

Aug. 29, 1950

G. PRESTON
ROCKABLE BED

2,520,563

Filed March 1, 1949

3 Sheets-Sheet 1

Fig. 1

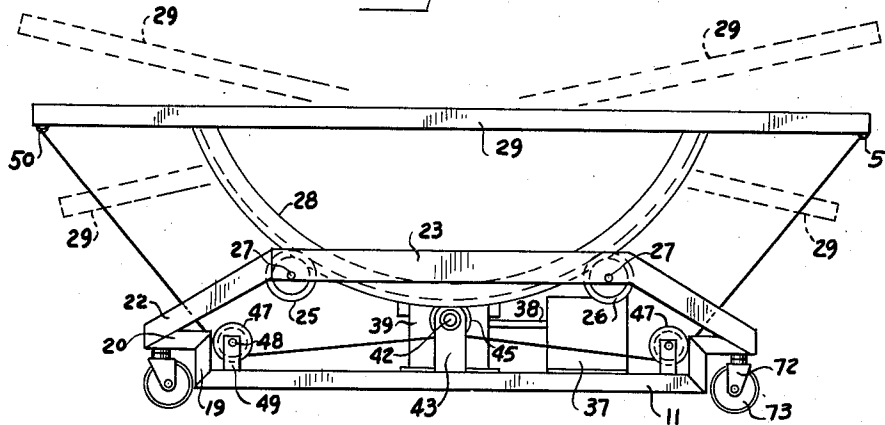


Fig. 2

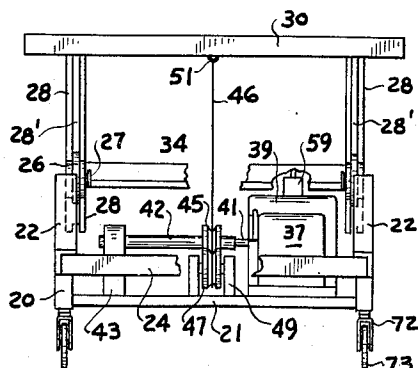
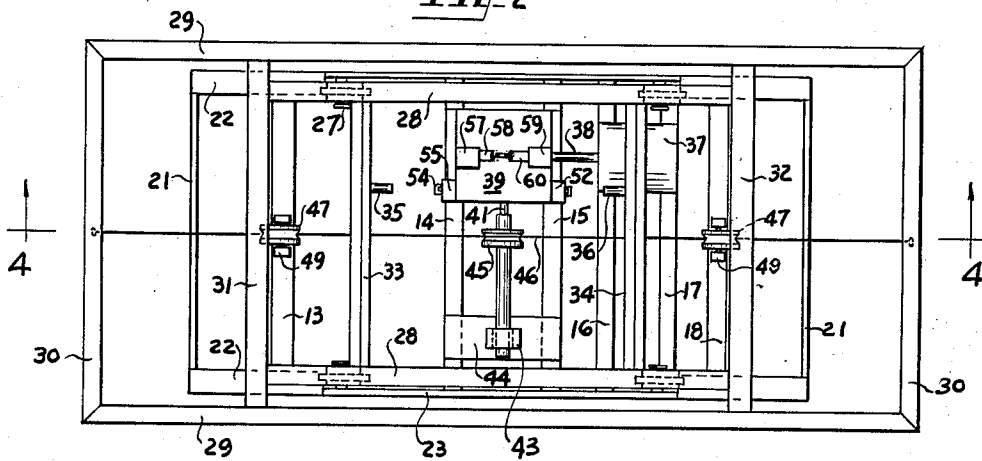


Fig. 3

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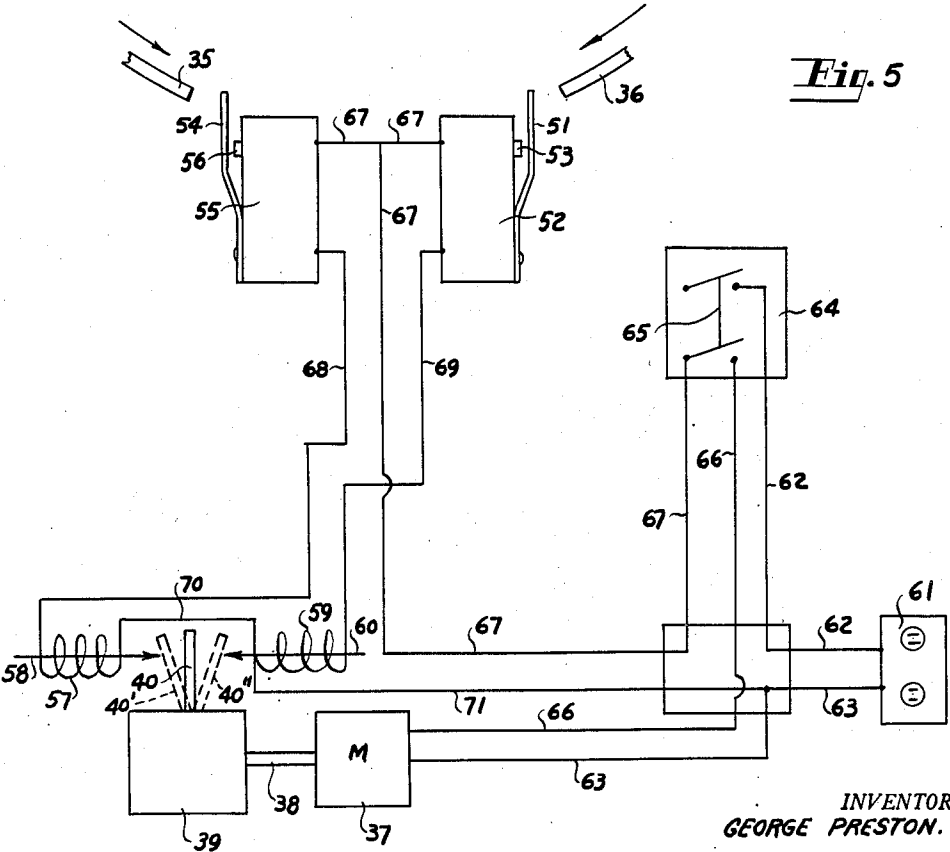
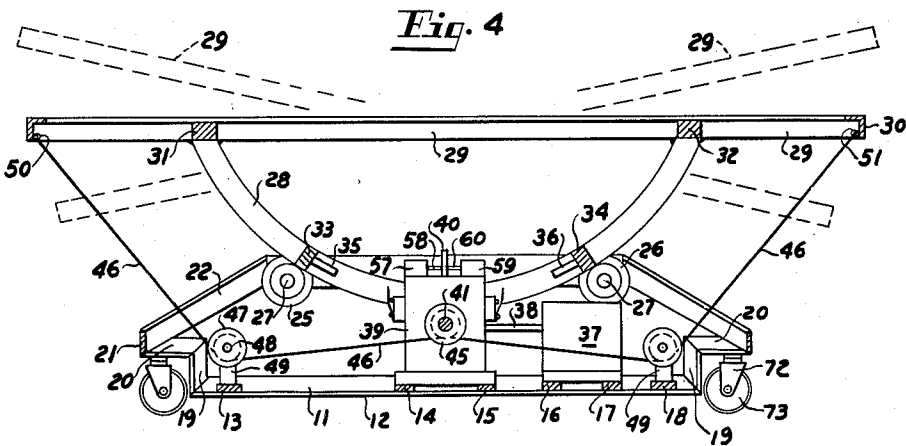
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3 Sheets-Sheet 3

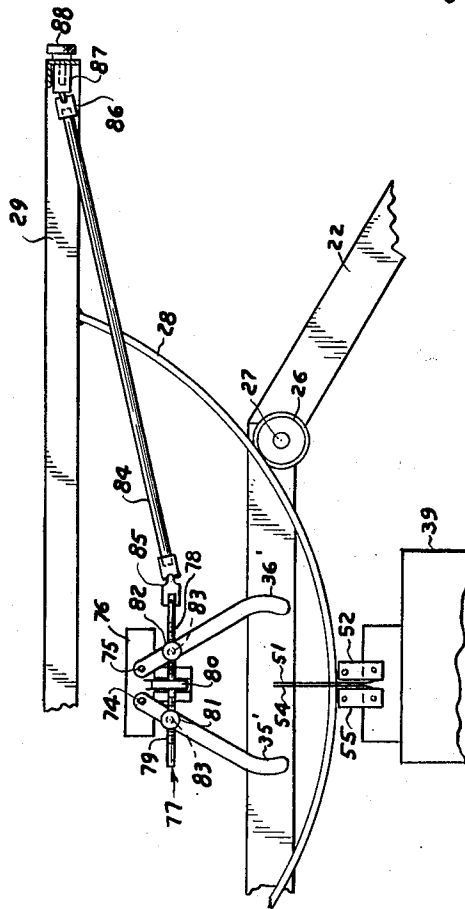


Fig. 6

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UNITED STATES PATENT OFFICE

2,520,563

ROCKABLE BED

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Application March 1, 1949, Serial No. 78,950

11 Claims. (Cl. 5—109)

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This invention relates to a rocking bed, and more particularly to a rocking bed construction including hydraulic means for effecting reciprocal rocking movement thereof.

It is the object of the present invention to provide a bed frame which is reciprocally and rockably mounted upon rollers together with a hydraulic mechanism for reciprocally rocking said frame upon said rollers.

It is the further object of this invention to provide in said construction a reversably operable hydraulic motor to which is joined a cable actuating winch, with said cable being centrally wound around said winch and with the ends thereof extending around rollers and joined to the respective opposite ends of said bed frame.

It is the further object of this invention to provide a switching mechanism in conjunction with said rockable frame to automatically effect reversals of the direction of rotation of said hydraulic motor whereby the frame rocking cable is moved first in one direction and then in the other.

These and other objects will be seen from the following specification and claims in conjunction with the appended drawings in which:

Figure 1 is a side elevational view of the rockable bed.

Figure 2 is a plan view thereof.

Figure 3 is a right end elevational view thereof, partially broken away for clarity.

Figure 4 is an elevational section taken on line 4—4 of Figure 2;

Figure 5 is a diagrammatic view illustrating the hydraulic motor, its driving motor and the various electrical connections and switches associated therewith.

Fig. 6 is a fragmentary view illustrating an alternate control arm mounting.

It will be understood that the above drawing illustrates merely a preferred embodiment of the invention and that other embodiments are contemplated within the scope of the claims hereafter set out.

Referring to the drawings the base of the rocking bed is made up of a rectangular frame work which includes a pair of spaced horizontally extending supports 11 with inturned horizontal flanges 12. Interposed between supports 11 and secured thereto are the transverse cross supports 13, 14, 15, 16, 17 and 18 whose opposite ends are respectively positioned upon the flanges 12.

Supports 11 terminate at their ends in the upwardly extending members 19, at the upper ends of which project outwardly horizontal members 20 as shown in Figure 4. Cross supports 21 co-

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operatively extend between and are respectively secured at their outer ends to the outer portions of members 20.

The frame work also includes the inwardly inclined upwardly extending members 22, and the horizontal roller supports 23 are positioned and secured between the upper ends of the inclined members 22, to complete the frame work for said base, there being two such frames in parallel spaced relation, one of which is shown in Figure 1 and the other of which is shown in Figure 4. Intermediate cross braces 24 as shown in Figure 3 are interposed between the inclined members 22 at opposite ends of the frame work for reinforcing the same, the brace 24 in Figure 3 being partially broken away for the purpose of clarity.

A pair of spaced rollers 25 and 26 are journaled upon supporting shafts 27 which are secured to and which project inwardly from the respective opposite ends of the horizontal roller supports 23 as shown in Figures 1 and 4. Each pair of rollers 25 and 26 are adapted to rockably support the pair of spaced arcuate substantially semi-circular sectors 28 which depend from opposite sides of the bed frame 29.

Said bed frame includes the parallel spaced elements 29 and the end cross pieces 30 which are joined thereto to form a hollow rectangular frame from which the sectors 28 depend, being secured thereto at their opposite ends adjacent the cross braces 31 and 32 which interconnect elements 29.

An additional pair of cross braces 33 and 34 are interposed between sectors 28 in parallel spaced relation to establish a rigid relationship between said sectors and between the bed frame 29—30. Each of the cross braces 33 and 34 carry the inwardly extending control arms 35 and 36 respectively which are adapted to intermittently energize a pair of microswitches in the manner and for the purpose hereafter set out in detail.

Electric motor 37 is mounted and secured within the base of the rocking bed upon the cross supports 16 and 17 and is joined to the hydraulic motor 39 by the interconnecting driving shaft 38 which is rotated by the motor 37.

Hydraulic motor 39 is illustrated diagrammatically and is shown positioned and secured upon the cross braces 14 and 15, Figures 2 and 4, said hydraulic motor having a rotatable drive shaft 41 which is joined to the winch or shaft 42 for rotating the same in one direction or the other.

The detail of construction of said hydraulic motor forms no part of the present invention and

its detailed description is omitted, said motor being of a conventional construction adapted to be driven by motor actuated shaft 38, and having a reciprocally rotatable drive shaft 41. Said hydraulic motor is covered by one or more of the following United States patents: 1,867,308; 2,250,512; 2,277,570; and 2,313,404.

Said hydraulic motor has a control arm 40 shown in Figures 4 and 5 which is adapted to assume either of the dotted line positions shown in Figure 5 for determining the direction of rotation of shaft 41 which operates the winch 42.

The outer end of shaft 42 is rotatably supported and journaled within the upper end of upright support 43 upon the platform 44, said platform straddling and being supported upon cross braces 14 and 15.

Winch 42 has secured thereto the cable engaging pulley 45 around which is wound cable 46 at its central portion, the opposite ends of said cable projecting in opposite directions around the guide rollers 47 carried upon supports 49, with the ends of said cable being respectively joined at points 50 and 51 to the opposite ends of the bed frame 29—30 as shown in Figure 4. It is noted from Figure 4 that the supports 49 are centrally mounted upon the cross braces 13 and 18 of the bed frame or base 11.

As shown in Figure 3 the sectors 28 have formed in their under surfaces the undercut arcuate slots 28' into which retainingly and cooperatively project the sector supporting rollers 25 and 26. By this construction it is apparent that the bed frame carried by said sectors is adapted to freely rock upon said rollers with a minimum of friction with the rocking motion of said frame being determined by the translatory movements of the cable 46 first in one direction and then in the opposite direction as the winch 42 is rotated first in one direction and then in the opposite direction.

As above described a hydraulic motor of a conventional construction may be employed wherein a single control arm by its positioning may determine the direction of rotation of the drive shaft which projects from such motor. In the present embodiment such a hydraulic motor is employed as an element in the present combination whereby shaft 41 may be rotated in one direction or the other for winding and unwinding the cable 46 upon the pulley wheel 45.

It will be noted that rotation of the drive shaft 41 in one direction affects the corresponding rotation of the winch or shaft 42 which carries cable operating pulley 45. Consequently rotation of pulley 45 in one direction will cause lengthening of one end of cable 46 and shortening of the other end to effect a tilting rocking motion of the bed frame 29. It follows further that rotation of said pulley in the opposite direction will cause lengthening of the other end of the cable and corresponding shortening of the opposite end to effect a tilting motion of the bed frame in the opposite direction.

The present invention contemplates an automatic mechanism for intermittently setting the position of the control arm 40 of the hydraulic unit 39 between the two positions 40' and 40'' shown in Figure 5. Thus, a rocking motion of the bed frame 29—30 will be accomplished. The positioning of control arm 40 is effected by a pair of solenoids 57 and 59 which are mounted upon the hydraulic motor 39 as shown in Figure 4 and Figure 2 and whose movable elements 58 and 60 are arranged so that their inner ends

are adapted to intermittently engage control arm 40.

When solenoid 57 is energized control arm 40 will be moved to the dotted line position identified as 40'', and the winch 42—45 will rotate in one direction. When solenoid 59 is energized control arm 40 will be moved to the dotted line position 40', and the winch will rotate in the opposite direction.

Referring to Figures 4 and 5 there is shown micro switch 52 mounted on hydraulic motor 39, including contact arm 51 and contact 53, with control arm 36 being adapted to project contact arm 51 into engagement with contact 53, to close electrical circuit through solenoid 59.

A second microswitch 55 is mounted upon the opposite side of hydraulic motor 39, and includes the contact arm 54 intermittently engageable by the control arm 35 for projecting contact arm 54 into engagement with the contact 56 for closing the electrical circuit through the solenoid 57.

As the control arms 35 and 36 are carried by the rockable sectors 28, it is apparent that said arms will intermittently energize or engage the corresponding contact arms 54 and 51 of the microswitches 55 and 52 respectively, whereby the solenoids 57 and 59 will be alternately and intermittently energized.

As shown in Figure 5 a duplex outlet 61 is shown which is adapted for attachment upon the outside of the bed base whereby electrical energy may be introduced for operating the electric motor 37 and for energizing the two solenoids 57 and 59.

A toggle switch is generally indicated at 64 and is connected with outlet 61 by the lead 62. A second lead 63 interconnects outlet 61 with the motor 37.

Control arm 65 forms a part of toggle switch 64 and is adapted upon closing movement to establish connection between lead 62 and the return lead 66 between switch 64 and motor 37. Consequently when the control arm 65 is moved to a closed circuit position the electrical circuit to the motor 37 will include the leads 62, 65 and 63.

Control arm 65 is adapted to also close the circuit between the lead 62 and the lead 67 which is joined to the two microswitches 55 and 52 as shown in Figure 5. Microswitch 55 is joined to the solenoid 57 by the lead 68, and said solenoid will be energized when the contact arm 54 is brought into engagement with contact 56. As illustrated diagrammatically in Figure 5 contact arm 35 when moved in the direction indicated by the arrow will close the connection between contact arm 54 and contact 56 so that electrical energy will flow through the leads 62, 67, 54, 68, 70 and 71, also lead 63.

Furthermore micro switch 52 is joined to solenoid 59 by the leads 69, and said solenoid will be energized when the contact arm 51 is brought into engagement with contact 53. As illustrated diagrammatically in Figure 5, contact arm 36 carried by the arcuate sector 28, when moved in the direction indicated by the arrow will close the connection between contact arm 51 and contact 53 so that electrical energy will flow through the leads 62, 67, 51, 69, 71 and 63.

By the above construction it appears that when the switch 64 is closed the motor 37 is immediately energized and the shaft 38 rotated. The direction of rotation of the shaft 41 of hydraulic motor 39 will be determined depending upon the position of the control arm 40. Thus, the two circuits above identified will be inter-

mittently and alternately energized so that first the arm 40 is moved to one position such as 40' and then will be moved to the opposite position 40''. In this manner the position of the control arm 40 will be intermittently changed with the result that shaft 41 will rock or reciprocally rotate first in one direction and then in the other.

This will accomplish winding of the cable 46 around the pulley 45 first in one direction and then the other and this in turn will rock the bed frame 30—29 upon its supporting rollers 25 and 26.

As shown in Figures 1, 3 and 4 there are four casters 72 provided at the opposite corners of the device being swivelly joined below and to the frame elements 20, said casters journalling the wheels 73 whereby the rockable frame may be pushed as desired.

A slight variation is shown in Figure 6 of the drawing which provides a caliper adjustment for the control arms 35' and 36' to regulate their angularity for controlling the pitch or extent of the rocking motion of the bed frame 29.

It will be noted that the control arms 35' and 36' which correspond to the control arms 35 and 36, are pivotally mounted at their upper ends at points 74 and 75 respectively to the block 76 which is suitably carried by the frame 29 between arcuate members 28.

A leadscrew shaft 77 is provided having formed thereon a pair of oppositely arranged threads 78 and 79 which are respectively threaded through the nuts 82 and 81 pivotally joined at points 83 to the respective control arms 36' and 35', said shaft being centrally supported by the supporting element 80 which depends from the block 76 and which has an opening for receiving said shaft.

Rotatable shaft 84 is arranged in a central position longitudinally of the frame 29 and thereunder, and is joined to the shaft 77 by the universal connection 85. There is a second universal connection 86 at the upper end of shaft 84 for joining the same to the rotatable element 87 supported within frame 29.

Collar 88 is provided upon the outer end of element 87 and may be manually rotated or by a suitable crank for transmitting rotary motion to the shaft 77. It is apparent that rotation in one direction will adjust control arms 35' and 36' toward each other tending to reduce the rocking arc of the frame 29. On the other hand rotation in the opposite direction will adjust control arms 35' and 36' away from each other tending to increase the rocking arc of the frame 29.

Having described my invention, reference should now be had to the claims which follow for determining the scope thereof.

I claim:

1. In combination, a base including a pair of spaced side frame elements, a pair of aligned longitudinally spaced rollers journalled upon each element, a bed frame, a pair of spaced arcuate sectors joined at their ends to said bed frame and depending therefrom for cooperative supported engagement with said rollers, a reciprocally rotatable winch on said base, and a cable centrally wound on said winch with its ends joined to the respective opposite ends of said bed frame for rocking the same on said rollers.

2. In combination, a base, a pair of aligned longitudinally spaced rollers journalled upon each side of said base, a frame, a pair of spaced arcuate sectors joined at their ends to said frame and depending therefrom for cooperative sup-

ported engagement with said rollers, a reciprocally rotatable winch on said base, and a cable centrally wound on said winch with its ends joined to the respective opposite ends of said frame for rocking the same on said rollers.

3. In combination, a base, a pair of aligned longitudinally spaced rollers journalled upon each side of said base, a frame, a pair of spaced arcuate sectors joined at their ends to said frame and depending therefrom for cooperative supported engagement with said rollers, a reciprocally rotatable winch on said base, a cable centrally wound on said winch with its ends joined to the respective opposite ends of said frame for rocking the same on said rollers, and a hydraulic motor joined to said winch for reciprocally rotating the same.

4. In combination, a base, a pair of aligned longitudinally spaced rollers journalled upon opposite sides of said base, a frame, a pair of spaced arcuate sectors joined at their ends to said frame and depending therefrom for cooperative supported engagement with said rollers, a reciprocally rotatable winch on said base, a cable centrally wound on said winch with its ends joined to the respective opposite ends of said frame for rocking the same on said rollers, a hydraulic motor joined to said winch for reciprocally rotating the same, and an electric motor on said base in driving relation with said hydraulic motor.

5. In combination, a base, a pair of aligned longitudinally spaced rollers journalled upon opposite sides of said base, a frame, a pair of spaced arcuate sectors joined at their ends to said frame and depending therefrom for cooperative supported engagement with said rollers, a reciprocally rotatable winch upon said base, a cable centrally wound on said winch with its ends joined to the respective opposite ends of said frame for rocking the same on said rollers, and a hydraulic motor on said base joined to said winch for reciprocally rotating the same, said hydraulic motor having a movable control arm for reversing the direction of rotation of said winch.

6. In combination, a base, a pair of aligned longitudinally spaced rollers journalled upon opposite sides of said base, a frame, a pair of spaced arcuate sectors joined at their ends to said frame and depending therefrom for cooperative supported engagement with said rollers, a reciprocally rotatable winch supported upon said base, a cable centrally wound upon said winch with its ends joined to the respective opposite ends of said frame for rocking the same on said rollers, a hydraulic motor on said base joined to said winch for reciprocally rotating the same, said motor having a movable control arm for reversing the direction of rotation of said winch, and a pair of spaced control means on said sectors adapted to intermittently move said control arm in opposite directions.

7. In combination, a base, a pair of aligned longitudinally spaced rollers journalled upon opposite sides of said base, a frame, a pair of spaced arcuate sectors joined at their ends to said frame and depending therefrom for cooperative supported engagement with said rollers, a reciprocally rotatable winch journalled upon said base, a cable centrally wound upon said winch with its ends joined to the respective opposite ends of said frame for rocking the same on said rollers, a hydraulic motor on said base joined to said winch for reciprocally rotating the same, said motor having a movable control arm for reversing

the operation of said motor, and a pair of spaced solenoids upon said motor with their respective movable elements arranged upon opposite sides of said control arm to operatively engage the same upon intermittent energization of said solenoids.

8. In combination, a base, a plurality of longitudinally spaced rollers journaled upon opposite sides of said base, a frame, a pair of spaced arcuate sectors joined at their ends to said frame and depending therefrom for cooperative supported engagement with said rollers, a reciprocally rotatable winch journaled upon said base, a cable centrally wound upon said winch with its ends joined to the respective opposite ends of said frame for rocking the same on said rollers, a hydraulic motor on said base joined to said winch for reciprocally rotating the same, said motor having a movable control arm for reversing the operation thereof, a pair of spaced solenoids upon said motor with their respective movable elements arranged upon opposite sides of said control arm to operatively engage the same upon intermittent energization of said solenoids, and a pair of spaced control arms on said sectors adapted to intermittently energize said solenoids as said frame is rocked upon said rollers.

9. In combination, a base, a pair of aligned longitudinally spaced rollers journaled upon opposite sides of said base, a frame, a pair of spaced arcuate sectors joined at their ends to said frame and depending therefrom for cooperative engagement with said rollers, a reciprocally rotatable winch journaled upon said base, a cable centrally wound upon said winch with its ends joined to the respective opposite ends of said frame for rocking the same upon said rollers, a hydraulic motor on said base joined to said winch for reciprocally rotating the same, said motor having a movable control arm for reversing its direction of operation, a pair of spaced solenoids upon said motor with their respective movable elements arranged upon opposite sides of said control arm to operatively engage the same upon intermittent energization of said solenoids, a pair of limit

switches electrically connected to said solenoids, and a pair of spaced control arms on said sectors adapted to intermittently energize said limit switches as the frame is rocked on said rollers.

10. In combination, a base including a pair of spaced side frame elements, a pair of aligned longitudinally spaced rollers journaled upon each element, a bed frame, a pair of spaced arcuate sectors joined at their ends to said bed frame and depending therefrom for cooperative rocking engagement upon said rollers, a reciprocally rotatable winch on said base, and a cable centrally wound on said winch with its ends joined to the respective opposite ends of said bed frame for rocking the same on said rollers, said sectors having central undercut slots along their bottom surfaces for cooperatively receiving and supportably engaging said rollers.

11. In combination, a base, a pair of aligned longitudinally spaced rollers journaled upon each side of said base, a frame, a pair of spaced arcuate sectors joined at their ends to said frame and depending therefrom for cooperative rocking engagement upon said rollers, a reciprocally rotatable winch on said base, a cable centrally wound upon said winch with its ends joined to the respective opposite ends of said frame for rocking the same on said rollers, and guide pulleys supported upon and journaled adjacent opposite ends of said base around which said cable extends.

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

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40 856,580	Hantske	June 11, 1907

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