

May 28, 1940.

G. C. LAWSON

2,202,293

VENETIAN BLIND

Filed Jan. 26, 1938

3 Sheets-Sheet 1

Fig. 1.

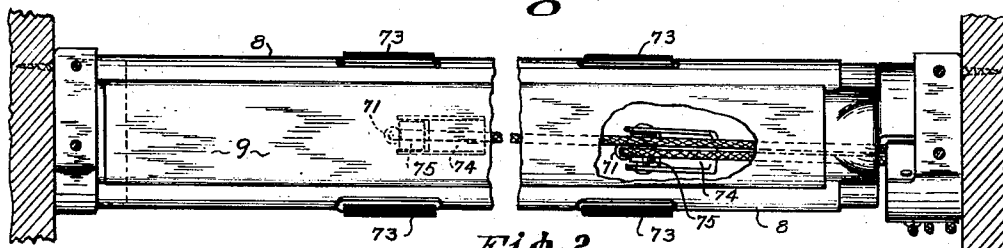


Fig. 2.

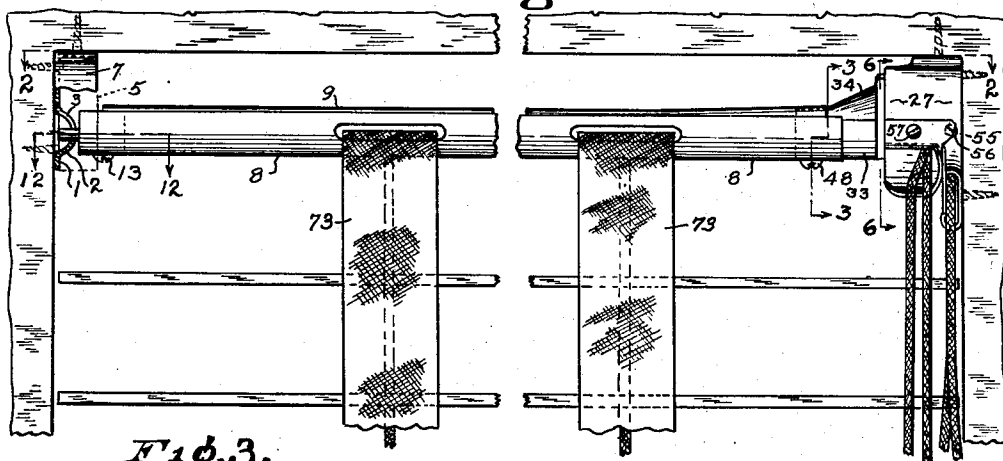


Fig. 3.

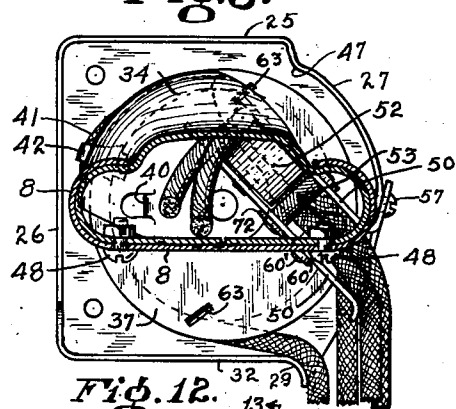


Fig. 12.

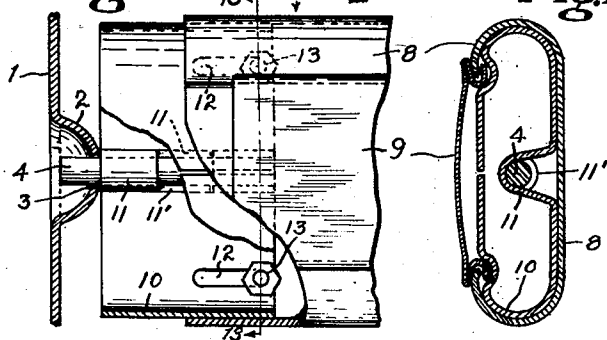


Fig. 13.

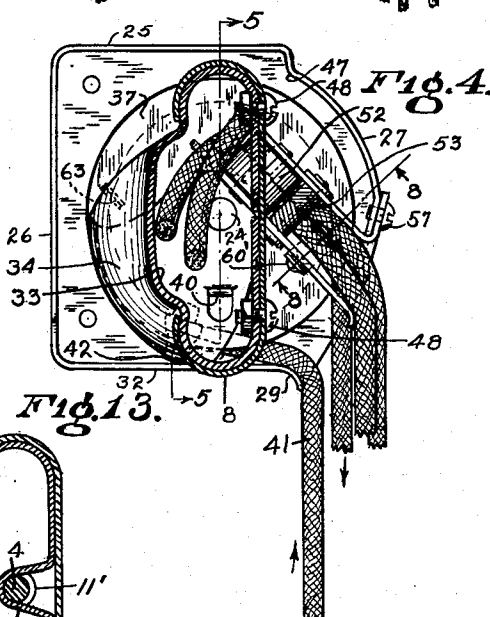


Fig. 4.

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Fig. 5.

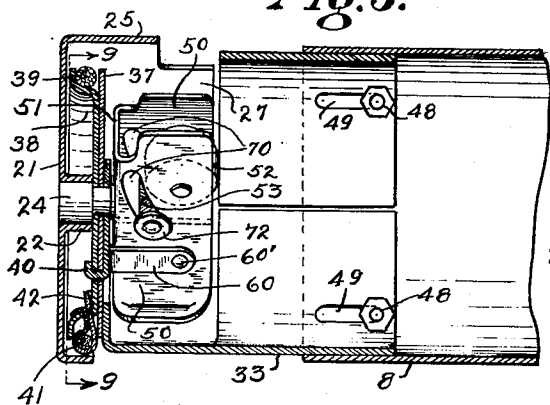


Fig. 6.

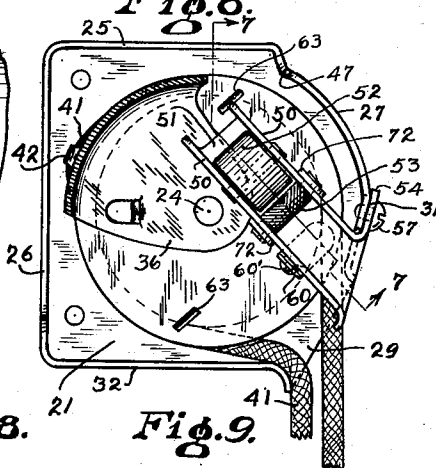


Fig. 7.

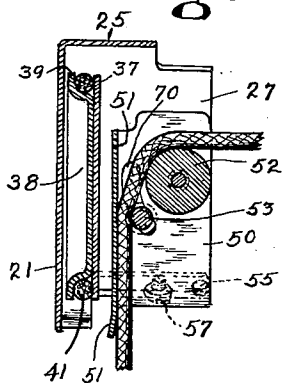


Fig. 8.

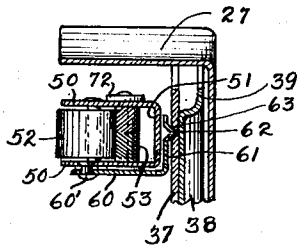


Fig. 9.

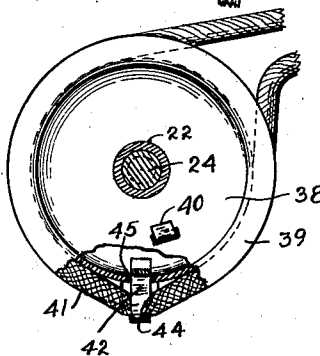


Fig. 10.

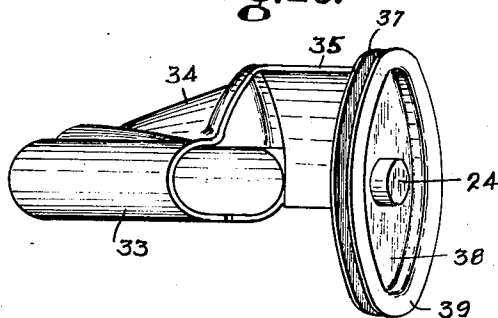
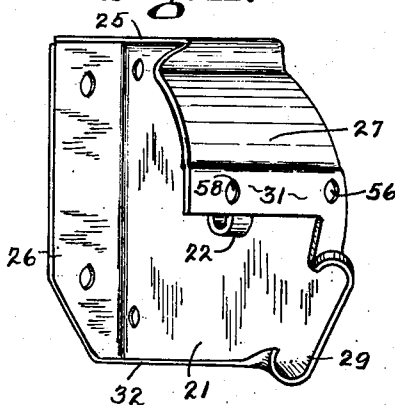


Fig. 11.



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Fig. 14.

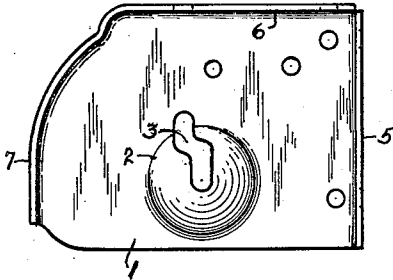


Fig. 15.

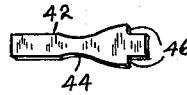


Fig. 17.



Fig. 16.

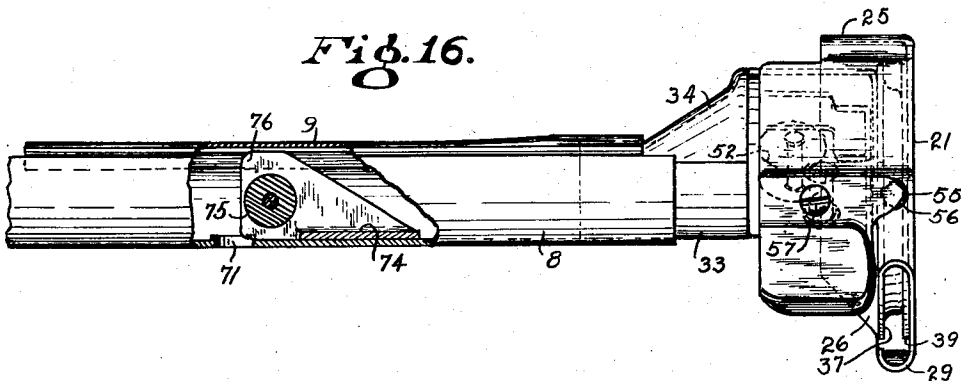
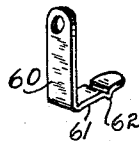


Fig. 18.



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UNITED STATES PATENT OFFICE

2,202,293

VENETIAN BLIND

Gottfrid C. Lawson, Cleveland, Ohio

Application January 26, 1938, Serial No. 187,031

10 Claims. (Cl. 156—17)

This invention relates to improvements in Venetian blinds, and more particularly to blinds of the type having a tilt rail from which slats are suspended by means of ladder tapes, and means for opening and closing or tilting the slats as well as raising and lowering the same.

Heretofore blind installations have usually included a top rail called a head rail which was secured directly to the window casing or supported in brackets secured on the casing. The head rails usually supported a tilt rail and a tilting mechanism therefor as well as the controls for raising and lowering the slats. In some instances the tilting mechanism was contained within a head rail. However, in all of the prior blinds there have been numerous disadvantages which it is the purpose of the present invention to overcome.

One of the particular disadvantages of the prior blinds was the fact that the space between the tilt and head rails was not capable of being closed to shut out the light. Still further, when the blind was raised it took up considerable space since the slats only moved as far as the tilt rail and the tilt and head rails did not move vertically relative to each other. Still other disadvantages of the prior blinds resided in the fact that the blinds were cumbersome to install and were difficult to operate after installation. In many instances the upper ends of the blinds did not present a neat appearance or one which was capable of being blended aesthetically with the drapes because the operating mechanism was visible. The prior constructions were somewhat complicated since they used various combinations of gears and pulleys; these gears and pulleys could not be readily lubricated and when lubricated, were liable to come in contact with and soil the window drapes.

By my present invention I have completely eliminated the head rail, or any equivalent therefor. In installing the blinds only two brackets are used which may be, and are, easily secured to the casing. The operating mechanism for the blind is effectively shielded from sight and against contact with the drapes, only those parts of the control cords which operate the mechanism being visible. The operation of the blinds are relatively easy, quiet and simple.

Still another advantage of my improved blind resides in the fact that the blind, when raised, takes up considerably less of the open space in the window than other blinds. The blind may also be quickly and easily removed without special tools and by inexperienced persons for the pur-

pose of cleaning. The control cords being all at the same side of the window, make it necessary to approach only one side of blind to adjust the same. The mechanism is light in weight and the working parts are reduced in number and entail numerous economies in construction, not possible in prior blinds. The construction is such that when the blind is closed, no direct light may obtain entrance, a complete closure being effected.

Still other advantages of the invention and the invention itself will become more apparent from the following description of an embodiment thereof, which description is illustrated by the accompanying drawings.

In the drawings:

Fig. 1 is a plan view of a blind constructed according to my invention with certain parts broken away to show the structure below, and certain parts shown in dotted lines;

Fig. 2 is a similar view in elevation;

Fig. 3 is a sectional view taken along the lines 3—3 of Fig. 2, looking in the direction of the arrows;

Fig. 4 is a view like Fig. 3 but showing the tilt rail rotated 90°;

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4;

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 2;

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 6;

Fig. 8 is a sectional view taken on the line 8—8 of Fig. 4;

Fig. 9 is a sectional view taken on the line 9—9 of Fig. 5;

Fig. 10 is an isometric view of the tilt rail support and pulley or sheave end;

Fig. 11 is an isometric view of an end bracket for the tilt rail;

Fig. 12 is an enlarged sectional view taken on the line 12—12 of Fig. 2 with certain parts broken away;

Fig. 13 is a sectional view taken along the line 13—13 of Fig. 12;

Fig. 14 is an inside elevational view of a bracket for the end of the tilt rail;

Fig. 15 is a plan view of a blank used to form a clip for the tilt cord.

Fig. 16 is a fragmentary elevational view of the cord operating end of the rail showing the interior structure in dotted lines and with certain parts broken away and shown in section;

Fig. 17 is a perspective view of a tilt cord attaching clip showing a fragment of a cord; and

Fig. 18 is a perspective view of the tilt sheave friction brake.

Briefly, the invention contemplates a pair of supporting brackets made of sheet metal which are so formed that they may be secured to the casing of the window by screws or the like. One of the brackets provides a housing which encloses the raising, lowering and tilting mechanism as well as a bearing for the tilt rail trunnion, while the other merely provides a bearing for the trunnion on the other end of the tilt rail. One end of the rail is relatively plain and the bearing in the bracket is so formed that the trunnion may be disengaged from the bearing by lifting the rail upward. The other end of the rail provides a tilt mechanism which is attached directly to the rail. The rail is hollow, being preferably formed of sheet metal, and the raising and lowering cords are trained through a cord lock and guide secured to the bracket and extending into the hollow rail longitudinally and thence downward in back of ladder tapes which are secured to the tilt rail, and which cords are connected to a bottom rail in the usual manner. The cord lock serves a dual function since in combination with the bracket it serves also to lock the parts in operative position.

More specifically, the one end bracket comprises a sheet metal member having an end wall 1 which is formed to provide an inwardly extending boss 2. The boss is apertured to provide an upwardly extending Z-shaped slot 3 of irregular shape, the bottom of which terminates co-axially with the center of the boss and provides a bearing for a trunnion 4 of the tilt rail. The bracket has flanges 5 and 6 extending at right angles from the end wall and running perpendicularly and horizontally respectively on the back and top sides of the bracket. The flanges and side wall of the bracket are provided with a plurality of apertures through which screws may extend to hold the bracket on the window casing, thus making it possible to secure the bracket to the window in substantially any desired position, which position may vary with different types of windows. The forward face of the bracket is provided with a laterally extending flange or apron 7, as best shown in Fig. 14, curved to permit rotation of the tilt rail in back thereof and to provide a pleasing contour. The Z-shaped slot makes it necessary when removing the trunnion 4 of the tilt rail from engagement therewith to raise the same vertically, then laterally, and finally vertically, thus guarding against accidental displacement of the trunnion from the slot.

The rail is hollow, being formed by a sheet metal channel 8, the upper side of which is closed by a strip 9. The channel and closure strip being the subject matter of Patent No. 2,100,648 to Lawson and Lindquist of November 30, 1937. The trunnion 4 for the tilt rail is carried by a sheet metal slide 10 shaped to conform to the interior surface of the rail. As best shown in Figs. 12 and 13, the bottom center portion of the slide is deformed to provide upwardly extending spaced portions 11 and an intermediate downwardly extending portion 11' which securely embraces the trunnion 4. The trunnion may be spot welded to be held in place, but I have found that the resiliency of the metal is sufficient to retain the same in its proper position. The slide 10 is telescopically disposed within the channel which permits a longitudinal extension of the rail resulting in a substantial lengthening thereof to compensate for slight variation of length due to manufacturing

tolerances or to permit the rail to be lengthened to adapt it to various window widths. When the slide is once adjusted to the desired position, a screw which extends through an aperture in the tilt rail and a slot 12 in the slide may be locked in place by tightening the screw and its nut 13 (note particularly Fig. 12), holding the slide in a fixed position.

The bracket for the other end of the rail which also houses the tilting mechanism hereinafter called the bracket housing, has the same general contour as that of the bracket just described, it being provided with an end wall 21, and top and back flanges 25 and 26 respectively, all of the walls being apertured in the manner previously described and for the same purpose. The trunnion bearing 22 is, in this instance, a plain bearing and of substantially larger diameter for supporting the trunnion 24 of the tilt rail. The apron 27 of the bracket housing, instead of being the same width as the flanges 25 and 26 as in the other bracket, is wider for a purpose hereinafter described, and instead of extending downward to the bottom of the bracket, terminates at its lower edge approximately midway of the bracket in a flat plane surface 31 for supporting the cord lock mechanism. The bottom edge of the bracket is provided with a relatively narrow flange 32 and the forward bottom corner of the bracket extending from the bottom toward the lowered edge of the apron 27—31, is formed as best shown in Fig. 11 to provide a cord guide 29 for the tilt cords.

The trunnion support and tilt mechanism comprises, as best shown in Fig. 10, a sheet metal member having a body 33 shaped to the contour of the side of the tilt rail and telescopic in the rail in a manner similar to that described for the other end. The upper side of the body flares upwardly at 34 and connects with an extension 35 of arcuate cross section, the end of which has an arm 36 Figs. 5 and 6 extending inwardly to the center of the rail and carries the trunnion 24 disposed in axial alignment with the center of the rail. The portions 34, 35 and 36 may be considered as a crank arm with the part 35 offset to provide a substantial clearance space into the center of the rail and is relatively broad to provide sufficient strength and to close certain open spaces between the rail and bracket which would otherwise, if open, allow light to pass, as will hereinafter more clearly appear.

The mechanism for revolving the crank arm for the rail in general may be considered as a sheave secured coaxially with the trunnion over which and to which the tilt cord is secured. The specific construction may be varied but the type shown is of the preferred type and comprises a flat circular disk 37 disposed coaxially about the trunnion 24 and juxtaposed to the arm 36, and a second disk 38 of substantially the same diameter but formed at its periphery with an offset flange 39. The two disks are secured to the arm 36 by a tongue 40 which is struck from the arm 36 and extends through the two disks, being bent over against the outer face of the disk 38. Obviously these parts could be held together in other manners such as by a screw or by spot welding, if such should be desired. It will thus be seen that in the assembled position the disks comprise a sheave having a groove in its periphery formed by the channeled member 39.

The sheave or pulley provides means whereby the tilt rail may be rotated about its trunnions in the brackets by a cord 41. The cord 41 is dis-

posed in the groove of the sheave and held in place by a clip 42. The clip comprises a sheet metal member having a narrow body portion 44 adapted to be folded about the cord (Fig. 15) and a pair of lugs which extend through a slot 45 in the bottom of the channel 39, one of which lugs may be folded backward to hold the clip securely in position; the shoulders 46 on one of the lugs engage the wall at the bottom of the channel and limit the distance that the clip may be pulled into the channel, thus causing the clip to protrude from the channel (Figs. 5 and 6). The cord is thus held on the pulley fixed relative thereto and cannot slide around the pulley since the clip grips the cord sufficiently tight to prevent sliding. The ends of the cord extend out of the bracket through the guide 29 (Figs. 6 and 11). The clip also provides a stop for limiting the rotation of the sheave in that it extends far enough beyond the periphery of the pulley to engage the bottom flange 32 (Fig. 4) of the bracket when the tilt rail is tilted to the position shown, and also engages the boss 47 at the juncture of the upper flange and apron when the sheave is rotated 180° in the other direction.

The body 33 when once adjusted to its desired position within the rail, is secured in place by bolts 48 which extend through apertures in the rail and slots 49 in the body 33, nuts being provided on the interior of the body. The tolerance between the sheave and the guide 29 of the bracket, is such that the cord cannot accidentally escape from the sheave.

The sheave and trunnion are held in position in the bracket and bearing by the raising cord lock and guide mechanism. The apron 27 terminates in a flat plane surface 31 for supporting the cord guide which comprises a channel member of U-shaped cross section (Figs. 4 to 8 inclusive), having side walls 50 and a back or bottom wall 51. The guide roller 52 and cord lock 53 are supported between the side walls of the guide. The lower extremity of the channel member has an upwardly extending flat flange 54 shaped to conform to the surface 31 of the bracket. A lug 55 is provided on the flange and extends into an aperture 56 in the surface 31. The flange is secured to the surface 31 by a screw 57 which extends through the flange into a threaded aperture 58 in the portion 31. The screw and the lug 55 thus hold the member securely and the guide body extends into the interior of the bracket with the sheave 36—38 interposed between the wall of the bracket and the guide. Friction means is provided on the guide for engagement with the sheave and comprises a spring arm 60, Fig. 18, which has one end riveted to one side wall of the guide as shown at 60' (Figs. 4, 5, 6 and 8) and extends along the side of the guide toward the sheave and between the guide and the sheave, the free end 61 is formed with a boss 62 which bears frictionally against the disk 37 of the sheave at all times. The disk 37 may also be provided with detents 63 into which the boss 62 may drop upon a predetermined amount of rotation of the sheave.

It will thus be seen that the cord lock and guide with its spring brake 60 is in frictional engagement with the sheave at all times frictionally resisting the turning movement of sheave and in certain positions forming a frictional lock with the sheave to hold it against movement. There are two detents 63 disposed in the positions shown in Fig. 3, 180° apart. This permits the slats to be adjusted at any desired angle

frictionally holding the same at the angle and also provides an additional braking or holding action at the two positions where the strain upon the tilt rail is the greatest due to the weight of the slats on one of the ladder tapes which tend to rotate the tilt rail.

The raising and lowering cords extend through the guide lock just mentioned and into the interior of the rail. The bottom extremity of the guide is flared or flanged and the cords extend upwardly along the bottom of the channel between the cord lock and the channel and over the pulley or roller 52. The cord lock comprises a roller loosely journaled in arcuate slots 70 in the opposite channel sides, the roller having flanges 72 on its ends for retaining the same in place and being provided with herringbone grooves on its surface.

The roller 52 is rotatably journaled in the channel above the cord lock. As previously stated, the guide extends into the interior of the bracket with its open side toward the tilt rail. The arm 35 just clears the end of the guide when the sheave is rotated. The cords then extend over the top of the roller 52 and into the rail 8. The rail 8 has openings 71 formed in its bottom center directly in back of the ladder tapes 73; two such openings are provided, each disposed between the point of connection of the ladder tape webs. In most instances, it will be found, except in the case of a larger window, that two ladder tapes will be sufficient. In either event only two raising cords are usually needed.

Secured to the bottom of the rail adjacent to the openings 71, are brackets 74 which support rollers 75 between upwardly extending ears 76. The raising cords extend from the guide into the tilt rail, one of them being trained over the roller 75 in the first bracket (Figs. 1 and 16) and extends downward through the aperture 71 between the webs of the ladder tape, through slots in the slats and is secured to the bottom slat or rail. The other cord extends over the roller 75 in the first bracket and continues through the rail to the second bracket and roller over which it is trained in a like manner, thence downward through the opening in the bottom of the rail and is secured to the bottom rail. The apertures 71 may be formed by upsetting the bottom of the channel to provide a flared guide preventing abrasion of the cords by sharp metal. The sides 76 of each bracket extend upwardly beyond the roller 75 to form a guide channel for the cords, which channel is substantially closed by the closure member 9 as best shown in Fig. 16, preventing accidental escape of the cords from over the rollers. The cords may be easily trained over the rollers, since the slide is readily removable as disclosed in the aforementioned patent.

The operation of the tilt mechanism has been described. The raising and lowering cords, however, operate in a manner well known, except, of course, that the cords extend into the hollow rail. The crank arm 35 provides ample clearance for the cords and guide, and the cords thus operate readily without fouling upon any of the parts.

The part 35 being relatively wide prevents light from leaking through the open space between the apron 31 and the edge of the rail as best shown in Fig. 4, where the open space below the apron 27 exists.

It will thus be seen that I have provided an improved blind which is simple and economical in construction, easy and positive in its opera-

tion, and wherein the installation lends itself to a harmonious blending with its surroundings.

It will also be obvious that certain changes and departures from the structure can be made, but without departing from the spirit or scope of the invention as defined in the appended claims.

I claim:

1. A tilting mechanism for a Venetian blind tilt rail including a bracket adapted for attachment to a window casing, a bearing in said bracket and a trunnion rotatable in said bearing, a connector for connecting said trunnion to said tilt rail and a sheave operably connected to said trunnion, means to engage said sheave to hold said tilting mechanism in operative position in said bracket.

2. A tilting mechanism for a Venetian blind tilt rail including a bracket adapted for attachment to a window casing, a bearing in said bracket and a trunnion rotatable in said bearing, a connector for connecting said trunnion to said tilt rail and a sheave operably connected to said trunnion, friction means to engage said sheave to hold said tilting mechanism in operative position in said bracket, said sheave being formed with detents and said friction means engageable in said detents to hold the pulley and rail in predetermined positions.

3. A tilting mechanism for a Venetian blind having a tilt rail including a bracket adapted for attachment to a window casing, a bearing in said bracket, a connector and a trunnion on the tilt rail, said trunnion being rotatable in said bearing, a pulley operably connected to said trunnion and a cord for said pulley, means supported by the bracket and operable to engage said pulley to hold said tilting mechanism in operative position in said bracket.

4. A tilting mechanism for a Venetian blind tilt rail including a bracket adapted for attachment to a window casing, a bearing in said bracket, a trunnion rotatable in said bearing and a connector for connecting said trunnion to the tilt rail and a sheave secured to said trunnion, and means to frictionally engage the sheave to resist turning thereof and to hold the said mechanism in said bracket.

5. In a Venetian blind, a hollow tilt rail, a supporting bracket for one end of said rail and a trunnion carried by the rail and rotatably and removably journaled in said bracket, supporting and tilting means for the other end of the rail including a bracket having a bearing formed therein, a trunnion rotatably journaled in the bracket and a connector secured to said trunnion and carrying said rail, a pulley secured to said trunnion and a cord connected to the pulley, said connector being formed to close the open space between the tilt rail and bracket against direct light.

6. In a Venetian blind, a hollow tilt rail, a supporting bracket for one end of said rail and a trunnion carried by the rail and rotatably and removably journaled in said bracket, supporting

and tilting means for the other end of the rail including a bracket having a bearing formed therein, a trunnion rotatably journaled in the bracket and a connector secured to said trunnion and carrying said rail, a sheave secured to said trunnion and a tilt cord connected to the sheave, said connector being formed to provide a shield, said brackets being provided with aprons to cooperate with the shield of the connector to close the space between the tilt rail and the bracket against direct light.

7. A mechanism of the class described including a tilt rail, a tilting mechanism therefor comprising a crank arm for supporting one end of the rail, a trunnion for supporting the crank arm, and a bracket for supporting the trunnion, a sheave connected to the crank arm and having a tilting cord attached thereto for rotating the crank arm, locking means for the sheave carried by the bracket and engageable with the sheave to hold the same in operative position in the bracket.

8. A tilting mechanism for a Venetian blind having a hollow tilting rail, comprising a hollow sleeve disposed in one end of said rail, an arm on said sleeve forming a crank and carrying on its free end a trunnion, a bracket adapted to be secured to the window casing or the like having a bearing rotatably supporting said trunnion, a pulley disposed about said trunnion fixedly connected to said crank, and a tilt cord looped about said pulley and secured thereto at one point on its periphery, friction means engageable with the surface of said pulley to resist turning of the pulley and to hold said trunnion in said bearing.

9. A tilting mechanism for a Venetian blind tilt rail comprising supporting means for one end of the rail including a bracket adapted to be secured to one side of a window, means carried by the tilt rail and engageable with the bracket comprising a telescopic member moveably secured in the end of the rail and having an arm extending therefrom, a trunnion carried by said arm and a bearing in said bracket adapted to rotatably receive said trunnion, a sheave secured to said arm concentric to the trunnion, cord means secured to and carried by the sheave for rotating the same.

10. A mechanism of the class described, a Venetian blind tilt rail, means for tilting and supporting the tilt rail including a bracket adapted for attachment to a window casing and formed to provide a bearing therein, connecting means on the tilt rail co-operating with the bearing in the bracket and the tilt rail comprising a connector and a trunnion, a sheave concentrically disposed on the trunnion and a tilt cord trained over the sheave and secured to the sheave, said bracket being formed with a forwardly extending apron to provide clearance for the sheave and guide means integral with the bracket between the apron and the bottom thereof to receive and guide the cord.

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