

June 12, 1956

J. O. LEWIS
VENETIAN BLIND

2,749,976

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2 Sheets-Sheet 1

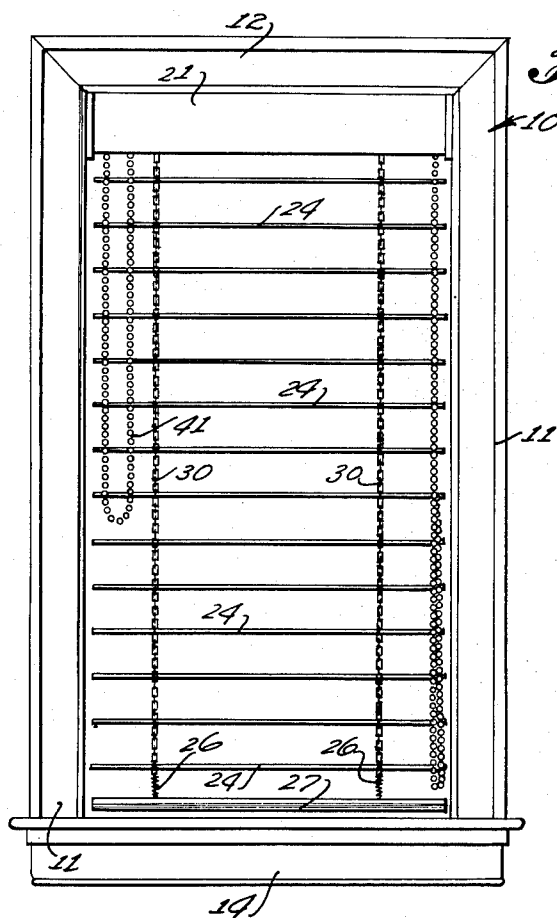


Fig. 1.

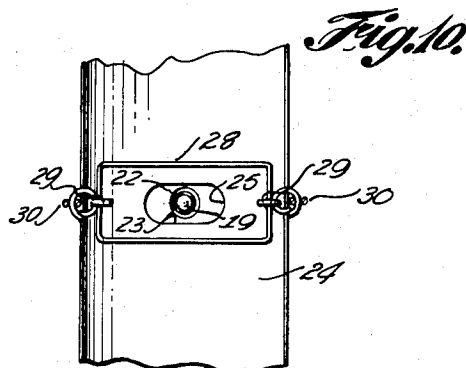


Fig. 10.

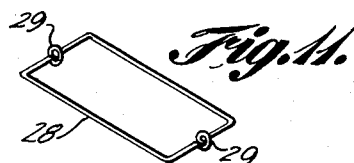


Fig. 11.

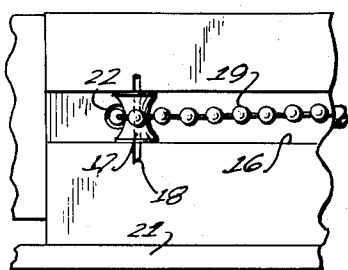
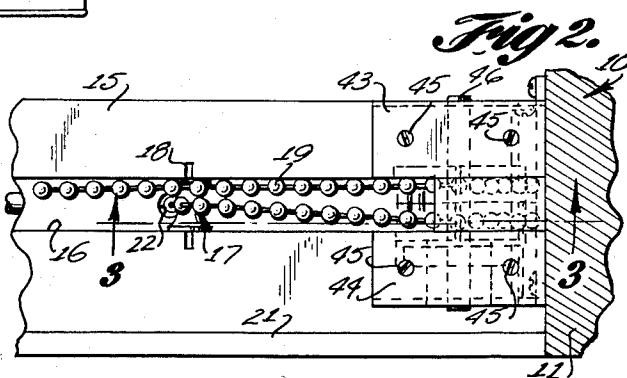


Fig. 2.

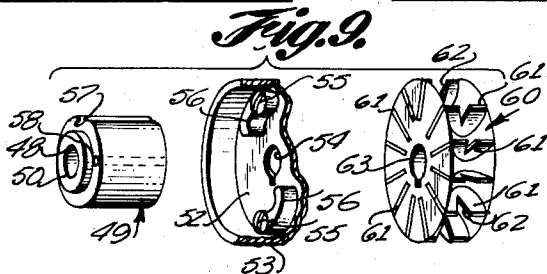


Fig. 9.

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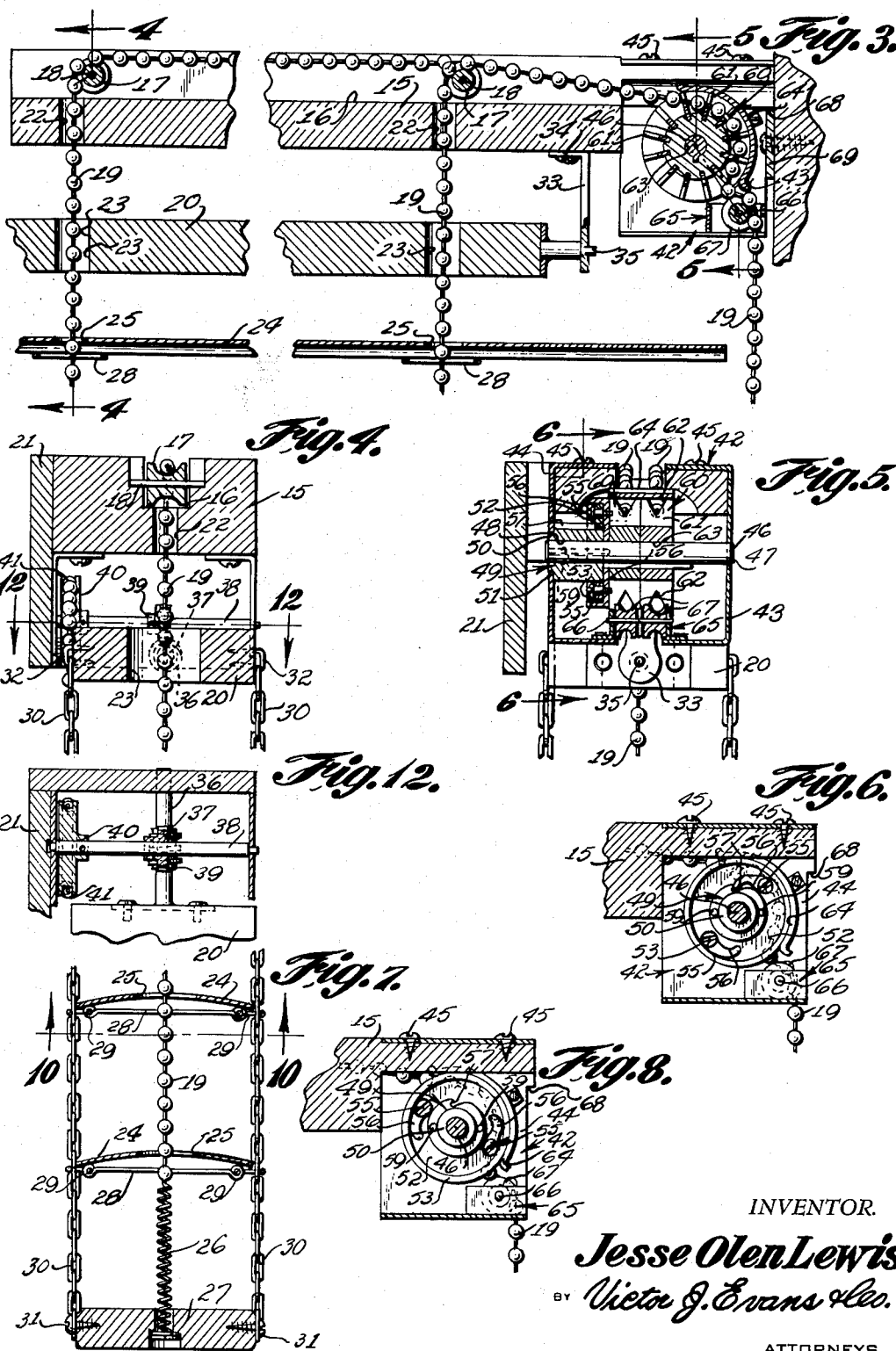
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VENETIAN BLIND

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Application September 11, 1953, Serial No. 379,686

5 Claims. (Cl. 160—168)

This invention relates to a window, and more particularly to a Venetian blind for a window.

The object of the invention is to provide a Venetian blind which is simple to operate and which is constructed so that the parts are extremely durable and long lasting.

Another object of the invention is to provide a Venetian blind which does not utilize any fabric therein so that the parts will not readily wear out or become damaged, the blind being operated in an extremely simple manner and wherein no struggling is required to move the shutter up or down, there being a latching mechanism for automatically stopping and maintaining the parts where desired.

A further object of the invention is to provide a Venetian blind which is extremely simple and inexpensive to manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are used to designate like parts throughout the same:

Figure 1 is a front elevational view showing the Venetian blind of the present invention mounted in a window frame.

Figure 2 is a horizontal sectional view taken through the top of the window frame and looking down on the Venetian blind.

Figure 3 is a sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a sectional view taken on the line 4—4 of Figure 3.

Figure 5 is a sectional view taken on the line 5—5 of Figure 3.

Figure 6 is a sectional view taken on the line 6—6 of Figure 5.

Figure 7 is a sectional view taken through the slats and showing the oscillating chains and connection of the bottom bar to the raising and lowering chain.

Figure 8 is a sectional view showing a portion of the locking mechanism.

Figure 9 is a perspective exploded view of a portion of the locking mechanism, and with parts broken away and in section.

Figure 10 is a fragmentary bottom plan view showing one of the support members that is arranged adjacent the lower surface of each of the slats.

Figure 11 is a perspective view of one of the support members or brackets.

Figure 12 is a sectional view taken on the line 12—12 of Figure 4.

Referring in detail to the drawings, the numeral 10 designates a conventional window frame which includes spaced parallel vertically disposed side rails 11, Figure 1, a top piece 12, and a bottom sill 14. Positioned adjacent to the window frame 10 is the Venetian blind of the present invention, and the Venetian blind includes a horizontally disposed body member 15 which is arranged adjacent the top of the frame 10. The body member 15 is

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provided with a longitudinally extending channel or cut-out 16, Figures 3 and 4. Journaled in the channel 16 on pins 18 are a pair of spaced apart rollers 17, and chains 19 are trained over the rollers 17 for use in raising and lowering the slats. The chains used in the Venetian blind of the present invention include a plurality of balls interconnected together by links and the chains are used in lieu of tapes or cords so that the parts will not easily become damaged or worn out.

Arranged below the body member 15 is a rockable or pivotally mounted arm 20, and depending from the body member 15 and secured thereto is a plate or strip 21, Figures 1 and 4. The body member 15 is provided with a pair of spaced openings 22 which register with openings 23 in the arm 20, and arranged below the arm 20 and mounted for movement towards and away from the arm 20 is a plurality of superimposed spaced parallel slats 24. Each of the slats 24 is provided with a pair of openings 25 which register with the openings 23 and 22. The chains 19 extend through these registering openings. Arranged below the lowermost slat 24 is a bottom bar 27, and the lower ends of the chains 19 are connected to the bar 27 by springs 26, Figure 7.

Each of the slats 24 rests on a support member or bracket 28, Figure 11, and the support members 28 may be made of wire. The support member 28 may have its ends shaped to provide eyelets 29, and connected to the eyelets 29 are chains 30. All together, four of the chains 30 are provided, the chains 30 being arranged in pairs and extending down along the side edges of the slats 24 and connected to the eyelets 29. The lower ends of the chains 30 are secured to the bottom bar 27 by suitable securing elements such as the screws 31, Figure 7, and the upper ends of the chains 30 are connected to the oscillating arm 20 by means of staples 32. The chains 30 may be made of steel wire and if desired they may be nickel plated, and these chains 30 may include a plurality of links as shown in the drawings.

A bracket 33 depends from the body member 15 and is secured thereto by suitable securing elements such as screws 34, Figure 3, and a trunnion 35 extends from one end of the oscillatable arm 20, the trunnion 35 being rotatably supported by the bracket 33. Extending from the other end of the arm 20 is a stub shaft 36 which has a worm 37 mounted thereon that meshes with a worm gear 39 on a drive shaft 38. The drive shaft 38 is arranged at right angles with respect to the stub shaft 36, and a sprocket 40 is mounted on the drive shaft 38. An endless chain 41 is trained over the sprocket 40. Thus, it will be seen that by manually pulling on the chain 41 the drive shaft 38 will be rotated and the worm gears will oscillate the arm 20 so as to tilt the slats 24 to any desired angular position and these slats 24 will remain immobile in their various tilted positions.

Arranged adjacent the end of the body member 15 is a frame 42, Figure 5, and the frame 42 includes a pair of sections 43 and 44 which may be secured to the body member 15 by suitable securing elements such as the screws 45. An operating shaft 46 has one end supported in an opening 47 in the section 43, and the other end portion of the operating shaft 46 extends through a bore 48 in a latch block 49, Figure 9. The latch block 49 has a cylindrical shape and includes an annular collar 50 that seats in an opening 51 in the frame section 44.

A disk 52 is provided with a central opening 54 for receiving the operating shaft 46, and the disk 52 is keyed to the shaft 46. The disk 52 is provided with an annular flange or rim 53, Figure 9, and a pair of pawls or dogs 56 are pivotally connected to the disk 52 by suitable securing elements 55. The pawls 56 are mounted for movement into and out of engagement with a slot or recess 57 in the latch 49, so that when the pawls 56 engage the slot

57 the slats will be maintained immobile in their adjusted position. When the operating shaft 46 is revolving at a high enough speed centrifugal force will keep the pawls 56 out of the slot 57, but when the operating shaft slows down sufficiently, the pawls 56 will move inwardly so that one of the pawls can engage the slot 57. The latch 49 is provided with a pair of openings 58 through which project suitable securing elements 59 in order to secure the latch 49 in place.

Arranged contiguous to the disk 52 is a pair of similar sprocket pulleys 60, Figure 9. Each of the sprocket pulleys 60 is provided with a plurality of radially extending ribs 61 which each have a V-shaped notch 62 therein for receiving the link portions of the chains 19. The pulleys 60 are also provided with central openings 63 which receive the operating shaft 46, and the pulleys 60 are keyed to the shaft 46. A shield 64 covers a portion of the pulleys 60 for a purpose to be later described.

Arranged just below the pulleys 60 is a casing 65 which has a pin 66 journaled therein. A pair of grooved guide rollers 67 are mounted on the pin 66, Figures 5, 6 and 8, and the guide rollers 67 have the chains 19 trained thereover.

From the foregoing it is apparent that a Venetian blind has been provided which is easy to operate and ruggedly constructed. The slats 24 can all be simultaneously tilted to any desired angle by merely pulling on the chain 41. By pulling on the chain 19 the slats 24 can be raised and the slats 24 can be held stationary in any of their adjusted raised positions by releasing tension on the chain 19 due to the pawls 56 engaging the slot 57. The slats 24 can be pulled all the way up by means of the chain 19, and by releasing pressure on the chain 19 quickly the weight of the slats 24 and bar 27 will cause the pawls 56 to fly out by centrifugal force and move from the position shown in Figure 6 to the position shown in Figure 8 so that the slats will be able to move downwardly as for example to the position shown in Figure 1.

The Venetian blind uses no cloth or tapes which may rot and the springs 26 provide resiliency when the slats are drawn all the way up. The four chains 30 take the place of tapes in the usual Venetian blind and the worm gears 37 and 39 serve to convert the movement of the chain 41 into slow tilting movement of the slats 24.

The pivoting arm 20 may have a little more than one-half of the spacing between it and the top piece 15 as there is between the slats 24 to permit the arm 20 to oscillate without touching the member 15 when the shutters or slats are closed or when the pivotal arm 20 is in a vertical position. The supporting chains 30 are connected to the arm 20 by staples 32 which provide a turning hinge as the pivoting arm is moved to and fro. The support members 28 have eyelets 29 which are connected to the links of the chains 30. The slats 24 rest on the supports 28 and there are no tracks used to guide the blind. The ball chains are attached to the bar 27 through the medium of the springs 26 and pass up through the lateral slots 25 in the slats 24 and then over the small spool rollers 17 and then to the upper right hand corner of the set where they enter separately onto two non-slip sprockets 60 which are mounted on the shaft 46 of the raising and lowering unit which is provided with automatic holding pawls 56 for use when the set is raised or lowered from one position to another. The channel 16 accommodates the chains 19 and the member 15 can be made of wood. The sections 43 and 44 of the frame 42 have shoulders 68, Figure 3, which rest on a bracket 69 that is attached to the window frame 10. The parts 43 and 44 can be made of heavy gauge galvanized metal. The latch 49 has the notch 57 into which the pawls 56 fall to hold backward movement of the shutter set. The notch 57 is on top of the latch 49. There is a slight clearance between the flange 53 on the disk 52 and the latch block 49 and this clearance permits outward and inward movement of the pawls 56. Outward movement of the pawls

is limited by the flange 53 and inward movement is limited by the latch 49. The opening and closing movement of these pawls is caused by the operating shaft 46. When the shaft 46 is revolving, these pawls open out and pass right on over the notch 57 in the latch 49, but when the momentum of the shaft 46 is slowed down or stopped, the nearest one of the pawls 56 falls into the notch 57 to prevent further downward movement of the shutters. The movement of the shaft 46 is caused by the draw chains 19 being pulled down or to the right by hand to raise the shutters. To lower the shutters it is necessary to pull the chains 19 downward or to the right slightly and this moves the pawls 56 out of the notch 57 and then upon a quick let-up on the chains 19, the shutters 24 will move downward rapidly by gravity and this quick downward movement causes the pawls 56 to open out due to centrifugal force and pass right on over the notch 57 in the latch 49. This permits the shutters to move down to the desired point. When the desired point is reached it is necessary to pull on chains 19 to stop downward movement of the shutters and when this movement ceases, the nearest one of the pawls 56 falls into the notch 57 in the latch 49 to thus hold the shutters where the operator desires to stop them. The ribs 61 in the pulleys 60 are spaced apart so that there is just enough space between them for the wire-like coupling between the balls of the chains 19 to enter and these spaces are of such size that the ball of the chain will not be permitted to accidentally pass therethrough. The ribs are spaced so that each ball of the chain will fall between them. The guard 64 fits very closely around the top side of the pulleys 60 so that the chains 19 cannot get out of the grooves or rise to where either or both of the chains might slip in the pulley which would cause one end of the shutters to be higher than the other. The guide rollers 67 serve to guide the chains 19 onto the pulleys 60 and also serve as a flush bearing for the chains. The springs 26 prevent the shutters from jamming in the top and when the shutters are completely raised to the top, by pulling down on chains 19 these springs will stretch, releasing latching pawls 56 to permit the shutters to be lowered easily.

The Venetian blind of the present invention is simple to operate and the parts will last indefinitely since the parts are all made of lasting material such as metal. No fabric is used and the invention is extremely attractive. No tangling will occur during the use of the blind.

I claim:

1. A Venetian blind comprising a horizontally disposed body member arranged adjacent the top of a window frame and provided with a longitudinally extending channel, a pair of rollers journaled in said channel, a plurality of spaced parallel slats arranged below said body member and mounted for movement toward and away from said body member, a horizontally disposed arm pivotally supported below said body member, there being registering openings in said arm, body member and slats, chains trained over said rollers and extending through said registering openings, a bar arranged below the lowermost of said slats, resilient means connecting said bar to said chains, a frame supported adjacent one end of said body member, an operating shaft rotatably supported by said frame, a pair of pulleys keyed to said shaft and having said chains trained thereover, a disk keyed to said shaft and provided with an annular flange, a pair of pawls pivotally connected to said disk, a latch block mounted on said shaft and provided with a notch for selective engagement by said pawls, a support member arranged adjacent the lower surface of each of said slats, chains connected to the ends of said support member and to the side edges of the arm, and manually operable means for tilting said slats.

2. The apparatus as described in claim 1, wherein said manually operable means comprises a stub shaft extending from an end of said arm, a drive shaft arranged at right angles with respect to said stub shaft, worm gear

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means connecting said drive shaft to said stub shaft, a sprocket mounted on said drive shaft, an endless chain trained over said sprocket.

3. The apparatus as described in claim 1, wherein said resilient means comprises a coil spring.

4. A Venetian blind comprising a horizontally disposed body member arranged adjacent the top of a window frame and provided with a longitudinally extending channel, a pair of rollers journaled in said channel, a plurality of spaced parallel slats arranged below said body member and mounted for movement toward and away from said body member, a horizontally disposed arm pivotally supported below said body member, there being registering openings in said arm, body member and slats, chains trained over said rollers and extending through said registering openings, a bar arranged below the lowermost of said slats, resilient means connecting said bar to said chains, a frame supported adjacent one end of said body member, an operating shaft rotatably supported by said frame, a pair of pulleys keyed to said shaft and having said chains trained thereover, a disk keyed to said shaft and provided with an annular flange, a pair of pawls pivotally connected to said disk, a latch block mounted on said shaft and provided with a notch for selective engagement by said pawls, a support member arranged adjacent the lower surface of each of said slats, chains connected to the ends of said support member and to the side edges of the arm, and manually operable means for tilting said slats, and a shield arranged over said pulleys.

5. In a Venetian blind, a horizontally disposed body member arranged adjacent the top of a window frame and provided with a longitudinally extending channel, a

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pair of rollers journaled in said channel, a plurality of spaced parallel slats arranged below said body member and mounted for movement toward and away from said body member, a horizontally disposed arm pivotally supported below said body member, there being registering openings in said arm, body member and slats, chains trained over said rollers and extending through said registering openings, a frame supported adjacent one end of said body member, an operating shaft rotatably supported by said frame, a pair of pulleys keyed to said shaft and having said chains trained thereover, a disk keyed to said shaft and provided with an annular flange, a pair of pawls pivotally connected to said disk, a latch block mounted on said shaft and provided with a notch for selective engagement by said pawls, a support member arranged adjacent the lower surface of each of said slats, chains connected to the ends of said support member and to the side edges of the arm, manually operable means for tilting said slats, said manually operable means comprising a stub shaft extending from an end of said arm, a drive shaft arranged at right angles with respect to said stub shaft, worm gear means connecting said drive shaft to said stub shaft, a sprocket mounted on said drive shaft, and an endless chain trained over said sprocket.

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