

June 26, 1962

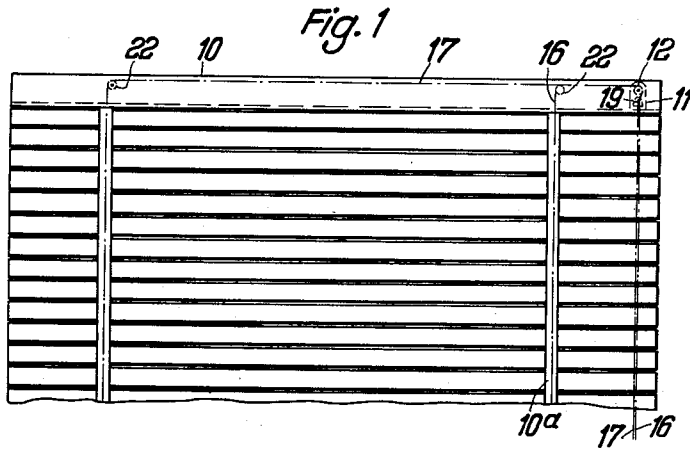
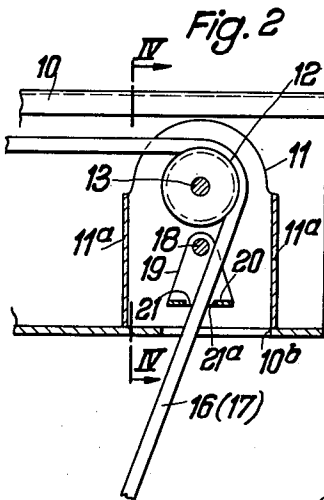
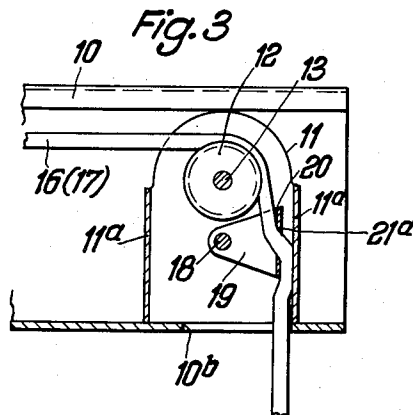
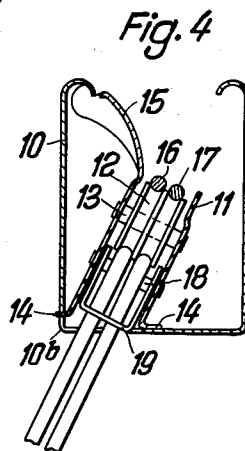
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3,040,403

RELEASABLE LOCK FOR VENETIAN BLINDS AND THE LIKE

Filed Oct. 23, 1959

2 Sheets-Sheet 1



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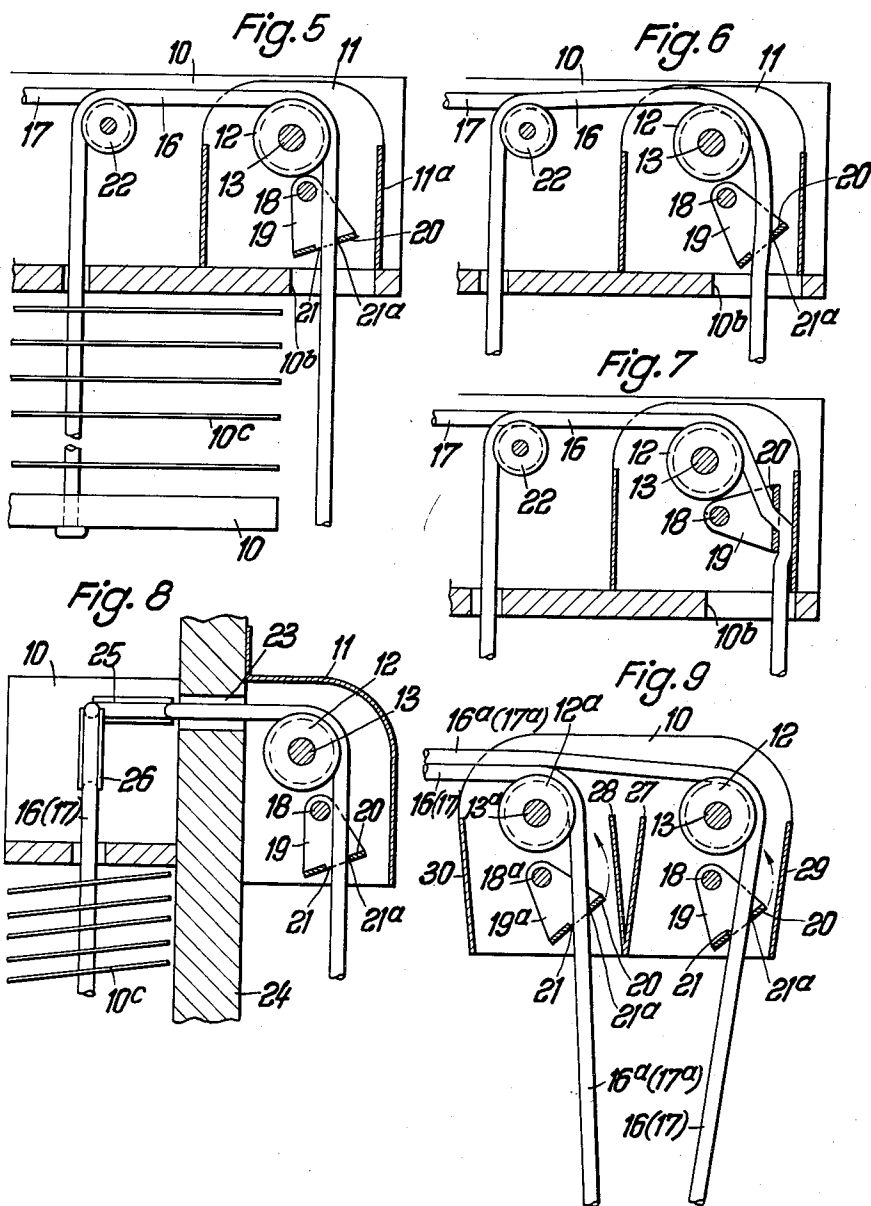
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3,040,403

RELEASABLE LOCK FOR VENETIAN BLINDS AND THE LIKE

Filed Oct. 23, 1959

2 Sheets-Sheet 2



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3,040,403

RELEASABLE LOCK FOR VENETIAN BLINDS AND THE LIKE

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Filed Oct. 23, 1959, Ser. No. 848,395

Claims priority, application Germany Aug. 27, 1959

6 Claims. (Cl. 24—134)

The present invention relates to devices capable of locking tensioned cords so that these cords will not move.

For example, in the case of Venetian blinds a device is provided for releasably locking a tensioned cord which supports part of the blind, so that in this way the blind can be set in any position where it is at any desired elevation from the lowermost part of a window, for example.

Although releasable locking structures of the above type are well known, they suffer from several defects the most pronounced of which is that they releasably lock the tensioned cord by engaging the cord with a toothed edge of a lever or the like. As a result, the cord will inevitably become frayed and worn to such an extent that the lock is incapable of functioning with the cord and a new cord is required.

It is accordingly one of the objects of the invention to provide a cord lock of the above type which will not engage the cord with elements such as teeth or the like so that the structure of the invention will not cause the cord to become worn and frayed. Thus, with the structure of the invention the cord will only be gripped between relatively smooth surfaces when locked against movement.

Another object of the present invention is to provide a structure of the above type which is relatively simple and inexpensive to manufacture and install and which is very reliable in operation.

A further object of the present invention is to provide a cord lock of the above type which will operate automatically to lock the cord when the latter is released so that it tends to be pulled by the article which it supports.

It is also an object of the present invention to provide a cord lock structure which can operate efficiently with cords extending from a plurality of devices such as Venetian blinds in such a way that the devices such as the Venetian blinds are acted on in the same way through the cords thereof so that in the case where a pair of Venetian blinds are located in side by side relation, for example, the cords will not be actuated in such a way as to cause the slats of one blind to be inclined with respect to those of the other blind.

With the above objects in view the invention includes in a device which is adapted to be used with Venetian blinds or the like for releasably locking a tensioned cord, a support means and a guide around which the cord is adapted to be guided, this guide being carried by the support means. A movable lock member of the invention has a wall formed with an opening through which the cord passes, and the support means supports this movable lock member for movement in one direction to a locking position in response to pulling of the cord around the guide by the article supported by the cord, and the support means supports the movable lock member for movement in an opposite direction to an unlocking position in response to pulling of the cord around the guide by the operator. The support means carries a stationary lock member at a distance from the path of movement of the movable lock member small enough to prevent movement of the movable lock member beyond its locking position as a result of gripping of the cord between the lock members.

The novel features which are considered as character-

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istic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

FIG. 1 is a fragmentary, schematic front elevation of a Venetian blind provided with the structure of the invention;

FIG. 2 shows on an enlarged scale and in a sectional elevation the structure of the invention mounted within the upper part of the Venetian blind with the cord shown held by the operator in an inclined position;

FIG. 3 shows the structure of FIG. 2 in its locking position;

FIG. 4 is a transverse section taken along line IV—IV of FIG. 2 in the direction of the arrows;

FIG. 5 is a fragmentary sectional elevation showing the interior of the upper part of a Venetian blind which is provided with another embodiment of a lock structure of the invention, the embodiment of FIG. 5 being somewhat different from that of FIG. 2;

FIG. 6 illustrates the structure of FIG. 5 in an intermediate position between the unlocked position of FIG. 5 and the locked position of FIG. 7;

FIG. 7 shows the structure of FIG. 5 in the locked position thereof;

FIG. 8 shows how the invention is adapted to be used with a structure where the Venetian blind or the like is arranged on the outside of a wall while the manipulating cords are on the inside of the wall; and

FIG. 9 shows an embodiment of the invention adapted for use with a pair of blinds or the like which are located beside each other and which are controlled from a single location.

Referring now to FIG. 1 of the drawings, there is shown therein the upper assembly 10 of a Venetian blind, this upper assembly being in the form of an elongated hollow channel member of substantially U-shaped cross section (FIG. 4) which is fixed to the upper part of a window in a known way and beneath which the slats of the blind are located, as is apparent from FIG. 1. The structure of the invention includes a support means 11 in the form of a bracket having a pair of side walls spaced from each other, and between these side walls extends a guide formed by the shaft 13 and the roller 12 turntable thereon. The axis of the shaft 13 and thus the axis of the roller 12 of the guide extend perpendicularly to the side walls of the supporting bracket 11, and in the illustrated example the pulley or roller 12 can be fixed to the shaft 13 which is turnably supported at its ends by the pair of side walls of the supporting bracket 11. As is apparent from FIG. 4, the roller or pulley 12 has a pair of annular grooves receiving the cords 16 and 17 which are guided around the axis of the guide 12, 13 in the manner illustrated in FIGS. 2 and 3. The bracket 11 is set into the channel 10 from above and the side walls of the bracket 11 terminate, respectively, at their bottom ends in tongues 14 having the configuration shown in FIG. 4 and engaging the channel 10 in the manner shown in FIG. 4. Thus, the left tongue 14 of FIG. 4 engages the upper edge of the opening 10b which is formed in the channel 10, while the right tongue 14 of FIG. 4 engages the bottom wall of the channel, and the left side wall of the bracket 11 is provided with an elongated springy extension 15 which at its top end engages behind the left upper curved edge of the channel 10, as illustrated in FIG. 4, so that the bracket 11 will remain in the position illustrated in FIG. 4.

The cords 16 and 17 are guided around the guide 12, 13 in the manner illustrated in FIGS. 2 and 3, and these

cords 16 and 17 extend around the guides 22 diagrammatically shown in FIG. 1 along the Venetian blind behind tapes 10a thereof through openings in the slats and the cords are connected in a known way to the lowermost slat so that when the cords 16 and 17 are pulled downwardly by the operator the lowermost slat will be raised to raise the slats located thereover while when the cord 16 and the cord 17 are held in a proper position and allowed to move upwardly around the guide 12, 13 the Venetian blind can be lowered, as is well known.

It is of course to be understood that the structure of the invention is not limited to use with the Venetian blinds but can be used also with any type of curtains or the like which are raised and lowered.

The structure of the invention includes a movable lock member in the form of a stirrup 19 located between the side walls of the bracket 11 and pivotally carried by a pivot pin 18 which extends between and is carried by the side walls of the bracket 11, the pin 18 being parallel to the pin 13 so that the stirrup 19 is freely swingable about an axis which is parallel to the axis of the guide 12, 13 around which the cord is guided. In the example illustrated in FIGS. 2 and 3 the axis of the pivot pin 18 is directly beneath the axis of the shaft 13. The stirrup 19 is provided with an end wall 20 distant from its turning axis, and this end wall 20 is formed with an opening 21 in the form of an elongated slot having side edges which extend perpendicularly with respect to the side walls of the bracket 11, and one of these side edges 21a is shown in FIGS. 2 and 3. The cords 16 and 17 both pass downwardly through the opening 21.

The supporting bracket 11 includes at least one transverse wall 11a extending between and fixed to the side walls of the bracket 11, and in FIGS. 2 and 3 the bracket 11 is provided with a pair of transverse end walls 11a which are parallel to and spaced from each other and located equidistantly from the shaft 13 and pivot 18 in the embodiment of FIGS. 2 and 3.

The embodiment of FIGS. 2 and 3 where the bracket 11 and the structure carried thereby is symmetrical is provided so that the same structure can be used either at the right end of the assembly, as shown in FIG. 1 or at the left end of the assembly.

As may be seen from FIG. 3 the stirrup 19 can turn upwardly from its lowermost position shown in FIG. 2, which is its unlocking position, through substantially 90° toward the right end wall 11a as viewed in FIG. 3, and the transverse wall 11a is located so close to the stirrup 19 that the latter cannot turn beyond the locking position shown in FIG. 3 because of the gripping of the cord between the stirrup 19 and the transverse wall 11a shown at the right of FIG. 3, and thus the Venetian blind or the like can be securely locked in a desired position with this construction. It will be noted that in its locking position the end wall 20 is substantially parallel to the transverse 11a so that the cord is gripped in such a way that there is a minimum wear inasmuch as the gripping pressure is distributed over a relatively large area of the cord.

When the cords 16 and 17 are pulled downwardly to the left, as shown in FIG. 2, it is apparent that they will be maintained stretched and at the same time the cords can be pulled by the operator to raise the blind or while held taut in the position shown in FIG. 2 the operator can allow the cords to move upwardly around the guides 12, 13 for the purpose of lowering the blind.

Once the blind has been adjusted as desired the operator simply releases the cords 16 and 17 so that due to their tendency to hang vertically they engage the right edge 21a of the stirrup 19 and automatically turn the latter in a counterclockwise direction, this initial phase of the automatic locking being illustrated with a somewhat different embodiment of the invention in FIG. 5. Because of the weight of the slats of the blind on the cords 16 and 17, they are pulled in a direction which tends to lower the blind, and the engagement of the cords

with the stirrup 19 by passing through the opening 21 thereof causes the stirrup to be automatically turned by engagement with the cords 16 and 17 in a counterclockwise direction, as viewed in FIGS. 5-7, from the position of FIG. 5 through the position of FIG. 6 to that of FIG. 7, and thus the cords will become automatically locked in the position illustrated in FIG. 3.

Thus, with the structure of the invention the cords will be automatically locked as soon as they are released. The edge 21a is preferably rounded so that there is a minimum of rubbing of the cords with a minimum of wear thereon.

In the embodiments of the invention illustrated in FIGS. 5-9 the pivot pin 18 which supports the stirrup 19 for free turning movement is not located directly beneath the shaft 13 of the guide 12, 13. The shaft 18 is offset toward the right in FIGS. 5-7 so that the shaft 18 in this embodiment is nearer to the right transverse wall 11a than the shaft 13. As long as the operator holds the cords 16, 17 in stretched condition extending downwardly from the guide 12, 13 through the opening 19b the operator can raise or lower the blind, curtain, or the like since at this time the cords will extend freely through the opening 21 and only the rounded edge 21a will engage the cords. On the other hand, whenever the operator releases the cords 16, 17, these cords cooperate with the stirrup 19 because of the weight of the Venetian blind or the like pulling on the cords 16 and 17 to turn the stirrup 19 from the position of FIG. 5 through that of FIG. 6 and finally to the position of FIG. 7 where the cords are automatically locked between the movable lock member formed by the stirrup 19 and the stationary lock member formed by the right transverse wall 11a of the bracket 11, so that in this way the blind, curtain, or the like automatically remains in its adjusted position and the operator need not take any particular care to pull the cords 16, 17 in one direction or the other so as to guarantee that they are properly clamped. Since the stirrup 19 is turned part of the way toward the right wall 11a of FIGS. 5-7 when the cords 16, 17 are held stretched straight down from the guide 12, 13 by the operator, the angle through which the stirrup must turn from the position of FIG. 5 to that of FIG. 7 is less than 90°. As a result when the cords 16, 17 are simply suddenly released so that they suddenly become loose, the structure operates automatically to clamp the cords in the manner illustrated in FIG. 7 and the blind will not fall all the way down to its closed position.

Since with the embodiment of FIGS. 5-7 the cords 16 and 17 need only be pulled by the operator straight down for raising the blind and simply held stretched in a vertical position while being allowed to move upwardly in order to allow the blinder to lower, this embodiment is particularly suitable for those Venetian blinds which are located on the outside of a wall such as the wall 24 so that the operating cords are on the inside of the wall and adjust the blind from the inside. Thus, referring to FIG. 8, it will be seen that the cords 16, 17 are guided through an opening 23 of the exterior wall 24 behind which the guide rolls 25, 26 are located. With this embodiment the axis of the guide 12, 13 extends parallel to the elongated slats 10c of the exterior Venetian blind. The structure is otherwise identical, except, of course, the bracket 11 is suitably shaped so that it can be fixed to the inner surface of the wall 24. Since with this installation, as shown in FIG. 8, it would be necessary with a conventional device to incline the cords 16, 17 of the right side of the wall 24, as viewed in FIG. 8, toward the wall 24, which would be very difficult to do with this arrangement, the structure of the invention is particularly of advantage with the embodiment of FIG. 8 since it is only necessary to maintain the cords 16, 17 in a vertical position parallel to the wall 24 on the right side of the latter, as viewed in FIG. 8.

The embodiment of the invention which is illustrated

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in FIG. 9 shows how the invention is constructed when used with a pair of Venetian blinds located in side by side relation with all of the cords controlling the pair of blinds being located at the right of the right one of the pair of blinds. First, FIG. 9 shows the cords 16a, 17a extending from the left blind to the right part of the structure shown in FIG. 9, while the cords 16, 17 extend from the right blind to the left part of the structure shown in FIG. 9. All of these cords are connected together at a portion located beneath the structure shown in FIG. 9 so that all four cords are operated simultaneously, and with conventional structure of this type the pair of blinds are not operated uniformly because of the different inclinations of the sets of cords and different treatment thereof when they are pulled or released simultaneously by the operator. This disadvantage is avoided with the structure shown in FIG. 9. As may be seen from FIG. 9, the supporting bracket illustrated therein carries a pair of guides 12, 13 and 12a, 13a. The transverse walls of the bracket of FIG. 9 include a pair of walls 28 and 29 which respectively form the stationary lock members of the embodiment of FIG. 9. As may be seen from FIG. 9, the pivot pin 18a is displaced to the right of the axis of the shaft 13a toward the wall 28 which is inclined upwardly to the left, as viewed in FIG. 9, while the pivot pin 18 is displaced to the left of the axis of the shaft 13 away from the transverse wall 29 which is inclined upwardly to the right, as viewed in FIG. 9. As may be seen from FIG. 9, the transverse wall 28 is located between the pair of guides 12a, 13a and 12, 13 while the guide 12, 13 is located between the pair of transverse walls 28 and 29. The stirrups 19a and 19 are identical with those described above, and the structure of FIG. 9 operates in the same way as described above, the cords when released by the operator cooperating with the stirrups to turn the latter in the direction of the arrow shown in FIG. 9 so as to lock the cords between the stirrups and walls 28, 29. Because of the opposed inclinations of the walls 28, 29, these walls diverging from each other in an upward direction, as viewed in FIG. 9, and because of the displacement of the pins 18a and 18 with respect to the shafts 13a and 13, as described above, the stirrups will turn through substantially the same angle from their unlocking position shown in FIG. 9 to their locked position where the cords are clamped between the stirrups and the transverse walls 28, 29 so that with this construction the pair of Venetian blinds will always be at the same elevation.

The structure of FIG. 9 is not limited to use at the right end of a pair of Venetian blinds which are in side by side relation. The structure shown in FIG. 9 can, if desired, be installed at the left end of the pair of Venetian blinds, and all that is required for this purpose is the pair of additional walls 27 and 30 shown in FIG. 9, these walls 27 and 30 being respectively parallel to the walls 29 and 28 and also diverging from each other in an upward direction. It will be noted that the walls 27, 28 are directly next to each other and form a V-channel between themselves. When the embodiment of FIG. 9 is mounted at the left end of a pair of Venetian blinds which are in side by side relation, the stirrups 19a and 19 respectively cooperate with the walls 30 and 27 which in this case form the stationary lock members, and of course the cords come from the right of FIG. 9 over the guides and extend downwardly on the left sides of the guides, as viewed in FIG. 9, through the openings 21 of the pair of stirrups so that these stirrups are in this case tilted in the direction opposite from that shown in FIG. 9, and of course both of the side edges of the openings 21 are rounded. Thus, the same structure which is shown in FIG. 9 can be used at either end of a pair of Venetian blinds so that the cost is not increased by requiring special structures depending upon the particular location of the structure shown in FIG. 9. Irrespective of which end of the assembly the structure of FIG. 9 is located at, the structure will operate

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reliably to prevent one of the stirrups from getting ahead of the other of the stirrups so that with this construction the slats of one blind will not be located at an elevation different from or inclined with respect to the slats of the other blind.

Although inclined stationary lock members formed by the walls 27—30 are shown in FIG. 9, this construction is not essential and could be replaced by vertical walls to which wedge-shaped elements are fastened so as to provide inclined stop surfaces to cooperate with the transverse walls 20 of the stirrups 19 and 19a.

The structure of the invention can be used with all types of cords, bands, strips, or the like, and with all kinds of blinds, curtains, or vertically movable sheet metal walls, etc. The lock structure of the invention can be located at any desired part of the assembly depending upon the particular installation.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of releasable locks differing from the types described above.

While the invention has been illustrated and described as embodied in releasable locks for tensioned cords, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. A device, adapted to be used in Venetian blinds and the like, for releasably locking a tensioned cord, comprising, in combination, a supporting bracket having a pair of spaced side walls and a pair of spaced end walls extending between and fixed to said side walls; an elongated guide extending between and carried by said side walls, said guide having an axis substantially perpendicular to said side walls and located substantially midway between said end walls; and a stirrup located between and carried by said side walls for free turning movement around an axis located directly beneath the axis of said guide also substantially midway between said end walls, said stirrup having distant from its turning axis an end wall formed with an opening passing therethrough, and said stirrup when it is turned upwardly in either direction from its lowermost position through substantially 90° having its wall which is formed with said opening located close enough to either end wall of said bracket to grip between the stirrup and end wall a cord which passes through the opening of the stirrup and around said guide.

2. A device, adapted to be used with a Venetian blind or the like, comprising, in combination, a pair of spaced side walls and a pair of spaced transverse walls extending between and fixed to said side walls and forming a supporting bracket therewith, said transverse walls also participating in the locking of a pair of cords and acting as stationary lock members, said transverse walls being oppositely inclined and diverging from each other in an upward direction; a pair of parallel guides extending between and carried by said side walls with one of said transverse walls located between said guides and with one of said guides located between said transverse walls, said guides having axes extending substantially perpendicularly to the spaced walls; and a pair of stirrups pivotally carried by said side walls in the space between the latter for free turning movement respectively around axes parallel to said guide axes and located at an elevation lower

than said guide axes and laterally offset with respect to said guide axes toward said transverse wall which is located between said guides, each of said stirrups having an end wall formed with an opening passing therethrough so that a pair of cords extending around said guides can pass downwardly through said openings of said stirrups, said stirrups when they are turned upwardly from their lowermost position through substantially 90° respectively toward said transverse walls being located so close to the latter that the cords are gripped between the stirrup end walls and said transverse walls to be locked against further movement.

3. A device, adapted to be used with a Venetian blind or the like, comprising, in combination, a pair of spaced side walls and a pair of spaced transverse walls extending between and fixed to said side walls and forming a supporting bracket therewith, said transverse walls also participating in the locking of a pair of cords and acting as stationary lock members, said transverse walls being oppositely inclined and diverging from each other in an upward direction; a pair of parallel guides extending between and carried by said side walls with one of said transverse walls located between said guides and with one of said guides located between said transverse walls, said guides having axes extending substantially perpendicularly to the spaced walls; a pair of stirrups pivotally carried by said side walls in the space between the latter for free turning movement respectively around axes parallel to said guide axes and located at an elevation lower than said guide axes and laterally offset with respect to said guide axes toward said transverse wall which is located between said guides, each of said stirrups having an end wall formed with an opening passing therethrough so that a pair of cords extending around said guides can pass downwardly through said openings of said stirrups, said stirrups when they are turned upwardly from their lowermost position through substantially 90° respectively toward said transverse walls being located so close to the latter that the cords are gripped between the stirrup end walls and said transverse walls to be locked against further movement; and a pair of additional transverse walls extending between and fixed to said side walls, said additional transverse walls being respectively parallel to said first-mentioned transverse walls and said first-mentioned transverse wall which is located between said guides being located directly next to that one of said additional pair of transverse walls which is parallel to the other of said first-mentioned transverse walls.

4. A device, adapted to be used in Venetian blinds and

the like, for releasably locking a tensioned cord, comprising, in combination, a supporting bracket having a pair of spaced side walls and a pair of spaced end walls extending between and fixed to said side walls; a guide roller located between said side walls and having an axis substantially perpendicular to said side walls and located substantially midway between said end walls; means supporting said roller for free rotary movement about its axis; and a stirrup located between and carried by said side walls for free turning movement around an axis located directly beneath the axis of said guide roller also substantially midway between said end walls, said stirrup having distant from its turning axis an end wall formed with an opening passing therethrough, and said stirrup when it is turned in either direction from its lowermost position through substantially 90° having its wall which is formed with said opening located close enough to either end wall of said bracket to grip between the stirrup and end wall a cord which passes through the opening of the stirrup and around said guide roller.

5. A device as recited in claim 4 and wherein said opening is located substantially midway between the ends of said end wall of said stirrup and wherein said opening has a length in a direction extending between the ends of said end wall of said stirrup substantially smaller than the diameter of said guide roller so that a cord extending straight down from said guide roller through said opening will engage an end of said opening and will maintain said stirrup at an inclined position between said lowermost position thereof and a position angularly spaced 90° from its lowermost position, so that upon release of a cord extending straight down from said guide roller the cord will be pulled upwardly by the weight of the blind or the like and will automatically turn the stirrup to a position gripping the cord between the stirrup and an end wall of said bracket.

6. A device as recited in claim 5 and wherein said opening has rounded ends to prevent fraying of the cord.

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