

Oct. 9, 1945.

A. LISTER-TORSEN

2,386,695

WINDOW BLIND

Filed Oct. 21, 1944

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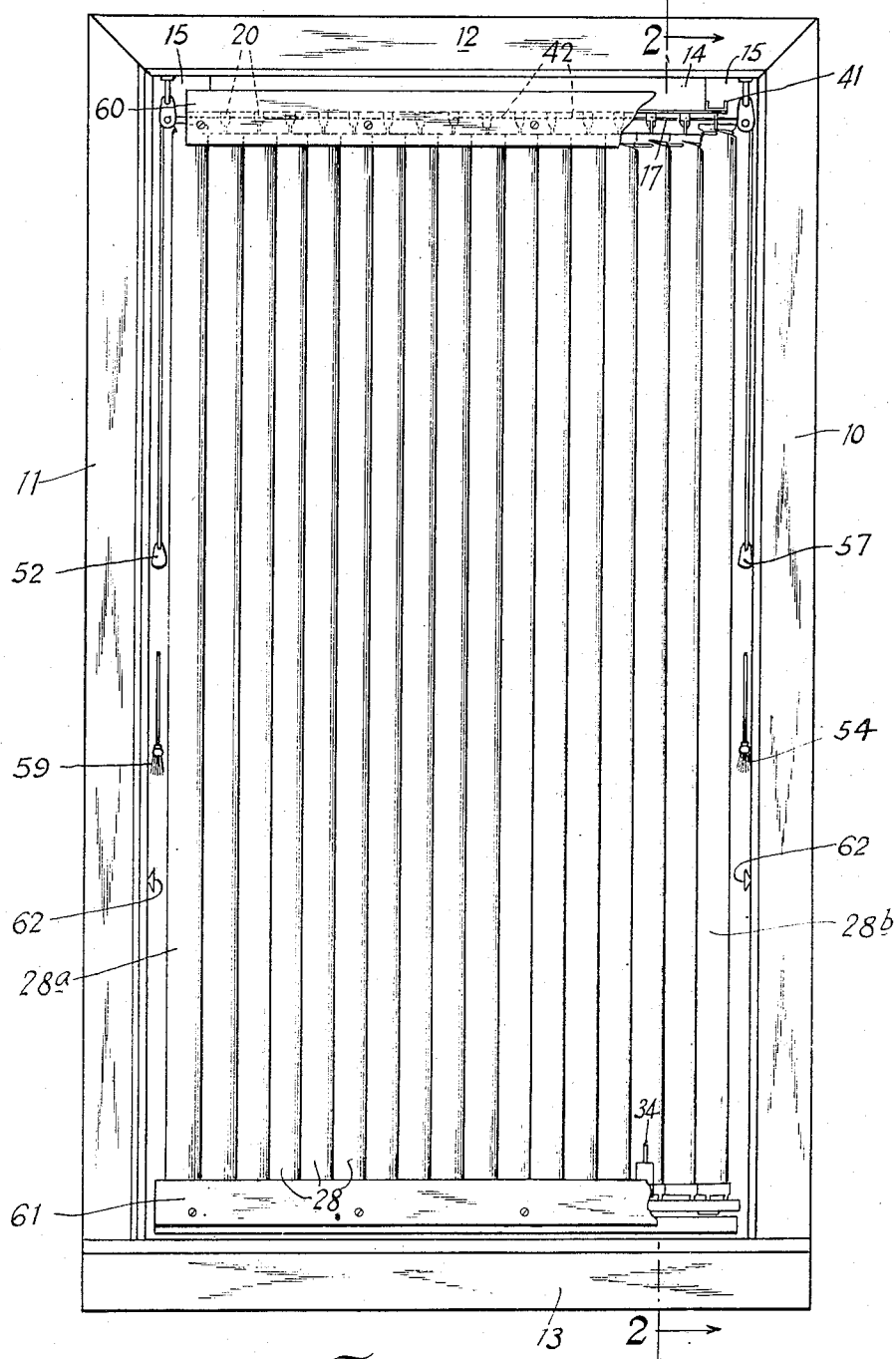


Fig. 1

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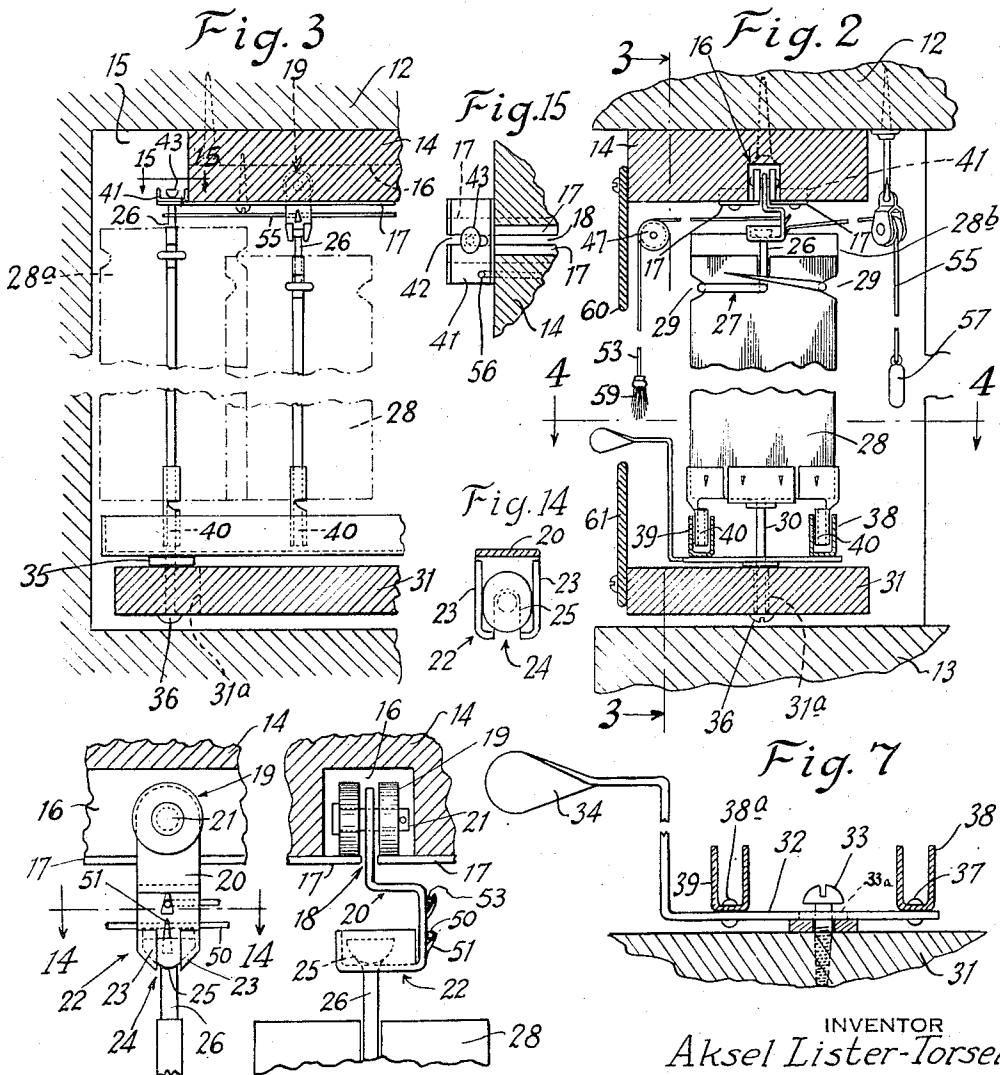
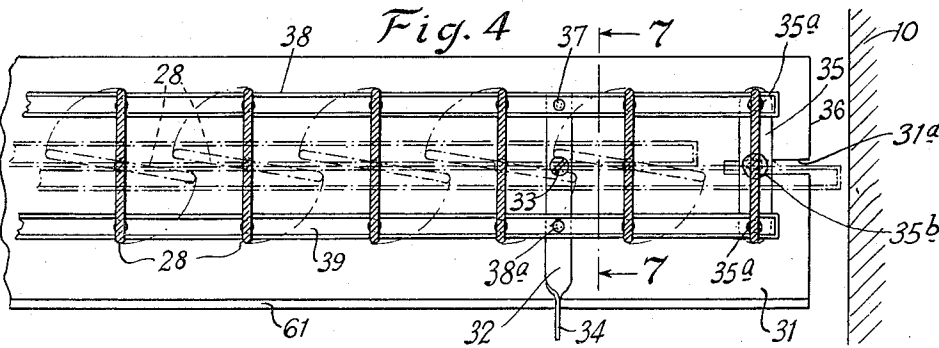
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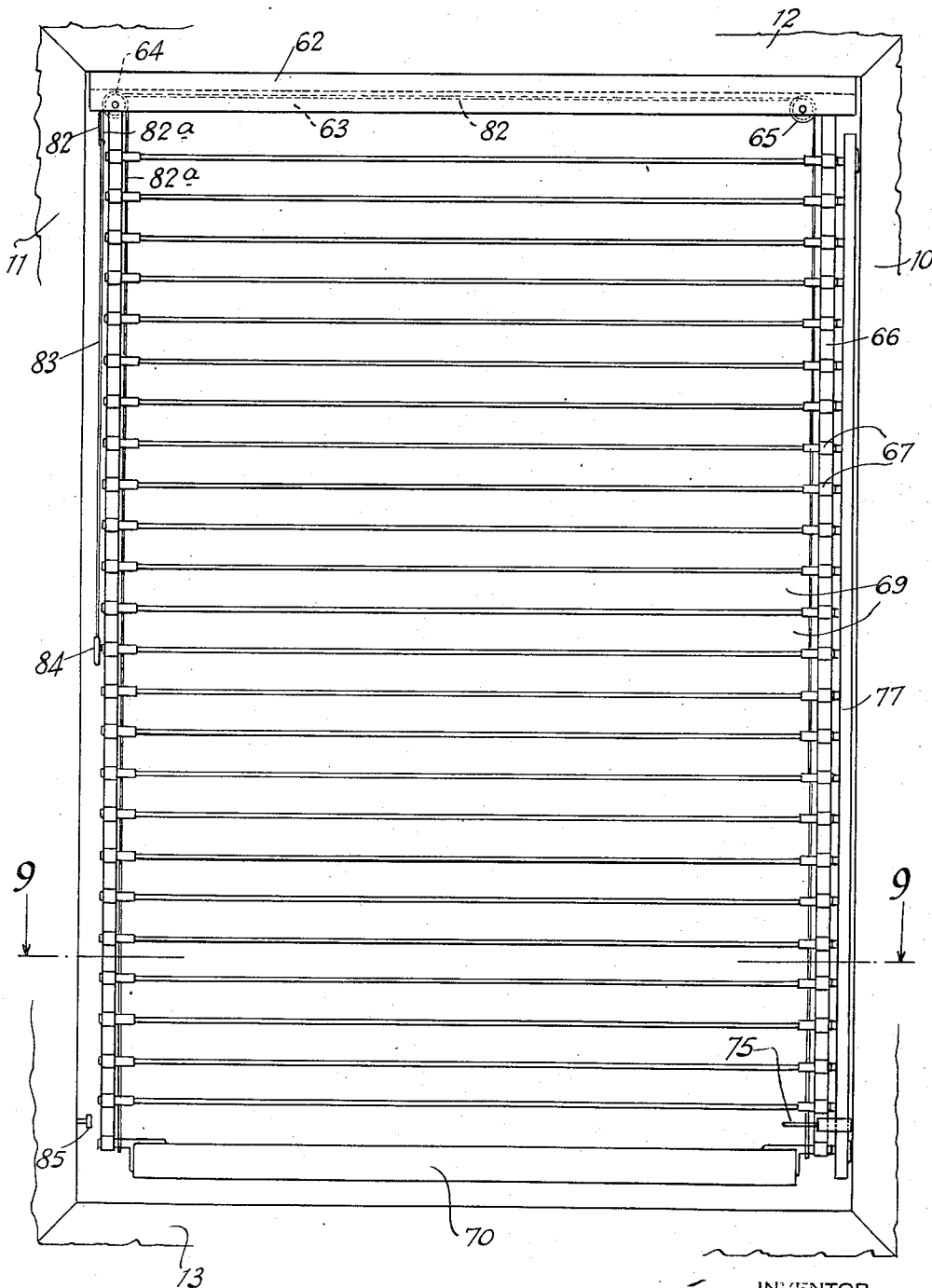


Fig. 8

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Fig. 9

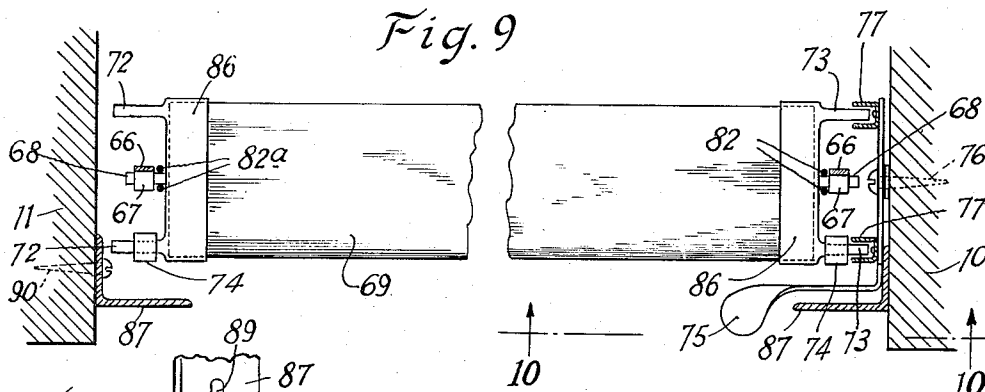


Fig. 13

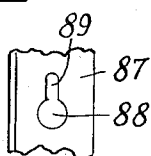


Fig. 10

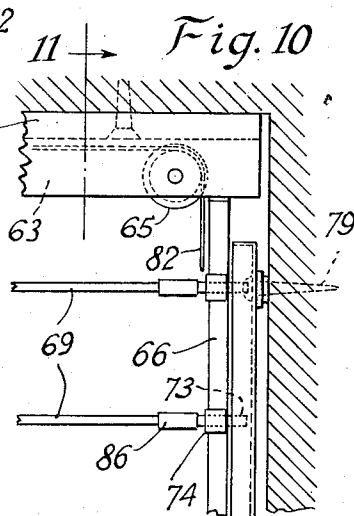


Fig. 12

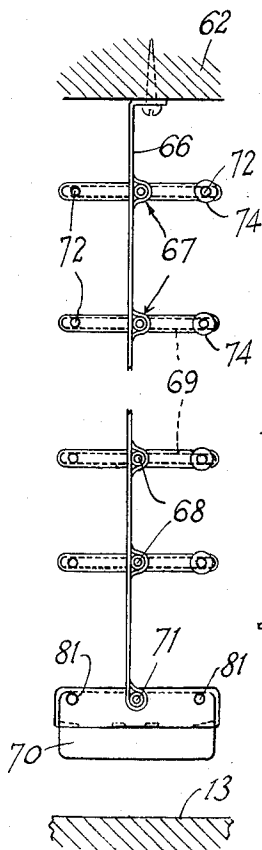
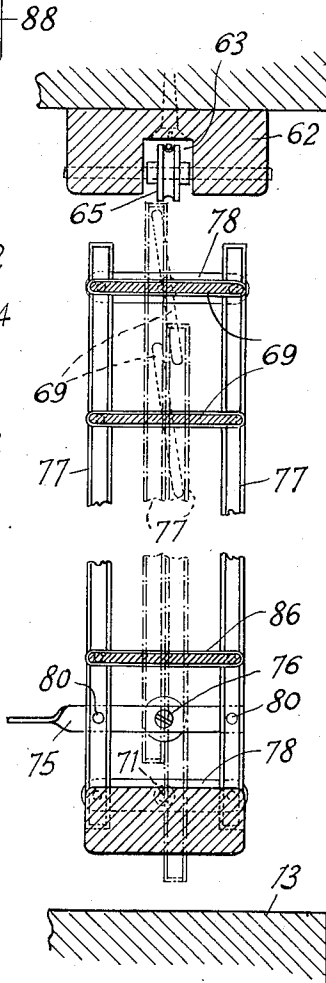


Fig. 11



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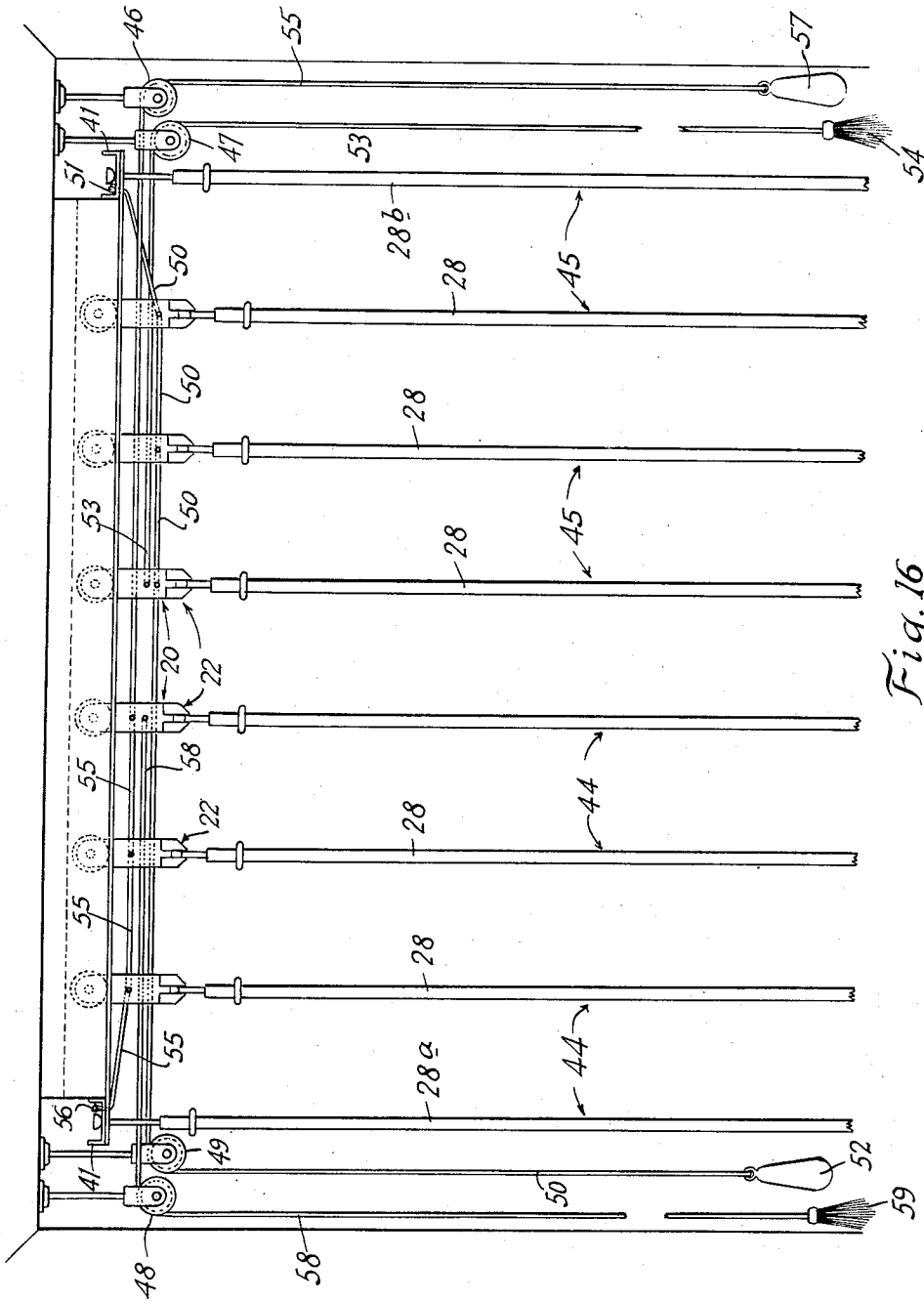


Fig. 16

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UNITED STATES PATENT OFFICE

2,386,695

WINDOW BLIND

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Application October 21, 1944, Serial No. 559,690

6 Claims. (Cl. 160—172)

This invention relates to window blinds of the pivoted slat type, known as Venetian blinds when the slats are horizontal and as Tunisian blinds when the slats are vertical, and aims to provide various novel features embodying improvements in the construction and operation of such blinds. Among such improvements may be mentioned, briefly, the means for swinging the slats synchronously on their axes to increase or decrease the light passage space between the slats, the means for and manner of moving all of the slats out of the window space against the sides of the window frame in the case of the Tunisian blinds, and means involved in the construction of the blinds whereby any one or more slats may be removed for the purpose of repair or cleaning.

The above general as well as additional and more specific objects of the invention will be set forth in the following description, wherein characters of reference refer to like-numbered parts in the accompanying drawings. It is to be understood that the drawings are intended for the purpose of illustration only, and it is neither intended nor desired to limit the invention necessarily to the specific details of construction shown excepting insofar as they may be deemed essential to the invention.

Referring briefly to the drawings:

Fig. 1 is a front elevational view, with parts broken away, of a window equipped with Tunisian blinds.

Fig. 2 is a broken sectional elevational view taken on the line 2—2 of Fig. 1.

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

Fig. 4 is a partial sectional view taken on the line 4—4 of Fig. 2.

Fig. 5 is an enlarged fragmentary view of a portion of Fig. 2.

Fig. 6 is a side view of Fig. 5.

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 4.

Fig. 8 is a front elevational view of a window equipped with Venetian blinds.

Fig. 9 is a broken sectional view taken on the line 9—9 of Fig. 8.

Fig. 10 is a broken sectional view taken on the line 10—10 of Fig. 9.

Fig. 11 is a broken sectional view taken on the line 11—11 of Fig. 10.

Fig. 12 is a side view of Fig. 11.

Fig. 13 is an elevational view of a fragment of the channel concealing members of the Venetian blinds, shown in Fig. 9 in cross-section.

Fig. 14 is a sectional view taken on the line 14—14 of Fig. 6.

Fig. 15 is a sectional view taken on line 15—15 of Fig. 3.

Fig. 16 is a partial reproduction of Fig. 1 on an enlarged scale.

Referring in detail to the drawings, the numerals 10 and 11 indicate the side members and the numerals 12 and 13 the top and bottom members, respectively, of a window frame having Tunisian blinds mounted thereon. Secured against the underside of the top member 12 is a rectangular block 14 of lesser length than the width of the window frame so as to leave a clearance space 15 at each end of the block. This block is provided with an undercut longitudinal groove 16. Secured against the undersurface of the block 14 are a pair of longitudinal plates or strips 17 of metal or other suitable material which project partway over the groove 16 and whose opposed edges are spaced parallel with each other to leave a reduced slot 18 therebetween. A plurality of two-roller trucks 19 are mounted within the groove 16 and ride on the opposed projecting edges of the strips 17. An approximately Z-shaped bracket 20 is suspended from the axle 21 of each truck and a cuplike extension 22 is formed on the lower extremity of the bracket. The extension 22 is integral with the bracket 20 and has a pair of spaced wings or side walls 23 with an entering slot 24 therebetween which also extends partway through the floor of the cup. The substantially semi-ovate head 25 of a vertical pin 26 rests pivotally between the wings 23 with the pin extending downward through the slot 24. From each pin 26 a vertical slat 28 depends. The pin 26 is formed by bending a wire 27 around the end of the slat, as shown in Fig. 2, and to prevent the bent wire from slipping the opposed edges of the slat are notched at 29. Thus the slat is rigid with the pin 26 and turns therewith.

Each end slat 28a and 28b has a pin 30 extending from the lower end thereof through a longitudinal end slot 31a in a horizontal rectangular block 31 which is supported or suspended by the heads 36 of the pins 30, the latter being at the same time pivotally and slidably mounted within the end slots 31a. A lever 32 is pivotally mounted by a screw 33 on the upper surface of the block 31 and has a handle 34 extending upward and forward. By means of pivot pins or rivets 37 a channel 38 is supported upon the rear end of the lever 32, and similar pivots 38a support a similar channel 39 on the forward end of the lever.

Above the slots 31a at both ends of the block 31, end links 35 are pivotally secured parallel with each other and with the lever 32, to the channels 38 and 39 by means of rivets or the like 35a similar to the rivets 37 and 38a. Heads 36 on the pins 30 are of smaller diameter than the center holes 35b of the links 35 but of greater diameter than the width of the slots 31a, and these heads provide seats for the block 31 to rest upon.

The two channels 38 and 39 thus comprise the two sides of an elongated parallelogram and the two links 35 the end members thereof, all pivoted at their intersections; and since the lever 32 is also pivoted at its ends to the channels 38 and 39 and is parallel with the end links 35, it is apparent that as the lever 32 is swung in either direction on its pivot 33 the channels will be brought closer together or spread farther apart yet always remain mutually parallel. Cylindrical projections or pegs 40 extend downward from the ends of the lower edges of the slats and register slidably and pivotally, or loosely, in the channels 38 and 39. It is therefore now apparent that swinging of the lever handle as above-mentioned will synchronously swing all the slats on their pivots 30 in the same direction as the lever, either to reduce the light spaces between the slats or to increase the same.

Both extreme end slats 28a and 28b are suspended from cradles 41 supported on the end extensions beyond the block 14, of the strips 17, these cradles having inlet slots 42 in alignment with the slot 18, through which the pins 26 thereof project. Semi-ovate heads 43 thereon, of smaller size than the heads 25, suspend the slat removably in the cradle, as is obvious. It is apparent that the end slats 28a and 28b are readily removable by lifting the heads 43 out of the cradles 41 and their lower end pins 40 out of the channels 38 and 39. Each of the intermediate slats 28 is readily removable by lifting the head 25 out of the cup 22 through passing the stem 26 through the slot 24, and also lifting its lower end pins 40 from the channels 38 and 39.

The manner of tying the slats together for moving them away from the window space so as to open the latter, and vice versa, is illustrated in Fig. 16, wherein, for the sake of simplicity, a smaller number of slats is shown suspended before the window. Where there is an even number of slats, as in Fig. 16, they are grouped into two sets, each one-half of the total number, on either side of the vertical center line of the window, that is, in Fig. 16, there are four slats 44 in the left-hand group and a like number, indicated by the reference numeral 45, in the right-hand group. In addition to the new numerals 44 and 45 indicating the slats of the two groups, the slats also bear the same reference numerals used above, that is, the end slats are indicated by the numerals 28a and 28b, and the intermediate slats by the numeral 28. When there are an uneven number of slats in the window, one group will contain one slat more than the other group.

Suspended from the upper member of the window frame are, on one side, a pair of pulleys 46 and 47, and on the other side a similar pair of pulleys 48 and 49. A cord or the like 50 has its free end 51 secured to the right-hand cradle 41, and is attached at evenly spaced intervals to the inner three slats 45 in any desired manner, such as, for instance, by locking the cord in a pinch finger 51 cut out of the back of the member 20, shown in Figs. 5 and 6. The cord 50 then extends loosely from the innermost slat 45 past the

other slats, 44, over the pulley 49, and down therefrom on the left-hand side of the window, and its free extremity has a weight 52 secured thereto. Thus the slats 45 will always be maintained by the weight 52 in their spread relationship illustrated in Fig. 16. A cord 53 has one end secured in the bracket 20 of the innermost slat 45 and extends past the other slats 45 toward the right, around the pulley 47 and down the right side of the window, terminating in a tassel 54. To draw all the slats 45 against the end slat 28b, the tassel 54 is pulled down, thus also raising the weight 52; hence, when the tassel is unheld or is released, the weight 52 descends and normally holds the slats 45 in the spread relationship shown.

A cord 55 has its left-hand end 56 secured in the left-hand carriage 41, and at the same evenly spaced intervals is attached to the inner three slats 44 and then passes loosely around the pulley 46 and down the right-hand side of the window, having a weight 57 thereon. It is obvious that the weight 57 normally retains the slats 44 in the spread relationship shown. A cord 58 has one end secured to the innermost slat 44 and passes to the left around the pulley 48 and has a tassel 59 at its lower end. By pulling the tassel 59 downward, the slats 44 can obviously be drawn together against the end slat 28a.

It is thus apparent that either the left-hand, the right-hand, or both sides together of the window may be cleared of slats to provide the clear vision through the window that is desired. At the same time the slats may be pivoted on their axes as abovementioned. In order to conceal what might be termed the hardware of the blinds, aprons 60 and 61 may be secured to the blocks 14 and 31, respectively. Means for tying or clamping the tasseled cords to retain them in pulled down positions may be provided on the side members of the window frame in the form of buttons or the like 62.

In the construction for horizontal slats, that is, Venetian blinds, shown in Figs. 8-13, inclusive, a block 62, substantially similar to the block 14, is secured against the upper frame member 12 and has a longitudinal groove 63 open at the bottom. Near the ends of the groove 63 pulleys 64 and 65 are mounted within the groove. At both sides of the window frame, ribbons of flexible plastic material, 66, are secured to the underside of the block 62, and have formed at vertically spaced positions thereon bearing loops 67 in which the pins 68 extending axially from the ends of the blind slats 69 are pivotally supported. A thicker and heavier slat, or block, 70 is similarly supported in the lower extremities of the ribbons 66 on its axial pins 71. Each slat 69 has a pair of like parallel pins 72 extending from one end and a similar pair of pins 73 extending from the other end. The two forward pins, that is, the lower pins 72 and 73 of Fig. 9, are weighted by mounting a sleeve 74 thereon, in order to unbalance all the slats so that when freely suspended they will all tend to have their forward edges (looking into the window from within the house) tilted downward.

A jointed parallelogram arrangement, similar to that previously described in connection with the vertical slats, is here provided against one side wall of the window frame, that is, the side 10 as shown in the drawings. A lever 75, similar to the lever 32, is pivotally mounted against the frame member 10 by means of a screw 76. A pair of horizontally spaced channels 77, similar to the channels 38 and 39, are united at their extremi-

ties by pivoting links 78, similar to the links 35, thereto, to form the jointed parallelogram. The slat pins 73 on that side of the window register in the channels 77, as before. Screws 79 serve as pivotal mountings for the links 78 against the window frame. The ends of the lever 75, which always remains parallel with the links 78, are pivoted at 80 to the channels 77. The bottom block 70 is also provided with spaced pins 81 similar to the slat pins 72 and 73 on both sides, and those on the right-hand side also register in the channels 77. It is apparent that tilting of the lever 75 will cause all the slats 69 to swing synchronously on their pivots. The top slat 69 is not provided with any weights like those shown at 74, nor is the bottom block 70.

A doubled back loop of cord 82 and 82a passes down on each side of the slats and block 70, passing under the pins 71 of the latter and having the pins 68 of the slats between the sides thereof. The former passes over the pulley 65 and then over the pulley 64, and the latter passes over the pulley 64 only. The cords 82 and 82a are then joined to a single cord or rope 83 which may have a ring 84 on its lower end. A pin or other fastening means for the ring or rope 83 is secured against the window frame, as at 85, to secure the cord when the blinds have been raised from the bottom in an obvious manner.

In the above description the pins extending from the end edges of the slats have been stated merely to extend from the slats. Actually, caps of metal or other suitable material such as shown at 86 which have the said pins formed or secured integrally therewith, are locked over the ends of the slats in any desired manner. It is not believed necessary, however, to describe this construction in detail for all the slats and blocks on which it is illustrated, as the principle involved is but one of practical and durable construction. Channels 87 may be mounted on both sides of the window frame to conceal the pinned ends of the slats, if desired, as shown only in Fig. 9. They may be provided with circular openings 88, Fig. 13, having slots 89 extending vertically therefrom and be mounted over the screws 90 in the side frame members, or removed therefrom, in an obvious manner.

The bottom block 70 serves as a weight to normally bring the slats into the window covering position, and also, by virtue of the position of each looped cord 82 and 82a against the ends of the slats, to maintain them in position of vertical alignment. The duplication of the pins 72 on the left-hand ends of the slats 69 and of the pins 81 on the same end of the block 70, is for the purpose of reversibility of the slats endwise if and when desirable. It is obvious that any of these slats may readily be removed for repair or replacement.

Modifications in form and structure may obviously be made without departing from the spirit and scope of the invention.

It is to be noted that the end slot 31a at each end of the block 31 is to be at least twice the length of the normal suspended position of the pin 30 from that end. For, to remove the block 31 from its position of support on the pin heads 36, it is necessary to lift the block off the seats on these heads or at least to reduce the friction of the seats on the heads sufficiently to permit sliding of the block either to the right or to the left a sufficient distance to move either end pin 30 out of its slot 31a and clear of the block 31. Then that end slat can be lifted out of its cradle

41. The screw head 33 holding the lever 32 on the block 31 must have a slightly smaller diameter than the center hole 33a in the lever 32 so that the latter may be raised or slipped off the screw 33. The block is likewise shifted in the opposite direction to release the pin 30 of the other end slat to permit removal of the latter. Since the center hole 35b of each link 35 is larger than the head 36, the end slats may be readily lifted clear of the device. The manner of lifting out the other slats 28 has already been described.

It is further to be noted, from Figs. 5 and 14, that the elongated heads 25 register in their cups 22 in such manner that they are constrained to remain parallel with each other and thereby likewise to maintain their depending slats parallel with each other at all times.

I claim:

1. A window blind comprising a plurality of equidistant parallel slats pivotally suspended from the top of a window frame, said slats having substantially axial pins extending from one end thereof, means positioning said pins in a common plane, a pair of spaced links equal in length pivotally mounted in a plane at right angles to said common plane, the pivot points of said links being positioned substantially midway of their length and in the same plane as said common plane, a lever pivotally mounted substantially in the same plane as said links and parallel therewith and having its pivot point in alignment with said link pivot points, a pair of parallel channel members pivotally mounted on the ends of said links to form a jointed parallelogram, said lever being pivotally joined to said channel members, said slats having pegs extending from one end thereof, said pegs registering loosely in said channel members.

2. In combination with a window frame, a block secured against the upper member of the frame and having a longitudinal groove in the lower surface thereof, spaced strips secured against said surface and projecting over said groove to provide a floor for said groove having a longitudinal slot therethrough, a plurality of trucks mounted on the projecting edges of said strips with their axles at right angles to said slot, brackets pivotally suspended from said axles, slats suspended vertically from said brackets, said slats having equally spaced pegs extending from their lower ends, said strips extending beyond the ends of said block to provide extensions of said floor, additional end slats pivotally suspended from said extensions of said floor and having substantially axial pins extending from the lower ends thereof, a block suspended from said pins and having means providing pivotal connection between said pins and said block, said additional slats having similarly spaced pegs extending from the lower ends thereof, a pair of spaced parallel links pivotally mounted substantially midway of their length on said lower block near the ends of the latter, a pair of spaced parallel channel members pivotally mounted on the ends of said links to form with said links a jointed parallelogram, a lever pivotally mounted on said lower block parallel with said links and having said channel members pivotally secured thereto, and means for drawing said first-named slats away from the window space of said frame.

3. The combination set forth in claim 2, said suspension of said slats from said brackets comprising a cup-like member on the lower end of the bracket, said member having a slot extending through the wall thereof and partway through the floor thereof, a pin extending substantially

axially upward from the slot and having a head thereon, said last-named pin having a lesser thickness than the width of said last-named slot, said pin projecting through said slot in said floor of said cup-like member with said head resting on said floor.

4. The combination set forth in claim 2, said suspension of said slats from said brackets comprising a substantially elongated cup-like member on the lower end of said bracket having a slot extending through the end wall thereof and part-way through the floor thereof, a pin extending substantially axially upward from the slot and having a substantially semi-ovate head thereon, said last-named pin having a lesser thickness than the width of said slot, said pin projecting through said slot in said cup-like member with said head resting on said floor with the longer axis of said ovate head aligned with said last-named

slot, the shorter axis of said head being slightly less in length than the width of said cup.

5. The combination set forth in claim 2, having means for drawing said first-named slats on one side of a vertical line through the window frame against that side of said frame and said first-named slats on the other side of said line against the other side of said frame, and means secured to said slats on each side of said line normally urging the same toward said line.

6. The combination set forth in claim 2, having means for drawing said first-named slats on one side of a vertical line through the window frame toward that side of said frame and said first-named slats on the other side of said line against the other side of said frame, and weighted means secured to said slats on each side of said line normally urging the same toward said line.

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