

Oct. 10, 1950

H. NELSON

2,524,988

CORD LOCK FITTING

Original Filed Feb. 27, 1947

2 Sheets-Sheet 1

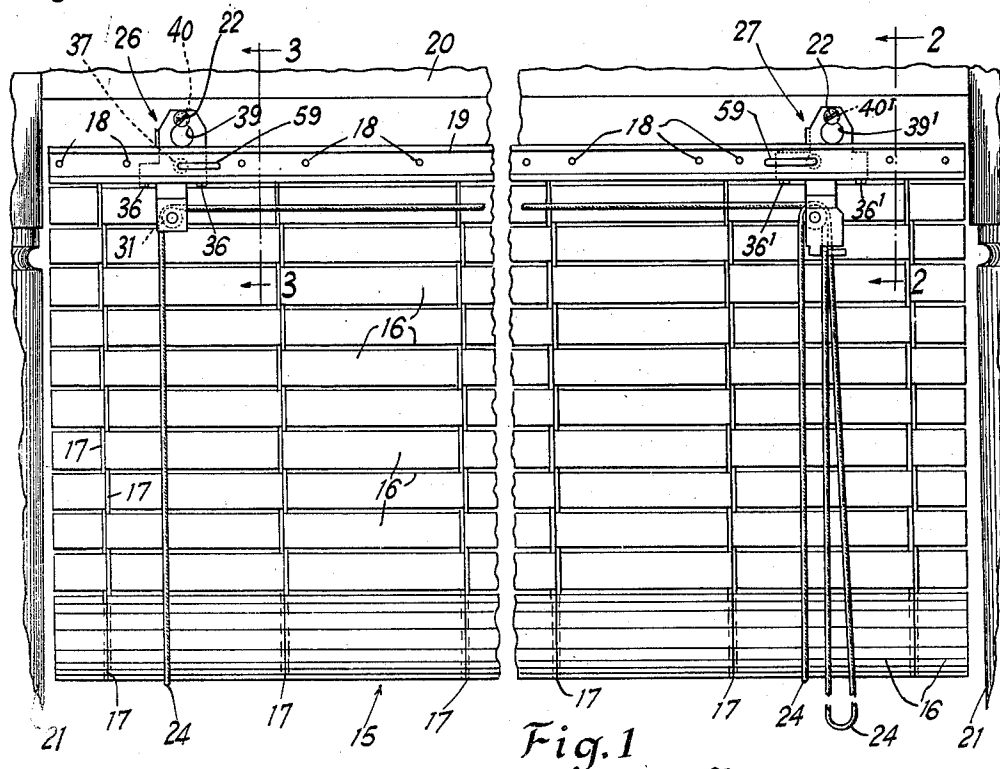


Fig. 1

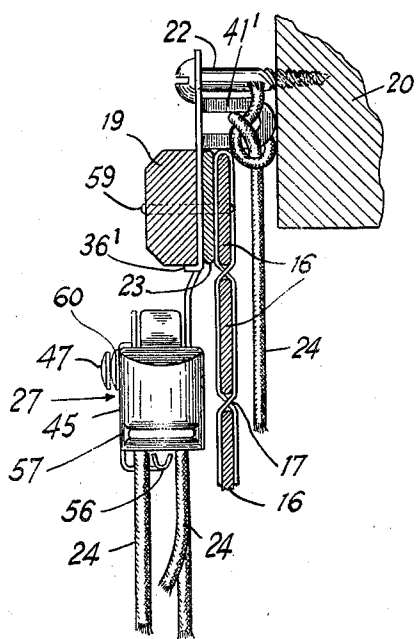


Fig. 2

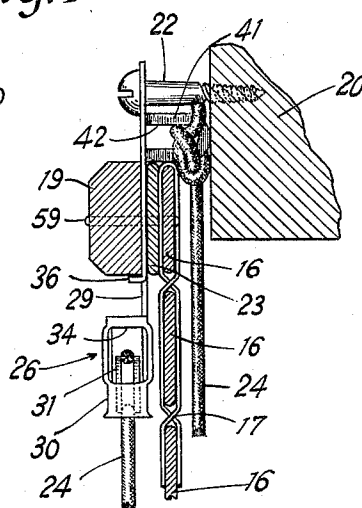


Fig. 3

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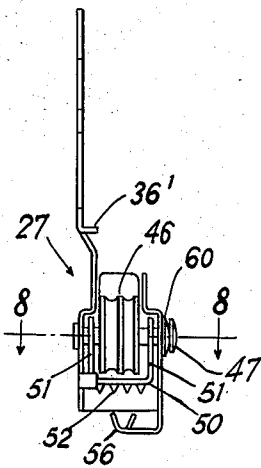


Fig. 5

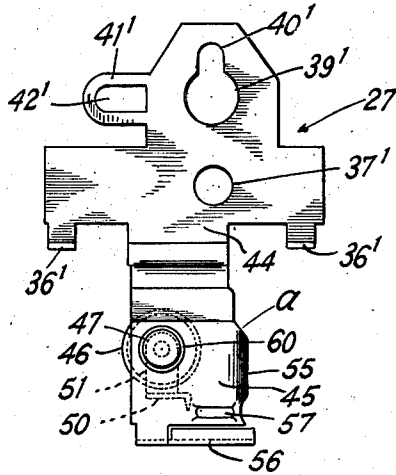


Fig. 4

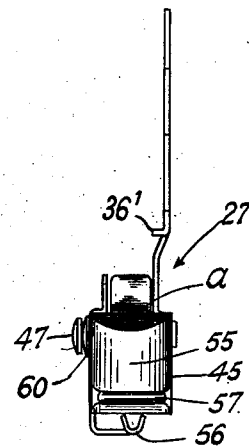


Fig. 6

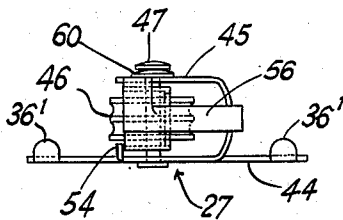


Fig. 7

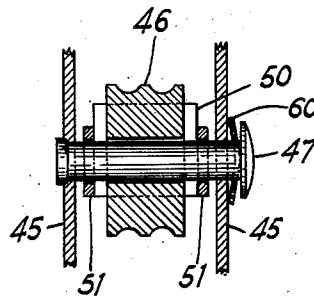


Fig. 8



Fig. 9

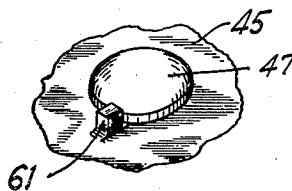


Fig. 10

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2,524,988

CORD LOCK FITTING

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Original application February 27, 1947, Serial No.
731,392. Divided and this application Decem-
ber 11, 1948, Serial No. 64,727

4 Claims. (Cl. 24—132)

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This invention relates to cord locks, and the present application is a division of my application Serial Number 731,392, filed February 27, 1947. The invention is particularly applicable to shades of the type often referred to as "porch shades," and it will be disclosed and discussed in that connection. However, certain aspects of the invention are applicable to other types of blinds, within which term I include porch shades, roll screens and Venetian blinds.

The usual "porch shade" is essentially a mat of one sort or another hung in a vertical plane and arranged to be rolled up by lift cords or ropes. The mat may take various forms, a frequent form being a woven mat having spaced vertically-disposed strings or cords as warp and relatively narrow horizontally-disposed strips of wood or bamboo as woof.

In an operative sense there are ordinarily two lift cords, and these may consist of two branches of a single piece of cord. The terminal end of one lift cord is anchored at the top of the blind near a first end thereof. From there this cord extends down the rear face of the blind, under the bottom of the blind, up the front face of the blind, over a pulley or other suitable cord guide, to a point near the second end of the blind, over another pulley or other suitable cord guide, and thence through a cord lock. The other lift cord has its terminal end anchored at the top of the blind near the second end thereof. From there this cord extends down the rear face of the blind, under the bottom of the blind, up the front face of the blind, over a pulley or other suitable cord guide, and thence through the cord lock. If the two lift cords consist of two branches of a single piece of cord, they unite after passing through the cord lock.

The present invention, in its preferred form hereinafter disclosed, is concerned with a cord lock fitting which acts as a cord guide and includes a cord pulley and which also includes means for hanging the shade.

An object of the invention is to provide for porch shades or similar blinds, a convenient and effective fitting which includes a shade hanger, a cord guide and a cord lock.

Another object of the invention is to provide an improved fitting which includes a shade hanger, a cord anchor, a cord guide, and a cord lock.

A further object of the invention is to provide for blinds a cord lock which is substantially protected against false or unintended operation.

A still further object of the invention is to provide for blinds an improved cord lock which prevents two branches of cord passing through the lock from becoming twisted within the casing of the lock.

Additional objects of the invention are to accomplish the foregoing results with a fitting

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adapted for manufacture as a unitary sheet metal stamping or assembly thereof.

Further objects and objects relating to details and economies of construction will more definitely appear from the detailed description to follow.

My invention is clearly defined in the appended claims. In the claims, as well as in the description, parts are at times identified by specific names for clarity and convenience, but such nomenclature is to be understood as having the broadest meaning consistent with the context and with the concept of my invention as distinguished from the pertinent prior art. The best form in which I have contemplated applying my invention is illustrated in the accompanying drawings forming part of this specification, in which:

Fig. 1 is a front elevation of a mounted porch shade having a fitting in accordance with the preferred form of the present invention installed thereon, the central portion of the shade being broken away.

Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1 and showing the combined hanger and cord lock fitting, a portion of the shade support being omitted for clarity of illustration.

Fig. 3 is a vertical section taken on the line 3—3 of Fig. 1, a portion of the shade support being omitted for clarity of illustration.

Fig. 4 is a front elevation of the combined hanger and cord lock shown in Fig. 2, prior to installation on the shade.

Fig. 5 is a right-side elevation of the fitting shown in Fig. 4.

Fig. 6 is a left-side elevation of the fitting shown in Figs. 4 and 5.

Fig. 7 is a bottom plan view of the fitting shown in Figs. 4, 5 and 6.

Fig. 8 is a horizontal section of the fitting, taken generally on line 8—8 of Fig. 8.

Fig. 9 is a perspective view, on a large scale, of a modified spring washer which may be positioned under the head of the pulley shaft of the cord lock fitting.

Fig. 10 is a detail perspective view, also on a large scale, showing an alternative means for engaging the head of the pulley shaft.

The shade, generally designated as 15 and shown in Fig. 1, is comprised of a multiplicity of edgewise-positioned horizontal strips or slats 16 which are collectively secured into a flexible sheet by interwoven vertical cords 17 extending at intervals from top to bottom of the shade. The upper portion of the shade 15 terminates in a head or top bar 19 which has, mounted alongside it, the topmost slat 16 of the shade, a second slat 23 being frequently interposed between the top slat 16 of the shade and the head bar 19, as shown in Figs. 2 and 3. The head bar 19 and the slats

16 are secured together at intervals along their length by fasteners, such as rivets 18.

The shade 15 is suspended from a support 20, such as the marginal roof beam of a porch, and is often positioned between porch pillars 21, 21 as shown in Fig. 1. The shade 15 may be conveniently suspended from the support 20 by the use of fittings to be described which detachably engage headed fasteners, such as the screws 22, 22 secured in the support.

In the form of multiple slat shade shown in Fig. 1, the slats are not tiltable, and the shade is raised to open position by rolling it upwardly from the bottom. Opening of the shade 15 is accomplished by lift cords 24, 24 which cooperate with the shade in the well-known manner:

The two fittings may be conveniently designated as a cord guide fitting 26 and a cord lock fitting 27, the cord lock fitting also serving the function of a cord guide for changing the direction of pull of the lift cords 24, 24. The cord guide fitting 26 and the cord lock fitting 27 also serve as hangers for mounting the shade 15, as will be described.

Referring to Fig. 3, the cord guide fitting 26 is formed from a flat sheet of metal, preferably plated or treated to resist corrosion by the use of stamping dies or otherwise. The cord guide fitting 26 includes a flat plate 29 having its lower portion horizontally folded upon itself in spaced relation to form a housing 30. A single-groove pulley 31 is mounted for rotation within the housing 30 on a rivet passing through the housing perpendicular to the plate 29. One side of the housing 30 is cut away to provide a hole 34 in order to permit lateral passage of the lift cord 24 from the pulley 31, as is shown in Fig. 1. The edge portions of the metal at either vertical side of the hole 34 and along the opposite lower edges of the housing 30 are turned slightly outward to prevent fraying of the lift cord 24 as it runs past these edges.

The mid-portion of the plate 29, slightly above the housing 30, is provided with two small forwardly-extending flanges 36, 36 lying in the same horizontal plane and preferably spaced as far apart as the width of plate 29 permits. The mid-portion of the plate 29 is also provided with a round hole 37 (Fig. 1), the hole 37 and the flanges 36, 36 being provided for mounting the fitting 26 on the shade 15 in a manner to be described.

The upper end of the plate 29 is provided with a so-called keyhole, composed of a round hole portion 39 and an upwardly-projecting slot portion 40, the hole portions 39 and 40 being identical with hole portions 39' and 40' shown in Fig. 4. The round portion 39 is of sufficient size to permit it to be passed over the head of the screw 22 (Fig. 1) secured to the support 20; the slot 40 being of suitable width to slide down on the shank of the screw. This arrangement permits quick-detachable mounting of the fitting 26 on the screw 22, as will be apparent.

A rearwardly-projecting tab 41 is also provided on the upper portion of the plate 29 and has a hole 42 therein, the hole preferably being given a shape corresponding with the outline of the tab. The tab 41 serves as an anchor for one end of the lift cord 24, and additionally it assists in retaining the fitting 26 in engagement with the shade 15, as will be subsequently explained. Prior to installation the portion of the plate 29 which is above the flange 36, 36 is planar, the tab 41 being bent rearwardly to the position shown after the fitting 26 has been put in place on the blind.

The cord lock fitting 27 is formed similarly to the cord guide fitting 26 from a flat plate 44. The midportion and the upper end of the plate 44 are similar to the corresponding portions of the plate 29 of the cord guide fitting 26. These similar parts are indicated by similar reference characters marked prime (') and denoting similar parts having similar functions, the only difference between these portions of the two plates being that the plate 44 is somewhat greater in width than the plate 29 in order to space the flanges 36', 36' a greater distance apart so as to provide for a firmer attachment to the shade 15, as will be subsequently explained.

The lower portion of the plate 44 is folded horizontally upon itself in spaced relation to form a housing 45 having two parallel vertical walls. A double-groove pulley 46 is rotatably mounted on a rivet 47 passing perpendicularly through the parallel vertical walls of the housing 45.

From an examination of Figs. 5 and 8, it will be observed that the pulley 46 is of considerably less width than the distance between the parallel walls of the housing 45, and that these parallel walls are stepped in towards the upper portion of the pulley. The stepped-in portions of the housing walls maintain the pulley centered within the housing, and also maintain the lift cords 24, 24 in position on the pulley. Plate 44, above the housing 45 and immediately below the flanges 36', 36', is given an inclination so as to maintain the rear side of the housing in the plane of that portion of the plate 44 which is above the flanges 36', 36', as is shown in Fig. 5.

A locking dog 50 is positioned within the housing 45 and has extensions 51, 51 projecting on either side of and spaced from the pulley 46. The locking dog 50 is oscillatably mounted on the rivet 47, the rivet being passed through the free ends of the extensions 51, 51. Downwardly-projecting teeth 52 are formed along the forward edge of the locking dog 50 to insure holding engagement of the locking dog with the lift cords 24, 24 when the dog is in operated position. The locking dog 50 extends for substantially the entire width between the parallel sides of the housing 45, and this maintains the locking dog in a centered position in the housing. Since the pulley 46 is also maintained in a centered position in the housing 45, engagement of extensions 51, 51 of the locking dog with the sides of the pulley is prevented. The function of this feature of my invention will be explained hereinafter.

The clockwise oscillating movement of the locking dog 50, as viewed in Fig. 4, is limited by a detent in the form of a finger 54 which is struck out from the metal of the housing and projects into the path of movement of the dog, as is best seen in Figs. 5 and 7. This finger arrests the locking dog in the position shown in Fig. 4. The stepped-in upper portion of the housing 45 serves to limit the counterclockwise oscillation of the locking dog 50, although, in operation, the engagement of the locking dog with the lift cords 24, 24 limits its motion in this direction before it reaches the stepped-in portion of the housing.

The wall 55 of the housing 45 provides a wall against which the lift cords 24, 24 are locked by the dog 50. This wall is preferably given a slightly outwardly bowed contour to crowd the two cords 24, 24 together and to aid in retaining them in alignment with the pulley 46. The action of the locking dog 50 in cooperation with the locking surface 55 is such that when the pendant portions of the lift cords 24, 24 are swung

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to the left in the operation of the shade 15 as viewed in Fig. 1, the cords will engage the teeth 52 of the locking dog 50. Then, upon the lift cords 24, 24 being permitted to withdraw through the cord lock enough to lower the shade 15 very slightly, the lift cords will oscillate the locking dog 50 into locking position in the usual manner, the locking dog forcing the lift cords against the locking surface 55, including inclined portion α thereof, and frictionally engaging the cords so as to maintain them in position against the weight of the shade 15, which tends to draw the cords upwardly through the cord lock. The cord lock herein described is similar in some respects to that shown in my copending application Serial No. 538,601, which has issued as Patent 2,507,610.

Some difficulty is often encountered in blinds having two lift cords, running side by side through a cord lock, in that the pendant ends of the lift cords tend to become twisted about each other. This difficulty may arise irrespective of whether braided or twisted cords are used. If lift cords in such twisted condition are permitted to pass into the cord lock housing 45, they are apt to become jammed between the pulley 46 and the locking surface 55 of the housing, or to actuate the locking dog 50 into locking position although there has been no lateral movement of the ends of the lift cords such as is normally required to cause the locking dog to engage the cords. To prevent this, a separator 56 is provided adjacent to the lower end of the housing 45 to cause the lift cords 24, 24 to untwist as they enter the cord lock housing. The separator 56 projects horizontally in a direction parallel with the grooves of the pulley 46, as is well-known in the art.

The separator 56 shown herein is stamped from the plate 44, this stamping being accomplished simultaneously with the forming of the housing 45. This separator is, in general, L-shaped, the base of the L being a flat flange bent from the bottom edge of one of the parallel walls of the housing 45 and projecting halfway across the open bottom of the housing 45.

The stem of the L-shaped separator 56 comprises the operating portion thereof. This operating portion is formed from a projecting flat strip of metal integral with the base of the L which is given a generally upright U-shaped cross section. The operating portion of the separator 56 lies adjacent to the bottom of the housing 45, projecting for a short distance beyond the locking surface 55 thereof, as shown in Figs. 4 and 7. Inasmuch as substantially all of the frictional engagement of the lift cords 24, 24, when in twisted condition, occurs on the lower face of the separator 56, the shape described does not result in any fraying of the cords and provides a separator that may be integrally and simultaneously formed by suitable dies during the stamping of the cord lock fitting 27 as a whole.

The cord lock also has an instruck bead or corrugation 57 formed adjacent the lower edge of the housing 45, this bead extending transversely across the lower end of the locking surface 55 and thence for a substantial distance into each of the parallel walls of the housing. This bead provides a smooth bearing surface for the cords as they run through the cord lock, preventing fraying of the cords on the lower edge of the housing 45. Also, the portions of the bead 57 which are in the parallel side walls of the housing, keep the cords so centered with

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respect to the locking dog 50 as to obviate any tendency of a cord to jam between a corner of the locking dog and a side wall of the housing. Bead 57 may be a continuous bead, but to facilitate stamping thereof it may be interrupted where it goes around the corners between surface 55 and the side walls of the housing 45 as is best seen in Fig. 4.

Some difficulty has been encountered in the operation of cord locks having the locking dog and the pulley mounted for rotation on the same axis, in that the rotation of the pulley during the lowering of the blind sometimes causes so-called false operation of the cord lock, i. e., carries the locking dog into engagement with the lift cords when the cords have not been swung sidewise to effect operation of the lock. This type of false operation is prevented in the cord lock shown herein, since the sides of pulley 46 are prevented from coming in contact with extensions 51, 51 of locking dog 50. Therefore, as the pulley rotates it cannot, through frictional contact with dog extensions 51, 51, pick up the dog and swing it into engagement with the cords.

Cord locks having the locking dog and the pulley mounted on the same axis are also occasionally subject to another type of false operation. If the rivet which acts as an axle becomes loose in the cord lock housing, but through roughness or otherwise becomes a little tight with respect to the pulley and locking dog, then the rotating pulley may carry the rivet around with it, and the rivet may then carry the locking dog around with it, thereby causing false operation of the cord lock. To prevent this, a slightly coned spring washer 60 is placed under the head of rivet 47, the washer becoming stressed as the rivet is set. The washer then resiliently engages the housing 45 and the rivet head, thereby effectively preventing fortuitous rotation of the rivet should it become rotationally loose in the housing. The same result can be accomplished by stamping the housing with the side walls initially divergent to a slight extent and using a rivet of a length which will draw the walls into parallel relationship.

Figs. 9 and 10 show alternative means for preventing rotation of the rivet 47 should it become loose in the housing 45. Fig. 9 shows a washer of thin spring sheet metal, the washer, when unstressed, conforming to the surface of a cylinder. This washer when substituted for the conical spring washer 60, acts in similar fashion to washer 60. In Fig. 10 an angular projection 61 is shown struck up from a parallel wall of the housing 45 adjacent the hole provided for the rivet 47. When the rivet 47 is inserted in the housing 45, a corner of projection 61 engages and cuts into a portion of the periphery of the rivet head so as to prevent rotation of the rivet relative to the housing. Either of the alternative means herein described and shown in Figs. 9 and 10 may be used instead of the conical washer 60 shown in Fig. 8.

The attachment of the cord guide fitting 26 and the cord lock fitting 27 to the shade 15 is quickly and easily accomplished. By reference to Figs. 2 and 3, it will be noted that the head bar 19 is mounted alongside the topmost slat 16 of the shade, and a second slat 23 is interposed between the topmost slat and the head bar. As above described, these slats, which are relatively flexible, are secured to the head bar 19 at intervals. The upper portion of the plate 29 of the

cord guide fitting 26 may be inserted between the head bar 19 and the slat 23, between adjacent rivets 18, the slat 23 being deflected slightly if necessary to permit passage of the plate. This plate is inserted adjacent the left end of the head bar 19, as shown in Fig. 1, and is pushed upwardly until the flanges 36, 36 engage the lower edge of the head bar.

After the cord guide fitting 26 has been inserted as above described, the laterally-projecting tab 41 will be positioned immediately above the top edge of the head bar 19. This tab is then bent rearwardly to the position shown in Fig. 3, in which position it projects to the rear of the topmost slat 16 of the shade. The bent tab 41 serves to prevent withdrawal of the cord guide fitting 26, and, in conjunction with flanges 36, 36, it prevents oscillation of the cord guide in a plane parallel to the plane of the shade.

Longitudinal movement of the cord guide fitting 26 along the head bar 19 is prevented by the frictional engagement of the head bar and the slat 23 with the fitting, and also by the rivets 18 which serve to limit such longitudinal movement. In addition, a driven fastening 59, such as a staple, is preferably driven into the head bar 19 with one leg thereof passing through the hole 37 of the cord guide 26 so as to more definitely position the cord guide on the head bar. The staple 59 may be omitted if desired. The cord lock fitting 27 is positioned on the head bar 19 adjacent the right-hand end of the shaft 15 in a similar manner.

The lift cords 24, 24 are installed by passing one end of a piece of cord upwardly through the cord lock housing 45 halfway around the pulley 46, downwardly along the front of the shade, as viewed in Fig. 1, around the bottom of the shade, and up the back of the shade, that end of the cord being then secured to the tab 41' of the cord lock fitting 27. The other end of the piece of cord is passed upwardly through the cord lock housing on the opposite side of the separator 56, one-fourth way around the pulley 46, horizontally across the top of the shade 15, through the cord guide fitting 26 (making a quarter turn around pulley 31), downwardly on the front of the shade 15, under the shade, and upwardly along the back side of the shade, that end of the cord being then secured to the tab 41 of the cord guide fitting 26. This reeving of the lift cords 24, 24 leaves a pendant loop of cord at the right end of the shade 15 which may be grasped by the operator for opening or closing the shade.

If desired, the cord guide fitting 26 and the cord lock fitting 27 may be made of hands opposite to those shown, so as to place the pendant loop of the lift cords 24, 24 at the left hand rather than the right end of the shade.

I claim:

1. A cord lock for blinds, said cord lock comprising: a housing having a cord-locking surface and parallel side walls centrally converging at the top of the housing, a pulley over which a cord may be passed, a shaft passing through the side walls for rotatably mounting the pulley, and a cord-engaging dog for locking a cord against said surface, said dog being oscillatably mounted on said shaft by portions thereof extending alongside of and spaced from said pulley and being maintained centered within the housing by the side walls thereof, said converging side

walls abutting the sides of said pulley to maintain it centered with respect to said portions of said dog.

2. A cord lock for blinds, said cord lock comprising: a housing having a cord locking surface and parallel side walls, a pulley over which a cord may be passed, a shaft passing through the side walls and rotatably mounting the pulley, portions of the side walls above said shaft being stepped inwardly into abutting relationship with the sides of the pulley, and a cord-engaging dog for locking the cord against said surface, said dog being oscillatably mounted on said shaft by portions thereof extending beside and spaced from said pulley and being held centered within the housing by the side walls thereof, and said pulley being held centered within the housing by the stepped-in portions of said side walls.

3. In a cord lock for blinds having a sheet metal housing provided with two parallel side walls and an end wall, a movable locking dog mounted within the housing, a pulley over which two cords may be reeved in parallel relation, the pulley being mounted between said side walls for rotation in a plane parallel thereto, and a cord separator at the bottom of the housing; the improvement which comprises: the cord separator being formed integrally with the housing and being generally L-shaped and projecting across the bottom of the housing from one of the side walls to a point substantially midway between the side walls and then substantially to the bottom edge of the end wall in a direction parallel to the side walls.

4. A cord lock for blinds, said cord lock comprising: a housing having a cord-locking surface and generally parallel side walls, a pulley over which a cord may be passed, a shaft passing through the side walls and rotatably mounting the pulley, and a cord-engaging dog for locking a cord against said surface, said dog being oscillatably mounted on said shaft by side portions thereof extending alongside of and spaced from said pulley and being maintained centered within the housing by parallel portions of the side walls, said side walls beyond said parallel portions extending inwardly at a point adjacent the periphery of said pulley to engage the sides of said pulley and maintain it centered with respect to the cord-engaging dog.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
191,814	Pope	June 12, 1877
1,636,273	Baker	July 19, 1927
2,010,286	Weiner et al.	Aug. 6, 1935
2,054,240	Burns	Sept. 15, 1936
2,075,214	Lorentzen	Mar. 30, 1937
2,091,033	Dodge	Aug. 24, 1937
2,198,187	Tolley et al.	Apr. 23, 1940
2,507,610	Nelson	May 16, 1950

FOREIGN PATENTS

Number	Country	Date
8,827	Australia	Aug. 12, 1927
1927		
393,645	France	Dec. 29, 1908