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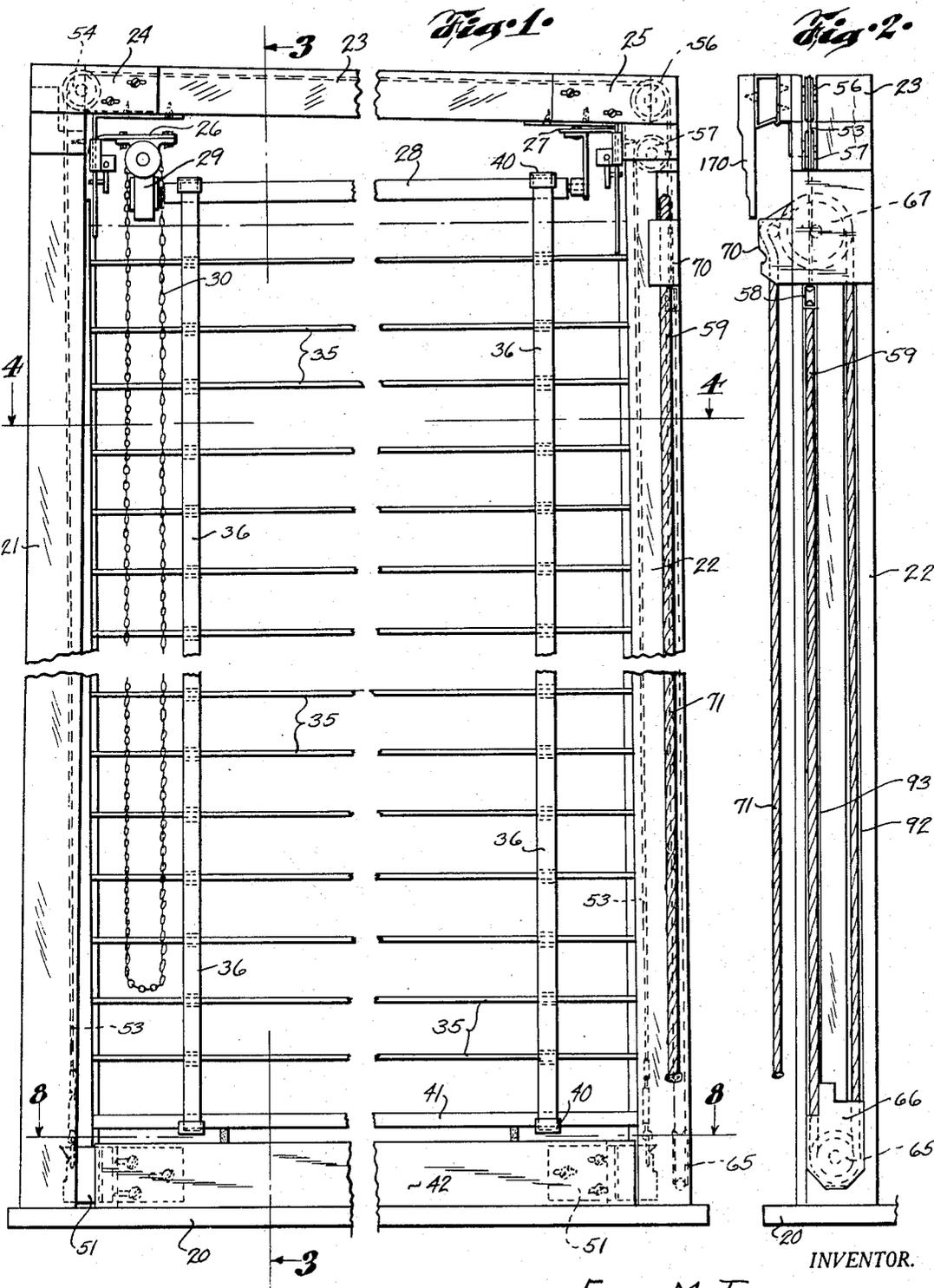
E. M. TRAMMELL

2,139,781

VENETIAN BLIND

Filed April 16, 1937

3 Sheets-Sheet 1



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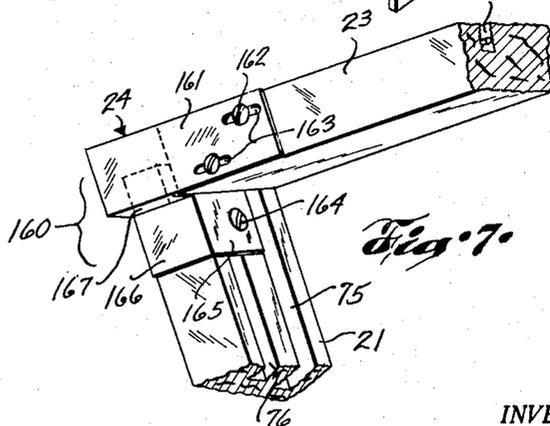
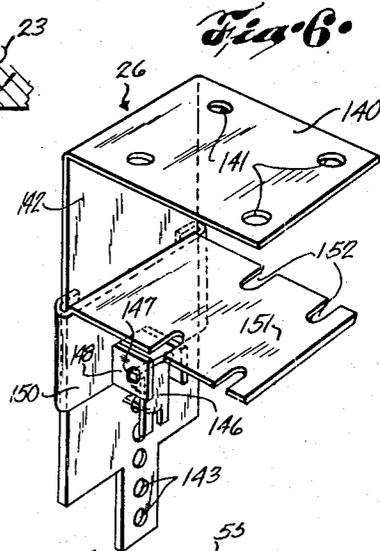
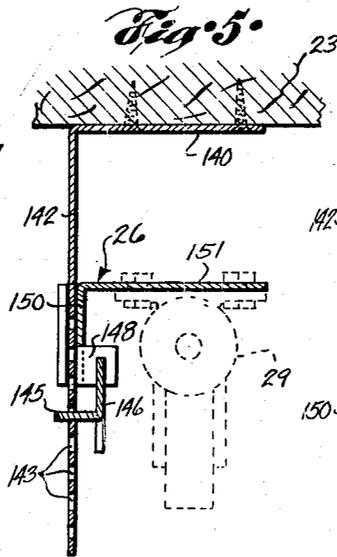
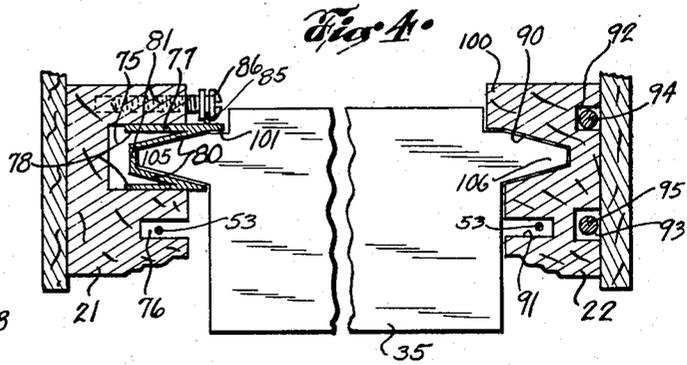
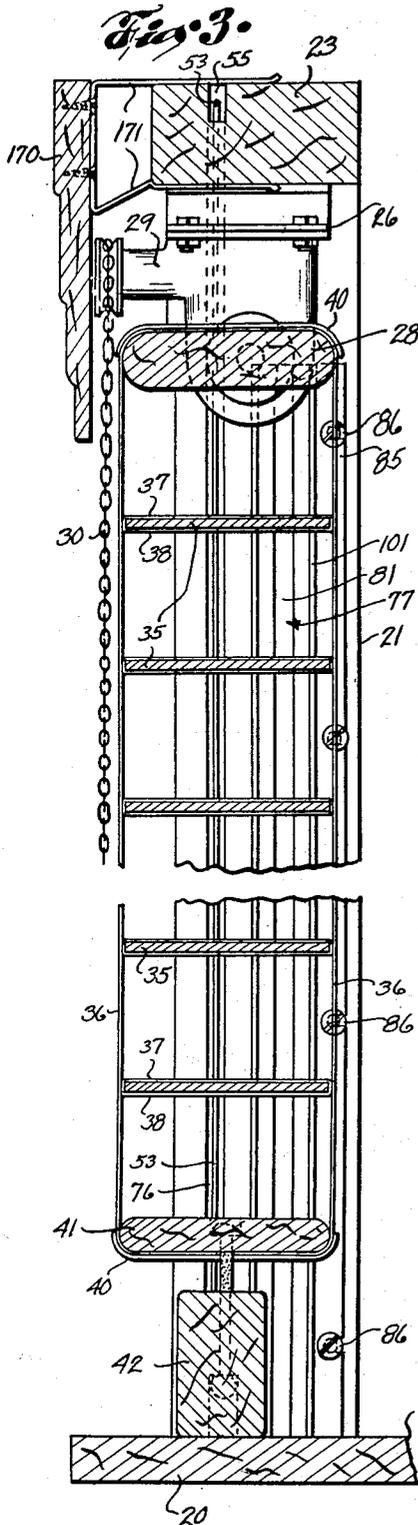
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3 Sheets-Sheet 2



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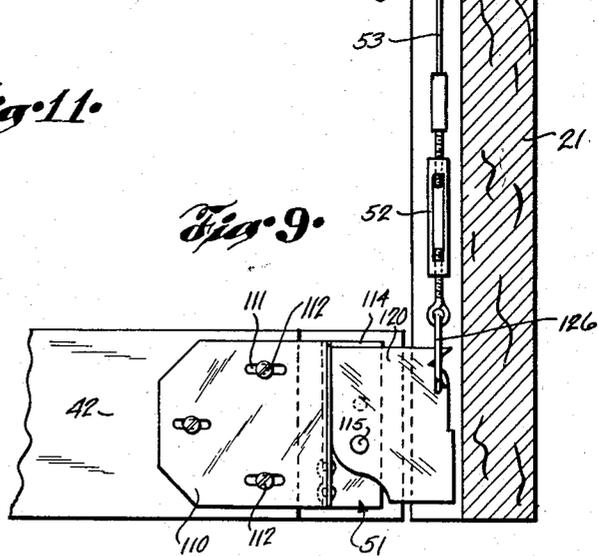
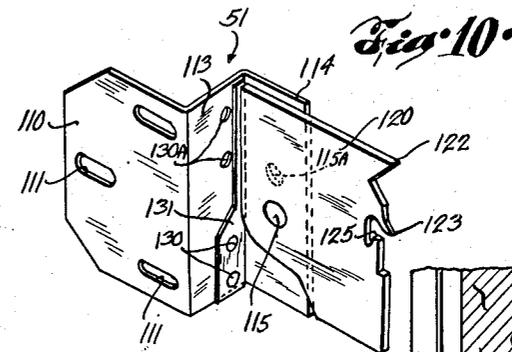
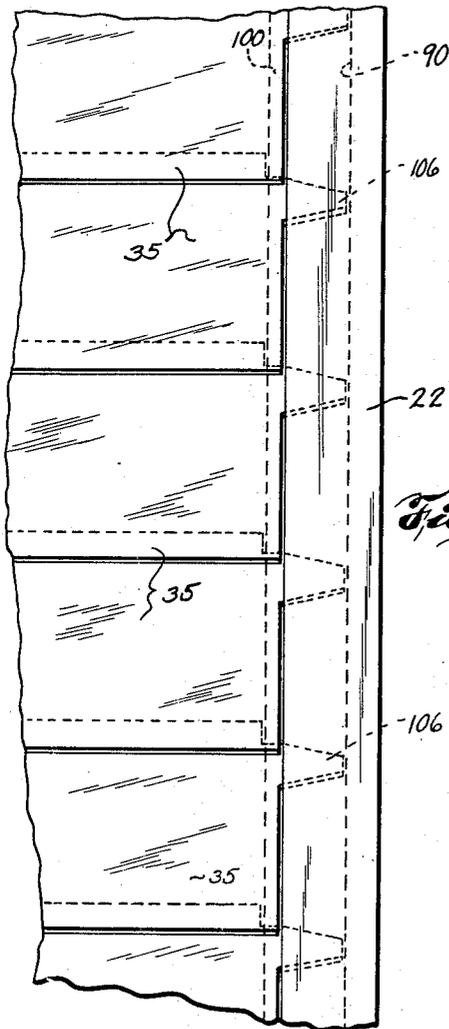
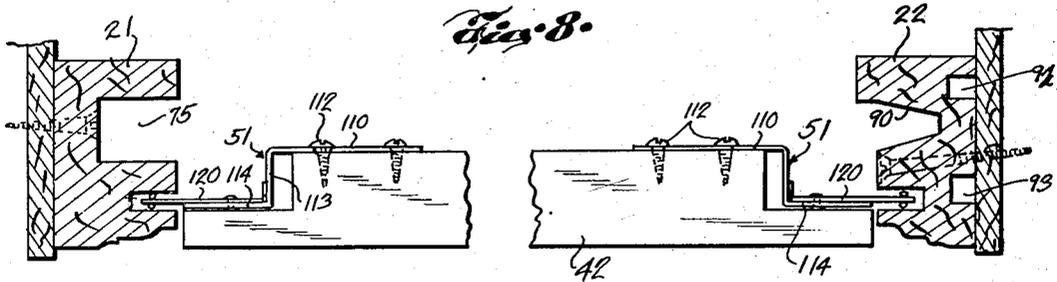
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VENETIAN BLIND

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,139,781

VENETIAN BLIND

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Application April 16, 1937, Serial No. 137,292

35 Claims. (Cl. 156—17)

This invention relates to improvements in Venetian blinds, and more particularly to Venetian blinds of guided type, as distinguished from those usually designated in the trade as of free-hanging type.

Among the many difficulties heretofore prevalent in the production and installation of guided Venetian blinds, is noted the fact that the window openings in which the blinds are installed, are rarely ever of exactly the same dimensions, even though approximating standard widths and heights. Furthermore, in very many cases the jambs, sills and rails which define the window openings, are rarely or truly rectangular. Otherwise expressed, the window openings defined by the jambs and the like may be of substantially even horizontal width, and yet the jambs and sills be somewhat out of rectangular relation. In still other cases, irrespective of correct angularity of the window-defining elements, the height of the window opening may be greater at either side of the opening than at the other, and every variety of uneven width between jambs may be presented in the installation of the given lot of blinds.

The foregoing conditions have heretofore necessitated the manufacture of Venetian blinds of guided type, on a tailored or custom-made basis, or in case the elements of the blinds of a given lot were constructed uniformly, there resulted an unwarranted time and expense of installation incident to shimming, cutting and fitting the guide rails, head rails, and other parts of the blind to compensate for even relatively small irregularities in dimensions and angularity of the parts of the windows to which they were fitted. As one of its broader and major objectives, the present invention accordingly attains a blind assembly of guided type, in which all of the parts may be constructed uniformly for windows of each of the usual standard sizes, and which may be quickly and easily installed without special tools, equipment or experience.

Yet another object, resulting from the structural provisions enabling the attainment of the foregoing object, is the ability to change the elements of the improved blind, readily and easily at any time after installation, so as to compensate for climatic changes, changes in condition of the wood elements which may be used in the assembly, and in fact any other of the many changes in conditions not infrequently encountered.

The advantages of blinds of guided type over those of free-hanging type are well known, but it may be briefly noted that those of the latter order are easily subject to disarrangement of the slats and displacement of the blind as a whole under the influence of even moderate breezes, directed either inwardly or outwardly of the room or window equipped with the blind. These dif-

ficulties have been overcome in a certain measure by heretofore existing types of guided blinds, but with only indifferent success, because of the known likelihood of guided blinds to rattle excessively in the guides, the tendency for the slats to become displaced from their desired horizontal position, and the effect of incorrect lifting and lowering actuation of blinds of guided type, which has heretofore resulted in excessive noise and a marked tendency for the slat tenons to become casually and accidentally disengaged from the guide grooves. It is accordingly a further important and general objective of this invention to overcome each and all of the last noted difficulties.

A further inherent difficulty has heretofore existed in the usage of Venetian blinds of both free-hanging and guided type, in that when the slats are tilted in an attempt to preclude visibility and the entrance of light, the spaces necessarily allowed for safe working clearances at the ends of the slats, even in Venetian blinds of guided type, at once precluded any possibility of a light-tight closure of the slats. The present invention importantly attains as a further object, through the provision of improvements in the guide rail structure and in the arrangement and construction of the slat tenons, facilities for insuring a light- and vision-proof blind of guided type, when the slats are tilted for this purpose.

As reflected in the structural features by which the foregoing general objects are attained in the example disclosed, the invention also has among its objects an adjustable hanger or bracket for the tilt rail and tilting mechanism, which is of an improved and novel type; an improved corner fitting or connection, enabling a compensating adjustment between, and a convenient assembly expedient for connecting the head rail and guide rails; an improved self-locking lift bar, rendering practically impossible the casual or accidental displacement of the lift bar and hence of the slats, from their correct horizontal placements; the provision of a readily and easily adjustable channel element associated with one or both of the vertical guide rails, so as to permit a ready compensation for out-of-plumb window jambs; various other assembly expedients and hardware items, as well as an improved general arrangement and construction of parts.

The foregoing and numerous other objects will appear from the following detailed description of a presently preferred exemplary embodiment of the invention, considered in connection with the accompanying drawings, in which:

Fig. 1 is a front elevation of a Venetian blind assembly embodying the present improvements, in this figure an irregular angular arrangement of some of the parts being exaggerated for better illustration; Fig. 2 is a vertical side elevation of the blind assembly shown by Fig. 1; Fig. 3

is a vertical section through the assembly, as viewed along line 3—3 of Fig. 1; Fig. 4 is a horizontal sectional elevation of the assembly of Fig. 1, as viewed along line 4—4 thereof; Figs. 5 and 6 are, respectively, a vertical section and an isometric or perspective view of an adjustable bracket or hanger for the tilting assembly; Fig. 7 is a fragmentary elevation in perspective of an improved adjustable corner bracket such as preferably employed for connecting the head rail and each of the vertical or guide rails; Fig. 8 is a horizontal sectional elevation as viewed along line 8—8 of Fig. 1, and illustrating particularly the lift bar and appurtenances; Fig. 9 is an end elevation of the lift bar showing particularly the adjustable metal tenon and means for insuring automatic leveling of the bar, as well as the means for anchoring the flexible lifting element such as a wire, to the lift bar structure; Fig. 10 is an isometric view of the adjustable metal tenon, showing also the automatically extensible features from which result the self-locking properties of the lift bar, and Fig. 11 is a fragmentary plan view or development, illustrating the light-tight and lapping relation of the adjacent slats, when tilted to preclude vision or the entrance of light.

Referring now by characters of reference to the drawings, there is indicated at 20, (Fig. 1), the usual window sill, extending vertically from the opposite ends of which are the jambs (not shown), and adjacent and parallel to which are secured the vertical guide rails 21 and 22. The latter are connected by a transverse head rail bridging their upper ends, and designated at 23. The preferred form of connection embodying the brackets, such as 24 and 25, is hereinafter described in more detail.

Suspended from the head rail 23, as by adjustable hangers 26 and 27, is the tilt rail 28, provided, preferably at one end, with a worm and worm gear type of tilt mechanism indicated generally at 29, and actuated as through an endless chain or the like, 30. The several slats 35 are suspended in vertically spaced relation as by means of a plurality of ladder tapes 36, which are preferably of webbed textile construction, and characterized by somewhat heavy transverse cords 37 which extend in parallel relation between the verticals 36 of the ladder tape, and which are transversely and somewhat vertically separable so as to permit each of the slats 35 to be brought under some of the cords of each group as shown at 37, and supported by others, as at 38. From this it will appear that as the blind is lifted and the slats are brought into adjacency, the intervening layer of cords will preclude direct impact of the slats against each other, thus protecting their finish and cushioning the adjacent slat members against rattling, irrespective of the speed of tilting or raising the assembly.

By preference the ends of the verticals of each of the ladder tapes are brought into over-lapped relation and detachably secured to the tilt rail or bar 28, as by a metal clip or the like 40 (Fig. 3). The lower end of each of the ladder tapes is secured in any suitable manner to a somewhat heavier lower slat 41, as by a clip 40 or the like. The slat 41 is, in turn, flexibly secured to a lift bar 42, as by any suitable means, such as short sections of cord or the like. The heavier lower slat and clip serve to keep the verticals of the ladder tape substantially parallel at all times.

It will appear from Fig. 1 that the tilting mech-

anism 29, supporting as it does one end of the tilt bar 28, provides a rockable bearing for one end of the bar, while the bracket 27 provides a pivoting support for the opposite end. It is thus apparent that actuation of the tilt mechanism 29 as through chain 30, will impart a partial rotation to the tilt bar 28, in either direction, resulting in a tilting actuation of the several slats 35 in either direction from their normal position of repose, each in a horizontal plane, to positions in which they are in partly over-lapped relation, resulting in a light-sealing closure as exemplified by Fig. 11.

By way of a general description of the assembly for lifting the slats of the blind, it will appear from Fig. 1 that the lift bar 42 is provided at each end with a laterally adjustable metal tenon assembly 51, hereinafter described in detail, and best shown by Fig. 9. To this assembly is anchored, as through a turnbuckle or the like 52, a flexible lifting element, preferably a stranded metal wire 53 of circular section, and by further preference, formed of stainless steel to obviate the effects of rust or corrosion. The wire 53 which is anchored to the left hand end of the lifting bar 42, operates over a pulley 54 mounted in a suitable pulley case carried by and located at the upper end of the adjacent guide rail. This lift wire thence extends transversely of the assembly within a suitable groove 55 in the head rail, thence over and downwardly from a pulley 56 similar and similarly mounted to the pulley 54. The lifting element such as a wire 53 engaging the right hand end of the lift bar, passes upwardly and over a suitable pulley 57, the ends of the wires then being brought together and engaging a swivel coupling 58 connected to a lifting cord 59. It may here be noted that the pulleys 56 and 57 may both be carried by one, say the right hand guide rail, and that each of the pulleys such as 54, 56 and 57, may be journalled on antifricition bearings, for ease of operation and silence as well as to minimize lubrication attention. It is further to be noted that the pulley 57 may be dispensed with, and that in this case both wires may be operated over the pulley assembly 56. In this case the latter may be identical with the pulley assembly 54.

It is further preferred, for convenience of installation, that the pulleys 56, and 57 when utilized, be mounted in the guide rail by means of a common pulley casing engaging the upper end of the right hand guide rail, in the assembly shown.

It will have appeared that a downward movement of the swivel connection 58 to which is connected the wires 53, will result, because of the arrangement of pulleys, in a lifting actuation of the bar 42 which, in turn, individually picks up and stacks the several slats 35 and 41, until the blind is in fully raised position. The aforesaid downward movement of the connection 58 is effected through downward movement of the adjacent end of the cord 59 which passes under and upwardly from a pulley 65 mounted in a suitable pulley case 66. The cord thence continues over a pulley 67, mounted in a suitable pulley case within and laterally of the right hand guide rail, whence the cord extends outwardly through an automatic locking mechanism 70 (not shown in detail) whence there is exposed exteriorly of the blind assembly a portion 71 to be engaged for lifting actuation.

In the case of a blind assembly which by reason 75

of abnormal length, height or for other reasons required a greater lifting energy, the lifting actuation of the cord portion 71 is conveniently compounded by securing the ends of the round wires 53 to the case of a fall pulley (not shown). The end of the operating cord may in this case be attached to the case of the fixed pulley at the lower end of the assembly, thence passes over the fall pulley, thence downwardly to, and under the lower fixed pulley, thence upwardly over the upper fixed pulley, and out through the locking mechanism to a convenient point of actuation. The compounding structure is not presently illustrated, as involving only the addition of the fall pulley to the elements shown herein.

Proceeding now to a description of certain of the features of improvement in the slat tenons and guide provisions therefor, it will best appear from Fig. 4 that the left hand guide rail 21 is provided with a pair of inwardly presented, substantially vertical channels 75 and 76. In the latter of these operates the lifting wire 53, which is thus kept entirely operatively independent of the slat tenons and slats, so as to prevent any possibility of interengagement with the wire, or fouling of either thereof. The channel 75 is partly occupied by a longitudinally extending metal channel-forming element, preferably formed of aluminum, and indicated generally at 77. This is characterized by a pair of substantially parallel, resilient side portion 78, between which are a pair of convergently related guide-groove-forming elements 80, connected at the bottom of the groove as through a bridge piece 81. As a means for securing the metal channel-forming element 77 in the channel 75, the strip is provided with a lateral flange 85, which, at regularly spaced intervals, is apertured, the apertures each being of slotted form to engage an annular unthreaded undercut or reduced portion of a screw 86, which is threaded into the guide rail 21. It will have appeared that the provision of the channel element 77, coating with the screws 86, provides a guide-groove-forming member which may be placed at different depths within the channel 75, and hence with respect to the guide rail 21, at any predetermined points between the sill and head rail of the window opening.

The opposite guide rail 22 may, if desired, be provided with a similar channel-forming element such as 77, but this is usually unnecessary since a single such element will usually provide a range of adjustment requisite to compensate for irregularities in width of the window opening between top and bottom, compensating as well for irregularity in angularity of the window-defining elements such as the jambs and sills. Accordingly, there is shown in the assembly and in the detail of Fig. 4, a guide groove 90 constituting a channel formed directly in the wood or other material of the guide rail 22. This groove in the rail 22 preferably corresponds in shape, section and dimensions to that formed in the metal element 77. The rail 22 is further provided with a second independent groove 91, for the reception of the lifting wire on this side of the assembly, and with channels 92 and 93 respectively, for the reception of cord portions 94 and 95 consisting of parts of the lifting cord 59 above described, and at times, portions of the lifting wire 53 above referred to.

It is importantly to be noted that the rail 22 is provided with a projection from its outside face, extending toward the center of the blind, and indicated at 100, and that the outer plate portion 78 of the metal guide channel is similarly pro-

vided with a flange 101 which projects inwardly toward the center of the blind somewhat further than the opposite flange of this element.

These elements 100 and 101 serve the purpose of a light seal, in connection with the slats, as will later appear.

A highly important and desirable feature of the present invention consists in the location of the tenons of each of the slats 35, the tenons being indicated at 105 and 106 respectively, on the left and right hand ends (Fig. 4) of each slat. These tenons are characterized by converging or V-shape outline in plan, thus conforming in general shape to each of the guide grooves. This offers a very distinct advantage in that, due to the substantially reduced width of the extremities of the tenons and the bottoms of the guide grooves, the operating clearance between the tenons and grooves is scarcely greater when the slats are tilted, than when occupying their horizontal positions. In this manner, even though the slats be tilted to their fullest extent, there is minimized the tendency for the slats to rattle within the grooves, due to wind pressure and any other vibrating effects. The location of the tenons distinctly rearwardly or back of the longitudinal axis or center line of each slat, results, when the slat is tilted, in a marked reduction in tendency of the slats to be displaced, each about its own axis, under the influence of wind or other causes, thus further reducing any tendency for misalignment and rattling. It will further be noted that a line connecting the lifting wires 53 (Fig. 4) is somewhat offset from the longitudinal axis or median line of the slats.

The preference in mounting the blind, is to locate the projection 100 and projecting flange 101, on the street side or outside of the window, as distinguished from the inside or room side thereof. In this manner, as will best appear from Fig. 11, which illustrates the slats as they would appear if tilted completely, the line opening otherwise and usually remaining at the ends of the slat, is covered, as by the projection 100, thus precluding the entrance of substantially any light, and rendering a vision-proof structure which, besides offering all of the advantages of the Venetian blind, serves as a complete substitute for window shades.

Proceeding now to a more complete description of the means by which the lift bar is kept horizontal at all times in order to obviate casual tilting thereof, with resulting displacement of the slats from their desired horizontal position, it will best appear from Fig. 9 that the metal tenon assembly indicated generally at 51 (Fig. 1), includes a mounting plate 110 provided with a plurality of slotted screw apertures 111 for the reception of screws 112, through which the metal assembly may be secured at variable distances endwise of the wood portion of the bar 42 in order to compensate for any irregularity in or departure from standard widths of window openings. The plate 110 (see also Fig. 10) is provided with an angulate portion 113, from the opposite margin of which extends a second free plate portion 114 approximately parallel to the plate 110. To the plate portion 114 is pivoted, as at 115, a plate 120. Since the pivots are off center with respect to the plates 120, the provision of an extra aperture 115A in each plate 114, avoids the necessity of separate right and left hand assemblies. The plate 120 is provided with a projection or tooth 122, and an open-side aperture 125 for the reception of a bight or loop of

wire or the like 126, engaging the turnbuckle 52 (Fig. 9). Secured as by rivets 130, the plate 113, is a leaf spring 131 tending to urge the plate 120 in a clockwise direction (Fig. 10) about its pivot 115. A second set of openings 130A, are provided for the rivets 130, when the assembly is utilized at the opposite end of the bar. When in use the tension normally kept on the wires 53 maintains the plates 120 in the positions shown by Figs. 9 and 10. When, however, tension is slackened to any material degree on the lifting wires, for whatever reason, as by directly manually lifting the bar 42, the leaf springs 131 operate to rotate the plates 120 clockwise, to bring the teeth 122 into a biting and gripping engagement with the bottom of the groove in which they operate, being respectively the channels 76 and 91 in the guide rails 21 and 22. Thus it is seen that it is practically impossible for children or those unaccustomed to the lifting mechanism of the blind, to disengage the bottom rail and hence the slats, by incorrect lifting attempts. It will have appeared that the metal tenon assembly and the described self-locking feature combined therewith, attains the dual purpose of providing a lateral or endwise adjustable anchorage for assembling the lifting wires to the lift bar, and also serves the noted purpose of preventing unequal lifting of the ends of the bar.

The immediately ensuing description refers to the provisions by which, irrespective of angular irregularities in the jambs, sills and the like defining the window, the blind assembly proper is kept so that its slats are in true horizontal position. It will appear from Fig. 1, wherein is shown an exaggerated variation in height of the window opening at its opposite sides, that the brackets 26 and 27 carried by the head rail 23, permit easy and positive leveling of the pivoted ends of the tilt bar 28. The details of structure by which this is accomplished best appear in Figs. 5 and 6, as preferably involving a pair of L-shaped brackets, one of which is indicated at 140, a horizontal leg portion of which is secured to the under surface of the head rail as through screws extending through the openings 141. The vertical leg 142 of this bracket is provided with a plurality of adjusting apertures 143 for the reception of a holding or locking pin 145. The latter constitutes a projection on a swingable or pivoted member 146 pivoted at 147 on a projection 148 carried by the second major element of the bracket structure which includes a vertical leg element 150 and a horizontal leg or plate element 151. To one of the latter, as through slotted screw openings 152, is secured the hanger for the pivot on the free end of the tilt bar on the one side, and to another element 151, the tilting mechanism such as 29, on the other side of the tilt bar. As will be readily apparent from Fig. 1, any disparity in vertical dimension between the two sides of the window opening, may thus be readily and easily compensated for in a few moments at the time of installation, in order to insure horizontality of the tilt bar, and hence of the slats.

In the installation of Venetian blinds of guided type, a prevalent difficulty exists in attaining a smooth joint and an even abutment between the vertical or guide rails and the head rail, in window openings wherein the height of the opening is unequal at the opposite sides of the window, or wherein the top rail of the window and the jambs, are out of true rectangular relation, or the jambs are of unequal horizontal spacing in

different parts of the window opening. Accordingly it has heretofore been impossible to pre-cut at the time of manufacture, either the head rails to standard length, or the guide rails to standard lengths, with any assurance of a neat corner construction.

To overcome this defect and to minimize the time and labor of installation, the present invention includes an improved corner fitting or connection piece, best illustrated by Fig. 7. At the time of shipment the rail 23 is equipped with the fitting indicated generally at 160. This includes a plate-like portion 161, secured as by screws 162 extending through horizontally slotted openings 163. The fitting 160 may thus be adjusted right or left to the ends of the rail 23 in a manner to compensate for any increase or decrease from standard width dimensions of the window opening. The adjustment possible is dependent of course, upon the length of the slots 163, and may be made as great as desired. The guide rail such as 21 is fastened at the time of installation, as through one or more screws 164 engaging a plate portion 165 which lies at a right angle to a second such portion 166, these plates coacting to form a seat embracing, at least partially, the upper end of the guide rail 21. The elements 165 and 166 are connected to the plate portion 161, as through a horizontal connecting piece 167, which, if desired, may extend somewhat about the end of the head rail, thereunder as far as desired, and for a more complete engagement with the rail may also be extended over the top rail face. From this form of connection it will appear that even though the guide rail 21 is not brought into abutment with the under surface of the head rail, the resulting recess will nevertheless be concealed by the plate portions 165 and 166 and that, similarly, even though the head rail 23 be too short to fill fully the horizontal space in this portion of the window opening, the plate portion 161 will nevertheless fill out and cover any remaining recess at the ends of the rail. It results that, in appearance, the finished structure will always be the same or substantially the same, irrespective of the described window irregularities. The fixture or connecting piece 160 is formed of a fairly rigid or heavy sheet metal, which is nevertheless sufficiently flexible that when necessary, the rails 21 and 23 may be brought somewhat out of perfect right angular relation without adversely affecting the appearance of the corner connection or the strength of the joint in this zone. It may here be noted that the fitting shown by Fig. 7 is substantially similar in all important respects to those indicated generally by location, at 24 and 25 in the assembly of Fig. 1.

Although not necessary in many cases, in the event of exaggerated misalignment or irregularities in the window elements, or when otherwise desired for appearance of ornamentation, there may be applied across the upper end of the blind assembly a valance board 170, which is conveniently secured in detachable relation as by spring clips 171, engaging the head rail 23.

It will have appeared from the foregoing description that the assembly described results in a Venetian blind that constitutes a more permanent and definite part of the window, at the same time maintains a pleasing appearance, and is more practical and durable in service than the blinds of guided type as heretofore constructed. Due to the special shape of the tenons on the slats, and the fact that these are closely similar

in shape to the section of the grooves, the tenons will always be reasonably tight, except only for a desirable working clearance, thus preventing any side motion of an extent to cause noticeable noise. This is due in part to the fact that the present invention renders it possible for the first time, so far as is known, to be assured that each of the slat tenons enters its channel or guideway, at the same depth in every part of the blind, and that all of the tenons of the different slats operate in the channels or guides with a uniform lateral clearance in any zone of their range of operation.

It will also be apparent from the foregoing description that by following the practice hereinabove outlined to afford the several adjustments described, it has become possible for the first time, so far as is known, to machine the slats to lengths that assume a standard practice, rather than to lengths the exactness of which varies with each individual window opening, according to the procedure heretofore prevalently followed.

It will further appear that the present invention offers an important improvement in the art in the marked reduction of time and skill required for successful and neat installation, irrespective of irregularities of the elements defining the windows in and to which the blinds are installed.

It will have further appeared that the off-center placement and construction of the tenons, and the relation thereof to the guides, as well as the provision of the ledge or shoulder (such as 100) provides for the first time, so far as is known, a substantially complete light seal when the blind slats are tilted fully to closed position, thus preventing vision through the formerly prevailing spaces at the ends of the slats, and completely precluding the transfer of light through the slats, when such condition is desired.

In addition to the foregoing outstanding advantages, it will appear that the invention fully attains each of the several objects hereinabove expressly enumerated, as well as those implied from the description of the example disclosed.

While the invention has been described by making specific reference to the assembly and the elements in their presently preferred form, such description is not to be understood in a limiting sense, since numerous changes may be made in the parts, as well as in their combinations and arrangements, without departing from the spirit and full intended scope of the invention as defined by the claims hereunto appended.

I claim as my invention:

1. In a Venetian blind assembly, in combination with the slats, a lift rail therefor, a plurality of pulleys and flexible lifting elements operatively connected to the lift rail and operating over the pulleys, said lifting elements consisting of metal wire of stranded type, and being of substantially circular section, irrespective of reasonable twisting or torsional effects, whereby to assure uniform engagement of the wire with the pulleys at all times.

2. In a Venetian blind assembly, in combination with the slats, a pair of vertical rails at opposite sides of the assembly, slat-gliding means associated with the vertical rails, lifting mechanism for the slats, including pulleys and flexible tension members operable over the pulleys, the lifting mechanism being mounted on and carried entirely by the vertical rails, a head rail bridging the vertical rails, and elements connecting

the head rail to the vertical rails, and adapted to permit a limited angular and distance variation therebetween without affecting the lifting mechanism.

3. In a frame structure for Venetian blinds of guided type including a pair of opposed vertical guide rails, a head rail connecting the guide rails, lifting means carried by the guide rails, and members connecting the head rail to the guide rails, so as to permit its connection to and removal from the guide rails without affecting the operation of the lifting means, said members being formed to permit an adjustment of the head rail distantly with respect to either of the guide rails.

4. In a Venetian blind of guided type including the slats together with lifting and tilting mechanism therefor, a pair of opposed vertical frame members each constructed to provide therein a pair of channels, one adapted to coact with the slats as a guide groove, and another adapted to house a flexible tension element for lifting the slats of the blind.

5. In a Venetian blind assembly, in combination with the slats, together with tilting and lifting mechanism therefor, a vertical element constituting a guide for the slats, means for adjusting said element in the plane of the window opening to which the blind is fitted, the tilting mechanism including a tilt rail from which the slats are suspended, hangers for the tilt rail and means for adjusting the length of said hangers to effect an angular adjustment of the tilt rail and elements suspended therefrom.

6. In a Venetian blind assembly of guided type, in combination with the slats together with tilting and lifting mechanism therefor, means forming a slat guide, means associated with said guide permitting its adjustment in a vertical plane, the lifting mechanism including a lift rail, a metal tenon on the lift rail, and means associated with the tenon permitting its adjustment endwise of the rail.

7. In a Venetian blind assembly, in combination with the slats and tilting and lifting mechanism therefor, means forming a guide for the slats, means associated with the slat guide permitting its adjustment in a substantially vertical plane, a pair of vertical rails at the sides of the blind assembly, a head rail, a corner fitting connecting each of the vertical rails and the head rail, and means associated with said fastening, permitting a variation in spacing and angularity of the head rail with respect to the adjacent vertical rail.

8. In a Venetian blind assembly, in combination with the slats and lifting and tilting means therefor, the lifting means including a lift rail, a metal tenon at each end of the lift rail adapted for adjustment endwise of the rail to vary the effective overall length thereof, a pair of vertical rails, a head rail connecting the vertical rails, and a fitting connecting each end of the head rail and the adjacent vertical rail, each fitting providing for a variation in spacing and angularity of the head rail and adjacent vertical rail.

9. In a Venetian blind assembly, in combination with the slats together with lifting and tilting mechanism therefor, a pair of vertical rails at opposite sides of the assembly, a head rail connecting the upper end portions of the vertical rails, a connecting member at each end of the head rail and including means permitting a variable distance placement of the head rail

- and associated vertical rail as well as a slight variation in angularity between said rails, said tilting mechanism including a tilt rail, end hangers for the tilt rail, and means associated with said end hangers permitting the location and securement of the ends of the tilt rail at different distances below the head rail.
10. In combination with a Venetian blind assembly of guided type including the slats together with lifting and tilting mechanism therefor, a slat guide, means associated therewith permitting an adjustment of the slat guide in substantially the vertical plane of the window opening, the lifting mechanism including a lift rail, a pair of adjustable tenon elements on the ends of the lift rail, means associated with said tenon elements permitting a variation in their placement endwise of the rail so as to vary the effective overall length of the lift rail, the tilting mechanism including a tilt rail, a pair of independently adjustable hangers for pivotally supporting the ends of the tilt rail and enabling the adjustment thereof to a horizontal position, a pair of vertical rails at opposite sides of the assembly, a head rail connecting the upper end portions of the vertical rails, and a corner connection at each end of the head rail, engaging the adjacent vertical rail, and means associated with each of said connections permitting a variation in rail distance placements, as well as a variation in angularity of the head rail and each of the side rails.
11. In a Venetian blind assembly of guided type, including a plurality of slats, tenons on the ends of the slats, means forming guide grooves for the tenons, the tenons and grooves each being of decreasing width, in a direction from the body of the slat toward the end of the tenon.
12. In a Venetian blind assembly of guided type, a plurality of slats, tenons on the ends of the slats, said tenons being disposed substantially off of the axis or longitudinal median line of each of the slats, and means forming a guide for each set of tenons, the coating guides and tenons being shaped to maintain a substantially uniform operating clearance about the tenons, irrespective of the angle of tilt of the slats.
13. In a Venetian blind assembly of guided type, a plurality of slats, tenons on the ends of the slats, said tenons being formed integrally with the slats, and disposed substantially off of the axis or longitudinal median line of each of the slats, and means forming a guide for each set of tenons, the coating guides and tenons being shaped to maintain a substantially uniform operating clearance about the tenons, irrespective of the angle of tilt of the slats.
14. In a Venetian blind assembly of guided type, in combination with the slats, tenons on the ends of the slats, means forming guide grooves for the tenons, lifting means for the slats including a pair of oppositely disposed flexible tension elements located beyond the ends of the slats, the tenons being located beyond or offset from the axes or longitudinal median lines of the slats, and the flexible lifting elements being arranged to operate in a plane beyond said median lines of the slats.
15. In a Venetian blind of guided type, including a plurality of slats and tenons on the slats, a stationary guide element for the tenons and a projection on said guide element presented toward the center of the blind, and adapted to be overlapped by the slats when in fully tilted position.
16. In a Venetian blind assembly including a plurality of slats, tenons on the slats, means forming a guide element for the tenons, each of the slats being provided with an undercut or recess portion near at least one of its ends, a strip carried by the guide element adjacent the undercut portions of the slats, and adapted, in certain positions of the slats, to extend into said recess.
17. In a Venetian blind assembly including a plurality of slats, tenons on the slats, said tenons being of tapering width from the body of the slat toward the extremity of each of the tenons, means forming a guide element for the tenons, said guide element providing a groove of tapering width, corresponding substantially to the taper of the tenons engaged thereby, each of the slats being provided with an undercut or recess portion at one of its ends, a strip carried by the guide element adjacent the undercut portions of the slats, and adapted, in certain positions of the slats, to extend into said recess.
18. In a Venetian blind assembly of the guided type, including a plurality of slats, means forming a guide channel for end portions of the slats, lifting means for the slats including a pair of normally vertical flexible tension elements and a lift bar operatively engaged by said elements, the flexible tension elements being arranged to operate in a substantially vertical plane, substantially offset from the longitudinal median lines or axes of the several slats.
19. In a Venetian blind assembly including the slats together with lifting and tilting mechanism therefor, a lift bar constituting an element of the lifting mechanism, means forming a guide groove near each end of the lift bar, a tenon member carried by each end of the lift bar, and means associated with the tenons and bar, permitting an adjustment of the tenon member in a direction endwise of the bar.
20. In a Venetian blind assembly including the slats, lifting mechanism therefor including a lift bar, means forming guide grooves for the lift bar, located laterally of the bar and slats, elements carried near the ends of the bar, and each projecting into one of the guide grooves, resilient means tending to urge said elements into an extended relation endwise of the bar, and flexible lifting members operatively connected with said elements, for lifting the bar, and arranged, when under tension, to maintain the elements into a relatively retracted and operative relation with respect to said grooves.
21. In a Venetian blind assembly including the slats and lifting mechanism therefor including the lift bar, means forming guide channels for the lift bar, elements pivotally mounted near the ends of the bar and each projecting into one of the guide channels, spring means tending to urge said pivoted elements about their pivots into a relatively extended relation and into engagement with wall portions of the guide channels whereby to support the bar therein, and flexible lifting members operatively connected with said elements and coating therewith for lifting the bar, said lifting members being arranged, when under tension, to maintain the said elements in a relatively retracted position against said spring means, and in a position such that said elements will coact as tenons in guided relation to said channels.
22. In a Venetian blind assembly including the slats, and lifting mechanism therefor including a lift bar, means forming guide grooves for the lift bar, elements carried near the ends of, and endwise adjustable with respect to the bar, and each projecting into one of the guide grooves, spring

means tending to bias said elements into an extended relation endwise of the bar, irrespective of their adjusted securement thereto, and flexible lifting members operatively connected with said elements for lifting the bar, and arranged when tensioned, to maintain said elements in a relatively retracted and operative relation with respect to the grooves in which the elements operate.

23. In a Venetian blind assembly of guided type, including the slats and actuating mechanism therefor, a stationary, substantially vertical rail near one side of the assembly, adapted to be secured within a window opening to which the blind is fitted, a grooved member carried by the rail and coacting with the slats in guiding relation thereto, and means for adjusting different portions of said groove member into and out of parallelism with respect to said rail.

24. In combination with a Venetian blind assembly of guided type including the slats and lifting mechanism therefor, a vertical rail secured at one side of the blind and provided with a groove, and a grooved member extending into the groove of the rail, and providing a slat-guide channel, said grooved member being adjustable depthwise with respect to the groove in said rail.

25. In combination with a Venetian blind assembly of guided type including the slats and lifting mechanism therefor, a vertical rail secured at one side of the blind and provided with a groove, and a grooved member extending into the groove of the rail and providing a guide channel for the blind, said grooved member being adjustable depthwise with respect to the groove in said rail, the grooved member being laterally resilient and approximating in width, the width of the groove in the vertical rail, whereby said member is compressible into the rail groove in variable angular relations to the rail.

26. In combination in a Venetian blind assembly of guided type, a vertical rail at one side of the assembly, provided with a longitudinal recess, and an elongate metal member of channel section, so disposed that its channel will guidingly engage an end portion of the slats, and means spaced along the metal channel member for positively securing its different zones in predetermined angular relation with respect to the vertical rail.

27. As an article of manufacture, a metal guide element of channel section adapted for use in guidingly engaging the end of slats of Venetian blinds, the element being characterized by a pair of oppositely disposed substantially parallel side members, and an intervening tapered-channel forming portion.

28. As an article of manufacture, a channeled strip formed of metal for guidingly engaging the end portions of the slats of Venetian blinds, the strip being characterized by a channel which is symmetrical in transverse section, and a projection from said channel forming portion, extended in a direction toward the center of the associated blind, and adapted to be overlapped by portions of the slats when tilted, so as to provide a light-seal therewith, in the end zones of the slats.

29. As an article of manufacture, a channeled aluminum strip adapted for mounting in a substantially vertical position for guiding coaction with the ends of Venetian blind slats, the strip including a plurality of apertured lateral projections, a screw element extended through the aperture of each projection, the screws each having an annular groove so as to provide an un-

threaded portion operable within the associated projection and engaging its opposite sides for adjusting movement, whereby the strip may be adjustably secured with its different zones in different angular relation to the adjacent portion of the vertical rail or the like.

30. In combination with a Venetian blind assembly, together with the slats and tilting mechanism therefor, including a pivoted tilt bar, an anchorage plate, a plate for supporting the tilt bar, and means for securing said plates in predetermined, variable spaced relations.

31. The combination in a Venetian blind together with the slats and tilting mechanism therefor, including a pivoted tilt bar, an anchorage plate for supporting the tilt bar in pivoted relation, and including a flat member for securement to a supporting surface above the bar, a depending leg carried by said flat member and provided with a plurality of vertically spaced apertures, a support plate for the pivot forming structure and tilt bar, and means on said support plate for selective engagement with said apertures, whereby to provide a variation in vertical spacing of the support plate and the overlying support.

32. An adjustable hanger for the tilt bar of a Venetian blind assembly, including a pair of L-shaped elements each comprising a normally horizontal leg and a normally vertical leg, the horizontal legs adapted respectively for securement to an overlying horizontal support, and for a pivot-forming structure carrying the tilt bar, one of the vertical legs being provided with a plurality of vertically spaced apertures, and a pivotally-mounted pin carried by the other said vertical leg, and adapted selectively for engagement with said apertures to provide for a variation in vertical spacing of the horizontal legs, and means associated with at least one of the vertical legs for maintaining them in slidably associated assembly.

33. In a Venetian blind assembly of a type including vertical and horizontal frame elements such as vertical rails and a head rail, a fitting for connecting the angularly related frame elements, said fitting including parts forming a pair of substantially rectangularly related seats, the fitting being provided with apertures for fastening means, at least some of said apertures being of elongate form and coacting with the fastening means to enable an adjustment of the fitting, in a direction endwise of one of the frame elements to be secured in assembly thereby.

34. As an article of manufacture, a corner bracket for joining in assembly a vertical rail and a head rail of a Venetian blind frame, said bracket including a pair of substantially rectangularly related elements forming seats adapted at least partially to embrace the ends of the rails to be connected thereby.

35. As an article of manufacture, a corner bracket for joining in assembly a vertical rail and a head rail of a Venetian blind frame, said bracket including a pair of substantially rectangularly related elements forming pockets adapted to embrace the ends of the rails to be connected thereby, at least one of said pocket-forming portions being provided with slotted screw-receiving openings, whereby to permit a variable endwise placement of the fitting with respect to at least one of the rails to be assembled by means of the fitting.