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F. J. BURNS

1,891,913

MECHANICAL ROLLER LIFT

Filed Feb. 27, 1931

2 Sheets-Sheet 1

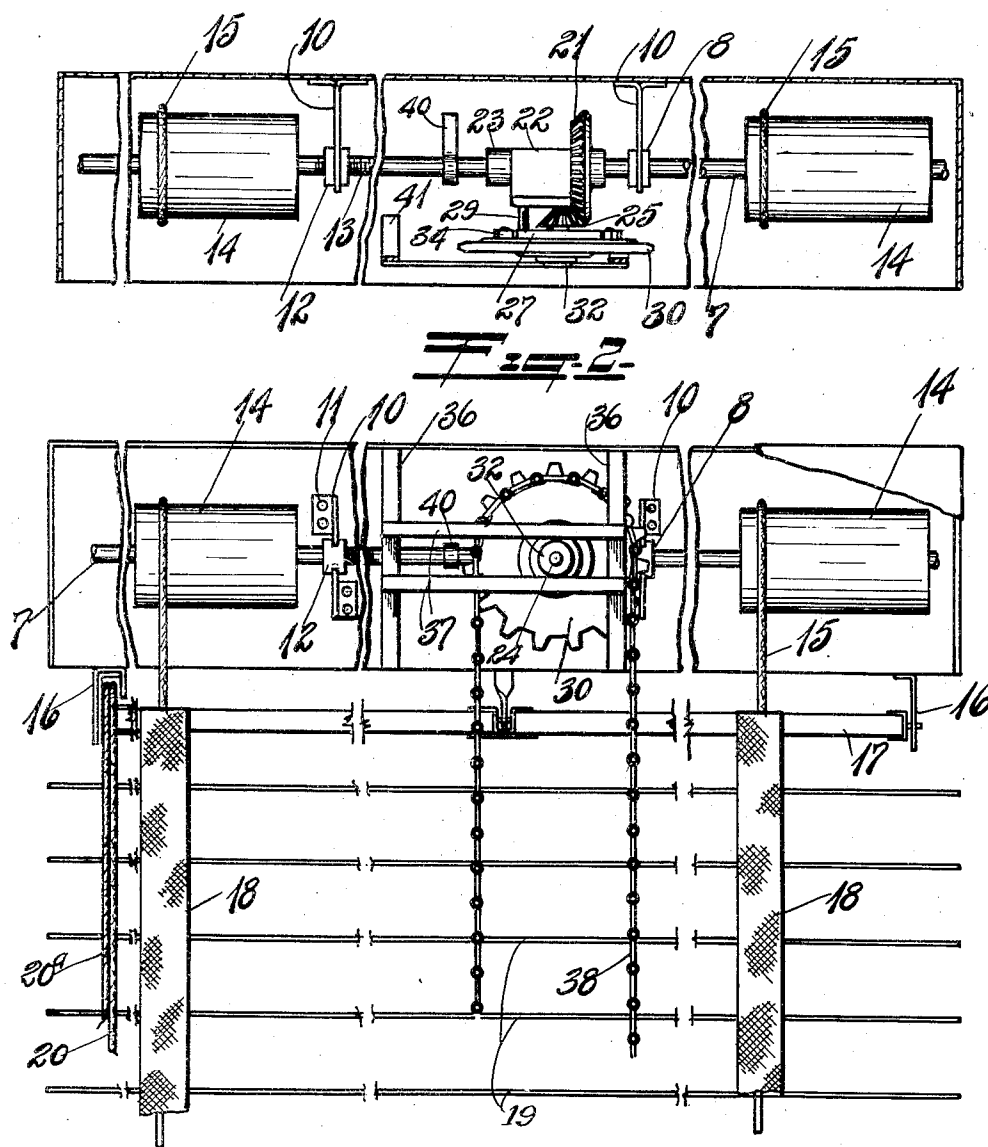


Fig. 1-

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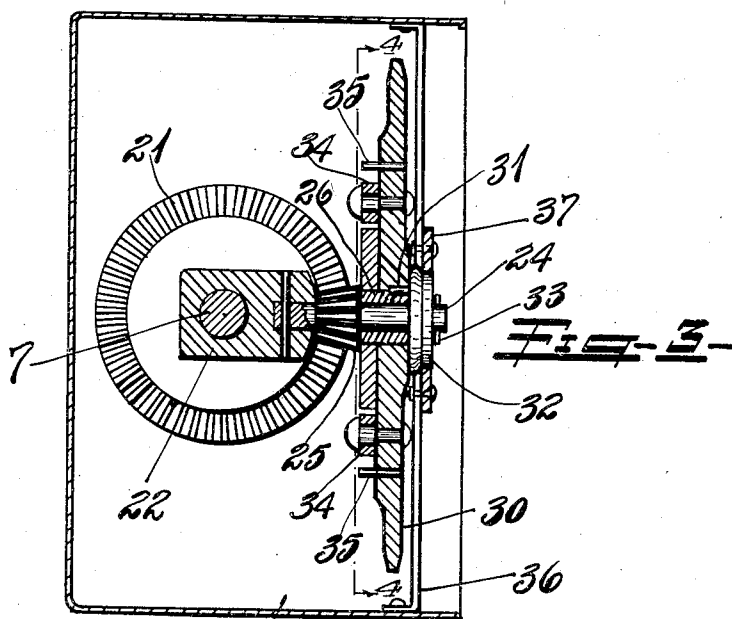
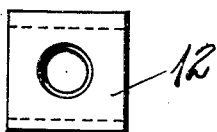


Fig. 4-

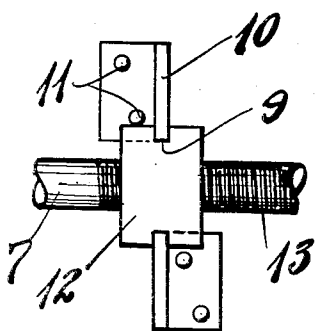


Fig. 5-

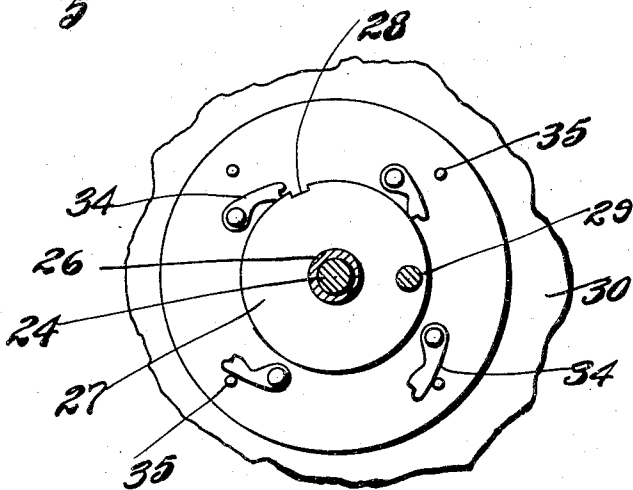


Fig. 6-

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MECHANICAL ROLLER LIFT

Application filed February 27, 1931. Serial No. 518,667.

This invention relates to mechanical roller lifts, and more particularly to gear driven roller lifts designed for use with Venetian blinds, for raising and lowering the slats of large, heavy blinds too heavy for the usual operation, as well as for ease of operation of blinds of smaller size.

The prime object of the invention is to design a mechanical roller lift of simple, practical, and economical construction, which can be easily operated, which will be positive in operation, and which is composed of a minimum number of parts.

A further object is to provide a gear driven mechanical roller lift, so that the blind can be held in any desired set position, which can be readily raised or lowered, and which will operate easily and smoothly.

Another object is to design a mechanical roller lift which will operate on the same general principle as the conventional shade roller, and which is provided with automatic means for stopping the mechanism when the blind is down, thereby eliminating the possibility of breakage, as well as continued operation (in the same direction) of the lowering chain, which would cause the blind to be raised by winding the lifting cords in a reverse direction, this would jam the mechanism, tangle the lifting cords, and make necessary a complete reassembling and resetting of the lift.

With the above and other objects in view, the present invention consists in the combination and arrangement of parts, hereinafter more fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes may be made in the form, size, proportion and minor details of construction, without departing from the spirit, or sacrificing any of the advantages of the invention.

In the drawings:

Fig. 1 is a fragmentary front view of a Venetian blind, showing the mechanical roller lift in position.

Fig. 2 is a top plan view, the case being shown in section.

Fig. 3 is an enlarged sectional detail view through the operating mechanism.

Fig. 4 is a fragmentary sectional view taken on the line 4—4 of Fig. 3 and looking towards the front of the case.

Fig. 5 is an enlarged fragmentary detail front view, showing the threaded bearing member and bracket support.

Fig. 6 is a detail side view of one of the threaded bearings.

Referring now to the drawings, the operating mechanism as shown in the accompanying drawings is preferably mounted in a sheet metal case or container 5, said case being provided with a front cover plate 6, which conceals the mechanism from view, and which can be secured in position in any approved manner; however, it will be readily understood that the mechanism can be mounted in a window frame, or in a recess, and a fascia board or other means may be provided for concealing the mechanism, and presenting a neat and finished appearance.

The winding mechanism comprises a horizontally disposed shaft member 7 which is mounted in bearings 8 as usual, each bearing being grooved as at 9 to fit and receive the edges of a preferably sheet metal bracket 10, which is secured to the case by means of rivets 11. The bearing 12 is internally threaded as shown in Figs. 5 and 6 of the drawings, and is adapted to receive the threaded section 13 of the shaft 7 so that as the shaft is driven, the mechanism will be shifted accordingly.

Winding rollers 14 are provided on the shaft in spaced apart relation, and the lifting cords 15 are anchored thereto and wind thereon, said cords being anchored to the end slat, (not shown), in the conventional manner.

Brackets 16 are secured to the bottom of the case by means of screws or the like, and a tilt bar 17 is pivotally mounted thereon, tapes 18 being secured to the tilt bar and serve to tilt the slats 19 as usual, cords 20 and 20^a being provided for operating the tilting mechanism which can be of any conventional design.

The mechanical roller lift proper comprises a bevel gear 21 which is secured on the shaft 7, a bearing block 22 being mounted on the

shaft directly adjacent said gear, and a collar 23 prevents a longitudinal movement on the shaft. A transversely disposed shaft 24 is secured in the bearing block 22 by means of a pin or the like, and projects towards the front of the case, a bevel pinion 25 being journaled on said shaft and is provided with an elongated hub 26 on which a nonrotatable ratchet member 27 is mounted, said ratchet being provided with a notch 28 in the outer rim thereof, and for a purpose to be presently described, ratchet locking pins 29 being provided in the bearing block, projecting into and preventing rotation of said ratchet.

A sprocket member 30 is mounted on the pinion hub, and is secured thereto by means of the pin 31 so that rotation of the sprocket will rotate the pinion, a guide wheel 32 being revolvably journaled on the end of the shaft, and a pin 33 secures said wheel in position.

Pawls 34 are pivotally mounted on the sprocket in spaced apart relation, and are formed as clearly shown in Fig. 4 of the drawings, stop pins 35 being provided directly adjacent thereto and limit the outward throw of said pawls, and it will be clearly obvious that when the sprocket is rotated slowly that two of said pawls will ride on the face of the ratchet, and when the mechanism is stopped one of said pawls will engage the notch in said ratchet and hold the mechanism in set position, rapid rotation of the sprocket will throw the pawls outwardly and prevent engagement with the notch.

Vertically disposed brackets 36 are secured to the top and bottom walls of the case, and horizontally disposed spaced apart guide strips 37 form the track for the guide wheel, so that as the operator actuates the operating chain 38, the pinion 25 will rotate the bevel gear 21, and the shaft 7 respectively, and the mechanism which is mounted on said shaft will be shifted transversely due to the threaded section, as hereinbefore described.

In practice the operation of the mechanism is as follows: When desiring to raise the blind, the operator, (facing the window) pulls downwardly on the right hand chain, this rotates the sprocket in a clockwise direction, releasing the engaged pawl from the ratchet notch, and as the sprocket is rotated these pawls will ride over said notch, (due to the shape of said pawl), the pinion 25 driving the gear 21, which in turn rotates the shaft 7, so that the lifting cords 15 are wound on the rollers 14, the shaft, together with the mechanism mounted thereon, being shifted transversely so that the cords will wind evenly on the rollers, the wheel 32 traveling on the track 37 as the mechanism is shifted.

When the blind has been raised to the desired height the sprocket is permitted to swing back anti-clockwise until one of the pawls drops into the notch 28 to hold the blind in set position, and inasmuch as the

natural tendency of the mechanism is to unwind, due to the weight of the blind, it will be clearly obvious that it will remain in set position until again actuated by the operator.

To lower the blind the operator pulls downwardly on the chain so that the locked pawl is disengaged from the ratchet, the chain is then permitted to travel upwardly to rapidly rotate the sprocket in an anti-clockwise direction, the centrifugal force throwing the pawls outwardly, no pull is necessary by the operator, as the weight of the blind will drive the mechanism quite rapidly. When desiring to stop the lowering movement, the R. P. M. of the sprocket is retarded to permit one of the pawls to engage the ratchet as above described, and the mechanism will be held in set position; in fact, the operation is exactly the same as that used on conventional shade rollers.

The automatic stop feature comprises an arm 40 which is mounted on the shaft 7 in a predetermined position, a lug 41 is secured to one of the vertically disposed brackets 36 and projects laterally therefrom so that as the mechanism is operated to raise the blind the shaft will be shifted transversely bringing the arm 40 into engagement with the lug 41 and preventing further operation of the mechanism in that direction.

From the foregoing description it will be clearly obvious that I have perfected a very simple, practical and economical roller lift for operating Venetian blinds.

What I claim is:

1. A Venetian blind having a plurality of movable slats, means for selectively raising or lowering said slats including a stationary track support, a transversely suitable drive shaft, an arm mounted on said shaft, and a lug on the support and projecting into the path of the said arm for limiting the lowering movement of the slats.

2. Venetian blind having a plurality of slats, means for raising and lowering said slats including a support, a transversely shiftable shaft mounted thereon, means for driving said shaft, and including a driving pinion having a driving member associated therewith, a non-rotatable ratchet mounted on said pinion, a guide wheel adjacent said driving member, a track on which said guide member is adapted to travel, and pawls on the driving member and engageable with said ratchet for holding the mechanism in set position.

3. A Venetian blind having a plurality of slats, means for raising and lowering said slats including a support, a transversely shiftable winding roller mounted thereon, gears for driving said roller, a guide wheel associated with one of said gears, a track on which said wheel is adapted to travel, flexible means for driving said gears, and means for locking said slats in set position.

4. A Venetian blind having a plurality of slats, means for raising and lowering said slats including a transversely shiftable winding roller, manually operable means for selectively driving said roller in either direction, and including a shaft, a non-rotatable ratchet member mounted thereon and associated with said driving means, and pawls mounted on said driving means and engageable with said non-rotatable ratchet member for holding said slats in set position.

5. A Venetian blind having a plurality of slats, means for operating said slats to selectively raise and lower the same, including a transversely shiftable winding roller, manually operable means for driving said roller, and including a shaft, a pinion mounted thereon and provided with an elongated hub, a nonrotatable ratchet member mounted on said hub, a sprocket member rotatable with said pinion, and means for supporting said shaft and associated driving means.

In testimony whereof I hereunto affix my signature.

FRED J. BURNS.