March 6, 1934. H. MOORE 1,949,653

VENETIAN BLIND

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Fig. 9.

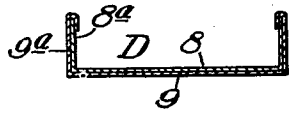


Fig. 1.

Fig. 10.

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Fig.2.

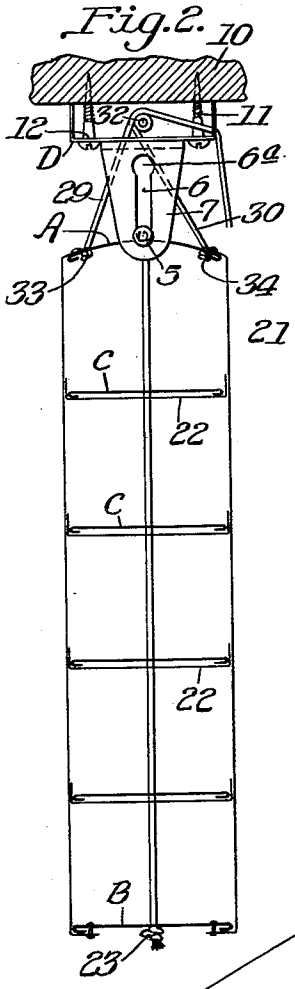


Fig.3.

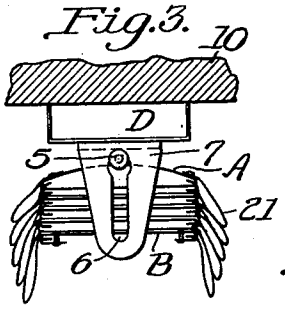


Fig.11.

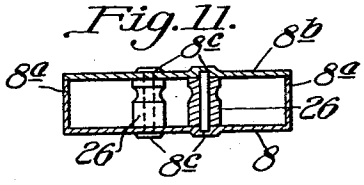


Fig.4.



Fig.5.



Fig.6.

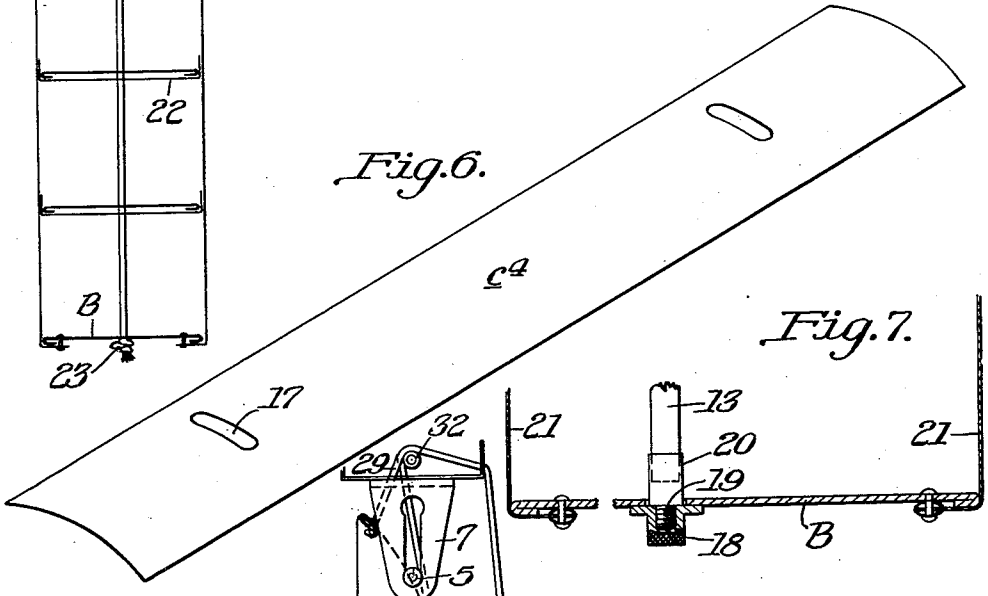
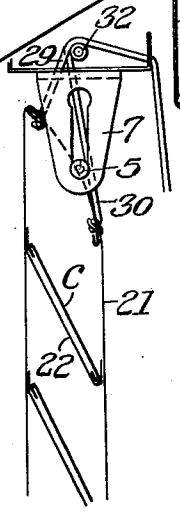


Fig.7.

Fig.8.



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Fig. 12.

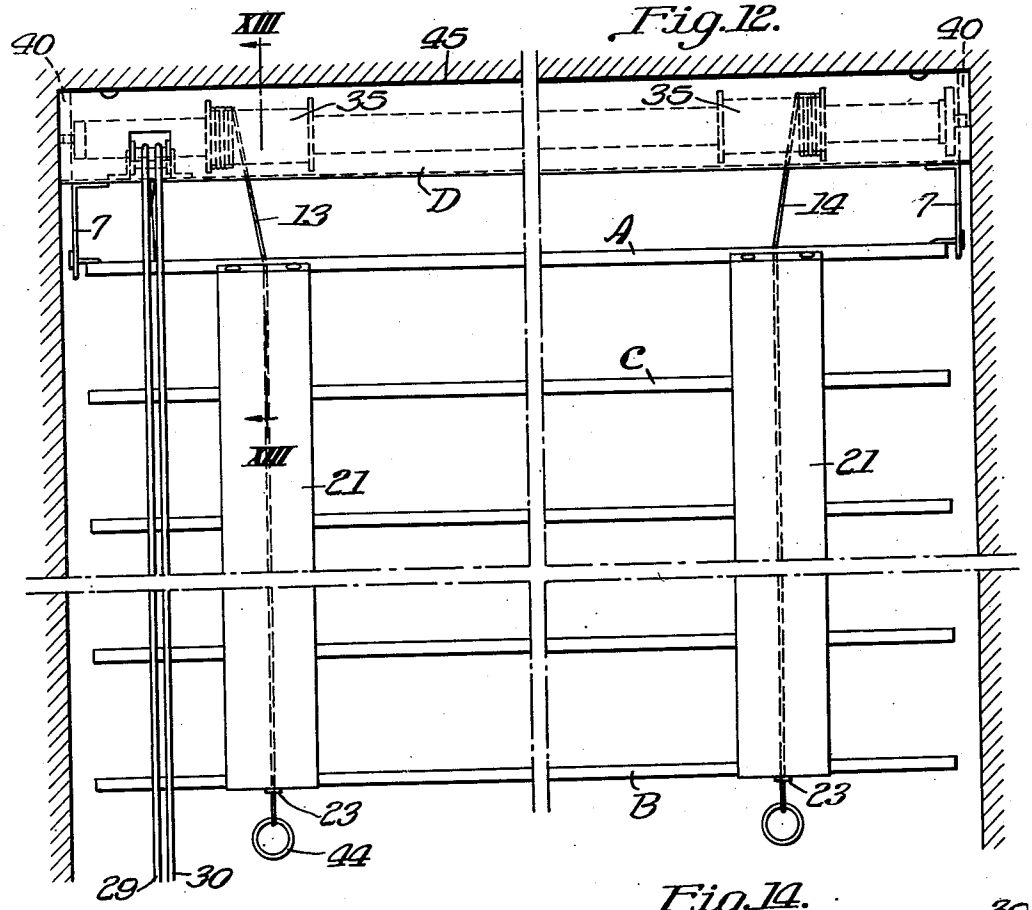
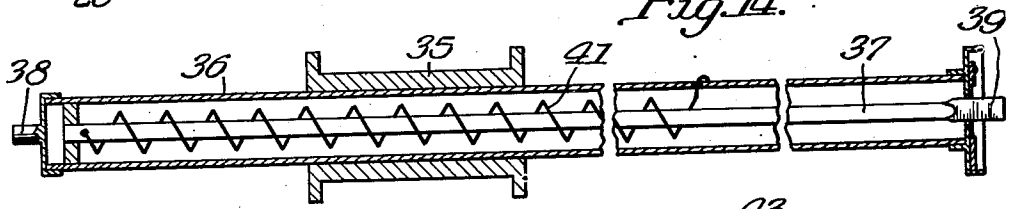


Fig. 14.



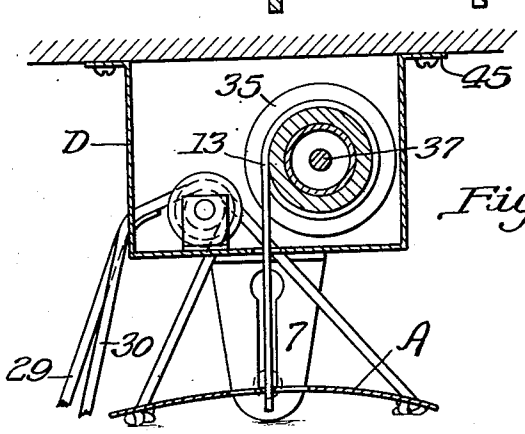


Fig. 13.

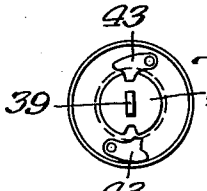


Fig. 15.

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Patented Mar. 6, 1934 1,949,653

UNITED STATES PATENT OFFICE

1,949,653

VENETIAN BLIND

Hubert Moore, Sewickley, Pa.

Application February 23, 1933, Serial No. 657,994

22 Claims. (Cl. 156—17)

My invention refers to improvements in Venetian blinds, especially applicable to the inner or outer sides of window openings of a building.

Heretofore such blinds have ordinarily consisted of a series of spaced apart slats of wood assembled for raising, lowering and tilting by means of manipulating cords, with relation to an upper supporting head piece.

Because of the necessary thickness of wooden slats, they are incapable of being collapsed into a minimum space, and especially so because of the necessary tilting clearance for the usual upper pivoted tilting bar. Likewise, it has heretofore been necessary to make the tilting bar, slats, and bottom bar of fixed dimensions to suit the particular window opening concerned.

In my invention the upper head bar is so constructed as to be lengthened or shortened, as are also the tilting bar, the several slats, and the elevating bottom bar, adapting the entire assemblage to be adjusted to maximum and minimum widths. A further feature of advantage is in making the latter members of thin sheet metal.

The head bar is also provided with terminal vertically slotted brackets facilitating close upward collapse of the assembled members. The bars and slats are of minimum thickness and ample stiffness for maximum ventilating space, compact collapsing and individual strength and advantage, together with other features of construction and novelty, as shall be more fully hereinafter described.

While in the principal figures of the drawings I show the blind provided with manually operated lifting and lowering cords, it may also be provided with semi-automatic spring actuated means, similar to shade roller operation, by inclusion of such devices combined with the other elements of the blind.

Referring to the drawings, showing certain preferred constructions of the invention:

Fig. 1 is a perspective view showing the complete blind and its parts as assembled in lowered position;

Fig. 2 is an end view thereof;

Fig. 3 is a similar view showing the working parts in elevated collapsed position;

Fig. 4 is an enlarged cross section on the line IV—IV of Fig. 1;

Fig. 5 is a similar view showing the slat members upwardly bowed or curved;

Fig. 6 is a perspective view showing a modified construction of slat in one piece;

Fig. 7 is a cross sectional view on the line VII—VII of Fig. 1;

Fig. 8 is a view similar to Fig. 2 showing the tilting bar and adjacent slat in tilted position;

Fig. 9 is a cross sectional detail view showing a modified construction of the head bar;

Fig. 10 is a similar view showing a modified construction of the end of a slat;

Fig. 11 is a cross section of the head bar;

Fig. 12 is a view in elevation, partly broken away, showing the blind provided with a spring roller;

Fig. 13 is an enlarged cross section on the line XIII—XIII of Fig. 12;

Fig. 14 is a longitudinal sectional view, partly broken away, of the spring roller;

Fig. 15 is an end view thereof.

The main operative elements of the blind proper consist of an uppermost tilting bar A, a lowermost bottom bar B and intervening slats C, all made of thin sheet metal as aluminum, steel, or the like. These are arranged and combined with the raising, lowering and tilting means connected with the uppermost head bar D, as in Figs. 1 and 2. The several slats C are preferably of compound construction, made in two telescoping sections c^2 and c^3 respectively, the outer edges of which are redoubled upon themselves, one interfitting within receiving grooves of the other for sliding engagement therewith, permitting lengthening and shortening of the entire composite slat, as indicated at 4.

By thus rounding the terminal edges of the inner and outer slat sections, terminal receiving grooves are provided in the outer slat into and through which the inner slat may slide, with sufficient friction to maintain the parts in adjusted position. Likewise the re-doubling of the edges greatly stiffens the comparatively thin metal slats, reinforcing them against any sagging tendency, and maintaining them in continuously flat condition.

While the slats as thus made are amply satisfactory, I show in Fig. 5 an alternative construction in which the members are curved or bowed upwardly, having similar interfitting frictional sliding connections at their opposite edges for the same purpose. Such curving or bending increases their stiffness and also facilitates nesting together. In such construction one edge of each slat is provided with an outer rounded edge terminal 4*a*, while the interfitting edge of the other slat is similarly rounded, of reduced size, adapting it to be slidably inserted within the portion 4*a*, as at 4*b*.

As thus constructed each slat is provided at one side with an enlarged receiving edge, and at

the other with a reduced rounded edge terminal, adapting it to interfit with a similar edge reinforcement of the other slat.

I show in Fig. 10 a modified construction of the ends of the slats, either flat or bowed, in which the middle portion is extended sufficiently beyond the inturned side edges to be folded underneath, as at c^5, providing the rounded end c^6. This arrangement avoids sharp corners which might injure draperies or curtains.

The tilting bar A is also preferably arched or bowed in the same manner, made of the two telescoping sections similar to the curved slat construction of Fig. 5, with either form of interfitting edge joints. Each telescoping section of the tilting bar is provided at the middle portion of each end with a tilting pin 5 supported in the lower pivoting end of vertical slot 6 of the head bar bracket 7. Otherwise the tilting bars are substantially like the several slats C.

The head bar D is also longitudinally adjustable, consisting of an inner channel member 8 and an outer similar channel member 9 of light sheet metal. Both sections are secured upwardly underneath the upper window frame lintel 10 by means of screws 11 inserted through openings 12 of each member 8 and 9.

The head bar is thus capable of being adjusted to the exact desired length and operating space, and provides the upper support for the depending slats and their operating cords.

The lifting cords 13 and 14 extend downwardly through openings 15 in the head bar members and through transverse slots 16 of the tilting bar, and slots 17 of the several slats as shown. The lower end of each lifting cord 13 and 14 is removably secured to the bottom bar B by any suitable means, as a flanged thumb nut 18 engaging stud 19 of a terminal 20 of each cord 13 and 14. By such construction, upon removal of the thumb nuts, the several slat members may be bodily removed for cleaning, repair, or any other purpose.

As is customary in ordinary Venetian blinds, the several transverse members are supported by the usual ladder tapes 21 and transverse connecting tapes 22. The raising and lowering cords 13—14 are connected with the bottom bar B in any suitable manner, as by the terminal knot 23, Fig. 2.

Lifting cords 13 and 14 pass over the roller bearings 24 carried by brackets 25 upwardly above the middle portion of the head bar members, such bearings being of any suitable construction, as thimbles rotatably mounted around transverse supporting pins carried by the bracket.

At one side, preferably the right side of the construction, the cords 13—14 pass around individual guide pins or grooved rollers 26, then outwardly through an opening in the inner channel flange 8a and over a similar thimble or other bearing 27 carried in brackets 28. These may be conveniently severed and struck out from the flange 8a as shown, the lifting cords extending downwardly a sufficient distance to be conveniently manipulated and fastened on a cleat or the like at any desired position, dependent upon the elevation of the lower or all portions of the blind.

The tilting of the several members of the blind is effected through tilting cords 29—30 arranged preferably at the left side of the blind. Such cords extend upwardly and inwardly through an opening 31 of the flange 9a of the other head bar member, formed by slitting the flange downwardly and bending it inwardly, providing a rounded edge surface over which the cords pass for alternate tilting. Both cords pass over a rotatable thimble bearing 32, cord 29 being connected to the tilting bar A at one side of its longitudinal center, cord 30 being connected at the other side, as indicated at 33 and 34, Fig. 2. By such construction and arrangement the several series of blind members may be all tilted in one direction by pulling downwardly on one of the cords, or in the reverse direction by the other cord, or adjusted to normal horizontal position, as will be readily understood.

In Fig. 9 is shown a modified construction of the telescoping sections of the head bar D, in which the outer flanges 9a are turned around over the edges of inner flanges 8a. By such construction the sections are more securely held together and guided in lengthening or shortening.

As thus constructed the tilting bar, the several slats, and the bottom bar, supported at opposite sides by the flexible tapes 21, are adjusted to the desired degree and will there remain, independent of the centrally disposed raising and lowering cords 13—14. When the latter are used to completely elevate the entire series, they will be drawn up compactly together immediately underneath the head bar, as in Fig. 3. By reason of the vertically slotted brackets 7 the pivoting pins 5 will ride clear up to the extreme upper position, resulting in a very compact assemblage with no lost space.

As shown, the upper end of slot 6 is enlarged as at 6a, whereby the pins 5 may be withdrawn inwardly upon slightly shortening the tilting bar A.

While the extensible tilting bar, bottom bar, and slat members A, B and C are capable of a considerable degree of adjustment and have the advantages noted due to their telescoping construction, they may also be made in one continuous piece c^4, as in Fig. 6. In such one piece construction however, they should be upwardly bowed or curved as shown to provide ample stiffness and rigidity against sagging. With either construction, the working members being of comparatively thin sheet metal are amply stiff and comparatively light in weight, while their minimum thickness permits them to be closely assembled in the relation shown. They are readily capable of being removed for painting, cleaning, etc., and of being quickly and cheaply installed in position.

I show in Fig. 11 a modified construction of the inner telescoping member 8 of the head bar, in which a partial cover plate 8b is secured on the edges of flanges 8a and used to provide bearings for the pins of the grooved bearing spools 26. In such case the bottom 8 and cover 8b are provided with socket bearings 8c for the pivoting pin terminals, thus holding them firmly at each end against tipping under the pressure of the lifting and lowering cords 13, 14.

I show in Figs. 12 to 15 inclusive a modified construction of the invention, utilizing spring-retracted rollers for raising the assembled members of the blind, in the manner of the well known spring supported window shade. In such arrangement the blind as a whole is substantially the same as above described except that the lifting cords 13—14 are wound upon winding and unwinding spools 35.

The spools are located in registering position above the center line of the lifting cords, upon

a hollow supporting shaft 36 surrounding the central supporting rod 37 having the bearing terminals 38—39. These are inserted in supporting brackets 40 mounted in any suitable manner upon the ends of the head bar D, immediately above its terminal brackets 7. The hollow shaft 36 in this respect is generally similar to, and corresponds in construction and operation, to that of the spring winding shade roller in common use, having an actuating spring 41, and at one end the usual locking disk 42 and the intermittently acting holding pawls 43, as is well understood.

Each spool 35 is of sufficient length to continuously wind or unwind the cord or wire 13 and 14 upon its periphery, and the central supporting rod 37 is sufficiently off-set, as in Fig. 13, to locate the spool periphery in proper winding and unwinding alinement with the vertically depending lifting cord. The winding surface of the spool may be continuously smooth as indicated, or may be spirally grooved as preferred, ensuring continuous placement of the cord in a single annular layer.

The lower ends of the raising and lowering cords 13—14 are provided with a supporting abutment 23, engaging underneath the bottom bar B, and have terminal rings 44 or the like for withdrawing the blind downwardly to any desired position, or for releasing it upwardly under tension of the winding spools.

The tilting cords 29—30 together with the several other parts of the blind, are arranged and operated in the same general manner as formerly described, and need no further explanation.

The head bar D may be in one piece, with securing flanges 45, and the spring winding mechanism for the lifting cords is readily incorporated within the interior of the head bar without interference with the other working parts and with but slight additional vertical space. The head bar may thus be located at its uppermost position within a minimum distance above the tilting bar A.

In operation, assuming the blind to be in its uppermost position, as in Fig. 3, it may be lowered by downward pull on the terminal rings 44 and there held by the locking pawls 43, or upon a slight downward pull may be released for continuous upward collapsing movement, either partially or entirely through the full length of the blind when completely extended. The several slats, tilting bar and bottom bar may be readily adjusted by cords 29—30, and the use of the spring retracting roller and spools materially reduces the degree of manual operation.

The entire construction as a working unit is comparatively simple and cheap in construction, readily installed and operated, and is not liable to get out of order. It will be understood that although a limited number of slats are shown in the drawings, the vertical length and number of the series may be varied at will to suit local conditions of application. Also, that the construction may be changed or varied by the skilled mechanic in various details, but all such changes are to be understood as within the scope of the following claims.

What I claim is:

1. In a ventilating blind, a channel form head bar provided at each end with a fixedly attached vertically slotted bracket, a tilting bar having supporting pins engaging the brackets, a series of spaced apart flexibly connected slats and a bottom bar, and means extending through the web of the head bar for inclining the tilting bar and for raising and lowering the bottom bar.

2. In a ventilating blind, a head bar provided at each end, with a vertically slotted bracket, a tilting bar having supporting pins engaging the brackets, a series of spaced apart flexibly connected slats and a bottom bar, a pair of tilting cords connected to opposite sides of the tilting bar passing upwardly and laterally through the head bar, and a pair of raising and lowering cords connected to end portions of the bottom bar passing upwardly through the slats and the head bar and outwardly thereof whereby the entire series of blind members may be lifted against the tilting bar to elevate its supporting pins through the slotted brackets.

3. In a ventilating blind, a longitudinally extensible two-piece telescoping head bar, a tilting bar, a series of flexibly connected slats, a bottom bar, raising and lowering cords extending through the head bar, tilting bar and slats, and connected with the bottom bar, and cords extending through the head bar and connected with opposite sides of the tilting bar.

4. In a ventilating blind, a longitudinally extensible two-piece telescoping head bar, a compound extensible tilting bar, a series of flexibly connected compound extensible slats, a compound extensible bottom bar, raising and lowering cords extending through the head bar, tilting bar and slats, and connected with the bottom bar, and cords extending through the head bar and connected with the opposite sides of the tilting bar.

5. Head bar construction for Venetian blinds consisting of a channel member having a middle web and upwardly disposed flanges, the web having clearance openings for tilting and lifting cords and cord directing bearings adjacent thereto, and the flange at one side having clearance openings for outward and downward disposition of the cords.

6. Head bar construction for Venetian blinds consisting of a channel member having a middle web and upwardly disposed flanges, the web having clearance openings for tilting and lifting cords and cord directing bearings adjacent thereto, vertically arranged guides for the lifting cords, and the flange at one side having clearance openings for outward and downward disposition of the cords.

7. Head bar construction for Venetian blinds consisting of a pair of longitudinally extensible telescoping channel members each having a middle web and upwardly disposed flanges, the web of one member having a clearance opening for tilting cords and cord directing bearings, the web of each member having a clearance opening for lifting cords and cord directing bearings, and the flange at one side of each member having a clearance opening for outward and downward disposition of the cords.

8. Head bar construction for Venetian blinds consisting of a sheet metal channel member having a middle web and upwardly disposed flanges each having clearance openings for tilting and lifting cords and cord directing bearings, and terminal vertically slotted brackets for a tilting bar secured to and extending downwardly from each end of the channel member.

9. Head bar construction for Venetian blinds consisting of a sheet metal channel member having a middle web and upwardly disposed flanges, and a tilting bar bracket secured to and extending downwardly from each end of the web portion of the bar having a vertically slotted bearing.

10. Head bar construction for Venetian blinds consisting of a pair of longitudinally extensible telescoping channel members each having a middle web and upwardly disposed flanges, the web of one member having a clearance opening for tilting cords and cord directing bearings, the web of each member having a clearance opening for lifting cords and cord directing bearings, and the flanges of one member being turned over in sliding embracing engagement with the flanges of the other member.

11. Head bar construction for Venetian blinds consisting of a sheet metal channel member having a middle web and upwardly disposed flanges, and a tilting bar bracket secured to and extending downwardly from each end of the web portion of the bar having a vertically slotted bearing provided at the top with an enlarged opening for insertion and removal of tilting bar pivoting pins.

12. Compound slat construction for Venetian blinds consisting of a pair of extensible overlapping sections of thin sheet metal and means embodied therewith holding the sections in face-to-face contact and providing for longitudinal adjustment thereof.

13. Compound slat construction for Venetian blinds consisting of two telescoping sections of thin sheet metal, the longitudinal edge of one section being reversed inwardly in embracing sliding engagement with the interfitting longitudinal edge of the other section.

14. Compound slat construction for Venetian blinds consisting of two telescoping sections of thin sheet metal, the longitudinal edge of one section being rounded upon itself providing an embracing female reinforcing edge at one side and having at its opposite edge a reduced rounded male reinforcing edge for sliding engagement with a similar edge portion of a co-operating section.

15. Head bar construction for Venetian blinds consisting of a channel member provided with a middle web having a socket bearing and upwardly disposed flanges, a cover secured on the flanges having a corresponding socket, a pin engaging the sockets by its ends, and a rotating roller bearing for a lifting cord on the pin.

16. In a ventilating blind, a sheet metal channel shaped head bar, a tilting bar, a series of flexibly connected slats, a bottom bar, raising and lowering cords extending through the web and one flange of the head bar and through the tilting bar and slats and connected with the bottom bar, spring actuated winding rollers in the head bar for the raising and lowering cords, and cords extending through the head bar and connected with opposite sides of the tilting bar.

17. In a ventilating blind, a head bar provided at each end with a vertically slotted bracket, a tilting bar having supporting pins engaging the brackets, tilting cords therefor, a series of spaced apart flexibly connected slats and a bottom bar depending below the tilting bar, a spring actuated shaft mounted in the head bar having winding spools thereon, and raising and lowering cords extending from the spools through the head bar, tilting bar and slats and connected with the bottom bar.

18. In a ventilating blind, a hollow box-like head bar, a series of spaced apart slats, ladder tapes engaging opposite edge portions of the several slats, flexible tilting members engaging opposite edge portions of the uppermost slat and extending through the head bar and connected with actuating means therefor, and raising and lowering cords extending downwardly through the head bar and the several slats and connected to the lowermost one thereof.

19. In a ventilating blind, a hollow box-like head bar, a series of spaced apart slats, ladder tapes engaging opposite edge portions of the several slats, flexible tilting members engaging opposite edge portions of the uppermost slat and extending convergingly through the head bar and engaging a rotatable thimble for tension exertion thereover, and raising and lowering cords extending downwardly through the head bar and the several slats and connected to the lowermost one thereof.

20. In a ventilating blind, a hollow box-like head bar, a series of spaced apart slats, ladder tapes engaging opposite edge portions of the several slats, flexible tilting members engaging opposite edge portions of the uppermost slat and extending through the head bar and connected with actuating means therefor whereby all of the several slats may be tilted with the uppermost one, and raising and lowering cords, extending downwardly through the head bar and the several slats, and connected to the lowermost one thereof.

21. In a ventilating blind, a hollow box-like head bar, an uppermost tilting slat, a series of flexibly connected slats depending therefrom terminating in a lowermost slat, flexible raising and lowering members connected with the lowermost slat and extending through the several superimposed slats and the head bar, and flexible members extending through the head bar and connected with opposite sides of the uppermost slat.

22. In a ventilating blind, a hollow box-like head bar, an uppermost tilting slat, a series of flexibly connected slats depending therefrom, raising and lowering cords extending through the bottom wall of the head bar and through the several slats and connected with the lowermost one thereof, winding rollers in the head bar for the raising and lowering cords, and flexible members extending divergently through the bottom wall of the head bar and connected with opposite sides of the tilting slat.

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