Feb. 16, 1932. T. S. FOWLER ET AL 1,845,870

TILTING BAR OPERATING DEVICE

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Fig. 1.

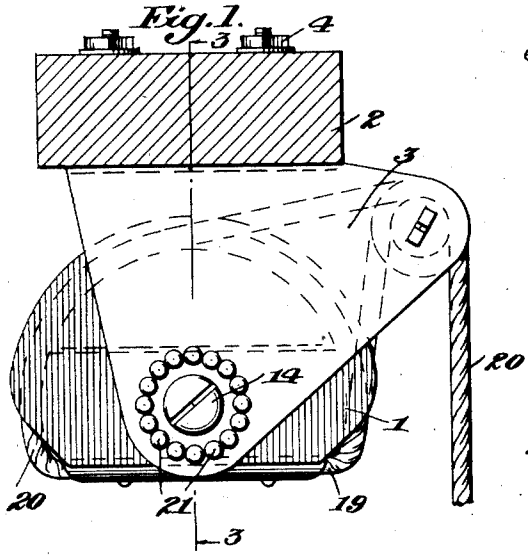


Fig. 2.

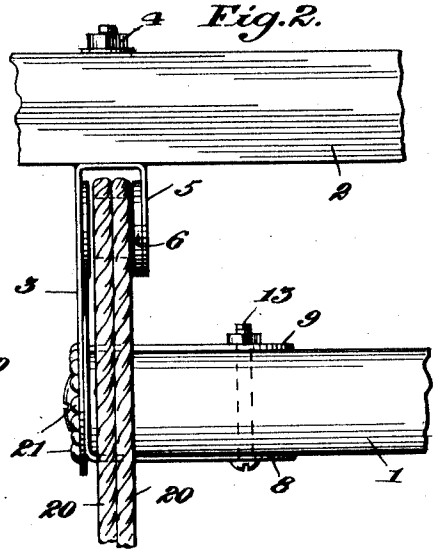


Fig. 4.

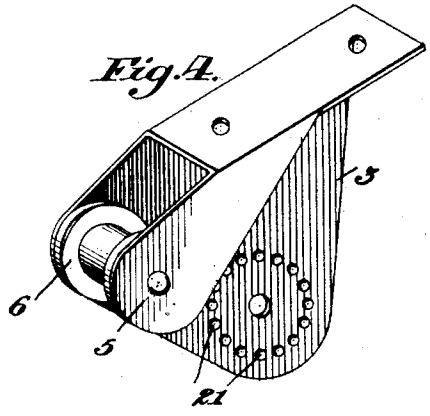


Fig. 3.

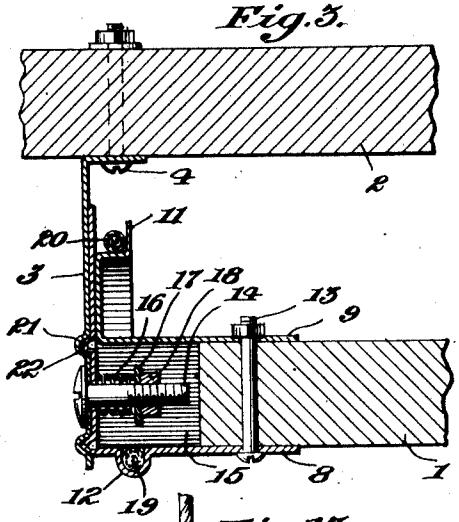


Fig. 5.

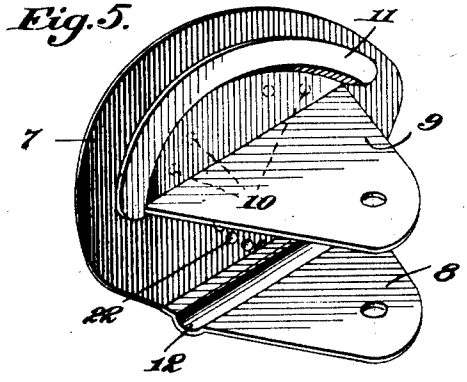
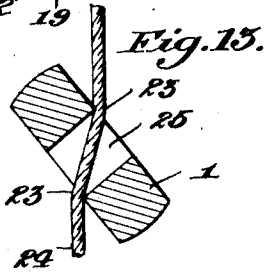


Fig. 15.



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TILTING BAR OPERATING DEVICE

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Fig. 6.

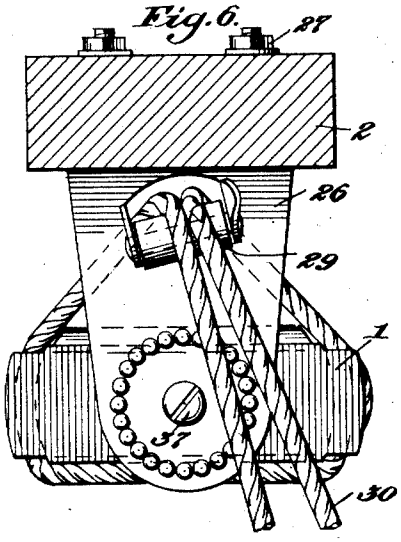


Fig. 7.

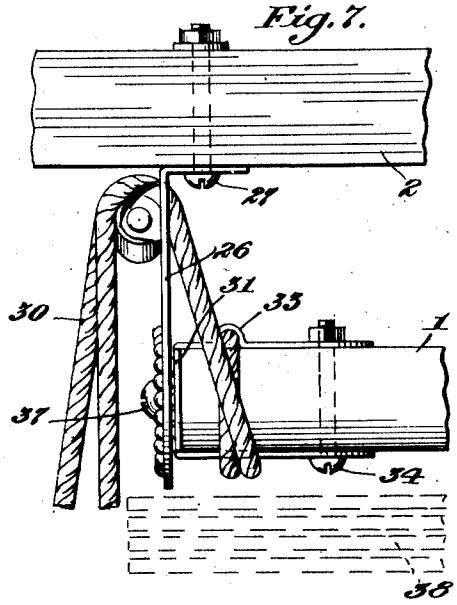


Fig. 8.

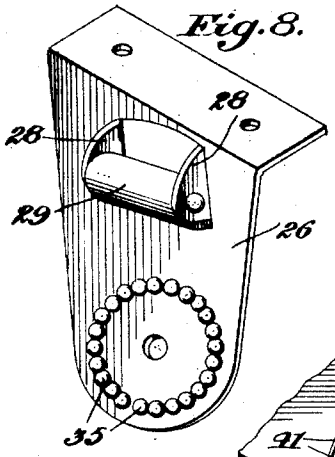


Fig. 9.

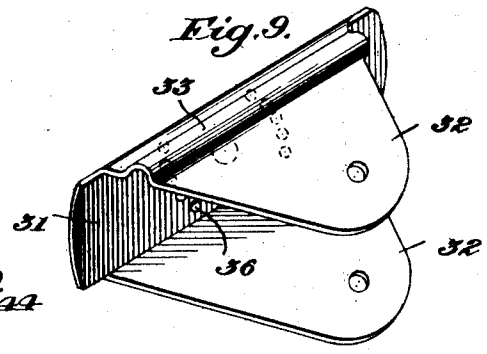


Fig. 10.

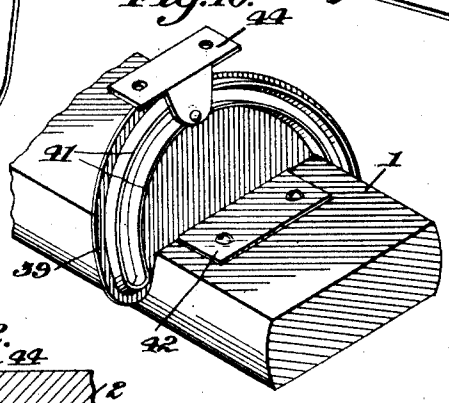


Fig. 11.

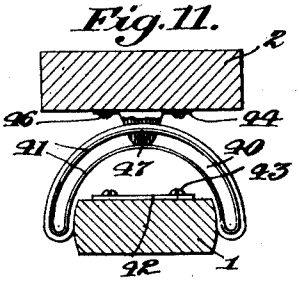
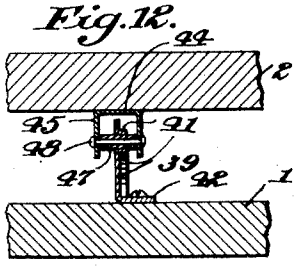


Fig. 12.



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Patented Feb. 16, 1932 1,845,870

UNITED STATES PATENT OFFICE

THEODORE SMITH FOWLER AND LAWRENCE THOMAS WARD, OF KANE, PENNSYLVANIA, ASSIGNORS TO KANE MANUFACTURING COMPANY, OF KANE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

TILTING BAR OPERATING DEVICE

Application filed March 19, 1931. Serial No. 523,916.

Our invention relates to tilting bar operating devices and, more particularly, to operating and locking means applicable to tilting bars which are associated with adjustable slats of Venetian blinds.

Venetian blinds in common use at the present time comprise a plurality of transversely arranged slats which are suspended by means of tapes from a pivotally mounted tilting bar which is adjustable around its main axis in order to vary the size of the openings between the various slats for control of light and ventilation through the openings. In the absence of special means to prevent unintentional variations in the positions of the slats, the latter are easily displaced from their adjusted positions by small applied forces. It is particularly desirable to lock the tilting bar after the slats have been moved to their substantially vertical positions on account of the forces exerted upon the slats and bar by the slat lifting cords which pass vertically through vertically aligned openings in the various slats and the bar, which forces tend to displace the slats and the bar from a vertical position.

According to the teachings of the prior art, various devices have been proposed for yieldably locking a tilting bar in different positions. These devices, of which we are aware, have been comprised of an undue multiplicity of parts which are expensive to construct and install and unsatisfactory from the standpoint of continuous and effective service.

According to our invention, we provide a main bar supporting member, a bar end supporting member and a pivot member associated therewith, which members are formed in a manner to provide a yieldable interlock therebetween, whereby the various members each serve a double function with no material increase in the cost of constructing or assembling the same.

The main object of our invention, therefore, is to provide an operating means for a tilting bar which is arranged to yieldingly lock the bar in any position to which it may be adjusted.

Another object is to provide a tilting bar operator which is adjustable to vary the turning effort necessary to tilt the bar and associated slats.

Another object is to provide a tilting bar operator which is mounted adjacent one end of the tilting bar and arranged to position the operating cords closely adjacent the associated window jamb.

Another object is to provide, in a tilting bar operator, a novel clip or bracket which is formed to serve both as a bar detent and a cord holding means.

Another object is to provide an auxiliary tilting bar support which is located intermediate the ends thereof.

A further object is to design a tilting bar operator and lock that is economical to manufacture and assemble, simple to install and adjust, and which is easily operable by one hand of an operator.

Other objects of our invention will be apparent in the specification which follows and the disclosure of the accompanying drawings wherein,—

Figure 1 is a side elevation, and Fig. 2 is a front elevation of one form of the invention;

Fig. 3 is a sectional view taken on section line 3—3 of Fig. 1;

Fig. 4 is a detail view of a unitary bracket and pulley support;

Fig. 5 is a detail view of a unitary bar end support and cable drum;

Fig. 6 is a side elevation, and Fig. 7 a front elevation of a modified form of operator;

Figs. 8 and 9 are detail views, respectively, of a bracket and a bar end support;

Fig. 10 is a view in isometric projection of a novel tilting bar center support;

Fig. 11 is a view in side elevation, and Fig. 12 a view in section of the center support shown in Fig. 10, while

Fig. 13 shows a detail.

Referring to the drawings in detail, Figures 1 to 5 show one form of our invention wherein a tilting bar 1 is suspended from a head rail 2 by means of brackets 3, one only of which is shown in the various figures. The bracket 3 which is supported from the head rail by bolts or the like 4, is formed from a single stamping which is bent down-

wardly along one edge to form an ear 5 spaced from the main portion 3 to provide spaced supports for a pulley 6. A tilt bar supporting clip 7, shown in detail in Fig. 5, is formed from two separate metal stampings 8 and 9 which are connected preferably by spot welding as at 10. The stamping 9 is formed to provide a cord drum or guide 11, while the stamping 8 is formed to provide a cord retaining groove 12. The unitary clip 7 is fastened to the bar 1 by means of a bolt 13. The bracket 3 and clip 7 are pivotally assembled by means of a bolt 14 which is passed through registering openings in both members and is received within a recess 15 formed in one end of the bar 1. A tension spring 16 is positioned on the bolt 14 between the clip 7 and a washer 17 and the tension of this spring may be varied by means of a nut 18 threaded on the bolt. The nut is prevented from turning bodily by its contact with the side walls of the recess. It will be noted that the tension in spring 16 acts to force the bracket 3 and clip 7 toward each other. The bight end of a cord 19 is firmly retained against the rail 1 by the gripping action of the groove 12, and the free ends 20 of the cord are passed over the face of the drum 11 and thence over the pulley 6.

The bar 1 may be rotated in a desired direction by a pull on one or the other of the cords 20. In order to yieldingly retain the bar 1 in any desired position, we provide a plurality of struck-out teats 21 on the bracket 3 which intermesh and coact with a corresponding group of teats 22 formed on the outer face of the clip 7. If desired, a single teat may be employed on one of these members. Rotation of the bar 1 and clip 7 with respect to the bracket 3 will cause the teats 22 to pass over and engage the teats 21, during which operation the spring 16 will yield slightly as the opposed teats separate. The nut 18 may be adjusted to vary the force necessary to rotate the bar 1 as well as the restraining force offered by the interengaging teats.

Fig. 13 illustrates the lateral distortion at 23 set up in the slat raising cords 24 which, as usual, pass through openings 25 formed in the tilting bar 1. The returning force in the cords caused by this distortion acts to rotate the bar counter-clockwise as viewed in Fig. 13, and such rotation will permit the slats suspended from the bar 1 to move from their vertical position unless means are provided as described above to lock the bar 1 in its adjusted position.

In Figs. 6 to 9 is shown a modified form of operator which is designed to permit the bar operating cords to hang to one side of the slats. The tilting bar 1 is suspended from a head rail 2 by means of a bracket 26 which is supported below the rail by bolts 27. It will be noted that a pair of ears 28 are struck out from the stamped metal bracket and serve to support a cord roller 29 which is tilted from the horizontal to permit the pull on the bar operating cord 30 to be exerted at right angles to the pulley axis.

A bar supporting clip 31 is shown in detail in Fig. 9 and which is formed as a unitary metal stamping to provide a pair of bar contacting lugs 32 and a cord gripping groove 33. The clip is attached to the bar end by a bolt 34. The bracket 26 and clip 31 are each provided with a circular series of struck out teats 35 and 36 similar to those shown in Fig. 3. The bracket and clip are pivotally assembled for operation by means of a bolt 37 in the same manner as shown for the modification of Fig. 3. A plurality of slats 38 are suspended from the bar 1 as shown in Fig. 7 and in the usual manner. It will be noted that the cords 30 will hang freely at one end of the slats 38 due to the location of the pulley 29 on the outer face of the bracket 26.

In Figs. 10 to 12, we have shown a novel and effective form of tilting bar support 39 adapted to be applied to the bar to provide an auxiliary support for the same adjacent its central portion. This support is formed as a single metal stamping and is so designed that it may be attached to the bar without cutting away material or altering the shape of the bar in any manner that would weaken the bar near its midportion. The support comprises a main vertical web portion, the upper arcuate end of which is provided with an arcuate slot 40 which is formed by striking out the metal to form a pair of laterally extending flanges 41. The lower edge of the support is bent at right angles to the main portion to provide an ear 42 adapted to be attached to the bar by means of screws 43. A bracket 44, which has a pair of downwardly extending lugs 45 is attached to the head rail 2 by means of screws 46. A roller 47 is mounted between the lugs 45 by means of a pin axle 48. As shown in Fig. 12, the support and bracket are assembled with the roller 47 within the slot 40 and the roller in operation engages the upper arcuate flange 41 which provides an extended bearing surface for the roller. The flanges 41 also serve to stiffen the web, thereby permitting the use of a thinner metal in forming the support.

The adjustable slats in a Venetian blind, when in their lowered position, impose a materially heavy load upon the tilting bar and, in blinds of large area and width, this load causes an appreciable deflection of the midportion of the bar which is undesirable particularly because a lateral thrust is imposed inwardly upon the bar supporting brackets which indirectly results in a defective pivotal action of the tilting bar. By employing a central bar support, we are able

to maintain the bar in axial alignment at all times.

It will be noted that the bar supporting brackets 3 or 26 serve the double function of supporting the bar and providing a locking means therefor. The bar end clips 7 or 31 function to support the bar end and cooperate with the brackets to lock the bar as well as to grip the operating cords by means of the grooves 12 or 33. The number of elements employed to secure the results described has been reduced to a minimum, thereby effecting great economy in material and labor in the manufacture of these devices in quantity production. When installing our unitary bar support and lock, it is necessary to merely fasten the operator as a unit to the head rail and secure the ends of the tilting bar between the lugs 8 and 9 (Fig. 5) or 32 (Fig. 9). Any desired adjustment of the bar locking action may be readily effected in a minimum of time by merely rotating the pivot bolts 14 or 37.

Although we have illustrated our invention by disclosing detailed practical embodiments thereof, we do not limit ourselves to what is shown but contemplate other modifications and equivalents such as may be embraced within the scope of the claims which follow.

What we claim is:

1. In a Venetian blind, a tilting bar, a bracket member, said bar being provided with a supporting member at an end, a pivot for connecting said members to each other for relative rotation, each member having a vertical portion, a plurality of detents extending laterally from one vertical portion, a laterally extending detent on said other portion in position to engage said first named detents in succession to provide a plurality of stop means for retaining said bar in positions of adjustment, a spring for yieldably maintaining said members in contact, said pivot being rotatable to vary the tension of said spring.

2. In a Venetian blind, a tilting bar, a bracket member, said bar being provided with a supporting member at an end, a threaded bolt for connecting said members to each other for relative rotation, each member having a vertical portion, a plurality of detents extending laterally from one vertical portion, a laterally extending detent on said other portion in position to coact with said first-named detents in succession, the coacting detents being relatively yieldable during rotation of said bar, an adjusting nut on said bolt, a spring in position on said bolt and contacting said nut, the headed end of said bolt engaging said bracket member to provide an external adjustment for said nut.

3. In a Venetian blind, a tilting bar, a bracket member, a pivot supporting member on an end of said bar, a pivot bolt for connecting said members for relative rotation, each member having a vertical portion, a plurality of struck out detents on one portion and a struck out detent on said other portion in position to engage said first-named detents in succession, yieldable means for permitting separation of said vertical portions during rotation of said bar, said means comprising a nut on the inner end of said bolt and a spring in contact with said nut and said supporting member.

4. In a Venetian blind, a tilting bar, a pivot supporting member on an end of said bar, a bracket, a pivot for rotatably connecting said member and bracket, the inner face of said bracket extending parallel to said supporting member, a pulley mounted on the outer face of said bracket in a position displaced from the horizontal, said bracket having an opening therethrough adjacent said pulley, and a pair of bar operating cords extending over said pulley and through said opening and connected respectively to opposite sides of said tilting bar.

5. In a Venetian blind, a tilting bar, a bracket, a clip associated with an end of said bar, said clip having a vertical portion and a laterally extending portion, said last-named portion being provided with a transverse groove and attached to said bar, said vertical portion being pivotally connected to said bracket, interengaging stops on said vertical portion and bracket a pulley on said bracket, an operating cord engaging said pulley, said cord being extended to pass between said laterally extending portion and said bar and within said groove.

6. In a Venetian blind, a tilting bar, a bracket for supporting said bar, a recess extending axially within the bar end, a pivot supporting plate engaging the bar end, a bolt extending through said bracket and plate and providing a pivotal connection therebetween, the threaded end of said bolt extending within said recess, a nut threaded on said bolt and engaging a side of said recess, a spring surrounding said bolt between said plate and said nut, said bolt being rotatable to shift said nut along said bolt to tension said spring.

7. In a Venetian blind, a tilting bar, a head rail, brackets for supporting the ends of said bar from said rail, an auxiliary bar support associated with said bar intermediate the ends thereof, said support comprising a vertical web portion, said web portion provided with an arcuate slot concentric with the center of rotation of said bar, means comprising an integral portion extending from said web portion laterally and adapted to be connected to the surface of said bar, a bracket on said head rail, and a roller supported on said bracket and positioned within said slot for engaging the upper edge of said slot.

8. In a Venetian blind, a tilting bar, a head rail, brackets for supporting the ends of said bar from said rail, an auxiliary bar support associated with said bar between the ends thereof, said support comprising a vertical

web portion and an integral laterally extending portion, means for connecting said lateral portion to said bar, said web portion being provided with an arcuate slot concentric with the center of rotation of said bar, a bracket on said head rail, and a roller supported on said bracket and positioned within said arcuate slot.

9. In a Venetian blind, a tilting bar, a head rail, brackets for supporting the ends of said bar from said rail, an auxiliary bar support associated with said bar between the ends thereof, said support comprising a vertical web portion and a lateral portion, means for connecting said lateral portion to said bar, said web portion being provided with an arcuate slot concentric with the center of rotation of said bar, an arcuate flange extending laterally along the upper edge of said slot, a bracket on said head rail, and a roller supported on said bracket and positioned within said slot in contact with said flange.

In testimony whereof we affix our signatures.

THEODORE SMITH FOWLER.
LAWRENCE THOMAS WARD.