Oct. 2, 1962 R. L. McKINLEY ETAL 3,056,145

UNITARY DEVICE FOR ROCKING A BED

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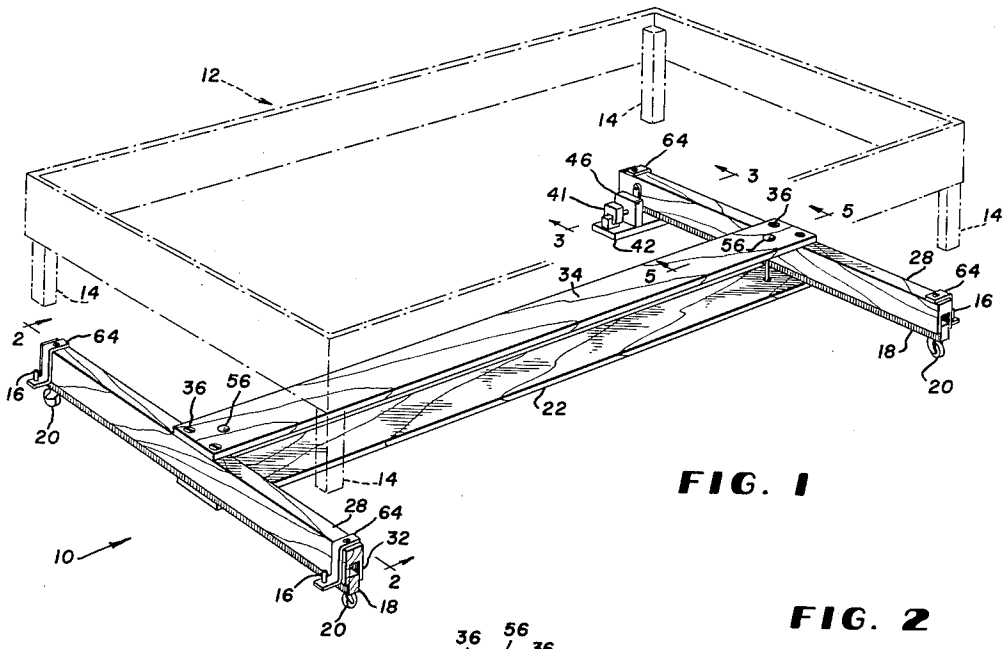


FIG. 1

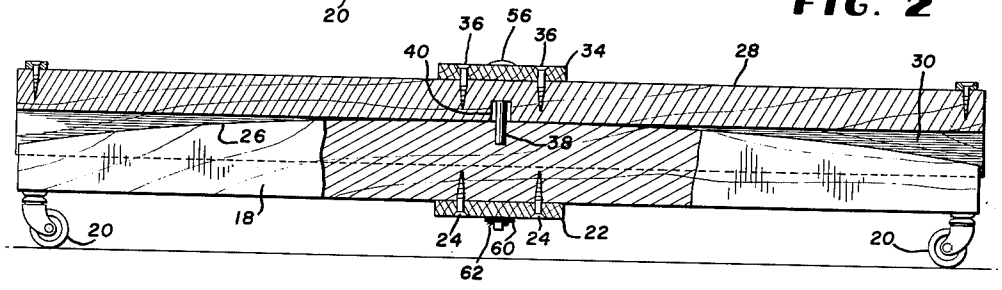


FIG. 2

FIG. 3

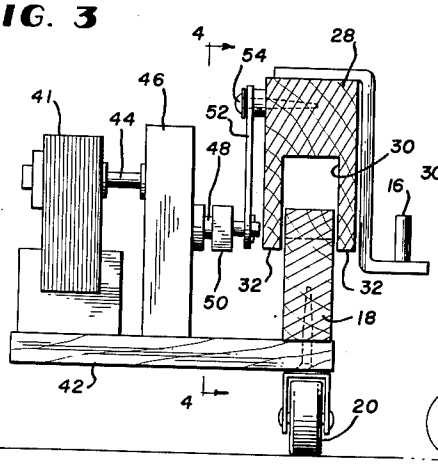
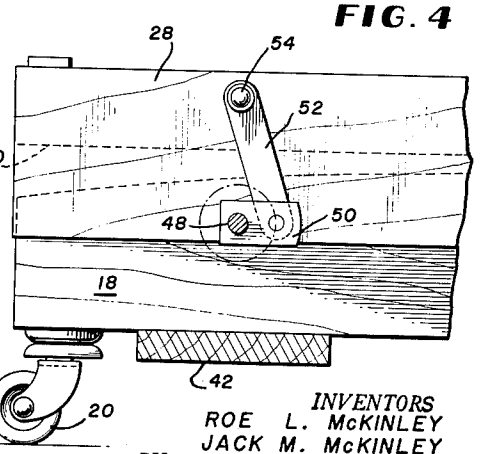


FIG. 4



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FIG. 5

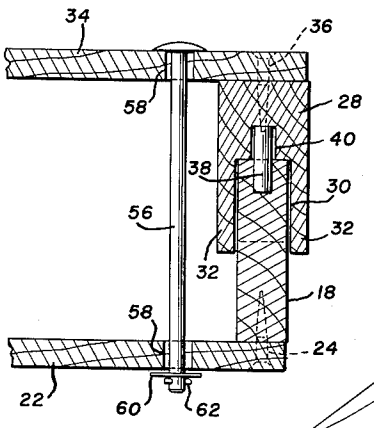


FIG. 6

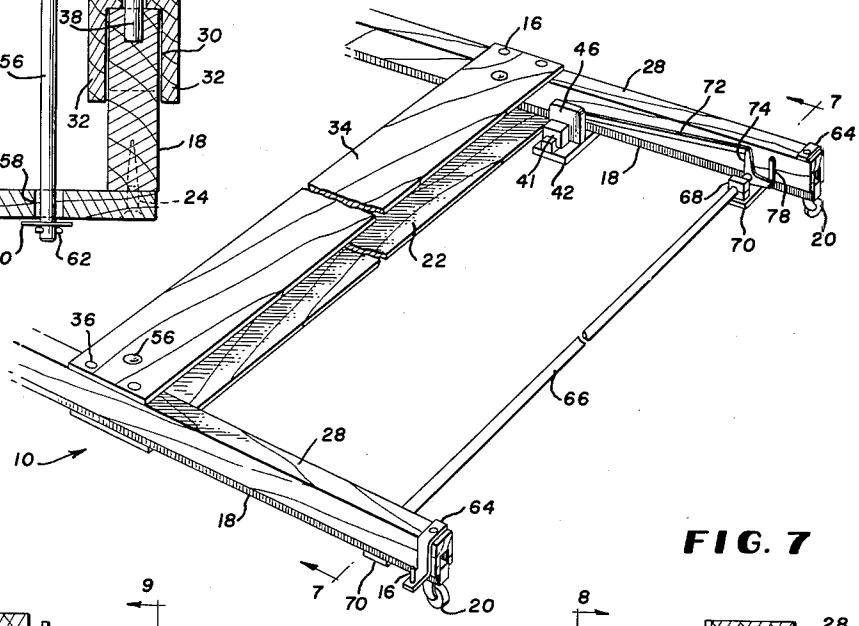
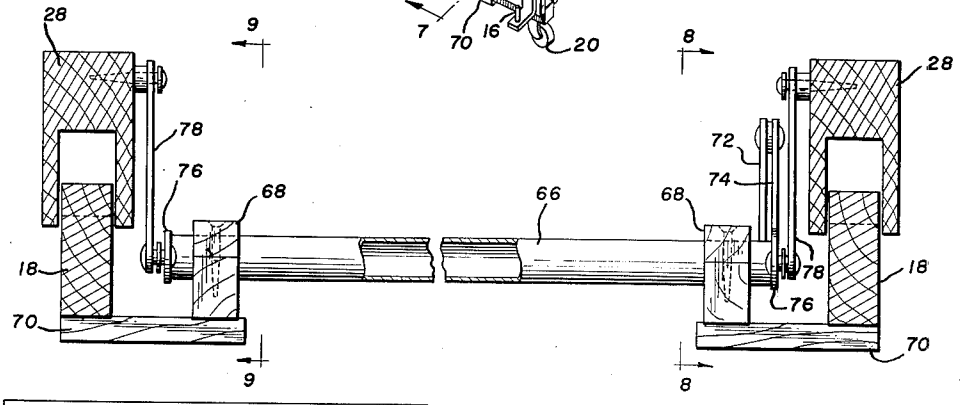


FIG. 7



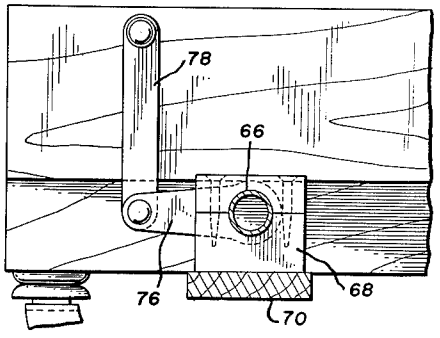


FIG. 9

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FIG. 8

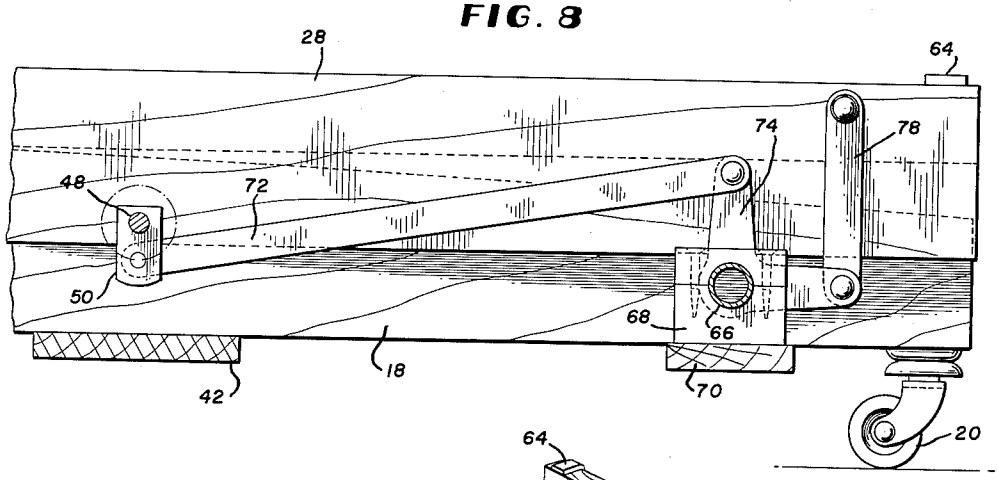


FIG. 10

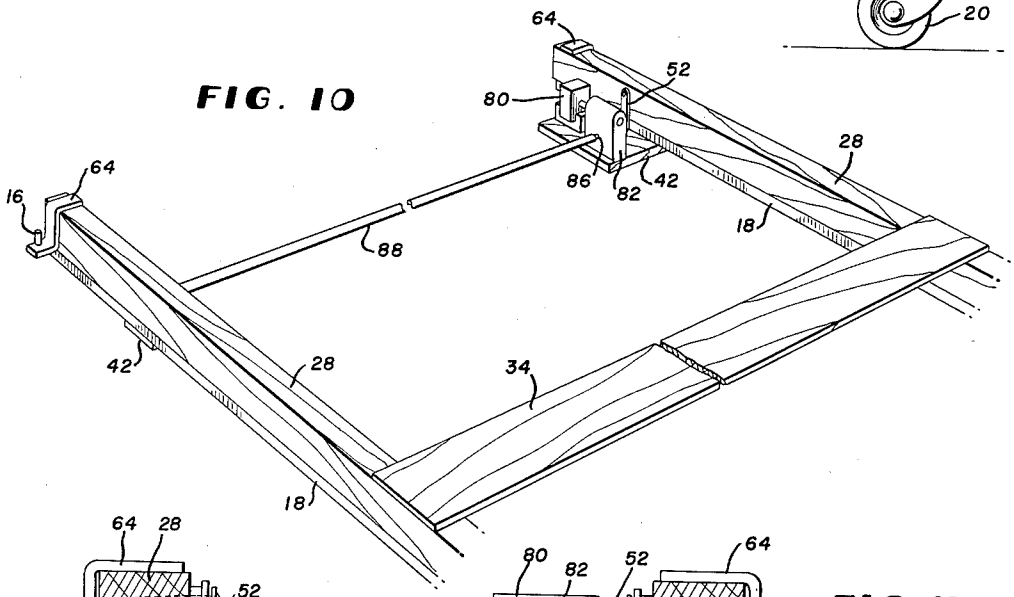
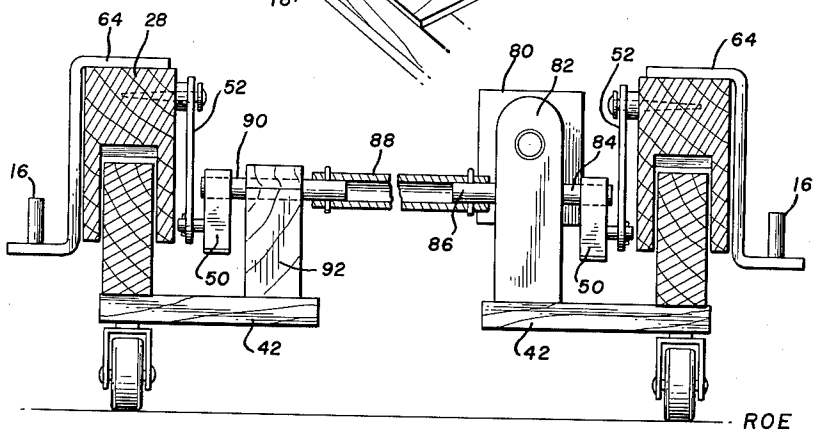


FIG. 11



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UNITARY DEVICE FOR ROCKING A BED

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Filed May 19, 1960, Ser. No. 30,159
8 Claims. (Cl. 5—109)

This invention relates to apparatus adapted to impart rocking motion to a bed and more particularly to a unitary device which may be readily applied to a conventional bed, or crib, to impart rhythmic rocking motion thereto and to its occupant and thus provide a soothing, sleep engendering and healthful effect.

It has been suggested that beds and cribs may be constructed to reciprocate, oscillate, or rock under power supplied by an electric motor and thus provide exercise, stimulation, therapeutic and/or soothing effects to the adult or juvenile occupants. However, beds of the suggested construction have been extremely complicated and subject to many disadvantages so that they have not come into widespread use, or favor. Among the disadvantages of the proposed devices have been the following; the need for specially designing and constructing a complete new bed rather than the ability to add an accessory unit to impart the desired rocking movement, the heavy and bulky construction of the proposed structures together with the complicated mechanism for imparting the rocking motion, the improper application of the driving force to one end or a central portion of the bed which permits shimmy, wobble or snagging and prevents even, smooth, rocking movement without danger of jamming.

It is a primary object of the present invention to provide an improved unitary device for imparting rocking movement to a bed which obviates the stated disadvantages outlined above.

It is a further important object of the invention to provide a unitary device to be added to a bed for imparting rocking motion thereto and which may be utilized with any standard bed, or crib without the need to modify or alter the bed construction.

Another object of the invention is to provide a device of the character indicated which requires little space, which may be slipped under a bed and is virtually hidden from view, and which does not change the appearance of the bed.

Still another object of the invention is to provide a unit of the described character for imparting rocking motion to a bed which is light weight and of simple design and construction, which uses a minimum of parts and which is consequently inexpensive to construct, install and operate.

A still further object of the invention is to provide an improved unit of the described character for imparting rocking motion to a bed which utilizes a pair of fixed rails and a pair of movable rails, the former nested within channels of the latter, and each rail of one pair having a curved surface to enable rocking movement while the channels prevent relative transverse movement of the rails.

Yet another object of the invention is to provide an improved unit of the described character for imparting rocking motion to a bed which incorporates additional means for preventing relative longitudinal sliding movement of the rails.

A further object of the invention is to provide an improved unit of the described character for imparting rocking motion to a bed which incorporates brace members tying the pairs of rails together plus a plurality of tie rods which fasten the fixed and movable rails in a unitary assembly without preventing relative rocking motion thereof.

A still further object of the invention is to provide a unit of the described character for imparting rocking motion to a bed wherein each of said pair of movable rails is driven in the desired motion to lessen the probability of snagging of the moving bed and jamming of the drive mechanism.

Yet another object of the invention is to provide a unit of the described character for imparting rocking motion to a bed wherein the pairs of fixed rails are so nested within the movable rails as to prevent foreign objects falling between and to increase the safety of operation by lessening the danger of children placing objects or their fingers between the relatively moving rails.

The novel features that are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of specific embodiments when read in connection with the accompanying drawings, wherein like reference characters indicate like parts throughout the several figures and in which:

FIG. 1 is a perspective view of a unit, in accordance with the invention, adapted to support and rock a bed, and showing a standard, conventional bed in phantom lines about to be lowered on the unit;

FIG. 2 is a sectional view taken on line **2**—**2** of FIG. 1 and looking in the direction of the arrows;

FIG. 3 is an enlarged sectional view taken along line **3**—**3** of FIG. 1;

FIG. 4 is an enlarged sectional view taken along line **4**—**4** of FIG. 3 and looking in the direction of the arrows;

FIG. 5 is an enlarged sectional view taken on line **5**—**5** of FIG. 1;

FIG. 6 is a fragmentary perspective view of a modified unit for rocking a bed which applies driving force to both rocking rails rather than to one only;

FIG. 7 is a sectional view taken along line **7**—**7** of FIG. 6 and and looking in the direction of the arrows;

FIG. 8 is a sectional view of the drive connection to one rail taken from line **8**—**8** of FIG. 7;

FIG. 9 is a sectional view of the drive connection to the other rail taken from line **9**—**9** of FIG. 7;

FIG. 10 is a fragmentary perspective view of another modified unit which also applies driving force to both rocking rails; and,

FIG. 11 is a sectional view taken along line **11**—**11** of FIG. 10 and looking in the direction of the arrows.

Referring now to the drawings, FIGS. 1–5 illustrate a preferred embodiment of the invention in the form of a unit to be positioned under and support a conventional bed, or crib, and capable of imparting rocking motion to the bed. The unit generally indicated by the reference numeral **10**, is shown in FIG. 1 as ready to receive a standard bed **12** which may be lowered to engage the caster shank openings in the bed feet **14** about the upstanding studs **16** carried by unit **10**.

The unit **10** generally comprises a base including a pair of fixed rails, a pair of movable rails seated in the fixed rails for rocking motion, power means and a mechanism for converting the rotary motion of the power means to rocking motion of the movable rails.

In FIGS. 1 and 2 the base may be seen to be of exceedingly light weight, skeletonized construction and includes, as a minimum, the pair of spaced, parallel fixed rails **18**, mounted on casters **20** and joined by a central bracing member **22**. Rails **18** and bracing member **22** may be made of wood, metal or other suitable, strong material. The rails are fastened to bracing member **22** by suitable means such as screws **24**. The upper edge,

or surface, of each fixed rail **18** is shaped to a curved or arcuate form as illustrated at **26**. In the installed position of the accessory unit **10** the fixed rails are adapted to align with and seat under the head and foot boards of a standard size bed.

Seated on each fixed rail, to rock on the arcuate surface **26**, is a movable rail **28**. The movable rails are also preferably fashioned of wood or metal and each is channeled at **30** to nestingly receive the associated fixed rail. The dependent side walls **32** of rails **28**, which define the channels **30**, are preferably deep enough to cover most of the associated fixed rail and extend at least below the end edges of the arcuate surfaces **26** so as to lessen the danger of foreign articles falling between the rails. The movable rails **28** are secured to each other by at least one longitudinal, central, bracing member **34** fastened by screws **36**. To prevent longitudinal creeping movements of the fixed and movable rails relative to each other during motion of the bed, each fixed rail is provided with an upstanding pin **38** centrally located in the pivotal or fulcrum plane of the movable rails. The protruding end of pin **38** seats loosely in a recess **40** in the associated movable rail **28**. Thus when rail **28** rocks on rail **18**, the fit of the pin **38** and recess **40** is loose enough to permit such rocking motion but prevents longitudinal movement of one rail with respect to the other. The mechanism for driving the movable rails comprises an electric motor **41** of conventional type, powered by flexible electric leads not shown. The motor is supported on a base extension **42** which is secured to one of the fixed rails close to an end thereof. The output shaft **44** of the motor is connected to the input of a gear reduction unit **46** which is also supported on extension **42**. The output shaft **48** of the gear reduction unit is connected to a crank **50**. A link **52** is pivotably connected at one end to the crank and at the other to a pin **54** in the end of the adjacent movable rail **28**. Thus, when the motor is switched on, the rotation of the gear reduction unit shaft **48** is converted by the crank **50** and link **52** to vertical oscillatory movement of the connected rail **28** causing the rail to roll on the curved surface **26** of the associated fixed rail **18**. The rocking movement engendered takes place about a fulcrum plane including the pin **38** and is transmitted through the bracing member **34** to the other movable rail so that both rails rock in unison. Longitudinal creepage of the movable rails with respect to the fixed rails is prevented by the pins **38** during rocking, and the dependent walls **32** retain the movable rails aligned with and seated on the fixed rails preventing any lateral respective movement. Because of the nested relationship of the fixed rails within the movable rails the danger of foreign articles falling between them is avoided and this safety feature also tends to greatly lessen the possibility of a child inserting his fingers between the fixed and rocking rails.

It will be apparent that the rocking motion engendered in the rails **28** may be varied in frequency by employment of a suitable control for the speed of the motor and the rocking displacement may be adjusted by changing the length of the crank **50** and link **52**.

The moving rails are assembled to the fixed rails and drive mechanism to form a single bed accessory unit by means of a pair of tie rods **56** extending through fulcrum plane openings **58** in the bracing members **22** and **34** as best shown in FIG. 5. The lower end of each tie rod seats a washer **60** and a cotterpin **62**, or equivalent fastening means. The fastening means is positioned so as to loosely tie the upper and lower bracing members together, allowing some vertical displacement between them. Preferably, the openings **58** also loosely surround the tie rods **56** to provide play adequate to permit the movable rails to rock on the fixed rails, turning about the fulcrum plane which includes the pins **38** and the tie rods **56**. The described accessory unit may be readily and quickly installed under any conventional bed. As illustrated in FIG. 1, the casters **20** are first removed from feet **14** of the bed and inserted in openings therefor in the undersurfaces of the fixed rails **18**. The bed **12** is then lifted above the floor and the accessory unit **10** pushed under the bed so as to align the stud **16**, carried by brackets **64** fastened to the movable rails **28**, with the feet of the bed. The bed is then lowered onto the brackets **64** to insert the studs **16** into the caster stud openings of the bed feet. When thus installed, the rocking accessory unit **10** is practically completely hidden under the bed which is supported by the movable rails **28**. It will be apparent that once the bed and unit have been assembled the application of electric energy, from a source not shown to the motor **41** through conventional connections and controls, will start the bed rocking, turned by the movable rails **28** substantially about the longitudinal axis of the bed.

In FIGS. 6–9 is shown a modified embodiment of the invention wherein the drive means for the accessory unit **10** is applied to both movable rails. In this modification all elements of the accessory unit except the drive means are the same, or similar, to those as described for the embodiment illustrated in FIGS. 1–5. The drive means is modified in the following respects. An equalizer bar **66** is mounted between bearings **68** at one end of the accessory unit. The bearings are supported on members **70** which extend inwardly from the fixed rails **18**. The crank **50** on the output of the gear reduction unit **46** is pivotably connected to one end of a link **72**. The other end of the link is pivotably attached to the end of a lever **74** which is affixed to the equalizer bar at a point between one bearing **68** and the adjacent rail **28**. Thus rotary motion of the crank **50** is converted into oscillatory movement of the equalizer bar **66**. A pair of levers **76**, one affixed at each end of the equalizer bar, is pivotally connected to a pair of links **78** each of which is in turn pivoted to one of the movable rails **28**. The oscillations of the equalizer bar are thus converted into vertical oscillations of the ends of the movable rails causing the rails to rock on the curved surfaces of the fixed rails. This application of power to both movable rails, rather than to one only, insures a smooth, even rocking movement of the rails and the bed supported thereon and entirely prevents shimmy, wobble or snagging which otherwise might occur.

In FIGS. 10 and 11 is shown another modified embodiment of the invention also adapted to provide drive to both movable rails. In this modification the motor **80** is connected to the input of a gear reduction unit **82** which has two output shafts **84** and **86** extending in opposite directions toward the movable rails. Depending upon the internal construction of the gear reduction unit, the dual output shafts could be a single shaft. A crank **50** is affixed to shaft **84** and link **52** is pivotally connected to the crank and to the adjacent movable rail. The second output shaft **86** is extended by means of tube **88** toward the second movable rail where it is connected to a short shaft **90** journaled in a bearing **92**. A crank **50** and link **52**, similar in all respects to those utilized at the other movable rail, serve to connect the shaft **90** to the opposite movable rail as clearly shown in FIG. 11.

The described units may be installed or removed from any standard bed in just a moment or two. No alteration of the bed is necessary. When installed, the bed makes up with a neat appearance differing in no respect from a conventional bed not so equipped. It has been found that utilizing the accessory device to rock the bed with a maximum vertical displacement of approximately 1 and a half inch about thirty times per minute gives a soothing, restful effect to tired and weary nerves and engenders sleep among those affected with insomnia, arthritis or other illness. The frequency and displacement of the rocking movement may of course be modified should it be desired to exercise or stimulate the occupant of the bed. The use of the equalizer bar to provide a

dual drive and equal thrust to each of the movable rails prevents all danger of hang up or jamming of the apparatus due to unequal forces or friction which may arise from the position of the occupant in the bed or from other causes. While the invention has been disclosed and illustrated in the form of an accessory unit for rocking a bed transversely of its longitudinal axis, it will be apparent that, if desired, the accessory may be so designed as to rock the bed longitudinally about a transverse axis. Although the fixed rails have been shown as bearing curved surfaces for engendering the rocking movement, the curved surfaces could be formed on the movable rails instead. It will also be obvious that the rails may be lengthened or shortened and the brackets **64** moved relative thereto to accommodate different beds of non-standard size.

Although certain specific embodiments of the invention have been shown and described it is obvious that many modifications thereof are possible insofar as is necessitated by the prior art and by the spirit of appended claims.

What is claimed is:

1. A flat, compact accessory unit for imparting rocking movement to a standard bed, comprising a pair of spaced, fixed rails parallel to each other and connected by a single flat brace to form a skeleton base lying substantially in a horizontal plane and adapted to rest on a floor underlying the bed, a pair of movable rails connected by a second brace also lying substantially in a horizontal plane and forming a rockable skeleton platform, said movable rails being seated on said fixed rails, each rail of one of said pairs of rails being provided with a curved surface to enable relative rocking movement of the associated rails, means for supporting a bed on said platform, power means on said base, means interconnecting the power means and one of said movable rails to rock the platform, and tie means for holding said platform and base together while permitting rocking movement of the platform, whereby the platform and base as a unit may be fitted under and within the confines of a standard bed without alteration of the structure and appearance thereof.

2. The accessory unit described in claim 1 wherein said means for supporting all four legs of a bed comprises a plurality of angle brackets each having an upstanding stud adapted to fit within the castor shank opening of the leg of a bed, whereby the supporting rails are positioned within the confines of a supported bed and the legs of the bed are seated below the upper surfaces of the rails.

3. The accessory unit described in claim 1 wherein said power means comprises an electric motor and a gear reduction unit, and said interconnecting means includes a crank on the output shaft of said reduction unit, an equalizer bar oscillatably mounted between said pair of fixed rails, linkage connecting said crank to the equalizer bar, and drive means connecting each end of the equalizer bar to the adjacent movable rail to convert the oscillatory movement of the equalizer bar to synchronized rocking movement of said pair of movable bars.

4. The accessory unit described in claim 1 wherein said tie means for holding the movable rails to the fixed rails comprises aligned openings in said first and second braces lying substantially in the pivotal plane of said movable rails and a tie rod loosely joining said brace members to hold the movable and fixed rails asembled as a unit while permitting rocking movement of the movable rails.

5. The accessory unit described in claim 1 wherein said movable rails are each provided with a channel having depending sides to enclose a fixed rail and prevent relative transverse movement while the movable rail rocks with respect to the fixed rail, the depending sides of the channel extending below the arcuate surface of the associated fixed rail for the full length of such surface whereby to prevent foreign objects falling or being placed between said rails.

6. The accessory unit described in claim 5 in which each fixed rail is provided with an upstanding pin to form a fulcrum for rocking and each movable rail is provided with a recess loosely receiving said pin whereby relative longitudinal movement of said rails is prevented during rocking motion.

7. The accessory unit described in claim 1 wherein said power means comprises an electric motor and a gear reduction unit, and said interconnecting means includes a crank on the output shaft of said reduction unit and a link pivotally connected to the crank and one of said movable rails.

8. The accessory unit described in claim 7 wherein said gear reduction unit is provided with a second output shaft extended into proximity to the other movable rail, and a second crank and link connected to said other movable rail to simultaneously impart rocking motion thereto.

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