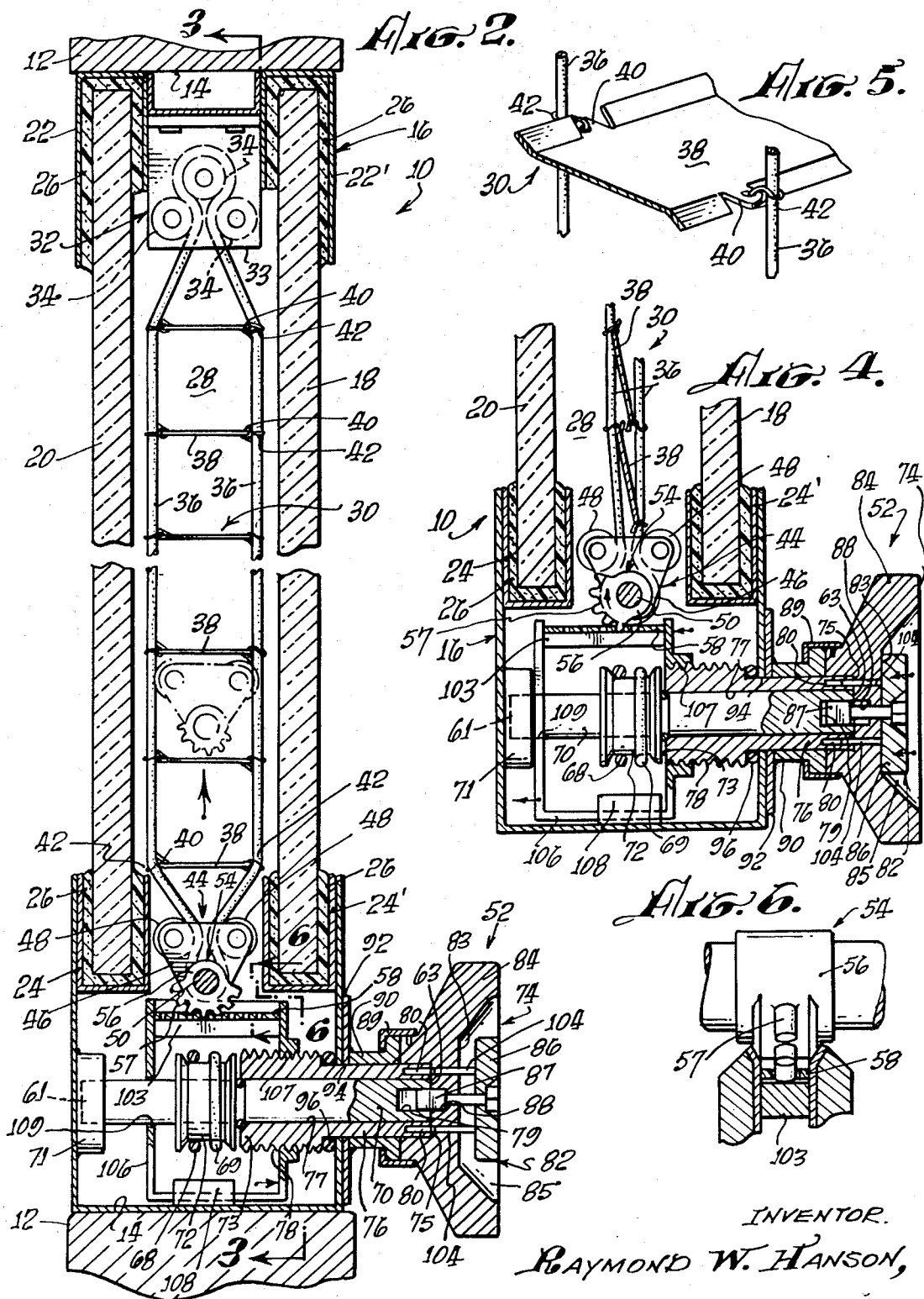
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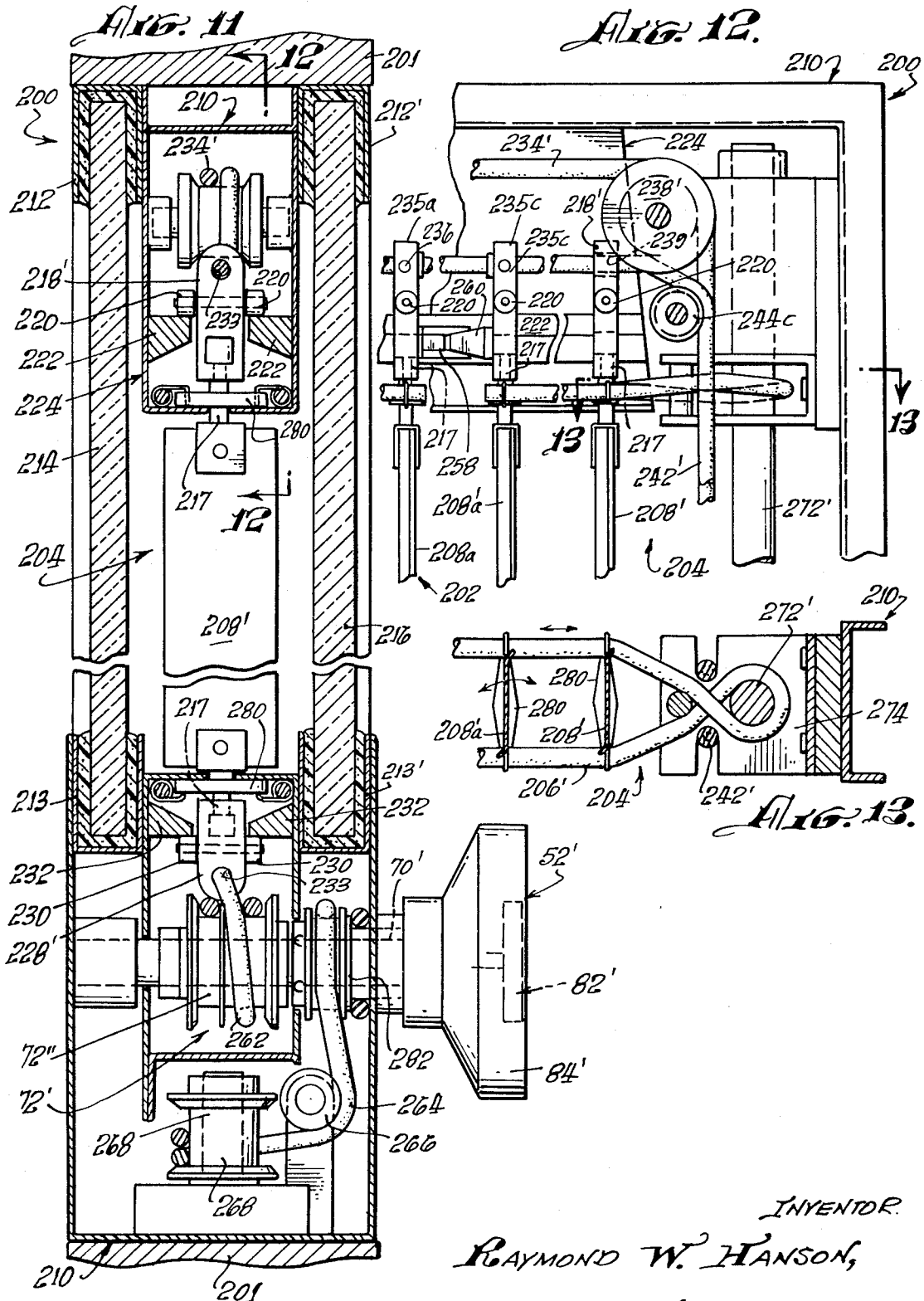
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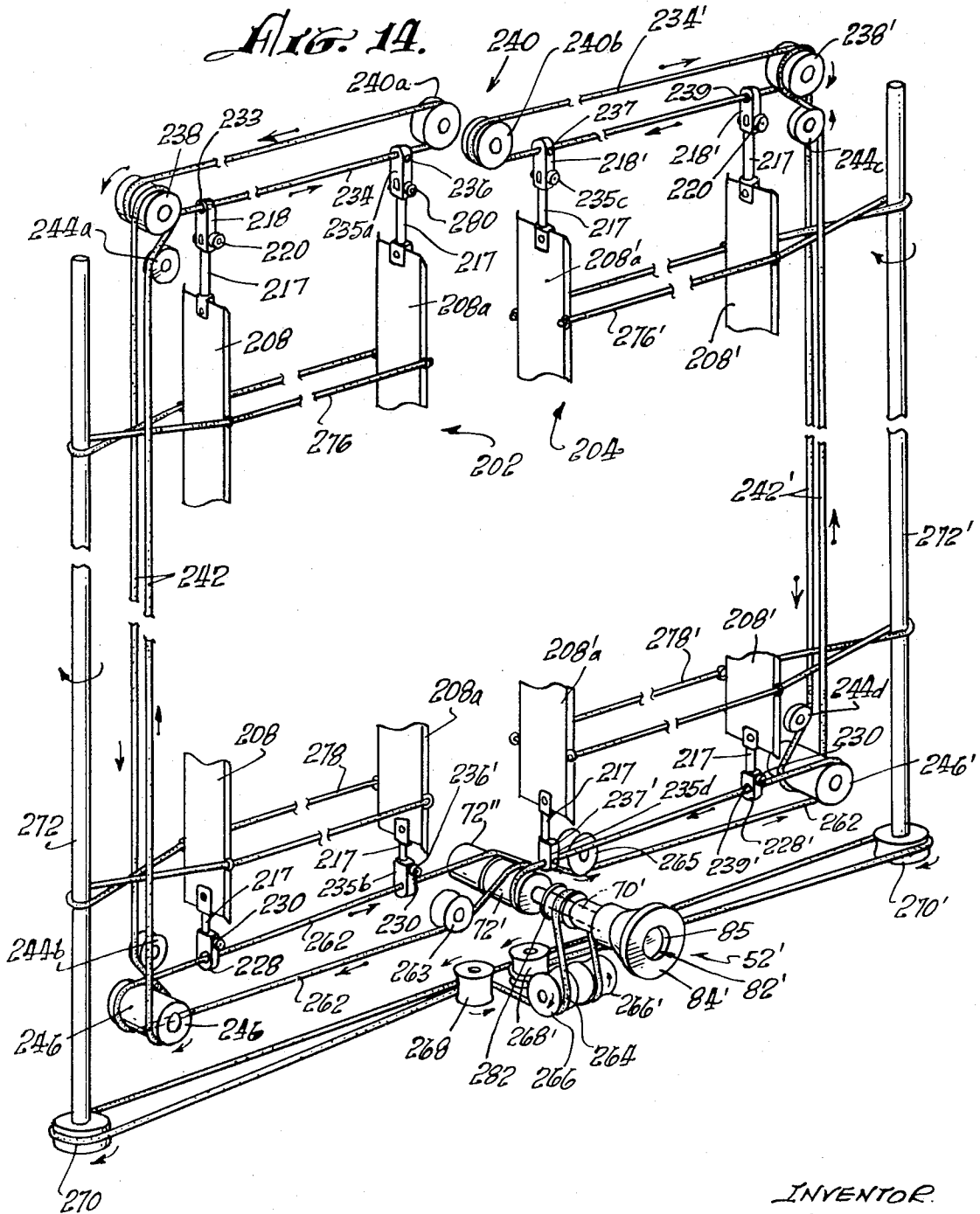
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VENETIAN BLIND WINDOW ASSEMBLY

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VENETIAN BLIND WINDOW ASSEMBLY
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5 Claims

ABSTRACT OF THE DISCLOSURE

Separate rotary means are provided for operating a cord which adjusts the effective size of a Venetian blind and the cord which tilts the slats, respectively. An adjustable coupling acts to connect a rotary manual or power drive to one or the other of the rotary means. In a preferred form, the Venetian blind is housed in a closed space provided by parallel window panes, the drive being accessible outside of the space and controlling the Venetian blind while the window panes remain in situ supported by a suitable frame. In one form of the invention the slats are horizontal, and in another form of the invention the blind is arranged in two sets of vertical slats movable toward or away from each other as well as being tiltable. Provision is also made for housing the blind in a space which consists in part an existing window pane and in part another window pane carried by a supplementary frame member which has means for sealing that frame member against the existing window pane, that frame member also carrying fastening means, such as a bolt, for securing the supplementary frame member to the frame member for the existing window pane.

BACKGROUND OF THE INVENTION

(1) Field of the invention

This invention relates, generally, to a Venetian blind window assembly and, more particularly, to a Venetian blind window assembly having an operating connection positioned outside of the window frame structure for adjusting the Venetian blind assembly.

(2) Description of the prior art

As is well known in the art, various problems and difficulties are encountered in providing a proper light control through windows, particularly with regard to very large windows used in tall building structures. The windows of this type, generally, have a dual window pane structure with a light control unit, such as a Venetian blind disposed therebetween. Therefore, adjusting the Venetian blinds becomes a major problem. The window, as described above, is generally rotatably supported about an axis, either vertically or horizontally, allowing the window to rotate for cleaning and access to the Venetian blind controls. These controls are the usual cord-adjustable type found on the average Venetian blind unit and are found enclosed within the frame structure of the window. It can be understood that, each time the blind is required to be adjusted, it is necessary to unlock and rotate each window to an open position before the adjustment can be made. Not only is this time consuming, but generally requires a particular individual to operate it. In addition, if during such operation the weather is inclement, other problems are added to complicate the adjusting

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operation. As to the window itself, the space between each pane is not adapted to be sealed from adverse conditions, causing dirt and other foreign materials to enter the space therebetween and, thereby, necessitating frequent cleaning thereof. The prior art includes various patents having a single control knob for both raising or lowering the blind and tilting the slats. In the known devices the tilting device depends on the means which raises or lowers the slats; and in some cases the slats are allowed to fall by gravity.

SUMMARY OF THE INVENTION

The present invention comprises each of the following, separately or in combination: rotary means for operating a cord which positively expands or contracts the Venetian blind as a whole to adjust its effective size, rotary means for operating the cord which tilts the slats, and an adjustable coupling for connecting a rotary manual or power drive to a selected one of the rotary means.

The present invention also comprises a Venetian blind window assembly having a plurality of parallel panes of transparent material, such as glass and the like, supported within window frame structures, some of which are arranged to rotate about an axis, either vertically or horizontally. However, with the present invention, this is no longer necessary. Each window pane is secured within the frame and fixed in a spaced relationship with each other, thereby defining a space wherein a Venetian blind assembly is operably disposed and generally sealed therein. There is provided an operating connection for internally adjusting the Venetian blind assembly and the individual slats thereof, from which it extends outside the fixed space between the panes and is operably attached to the frame structure of the window. This, then, allows the Venetian blinds to be sealed within the space or chamber, if required. The operating connection includes means for selectively controlling the slats of the blind from an open position to transmit light to a closed position, in either direction, as typical with Venetian blinds. This is accomplished by a cord and pulley arrangement attached to each individual slat along the length of the cord, which is operably connected to the operating means. There is provided within the operating means a pin and socket arrangement for selecting the movement of the slats, as described above, or movement of the entire Venetian blind assembly to a raised position, leaving a greater portion of the window without an obstruction. The folding of the Venetian blind assembly is also accomplished by a cord and pulley arrangement operably connected to the operating means.

The invention also comprises means for adapting an existing window pane to provide an enclosed space for a Venetian blind, preferably for the blind of this invention.

One embodiment is related to a Venetian blind window assembly having a Venetian blind assembly arranged with its slats in a horizontal parallel position and another embodiment of the invention illustrates the Venetian blind having vertically arranged parallel slats.

The present invention has for an important object a provision wherein a Venetian blind assembly is disposed within a window structure and can be operated without the movement of the window structure.

It is another object of the invention to provide a Venetian blind assembly disposed within the space or chamber

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between window panes of a window assembly and being positioned and operable outside of said space.

It is further another object of the invention to provide a Venetian blind window wherein the Venetian blind assembly may be operably sealed therein.

It is a further object of the invention to provide Venetian blind window wherein the slats disposed within the space therein may be selectively positioned by a single control outside of the space.

A still further object of the invention is to provide a Venetian blind window having an operating connection to raise or lower the Venetian blind assembly therein, while the window panes remain in situs in the frame structure in fixed spaced relation.

It is another object of the invention to provide a device of this character having an operating connection being operable to either raise or lower, or angularly adjust, the parallel strips to control the light opening through the Venetian blind assembly.

It is still another object of the invention to provide a device of this character having a relatively long working life and easy to service and maintain.

The characteristics and advantages of the invention are further sufficiently referred to in connection with the accompanying drawings, which represent different embodiments. After considering these examples, skilled persons will understand that variations may be made without departing from the principles disclosed and I contemplate the employment of any structures, arrangements or modes of operation that are properly within the scope of the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring, more particularly, to the accompanying drawings, which are for illustrative purposes only:

FIG. 1 is an elevational view showing one embodiment of the invention installed within a wall structure.

FIG. 2 is an enlarged sectional view taken on line 2—2 of FIG. 1.

FIG. 3 is a sectional view taken, substantially, on line 3—3 of FIG. 2.

FIG. 4 is a fragmentary section similar to the lower portion of FIG. 2 but showing parts thereof in alternate operating position.

FIG. 5 is a fragmentary perspective view of a slat and cord connection.

FIG. 6 is a fragmentary sectional view taken on line 6—6 of FIG. 2.

FIG. 7 is a fragmentary sectional view taken on line 7—7 of FIG. 3.

FIG. 8 is a fragmentary elevational view of another embodiment of the invention.

FIG. 9 is a sectional view taken on line 9—9 of FIG. 8 thereof.

FIG. 10 is a partly schematic view of another embodiment of the invention showing the slats in a vertical position within the window structure.

FIG. 11 is an enlarged sectional view taken, substantially, on line 11—11 of FIG. 10.

FIG. 12 is a partial sectional view taken on line 12—12 of FIG. 11 thereof.

FIG. 13 is a sectional view taken, substantially, on line 13—13 of FIG. 12 thereof.

FIG. 14 is a perspective view of one form of cord drive for the Venetian blind with vertical slats shown in FIGS. 10 to 13.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring, more particularly, to FIG. 1, there is shown a Venetian blind window assembly, generally indicated at 10, and disposed within a wall structure 12. The wall structure 12 may be a portion of a building, airplane, or any such structure which requires a window of this type. However, for a more clear understanding of the invention, the wall structure will be understood to be a portion

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of a building. Mounting of the window assembly into the wall opening 14 may be accomplished in any conventional manner, such as screws, bolts, cement, or the like.

Essentially, the Venetian blind window assembly 10 comprises a frame structure 16, having a substantially rectangular configuration, which is adapted to receive parallel spaced-apart glass panels or panes of transparent material, such as a normal window pane, indicated at 18 and 20, respectively. Each of the glass panels or panes is secured and retained in channel-like members 22, 22' and 24, 24', respectively. These channel members form part of the frame structure 16. To secure and seal the panes within the channels a conventional-type glaze and cement, or plastic material, 26 may be used, as shown in FIG. 2. Thus, a sealed chamber 28 is defined between the spaced glass panels, whereby air can be purged, causing a vacuum condition within the chamber to occur. In addition, an inert gas may be injected within the chamber 28 to preserve the interior thereof from deterioration, dirt and the like, thereby eliminating the need to clean the inner faces of each pane of glass.

A Venetian blind shutter assembly, generally indicated at 30, is interposed between said panes and suspended from the upper part of the frame member 16 within the chamber 28 by means of bracket assemblies 32, 32', as clearly illustrated in FIGS. 2 and 3. Each bracket like 32 comprises a pair of L-shaped members 33, oppositely disposed and spaced apart to receive a plurality of rollers 34 which are rotatably mounted therebetween. Suspended from brackets 32, 32' are endless adjustable cords 36, 36' which are threaded through and round the rollers like 34.

Pivotaly mounted to cords 36, 36' are light rectangular strips or slats 38 which are horizontally disposed therebetween and positioned in equally-spaced, parallel relationship with each other, as typical in most Venetian blind assemblies. The pivotal connection of the cord 36 and slat 38 is more clearly illustrated in FIG. 5 as having tabs 40, through which wire loops 42 loosely pass therethrough by means of an opening in the tab. The wire 42 is fixedly secured to the adjacent portion of the cord 36, thereby allowing the slats to tilt or pivot with respect to the longitudinal axis of the slat due to the opposite movement of the endless cords.

As shown in FIG. 7, the lower end of the cord 36 passes through a pulley assembly, indicated generally at 44, having a pair of vertical parallel plates 46 and rollers 48, which are rotatably supported therebetween. Movably supported by the lower ends of the plates 46 is an elongated shaft 50 adapted to rotate about its axis while being supported therein. As the endless cord 36 passes around the rollers 48, it positively engages the shaft 50 for movement therewith. As indicated in FIG. 3, cord 36' has a similar pulley assembly 44'.

As shown in FIGS. 2, 4 and 6, an operating connection or drive, indicated generally by reference character 52, is operably connected to the shaft 50 by a segmented gear arrangement 54. The gear arrangement 54 has a collar or sleeve 56 secured to the shaft and provided with integrally formed teeth 57 for engaging directly with a rack 58, shown as a plate having apertures therein to accommodate the teeth. When the shaft 50 is rotated in either direction, the endless cord 36 will thereby traverse in the direction with the shaft, causing one portion of the cord to move downwardly and the other portion to move upwardly, thereby forcing the slats connected thereto to tilt, FIG. 4 showing the slats folded in closed position.

FIGS. 2 and 4 show the operating connection 52 in different operating positions, each position effecting a different operating adjustment to the Venetian blind assembly within the window assembly structure. The operating connection 52 is centrally located at the bottom of the frame structure 16 of the window assembly 10 outside of the chamber between the window panes 18 and 20 and communicates with the interior of that chamber for complete adjustment of the Venetian blind assembly 30 therein.

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The Venetian blind assembly is also provided with an additional means for adjusting the Venetian blind assembly 30 to a raised or lowered position whereby, when desired, the blinds may be retracted upwardly (as indicated in phantom lines in FIG. 2), to reduce the obstruction to the effective window opening. This second adjusting means comprises a cord and pulley system, generally indicated at 60 in FIGS. 1 and 3.

System 60 comprises a series of pulleys 62, 62' which are attached in the opposite upper corners of the frame 16 and pulleys 64, 64', similarly attached in the lower corners thereof. The endless cord 66 extends vertically downwardly from the upper pulley 62 to the lower pulley 64 and cord 66' extends from upper pulley 62' to lower pulley 64', on each side of the frame 16, as shown particularly in FIG. 3. To impart movement to the cords 66, 66', an additional set of cords 68 and 69, respectively, are entrained about the lower pulleys 64 and 64', respectively, and extend horizontally to an operable engagement with the centrally-located operating connection 52. A more detailed description of both adjusting means and operating connections will hereinafter be described.

The operating connection, as shown in FIGS. 2 and 4, comprises a main rotating shaft 70 having its inner end 61 thereof journaled in a stationary bearing 71 which is fixedly secured to the inside of the frame structure 16, and the opposite outer free end 63 of the shaft 70 terminates outside of the sealed chamber 28. Positioned intermediate the sides of the frame 16 and within the chamber 28 is a drum member 72 fixedly mounted to shaft 70 for rotation therewith. The drum 72 operably engages the cords 68 and 69 for transverse movement of the cords. Rotatable movement of the drum member 72 is imparted thereto by a means for controlling the operating connection, indicated generally at 74.

A hollow shaft 76 is superposed over the outer free end of the shaft 70. That is, the shaft 76 is provided with a longitudinal bore 77 which receives said shaft 70. The inner end 73 of the shaft 76 is arranged with a worm gear or threads 78 located within the chamber area 28 and adjacent the drum 72. The opposite outer free end 75 of shaft 76 terminates in the same plane as the free end 63 of the shaft 70. To prevent leakage of any gas or vacuum between the sealed chamber 28 and the atmosphere, an O-ring seal 96 is provided and arranged on the shaft 70, as described later. Shaft 70 has an axially-aligned cavity 79 located at its free end, said cavity being substantially square in cross section. The free end of the hollow shaft 76 has longitudinal bores 80. The cavity 79 and bores 80 are adapted to receive a coupling device 82 positioned to be axially aligned therewith.

Coupling device 82 is slidably supported within a handle or knob 84 having a recess area 85 to accommodate the button member 86 of said device. Centrally positioned and fixed to said button is a key 87 having the same configuration as that of the cavity 79, whereby said key slidably fits therein. To rotate shaft 70, the key 87 is moved to the position in FIG. 2 by pulling the button 86 outwardly. In doing so, the key 87 engages or overlaps both the cavity 79 and a matching cavity 88 in the knob 84, making a positive rotative connection therebetween.

Knob 84 is rotatably attached by means of a collar 89 to a flanged lug 90, which is fixedly secured to a cover plate 92 mounted on the frame 16 and covering an aperture 94 through which the operating connection extends. Aperture 94 is sealed by O-ring 96.

The knob or handle 84 may be rotated to either raise or lower the Venetian blind or to adjust the tilt of the slats as desired, depending upon the adjusted position of the coupling device 82.

One position of the coupling device 82, as shown in FIG. 2, allows for the adjustment of the Venetian blind assembly to be raised or lowered within the chamber 28, without tilting the slats. As the knob 84 is rotated in a clockwise direction, shaft 70 also rotates thus, causing

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transverse movement of cords 68 and 69 which engage the drum 72. Counterclockwise rotation is then imparted to pulley 64 and clockwise rotation to pulley 64' to lift the portions of cords 66 and 66', attached at their lower ends to magnetic holding blocks 98, 98', respectively, as illustrated in FIG. 3. The blocks 98, 98' rotatably support the outer ends of the shaft 50 by which the Venetian blind assembly 30 is raised or lowered, as required. In order to properly seat the lower portion of assembly 30 when lowered to the extreme position, there is provided holding means 100, comprising a magnet 101 mounted on pulley assembly 44, and holding means 100', comprising a magnet 101' mounted on pulley assembly 44' which releasably engage magnetic pedestals 102 and 102', respectively. In addition, a magnet 103 is provided within the operating connection 52 to provide a hold-down means for the magnetic teeth 57 of the gear arrangement 54, as seen in FIGS. 2, 4 and 6. While the strength of all magnets described is sufficient for their purposes, the magnetic attraction is readily overcome by the means for raising or tilting the Venetian blind.

FIG. 4 shows the operating position of the coupling device 82 for controlling the relative position of the slats 38, with the button 86 pushed inwardly against the face 83 of the recess area 85, the key 87 being disengaged from the cavity 88 of the knob 84. When button 86 is pushed inwardly, a pair of pins 104, which are an integral part of the button 86, slide into positive connection with the bores 80 of the hollow shaft 76. Since the key member 87 is rotatably mounted to the button 86 and is not fixed to said knob for rotation therewith, shaft 70 will not turn. However, the positive connection between button 86 and hollow shaft 76 provides the necessary means for shaft 76 to rotate. Thus, when the knob 84 is rotated in either direction the slats 38 are also caused to be tilted to any desired position, or closed as shown in FIG. 4. As the shaft 76 is rotated, a carriage member 106 is slidably moved along the axis of shafts 70 and 76 by means of a threaded opening 107 which is adapted to receive worm gear 78 of the shaft 76. The carriage 106 is slidably mounted in a bracket 108 which is fixed to the lower portion of frame 16. To further support the carriage for longitudinal movement, an aperture 109 in carriage 106 is provided to slidably engage shaft 70. Therefore, when the carriage 106 is moved by worm gear 78, the rack 58 which is supported by said carriage is also moved relative to the gear 54. The movement of gear 54 causes the rotation of shaft 50 which is operably connected to vertical cords 36, 36', as described above. One section of the cord travels upwardly while the other section travels downwardly and, since each is oppositely attached to slats 38, it will cause each slat to shift its position from wide open, as in FIG. 2, wherein light is transmitted, to a closed position as shown in FIG. 4, to prevent light from being transmitted through the window assembly, as well known.

In FIGS. 10 to 14 there is shown an alternative arrangement of the invention wherein the slats of the Venetian blind assembly are positioned in a vertical manner. While several cords are shown for opening or closing the right and left-hand sections of the slats, one endless cord may be used instead. A Venetian blind window assembly 200 is mounted within a wall structure 201, similar to window assembly 10. Enclosed within the window assembly 200 are oppositely-disposed Venetian blind assemblies 202 and 204, respectively, and indicated generally. Each assembly is adapted to be adjusted for folding or expanding in a horizontal direction, indicated by arrows 205 and 206. In addition, the slats 208 and 208' of assemblies 202 and 204, respectively, are rotatable about their vertical axes to control the light which transmits therethrough.

Window assembly 200 comprises a frame structure 210 having disposed in its channel members 212, 212', 213, 213' window panes 214 and 216, respectively, and are secured therein in a similar manner as that described in the first embodiment and as shown in FIGS. 1 to 7.

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The Venetian blind assemblies 202 and 204 are vertically suspended by means of roller carriages like 218' in FIG. 11 which are provided with rollers 220 for horizontal movement along support rails 222, said support rails being fixed to the inner structure 224 of the frame 210.

Each individual slat like 208' is journaled to the roller carriage 218' by means of a pin 217 fixedly attached to the slat. As shown in FIG. 11, the lower end of each slat is also journaled to a lower roller carriage 228' having rollers 230 and rail members 232. Similar rollers and rails are provided for the left-hand slat section 208.

Referring to FIG. 14, each of the carriages has an aperture like 233 to receive a cord. The left-hand section of slats in FIG. 14 includes a plurality of carriages like 218 which slidably receive the cord 234, the lower ends of those slats similarly each having a carriage like 228 having an aperture 233' to slidably receive the cord 262. Slat 208a of the left-hand section of slats 208 nearest the center has its carriage 235a fixed to cord 234 as indicated at 236. The lower end of slat 208a has its carriage 235b similarly fixed to cord 262 as indicated at 236'. Similarly, the slat 208'a nearest the center of the right-hand set of slats 208' has its carriage 235c fixed to cord 234' as indicated at 237 and its lower carriage 235d fixed to cord 262 as indicated at 237'. At the upper end of the remaining slats of the set 208', each slat has a carriage 218' having an aperture 239 to slidably receive cord 234', while their lower ends each have a carriage like 228' having an aperture like 239' to slidably receive the cord 262.

In FIGS. 11 and 14, the operating connection 52', the control knob 84', the coupling device 82', the drum 72' and the shaft 70' are similar to the items identified by corresponding numbers without primes as shown, for example, in FIGS. 2 and 4, the main difference being that whereas the form shown in FIGS. 2 and 4 has a worm gear 78 to operate the rack 58, in FIGS. 11 and 14 that is replaced by the drum 282 which operates cord 264 which passes over guide pulleys 268, 268' and around pulleys 270 and 270' to operate vertical shafts 272 and 272' to oscillate cords 276 and 278, also cords 276' and 278' to adjust the tilt of the slats. Shafts 272 and 272' are journaled in suitable bearings schematically indicated at 274 in FIG. 10. In FIGS. 11 and 14, shaft 70' carries a drum 72' and idler pulley 72''. Drums 72' and 282 are operated at certain times depending upon the operation of the coupling device 82', as explained in connection with FIGS. 2 and 4.

As shown in FIG. 14, cord 262 passes around drum 72' to be driven thereby, and under guide pulley 263, over pulley 246, over idler pulley 72'' on shaft 70', under guide pulley 265, over pulley 246' and back to drum 72'. Cord 262 thereby drives pulleys 246 and 246'. Pulley 246 drives cord 242 which passes around pulley 246, over guide pulley 244b, guide pulley 244a and around pulley 238. Cord 242' similarly passes over and is driven by pulley 246', over pulley 244d, pulley 244c and around pulley 238'. Cord 234, previously described, passes around and is driven by pulley 238 and passes over pulley 240a of the double pulley 240. Cord 234' similarly passes around and is driven by pulley 238' and passes over pulley 240b of double pulley 240. As the knob 84' is operated to operate drum 72', the pulleys 240a and 240b rotate in opposite directions to either close or open the blind sections.

When the blinds are adjusted to cover the window, as shown in FIGS. 10 and 12, a pair of magnets 258 and 260, respectively, may be employed and attached to carriage members 235a and 235c, respectively, to impositively hold the center carriages together with a force which is overcome when the knob 84' is operated to open the Venetian blind assemblies.

The vertical slats 208' are attached to cords 276' and 278' by arms 280, see FIGS. 11 and 13, said arms being fixedly secured to pins 217 as shown in FIG. 11. Since a pin like 217 with its arm like 280 is rigidly fixed to each

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end of each slat, rotation of the shaft 272 or 272' will, in turn, move cords 276, 276' and 278, 278' to tilt the slats about a vertical axis.

The cords and drive pulleys throughout the assembly may be magnetized to enhance attraction therebetween.

Although each embodiment is capable of manual operation, it should be understood that a power-operated means, such as motors and the like, may be used. Said means may be controlled electronically or electrically by heat or light sensing devices.

Referring now to FIGS. 8 and 9, there is shown a conventional window 300 adapted to be used with the present invention.

Window 300 comprises an existing pane of glass 302 mounted to an existing conventional frame 304 attached within the wall 12. A supplementary new frame 306 with a new pane of glass 308 is secured or bolted by a bolt 310 to the existing frame 304. Bolt 310 has a head 303 having a kerf 311. The frame member 206 has an aperture 301 in which the bolt 310 fits. Bolt 310 has a threaded end 305 which projects beyond the inner side of the frame member 306. The threaded end 305 has a nut 307 and engages in a threaded socket 309 in the existing frame member 304. There is provided a seal 312, located about and carried by the inner side of the frame 306, for sealing a chamber 314 into which Venetian blind assemblies of FIGS. 1 to 7 or FIGS. 10 to 14 may be operably disposed and actuated, as hereinbefore described.

The invention and its attendant advantages will be understood from the foregoing description and it will be apparent that various changes may be made in the form, construction and arrangement of the parts of the invention without departing from the spirit and scope thereof or sacrificing its material advantages, the arrangement hereinbefore described being merely by way of example, and I do not wish to be restricted to the specific form shown or uses mentioned, except as defined in the accompanying claims.

I claim:

1. A Venetian blind having slats, first cord means for stacking or unstacking said slats, first rotary means for operating said first cord means, second cord means for angularly adjusting said slats, second rotary means for operating said second cord means, a rotary drive, means for coupling said drive to a selected one of said first and second rotary means, said first and second rotary means comprising a first hollow shaft and a second concentric inner shaft, said coupling means comprising means for selectively coupling said rotary drive to either said first hollow shaft or said second inner shaft, said rotary drive comprising a handle, and a control member carried by said handle, said control member being movable to one position to couple said handle to said first hollow shaft and uncouple said handle from said second inner shaft, said control member being movable to another position to uncouple said handle from said first hollow shaft and couple said handle to said second inner shaft.

2. A Venetian blind according to claim 1, said second inner shaft being arranged to operate said first cord means for stacking or unstacking said slats, said first hollow shaft being arranged for operating said second cord means for angularly adjusting said slats.

3. A Venetian blind having slats, first cord means for stacking or unstacking said slats, first rotary means for operating said first cord means, second cord means for angularly adjusting said slats, second rotary means for operating said second cord means, a rotary drive, means for coupling said drive to a selected one of said first and second rotary means, said first and second rotary means comprising a first hollow shaft and a second concentric inner shaft, said coupling means comprising means for selectively coupling said rotary drive to either said first hollow shaft or said second inner shaft, a drum on said second inner shaft for operating said first cord means, and

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drum means associated with said first hollow shaft for operating said second cord means.

4. A Venetian blind according to claim 3, said slats constituting two vertical sets of slats arranged side-by-side, the slats of one set being movable toward and away from the slats of the other set to vary the central opening through said sets of slats, parallel panes of glass forming a sealed chamber in which said slats are arranged, said first and second rotary means being arranged in said chamber and said rotary drive being accessible at the exterior of said chamber.

5. A Venetian blind having slats, first cord means for stacking or unstacking said slats, first rotary means for operating said first cord means, second cord means for angularly adjusting said slats, second rotary means for operating said second cord means, a rotary drive, means for coupling said drive to a selected one of said first and second rotary means, said first and second rotary means comprising a first hollow shaft and a second concentric inner shaft, said coupling means comprising means for selectively coupling said rotary drive to either said first hollow shaft or said second inner shaft, a drum on said second inner shaft for said first cord means, said first hollow shaft having external threads, a rack having a nut

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operated by said external threads, a third shaft having a gear having teeth engageable with said rack, and pulley means operated by said third shaft for tilting said slats, said gear being engageable with and disengageable from said rack as said slats are raised or lowered.

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PETER M. CAUN, Primary Examiner

U.S. Cl. X.R.

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