

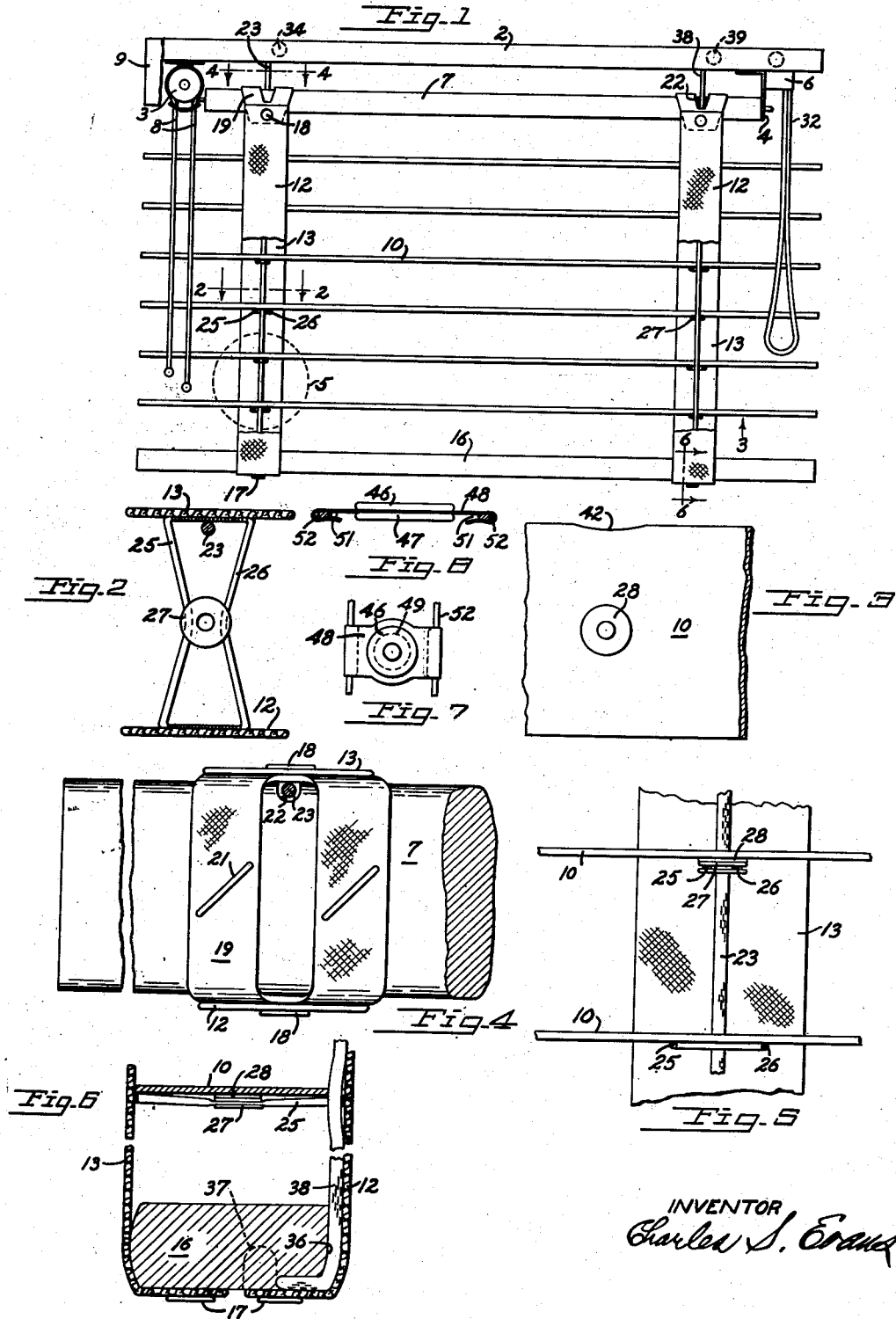
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VENETIAN BLIND

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## VENETIAN BLIND

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My invention relates to Venetian blinds, and the broad purpose of the invention is to provide a Venetian blind structure which is readily disassembled for cleaning and repairs. Another object is the provision of a Venetian blind having parts in simpler relation, so that manufacture and assembly are less involved and less expensive. Another object, and one bearing directly on durability and easy, smooth operation, is the elimination of friction between the lifting cords and other parts, which is the direct cause of breakage of cords and sluggish operation. Still another object goes to appearance in the even folding of the ladder tape between the stacked slats when the blind is raised.

The invention possesses other objects, some of which with the foregoing will be set forth at length in the following description wherein is explained that form of the invention which has been selected for illustration in the drawings accompanying and forming a part of this specification. In said drawings, one form of the invention is shown, but it is to be understood that it is not limited to that form, since the invention as set forth in the claims may be embodied in a plurality of forms.

The Venetian blind structure now common throughout the United States reveals an astonishing interdependence of parts and complexity of relationship. Many critical values require careful design, and the multiplicity of interconnected parts make manufacture of parts and their assembly a tedious and expensive procedure. Because of these things, the cost is out of proportion to worth and durability of the blind as it is finally hung in the window of the user. Moreover, when installed, cleaning is so nearly impossible, that it is usually neglected; and repair and replacement of parts are beyond the capacity of any but a contractor who installs them.

My invention is directed to the correction or lessening of several of these limitations and faults, by providing a construction in which each slat is demountably carried in the ladder tape so that it can be detached and lifted out to be cleaned, or replaced if damaged. The ladder tape is also demountably connected to its cooperating parts, so that it may be readily taken off for dry cleaning or replacement. With slats and ladder tape removed, the remainder of the blind is readily accessible to the dust cloth and damp rag.

An experience common to most users of Venetian blinds is the fraying and breakage of the lifting cords due to abrading against the slats.

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Another is failure of the blind to drop to its full length, and great resistance in lifting, due to the cumulative effect of many small frictional contacts between the lifting cord and slats and rung tapes of the ladder. This condition has been overcome in my invention by a construction in which the lifting cords are substantially free of frictional drag on the rung tapes, and have only slight contact or none at all with the slats and other parts.

A crucial factor in the construction is the support of each slat in each ladder tape on a set of spaced twin rung tapes or cords, and the detachable securing of each slat to at least one set of the supporting rung tapes. The rung tapes are spaced apart in the horizontal plane; and of course are secured at their ends to the vertical front and rear webs of the ladder. This spacing of the twin rung tapes insures an ample freeway for the lifting cord which extends between them; and because the slats are secured to the twin rung tapes and thereby connected to the front and rear webs, there is no tendency at all for the rung tapes to be pushed or bear against the lifting cord and thus by the cumulative effect of many small frictions impede the raising and lowering of the blind.

The use of twin rung tapes to support the slats has other advantages over the single tape of the common staggered type. They are more satisfying mechanically and artistically; and because of the even tension applied to the vertical front and rear webs in a horizontal line at each junction point, the vertical webs fold evenly in a neat aligned pack when the blind is raised, instead of in an uneven and unsightly jumble, as usually found with the staggered type of ladder tape.

Referring to the drawings: Figure 1 is a front elevation of a short Venetian blind embodying my invention. Portions of the front vertical web of the ladder are omitted to disclose the parts behind it. Figure 2 is a sectional view of the ladder tape taken in a horizontal plane indicated by the line 2—2 of Figure 1, the slat being removed to disclose the twin rung tapes or cords, and the ring member of the snap fastener with which a demountable connection between rung tapes and slat is secured. Figure 3 is a bottom view of one end of a slat, showing the stud member of the fastener. The direction from which the view is taken is indicated by the arrow 3 in Figure 1.

Figure 4 is a top view of one end of the tilt rail, the horizontal plane in which the view is taken being indicated by the line 4—4 of Figure 1.

Figure 5 is an elevation, partly in vertical sec-

tion, showing on an enlarged scale that portion of Figure 1 which is enclosed by the dotted circle 5.

Figure 6 is a vertical sectional view through the bottom rail and lower slat. The plane of section is indicated by the line 6-6 of Figure 1. Figure 7 is a plan view, and Figure 8 is an elevation partly in vertical section of a fastening element slidably supported on the twin cross tapes. Figure 8 is on an enlarged scale; and in all of the figures small or thin parts are necessarily shown somewhat out of scale.

A Venetian blind generally includes a series of thin horizontal slats, with mechanism for adjusting their vertical position to vary the amount of window opening covered; and mechanism for tilting the slats with reference to the horizontal plane in order to vary the degree of opening of the blind; at all times the slats being maintained in parallelism. My invention is not primarily concerned with either the lifting cord lock or the tilting mechanism; excellent devices for those purposes having long been available. These portions of the blind embodied in my invention will therefore be referred to, but not explained in detail.

My blind comprises a ceiling board 2 having a tilting head 3 of common worm gear type at one end, and a bracket 4 at the other end forming part of the cord lock 6. A tilt rail 7 is supported between the tilting head 3 and the bracket; and cords 8 hanging down on the left side of the blind, provide means for turning the tilt rail. A molding 9 secured to the ceiling board extends across the front of the structure and conceals the tilt rail, tilting head and cord lock.

Detachably secured to the tilt rail near each end is a ladder tape in which the slats 10 are hung and demountably secured. Each ladder tape comprises front and rear vertical webs 12 and 13 respectively, extending downwardly from the tilt rail to the bottom rail 16. A detachable fastening means 17, preferably of snap fastener type, secures the end of each web to the bottom rail.

By snap fastener, I mean two-part releasable connecting device, comprising an annularly grooved stud which is fixed on one of the parts to be connected, and a resilient ring into which the stud may be inserted to be resiliently held thereby, and which is fixed on the other part.

The upper ends of the ladder tape webs are releasably connected by snap fasteners 18 to opposite ends of the saddle 19, fixed by double pointed tacks 21 to the top surface of the tilting rail; and hanging free over the curved sides of the rail as shown in Figure 1. The saddle may be made of thin leather or of light canvas stitched about the edges to prevent raveling. When laid out flat the saddle has the shape of an elongated ring. The center opening provides a free space surrounding the groove 22 in the side of the tilt rail, through which the lifting cord 23 passes.

The proportion and arrangement of parts are such that when the tilt rail is horizontal the bottom rail is also horizontal. Extending between the vertical webs 12 and 13 of each ladder tape are the rung tapes or cross tapes on which the slats 9 lie; and these are evenly spaced lengthwise of the webs so that the slats lying thereon will maintain parallelism with each other and with the tilt and bottom rails.

The rung tapes are arranged in pairs 25 and 26; and preferably are formed of a braided tubular body which flattens into a strong, double-thick-

ness, rather narrow cord-like tape. The ends are woven or sewed to the web; and at midpoint between the webs, the ring member 27 of a snap fastener is secured to both; the two parts of the ring clamping the tapes securely between them. Preferably the points of securement of the twin tapes to the webs and the fastener ring are such as to space their outer ends somewhat further apart than their midpoints caught in the fastener ring, as shown in Figure 2. There are several reasons for this: a more even and balanced stress is placed on the webs; there is less tendency for the fastener ring to tip out of the horizontal, easily engageable position when free of the slat; there is less tendency of the slats to sway lengthwise so that the blind has a greater vertical stability; and a freeway for the lifting cord with no frictional engagement against the tapes is ensured.

Lying on the corresponding sets of twin tapes in each ladder are the slats 10, each of which carries a stud member 28, so placed that when snapped into its associate ring 27, the slat is aligned laterally with other slats and with the bottom rail. It is to be noted that the slat is demountably secured directly to the twin supporting tapes, and through them to the vertical webs of the ladder. The eye demands alignment of the slats with the ladder webs which are the dominant vertical element in the design formed by the blind as a whole. The twin cross tapes are held taut by the weight of the slat; and since the slat is fastened to the twin tapes, accurate alignment is assured.

While a snap ring may join the centers of each set of twin tapes, as shown in Figure 2, and associate studs placed on each slat, it is preferred for reasons involving costs of manufacture and ease with which the slats may be detached and taken out, to use but one snap fastener to a slat; and to stagger these in the two ladders, so that as to each ladder, alternate slats are fastened to the twin tapes, the other end of the fastened slat being unsecured to the twin tapes on which it lies.

It will be noted that bringing the center portions of the twin tapes closer together in the snap ring than the ends fixed to the vertical webs, tends to shorten the distance between the latter, so that when fasteners are applied to every other set of twin tapes, the intervening sets are, in effect, somewhat longer since they extend straight across between the webs. This small variation when it occurs may be readily eliminated if desired during manufacture of the ladder tape, but the variation is so slight as to be negligible. Furthermore any variation is symmetrical and balanced from the side to side and for that reason is unnoticeable.

Means are provided for lifting the bottom rail so that as it rises, the slats are successively stacked thereon, until all are collected at the top of the blind between it and the tilt rail. On its upper face the ceiling board is formed with grooves in which lie the two strands of a cord loop 32. One strand 23 passes over a pulley 34 and down through the underlying saddle 19 and groove 22 in the side of the tilt rail, then down between the rear edge of the slats and the rear web 13, and through the spaces between the ends of the twin tapes supporting each slat, to the bottom rail where the end passes through a groove 36 and terminates in a knot seated in a recess 37 formed to one side of the center in the bottom of the rail where it is covered by the bottom end of the web.

The other strand 38 passes over pulley 39, and extends down similarly but in front of the slats and next to the front web 12. The two lifting cords 23 and 38, secured on opposite sides of the bottom rail are sufficient, but with a particularly long or heavy blind, a lifting cord may be arranged on each side next the front and rear webs in each ladder tape.

As the blind is pulled up from its lower position to stack the slats on the lower rail, the lifting cord moves smoothly upwardly with no lateral contact with the twin cross tapes since it lies midway between them; and with but light engagement with slat and web. With long and heavy blinds, it may be desirable to relieve the slat a small amount along the edge adjacent the lifting cord, as shown at 42, Figure 3, so that the cord moves past the slat with substantially no rubbing of the edge. Because each lifting cord, from bottom rail to top pulley, is almost free of frictional drag, except for a slight amount from the web which decreases as the blind is raised, my blind is noticeably easy to operate. Because of the balanced distribution of stresses on the webs, which results from the twin rung tapes, there is no tendency to uneven folding of the webs, which gather into vertically aligned and even folds as the blind rises. This result is materially aided by the securement of the slats to the rung tapes since that construction tends to prevent relative lateral movement of either one while promoting vertical alignment of the slats as the stack forms.

From the foregoing explanation it will be clear that the slats are readily demountable; and that any one or all of them may be detached from the rung tapes by separation of the fastener elements, and then removed from the blind for cleansing or other treatment, after which they may be reinserted and snapped in place. If it is desired to clean or replace the ladder tapes, the slats are first unsnapped and removed. The lower snaps 17 are then opened to free the lower rail from the ends at the bottom of each ladder web, and disengage the knotted ends of the lifting cords from the recesses in the bottom face of the rail. The rail may then be removed. By disengaging the snaps 18 on both sides of the saddle, the ladder tape may be pulled free, leaving the lifting cords hanging loose from the tilt rail, ready for reassembly of ladder tape, bottom rail and slats.

In Figures 7 and 8, I have shown a modification of the rung tape and fastener structure. It is desirable in some cases to space the twin rung tapes further apart than can be caught by a rather small standard fastener element. Sometimes also it is an advantage to permit a small amount of shifting of the slat along the rung tapes toward one of the webs. Either or both of these conditions may be satisfied by setting the two elements

46 and 47 of the fastener ring on opposite sides of a thin plate 48 having an aperture 49 therethrough in which the fastener is centered. The fastener thus is mounted directly on the plate instead of directly on the twin tapes as in Figure 2. It will be obvious that instead of inserting a thin apertured plate between the fastener elements, the lower element itself may be extended on opposite sides to provide the desired plate. In either case, the opposite ends of the plate are bent over and under as shown, to provide broad open resilient eyes 51 adapted to be hooked over the twin rung tapes 52, as shown in Figure 8.

The opening of the eye should be sufficient to permit entrance of the tape under light stress and free movement of the plate along the tape, if such movement is desired. If the plate is to be fixed on the cross tapes, the eye is smaller so as to clamp the tape therein.

I claim:

1. A ladder tape for a Venetian blind comprising spaced webs, twin rung tapes spaced apart and connected at their ends to the webs, and a fastener element bridged across the twin tapes intermediate their ends, the distance between the twin tapes at the fastener element being less than between their ends.

2. A ladder tape for a Venetian blind comprising spaced webs, twin rung tapes spaced apart and connected at their ends to the webs, a plate bridged across the twin tapes intermediate their ends and spacing the tapes closer together than at their ends, and means adjacent opposite edges of the plate to fix the plate to the rung tapes.

3. A ladder tape for a Venetian blind comprising spaced webs, twin rung tapes spaced apart and connected at their ends to the webs, a plate bridged across the twin tapes intermediate their ends and spacing the tapes closer together than at their ends, and opposing surfaces adjacent opposite edges of the plate to fix the plate to the rung tapes.

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#### References Cited in the file of this patent

##### UNITED STATES PATENTS

Number	Name	Date
451,924	Fisher	May 12, 1891
1,861,606	Mackin	June 7, 1932
2,031,981	Runge	Feb. 25, 1936
2,043,501	Wood	June 9, 1936
2,111,978	Lawson et al.	Mar. 22, 1938
2,123,817	Warren	July 12, 1938
2,141,502	Ajouelo	Dec. 27, 1938
2,200,349	Walker	May 14, 1940
2,311,716	Walker	Feb. 23, 1943
2,317,660	Williams	Apr. 27, 1943
2,381,060	Kahn	Aug. 7, 1945