March 22, 1949. H. J. MACKIN 2,465,246

BLIND

Filed May 16, 1945 4 Sheets-Sheet 1

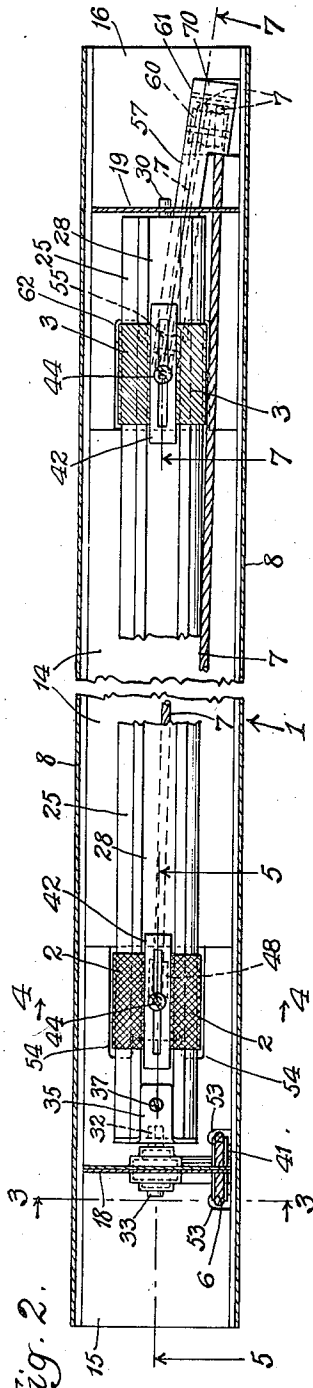


Fig. 2.

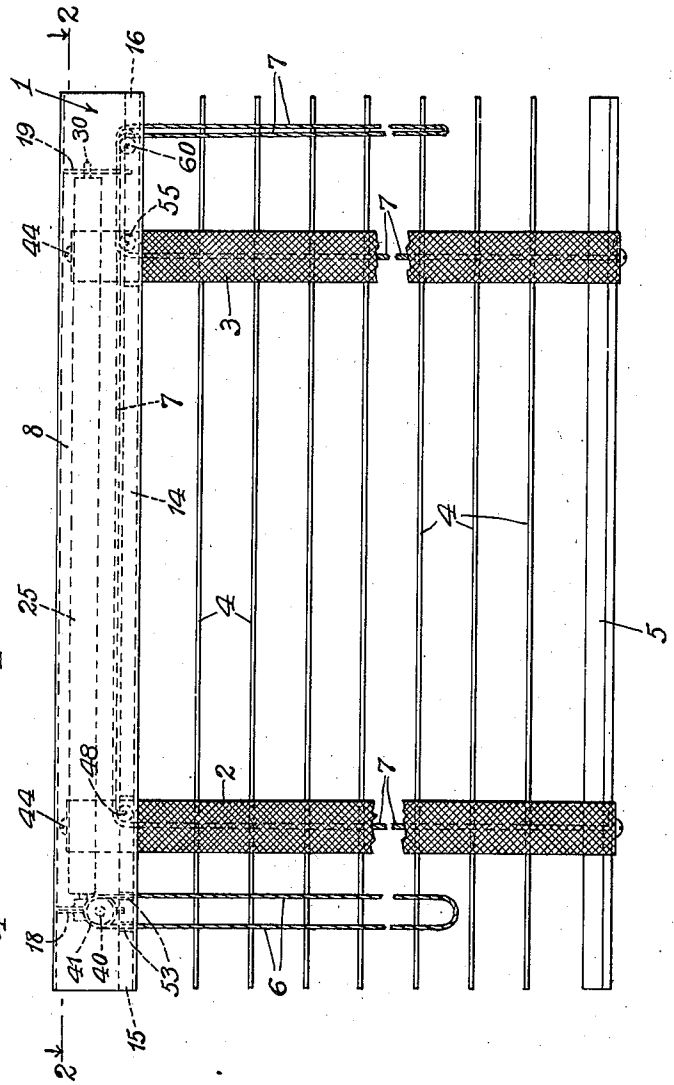


Fig. 1.

Inventor
Henry J. Mackin
by Parker & Carter.
Attorneys.

March 22, 1949. H. J. MACKIN 2,465,246

BLIND

Filed May 16, 1945 4 Sheets-Sheet 2

Fig. 3.

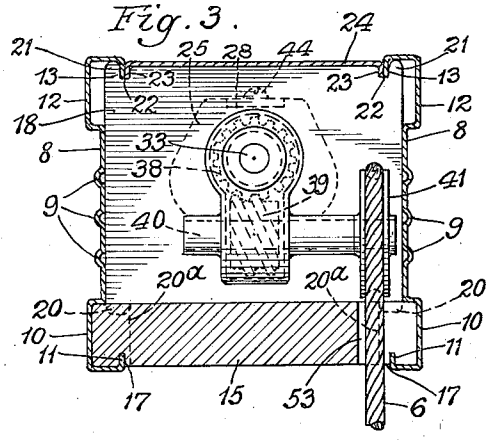


Fig. 4.

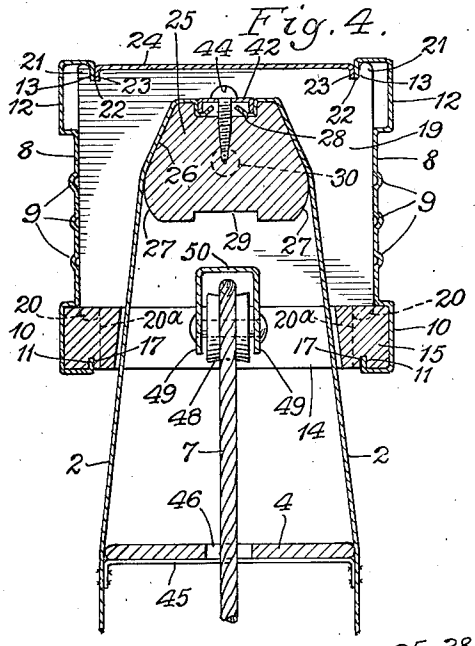


Fig. 5.

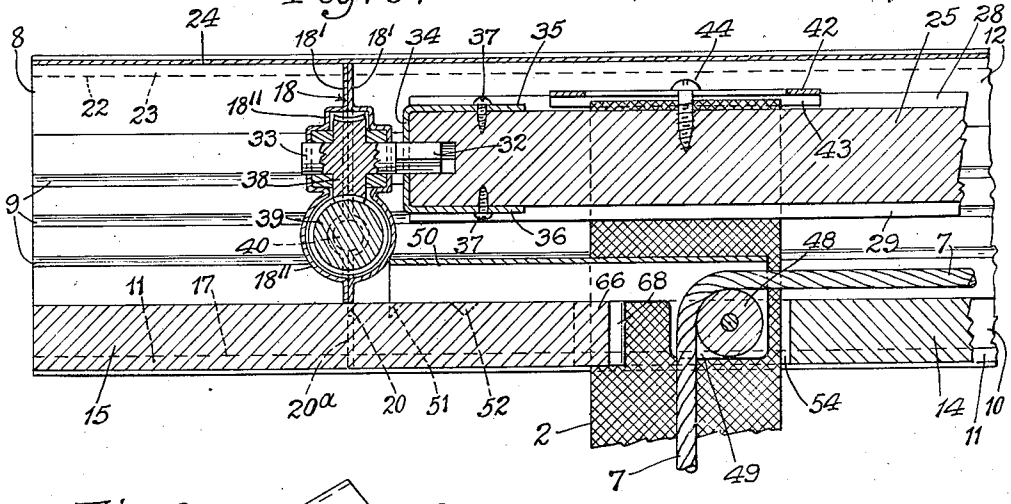
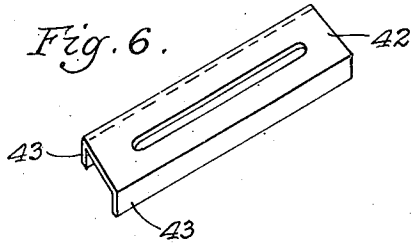


Fig. 6.



Inventor
Henry J. Mackin
by Ralph R. Carter.
Attorneys.

March 22, 1949. H. J. MACKIN 2,465,246

BLIND

Filed May 16, 1945 4 Sheets-Sheet 3

Fig. 7.

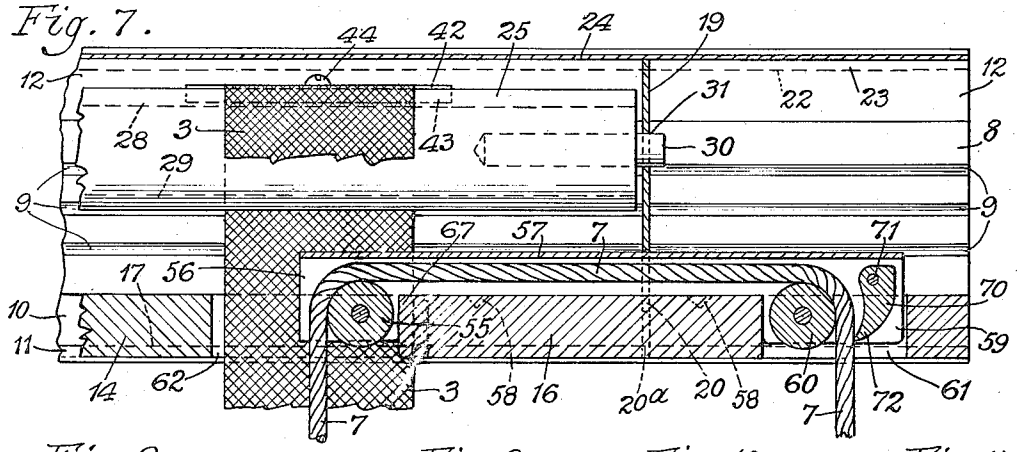


Fig. 8.

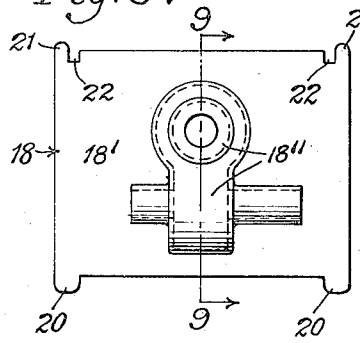


Fig. 9.

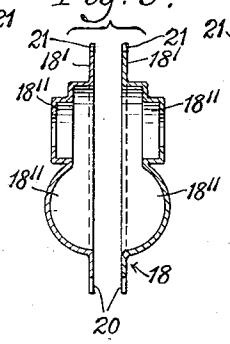


Fig. 10.

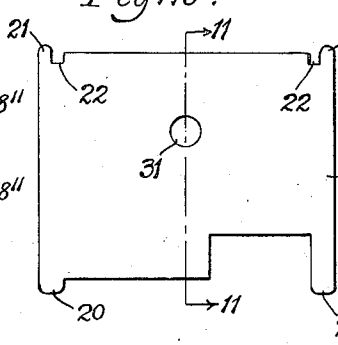


Fig. 11.

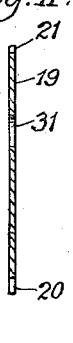


Fig. 12.

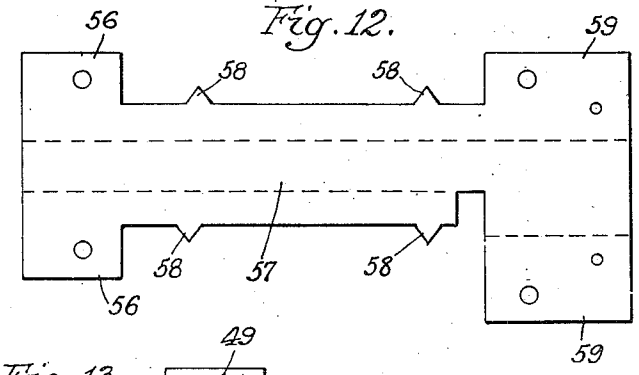
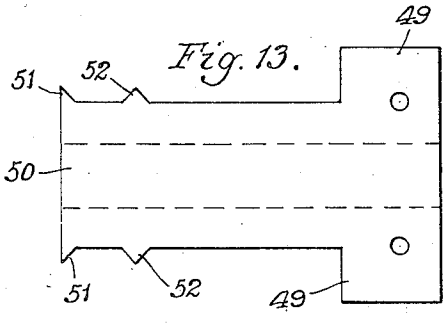


Fig. 13.



Inventor
Henry J. Mackin
by Parker & Carter
Attorneys.

March 22, 1949. H. J. MACKIN 2,465,246

BLIND

Filed May 16, 1945 4 Sheets-Sheet 4

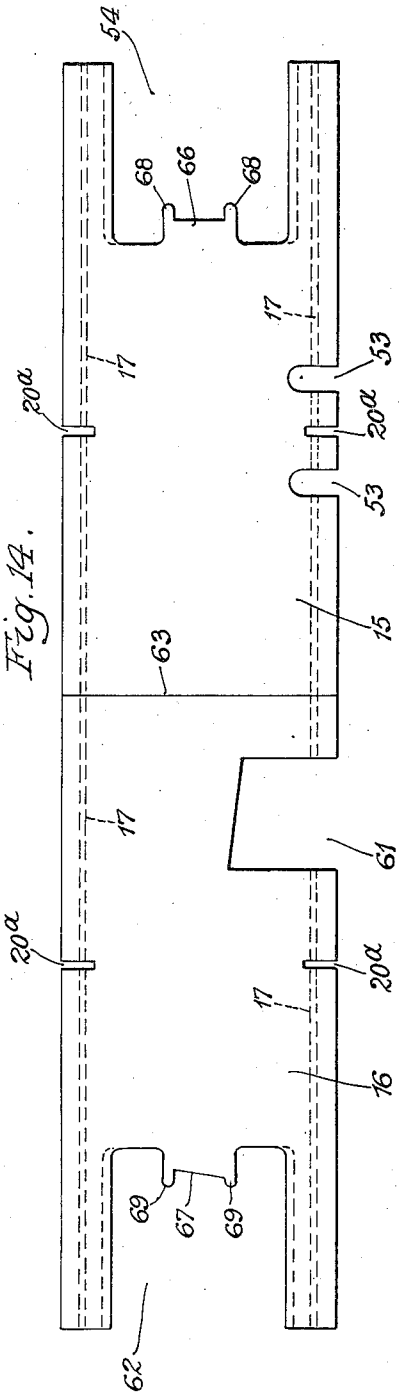


Fig. 14.

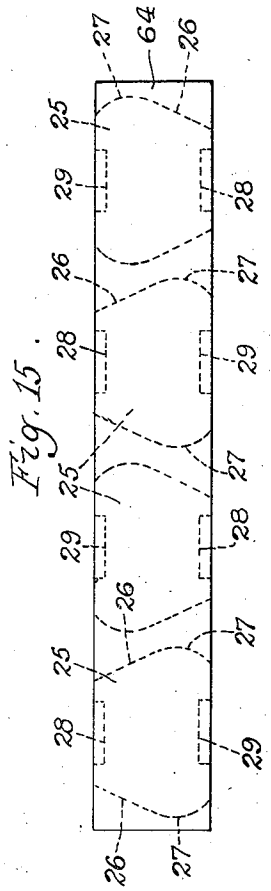


Fig. 15.

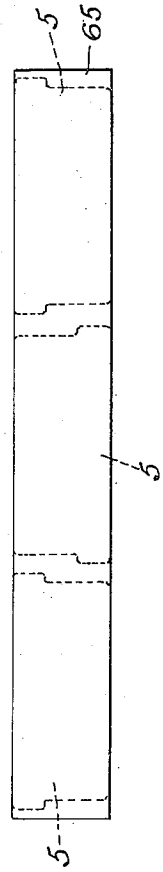


Fig. 16.

Inventor
Henry J. Mackin
by Parker & Carter
Attorneys.

Patented Mar. 22, 1949 2,465,246

UNITED STATES PATENT OFFICE

2,465,246

BLIND

Henry J. Mackin, Kankakee, Ill.

Application May 16, 1945, Serial No. 594,103

14 Claims. (Cl. 160—178)

1

This invention relates to a blind and particularly to the support for a blind. It has for one object to provide a means of making and assembling the box of supporting construction for a Venetian blind, although it is not limited to that particular type of blind.

One object is to provide a method of making a support which is formed of standard pieces of uniform design, which may be separately made and readily assembled.

Another object is to form a support for a blind in which the necessary mechanical means for blinds of any length are carried upon standard supporting parts of uniform length, irrespective of the length of the particular blind in which they are embodied.

Another object is to provide a method for forming a box or support which carries and encloses the necessary supporting and operating means for a blind.

Another object is to provide means for assembling a supporting box for a blind without the use of additional fastening means.

Other objects will appear from time to time throughout the specification and claims.

This invention is illustrated more or less diagrammatically in the accompanying drawings, wherein:

Figure 1 is a side elevation of one form of a blind, showing the box or support in position with parts broken away;

Figure 2 is a longitudinal section taken at line 2—2 of Figure 1 on an enlarged scale;

Figure 3 is a transverse sectional detail taken at line 3—3 of Figure 2 on an enlarged scale;

Figure 4 is a transverse section taken at line 4—4 of Figure 2 on an enlarged scale;

Figure 5 is a longitudinal vertical section taken at line 5—5 of Figure 2 on an enlarged scale;

Figure 6 is a perspective view of one of the tape fastening means;

Figure 7 is a longitudinal vertical section taken at line 7—7 of Figure 2 on an enlarged scale;

Figure 8 is an elevation of one of the bearing supporting members;

Figure 9 is a section taken at line 9—9 of Figure 8;

Figure 10 is an elevation of another bearing supporting means;

Figure 11 is a section taken at line 11—11 of Figure 10;

Figure 12 is a plane view of one of the roller supporting means as blanked out and before shaping for use;

Figure 13 is a plan view similar to that of

2

Figure 12 showing the opposite roller supporting member;

Figure 14 is a plan view of the two bearing supporting members just after formation;

Figure 15 is an end view of a plank from which the rail or roller is formed; and

Figure 16 is an end view of a plank from which the bottom rail of the blind is formed.

Like parts are indicated by like characters throughout the specification and the drawings.

In the particular form here shown the invention is illustrated in connection with a Venetian blind, although it might be used in connection with blinds of another type. As shown in Figure 1, the box or support for the top of the blind is indicated generally by the numeral 1. Pairs of tapes 2 and 3 extend outwardly from the box 1 and are provided with means for supporting slats 4. At their lower ends the tapes are secured to a bottom rail 5. A tilting cord 6 extends outwardly from the box 1 and raising and lowering cords 7 also extend outwardly from the box 1. The construction of the blind is shown generally in Figure 1 and in detail elsewhere.

The box or housing or support construction for the operating and supporting parts of the blind is formed of two preferably identical side members 8, 8. Each side member may be of metal but might be of other material. The side members may be provided with corrugations 9 which serve as stiffening means and also have some ornamental value. Toward the bottom each member 8 is enlarged, as at 10, and is provided with an inwardly turned flange 11. Along their upper edges the members 8 are also enlarged, as at 12, and provided with inwardly turned flanges 13.

The bottom of the box is formed preferably of three pieces. These pieces may conveniently be made of wood. As shown in Figure 2, there is a central floor member 14, a left-hand floor member 15 and a right-hand floor member 16. Each of these members is provided on its lower surface with grooves 17. These grooves, as shown particularly in Figures 3 and 4, receive the flanges 11 of the side plates 8 and thus the floor plates 14, 15 and 16 are interlocked or interfitted with the side members.

The bottom and side members are secured together by two plate-like members 18 and 19. These members are shown in position in Figures 2 to 5, inclusive, and Figure 7, and are shown in elevation in Figures 8 and 10. As shown in those figures, the members 18 and 19, whatever their general shape, are provided on their lower

faces with projecting ear-like members 20 which are received in notches or grooves 20a in the members 15 and 16. The members 18 and 19 are provided in their upper edges with members 21 which are received in the enlargements 12 of the side members and are engaged by the flanges 13. The members 18 and 19 are notched, as at 22, to receive the flanges 13 of the side members 8 and also to receive the flange 23 of a cover member 24 which may be used, if desired. It is shown in position in Figures 3 and 4.

Where the invention is applied to or embodied in a Venetian blind, means must be provided for supporting a tilt rail upon which the tapes are themselves supported. Means must be provided for tilting this rail and for raising the slats. As shown the tilting rail comprises a member 25 which is shaped with sides 26 which flare outwardly and downwardly. These may terminate in rounded portions 27. Longitudinal grooves 28 and 29 are formed, respectively, in the top and bottom of the rail 25. Instead of continuous grooves 28 and 29, shorter depressions might be formed. At one end a pin 30 is positioned in the rail 25 and it is received in a perforation or hole 31 in the member 19, as shown in Figure 7 particularly.

At its opposite end as shown in Fig. 5 the rail receives the squared end 32 of a pin 33. The squared end 32 preferably fits within a correspondingly squared opening in a strap-like member 34 which embraces the rail 25 by means of the portions 35 and 36 which, as shown in Figure 5, fit respectively into the grooves 28 and 29 and are held against displacement by screws 37, or otherwise.

Since only a bearing is required at the right-hand end of the rail 25, the simple pin 30 suffices for that support. At the opposite end means are required for tilting the rail 25. The pin 33 which is fixed against rotation with respect to the rail 25 by the cooperation of the squared portion 32 with the corespondingly squared opening in the member 34 has formed on it a worm gear 38 which meshes with a worm 39 on a shaft 40. At its outer end the shaft 40 carries a grooved pulley 41 over which the tilting cord or cable 6 is positioned.

While many different sorts of bearing housings might be provided for the structure just described, it is convenient to form the member 18 of two complementary sections 18', as shown particularly in Figures 5 and 9. These sections are shaped, as at 18'', to provide suitable cavities for enclosing and supporting the gear 38 on the shaft 33 and the worm 39 on the shaft 40. Obviously the invention is not limited to these details and the worm, the worm gear and the shaft might be otherwise supported without departing from the spirit of the invention.

The slats of the blind are supported by means of tapes 2 and 3, as above mentioned. The tapes 2 are shown generally in Figure 1 and in detail in Figure 4. They are positioned about the rail 25 and their upper ends are engaged under the fastening member 42, which is shown in elevation in Figure 6 and generally in Figures 4 and 5. This member is positioned with the flanges 43 extending downwardly and is held removably in place by one or more screws 44. It fits within the groove 28 and holds the tapes removably in position. A corresponding member is positioned adjacent the right-hand end of the rail 25 and similarly holds the tapes 3 in place. Between the tapes 2 and between the tapes 3 are ladder members 45 upon which rest the slats 4. These slats may be perforated, as at 46, to permit passage of the raising and lowering cords 7. The raising and lowering cords are preferably secured to a bottom rail member 5 which is preferably heavier than the slats 4.

In addition to the means for tilting the tilt rail 25 and thus for tilting the slats, means for raising and lowering the blind are provided, and these means include the cords 7 and means for movably supporting them. At the left-hand end of the assembly a roller 48 is mounted for rotation between members 49, which are preferably integral with a trough-like member 50. This member may be provided with points 51, 52 which, when the parts are assembled, fit into or cut into the floor member 15. The floor member 15 is notched, as at 53, 53 to provide clearance for the tilting cord 6. It is generally cut away at one end, as at 54. This cut away portion provides an opening through which the tapes 2 extend and also provides an opening into which the members 49 and the roller 48 extend, as shown in Figure 5.

As indicated in Figure 2, one portion of the raising cord 7 extends over the roller 48 and moves more or less diagonally toward the right-hand end of the blind. In addition to this, the right-hand portion of the raising cord 7 extends vertically between the tapes 3 and over the roller 55 which is supported for rotation by the members 56. These members form part of a trough-like member or section 57 which may be provided with points 58. Also formed preferably integrally with the member 57 are members 59 between which is mounted for rotation a roller 60. This is a double roller, as shown particularly in Figure 2. The members 59 extend through the cut away portion 61 of the floor member 16 and the members 56 extend into the cut away portion 62 of the member 16. The tapes 3 also extend through the cut away portion 62. When the parts are assembled the points 58 fit into the floor member 16. As that member is formed of wood, they may act as blades and cut into that portion of the floor member which they contact.

For convenience in manufacture the floor sections 15 and 16 which carry the bearing supports may be manufactured from a single board or from a pair of boards. One such board is shown in Figure 14. It may be cut along a line 63 when finished, or if two boards are assembled together for the shaping steps, they will be fitted together along the line 63. Assuming that a single board is to be used, it will occupy the position shown in Figure 14 and will have formed in it simultaneously or by successive operations the grooves 20a, the cut away portions 53, 54, 61 and 62. These shapes may be provided by a single operation—in other words, the board may be moved with respect to cutters which are arranged simultaneously to form all of the notches or cut away portions, or they may be made by more than one movement. Either before the cut away portions have been produced or afterward, the board is preferably provided with the longitudinal grooves 17.

The top rail 25 may be formed in any desired manner. There is shown in Figure 15 a plank or board 64 from which a plurality of the rails 25 may be cut. The rails and the grooves in them are indicated in dotted lines. By forming the rails with the cross section indicated, a plurality of them can be formed from a single plank and by nesting them in reversed direction with respect to each other, a further economy is possible.

As shown in Figure 16, a plank 65 has indicated upon it a plurality of the bottom rails 5. They are nested and reversed with respect to each other so that an economy is achieved in manufacturing them from the plank shown.

The invention is not limited to the shape of the floor members shown in Figure 14, nor to the shape of the tilt rail of Figure 15 or the bottom rail of Figure 16. These figures indicate suitable and appropriate forms for these parts and indicate economical methods of manufacturing them. The present invention is not directed to the method of making these members. This method is claimed in a co-pending application. The present application is directed to the blind and to the support for the blind and, in particular, to the method of making the blind as a whole and to the method of assembling it.

If desired, automatic means for holding the raising cord in adjusted position may be used. The invention is not limited to the use of any special means and the one which is illustrated is shown merely as indicating one suitable form of latch. As shown, a latch 70 is pivoted at 71 in the members 59. This member is so shaped and balanced with respect to its point of support that it tends to fall with its point 72 against the cord 7. Thus it will engage the cord and when the cord is pulled downwardly it will run over the cord. When the cord is released the point will be engaged by the cord and will latch it against further movement in the upward direction.

Although I have shown an operative form of my invention, it will be recognized that many changes in the form, shape and arrangement of parts can be made without departing from the spirit of the invention, and my showing is therefore to be taken as, in a sense, diagrammatic. Thus the shape and arrangement of the grooves and cut away parts in Figure 14 might be varied. The extended portions 66 and 67 with their lateral flanges 68 and 69, respectively, might be omitted. In general, the shape of the members 15 and 16 is dictated by the size and shape of the hardware or associated parts which are to be used with or supported by them.

The main function of the extensions which form the cut away portions 54 and 62 is to accomplish proper spacings of the members 15 and 16 with respect to the central member 14. Any other spacing means might be used. The pulley boxes which support the pulleys 48, 55 and 60 might be of suitable length to accomplish this spacing.

As above described, the bottom of the box comprises the three pieces 14, 15 and 16. These are interlocked and held together with the side members by the members 18 and 19. This interlocking construction might be embodied in a device in which the bottom is formed of a single piece. Although this would require making a box of proper length for each installation and would therefore sacrifice some of the advantages of the invention, it might be done where desired, and the invention is therefore not limited to a device in which the bottom of the box is made of more than one piece. Similarly, a box of more conventional type in which the sides are fixed to the bottom by any means might be employed with the three piece bottom construction shown and the invention is therefore not limited to a construction in which there is the interlocking feature. Similarly, the bottom might be formed of more than three pieces. The feature of the multi-piece bottom is therefore not limited to any particular side construction nor to any particular means for holding the sides and the bottom together.

In Figure 1 and elsewhere a blind is shown supported by only two sets of tapes. More tapes might be used. The number of tapes or sets of tapes will depend on the length of the blind. For each set of tapes an opening is required in the bottom of the box. It has been pointed out that the bottom of the box may be made of one member or of any desired number of members. However the bottom is made, a sufficient number of openings is provided to permit each pair of tapes to pass through the bottom. Throughout the construction it has been emphasized that the parts fit together by interlocking with each other and that they are normally fastened and positioned by their shape, so that they are in effect sprung together. For some purposes and particularly where the blind is to receive especially heavy usage or where the wooden members may be subjected to rapid drying, if desired, screws or rails or other fasteners may be added. Thus the brackets 18 and 19 might have members or perforations so arranged as to receive nails, screws or other fasteners.

The use and operation of this invention are as follows:

Venetian blinds are generally arranged to fit accurately the size of the window to which they are applied. In the past this has required that the entire blind be designed to order and dimensioned to order and the entire box changed for each installation.

In the present invention this is not necessary. The members 15 and 16 are the same size for all possible sizes of blinds. They are made as shown in Figure 14 and the hardware or associated blind supporting and operating members are carried on them. The hardware need not be changed. All that need be changed is the central member 14. That will be whatever length is required. This and the length of the side members 8 will vary for a given installation. Thus in installing a series of blinds a suitable number of uniform floor members 15 and 16 will be supplied and for each of them the hardware which it is to carry will be supplied.

Also a suitable number of side members 8 will be supplied. These members will be cut to suitable length and the intermediate or central member 14 will be cut to suitable length. The box is then assembled by placing together the members 14, 15 and 16 in the position which they occupy in Figure 2. The side members are engaged in the grooves 17 in the bottom of these members. The parts 18 and 19 are then fitted into the position in which the ears or lugs 20 engage the notches or grooves 20a and in which the members 21 engage the flange 13. Thus the box is locked together by the members 18 and 19, and no additional fastening means are required. A tilting rail 25 of suitable length is supported in the bearings which are formed in or carried by the members 18 and 19.

Before or after the box is assembled, the tapes 2 and 3 are passed about the rail 25 and are fastened in place by means of the members 42, or otherwise. Slats of suitable length are put into place, the cords 6 and 7 are inserted, and the blind is ready for use.

From the above it will be clear that instead of making many different sizes of boxes or supporting constructions to fit many different possible sizes of windows, it is possible to make a series of standard sized parts and to assemble them.

The members 15 and 16 are of constant dimension and the hardware members which they carry are unchanged and the center piece 14 is the only floor member which is varied as to length. Thus no cutting and fitting is necessary on the job and the entire device is flexible in the sense that it can be adapted to windows of many sizes with a minimum of such fitting, cutting or sizing of parts.

Since the rail 25 is to be tilted, it is necessary that it should be fixed in relation to the member 32. It simplifies the construction to have that member of angular cross section and to apply the stirrup-like member 34 to the rail 25. The member 34 has a perforation which is of the same size and shape as the member 32. Hence when they are assembled, as shown in Figure 5, no relative rotation is possible.

In assembling the device the bottom or floor members are fitted into the side members. The head rail is then put generally in position and one of the bearing supports, either the member 18 or the member 28, is fitted into position so that it engages the flange 13 of the side members 8 and engages the appropriate notches 20a in the member 16. The pin 30 is then inserted in the opening 31. The bearing support 18 is then moved toward its final position and the member 32 is inserted through the opening in the member 34 and pushed far enough inwardly to bring the bearing support 18 in position to fit into the notches 20a in the member 15.

The bearing support is then, in effect, sprung into position and the parts are held together, the floor members and side members being held together by the bearing supports which now also support the tilting rail 25.

After this has been done, the tapes may be put in place and their ends engaged by the members 43 of the members 42 which are then screwed into place, and the tapes are in position to support the slats 4. Raising cords 7 are inserted. They are secured to the bottom rail 5, pass upwardly through perforations 46 in the slats 4 and are positioned over the rollers 43 and 55 and 60. The tilting cord 6 is inserted through the notches 53 in the member 15 and is positioned in the groove pulley 41. The blind as a whole is then assembled and ready for use.

The method of assembly would be the same no matter what the length of the blind and the standard floor members with their attached hardware are fitted into place on the job and require no special adjustment or special shaping no matter what the length of the blind with which they are used may be.

The method of assembly requires a shaping of the side and bottom members so that they interlock or interfit. The particular shapes here shown might be varied widely. Any shape of the side and bottom members which permits them to interfit either by partially surrounding one by the other or by interlocking will carry out the purposes of the invention. The bracket members 18 and 19 are shaped to hold the bottom and side members in interfitting relation and are so proportioned as to draw them tightly together. Thus the brackets 18 and 19 tend to force the upper edges of the side members upwardly and therefore draw the lower edges of the side members into engagement with the bottom members.

Where the word "hardware" is used in the specification and claims it is to be understood as meaning the hardware or mechanism which is used to support or move the mechanism of the blind.

I claim:

1. In combination, in a Venetian blind support, members defining the bottom of said support and hardware engaging said members, said bottom formed of a plurality of separate pieces, two of said pieces interfitting with said hardware.

2. In combination, in a Venetian blind support, members defining the bottom of said support and hardware engaging said members, said bottom formed of a plurality of separate pieces, two of said pieces interfitting with said hardware and an intermediate piece.

3. In combination, in a Venetian blind support, side members, members defining the bottom of said support and hardware engaging said members, said bottom formed of a plurality of separate pieces, two of said pieces interfitting with said hardware and an intermediate piece engaging said side members.

4. In combination, in a Venetian blind support, members defining the sides of said support and members defining the bottom of said support and hardware engaging said sides and said members and securing them together, said bottom formed of a plurality of separate pieces, two of said pieces interfitting with said hardware.

5. In combination, in a Venetian blind support, members defining the sides of said support and members defining the bottom of said support and hardware engaging said sides and said members and securing them together, said bottom formed of a plurality of separate pieces, two of said pieces interfitting with said hardware, and an intermediate piece engaging said side members.

6. In combination, in a Venetian blind support, members defining the sides of said support and members defining the bottom of said support and hardware engaging said sides and said members and securing them together, said bottom formed of a plurality of separate pieces, two of said pieces interfitting with said hardware, an intermediate piece engaging said side members, and said two pieces forming a bottom for said support.

7. In combination, in a Venetian blind support, members defining the sides of said support and members defining the bottom of said support and hardware engaging said sides and said members and securing them together, said bottom formed of a plurality of separate pieces, two of said pieces interfitting with said hardware, said hardware including bearing supporting means, there being a rail positioned above said bottom and supported in said bearing supporting means, one of said bearing supporting means including members adapted to be moved to tilt said rail.

8. In combination in a Venetian blind having a head box, a pair of members defining bottom parts of said box, and a plurality of bearing supporting means mounted in said box and engaging said bottom portions, said last-mentioned means supporting rotating means, a tilting rail positioned above said bottom portions and provided with members engaging said rotating means, said rail being of varying cross section and having its greatest width below its uppermost portion, said rail provided with a depression in its upper surface and tapes engaged upon said rail and within said depression, said bottom portions having cut away parts, said tapes extending through said cut away portions of said bottom portion.

9. In combination in a Venetian blind, a pair of members defining bottom portions, and a plurality of bearing supporting means interfitting with said bottom portions, one of said bearing supports supporting rail tilting means and blind raising means positioned on said bottom members, said bottom portions supporting said bearing supporting means.

10. In combination in a Venetian blind, a pair of members defining bottom portions, and a plurality of bearing supporting means engaging said bottom portions, one of said bearing supports carrying rail tilting means, said bottom portions supporting said bearing supporting means, and said tilting means.

11. In combination in a Venetian blind, a pair of members defining bottom portions, and a plurality of bearing supporting means engaging said bottom portions, one of said bearing supports supporting rail tilting means, and blind raising means positioned on said bottom members, said bottom portions interfitting with said bearing supporting means and said tilting means, and said raising means.

12. In combination in a Venetian blind, a pair of members defining bottom portions, a pair of side members, the side members and bottom portions interlocking with each other, and a plurality of bearing supporting means engaging said bottom portions and said side members and to lock them together, said bottom portions supporting said bearing supporting means and an intermediate separate bottom member positioned between said first mentioned bottom portions and engaging said side members

13. In combination in a Venetian blind, a pair of members defining bottom portions, a pair of side members, the side members and bottom portions interlocking with each other, and a plurality of bearing supporting means engaging said bottom portions and said side members and to lock them together, and blind raising means positioned on said bottom members, said bottom portions receiving said bearing supporting means and said raising means.

14. In combination in the head construction of a Venetian blind, means defining a box, said means including a bottom member, side members and hardware supporting means, said bottom and side members interlocking with each other, and said hardware supporting means engaging said bottom and said sides and to lock them together to form a finished box.

HENRY J. MACKIN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,894,833	Ruby	Jan. 17, 1933
1,949,653	Moore	Mar. 6, 1934
2,152,116	Wade	Mar. 28, 1939