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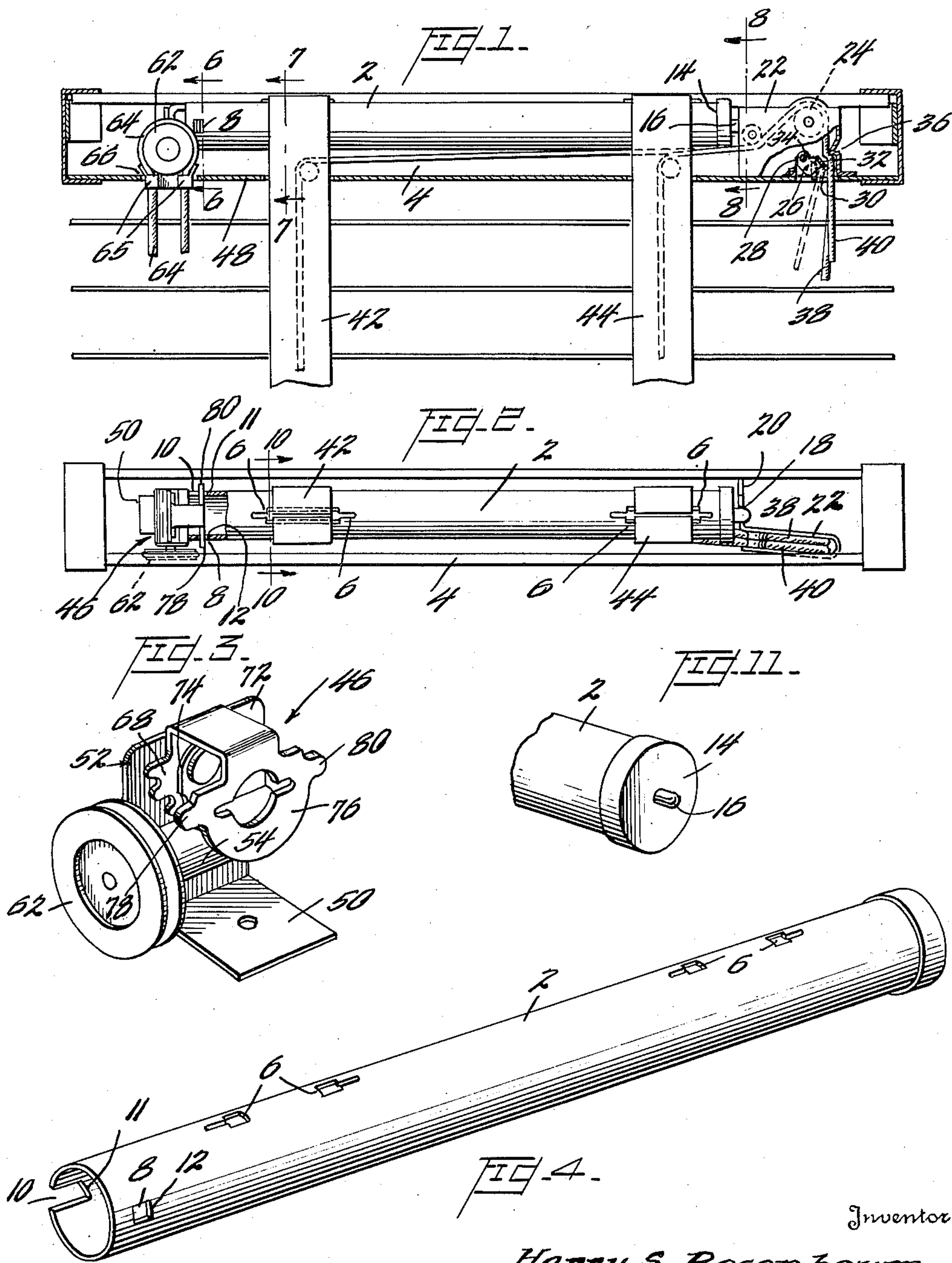
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2,544,184

TILTING MECHANISM FOR VENETIAN BLINDS

Filed July 2, 1947

2 Sheets-Sheet 1



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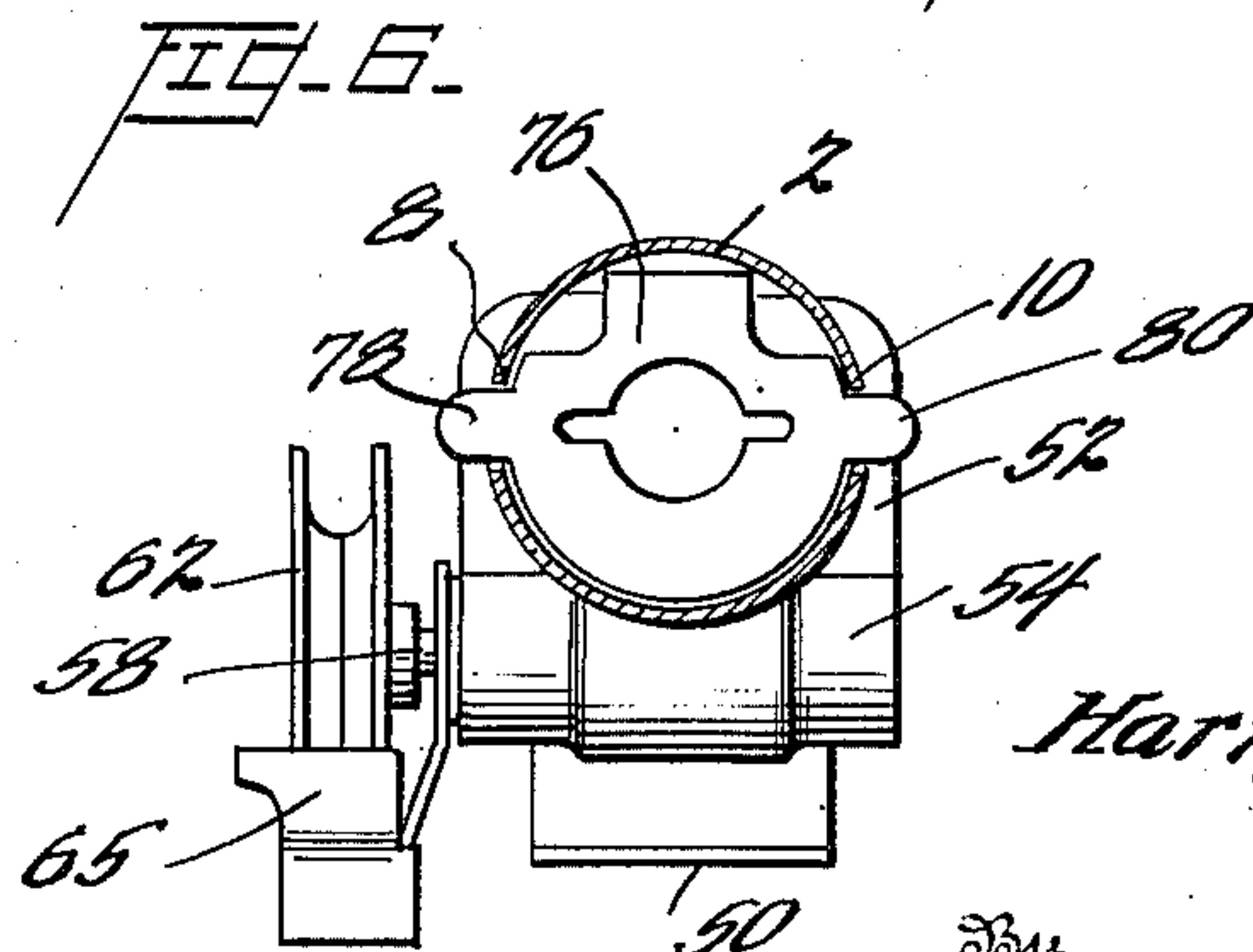
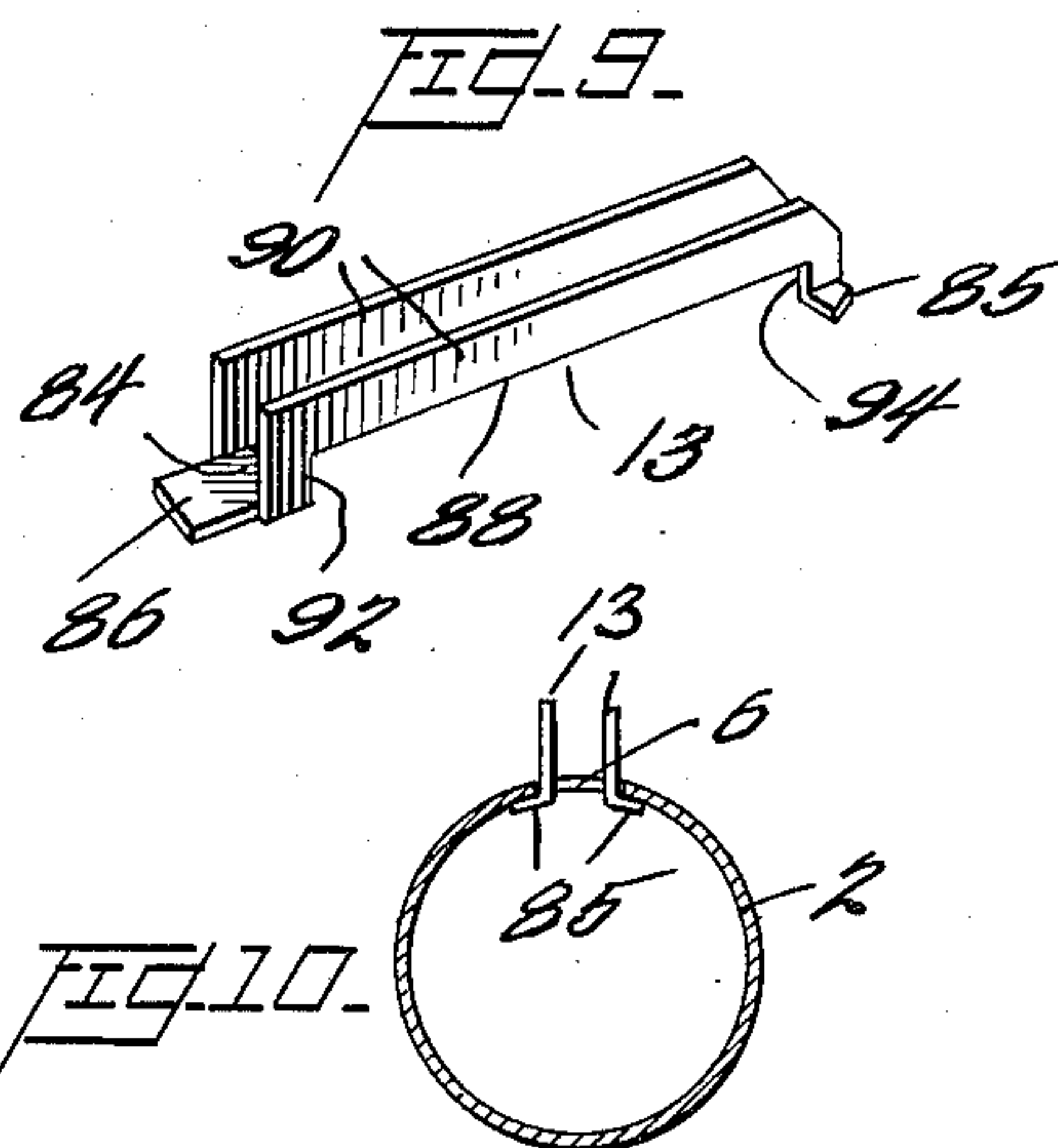
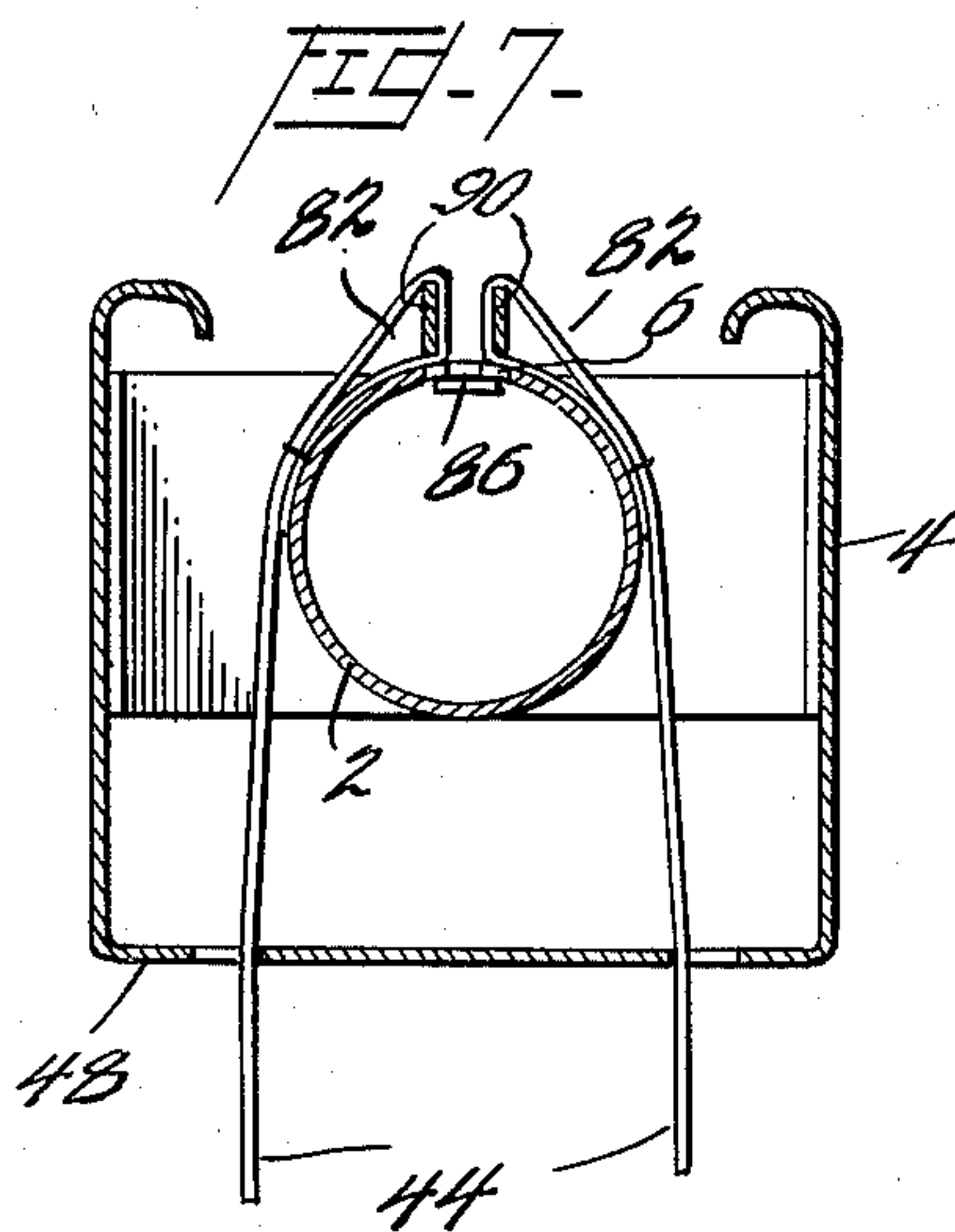
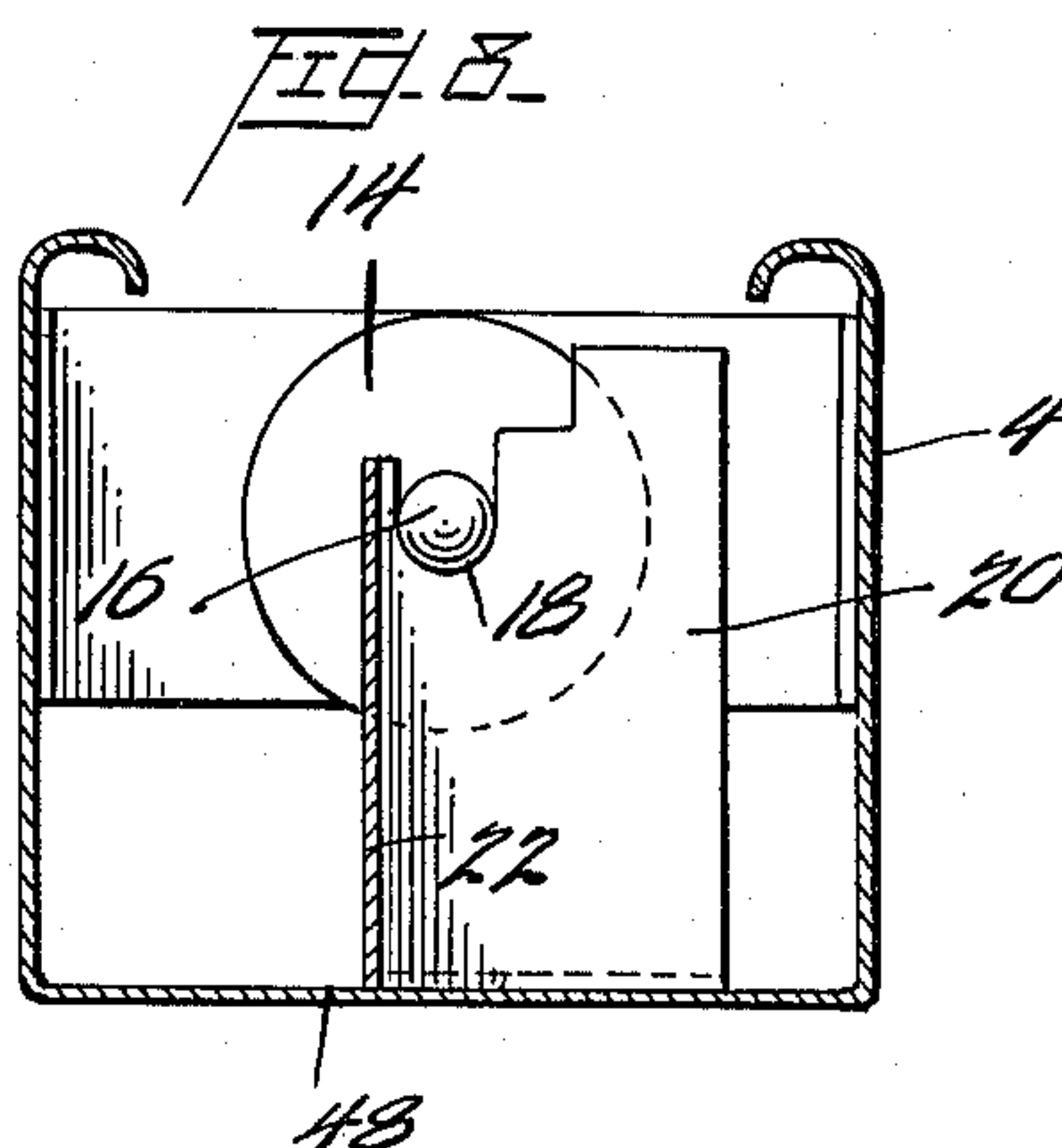
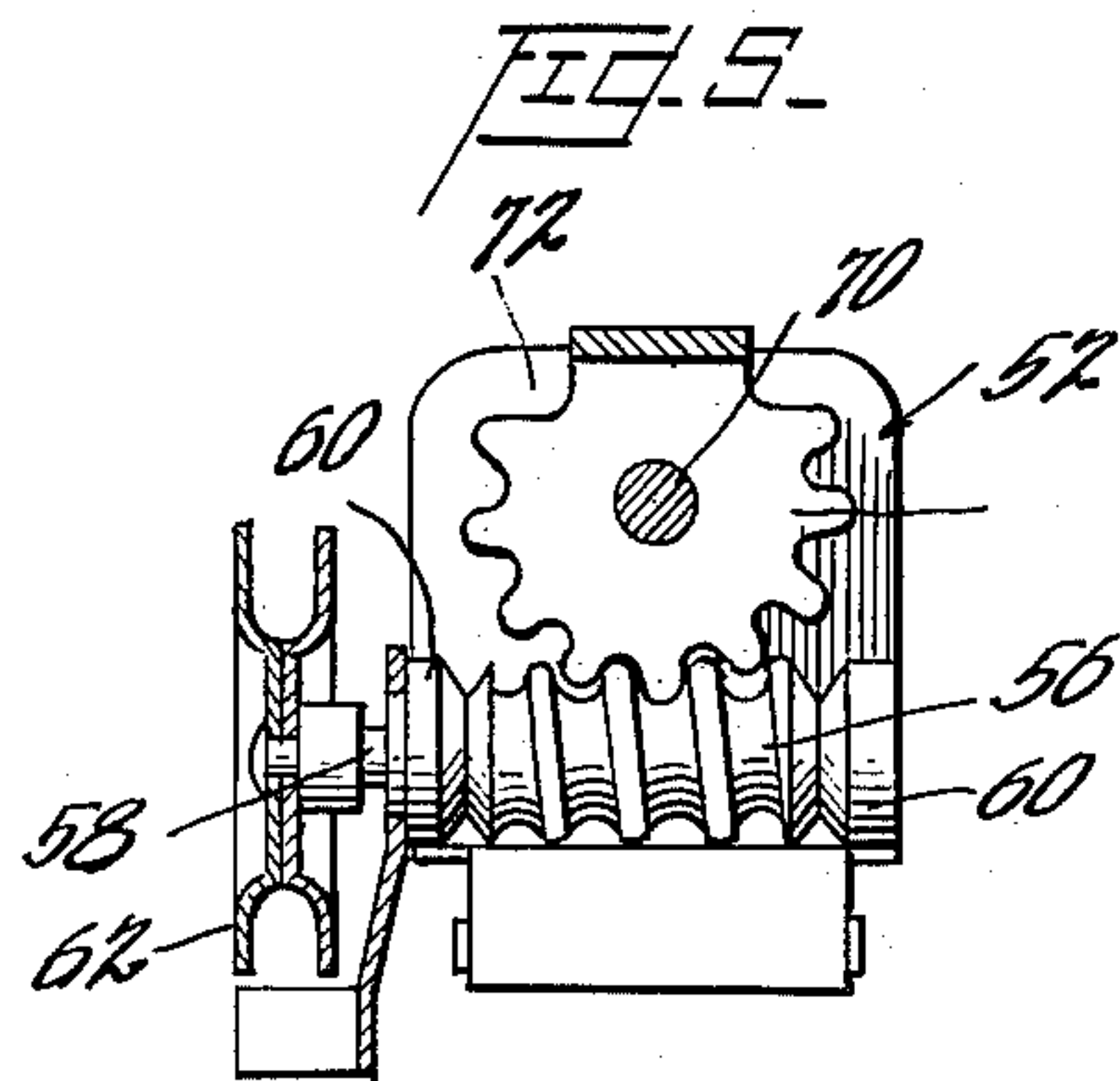
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TILTING MECHANISM FOR VENETIAN BLINDS

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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TILTING MECHANISM FOR VENETIAN
BLINDS

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2 Claims. (Cl. 160-177)

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This invention relates to improvements in tilting means for Venetian blinds and has particular application to the tilt pole for Venetian blind structures whereby the slats are turned or tilted to the degree of opening or closure desired.

In prior constructions of Venetian blinds, the tilting means employed a solid shaft of small diameter to which there were secured two or more wooden fillers or spools of much greater diameter than the shaft in order to provide a periphery of greater diameter so that the ladder tapes which were fastened thereto by tacks would travel a much greater distance for each revolution or angular movement of the shaft than if the movement of the ladder tapes corresponded to the circumference of the shaft. These comparatively slender shafts also have the disadvantage of sagging, except in the case of very short shafts. Where the Venetian blinds are employed on windows of any substantial width, it has been necessary to provide supports or braces to prevent such sagging of the shaft.

Among the objects of this invention is the provision of a tilt pole which dispenses with the use of the wooden fillers or spools and which does not sag even when it is of substantial or unusual length and for which there is no need of the intermediate supports heretofore used to prevent sagging of the shafts of prior constructions.

A more specific object of this invention is the provision of a hollow metal tilt pole which is free of the foregoing disadvantages incident to prior constructions.

A still further object is to provide a hollow metal tilt pole of this character whereby the ladder tapes may be given fixed, accurate alignment and spacing and which readily lends itself to easy and secure attachment to the other parts of the Venetian blind structure.

Other, further, and more specific objects of this invention will become readily apparent to persons skilled in the art from a consideration of the following description when taken in conjunction with the accompanying drawing wherein:

Fig. 1 is a fragmental elevation of the upper portion of a Venetian blind, showing the mode of attachment of the ladder tapes to the tilting part of the device being shown in section to illustrate the interior construction thereof.

Fig. 2 is a top plan view of the device shown in Fig. 1.

Fig. 3 is an enlarged detail perspective view of the tilt gear, rope pulley and bracket support therefor.

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Fig. 4 is an enlarged perspective view of my novel tilt pole.

Fig. 5 is a sectional detail view showing the sector gear and worm of the tilt gear.

Fig. 6 is a section on line 6-6 of Fig. 1.

Fig. 7 is a section on line 7-7 of Fig. 1.

Fig. 8 is a section on line 8-8 of Fig. 1.

Fig. 9 is a detail perspective view of the bifurcated spring member for securing the ladder tapes to the tilt pole.

Fig. 10 is a section on line 10-10 of Fig. 2.

Fig. 11 is a fragmental perspective view of the closed end of the tilt pole.

The novel tilt pole employed in my new Venetian blind construction comprises the hollow sheet metal cylinder 2 disposed within the sheet metal hood 4 which is fastened, preferably by screws, against the jamb of a window frame (not shown). This tilt pole 2 contains the perforations or slots 6, preferably T-shaped as illustrated in Fig. 4, the perforation or slot 8 near the open end of the pole and the diametrically opposite notch 10 at said open end. The base 11 of the notch 10 is spaced from the end of the tilt pole so as to be in registry with the innermost circumferential edge 12 of the slot 8. Each pole is provided with two or more cooperating pairs of slots 6, each pair of slots serving to hold and engage a bifurcated spring member 13 for the purpose to be described. The closed end of the tilt pole 2 has an end cap or cover 14 of metal, which is drawn at the center into a stud 16, whereby the tilt pole is supported at one end in the arcuate notch 18 of the bracket 20, serving as a bearing.

This bracket 20 is preferably integral with the U-shaped casing 22 serving as a housing for the pulley 24 and a conventional type of cord lock. A satisfactory cord lock is that disclosed in U. S. Patent 2,075,214 by H. K. Lorentzen and comprises a dog 26 having a pair of ears 28 and a serrated lip 30 extending from the plate 32. A pivot pin 34 passes through the upper ends of the ears 28 and is fixed to the legs of the U-shaped casing 22. This pin 34 is disposed at a point just below the level of a detent or shoulder 36 at the opposite end of the casing 22. The pull cords 38 and 40 which operate the ladder tapes 42 and 44 are trained over the pulley 24 and pass between the dog 26 and the detent or shoulder 36 in the end of the casing 22.

The parts thus described are so arranged that when the mechanism is in the unlocked position, shown in the dot-and-dash lines of Fig. 1, the plate 32 of the dog 26 is in substantially vertical position with one ear 28 of the dog in en-

gagement with an ear struck from the casing 22. When the parts are in this position the cords 38 and 40 are free to run vertically through the casing, and the blind can be raised or lowered to any position. When the proper position of the blind has been reached and it is desired to lock it in that position, the lower ends of the cords are swung toward the left to the dotted line position of Fig. 1. This action brings the cords into contact with the lip 30 of the dog 26, which is preferably toothed to increase frictional contact during this action, and the cords are then permitted to move upwardly under the weight of the blind. This upward movement of the cords while in contact with lip 30 moves the dog 26 to the locking position shown in the full lines of Fig. 1. In this position the two cords 38 and 40 are clamped between the dog 26 and the detent or shoulder 36, and any further upward tension on the cords merely serves to wedge the dog 26 more firmly against the detent 36. Due to the curved inner surface of detent or shoulder 36, the cords 38 and 40 can slide about the curved face, thereby adjusting themselves for any inequalities of size or shape between the two ropes and insuring equal pressure of the detent on both ropes.

The principle of the gripping action of this cord lock is that the pivoted dog 26 is pressed against the cords 38 and 40 by somewhat of a toggle action as its free end is pulled upwardly by the cords. At the same time the cords are bent around the detent or shoulder so as to obtain a snubbing action. The combination of these actions gives a very secure grip on both ropes without reliance on any biting action that would cut or cause excessive wear of the ropes.

The open end of the tilt pole 2 is attached to the tilt gear 46, fastened to the bottom 48 of the sheet metal hood 4 by the flanges or feet 50 of the support bracket 52. This support bracket 52 has an enlarged hollow cylindrical portion 54 serving to retain the worm 56, fastened to its shaft 58 and journaled in the bushings 60 disposed within said enlarged portion 54 of the bracket and securely positioned therein. The shaft 58 is also securely fastened to the pulley 62 over which the tilt cord 64 is trained, the ends of said cord passing through suitable guides 65 and openings 66 in the bottom of the sheet metal hood 4.

The worm 56 engages the teeth of a sector gear 68 which turns upon the shaft 70 secured to the upright lobes 72 and 74 of the bracket 52. This sector gear forms one leg of a U-shaped element, the other outer leg 76 having diametrically opposing lugs 78 and 80. In connecting the tilt pole to the tilt gear 46, one of the lugs is inserted in the slot 8 of the tilt pole and the tilt pole is swung so as to bring the opposing lug into the notch 10 of the tilt pole, which may then be brought into operating position by seating the stud 16 of the other end into the notch 18 of the bracket 20. In this operating position, the diametrically opposite lugs 78 and 80 will be in alignment and the tilt pole will be held against longitudinal movement in one direction by the bracket 20 and in the other direction by the lugs 78 and 80. Depending on the clearance between the slot 8 and notch 10 and the lugs 78 and 80 inserted therein, a limited amount of longitudinal and circumferential play of the tilt pole is provided, thus approximately simulating a universal action between the tilt pole and the U-shaped element having the sector gear. This limited play

admits of attachment of the tilt pole to the other mechanism of the Venetian blind without the introduction of misalignment incident to prior installations caused by irregularities in the parts to which the tilt pole is attached.

The ladder tapes 42 and 44, which vary in number relative to the width of the Venetian blind, are provided with loops 82 at the upper ends. One leg of the bifurcated spring member 13 is passed through one of the loops 82 and the other leg of the bifurcated member 13 is passed through the loop of the other end of the ladder tape. With the loops thus positioned on the legs of the spring member 13, they will lie between the bottom 84 of a channel-like portion of the spring member 13 and projecting lugs 85 at the other end of each of the legs of the spring member 13. The bottom 84 of the U-like channel portion has extending therefrom a projection 86. With the loops 82 in position over the legs of the spring member 13, the projection 86 is inserted in one of the pair of cooperating slots 6 of the tilt pole and moved so as to lie under the sheet metal cylinder 2. The free ends of the spring member 13 are then sprung toward each other so as to permit the lugs 85 to enter the other slot of the cooperating pair of slots. The legs are then allowed to spring back to their normal position, thereby bringing the lugs 85 beneath the sheet metal cylinder 2.

The bottom edge 88 of each of the elongated intermediate portions 90 of the legs of this spring member is sufficiently spaced from the bottom 84 of the channel-like portion and from the projecting lugs 85 and projection 86 to accommodate the ladder tapes between these bottom edges and the cylindrical tilt pole when the projection 86 and lugs 85 are under the sheet metal cylinder 2. Longitudinal movement of the spring member and the ladder tapes is prevented by the shoulders 92 on one end of the spring member and the shoulders 94 on the other end thereof.

My novel tilt pole is preferably made of sheet metal. However, other suitable materials of construction may be employed therefor, for example, plastics, etc.

The present invention is not limited to the specific details set forth in the foregoing examples which should be construed as illustrative and not by way of limitation, and in view of the numerous modifications which may be effected therein without departing from the spirit and scope of this invention, it is desired that only such limitations be imposed as are indicated in the appended claims.

I claim as my invention:

1. A coupling between the tilt mechanism and tilt pole of Venetian blinds, in combination with a hollow shaft having a notch at one end and a slot substantially diametrically opposite said notch and spaced from said end of the shaft so that the innermost circumferential edge of said slot is in substantial registry with the base of said notch, an outer leg of a U-shaped rocking member within said hollow shaft and having a pair of outwardly projecting lugs in substantial alignment with each other, one of said lugs fitting in and resting in said notch and the other lug fitting in and resting in said slot.

2. A coupling between the tilt mechanism and tilt pole of Venetian blinds, in combination with a hollow shaft having a notch at one end and a slot substantially diametrically opposite said notch and spaced from said end of the shaft so that the innermost circumferential edge of said

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slot is in substantial registry with the base of said notch, an outer leg of a U-shaped rocking member within said hollow shaft and having a pair of outwardly projecting lugs in substantial alignment with each other, one of said lugs fitting in and resting in said notch and the other lug fitting in and resting in said slot, and means for retaining said lugs in said notch and slot.

HARRY S. ROSENBAUM.

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