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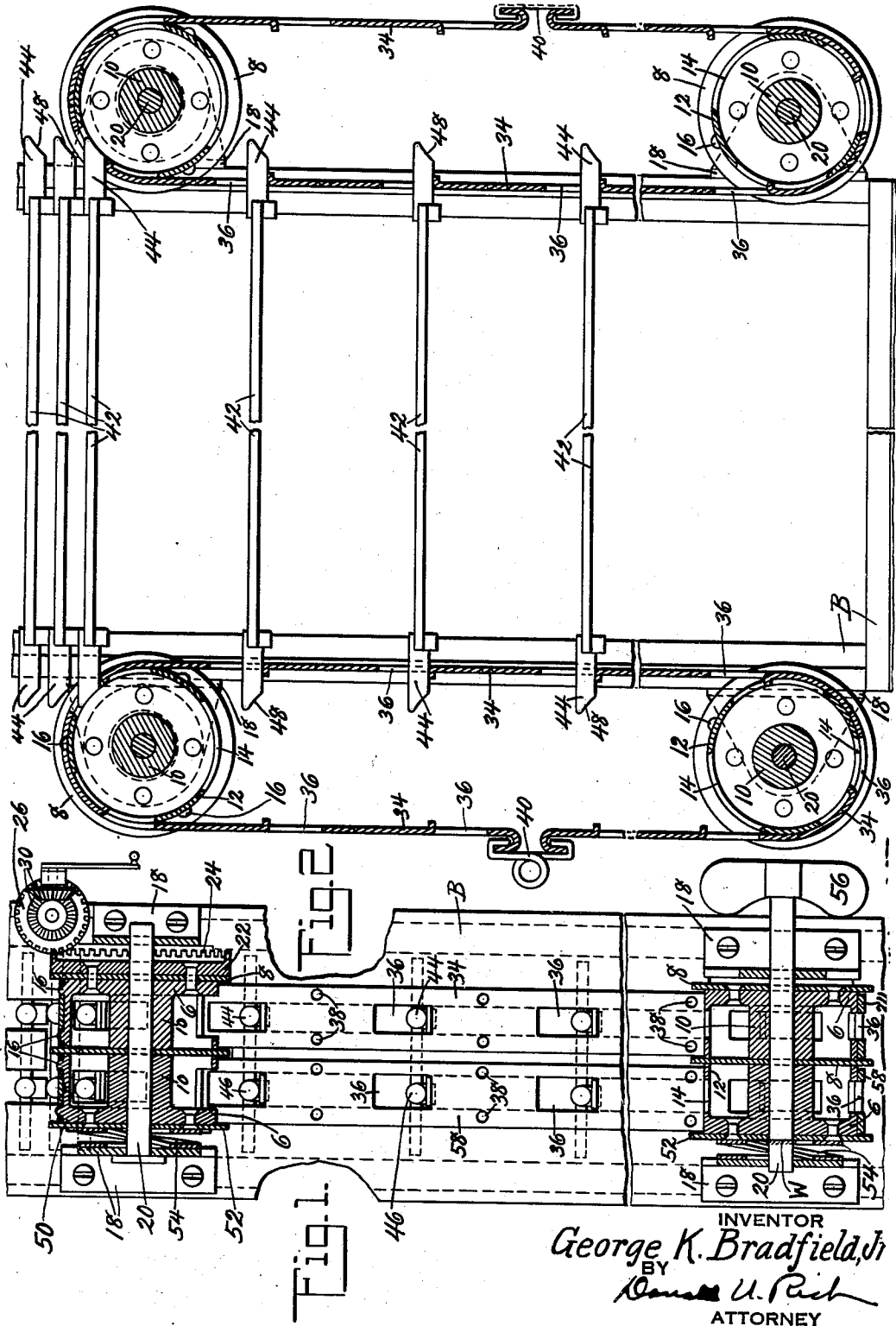
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2,100,625

VENETIAN BLIND

Filed June 15, 1937

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

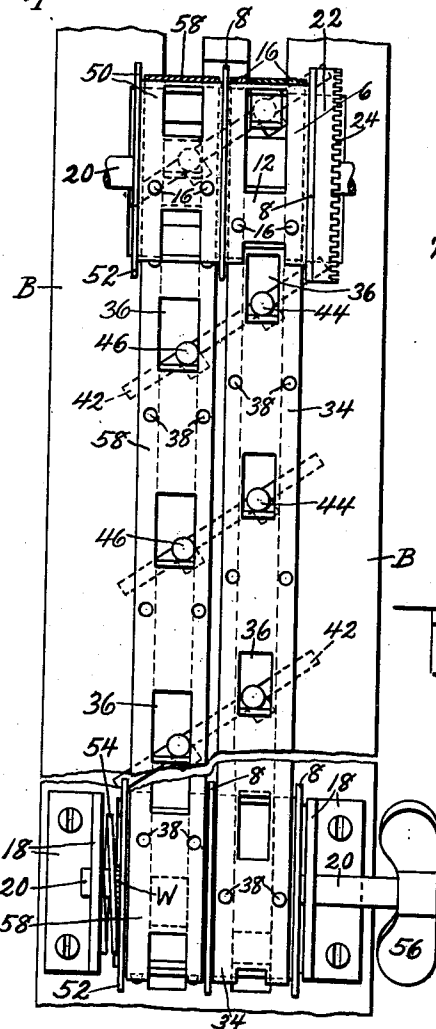
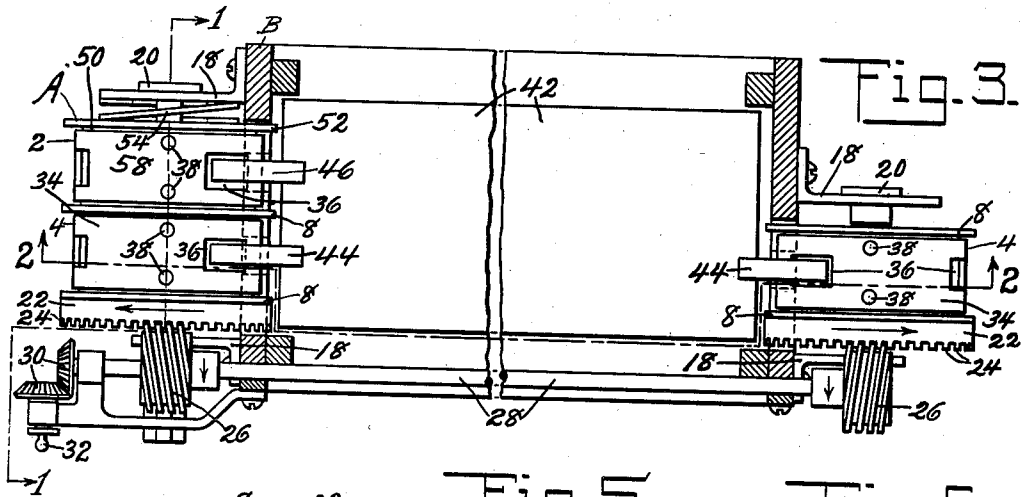


Fig. 5.

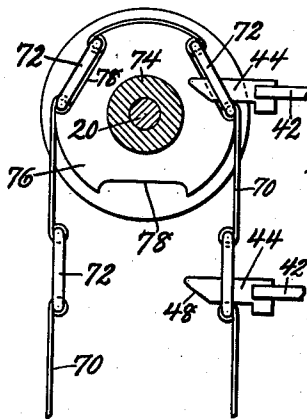


Fig. 6.

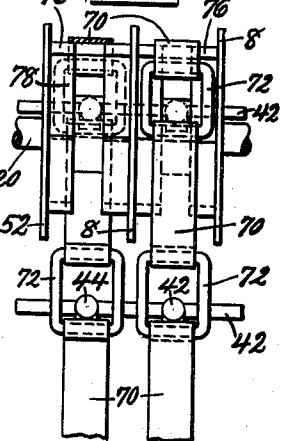


Fig. 4.

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# UNITED STATES PATENT OFFICE

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## VENETIAN BLIND

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7 Claims. (Cl. 156—17)

This invention relates to window blinds in general and in particular to blinds of the so-called Venetian type wherein a plurality of spaced slats may be raised and lowered and tilted to any desired degree of coverage for the window. Previously Venetian blinds have been built in which the surplus slats were stacked at the bottom, thus always placing an unsightly bundle of slats usually in the line of vision of the occupant of the room. Venetian blinds have also been proposed wherein the slats would be stacked at the top of the opening and lowered one by one, but such blinds have proven impractical due to complicated raising and lowering mechanism and to the fact that no suitable control for the tilting of the slats had been devised. It is an object, therefore, of this invention to provide a Venetian blind wherein the slats are stacked at the top of the opening and may be readily lowered and positively tilted to any desired position.

A further object of the invention is the provision of a Venetian blind in which the slats are raised and lowered singly while maintaining a predetermined degree of tilt.

A still further object of the invention is the provision of a Venetian blind of the top stacking type having an improved slat tilting arrangement.

These and other objects of the invention will be apparent to persons skilled in the art from a study of the following description and accompanying drawings, in which:

Figure 1 is a sectional view taken substantially on line 1—1 of Fig. 3;

Fig. 2 is a sectional view taken substantially on line 2—2 of Fig. 3;

Fig. 3 is a plan view of the improved blind as applied to a window opening;

Fig. 4 is an end view of the improved blind;

Fig. 5 is a sectional view of a winding drum showing a modification of the drum and belt arrangement; and

Fig. 6 is an end view showing the modified pulley and belt arrangement of Fig. 5.

Referring now to the drawings in detail, it will be seen that the improved blind consists of actuating mechanism A, normally secured to the sides B of an opening in such a position that the inner portions of the belts, later to be referred to, will be substantially flush with the inner surface of the opening. It is, of course, obvious that the opening may be a window in any dwelling structure, railway car or other mobile vehicle. The actuating mechanism consists of two parts, namely, the tilting part 2 and raising and lower-

ing parts 4, the latter of which are joined together for operation in unison. Each operating part consists of an upper and lower pulley, each formed by riveting or otherwise securing a casting 6 to a side plate 8. The casting is preferably formed with a central hub or supporting portion 10, while the rim 12 is spaced therefrom and provided with a plurality of elongated openings 14 and outwardly projecting driving knobs or lugs 16. These pulleys are rotatably mounted upon the structure adjacent the opening by any suitable means, such as brackets 18 and bolts or pins 20. One pulley of each set has secured thereto a gear wheel 22 having peripheral teeth 24 adapted to mesh with worm 26 which are mounted upon and joined together by shaft 28. The shaft 28 may be driven directly, but is preferably driven through bevel gears 30 in order that the crank 32 may be located inwardly of the structure and will be movable in a plane parallel to the wall of the structure. In the instance shown the operating or driving connections are located adjacent the upper portion of the opening, but it is obvious that it could as easily be located adjacent the lower portion of the opening without in any way modifying the operation of the device. The spaced operating pulleys on each side of the opening are joined together by means of an endless belt 34 formed with a plurality of properly spaced elongated openings 36 adapted to receive slat projections and with openings 38 adapted to engage the knobs of the pulleys in order that the belt may be positively driven without any slippage. In the present instance, and as shown in Fig. 2, the belt is formed of a flexible steel tape joined together by means of a tension device 40, but it is obvious that belts of other material and formation may be used. The slats 42 are each formed with an operating projection 44 at either end and also with a tilting projection 46 located at at least one end of a slat. Each of the projections is of sufficient length to engage the slots of the belt and has the inner end thereof curved as at 48 in order that it may under certain conditions ride upon the belt intermediate the slots.

In order that the slats may be tilted to any desired position a pair of pulleys 50 are provided having a hub casting substantially identical with that previously described in connection with the operating part, with the exception that the inner flange plate of each has been omitted and only the outer flange plate 52 applied. This is done in order to make the arrangement more compact and to also permit the inner edge of the hub

portion, which is preferably roughened, to frictionally engage one of the flange plates 8 of the operating pulleys. In order that the tilting pulleys may be held in frictional engagement with the operating pulleys, springs 54 are interposed between the supporting bracket and the flange 52 and will constantly urge the roughened edge of the pulley hub against the adjacent flange of the operating pulleys. One of these tilting pulleys is freely rotatable on the supporting pin, while the other pulley will be welded or otherwise secured as at W to the supporting pin and this latter pin will be provided inwardly of the wall structure with an operating crank or key 56 (Figs. 1 and 4). The tilting belt 58 is identical with that previously described and, therefore, the same reference numerals have been applied thereto.

The operation of the mechanism will be as follows and assuming the slats to be stacked in a position above the opening: Turning of the crank 32 will cause the operating pulleys to rotate in unison lowering the inner portion of the operating belts with the curved portions 48 of the slat projections riding on the smooth portion of the belt until a slot 36 is reached. The ends of the slat may now rest upon the lower edge of the slot and be lowered with the slat projection extending into the hub portion of the pulley. Continued rotation of the crank will cause further lowering of the belt and subsequent removal of the slat projection from the pulley hub, while the next adjacent slat will be riding on the smooth portion of the belt and about to enter the next adjacent slot of the belt. In returning the slats to their stacked position the reverse of the above operation takes place. It is thus seen that rotation of the crank will cause raising and lowering of the slats with each slat maintained in a definite relation with respect to the adjacent slats and that only as many slats as are desired need be lowered from the stack. A change in angular position of the slats is accomplished merely by moving the key 56, thus causing the tilting pulleys 50 to shift their position relative to the operating pulleys and, therefore, the position of the slots in the tilting belt relative to the slots in the operating belt. Once a proper tilt of the slats has been obtained then the slats may be raised and lowered, always maintaining this same degree of tilt since the operating pulleys and tilting pulleys will rotate in unison under action of the worm gearing.

In Figs. 5 and 6 is shown a slight modification of the belts and in this form each belt consists of a plurality of smooth metal strips 70 joined together by means of O-shaped members 72 which serve the same purpose as do the slots 36 of the previously described belts. With these belts the pulleys will, of course, need to be modified and are shown as formed with a hub portion 74 and spaced circular rim portions 76 having slots 78 cut therein to receive the O-shaped loop portions 72. It is intended that these pulleys and belts be merely substituted for the pulleys and belts of the form previously described and, therefore, the same reference numerals have been applied wherever possible and further description is believed unnecessary.

While the invention has been described more or less in detail, it is obvious that various modifications and rearrangements of parts will be apparent to persons skilled in the art and all such modifications and rearrangements of parts are

contemplated as fall within the scope of the following claims.

What is claimed is:

1. A Venetian blind comprising a plurality of belts each formed with a plurality of elongated openings, a plurality of slats, projections on the ends of the slats located in the openings of the belts when in an operative position, and pulleys supporting the belts whereby when said belts are moved over the pulleys in one direction they disengage themselves from the slat projections and the slats are piled in an inoperative position above the pulleys, certain of said belts engaging spaced projections on one end of the slats and being shiftable relative to each other to thereby permit tilting of the slats.

2. A Venetian blind comprising a plurality of belts each formed with a plurality of elongated openings, a plurality of slats, projections on the ends of the slats located in the openings of the belts when in an operative position, pulleys supporting the belts whereby when said belts are moved over the pulleys in one direction they disengage themselves from the slat projections and the slats are piled in an inoperative position above the pulleys, certain of said belts engaging spaced projections on one end of the slats and being shiftable relative to each other to thereby permit tilting of the slats, and means for driving all of said belts in unison irrespective of the relative belt positions.

3. A Venetian blind comprising a plurality of belts each formed with a plurality of elongated openings, a plurality of slats, projections on the ends of the slats located in the openings of the belts when in an operative position, pulleys supporting the belts whereby when said belts are moved over the pulleys in one direction they disengage themselves from the slat projections and the slats are piled in an inoperative position above the pulleys, certain of said belts engaging spaced projections on one end of the slats and being shiftable relative to each other to thereby permit tilting of the slats, driving means for moving all of said belts in unison irrespective of the relative belt positions, and tilting means for shifting the relative positions of the belts independently of the driving means.

4. A Venetian blind comprising a plurality of belts each formed with a plurality of elongated openings, a plurality of slats, projections on the ends of the slats located in the openings of the belts when in an operative position, pulleys supporting the belts whereby when said belts are moved over the pulleys in one direction they disengage themselves from the slat projections and the slats are piled in an inoperative position above the pulleys, certain of said belts engaging spaced projections on one end of the slats and being shiftable relative to each other to thereby permit tilting of the slats, and means for driving all of said belts in unison irrespective of the relative belt positions, said means comprising interconnected gearing and frictional devices.

5. A controlling mechanism for Venetian blinds of the independent slat type comprising a plurality of pairs of pulleys adjacent one end of the slats, a plurality of belts each engaging a pair of pulleys, elongated openings in each of the belts adapted to engage projections on one end of the slats, means for moving one pair of pulleys and associated belt whereby the relative positions of the belts may be changed thereby tilting the slats,

and additional means for moving the pulleys and belts in unison whereby the slats may be raised or lowered.

5 6. A controlling mechanism for Venetian blinds of the independent slat type comprising a plurality of pairs of pulleys adjacent one end of the slats, a plurality of belts each engaging a pair of pulleys, elongated openings in each of the belts adapted to engage projections on one end of the slats, means 10 for moving one pair of pulleys and associated belt whereby the relative positions of the belts may be changed thereby tilting the slats, and additional means for moving the pulleys and belts in unison whereby the slats may be raised or lowered, said

additional means consisting of gearing and friction devices.

7. A controlling mechanism for Venetian blinds of the independent slat type comprising a plurality of pairs of pulleys adjacent one end of the slats, a plurality of belts each engaging a pair 5 of pulleys, elongated openings in each of the belts adapted to engage projections on one end of the slats, and means for moving said pulleys and belts, one of said pairs of pulleys having frictional en- 10 gagement with the adjacent pair whereby said belts may be moved in unison to raise and lower the slats, and moved separately to tilt the slats.

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