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ROCKING WHEEL CHAIR APPARATUS

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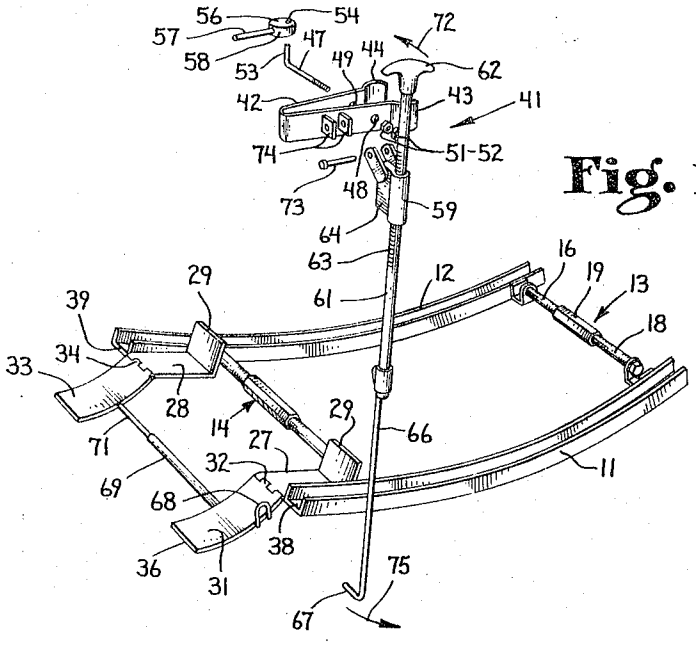


Fig. 1.

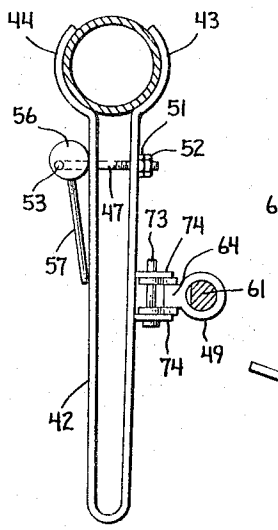


Fig. 2.

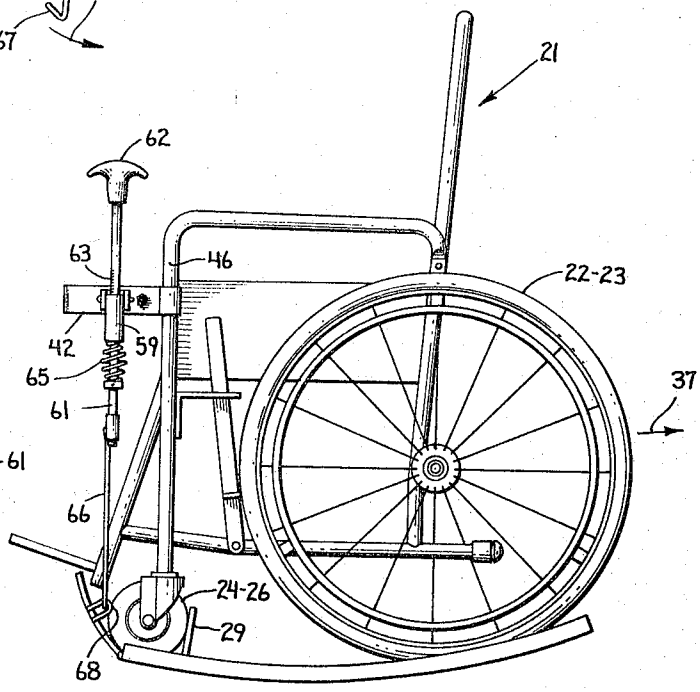


Fig. 3.

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ROCKING WHEEL CHAIR APPARATUS

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This invention relates generally to wheel chairs and more particularly to apparatus enabling a nonambulatory individual sitting in a wheel chair to wheel the chair about an area in conventional manner then place the chair in a rocking state and use it as a rocking chair, and then return the chair to its original state for wheeling along, all without external assistance and all while the individual remains seated in the wheel chair.

With a conventional wheel chair, in order to rock, an individual must perform the difficult act of dismounting from the wheel chair and mounting a rocking chair. In addition to the difficulty of this arrangement for some individuals, the complete impossibility of the task for other individuals must be considered. The arrangement also necessitates both a rocking chair and a wheel chair, with the space requirement for storage of both.

Hospitals, nursing homes, and various institutions generally have available several wheel chairs, but rarely have rocking chairs. However, rocking chairs may be quite desirable in such establishments for the purpose of relaxation, recreation, and physical therapy.

It is therefore a general object of the present invention to provide means enabling quick and easy conversion of a wheel chair to a rocking chair, with such means having a minimal space requirement.

A further object is to enable a nonambulatory individual to singularly and unaidedly convert a wheel chair to a rocking chair while at all times sitting in the wheel chair.

A further object is to attain the foregoing objects with conventional wheel chairs and at minimal expense.

A further object is to provide means for attaining the foregoing objects while at all times securing complete safety for the individual in the wheel chair.

A further object is to enable an institution maintaining several wheel chairs to conveniently make available rocking chairs at any location where wheel chairs are available.

Described briefly, in a typical embodiment of the present invention, two arcuate members, each having a channel shaped cross section, are arranged in parallel horizontally spaced relation on a floor or other supporting surface. The horizontal spacing is adajustable by expanders so as to enable reception of the large wheels of a wheel chair regardless of the horizontal spacing or "track" of these wheels. The front ends of the channels are normally disposed close enough to the floor to enable the large wheels of a wheel chair to be rolled over the front ends of the channels and rearwardly along the channels for support of the rear wheels in the channels.

Immediately inboard of the front end of each of the channels is a receiver plate for the small front wheel at each side of the wheel chair, with appropriate backstop means and ramp means to enable the front wheel to roll up the ramp onto the receiver so that the entire wheel chair is then supported on the combination of the arcuate members and front wheel receivers.

Suitable manually operable control means are provided which are readily mountable to a wheel chair and operable by hand to raise and lower the ramp as desired to enable rocking of the wheel chair and then enable separation of the wheel chair from the support assembly.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims.

FIGURE 1 is a perspective view of rocker and mounting apparatus according to a typical embodiment of the present invention.

FIGURE 2 is a top view of the operating handle mounting arrangement.

FIGURE 3 is a side elevational view of the complete rocking wheel chair combination, with the brake on the wheel chair itself in the "applied" position.

Referring now to the drawings in detail, wherein a typical embodiment of the invention is shown, two arcuate members **11** and **12** which may be channel shaped in cross section are provided and serve as rockers in a manner similar to a conventional rocking chair. Each of these channels may be approximately two inches in width and about one-half inch in depth and are made of a suitable material to provide sufficient rigidity. These channels **11** and **12** are secured in parallel horizontally spaced relation by two turnbuckle-type rigid expander assemblies **13** and **14**, which function to hold the channels in upright and rigid parallel spaced relationship and provide for adjustment of the space between the channels to accommodate wheel chairs having large wheels of different horizontal spacing or "track."

Each expander may consist of two threaded bars **16** and **18**, one bar being affixed at one end to one of the channels and having a right-hand thread thereon, and the other bar having one end affixed to the other channel and having a left-hand thread thereon. An elongated internally threaded connector nut **19** is provided and normally incorporates an external surface configuration facilitating the rotation thereof in one direction for increasing the spacing between the channels and in the opposite direction for decreasing the spacing between channels. For this purpose, the cross section of the nut **19** can be hexagonal, for example, if desired.

A conventional wheel chair **21** is provided with two large rear wheels **22** and **23** receivable in channels **11** and **12**, respectively. The wheel chair is also provided with two small front caster wheels **24** and **26** whose track is typically somewhat less than that of the large rear wheels.

While the arcuate channels are arranged to receive the large rear wheels of the wheel chair, two separate receivers **27** and **28** are affixed to the channels **11** and **12**, respectively, and between the channels as shown in the drawings. Receiver **27** is affixed to the front end portion of channel **11** at the inboard side of the channel and receiver **28** is affixed to channel **12** in the same manner. At the rear end of each of these receivers is an upstanding backstop plate **29** affixed in position to prevent the small front wheel of the wheel chair from rolling backward off the receiver. At the front end of each of the receivers is a foot plate or ramp, ramp **31** being hinged to the front end of receiver **27** at the hinge **32** and ramp **33** being hinged to the front end of the receiver **28** at **34**. The hinge axes of these ramps are colinear and, while the rear end of each ramp is supported by the corresponding receiver, the front end rests on the floor or other surface supporting the channels as indicated at **36**.

In the use of the device as described to this point, the individual seated in the wheel chair rolls the chair backward in the direction of the arrow **37** until the large wheels make contact with the front upper edges **38** and **39** of the channels. As the individual turns the wheels further rearward, the friction between the wheel and the point of contact at the front upper edge of each channel will cause the channel to tip forward and down at its front end whereupon the wheels will roll over the front ends and rearward along the channels in the direction of the arrow **37**. The rear wheels are rolled further backward along the channels until the front wheels contact the front ends of the ramps. Further rearward rolling of

the large wheels causes the front wheels to ascend the ramps and move onto the receiver plates **27** and **28** and roll rearward thereon until stopped by the backstop plates **29**, whereupon rearward motion of the wheel chair is stopped.

In order to keep the front wheels in position on the receiver plates **27** and **28**, and thereby secure the rocking chair in position for rocking, means are provided for lifting the front ends of the ramps clear of the floor and holding the ramps in position projecting upwardly from the front edges of the receiver plates. For this purpose, a manually operable ramp raising and lowering mechanism **41** is provided. This includes a generally A shaped spring member **42** having two semi-cylindrical facing clamping portions **43** and **44** at opposite distal ends of the spring member. These semi-cylindrical portions are adapted to grip onto a vertical arm support member **46** of the wheel chair and for this purpose an actuator is provided on the clamp spring. The actuator includes a pin **47** extending through aligned apertures **48** and **49** of the clamp spring member and threadedly receiving a pair of nuts **51**, **52** on opposite sides of the portion of the spring in which aperture **49** is provided. The short leg section **53** is received in an eccentrically located aperture **54** in a circular disk **56** having a handle **57** thereon whereby, upon turning the eccentric on the short leg **53**, the cylindrical surface **58** of the eccentric urges the two arms of the spring toward each other thus clamping portions **44** and **48** on the wheel chair.

A ratchet spring release mechanism **59**, which can be identical or similar to that used in many automotive vehicle hand brake actuators, slidingly receives an upstanding pull bar **61** having a hand grip **62** at the upper end thereof. The bar is provided with a row of ratchet teeth **63** and the guide **64** has lugs therein engageable with the teeth to hold the bar up at any desired location in its vertical travel. To release the bar to permit its descent, the hand grip need be turned approximately ninety degrees on its axis in conventional handle brake lever release procedure. A coil spring **65** can be provided below the guide to urge the bar downwardly, if desired.

A connecting link **66** is provided with its upper end connected to the lower end of the bar **61** and has an inwardly turned hooked portion or "short leg" **67** at its lower end. This hooked portion is receivable in an eyelet **68** projecting upwardly from an outer side margin of the ramp **31** and, by pulling up on the hand grip **62** the ramp **31** can be raised clear of the floor to permit rocking the chair forward and backward without the ramp engaging the floor. In fact, the ramp can be raised and by way of the latching mechanism can be retained in a position projecting upwardly from the front margin of the front wheel receiver **27** to provide horizontal support at the front of the receiver to cooperate with the horizontal support provided by the backstop **29** and the vertical support provided by the receiver plate **27**, to securely confine the front wheel of the wheel chair in the receiver so that the wheel chair can move neither forward nor rearward as it is rocked by the individual.

In order to provide for the elevation of ramp **33** at the same time as ramp **31** is elevated, a telescopic connector assembly is provided in the form of an elongated tube **69** affixed to the inner marginal edge of the ramp **31** and elongated rod **71** affixed to the inner marginal edge of the ramp **33**, the rod **71** telescopically received in the tube **69** so that increased and decreased spacing between the ramps as effected by adjustment of the expanders **13** and **14** is accommodated. Nevertheless, the assembly **69–71** serves to raise the ramp **33** along with ramp **31** as the hand grip **62** is raised.

When the individual desires to terminate the rocking mode of operation, and roll his wheel chair off to some other location, he need only turn the hand grip **62** to release the ratchet and lower the ramps. He then moves the hand grip inward toward the chair in the direction of the arrow **72** and this is facilitated by the pivotal attachment of the guide mechanism to the spring clamp by a hinge pin **73** extending through an aperture in the guide **64** and through a pair of apertured bracket lugs **74** on the spring clamp member. Consequently the lower end of the connector is swung out in the direction of the arrow **75** and is thereby withdrawn from the eyelet **68**. The hand grip can then be raised and latched to be sure that the lower end of the connector will be clear of the floor when the wheel chair is rolled off the rocker assembly and the individual can then proceed to roll the wheel chair forward off the rocker assembly.

If it is not desired to rely on the elevated ramp or foot plates to confine the front wheels of the wheel chair on the receiver plates, the brakes normally provided on wheel chairs can be set by the individual once the chair has been rolled back to position the front wheels against the backstop plates. Also, if desired, the ramp plates could be made straight rather than concave upwardly as shown, so long as assurance is provided that they will properly clear the floor when the chair is rocked. By pivoting the ramp plates in the manner shown, they are always disposed (when the wheel chair is separated from the rocker assembly) in a position facilitating the easy ascent of the front wheels of the chair onto the wheel receivers regardless of the tipped attitude of the rockers which might result from the particular position of the large wheels on the channels as the chair is being rolled backward into position on the channels.

While the invention has been disclosed and described in some detail in the drawings and foregoing description, they are to be considered as illustrative and not restrictive in character, as other modifications may readily suggest themselves to persons skilled in this art and within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. Chair rocking means comprising:

first and second arcuate members;

spanning means connected to said members and securing them in parallel horizontally spaced relation,

at least one of said arcuate members having upwardly projecting guide means thereon and extending therealong,

said chair means being arranged such that when freely resting on a flat supporting surface, certain ends of said arcuate members are normally disposed to enable the large rear wheels of a wheel chair to roll over said ends and thereby onto said arcuate members and be supported by said arcuate members for converting the wheel chair to a rocking chair.

2. The means of claim **1** and further comprising:

front wheel receiver means mounted between said arcuate members for receiving and supporting the small front wheels of the wheel chair after the rear wheels have been rolled onto said arcuate members.

3. The means of claim **2** wherein:

said receiver means include first and second receivers secured adjacent said first and second arcuate members, respectively near the said front ends thereof, each of said receivers having a first portion disposed to provide vertical support for a wheel chair front wheel and at least one of said receivers having a second portion projecting upwardly from said first portion to provide horizontal support at the rear of a wheel chair front wheel to limit the travel of the wheel chair as the large wheels thereof are rolled backward on said arcuate members.

4. The means of claim **3** and further comprising:

ramp means pivotally mounted at the front of said receiver means and movable between a first condition and a second condition, said first condition being one wherein front margins of said ramp means are engageable with and supportable by the supporting surface on which said arcuate members are supported

to enable easy ascent of the small front wheels of the wheel chair from the supporting surface to said receiver means as the large wheels are rolled backward on said arcuate members, and said second condition being one wherein said front margins are held clear of the supporting surface enabling rocking of said arcuate members forward and backward on the supporting surface without contact of said front margins with said supporting surface.

5. The means of claim 4 and further comprising:

holding means connected to said ramp means and operable when activated to hold said ramp means in position projecting upwardly from the front of said receiver means to provide horizontal support at the front of a wheel chair front wheel in said receiver means to confine the front wheel in said receiver means and thereby enable the occupant of a wheel chair supported on said arcuate members to rock the chair and arcuate members together forward and backward on the supporting surface as a rocking chair without separation of the wheel chair from the arcuate members.

6. The means of claim 4 and further comprising:

a generally upstanding pull bar with a hand grip at the upper end thereof and having fastener means slidably mounted thereto and fixable to a wheel chair, said pull bar having connector means connected thereto and extending from the lower end thereof and connected to said ramp means whereby said ramp means are movable from said first condition to said second condition by an upward pull on said hand grip.

7. The means of claim 6 and further comprising:

a wheel chair having large rear wheels received on said arcuate members and small front wheels received on said receiver means and having a chair supported on said wheels,

said fastener means being affixed to said chair at a location disposing said hand grip for easy manipulation by hand by a person sitting in the chair.

8. The means of claim 6 wherein:

the portions of said ramp means and said connector means at the connection therebetween are formed to enable disconnection therebetween upon predetermined movement of said pull bar by the person sitting in the chair, to enable release of said ramp means to said first condition and subsequent forward rolling of said wheel chair by the person sitting therein to separate said wheel chair with said pull bar and connector means thereon from said arcuate members and receiver means.

9. The means of claim 4 and further comprising:

a wheel chair having large rear wheels received on said arcuate members and small front wheels received on said receiver means and having a chair supported on said wheels;

a hand grip mounted on said wheel chair in a position enabling easy manipulation thereof by a person sitting in the chair;

and connector means connected to said hand grip and connected with said ramp means by manipulation of said hand grip to selectively move said ramp means from said first condition to said second condition, said connector means being constructed and arranged to thereupon hold said ramp means in said second condition independent of continued manual attention to said hand grip;

said hand grip and connector means remaining with said wheel chair when said wheel chair is separated from said arcuate members;

whereby a person sitting in a wheel chair can, without assistance, wheel the chair about an area in conventional manner, then place the chair in a hazard-free rocking state, and then resume wheeling the chair in conventional manner.

10. The means of claim 9 and further comprising:

a generally upstanding pull bar with a hand grip at the upper end thereof and having ratchet teeth thereon and a ratchet latching mechanism slidingly received on said bar; a manually operated spring gripping member affixed to a frame member of said wheel chair by eccentric means, said ratchet mechanism being pivotally mounted to said clamp assembly to permit tipping said pull bar in a plane perpendicular to the direction of movement of the wheel chair onto said arcuate members, said pull bar having connector means connected thereto and extending from the lower end thereof and having a hooked lower portion received in an aperture affixed to one of said ramp means whereby said ramp means are movable from said first condition to said second condition by an upward pull on said hand grip, said ramp means being thereupon retainable in said second condition by said latching mechanism, but said connector means having the lower portion thereof removable from said ramp means by first permitting said bar to descend and then tilting said bar in said plane;

said arcuate members being arcuate channels with an upwardly opening channel cross section;

said spanning means being adjustable turnbuckle-type expander means securing said channel members in upwardly opening parallel horizontally spaced relationship and permitting increases and decreases in the spacing between said channels to accommodate different wheel chairs having different amounts of track between the large wheels thereof;

said ramp means being semi-cylindrical upwardly concaved plates hinged at the front margins of said receiver means, with a telescopic connector extending between said plates to achieve simultaneous elevation of both said plates.

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