

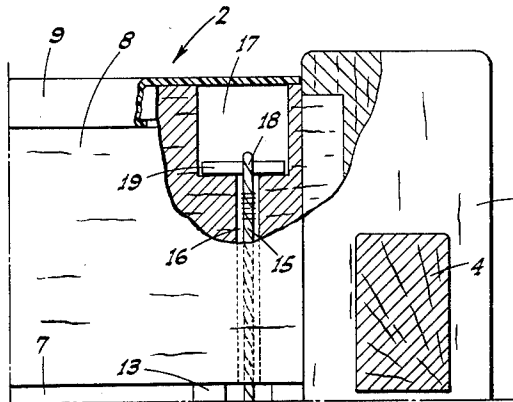
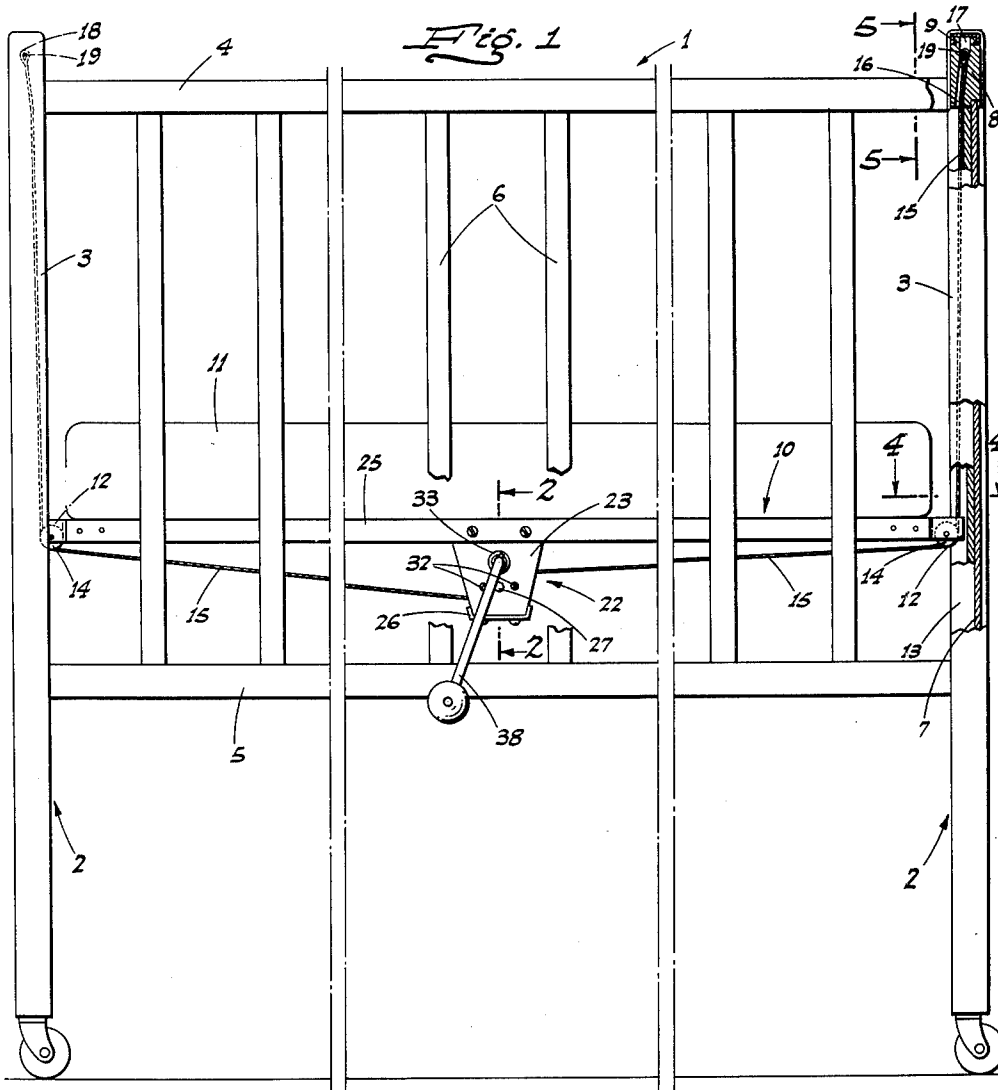
May 1, 1962

W. J. McNABB, JR
MATTRESS FRAME SUSPENSION AND CONTROL
MECHANISM FOR BABY CRIBS

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Filed Aug. 14, 1959

2 Sheets-Sheet 1



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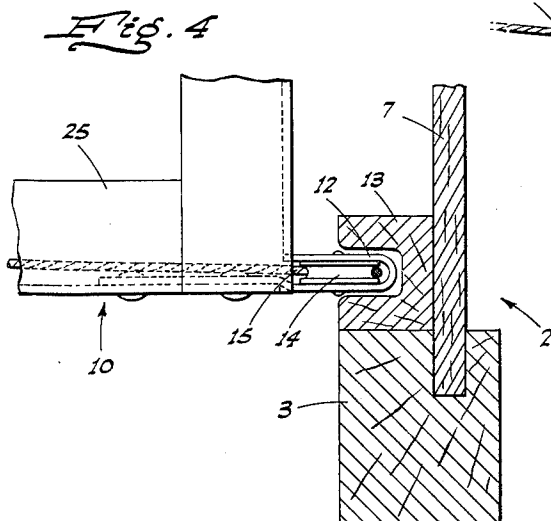
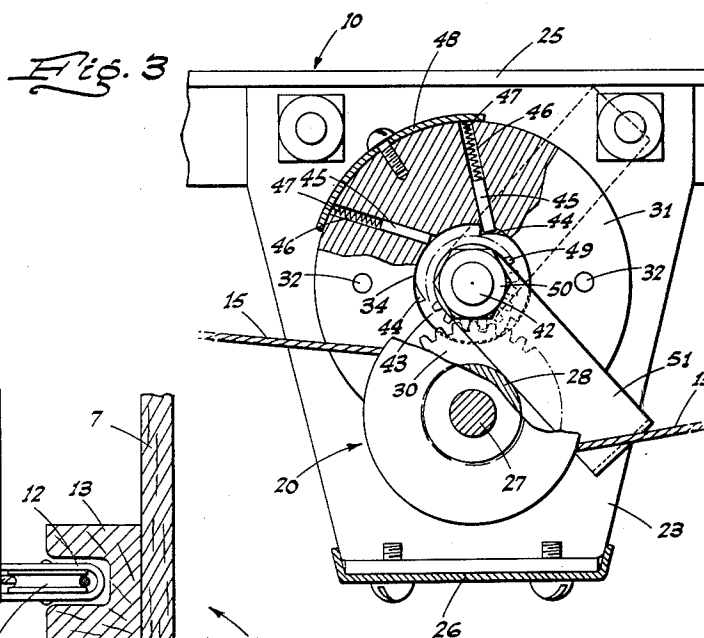
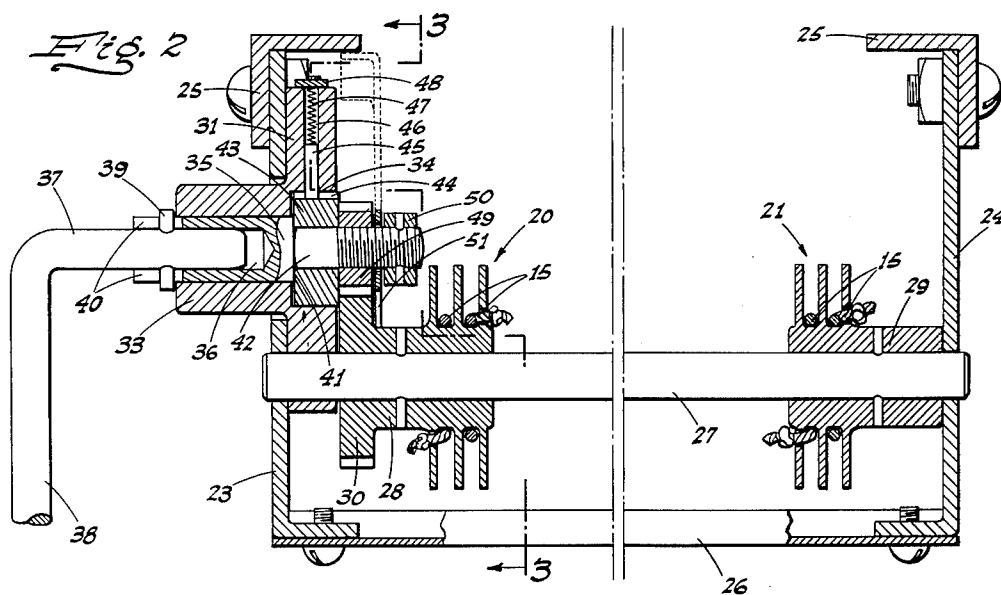
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MATTRESS FRAME SUSPENSION AND CONTROL MECHANISM FOR BABY CRIBS

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Filed Aug. 14, 1959, Ser. No. 833,812

1 Claim. (Cl. 192-16)

This invention relates in general to improvements in a baby crib, and particularly of the type which includes a mattress supporting frame, cable-suspended in the crib for adjustment between a lowered normal position and a raised position wherein a person has more convenient access to the mattress and can thus more readily attend to the baby resting thereon.

A major object of the present invention is to provide—in a baby crib as above—a novel crank-operated windlass unit for adjusting the mattress frame between lowered and raised positions; such unit being mounted on the mattress frame for movement therewith, and includes a removable crank disposed (in use) at one side of the crib for easy access.

Another important object of this invention is to provide a crank-operated windlass unit, as above and for the purpose described, which embodies a smooth functioning and safe mechanism; the latter being relatively simple and economical to manufacture, readily installed, and—with the crank removed—wholly out of the way to permit of normal and unobstructed use of the crib.

An additional object of the invention is to provide a novel connection between the upper ends of the mattress frame suspension cables and an adjacent part of the crib.

A still further object of the invention is to provide a practical and reliable mattress frame suspension and control mechanism, and one which is exceedingly effective for the purpose for which it is designed.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claim:

In the drawings:

FIG. 1 is a side elevation, foreshortened, of a baby crib embodying the novel mattress frame suspension and control mechanism.

FIG. 2 is an enlarged fragmentary sectional elevation of the windlass unit; the view being taken lengthwise of such unit, and on line 2—2 of FIG. 1.

FIG. 3 is a fragmentary transverse elevation, partly in section and partly broken away, substantially on line 3—3 of FIG. 2.

FIG. 4 is an enlarged fragmentary sectional plan view showing the manner of suspending and guiding the mattress frame at each corner thereof; the view being taken on line 4—4 of FIG. 1.

FIG. 5 is an enlarged fragmentary transverse sectional elevation showing particularly the connection employed at the upper end of each suspension cable; the view being taken on line 5—5 of FIG. 1.

Referring now more particularly to the drawings and to the characters of reference marked thereon, the crib which embodies the present invention is of the type which includes fixed sides 1, ends 2, and corner posts 3. The sides 1 each include a top rail 4, a bottom rail 5, and spaced vertical slats 6; the ends 2 including panels 7 and a top cross bar 8, the latter being fitted at its upper edge with a plastic teething cap 9 of inverted channel shape.

An elongated rectangular mattress frame 10 is disposed in the crib and supports the mattress 11; such mattress frame 10 being cable-suspended and vertically adjustable by means of the mechanism which embodies the

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present invention, and which comprises the following:

The mattress frame 10 is provided at each corner thereof with a longitudinally outwardly projecting clevis 12 which extends in guided relation into a vertical channel 13 fixed in the corner defined by the related post 3 and adjacent portion of the corresponding end panel 7; each such vertical channel 13 terminating at its upper end in abutment against the lower edge of the adjacent top cross bar 8.

Each clevis 12 carries a pulley 14, and a small flexible metallic cable 15 turns about each pulley 14 from below and thence extends upwardly in the corresponding channel 13. From the upper end of each channel 13, the cable passes through a generally perpendicular bore 16 in the top cross bar 8 and thence passes into an enlarged pocket 17 in said top cross bar 8.

At the upper end and within the pocket 17, each cable 15 is formed with an eye 18 through which a cross pin 19 extends; such cross pin seating on the bottom of the pocket and preventing downward displacement of the cable. The pockets 17 are initially open at the top for assembly of the cross pins 19 with the eyes 18, but thereafter such pockets are closed by the plastic teething cap extending thereover.

From the bottom of the pulleys 14, the cables 15 extend longitudinally inwardly, with corresponding cables oppositely wound about and secured to dual groove sheaves, indicated at 20 and 21, and which are in effect cable drums. These are included in a crank-operated windlass unit, indicated generally at 22, and which unit is mounted in connection with the mattress frame 10 intermediate its ends and on the underside thereof.

The windlass unit 22, which includes the dual groove sheaves 20 and 21, comprises the following:

Transversely aligned bracket plates 23 and 24 are fixed—by bolting as shown—to and depend below the corresponding side bars 25 of said mattress frame 10; such bracket plates 23 and 24 being connected at the bottom by a cross bar 26, while a cross shaft 27 is journaled in and extends between such bracket plates adjacent but above said cross bar 26.

The dual groove sheaves 20 and 21 include hubs indicated at 28 and 29, respectively; such hubs being fixed on the cross shaft 27.

The hub 28 of the dual groove sheave 20 is formed at its outer end with a gear 30 disposed in spaced relation to the adjacent bracket plate 23.

A circular body 31 is disposed against the back side of the bracket plate 23 with the axis of such body some distance above the cross shaft 27; said circular body 31 being fixed to such bracket plate 23 by screws 32.

The circular body 31 includes an integral axially outwardly projecting tubular boss 33 which communicates, at its inner end, with an enlarged circular recess 34 in body 31, and which recess opens to the rear thereof.

A rotary spindle 35 is disposed in the tubular boss 33; the spindle being of a length such that at its outer end it projects beyond said boss, while at its inner end it projects a considerable distance axially inwardly of the circular body 31.

The outer end portion of spindle 35 is formed as a socket 36 for the reception of the shank 37 of a removable hand crank 38; the shank 37 being fitted with a cross pin 39 which engages in open-ended notches 40 of the socketed portion of the spindle when the crank is in place.

The spindle 35 is reduced in diameter axially inwardly from substantially the radial plane of the bottom of the circular recess 34 whereby to define an inwardly facing radial shoulder 41. The reduced diameter portion of the spindle is indicated at 42; such portion, within the recess 34, being smooth but otherwise threaded as shown.

A ratchet collar 43 is journaled on the reduced diameter spindle portion 42 within the circular recess 34; such collar 43 being formed all about its circumference with a plurality of spaced ratchet notches 44. The collar 43 abuts on one side against shoulder 41 and is partially lapped on the other side by gear 30 whereby said collar is maintained against axial displacement. This also prevents the spindle 35 from sliding axially inwardly.

A pair of circumferentially spaced spring-pressed ratchet pins 45 are slidably disposed in bores 46 which extend from the circular recess 34 to the periphery of the body 31; the springs 47 which urge the pins 45 inwardly being disposed in said bores between the pins and a retention strap 48 mounted on the periphery of the body 31 in overlying relation to said bores.

At least one of the spring-pressed pins 45 normally seats in one of the ratchet notches 44; such notches being formed so that said pin then prevents rotation of the ratchet collar 43 in one direction, but permits rotation in the opposite direction by reason of the overrunning of the ratchet assembly.

A pinion 49 in the form of a nut is threaded on the reduced diameter spindle portion 42 immediately inwardly or rearwardly of the ratchet collar 43; such pinion nut 49 running in mesh with the gear 30 on the hub 28 of the dual groove sheave 20.

A stop nut 50 is threaded and fixed on the inner or rearward end of the reduced diameter spindle portion 42 in adjacent but normally clearance relation to the pinion nut 49.

The reduced diameter spindle portion 42 passes intermediate the pinion nut 49 and stop nut 50 through one end of a normally free swing finger 51, and which rests downwardly against the hub 28; such finger being of a length that when swung upwardly a predetermined distance it strikes the adjacent side bar 25 of the mattress frame 10, as indicated in FIG. 3.

In use, the above described mattress frame suspension and control mechanism functions as follows:

With the mattress frame 10 and mattress 11 thereon in lowered position, as in FIG. 1, a person desiring to raise such frame and mattress to an elevated point in the crib first engages the hand crank 38 by inserting the shank 37 in socket 36 with the cross pin 39 engaged in the notches 40; the crank then in the main being disposed outwardly of the adjacent side 1 of the crib for ready operation.

Thereafter, upon hand rotation of the crank 38 in a clockwise direction, the pinion nut 49—by reason of its threading on the reduced diameter spindle portion 42—moves axially outwardly until said pinion nut clamps the ratchet collar 43 between such nut and the inwardly facing radial shoulder 41. This locks pinion nut 49 and ratchet collar 43 on the reduced diameter spindle portion 42 for rotation therewith. Then, with continued rotation of the hand crank 38 in a clockwise direction, the cables 15 are simultaneously and progressively wound onto the dual groove sheaves 20 and 21, shortening the effective length of said cables above the pulleys 14 and resulting in raising of the mattress frame 10 to a selected level adjacent the top of the crib, or in fact at any intermediate point.

The ratchet assembly comprised of the ratchet collar 43 and spring-pressed pins 45 overruns upon rotation of the crank 38 in a clockwise direction, and when the mattress frame 10 is being raised. However, immediately upon cessation of the clockwise rotation of the hand crank 38, such ratchet assembly comes into play and prevents turning of the ratchet collar 43, and pinion nut 49 locked thereagainst, in a direction which would permit lowering of said mattress frame. The ratchet assembly thus provides a positive and safe arrangement for the purpose of holding the mattress frame 10 in any elevated position.

When it is desired to lower the mattress frame 10 to its normal or starting position, the hand crank 38 is rotated

in a counter-clockwise direction which results in the pinion nut 49 being backed away from the ratchet collar 43 sufficient to permit slippage therebetween; the reduced diameter spindle portion 42 turning in ratchet collar 43, and which collar cannot rotate in a corresponding direction. With such slippage between the pinion nut 49 and ratchet collar 43—yet with friction drag—the mattress frame 10, and mattress 11 thereon, gravitationally return to lowered position. While this is occurring, gear 30 rotates pinion nut 49 in a direction which tends to threadingly advance the latter into clamping engagement with the ratchet collar 43 but which clamping engagement cannot wholly occur because of the continuing counter-clockwise and compensating rotation of the reduced diameter spindle portion 42 by crank 38.

Thus, a controlled braking action is obtained, and the extent of which depends upon the speed of counter-rotation of said crank. Further, if counter-rotation of the crank 38 is stopped, pinion nut 49 immediately tightens or clamps against ratchet collar 43, and downward gravitational motion of the mattress frame 10 likewise stops.

By virtue of the foregoing, the mattress frame can never accidentally and freely drop.

If, by reason of continuing counter-clockwise rotation of the hand crank 38 after the mattress frame 10 is in lowered position, the pinion nut 49 backs away from ratchet collar 43 too far, the swing finger 51 (which provides a release means as hereinafter described) becomes bound between said pinion nut 49 and stop nut 50, rather than such nuts directly locking together.

Upon the next clockwise rotation of the hand crank 38, to raise the mattress frame 10, the swing finger 51 first rotates upwardly until it strikes the side bar 25, as shown in dotted lines in FIG. 3. When this occurs, the pinion nut 49—by reason of the stoppage of rotation of said swing finger—breaks loose therefrom and advances on the reduced diameter spindle portion 42 in the direction of and tightens against the ratchet collar 43 so that the mattress frame 10 can be raised in the manner previously described.

With such action of the pinion nut 49, the swing finger 51 falls freely back to its normal position as in full lines in said FIG. 3.

When the crib is in normal use, with the mattress frame in lowered position, the hand crank 38 is removed so as not to form any obstruction exteriorly of the corresponding side 1 of the crib; the remainder of the mechanism obviously being in an out-of-the-way position mainly beneath said mattress frame.

From the foregoing description, it will be readily seen that there has been produced such a device as substantially fulfills the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claim.

Having thus described the invention, the following is claimed as new and useful and upon which Letters Patent is desired:

In a windlass which includes a supporting frame, a horizontal rotary spindle supported from the frame and comprising an outer end portion and an inner end portion of reduced size providing a shoulder therebetween, means to forcefully rotate the spindle in one direction, a ratchet collar turnable and slidable on the inner portion of the spindle immediately beyond the shoulder to frictionally engage the same, a ratchet engaging pawl preventing rotation of the collar in the opposite direction, said inner end portion of the spindle beyond the collar being threaded, a pinion mounted on said threaded portion, the threading being disposed so that upon the spindle being turned in said one direction with a load on the pinion resisting such turning said pinion will be moved

along the spindle and into binding engagement with the collar, and when the spindle is rotated in the opposite direction said spindle will be backed away from the collar sufficient to permit slippage therebetween, and a stop element fixed on the inner end of the spindle and spaced from the pinion when the latter is engaged with the collar; a gravity-lowered swing finger freely turnable on the spindle between the pinion and stop element and narrower than the space therebetween when the pinion is engaged with the collar, and a fixed member mounted with the frame in the path of upswinging movement of the finger to stop the same when said finger becomes clamped between the stop element and pinion by movement of the latter away from the collar, and is swung up by the accompanying rotation of the pinion.

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