Dec. 6, 1960 E. M. KNABUSCH ET AL 2,963,077

PLATFORM ROCKER

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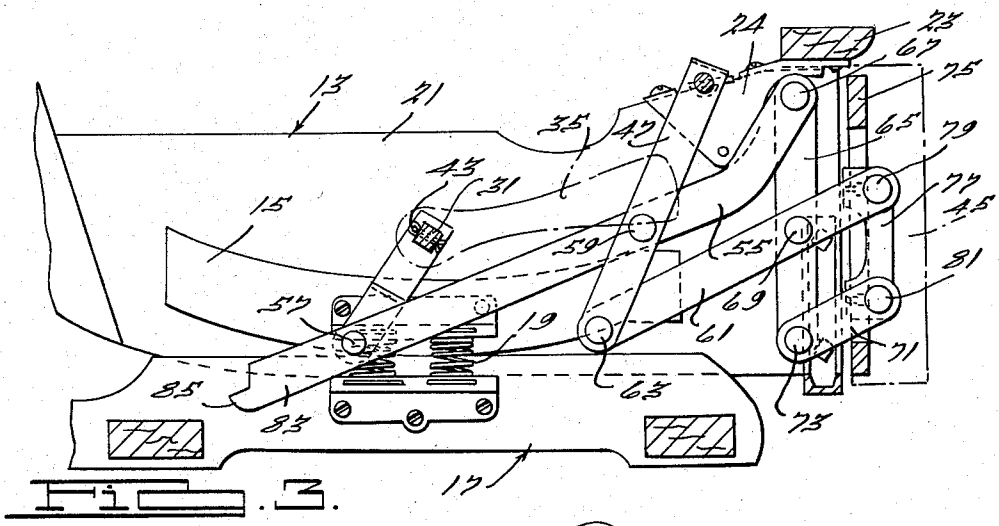


Fig. 3.

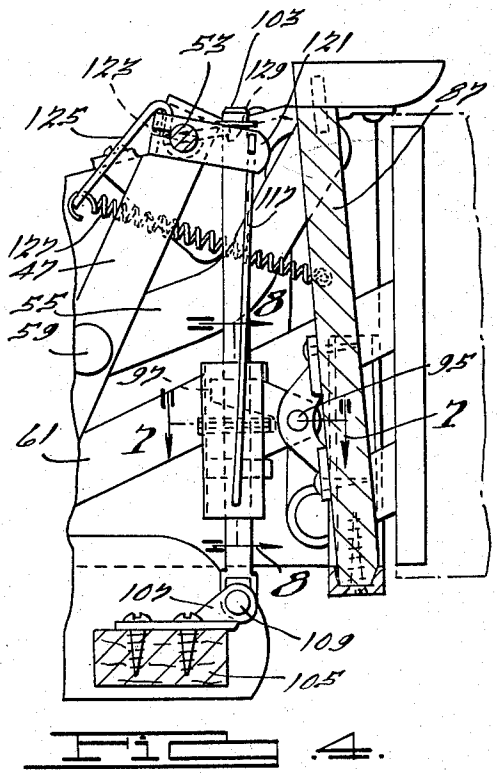


Fig. 4.

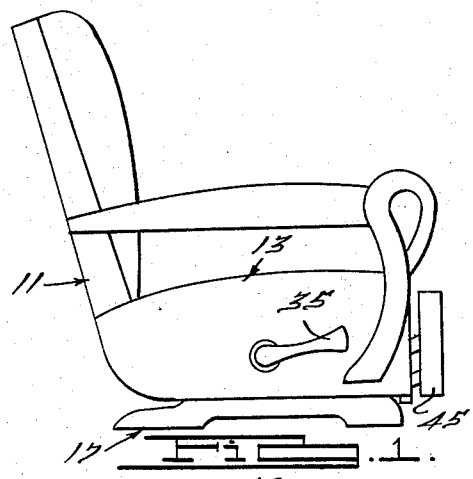


Fig. 1.

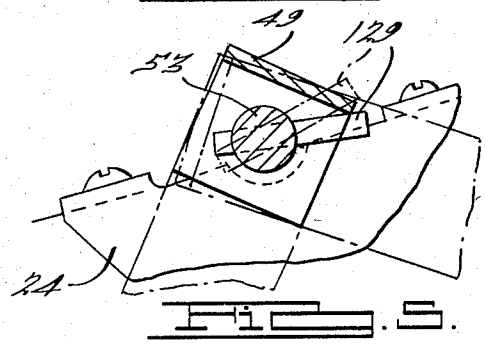


Fig. 5.

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PLATFORM ROCKER

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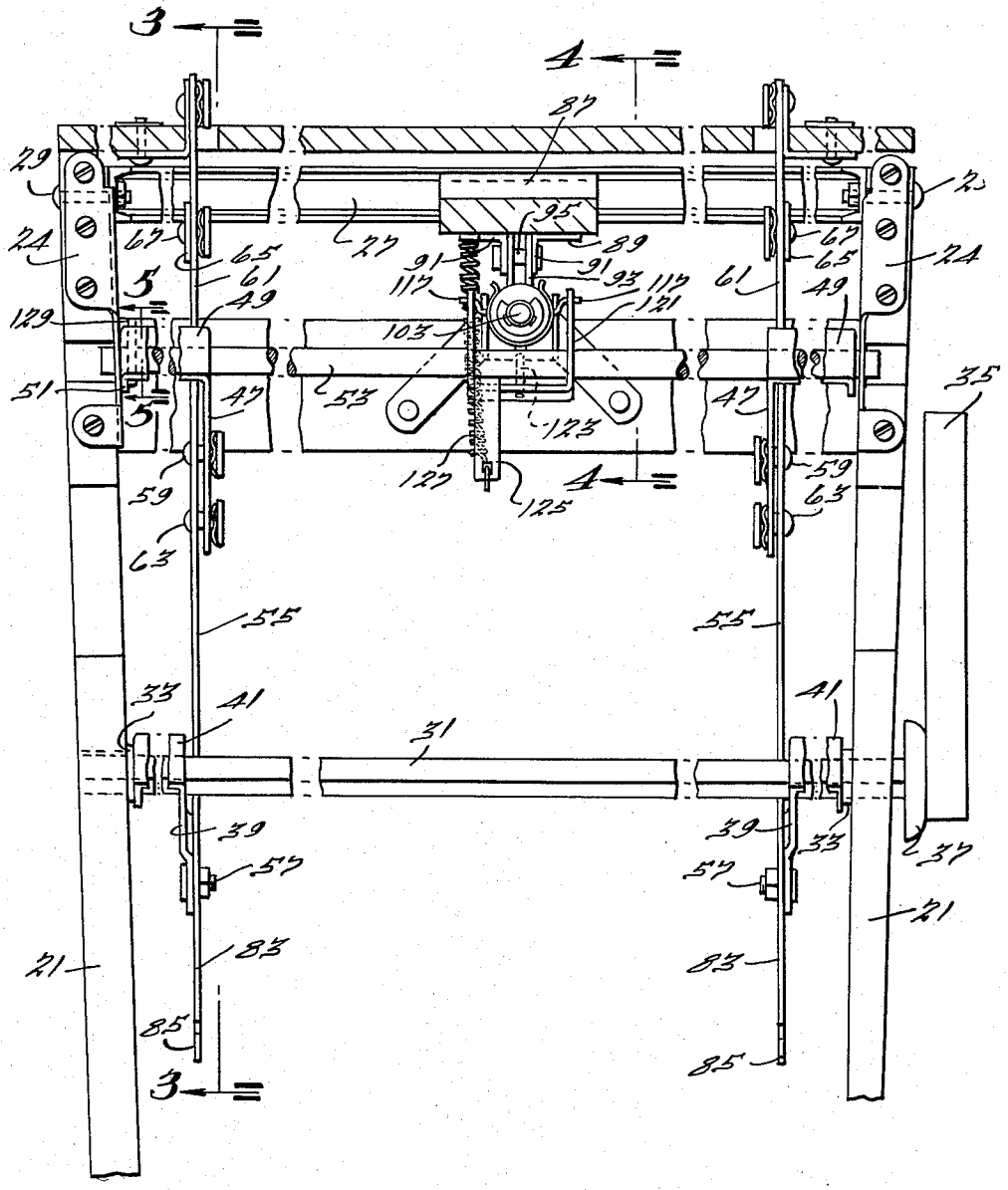


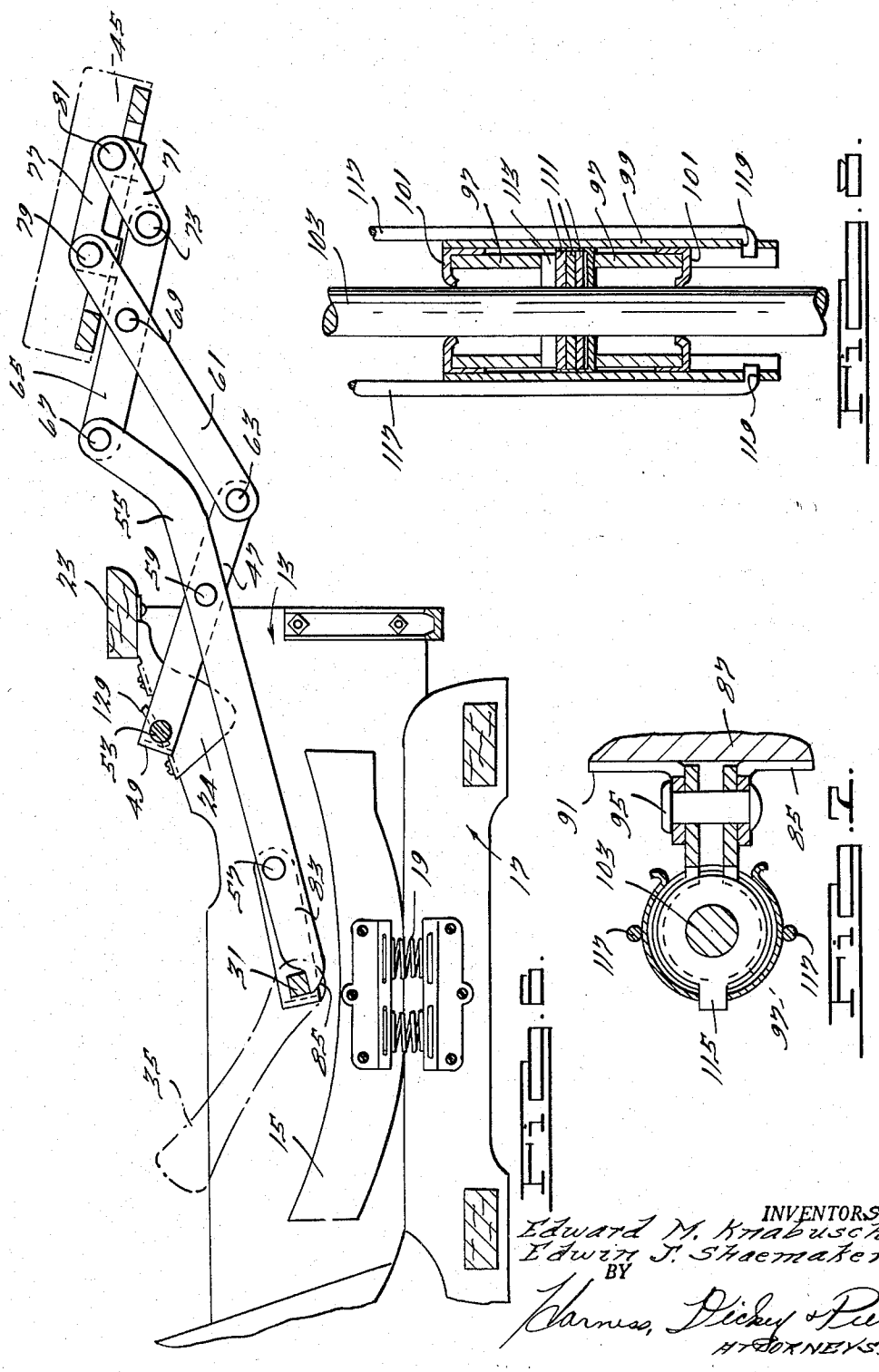
FIG. 2.

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PLATFORM ROCKER

Filed April 10, 1959 3 Sheets-Sheet 3



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United States Patent Office 2,963,077
Patented Dec. 6, 1960

2,963,077

PLATFORM ROCKER

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Filed Apr. 10, 1959, Ser. No. 805,429

1 Claim. (Cl. 155—72)

This invention relates to a platform rocking chair with an actuatable footrest and constitutes an improvement over the platform rocker illustrated and described in applicants' prior patent, No. 2,817,388, dated December 24, 1957.

The platform rocking chair illustrated in applicants' prior patent included a first operating handle, which raised and lowered a footrest connected with the chair, and a second operating handle which locked the chair against rocking motion. While a large number of these chairs have been manufactured and sold, it has been determined that it would be more desirable to provide a chair of the aforementioned type in which the chair was automatically locked against rocking when the footrest was moved from its inactive position to its raised foot or leg supporting position. Such an arrangement eliminates the necessity of two manual operations by the chair user and eliminates any possibility of the chair being tipped over if it was rocked with the footrest up.

It is, therefore, an object of this invention to provide an improved platform rocker having an actuatable footrest in which the chair is locked against rocking action when the footrest is manually raised from its inactive position to its foot or leg supporting position.

It is a still further object of this invention to provide an improved platform rocker of the aforementioned type which is rugged in construction, durable in use and relatively inexpensive to manufacture.

These and other objects of the present invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings in which:

Figure 1 is a side elevational view of a platform rocker of this invention;

Fig. 2 is a fragmentary, horizontal, sectional view, taken below the upper level of the seat and with the seat and upholstery removed;

Fig. 3 is a vertical sectional view, taken along the line 3—3 of Fig. 2;

Fig. 4 is a vertical sectional view, taken along the line 4—4 of Fig. 2;

Fig. 5 is an enlarged, vertical, sectional view, taken along the line 5—5 of Fig. 2;

Fig. 6 is a view, similar to Fig. 3, but illustrating the footrest in its raised or extended active position;

Fig. 7 is an enlarged sectional view of the structure illustrated in Fig. 4, taken along the line 7—7 thereof; and

Fig. 8 is an enlarged sectional view of the structure illustrated in Fig. 4, taken along the line 8—8 thereof.

Referring now to the drawings, it will be seen that the illustrated chair of this invention includes a back portion 11 rigidly fixed with respect to a seat portion 13, on either side of which there is affixed an arcuate rocker 15 rockable upon surfaces of a base 17. The rocker 15 and the base 17 are interassociated by a double compression spring mechanism 19 in a conventional platform rocker manner. Two parallel side rails 21 constitute elements

of the seat portion 13 and are joined at their rear by a rail, which is not shown, and are joined at the forwardmost ends by a front rail 23 affixed thereto through a pair of brackets 24. The side rails 21 are further interconnected by a generally U-shaped channel section member 27, the legs of which abut the inner faces of the side rails 21 and are affixed thereto by bolts 29.

An actuating shaft 31 extends transversely of the chair and is roughly centered on the side rails 21, although the precise location thereof may be varied. The elongated actuating shaft 31, which is shown as being of square cross-section, is rotatably mounted in a pair of flanged bushings 33 which are nonrotatably connected in apertures in the side rails 21. One end of actuating shaft 31 extends beyond the aperture in one of the side rails 21 and an actuating lever 35 is mounted thereon, a collar 37 preferably being interposed between the actuating lever 35 and the outside surface of the adjacent side rail 21. A pair of arms 39 is mounted near opposite ends of the actuating shaft 31, but inboard of the side rails 21. To establish a nonrotative relationship between the actuating shaft 31 and the arms 39, each arm 39 is provided with an upper U-shaped bracket portion 41 having a pair of parallel faces, each provided with an aperture conformed to and engaging the actuating shaft 31. Each bracket 41 preferably abuts the corresponding flanged bushing 33 and one or both may be retained in such abutment by means of a pin 43 extending through an aperture in the actuating shaft 31, as may be best seen in Fig. 3 of the drawings.

The actuating lever 35 is rotatable from the position shown in Fig. 3 of the drawings to the position shown in Fig. 6 of the drawings to correspondingly rotate the actuating shaft 31. This rotation operates a linkage mechanism to translate and rotate a footrest 45 from a retracted position, in which it lies adjacent to the front end of the seat portion 13 with its face surface extending substantially perpendicularly to the general plane of the upper surface of the seat portion 13 (Fig. 3), to an extended position in which it is spaced from the front edge of the seat portion 13 with its face surface disposed at a reduced angle to the general plane of the upper surface of the seat portion 13 (Fig. 6). Simultaneously, the movement of the actuating lever 35 will lock the seat and back portions 11 and 13 against rocking movement on the base 17, as will be hereinafter explained in detail.

The linkage mechanism is a compound parallelogram mechanism adapted to produce the desired translational motion, modified to produce the desirable rotational motion. The mechanism is pivotally mounted with respect to the seat portion 13 at two points, and is pivotally mounted to the footrest 45 at two points. The first pivotal connection between the linkage mechanism and the seat portion 13 is that previously described; the arms 39 are pivotally related to the side rails 21 by means of the actuating shaft 31. The second pivotal relationship between the linkage mechanism and the seat portion 13 is that existing between a pair of arms 47 and the side rails 21. Each of the arms 47 is formed generally similarly to the corresponding arm 39 in that it is provided with a generally horizontal flange portion 49 and spaced apart generally vertical flange portions 51 which are provided with apertures through which a cross-shaft 53 extends. The cross-shaft 53, while extending through the flange portion 51 of the arms 47, adjacent each of the side rails 21, is free to rotate relative to the arms to at least a limited extent, as will be hereinafter pointed out. The extreme opposite ends of the cross-shaft 53 are rotatably supported in upstanding lugs on the brackets 24.

At each side of the chair, a link 55 is pivotally associated with the arm 39 by means of a pin or bolt and nut 57 and is pivotally associated with arm 47 by means

of a pivot pin 59. Obviously, for true parallelogram operation, the length of arms 39 between pivotal axes 57 and 31 should equal the length of the arms 47 between pivotal axes 53 and 59, and the length of links 55 between pivotal axes 57 and 59 should equal the distance between the actuating shaft 31 and the cross-shaft 53. While such an arrangement may be employed in the disclosed embodiment of the invention, the linkage departs from true parallelogram action to produce a desired motion of the footrest 45.

Each of the arms 47 is further connected to the rear portion of a link 61 by means of a pivot pin 63. The foremost ends of each of the links 55 is connected to a link 65 by means of a pivot pin 67 and rings 61 and 65 and interconnected by a pivot pin 69. Again, these elements 55, 61, 47 and 65 may, but in the disclosed embodiment do not exactly, constitute a parallelogram linkage. The lowermost end of each of the links 65 is pivotally connected to a short link 71 by means of a pivot pin 73. The foremost ends of each pair of links 61 and 71 extend forwardly through slots in a bottom plate 75 which forms the base of the footrest 45. A pair of mounting brackets 77 are affixed to the bottom plate 79 and each is provided with a forwardly extending flange to which the links 61 and 71 are pivotally connected by means of pivot pins 79 and 81. Again, the distance between the pins 69 and 79 is or may be substantially equal to the distance between the pins 73 and 81 and the distance between the pins 69 and 73 is or may be substantially equal to that between the pins 79 and 81.

Each of the links 55 is provided with a rearwardly extending arm portion 83 having a further rearwardly extending lip 85. Each lip 85 is spaced from the pivot pin 57 by a distance substantially equal to the distance between that pivot pin by actuating shaft 31 (Fig. 3). When the actuating lever 35 is rotated from the position shown in Fig. 3 to the position shown in Fig. 6, links 55 are so moved that lips 85 engage a face of actuating shaft 31, thereby serving as a limit stop and effectively locking the footrest 45 in its extended position. Thus, as may be best seen in Fig. 6, to move the footrest 45 to its retracted position, pivot pin 57 must be rotated about the longitudinal axis of actuating shaft 31; yet, since the centerlines of links 55 and arms 39 are substantially parallel with one another when the footrest is extended, the weight of the sitter's legs will produce no forces tending to produce that rotational movement of pivot pin 57. It will be noted that actuating shaft 31 is properly oriented with respect to pins 57 so that the faces of lips 85 will properly engage a face of the shaft when the footrest is extended.

The cross-shaft 53 serves as an element of the locking mechanism for preventing rocking motion of the chair after the footrest has been raised to a predetermined angle and the details of this mechanism are shown in Figs. 3, 4, 5, 7 and 8. A support member 87 is locted centrally of the chair, in a lateral sense (Fig. 2) and extends between the bottom of the channel member 27 and the front rail 23 (Fig. 4) being screwed, doweled or otherwise affixed to each. A plate 89, provided with a pair of parallel rearwardly extending flanges 91, is affixed to the support member 87. A bracket 93 is pivotally mounted with respect to the support member 87 by a pivot pin 95 engaging aligned apertures in the bracket 93 and the flanges 91. Bracket 93 includes a pair of spaced apart, coaxial, tubular arms 97 (Figs. 4, 7 and 8). A sleeve 99 is slidably mounted upon end caps 101 which are affixed to the arms 97 (Fig. 8). Centrally disposed within the bracket arms 97, the sleeve 99 and the end caps 101 is a rod 103 which is pivotally affixed to a cross-piece 105, a constituent element of the base 17, by means of brackets 107 and pivot pin 109 (Fig. 4).

A series of washers 111 are positioned on the rod 103 within the sleeve 99 and are disposed in a notch or space which separates bracket arms 97. When the faces of these washers 111 are normal to the longitudinal axis of rod 103, the rod 103 may freely slide relative thereto, permitting rocking motion of the chair, the rod 103 pivoting through a small arc about pivot 109 and the bracket 93 and sleeve 99 pivoting through a small arc about pivot 95 as the chair rocks. When, however, the faces of the washers 111 are tilted relative to the longitudinal axis of the rod 103 (as hereinafter described) with the left-hand edges (Fig. 4) being tilted upwardly, downward movement of the washers 111 relative to the rod 103 is prevented, thereby preventing downward motion of the bracket 93 and, hence, of the forward portion of the chair or its base. Thus, after washers 111 are moved to their tilted positions when the footrest is raised and the chair is rocked back, return of the chair to its normal attitude is prevented.

The position of the washers 111 is controlled by the sleeve 99, one or both ends of a longitudinal slot in that sleeve being engageable with tongues 115 on washers 111 so that upward motion of the sleeve 99 relative to the washers 111 will produce tilting of those washers and downward motion of the sleeve will restore or permit restoration of the washers 111 to their horizontal position illustrated in Fig. 4. The position of sleeve 99 is controlled through a pair of hanger rods 117, the lower end of each hanger rod 117 is turned inwardly to extend through an aperture 119 in sleeve 99 (Fig. 8) and the upper end is turned outwardly to engage an aperture near the ends of one of the legs of a U-shaped bracket 121 which is mounted upon cross-shaft 53 and fixed against rotation relative thereto by any stop means such as a pin 123.

A rearwardly and downwardly extending bracket 125 has its forward end connected with the cross-shaft 53 and the U-shaped bracket 21 so that movement of the rearmost end of the bracket 125 in a counterclockwise direction will cause rotation of the cross-shaft 53 and the bracket 121 and will thus lift the hanger rods 117 so as to move the washers 111 to their tilted position and lock the chair against rocking movement on the base. A coil spring 127 is connected to the rearmost end of the bracket 125 and has its forward end connected to the support member 87. The spring is pretensioned so that the rearmost end of the bracket 125 is resiliently urged in the counterclockwise direction tending to lift the hanger rods 117 upwardly.

When the footrest and its appended linkage are in the normal inactive position shown in Fig. 3, it will be noted that the upper horizontal flange 49 of the left arm 47 engages a pin 129 which is mounted in the cross-shaft 53 and forces the pin in a clockwise direction which in turn causes rotation of the cross-shaft 53 and the brackets 121 and 125 so as to force the hanger rods 117 downwardly, thereby positioning the washers in their level position so that no locking engagement occurs with the rod 103 and the chair can rock on its base. However, when the chair user grasps the actuating handle 35 on cross-shaft 31 and pulls the same rearwardly so as to move the footrest 45 and its linkage to the position illustrated in Fig. 6, the horizontal flange 49 of the arm 47 moves away from the pin 120, as can be best seen in Fig. 5, and the spring 127 is then able to move the bracket 125 in a counterclockwise direction and lift up the hanger rods 117, thereby tilting the washers 111 to prevent downward movement of the washers on the rod 103 and thereby lock the chair against forward rocking motion. The chair will stay locked against rocking until the footrest returns to its normal inactive position, at which time the horizontal flange 49 of the arm 47 will again engage the pin 120 and rotate the cross-shaft 53 and bracket 121 in a clockwise direction so as to move the hanger rods 117 downwardly and unlock the washers 111 relative to the rod 103. It is, of course, necessary to locate the pin 129 at the proper angle in the cross-shaft 53 and relative to the horizontal flange 49 of the

arm 47 so that the chair will be locked against rocking movement only after the footrest has moved a certain distance toward its raised position and will be unlocked only when the footrest approaches its retracted or inactive position. In the illustrated embodiment, an angle of approximately 19 degrees between the centerline of pin 129 and the centerline of pin 123 is provided to accomplish the forementioned locking and unlocking of the chair against rocking at the desired positions of the footrest 45.

With this arrangement, it is not possible to rock the chair when the footrest is raised and any danger of tippin of the chair, such as has been possible in prior chairs, is eliminated and, also, the chair user need only to actuate one lever to accomplish the actuation of the footrest and locking or unlocking of the rocking chair.

It will be noted from the aforementioned description that when the footrest is swung to its raised position as shown in Fig. 6 that the pivots 57 and 59, as well as the links associated therewith, move to a position closely approaching an on-center position so that the overhanging weight of the footrest 45 holds the linkage assembly locked as a toggle joint; therefore, when the additional weight of a user's leg or feet is applied to the footrest, the linkage will retain the footrest in its elevated position. It is, however, possible to break this toggle joint by the user merely pulling rearwardly on the footrest, such as by application of the heels of the feet to the front edge of the footrest. Such rearward movement will release the footrest for downward swinging movement in the same manner as though the actuating lever 35 were used to cause this movement. Therefore, the footrest can be quickly released by the use of the user's heels without the necessity of actuation of the handle 35 and the linkage and other parts previously described will act in the same manner as the footrest moves to its lowered inactive position.

What is claimed is:

In a platform rocking chair, a base, a seat rockably mounted on said base, a footrest supported adjacent the front of said seat, a plurality of pivotally interconnected links supporting said footrest in said seat for movement between an inactive lowered position and an active raised leg supporting position, said footrest being retained in its raised position by said links moving to form a toggle joint type lock so that said raised footrest can support the legs of the user, actuable means associated with said platform and said seat for locking said seat against rocking motion with respect to said base, and means operatively connecting said links with said actuable locking means so that when said footrest is raised said locking means will be actuated to lock said seat against rocking motion on said base and when said footrest is lowered to its inactive position said locking means is rendered inoperative to permit said seat to rock relative to said base, said footrest being movable to its lowered position by the application of pressure thereto in a direction toward said seat, whereby to break said link toggle joint lock permits said footrest to move to its lowered position by gravity.

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