July 23, 1940. F. E. LAWSON 2,209,276

VENETIAN BLIND

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Fig. 1

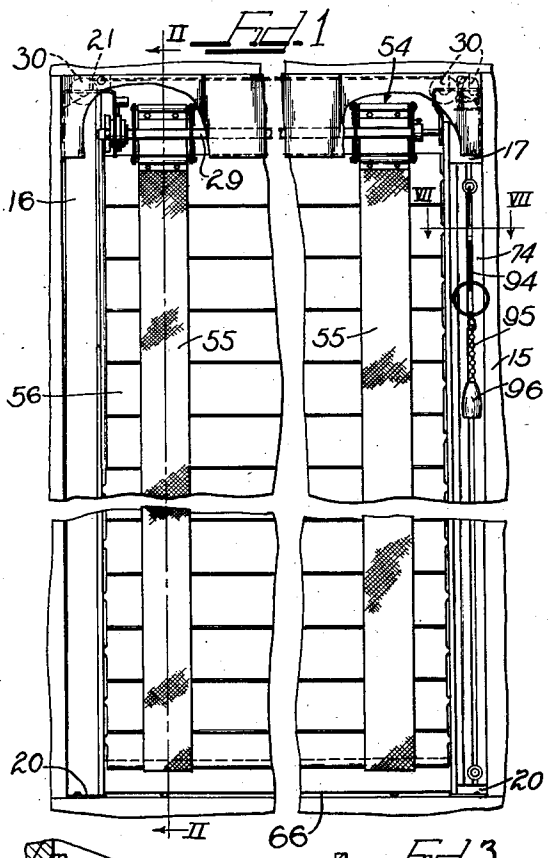


Fig. 2

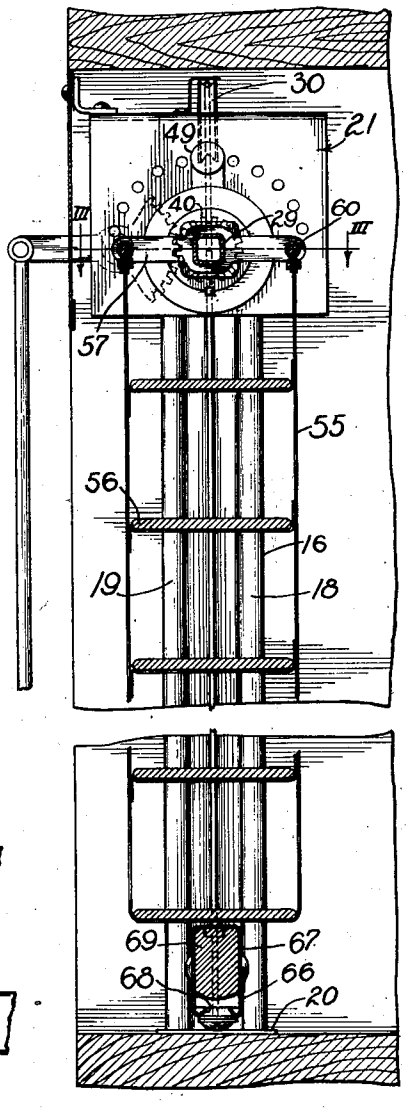
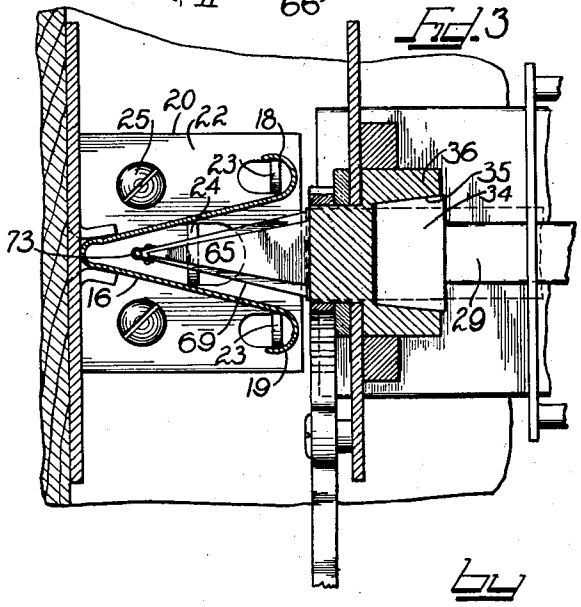


Fig. 3



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Fig. 4

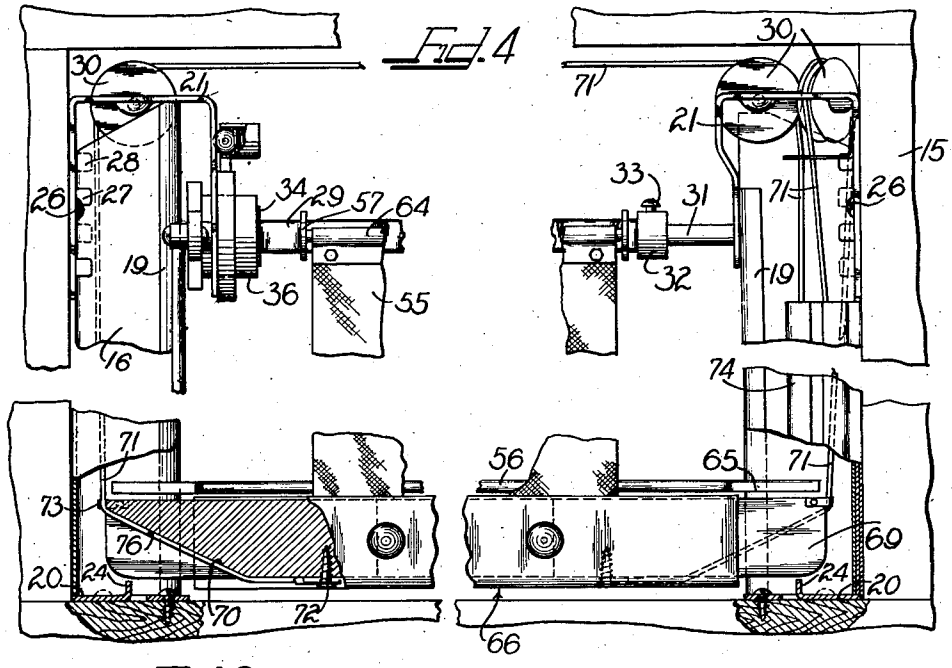
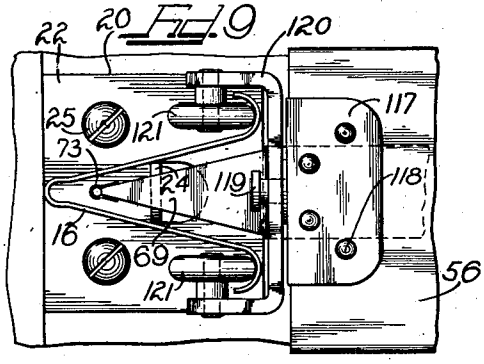


Fig. 9



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Fig. 5

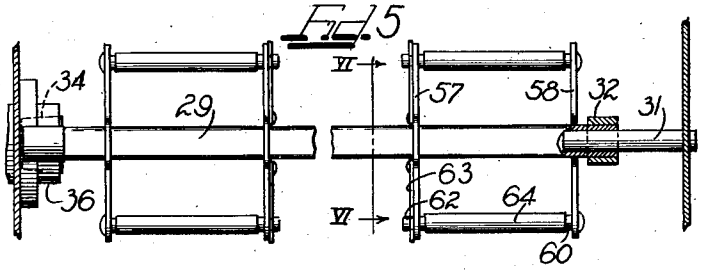


Fig. 6

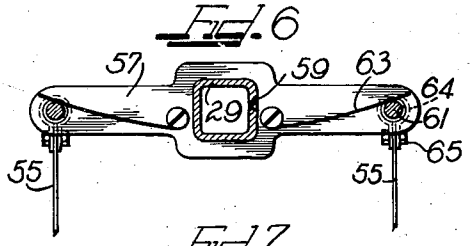


Fig. 8

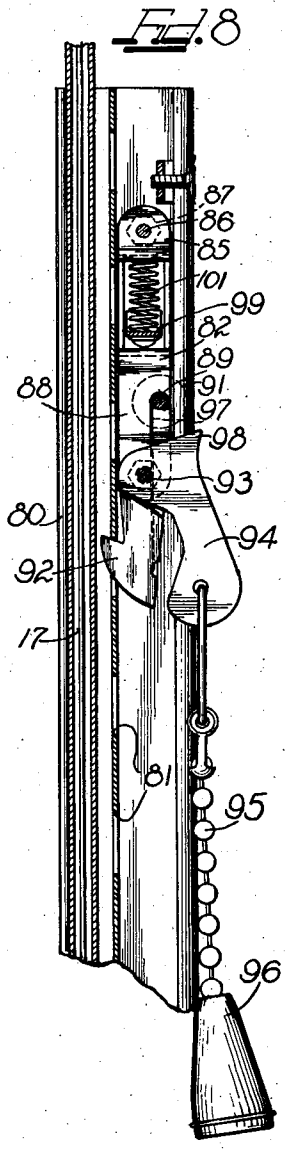
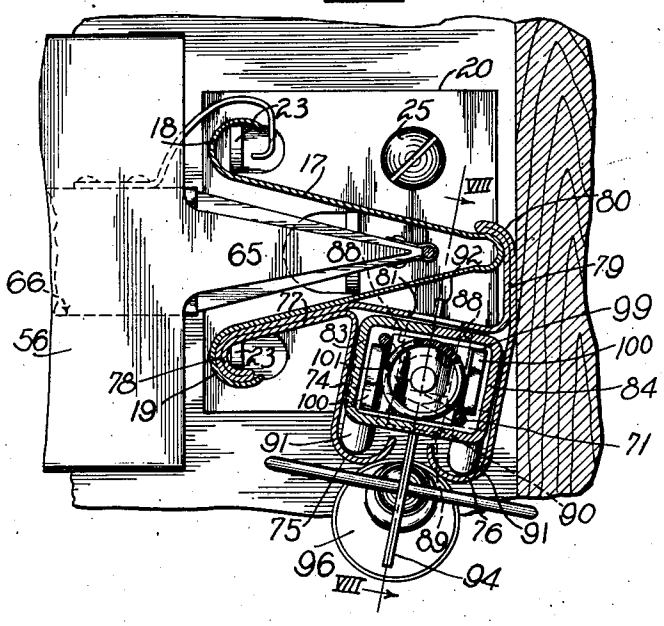


Fig. 7



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UNITED STATES PATENT OFFICE

2,209,276

VENETIAN BLIND

Fred E. Lawson, Detroit, Mich.

Application January 27, 1938, Serial No. 187,114

19 Claims. (Cl. 156—17)

The present invention relates to window blinds or shades, and particularly to devices of the character described, commonly known as "Venetian blinds," wherein a plurality of slats are supported in a manner to enable variation of their relative spacing.

A primary object of the invention is to provide a device of the character described which embodies improved means for raising and lowering of the slats.

Another object of the invention is to provide a device of the character described, wherein the device is supported within a window frame by means of pre-fabricated guide channels which may be cut to desired lengths and supported in position by means of novel end brackets.

Another object of the invention is to provide a novel auxiliary channel section for use in connection with the raising and lowering mechanism, which may be associated with and supported by one of the guide channels without the use of screws or other securing members, and the need of tools for such purpose.

Another object of the invention is to provide an improved lift bar construction embodying novel means for connecting the actuating cables thereto, and means preventing excessive longitudinal tilting thereof, but which will enable easy removal of the lift bar from the guiding channels, when desired.

A further object is to provide improved means for the cushioning of abnormal stresses which might be applied to the raising and lowering mechanism as by suddenly terminating the lowering movement of the blind or endeavoring to start the raising movement of the blind too suddenly.

A further object of the invention is to provide novel means for pivotally associating the ends of the slats with the guiding channels.

A still further object of the invention is to improve devices of the character described in various and sundry details hereinafter referred to and particularly pointed out in the appended claims.

Other objects and advantages of the present invention will more fully appear from the following detailed description taken in connection with the accompanying drawings, which illustrate a preferred embodiment thereof, as well as several variations in construction of detailed parts, and in which:

Figure 1 is an elevational view of a Venetian blind embodying the features of the present invention.

Figure 2 is an enlarged vertical fragmentary sectional view taken through the same substantially on line II—II of Figure 1.

Figure 3 is an enlarged fragmentary sectional view, certain of the parts being disclosed in full lines, taken substantially on line III—III of Figure 2.

Figure 4 is an enlarged fragmentary view having cut away portions disclosing certain details of construction, and showing the cooperative relationship of the means for raising and lowering the blind, and means for tilting the slats.

Figure 5 is an enlarged fragmentary view having cut away portions in section, illustrating the construction of the tilt bar and brackets thereon for connection to the ladder tapes.

Figure 6 is a transverse section of the same, taken substantially on line VI—VI of Figure 5.

Figure 7 is an enlarged fragmentary sectional view through one of the guide channels and the mechanism for raising and lowering the blind, taken substantially on line VII—VII of Figure 1.

Figure 8 is an enlarged fragmentary sectional view of the same, taken substantially on line VIII—VIII of Figure 7.

Figure 9 is an enlarged fragmentary view illustrating the details of modified means for supporting the ends of the slats in relation to the guide channels therefor.

As shown on the drawings:

Referring to Figure 1, the improved blind of my invention is disclosed as being applied to a window frame, generally indicated at 15. It will be understood that this frame is provided with the usual sash, and that this has been omitted for convenience of illustration.

Vertically disposed at the sides of the window frame are guide members 16 and 17 which are pre-fabricated to form V shaped channels, these channels being mounted substantially vertical and having their channel openings facing each other. As shown in Figure 3, it will be noted that the marginal edges of the channels are turned back as shown at 18 and 19.

The guide channels are each supported by a bottom bracket 20 and top bracket 21, these brackets being removably connectible to the associated channel and arranged to be fixedly secured to the window frame and form the sole means for holding the channel in operating position. In other words, the channel may be cut to any desired appropriate length depending upon the height of the window frame, and can be secured in operative position without having to

provide screw holes or the like for securing the channel itself to the window frame.

In the case of a bottom bracket, the bracket is formed from a plate member 22 which is provided with struck-up lugs 23 which are adapted to extend behind the turned edges 18 and 19 respectively of the channel. Substantially at the center of the plate 22 there is provided another struck-up lug, as shown at 24, which is adapted to extend into the end of the channel between the sides thereof. By making this lug of sufficient width to engage the respective sides of the channel, the channel will be held against lateral movement away from the side of the window frame, and the lugs 23 will retain the channel against movements in the opposite direction. The bracket is secured to the bottom of the window frame by means of screws 25 which extend through appropriate openings in the plate.

The bracket at the top end of the guide channel is substantially U-shaped, one leg of the bracket being secured as by screw 26 to the side of the window frame. This leg is provided with a series of spaced apart struck-up lugs 27 and 28 adapted to receive the top of the V-shaped channel therebetween so as to hold it against lateral movements. The other leg of the U-shaped bracket is disposed inwardly of the guide channel and is utilized as a pivotal support for a tilt bar 29 as will hereinafter be more fully described. The base portion of the bracket, this portion being disposed uppermost, serves as a mounting for a suitable pulley or pulleys 30 to be used in connection with the cable connection to the actuating mechanism. This base portion is also provided with struck-down lugs for association with the turned edges of the guide channel at is uppermost end.

The tilt bar 29 is of tubular construction and is pivotally mounted for swinging movement on the innermost legs of the top U-shaped brackets 21. This bar, at its right end, is provided with a telescopically associated extension 31 which is axially adjustable in the tubular member 29, so that the bar may be adjustably lengthened or shortened. The member 31 is held in adjusted position by a collar 32 arranged to fit over this end of the bar, this collar having a set screw 33 arranged to threadedly engage the bar and abut at its inner end against the member 31.

The other end of the bar 29 has affixed thereto a tapered collar 34 adapted to be disposed in an appropriate socket 35 formed in a rotatably mounted socket member 36 supported on the innermost leg of the U-shaped bracket associated with the left guide channel, as shown in Figure 4.

With the arrangement just described, it will be apparent that the tilt bar may be easily removed simply by loosening the screw 33, whereupon the member 31 may be retracted from a normal supporting position with its outermost end disposed in a suitable opening in the right hand top bracket. As soon as the bar is shortened by retracting the member 31, the bar may be shifted to the right so as to withdraw the collar 34 from its associated socket in the member 36, thereby enabling the tilt bar to be readily removed.

A pair of brackets, generally indicated at 54, are carried by the tilt bar 29. These brackets are respectively connected to ladder tapes 55 of usual construction arranged to support a plurality of slats 56 in the usual manner.

As more clearly shown in Figures 5 and 6, each of these brackets comprises a pair of arms 57 and 58 which are respectively apertured intermediate their ends as shown at 59 to receive the bar therethrough. The arm 58 is secured tightly to the bar 29 in any suitable manner, whereas the arm 57 is supported for sliding movement on the bar 29.

Each end of the arm 58 carries a pin 60 which extends at right angles to the arm and has one end fixedly secured thereto. The arm 57 is apertured as shown at 61 to receive the free end of the pin, this end of the pin being provided with a circumferential groove 62 which is adapted to receive a spring 63 therein for latching the pin against removel from the arm 57.

The uppermost ends of the ladder tapes are respectively secured to the pins 60 lying on opposite sides of the bar 29 by means of metal ears or clips 64 which are secured to the ladder tape as by rivets 65 and define tubular portions at the end of the ladder tape adapted to receive the pin therethrough and form a pivotal connection to the tape. With this arrangement, it is a very easy matter to disconnect the ladder tape and the supporting bracket, this being accomplished simply by releasing the ends of the pins which are engaged by the springs 63, whereupon the arms 57 and 58 may relatively be moved away from each other to free the ends of the pins and permit the ears 64 to be axially removed from the pins.

Although I have shown a particular manner of latching the ends of the pins relative to the arm 57, it will be appreciated that other types of latches or other means may be utilized for this purpose, without departing from the scope and spirit of the invention.

Each end of the slats is provided with a centrally disposed pointed end projection 66 which is adapted to extend into the associated V-shaped guide channel. These end projections retain the slats against lateral displacement, permit their being readily tilted, and maintain the slats in vertical alignment during raising and lowering movements.

Raising and lowering of the slats is accomplished by means of a lift bar, generally indicated at 66, which is disposed below the lowermost slat of the blind. As shown in Figure 2, the lift bar comprises an inverted U-shaped channel 67 having its edge margins inwardly turned as shown at 68.

Inserted in each end of the lift bar is a plug extension 69 which may be of wood or any appropriate material. The projecting end of this plug is tapered similar to the projecting portions at the ends of the slats so as to fit the associated guide channel. This plug at its projecting end is provided with an inclined downwardly opening groove 70 which terminates at its uppermost end adjacent the upper surface of the plug and at its lowermost end adjacent the lower surface of the plug, and forms a passageway for a flexible connection 71, in this instance, a flexible cable. The end of this cable is anchored at the bottom of the lift bar as by a screw 72. Where the cable passes around the upper end of the groove at the upper surface of the lift bar, the cable is retained by means of a clip as shown at 73.

With the foregoing arrangement, although the end of the cable 71 is secured at the bottom of the lift bar, the pulling forces are in effect applied at the top of the bar so that the weight of the bar will tend to maintain the bar in vertical position. The cables at each end of the lift bar are carried through the guide channels and over

pulleys 30 where they are connected to the mechanism for raising and lowering of the slats.

The mechanism for raising and lowering of the slats embodies an auxiliary U-shaped channel 74 which is associated with one of the guide channels, in this instance the right hand guide channel. The auxiliary channel 74 is supported with its open side facing the inside of the window, and the channel edges are deflected to form inwardly extending turned lips 75 and 76 having their innermost edges spaced apart as shown.

For mounting this channel in position, the material at the left bottom corner, as shown in Figure 7, is extended to form a lateral flange 77 having a turned back outer edge margin 78 adapted to fit into nested relation with the turned edge 19 of the guide channel.

The other bottom corner of the channel has the material thereof extended to form a rearwardly projecting flange 79 which is in abutting engagement with the adjacent window frame and at its edge is curved as shown at 80 to extend around the base of the V-shaped guide channel. It will be evident that with this arrangement, when the associated guide channel is secured in position by means of the top and bottom brackets, previously described, the auxiliary channel will be securely held in place. Moreover, with this construction, it is not necessary to use any tools for connecting the auxiliary channel to the guide channel, nor are any securing members such as screws, rivets, etc., necessary.

The base portion of the auxiliary channel is provided with a plurality of aligned spaced openings 81 throughout its length.

Mounted within the channel for longitudinal movement therein is a carriage assembly generally indicated at 82. This carriage comprises a box-like housing formed of two sections 83 and 84 which are secured together in confronting relation by means of integrally formed upwardly extending lugs 85 on the respective sections. When the sections are properly assembled, the lugs 85 are in surface engagement and may be secured together by a suitable bolt 86 and nut 87. Extending downwardly from each section is an arm 88, these two arms of the two sections being in spaced apart relation as shown in dotted lines in Figure 7. These arms form a support for an axle 89 having contracted end portions to define shoulders 90 for abutting the arms 88, when the ends of the axle are extended through suitable apertures in the arms. This axle has mounted on its ends outside of the arms 88 wheels 91 which are adapted to run along the inturned marginal edges of the auxiliary channel and enable easy movement of the carriage along the channel.

Swingably mounted between the arms 88 at their lowermost ends, as shown in Figure 8, is a latch member 92 in the form of a ratchet which is adapted to extend into the openings 81 and normally prevent movement of the carriage in an upward direction, but enable movement of the carriage in a downward direction. The latch 92 is pivotally mounted at its uppermost end on a bolt 93. Swingably mounted on this same bolt is a trip lever 94 which is connected to the latch 92 so that the lever and latch will be moved together when the lever 94 is actuated. The lever 94 extends between the inturned edges of the auxiliary channel and projects to the outside thereof. Secured to the projecting end of the actuating lever 94 is a flexible pull cord or chain 95 having a suitable knob 96 at its free end by means of which the operator may easily grasp the pull chain for actuation of the lever 94.

The latch member 92 is normally moved in a clockwise direction to latching position by means of a suitable spring 97.

The latch member 92 may be rotated in a counter clockwise direction to release it relative to the openings in the bottom of the auxiliary channel simply by an outward pull on the pull chain 95. This movement of the latch and actuating lever is limited by a projecting portion 98 formed on the actuating lever and adapted after predetermined movement of the lever to strike the axle 89 which extends between the two arms 88—88.

With the latch member 92 in released position, the carriage may be moved upwardly in the auxiliary channel by swinging the pull chain 95 in an upward direction to apply motive forces which will cause the carriage to move upwardly. In moving the carriage downwardly of the channel, it is, of course, only necessary to exert a downward pull on the pull chain, since the latch will automatically ride over the openings in the base of the auxiliary channel.

The top portion of the housing 84 is provided with suitable openings (not shown) to permit leading of the cables 71—71 thereinto. Inside the housing, a loop in the cable is carried around a nut 99 which is substantially U-shaped with leg portions 100 extending upwardly and operating to guide the nut in up and down movements within the housing. The nut is normally forced downwardly towards the bottom of the housing by means of a spring 101 having its lowermost end engaging the nut and its uppermost end engaging the top of the housing. This spring forms a resilient cushion for any suddenly applied forces which may be affected by starting to raise the blind too quickly or by terminating its lowering movement too suddenly.

From the foregoing description, it will be apparent that it is a simple matter to quickly raise and lower the slats of the blind as rectilinear movements of the carriage will be transmitted to the lifting bar which will be raised when the carriage is moved downwardly, and lowered when the carriage is moved upwardly. Moreover, the blind will be maintained in adjusted position by means of the latch 92 which will positively secure the blind against downward adjustment until such time as the latch is released by proper pull on the pull chain 95.

In the arrangement previously described, wherein the slats are provided with end projections 65, the slat construction enables removal of the slats simply by tilting the slats longitudinally until one of the end projections is disengaged relative to the associated guide channel. The slat may then be withdrawn from the ladder tapes by moving the slat longitudinally. It has been found, however, that in certain installations it may be desirable to still provide for pivotal movements of the slats during tilting thereof, but prevent their being longitudinally tilted to such position that they may be removed. This is accomplished by providing a bracket 117, as shown in Figure 9, which is secured to the slat end by means of rivets 118 or other suitable means. This bracket is provided with a pivot 119 extending from the end of the slat upon which may be pivoted a U-shaped arm 120 which has rotatably mounted thereon at its extremities wheels 121 which are adapted to make surface engagement with the back sides of the outwardly turned lips

or marginal edges of the associated guide channel. This arrangement permits the slats to be tilted as before, and raised and lowered in the usual manner, but will effectively prevent any attempt to longitudinally tilt the slats any appreciable amount.

From the foregoing description, it will be apparent that the present invention provides in a device of the character described improved means for raising and lowering of the slats; a device which includes novel means for supporting the same in a window frame by means of pre-fabricated members which may be cut to desired length and supported in position by means of novel end brackets; which utilizes a novel auxiliary channel section and means for securing this section to one of the guide channels; which includes improved means for supporting the slats; which includes a novel lift bar construction and means for connecting the actuating cables thereto, as well as improved means for preventing excessive longitudinal tilting of the lift bar; which incorporates improved means for cushioning of abnormal stresses which might be applied to the raising and lowering mechanism as by suddenly terminating the lowering movement of the blind or endeavoring to start the raising movement of the blind too suddenly; which pivotally connects the ends of the slats in a novel manner with the guiding channels; and which embodies various and sundry improvements in the details of construction of devices of the herein described character.

It is, of course, to be understood that although I have described in detail several embodiments of my invention, the invention is not to be thus limited but only insofar as defined by the scope and spirit of the appended claims.

I claim as my invention:

1. A window blind construction comprising means supported in a window for raising and lowering movements, an actuating mechanism for said means including a manually operable latch member mounted independently of said means for rectilinear movements, and means connecting said latch member and first means, whereby movements of the former are transmitted to the latter.

2. In a Venetian blind construction, a plurality of slats supported for raising and lowering movements, and ratchet means mounted independently of the blind and operable to raise and lower said slats, said means being freely movable in one direction but normally retained against movement in the opposite direction.

3. In a Venetian blind construction, a plurality of slats supported for raising and lowering movements, ratchet means mounted independently of the blind and operable to raise and lower said slats, said means being freely movable in one direction but normally retained against movement in the opposite direction, and means for releasing the ratchet means to enable free movement in both of said directions.

4. In a device of the character described, a plurality of slats supported for raising and lowering movements, a pull member for raising and lowering said slats, and latch means mounted independently of the slats and movable with said pull member adapted to maintain said slats in adjusted positions.

5. In a device of the character described, a plurality of slats supported for raising and lowering movements, means mounted independently of the slats and movable rectilinearly to raise and lower said slats including a latch member, and a pull member for actuating said latch and moving said means.

6. In a device of the character described, a plurality of slats supported for raising and lowering movements, means mounted independently of the slats and movable rectilinearly to raise and lower said slats including a latch member, and a pull member for moving said means, said pull member being connected to the latch member.

7. A device of the character described comprising a plurality of slats supported for raising and lowering movements, a fixedly mounted ratchet, a spring actuated latch member mounted independently of the slats and cooperatively associated for movement along said ratchet, said latch member being normally retained against movement in one direction relative to the ratchet, but free to be moved in the opposite direction, means for actuating the latch member to a position enabling its movement in both of said directions, and means connecting the latch member and slats, whereby the slats may be raised and lowered in response to movements of the latch member.

8. A window closure assembly comprising a blind arranged to be raised and lowered, an elongate member having a plurality of aligned opening spaced longitudinally thereof, a detent having a support mounted independently of the blind and movable along said member for selectively associating the detent with said openings, a flexible connection between said blind and support, whereby movements of the latter are transmitted to the former, and means for manually controlling said detent and moving said support to actuate the blind.

9. A window closure assembly comprising a blind arranged to be raised and lowered, a pull member supported for rectilinear movements, and means for transmitting the movements of said member to said blind, said means including a resilient member for cushioning any suddenly applied forces during the raising and lowering of the blind.

10. A Venetian blind assembly comprising a plurality of slats arranged for raising and lowering movements, a slat guide member, carriage means supported on the guide member independent of the slats for movement along said member, a latch normally enabling movement of the carriage in one direction, but securing it against movement in the opposite direction, means for transmitting the movements of the carriage to said slats, and a pull member for actuating said latch and moving said carriage.

11. A Venetian blind assembly comprising a plurality of slats arranged for raising and lowering movements, a slat guide member, an elongate channel member supported on the guide member, said channel having a plurality of aligned openings spaced longitudinally of its length, a carriage disposed in said channel independent of the slats for movements along said channel, a detent on the carriage movable therewith into selective association with said openings, means including a flexible member for transmitting the movements of the carriage to the slats, and means for manually actuating the detent to released position and moving said carriage.

12. A Venetian blind assembly comprising a plurality of slats arranged for raising and lowering movements, a guide channel for said slats, an auxiliary channel, snap-on means connecting the auxiliary channel and guide channel, a carriage supported for movements longitudinally of

the auxiliary channel, means for transmitting movements of the carriage to the slats, latching means supported on the carriage for movements therewith, and means for actuating said latch and moving the carriage to raise and lower the blind.

13. In a Venetian blind assembly including a plurality of slats arranged for raising and lowering movements; means for mounting the blind in position in a window frame, said means comprising an elongate slat guide channel disposed at one side of the frame in a substantially vertical position, an anchor bracket removably associated with the lower end of said channel and adapted to be secured to said frame, and an anchor bracket removably associated with the upper end of the channel and adapted to be secured to said frame.

14. In a Venetian blind assembly, means for mounting the blind in position in a window frame, said means comprising a pair of laterally disposed channel members opening towards each other, removable anchor brackets at the top and bottom ends of the channels secured to the window frame, said brackets constituting the sole means for connecting the channel to the window frame, a plurality of slats supported from the top anchor brackets, the ends of said slats being in guided association with said channels, and means for raising and lowering said slats.

15. In a Venetian blind assembly including a plurality of slats arranged for raising and lowering movements; guide members respectively associated with the ends of said slats, removably associated end brackets constituting the sole means for securing the guide members, the brackets at the upper end of said guide members constituting supports for said slats, pulleys carried by said latter brackets, and actuating means for raising and lowering said slats, said means including a flexible member trained over said pulleys.

16. In a Venetian blind assembly including a plurality of slats mounted for raising and lowering movements; the combination comprising a V shaped channel forming a guide for said slats, said channel having turned marginal edges, an auxiliary channel having a lateral edge in nested relation with one of the turned marginal edges of the V channel, and a lateral edge extending around the base of the V channel, means for independently securing the V channel in operative position on a window frame, whereby the V channel and window frame cooperate to retain the auxiliary channel against removal from the V channel, and means associated with the auxiliary channel for raising and lowering said slats.

17. In a Venetian blind assembly, a slat guide channel, an auxiliary channel, said channels having parts in overlapping relation, and means for securing the guide channel in operative position on a window frame, said auxiliary channel being retained against movement to a position wherein the overlapping parts of the channels are unlapped, by said window frame.

18. In a device of the character described, a plurality of slats supported for raising and lowering movements, a lift bar, an inclined groove at each end of the bar, said groove opening downwardly and having its upper end terminating at the upper surface of the bar, and its other end terminating at the lower surface of the bar, flexible members having end portions respectively extending through said grooves and secured to said bar, and means including said members for raising and lowering the lift bar.

19. In a device of the character described, a plurality of slats supported for raising and lowering movements, a lift bar, an inclined groove at each end of the bar, said groove opening downwardly and having its upper end terminating at the upper surface of the bar, and its other end terminating at the lower surface of the bar, flexible members having end portions respectively extending through said grooves and secured to said bar, a clip at the upper end of each groove for retaining the associated flexible member therein, and means including said members for raising and lowering the lift bar.

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