

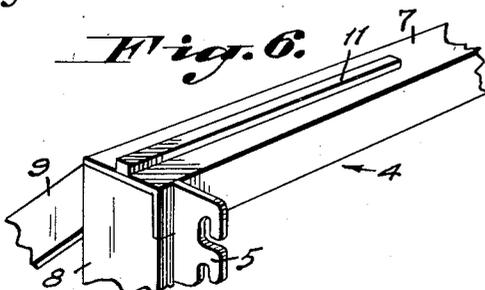
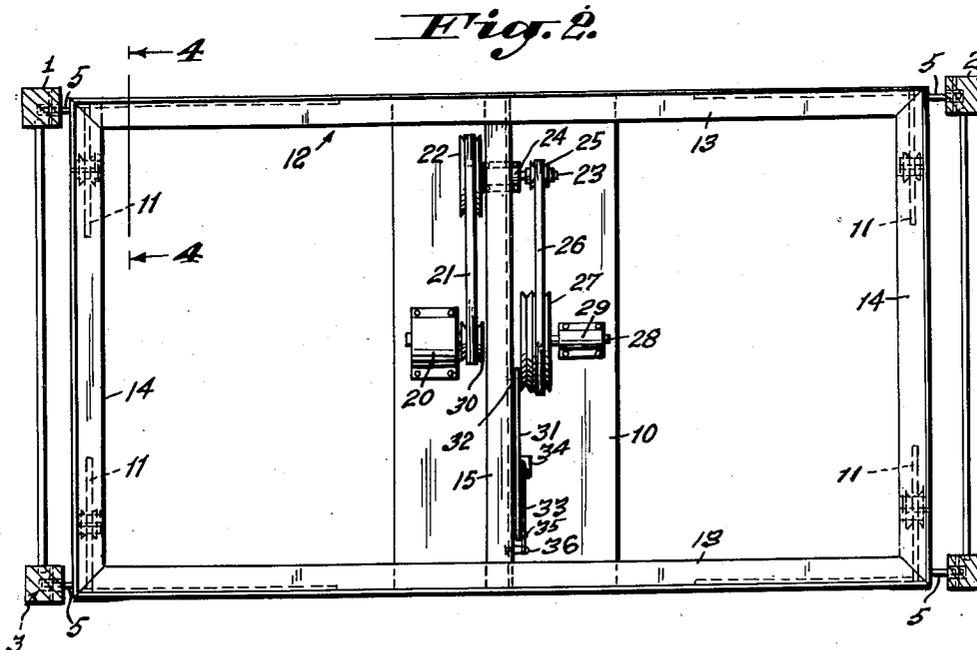
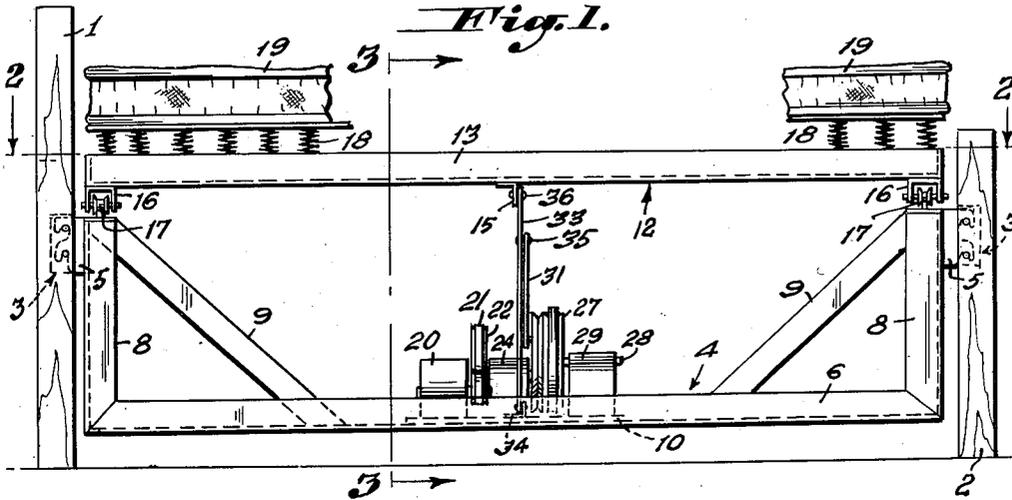
Oct. 9, 1951

J. V. HENDERSON
RECIPROCATING BED

2,570,676

Filed Dec. 14, 1950

2 Sheets-Sheet 1



INVENTOR,
John V. Henderson

BY *Henry P. Parker*
ATTORNEY

Oct. 9, 1951

J. V. HENDERSON

2,570,676

RECIPROCATING BED

Filed Dec. 14, 1950

2 Sheets-Sheet 2

Fig. 5.

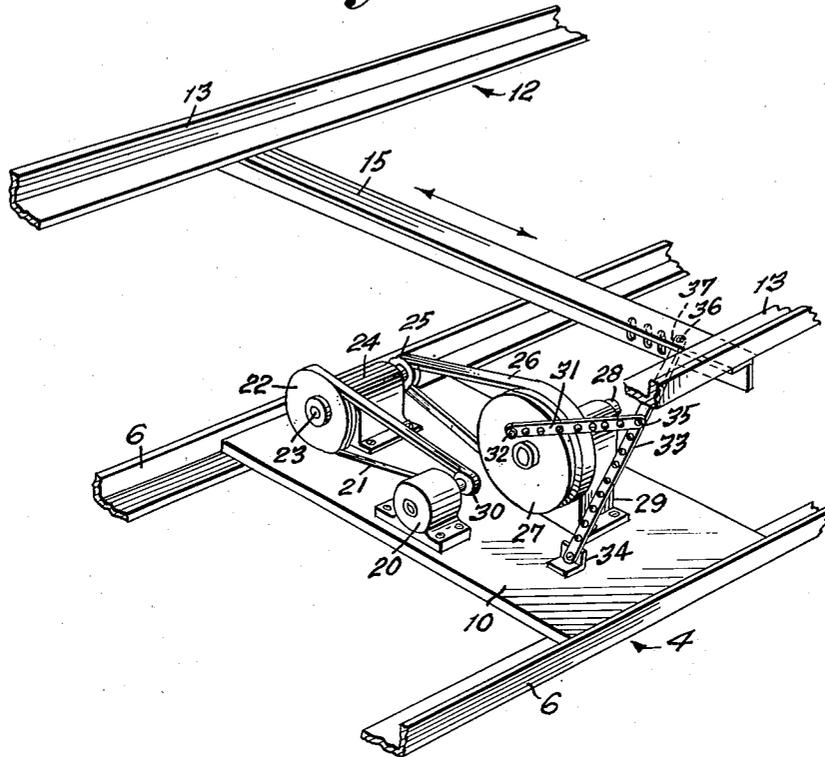


Fig. 4.

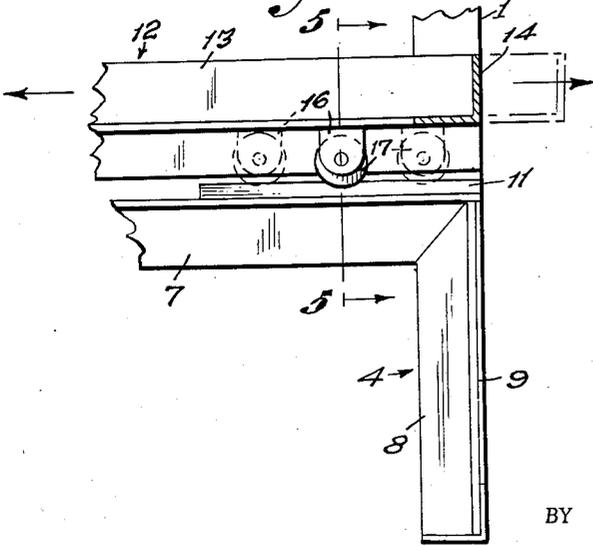
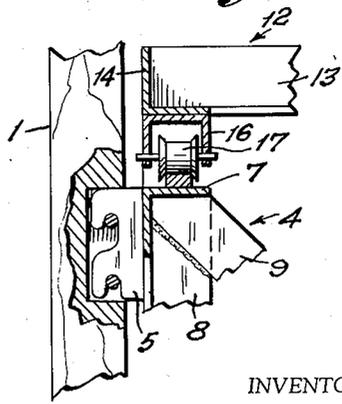


Fig. 5.



INVENTOR

John V. Henderson

Henry C. Parker

BY

ATTORNEY

UNITED STATES PATENT OFFICE

2,570,676-

RECIPROCATING BED

John V. Henderson, Birmingham, Ala.

Application December 14, 1950, Serial No. 200,764

4 Claims. (Cl. 128-33)

1

This invention relates to reciprocating bed; and it comprises a therapeutic bed adapted to reciprocate transversely at a predetermined rate and through an adjustable distance, said bed comprising a base frame with means for coupling it to the head and foot boards of a conventional bedstead, a pair of transverse end rails forming part of said frame and mounted between said coupling means, tracks mounted on the upper faces of said end rails, a pair of longitudinal side rails mounted at a level below that of said end rails, uprights at the corners of said frame securing the end rails to the side rails, a shelf mounted on said side rails and bridging the space between said side rails, means for producing reciprocating motion mounted on said shelf, a reciprocating upper frame adapted to be mounted on said base frame comprising side rails and end rails fastened together at their ends, spaced-apart flanged wheels rotatably mounted beneath the end rails of the upper frame and adapted to engage and to roll on said tracks as the sole support of said upper frame, a transverse bar attached to and mounted centrally beneath said upper frame, and adjustable means connected between said transverse bar and said reciprocating means for transversely reciprocating the upper frame of said bed with an adjustable stroke; all as more fully hereinafter set forth and as claimed.

While many devices have been developed for rocking and reciprocating cradles and children's beds for the purpose of putting the children to sleep, it has only recently been discovered that therapeutic benefit can be obtained in the case of adults making use of this general type of bed, not for a soothing effect, but rather for obtaining bodily exercise. I have discovered a rather simple construction for a reciprocating bed wherein maximum benefits are obtained by transverse reciprocation in a horizontal plane rather than a rocking, swinging, up-and-down or end-to-end motion of the bed. With transverse reciprocation the body tends to roll from side to side and, of course, it requires considerable muscular energy to oppose this motion, this energy being exerted usually at least in part involuntarily. With the bed of the present invention the sidewise motion may be made gentle so that a soothing and relaxing effect is obtained or more vigorous so that beneficial exercise and a stimulating effect are obtained. This motion speeds up all bodily processes. It stimulates circulation as well as digestion, and is particularly effective in cases of chronic constipation.

2

The effects obtained are much like those obtained from massage and it is beneficial in all cases where manipulation and/or massage of the body or of the joints is indicated. Different types of exercise can be obtained by lying in different positions on the bed. The body can be trained to relax by testing to see how little opposition can be offered to the motion of the bed.

My new reciprocating bed comprises a lower or base frame adapted to be coupled between the head and foot boards of a conventional bedstead, taking the place of the conventional side rails. This base frame comprises side rails and end rails and it supports a motor, reduction gearing, and a connection for reciprocating an upper frame. It is also provided with transverse tracks which are mounted on the upper faces of its end rails. An upper rectangular reciprocating frame is provided which has flanged wheels or rollers mounted underneath at its ends, these rollers being adapted to engage the tracks on the base frame and to constitute the sole support for the upper reciprocating frame. The reciprocating frame also has a transverse bar centrally mounted, this being connected to the reciprocating means mounted on the base frame. The reciprocating frame is adapted to receive the conventional bed springs and a mattress rests on the springs. The connection between the reciprocating means and the reciprocating frame is made adjustable so that the length of the stroke can be varied. And the speed reducing means is also made adjustable so that the rate of reciprocation can be varied. A very simple and inexpensive construction is thus provided which, however, provides maximum effectiveness for the purposes in question.

It is evident that the construction described makes use of the conventional head and foot board, springs and mattress of any conventional bed of standard size. A substantial saving in cost is thus effected since the average household normally has a standard bed which can readily be converted into a reciprocating bed of my design. Conversion is extremely simple and is accomplished by removing mattress, springs and side rails from the bed, removing the casters, coupling my base frame between the head and foot boards, laying the reciprocating frame over the base frame with its wheels engaging the rails of the base frame, connecting the driving link of the motor drive to the transverse bar of the reciprocating frame, then replacing the springs and mattress. After conversion the bed can, of course, be used as an ordinary bed since con-

3

version makes little if any difference in the height of the bed. Even its outward appearance is the same since the base frame, motor, etc., are well concealed. It is preferable to remove the casters from the bed to prevent it from rolling with the reciprocating motion of the upper frame and when these are removed the mattress is substantially at the same height as before conversion.

My invention can be described in greater detail by reference to the accompanying drawing which shows, more or less diagrammatically, a preferred embodiment of my reciprocating bed. In this showing,

Fig. 1 is a side elevation of my bed with the reciprocating frame resting on the base of supporting frame,

Fig. 2 is a plan view of the two frames,

Fig. 3 is a perspective view of the base board or shelf showing the motor and reciprocating mechanism mounted thereon taken approximately along the line 3—3 of Fig. 1,

Fig. 4 is a vertical section showing a detail of the corner structure of the bed, taken along the line 4—4 of Fig. 2,

Fig. 5 is another vertical section showing a detail of the corner construction and taken along the line 5—5 of Fig. 4, while

Fig. 6 is a perspective partial view of one corner of the base frame showing how the track and bed coupling are mounted thereon.

In the various views like parts are designated by the same reference numerals. Referring first to Figs. 1 and 2 my bed comprises the conventional head board 1 and foot board 2, which, of course, may be parts of conventional metal or wooden bedsteads provided with conventional female couplings indicated generally at 3 for securing thereto the conventional side rails. In my bed the side rails are replaced by a base frame shown generally at 4 which at its four corners is provided with standard male couplings 5 which when secured to the conventional female couplings on the head and foot boards of the bed support the base frame. The base frame is formed of two lower side rails 6 and two upper end rails 7, these being rigidly connected by corner uprights 8, cross braces 9 and a bottom shelf 10. The rails and cross braces of the base frame are welded or otherwise securely fastened together. These elements may be angle irons. The shelf may also be welded or riveted to the lower side rails or it may be secured thereto by means of screws, not shown. The end rails of the base frame are approximately at or slightly below the level of the conventional side rails and they are provided with tracks 11 mounted securely on their upper faces at each end as shown best in Fig. 6. These tracks provide means for supporting and guiding the motion of the upper or moveable frame shown generally at 12. This upper frame is merely a rectangular framework of side rails 13 and end rails 14 which are preferably angle irons welded at the corners. A cross bar 15 is also provided for a purpose which will appear later. This may also be an angle iron and is secured approximately centrally of the upper frame. Beneath the end rails at each corner of the upper frame bearing brackets 16 are mounted, these forming bearings for the flanged wheels 17 journaled in ball bearings which roll along the tracks 11 as shown best in Figs. 4 and 5. The upper frame provides support for the conventional springs 18 and mattress 19 as shown in Fig. 1.

4

Means for reciprocating the bed transversely are mounted on the bottom shelf 10, shown in Figs. 1, 2 and 3. This reciprocating means comprises a motor 20 mounted on the shelf, which through a drive pulley 30 and V-belt 21 drives a pulley 22 mounted at one end of jack shaft 23, the latter being journaled in bearing block 24. At the other end of the jack shaft another smaller pulley 25 is mounted which through V-belt 26 drives another larger pulley 27 mounted at the end of jack shaft 28 which is journaled in bearing block 29. A connecting rod 31 is attached eccentrically at one end to pulley 27 by means of a wrist pin 32 while the other end of the connecting rod is pivotally connected at 35 with drive link 33. The latter is pivoted at its lower end to an angle bracket 34 while at its upper end 37 it is connected by a sliding pivot connection 36 to cross bar 15 of the moveable frame. Connections 35 and 36 are adjustable as shown in Fig. 3 so that the distance through which the movable frame reciprocates can be varied to suit the condition of the patient and the treatment desired.

The pulleys and belts described serve as a convenient means of obtaining speed reduction. By changing the pulleys for others of different size the speed reduction can be varied as desired. The bed is advantageously provided with a change of pulleys of different size in order to produce a range of different operating speeds. The motor is advantageously of relatively low speed and I have found that a $\frac{1}{4}$ horse power motor provides adequate power. The stroke of the bed can be varied rather widely but I have obtained best results with reciprocating motions varying in length from about $\frac{1}{2}$ to 18 inches. With a slow period of reciprocation and a short stroke a soothing or sleep producing effect can be produced whereas for maximum stimulation a long stroke coupled with a short period is used.

While I have described what I consider to be the most advantageous embodiments of my reciprocating bed it is evident, of course, that various modifications can be made in the specific structures which have been described without departing from the purview of this invention. Thus, the constructions of both the base frame and the reciprocating frame can be varied substantially from those shown in the drawing. My bed can be made of either single or double width. It is only necessary to have a base frame constructed so it will support the tracks and the reciprocating drive while the upper frame supports the bed springs on rollers operating on said tracks. In place of the pulley and belt reduction gearing shown in the drawing it is possible, of course, to employ any other conventional speed reducing unit. I have found it advantageous to reciprocate my bed at such a rate as to produce from about 24 to 800 strokes per minute and, of course, the speed reduction unit should be selected to produce reciprocation within this range. The bed requires no overhead suspension and it does not need to be anchored to the floor. Other modifications of my invention which fall within the scope of the following claims will be immediately evident to those skilled in this art.

What I claim is:

1. A reciprocating bed comprising a generally rectangular base frame having two lower side rails and two upper end rails with corner uprights joining the ends of said rails, tracks mounted on the upper faces of said end rails and

5

means for producing reciprocating motion mounted between said side rails, an upper rectangular frame comprising side rails and end rails joined at their ends, at least two flanged wheels mounted beneath said end rails and adapted to engage the tracks on the base frame to support the upper frame, adjustable means for connecting the upper frame with said means for producing reciprocating motion transversely to reciprocate said upper frame, and coupling means mounted at the corners of said base frame adapting said base frame to be coupled between the head and foot boards of the conventional bedstead, the upper reciprocating frame being adapted to support the conventional bed springs.

2. The reciprocating bed of claim 1 wherein the means for producing reciprocating motion comprises a motor drive including pulleys and belts to produce speed reduction, a connecting rod attached eccentrically to one of said pulleys,

6

a link pivotally connected both to said base frame and said reciprocating frame and means for adjustably attaching said connecting rod to said link to reciprocate the same.

3. The reciprocating bed of claim 2 wherein said motor drive is mounted on a shelf mounted on and bridging the space between the side rails of said base frame, and cross braces are provided running from the upper ends of said uprights to the side rails to provide support for the shelf and motor drive.

4. The reciprocating bed of claim 1 wherein the reciprocating means operates at a speed within the range of from about 24 to 800 strokes per minute, the strokes having a length varying from about $\frac{1}{8}$ to 18 inches.

JOHN V. HENDERSON.

No references cited.