May 10, 1949. H. NELSON 2,469,839

VENETIAN BLIND FITTING

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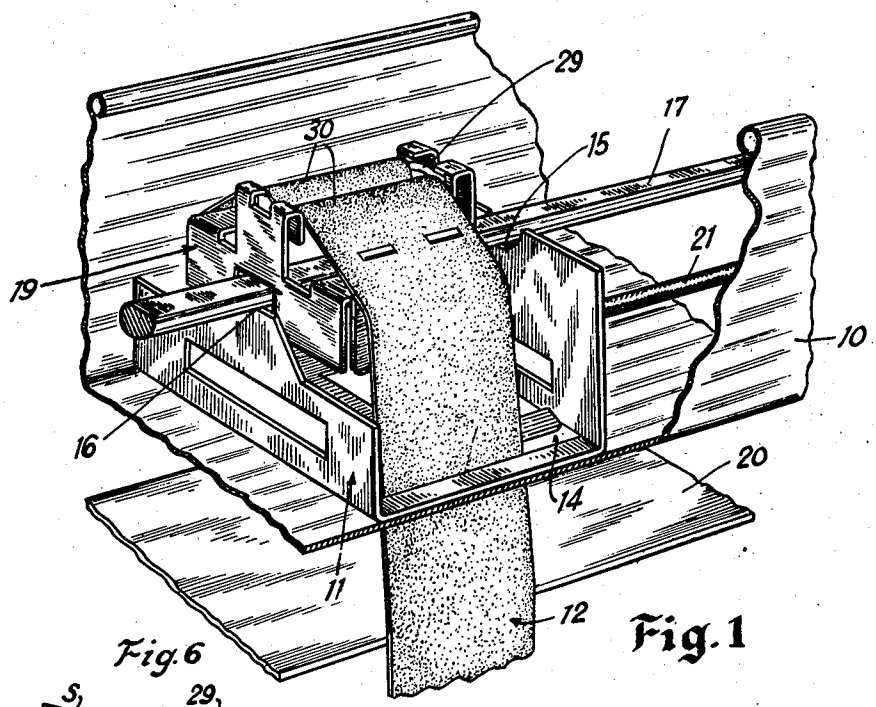


Fig. 1

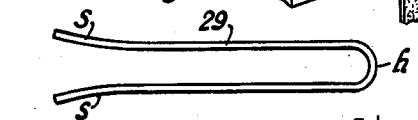


Fig. 6

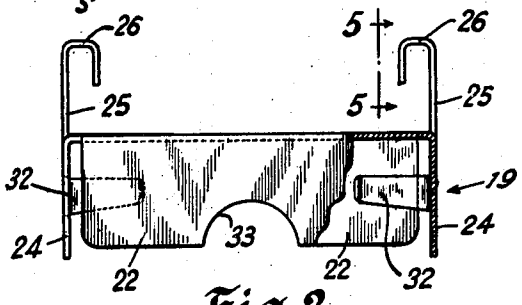


Fig. 2

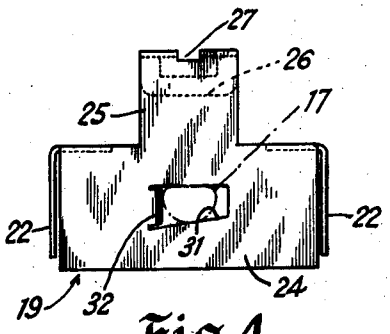


Fig. 4

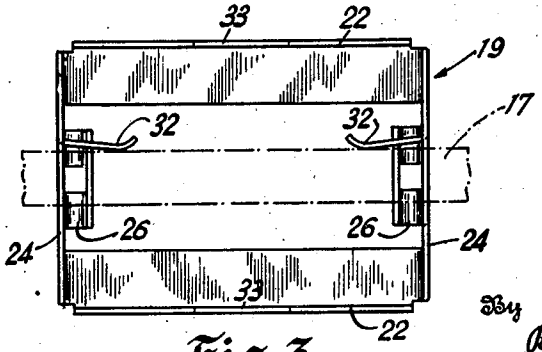


Fig. 3

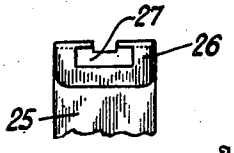


Fig. 5

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VENETIAN BLIND FITTING

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Application July 5, 1947, Serial No. 759,055

8 Claims. (Cl. 160—177)

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This invention relates to Venetian blinds, and more particularly to mechanism for tilting the slats of such blinds.

In Venetian blinds of the so-called inclosed head bar type, the head bar is provided with a tilt shaft or rod. This is an oscillatory shaft or rod which extends lengthwise within the head bar and which has mounted thereon two or more tape carriers or rockers. To each rocker there is attached the front and rear vertical webs of one of the ladder tapes of the blind. Thus, tilting movement imparted to the shaft or rod is effective to tilt the slats of the blind, as is well understood in the art.

In one well-known type of inclosed head bar, the tilt shaft or rod is of non circular cross section and is inserted through holes of corresponding cross section that are punched in depending skirt portions of the tape carriers or rockers. The tilt rod is merely a length cut from cold rolled steel stock of the proper nominal size and cross section; and since such stock varies considerably from its nominal size and cross section, there is apt to be considerable angular lost motion between the tilt shaft or rod and the tape rockers.

In the form shown of the present invention, the frame or skirt of the tape rocker is provided with wedge-shaped holes or slots for reception of the tilt rod. Each wedge-shaped slot is of such size that a tilt rod of noncircular cross section will be engaged somewhere along the length of the converging straight edges thereof, if the rod for which the rocker is intended falls within the ordinary manufacturing variations that are to be expected in the rod.

A yielding finger, which is preferably formed from the metal stamped from the skirt of the tape rocker when forming the hole, resiliently engages the side of the tilt rod so as to force it toward the small end of the hole or slot in the rocker, thus obviating angular lost motion between the tape rocker and the tilt bar.

A general object of the present invention is to provide a tape rocker which can be assembled with a tilt rod by merely inserting the rod through the rocker and which will be free of angular lost motion with respect to the rod despite a measure of variation in the size and shape of the rod.

Another object of the invention is to provide self-adjusting means for obviating angular lost motion between a Venetian blind tilt rod and an element connected thereto for concomitant rotation.

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Additional objects are to attain the foregoing results by means of an inexpensive and practical construction, by a construction adapted for rapid manufacture on a quantity-production basis, and by a construction which may be made as a sheet metal stamping.

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

My invention is clearly defined in the appended claims. In both the description and the claims, parts at times may be 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 drawing forming part of this specification, in which:

Fig. 1 is a fragmentary view of an enclosed head bar type of Venetian blind, having the present invention incorporated therein. A portion of the head bar is broken away to show details of construction.

Fig. 2 is a front elevation of the tape rocker shown in Fig. 1, a portion of the skirt of the rocker being broken away to show details of construction.

Fig. 3 is a bottom plan view of the tape rocker shown in Fig. 2, a tilt rod being indicated in dot-dash lines.

Fig. 4 is an end elevation of the tape rocker shown in Figs. 2 and 3, looking from the right of Fig. 2. A tilt rod is indicated in dot-dash lines.

Fig. 5 is a fragmentary view from the line 5—5 in Fig. 2.

Fig. 6 is a plan view of a hair-pin shaped fastener used to attach the two branches of a ladder tape to the tape rocker.

Referring to Fig. 1, the general organization of a Venetian blind of an enclosed head bar type is shown. A channel-shaped head bar 10 contains the operating mechanism of the blind. The particular head bar shown is a length cut from sheet metal channel stock, but the present invention is equally applicable to enclosed head bars of other materials and of other forms. One assembly of ladder tape, tilt rod, tilt rod cradle, and tape rocker is shown, it being understood that such an assembly is provided for each ladder tape of the blind and that at least two ladder tapes are used in each blind.

A tilt rod cradle 11 is positioned within the channel and is suitably secured to the bottom of the channel. The cradle has a pair of slots 14, one of which is shown, registering with similar slots in the bottom of the head bar. The slots 14 are adapted to receive the two branches of the usual Venetian blind ladder tape 12. The tilt rod cradle 11 is generally U-shaped and rotatably supports a tilt rod 17 in notches or bearings 15 and 16 in the upper portion thereof.

The tilt rod 17 is shown as a metal rod of D-shaped cross section, and it is usually a length cut from cold-rolled steel stock. The tilt rod 17, which may also be hexagonal or of any other suitable non-circular shape, extends within the head bar 10 so as to pass through and operate in unison a plurality of tape rockers 19, one rocker for each ladder tape. The tilt rod 17 is operated by a tilter mechanism, not shown, which oscillates the rod so as to effect tilting of the slats of the blind. A fragment of the topmost slat of the blind is shown at 20.

The tilt rod cradle 11 also serves as a cord guide to change the direction of a lift cord 21 for raising and lowering the blind, this lift cord being reeved in the usual manner. The construction described in the two paragraphs immediately preceding is now more or less conventional in many enclosed head bar Venetian blinds and is shown in my copending application S. N. 601,671, now Patent 2,455,135, issued November 30, 1948.

The tape rocker 19 is best seen in Figs. 2–5 inclusive. This rocker, which embodies the improvement of the present invention, is formed of a sheet metal stamping having downwardly-extending portions 22, 22 and 24, 24, collectively forming a marginal flange or skirt about the lower portion of the rocker.

Arms 25, 25 extend upwardly from the end portions 24, 24 and each terminates in a U-shaped inwardly turned tip 26 having an inverted T-slot 27 (see particularly Fig. 5) for the reception of a resilient hairpin-like fastener 29 (see Figs. 1 and 6). The fastener 29, which is formed of round springy wire, is adapted to be positioned within the slots 27, 27, bridging the space between the arms 25, 25 of the tape rocker 19. One leg of the fastener 29 is passed through each loop 30 formed at the tops of the two branches of the ladder tape 12 so as to secure the tape to the tape rocker. The head *h* of the fastener is nested into the wide part of the T-slot 27 in one of the arms 25; and after pressing the tips *s*, *s* of the fastener legs together, they are passed through the narrow part of the T-slot 27 in the other arm 25 and released, whereupon they spring apart and occupy the ends of the wide part of the T-slot. This method of securing the ladder tape to the tape rocker is also shown in my copending application S. N. 601,671.

Each skirt portion 24 has a slot 31 formed therein for reception of the tilt rod 17. These slots are generally wedge-shaped as shown in Fig. 4, two margins of the slot converging somewhat towards an end thereof. Each slot 31 is of suitable size to receive the tilt rod 17, the converging margins being so related that at some point along their length they will tightly engage the tilt rod 17. The tilt rod 17 is usually manufactured of cold-rolled steel and its cross-sectional dimensions tend to vary somewhat between individual rods and at different points along the length of the same rod. These variations in cross-sectional dimension will be found to fall within certain limits which may be considered as manufacturing

tolerances. Accordingly, each slot 31 is proportioned to engage a rod 17 of size which falls anywhere within the manufacturing tolerances.

A resilient finger 32 is positioned on the tape rocker 19 adjacent each of the slots 31 for engaging the tilt rod 17 and biasing it towards the smaller end of the slot, thus causing the converging margins of the slot to tightly engage the rod. The fingers 32 are preferably formed of material stamped from the edges 24, 24 of the skirt in forming the slots such as 31, these fingers preferably being bent inwardly as shown in Figs. 2 and 3.

By provision of wedge-shaped slots such as 31 in conjunction with the resilient fingers 32, 32, all lost motion between the tape rocker 19 and the tilt rod 17 is removed, the converging edges of the slot tightly engaging the tilt rod regardless of manufacturing variations in cross-sectional dimension thereof. Hence, there is no lost motion to pass through in adjusting the slats of a Venetian blind embodying the above described construction. The slats of such a blind may be tilted quicker and more easily as well as more accurately and will retain the desired adjustment.

Generally semicircular notches 33, 33 are cut from the lower edge of the skirt of the tape rocker 19, these notches being located at the center of portions 22, 22. When the rocker is tilted in either direction to extreme degree, these notches provide clearance between the lower edges of portions 22, 22 and the lift cord 21 at the point where it comes upwardly through the tilt rod cradle 11, thus preventing the edges of the tape rocker from fouling the lift cord.

It is contemplated that the tilt-rod-engaging portion of the tilter mechanism, not shown, might also embody a similar construction in order to remove any lost motion at this point in the operating linkage of the blind.

I claim:

1. In a Venetian blind tape rocker of the type which is actuated by a noncircular tilt rod that pierces spaced portions of the rocker, the improvement which comprises: the spaced portions of the rocker being provided with wedge-shaped openings for receiving the rod, and the rocker being provided with means for crowding the rod into the wedge formations to thereby obviate angular lost motion between the rod and the rocker, said rod-crowding means being located between said spaced portions of the rocker.

2. In a Venetian blind tape rocker of the type which is actuated by a noncircular tilt rod that pierces the rocker, the improvement which comprises: the rocker being provided with a wedge-shaped opening for receiving the rod, and being provided with means for crowding the rod into the wedge formation to thereby obviate angular lost motion between the rod and the rocker.

3. In a sheet metal Venetian blind tape rocker of the type which is actuated by a noncircular tilt rod that pierces opposite skirt portions of the rocker, the improvement which comprises: at least one of said skirt portions being provided with a wedge-shaped opening to receive the rod, and also being provided with means for crowding the rod into the wedge formation to thereby obviate angular lost motion between the rod and the rocker.

4. In a sheet metal Venetian blind tape rocker of the type which is actuated by a noncircular tilt rod that pierces opposite skirt portions of the rocker, the improvement which comprises: each of said skirt portions being provided with a wedge-

shaped opening to receive the rod, and also being provided with an integral outstruck member for crowding the rod into the wedge formation to thereby obviate angular lost motion between the rod and the rocker.

5. In a sheet metal Venetian blind tape rocker of the type which is actuated by a noncircular tilt rod that pierces opposite skirt portions of the rocker, the improvement which comprises: each of said skirt portions being provided with a wedge-shaped opening to receive the rod, and also being provided with an integral resilient finger extending toward the interior of the rocker, the finger being operative upon insertion of the rod to crowd the rod into the wedge formation to thereby obviate angular lost motion between the rod and the rocker.

6. In a sheet metal Venetian blind tape rocker of the type which is actuated by a noncircular tilt rod that pierces opposite skirt portions of the rocker, the improvement which comprises: at least one of said skirt portions being provided with a wedge-shaped opening to receive the rod, and also being provided with an integral resilient finger struck from the metal of the skirt portion, the finger being operative upon insertion of the rod to crowd the rod into the wedge formation

to thereby obviate angular lost motion between the rod and the rocker.

7. In a Venetian blind, a tilt rod of noncircular cross section and a fitting assembled therewith for concomitant rotation, the fitting having a wedge-shaped opening which receives the rod, and also having means for crowding the rod into the wedge formation to thereby obviate angular lost motion between the rod and the fitting.

8. In a Venetian blind, a tilt rod of D-shaped cross section and a fitting assembled therewith for concomitant rotation, the fitting having a wedge-shaped opening which receives the rod, and also having a member which resiliently crowds the rod into the wedge formation to thereby obviate angular lost motion between the rod and the fitting.

HARRY NELSON.

REFERENCES CITED

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

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