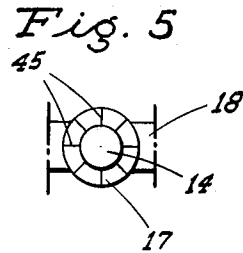
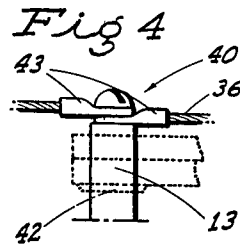
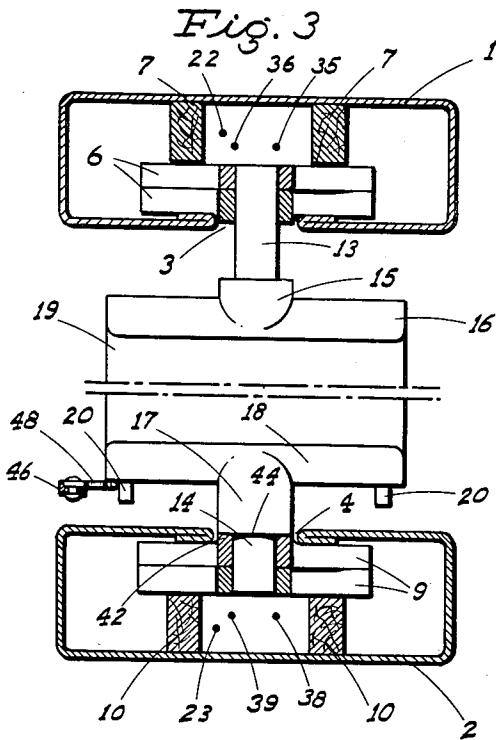
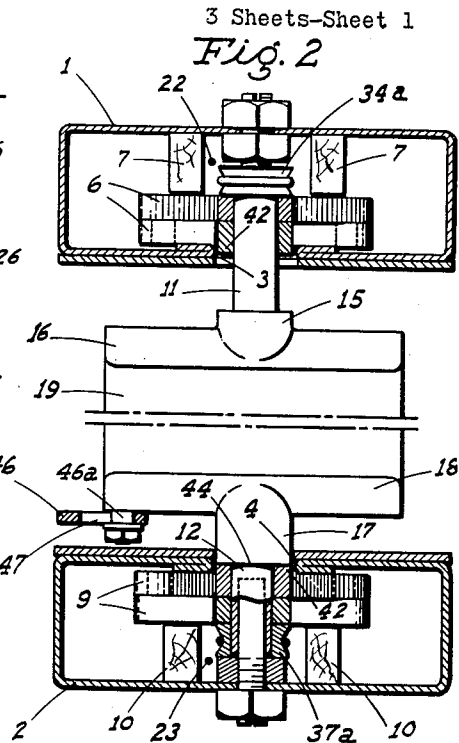
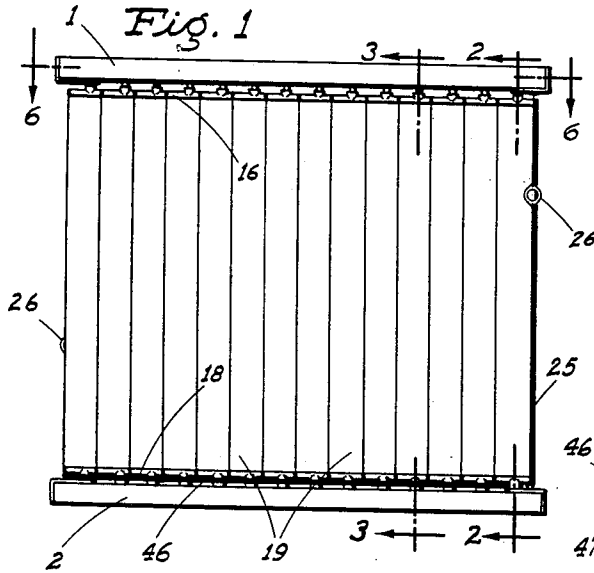


July 24, 1956

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VENETIAN BLIND

2,755,854

Filed July 15, 1952



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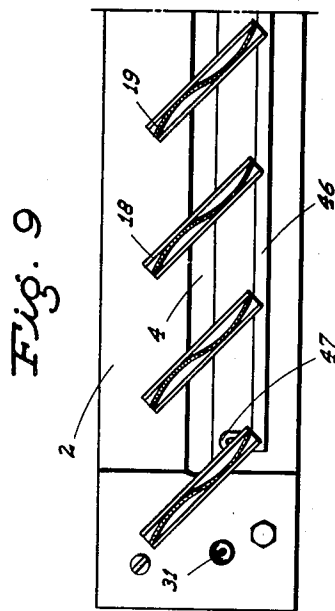
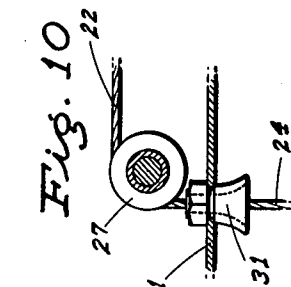
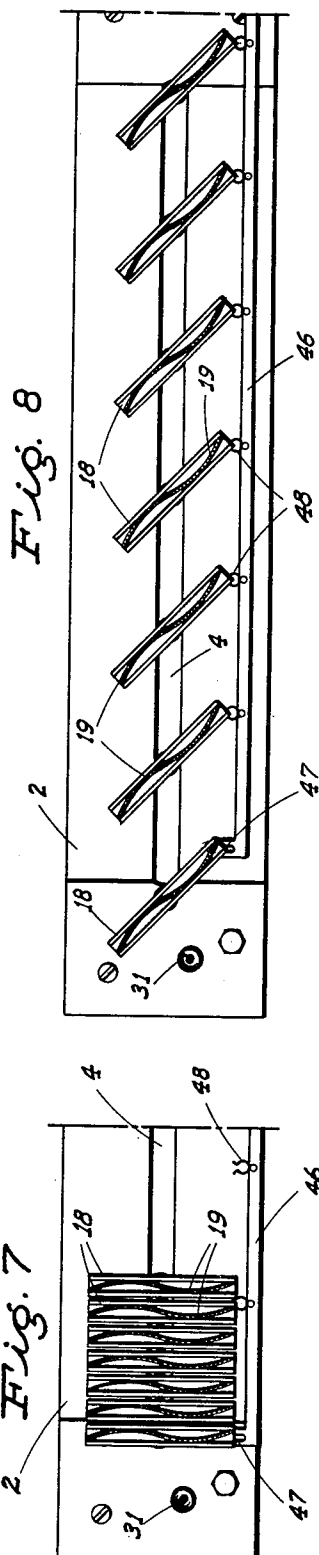
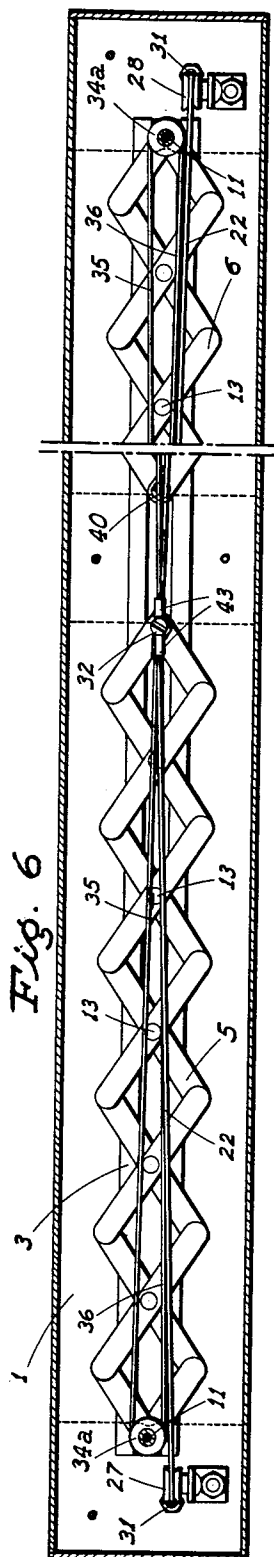
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Fig. 11

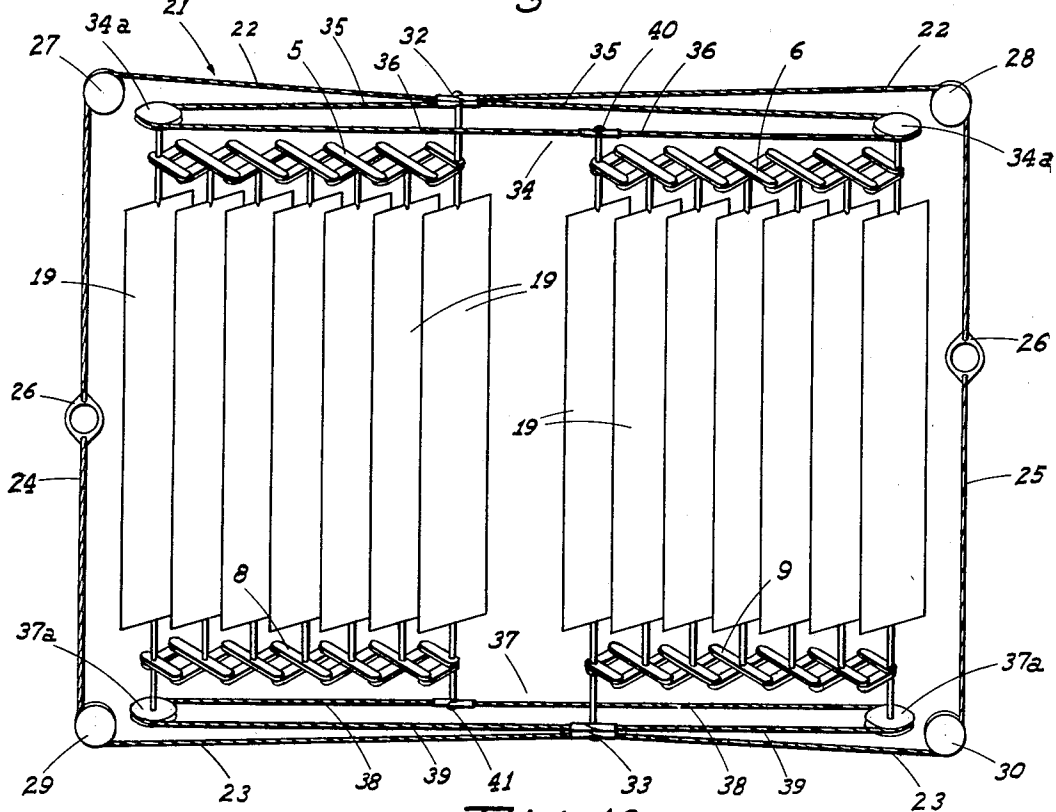


Fig. 12

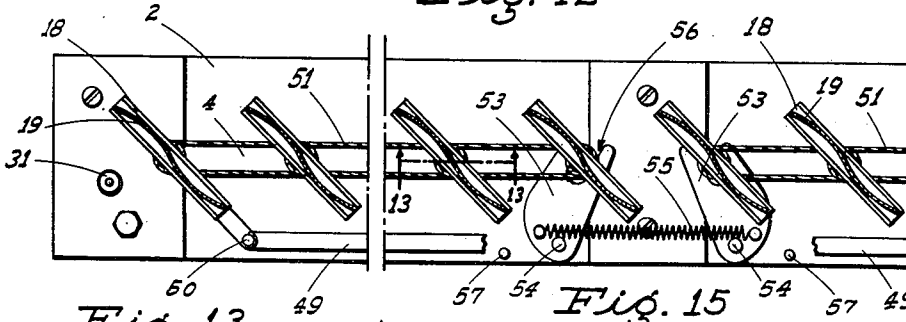


Fig. 13

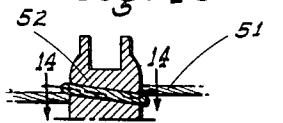
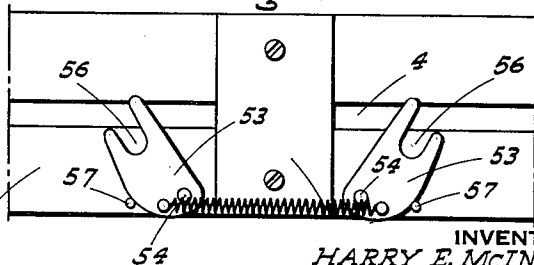


Fig. 14



Fig. 15



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VENETIAN BLIND

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2 Claims. (Cl. 160—176)

This invention relates in general to Venetian blinds; the invention being directed in particular to, and it is a major object to provide, an improved Venetian blind of the type wherein the slats are vertically disposed, adjust for light entry angle about a vertical axis, and shift laterally or in a horizontal direction to open or close as a whole.

Another important object of the invention is to provide a vertical Venetian blind which embodies a novel mount which supports the vertical slats, for such horizontal opening or closing motion, in a right and left hand section; i. e. the blind opens, as a whole, from the center laterally in opposite directions.

An additional object of the invention is to provide a vertical Venetian blind, as in the preceding paragraph, which incorporates a novel manually operated cable system for opening or closing such blind.

A separate object of the invention is to provide an arrangement which causes the slats, of each section, to automatically assume a predetermined angle when such section is opened from a closed position; the slats, in the latter position, being in close, parallel or face to face relation for desirable compactness.

A further object of the invention is to provide the Venetian blind with novel control mechanism for simultaneously adjusting the light entry angle of the slats which comprise the sections of the blind.

A still further object of the invention is to provide a vertical Venetian blind which is designed for ease and economy of manufacture, together with convenience of installation and use.

It is also an object of the invention to provide a practical, reliable, and durable vertical Venetian blind, and one which will be exceedingly effective for the purpose for which it is designed.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings:

Fig. 1 is an elevation of the vertical Venetian blind in closed position.

Fig. 2 is an enlarged transverse sectional elevation on line 2—2 of Fig. 1.

Fig. 3 is a similar view, but is taken on line 3—3 of Fig. 1.

Fig. 4 is a fragmentary elevation showing the connection of the cable ends with one of the laterally shiftable vertical spindles.

Fig. 5 is a bottom plan view of the hub of one of the lower keepers.

Fig. 6 is an enlarged sectional plan on line 6—6 of Fig. 1.

Fig. 7 is an enlarged fragmentary sectional plan, through one slat section, showing the same fully closed.

Fig. 8 is a similar view, but shows the slat section open.

Fig. 9 is a fragmentary sectional plan, as in Fig. 8, but shows the control bar shifted inwardly for use.

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Fig. 10 is a fragmentary sectional elevation on line 10—10 of Fig. 6.

Fig. 11 is a diagrammatic elevation of the blind, showing particularly the cable system.

Fig. 12 is a fragmentary sectional plan, through the slat sections, showing a modified control mechanism for adjusting the light entry angle of the slats.

Fig. 13 is a fragmentary transverse sectional elevation on line 13—13 of Fig. 12.

Fig. 14 is a fragmentary sectional plan on line 14—14 of Fig. 13.

Fig. 15 is a fragmentary plan showing the snap-lock plates, as used in the modification of Fig. 12, in open position.

Referring now more particularly to the characters of reference on the drawings, and at present to Figs. 1—11 inclusive, the improved vertical Venetian blind disclosed therein comprises a horizontal, upper mounting box 1 and a horizontal, lower mounting box 2; each of said boxes being of hollow construction and adapted to be secured in an adjacent part of the window frame by suitable means (not shown).

The upper mounting box 1 is formed on the under side with a substantially full length, longitudinal slot 3, and the top of the lower mounting box 2 is formed with a corresponding slot 4.

A pair of upper lazy tongs, indicated at 5 and 6, is disposed in the box 1 in end to end alinement, being held down against the bottom of said box by transversely spaced, longitudinal guides 7.

Similarly, a pair of lazy tongs 8 and 9 is disposed in end to end alinement in the box 2, being supported therein on transversely spaced, longitudinal guides 10.

The upper lazy tongs 5 and 6 are anchored at their outer ends in the box 1 by end spindles 11 which are turnably journaled, in the manner shown, in the box 1.

Similarly, the lower lazy tongs 8 and 9 are anchored at their outer ends by lower end spindles 12 which are turnably journaled in the box 2. The particular mounting of the spindles 11 and 12 is shown in Fig. 2.

The remaining central axes of the upper lazy tongs 5 and 6 are connected by turnable spindles 13 which project downwardly through the slot 3. Similarly, the remaining central axes of the lower lazy tongs 8 and 9 are connected by turnable spindles 14 which project upwardly through the slot 4.

The spindles 11 and 13 are each integral at their projecting lower ends with a hub 15 formed centrally on a horizontal, channel shaped, downwardly opening keeper 16. The spindles 12 and 14 are each integral, at their upper ends, with a downwardly facing hub 17 formed centrally on a horizontal, channel-shaped, upwardly opening keeper 18. Corresponding keepers 16 and 18 are alined in parallelism, and a spring metal Venetian blind slat 19 extends between, and engages at the ends in, corresponding keepers 16 and 18.

The slats 19 are of elongated reverse S-shape in plan and are engaged under tension in the related keepers.

Additionally, each keeper 18, except the outer end-most ones thereof, is formed at the bottom adjacent the ends with short depending studs or pins 20 for the purpose hereinafter described.

The slats 19 which extend between the lazy tongs 5 and 8 form a left-hand section of the blind, while the slats 19 which extend between the lazy tongs 6 and 9 form a right-hand section of the blind. (See Fig. 11.) By simultaneously extending the lazy tongs 5, 6, 8, and 9 the right and left hand sections of the blind are shifted toward each other and to a closed position. Contrarywise, simultaneous retraction of all of the lazy tongs opens the blind. Such extension and contraction of the

lazy tongs is accomplished simultaneously by means of the following cable system:

A continuous cable unit 21 extends wholly about the blind; such cable unit including an upper, horizontal run 22 traveling in the box 1 between the guides 7; a lower, horizontal run 23 traveling in the box 2 between the guides 10; and vertical, opposite end or pull runs 24 and 25 exposed for manual access at the related side of the blind. Each pull run includes an eye 26 for ease of finger engagement.

The continuous cable unit 21 changes direction between the adjacent described runs by passing over pulleys 27 and 28 in opposite ends of the box 1, and pulleys 29 and 30 in opposite ends of the box 2; the cable after passing over each such pulley being carried out of the related box through a bell-like guide 31.

The spindle 13, at the inner end of the upper lazy tongs 5, is extended upwardly and connects, as at 32, to the upper run 22 of the continuous cable unit 21, while the spindle 13, at the inner end of the lower lazy tongs 9, is extended downwardly and connects to the lower horizontal run 23, as at 33.

A separate, two-run continuous cable unit 34 travels in the box 1 between the guides 7; such unit comprising one run 35 and another run 36. The cable unit 34 is trained at its ends about pulleys 34a on the related spindles 11 (see Fig. 2) of the lazy tongs 5 and 6.

A separate, two-run continuous cable unit, indicated generally at 37, travels in the box 2 between the guides 10, and includes one run 38 and another run 39. The cable unit 37 is trained at its ends about pulleys 37a on the spindles 12 of the lazy tongs 8 and 9 (see Fig. 2).

The run 35 of the cable unit 34 is connected to the run 22 of the cable unit 21 at the connection 32. Also, the other run 39 of the cable unit 37 is connected to the lower run 23 of the cable unit 21 by the connection 33.

The other run 36 of the cable unit 34 is connected, as at 40, to an extension of the inner endmost spindle 13 of the upper lazy tongs 6.

The remaining one run 38 of the cable unit 37 is connected, as at 41, to an extension of the inner endmost spindle 13 of the lower lazy tongs 8.

With this arrangement it will be evident that by pulling up or down on either of the runs 24 or 25 of the cable unit 21, the lazy tongs will be actuated by the described cable system to simultaneously contract or extend the same to cause opening or closing of the blind.

As such lazy tongs contract or extend they are guided in the boxes 1 and 2 by bosses 42 which run in the slot 3 or 4; such bosses being formed, at the central axes of the lazy tongs, on the links which are adjacent said lot.

Also, the cables of the system, as described above, are fitted—at each connection point—with attachment tips 43, as shown—for example—in Fig. 4.

When all of the lazy tongs are contracted, with the right and left hand slat sections of the blind in open position, the slats 19 are parallel in close face to face relation, as in Fig. 7. However, when the lazy tongs are simultaneously extended for the purpose of closing the blind, the slats automatically assume a diagonal light-entry angle (see Fig. 8), and this is accomplished in the following manner:

Each of the hubs 17 faces downwardly and has frictional engagement with the related portion of the adjacent link of the corresponding lazy tongs; the line of frictional engagement being indicated at 44. The frictional engagement between these parts may be enhanced by forming the face of each hub 17 about the spindle 14 with small radial ribs 45 which normally seat in, but which can ride out of, matching grooves (not shown) in the related part of the lazy tongs.

By reason of the line of frictional engagement 44 between each hub 17 and the corresponding lazy tongs, the latter—as they extend—impart a part-rotation to the

hubs 17, resulting in automatically angling to diagonal of the keepers 18 and the slats 19 carried thereby.

Thus, each time that the vertical Venetian blind is closed, the slats 19 automatically assume a diagonal light-entry angle which is satisfactory for ordinary conditions. However, under some conditions it may be desired to further adjust the light-entry angle of the slats 19 in unison, either to a greater or lesser angle, and this is accomplished as follows:

A horizontal, laterally shiftable control bar 46 is disposed at the bottom of the blind directly above the inner edge portion of the box 2; such control bar, at the ends, having slotted returned ears 47 which engage, in the manner of a lost-motion connection, with studs 46a on the outer endmost lower keepers 18. The control bar 46 is normally shifted outwardly; i. e. away from the slats, maintaining engagement by the ears 47 only with the outer endmost keepers 18, as aforesaid. However, with this arrangement, when the lazy tongs are extended, and the slats 19 assume their automatic diagonal adjustment, the bar 46 is correspondingly laterally shifted. Such bar is fitted, along the length thereof, with spring clips 48 disposed so that upon inward shifting of said bar such spring clips 48 make snap-engagement with the near pins 20 on all of the keepers 18, saving and excepting the outer endmost ones thereof, and which are the ones to which the ears 47 connect.

With the control bar 46 shifted inwardly with the spring clips 48 engaging the pins 20, as above described, lateral shifting of such bar 46 will effect selective adjustment in unison of all of the slats 19, whereby to alter the light-entry angle thereof.

The control bar 46 is normally in an outward position with the spring clips 48 free for the obvious purpose of permitting the slats 19 to assume their automatic diagonal adjustment, as aforesaid.

In Figs. 12-15 inclusive there is disclosed a modification of the means employed to accomplish manual adjustment of the light-entry angle of the slats 19.

While here the general structural assembly of the blind remains the same, the shifting bar, indicated at 49, is pivoted at its ends, as at 50, to the outer endmost keepers 18 at opposite sides of the blind; such shifting bar having no other connection with any of the remaining keepers 18; i. e. the spring clips 48 of the previous embodiment are omitted.

Here the spindles which project downwardly from the slats 19 of each section of the blind are connected by a continuous cable system 51 which has connection with such spindles in the manner shown in Figs. 13 and 14; these spindles being here indicated at 52.

With shifting of the bar 49 in one direction or the other, the outer endmost keepers 18 are part-turned, which part-turn is also imparted in unison to the remaining keepers 18 by the continuous cable systems 51.

In order to maintain said cable systems 51 relatively taut when the lazy tongs are extended and the blind sections closed, the inner endmost spindles 52 at the bottom of the blind are engaged and pulled toward each other by over-dead center snaplock plates 53 pivoted, as at 54, on top of the box 2, with a spring 55 connecting said plates, as shown. The snap-lock plates 53 include pick-up notches 56 which open in a manner such that the plates 53 which start in diverging relation are engaged by the inner endmost spindles 52 when the blind closes; such plates, with the closing motion, swinging towards each other, passing over dead-center, and thence tensioning the continuous cable systems 51. Conversely, when the blind sections are opened, the snap-lock plates 53 swing apart, pass over dead-center, and the spindles 52 escape so that the blind sections may be opened by the lazy tongs without restriction.

When the snap-lock plates 53 swing apart to release position they engage stops 57.

The described vertical Venetian blind provides a struc-

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ture which can be manufactured in an economical manner; readily installed in a window; and—when installed—easily manipulated to cause opening or closing of the blind sections and selective manual adjustment of the slats with respect to the light-entry angle.

From the foregoing description it will be readily seen that there has been produced such a device as will substantially fulfill the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

I claim:

1. A vertical Venetian blind comprising top and bottom lazy tongs, means supporting the lazy tongs for contraction and extension relative to fixed outer ends thereof, the lazy tongs including hubs at their axes and pivotal elements projecting from the hubs, vertical slats connected to and extending between corresponding hubs, means operative to simultaneously contract or extend said lazy tongs whereby to open or close the blind, a horizontal laterally and transversely shiftable bar disposed at the bottom of the blind adjacent the lower ends of the slats, the pivotal elements including transverse keepers in which the slats engage and friction connection means between the keepers and hubs, and means including elements on the keepers and normally free spring clips on the bar adapted for engagement with the elements when the blind is open and upon the bar being shifted transversely in an inward direction, longitudinal shifting of the bar then part-turning said slats to adjust the light-entry angle thereof.

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2. A vertical Venetian blind comprising horizontal top and bottom lazy tongs, means supporting the lazy tongs for contraction and extension relative to fixed outer ends thereof, the lazy tongs including pivotal elements at the axes, vertical slats connected to and extending between corresponding pivotal elements, means operative to simultaneously contract or extend said lazy tongs whereby to open or close the blind, the slats being face to face in close relation when the blind is open, means between the lazy tongs and slats operative to cause the latter to assume a diagonaled light-entry angle upon extension of said lazy tongs and resultant opening of the blind, a control bar disposed horizontally at the lower end of the blind, said bar being shiftable laterally of the blind as well as in a direction transversely of said bar, means connecting one slat and the bar for limited motion of the bar in said last named direction, and other means operative only when the bar is moved inwardly in said direction arranged to couple said bar to the remaining slats.

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