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C. E. SHARP
ROCKING SWINGING BED
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2 Sheets-Sheet 1

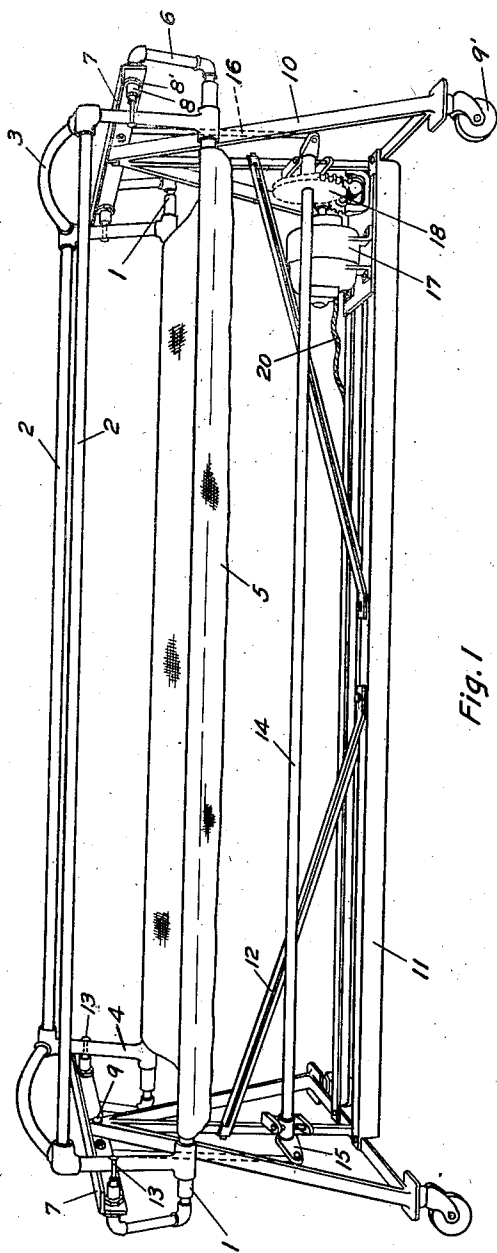


Fig. 1

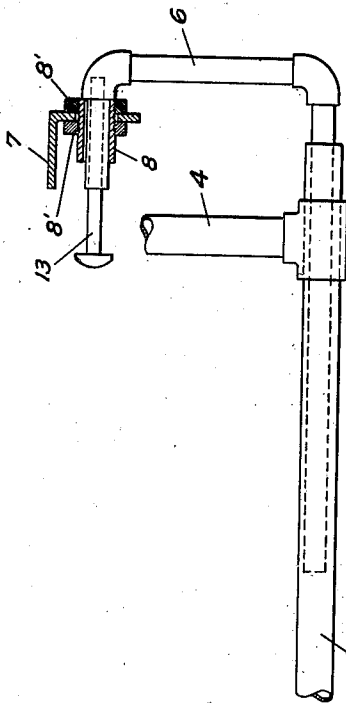


Fig. 4

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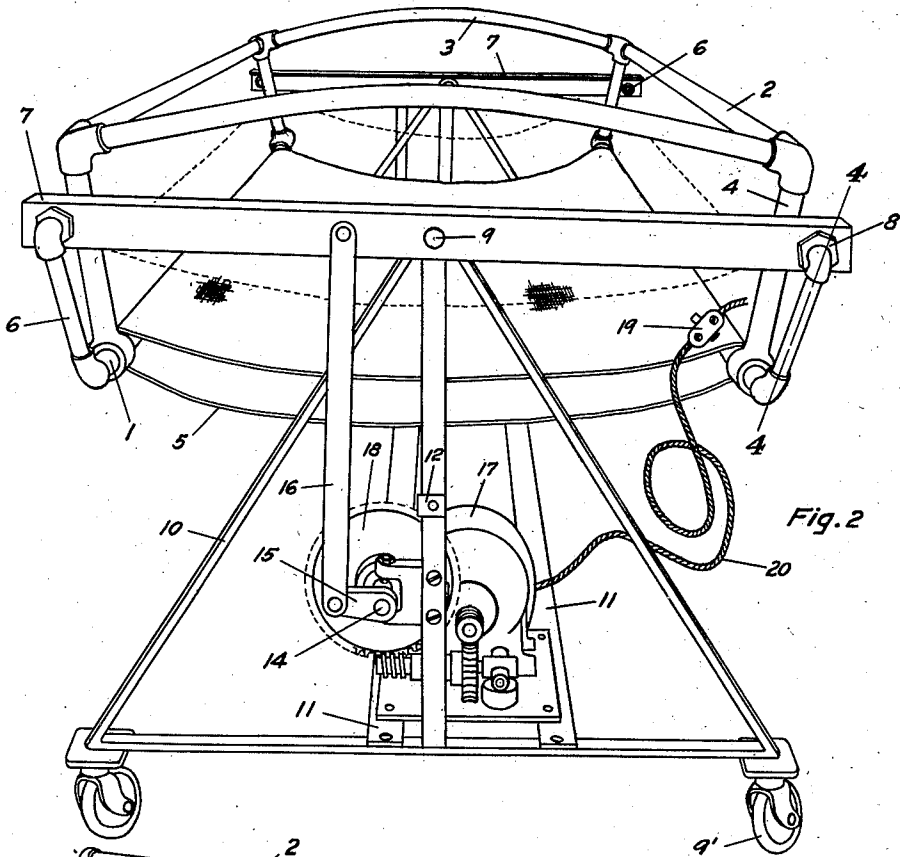
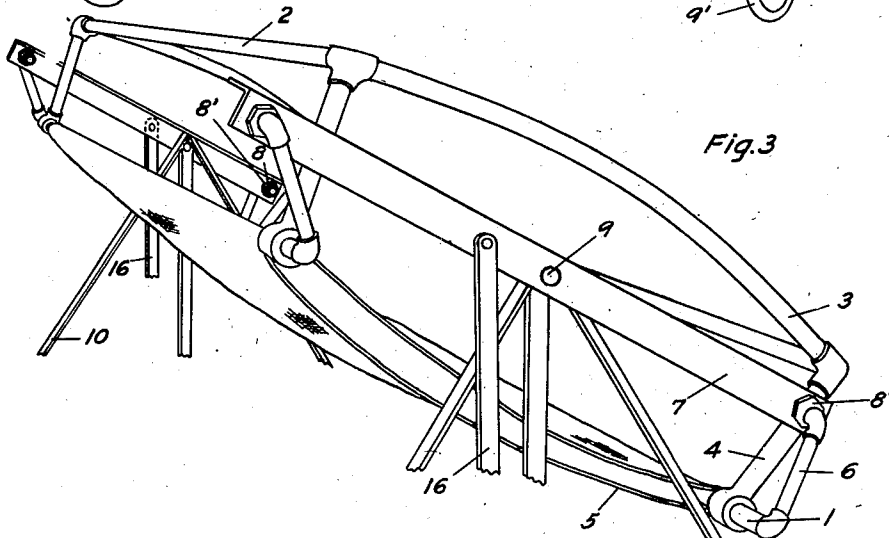
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2 Sheets-Sheet 2



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ROCKING SWINGING BED

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9 Claims. (Cl. 5—61)

The invention to be hereinafter described relates to rocking swinging beds.

By actual careful scientific observation it has been established that the normal healthy individual, during an eight hour interval of natural sleep changes his body position from twenty to forty-five times. The person in normal health has sufficient strength to sub-consciously make such changes of position without fully waking. But the sick, injured or bedridden are in serious difficulty. They must rely upon assistance, either a nurse or mechanical means or both. And, if the patient is heavy, such frequent moving is a serious strain on the nurse and uncomfortable for the patient.

To meet the above conditions, many constructions and devices have been invented. Beds which may be tilted bodily in one direction or another have long been known. The same is true of beds having one or more sections movable relatively to the other sections. Some are operable by motors and some mechanically but without motors.

Among the more serious objections to former beds intended for these purposes are the complexity of the mechanism, bulkiness and weight, difficulty of control, inability to turn the body of the user in the manner desired, and cost. These and many other objections are either entirely eliminated or greatly reduced by the present invention.

The present invention provides a simple, efficient, compact, durable and inexpensive bed having a simple, slow, regular travel, from side to side, which may be either automatically reversed at predetermined points or manually reversed when desired. Movement of this bed is at all times under control of the user so that it may be stopped at any point.

With a bed of this invention, completely under the control of the user, the body may be shifted easily and gradually with the least possible discomfort, to the exact extent desired, as frequently as desired, and exactly when desired. All of these factors contribute to the health and improvement of the user and tend to restore the sick or injured just that much sooner.

Obviously, people in the prime of health may use such a bed to great advantage. By it, the body would be very slowly and gently turned from one side to the other and back during sleep, just as the user would turn in his sleep, only with greater regularity and slower.

In order to more clearly disclose the construction, operation and use of the invention, reference should be had to the accompanying drawings

illustrating one preferred form of the invention and forming part of this application. Throughout the several figures of the drawings like reference characters designate the same parts in the several views.

In the drawings:—

Fig. 1 is a perspective view toward the longitudinal center of one side, with stops in position, but without mattress;

Fig. 2 is a right hand end view of Fig. 1, with mattress dotted in and stops omitted;

Fig. 3 is a view similar to Fig. 2, showing the bed tilted and approaching one extreme position, the lower part of the carriage and the motor being broken away; and

Fig. 4 is an enlarged side elevation of one of the hangers, removed but showing fragmentarily, the seating of the hanger in the side rail and cross head, and a stop in position—approximately on line 4—4 of Fig. 2.

As will be set forth more in detail in the following description, the bed of this invention has both a swinging oscillating movement and a rocking movement. The rocking movement is mechanically actuated and under complete instant control of the user. The swinging oscillating movement is gravity actuated and is affected by the weight of the user and his position on the mattress or other support. Of course the weight of the bed frame is added to that of the user as to gravity actuation. When desired, a very simple device prevents oscillation.

In the preferred construction, two rigid tubular side rails 1 are provided of the desired length for a bed and spaced apart the required distance for a single bed. As a matter of simplicity, economy and strength, these rails may be of tubing or pipes. A substantially rectangular frame maintains these rails in operative position for supporting a mattress or the like. It comprises two guard rails 2 connected by arched end members or bows 3. The members 2 and 3 may, readily, be of material similar to rails 1. They are connected at the corners in any usual and well known manner. From each corner of this frame extends a post 4 in the lower end of which is suitably seated one end of one of the rails 1. These four posts, therefore, with their frame members 2—3, maintain rails 1 in operative position, or spread. It should be mentioned that posts 4 are so proportioned that they hold guard rails 2 above rails 1 a distance somewhat greater than that of the thickness of the mattress plus the width of the user's body. Consequently, when tipped to the position of Fig. 3, the respective guard rail 2

prevents the user possibly falling out. A strong canvas or similar mattress support 5 is stretched from one side rail 1 to the other and the mattress is simply laid upon that. Both the canvas and the mattress, of course, take a slightly downwardly curved or dished position when in place, as will be obvious. There is no rigid lateral connection between the ends of rails 1 or the corresponding ends of posts 4. Consequently, with the frame suitably suspended as hereinbefore disclosed, the mattress and any weight on it will exert an inward pull on the rails 1, tending to draw them together. The curvature or arch of the bows or ends 3, through posts 4, resists this pull, and maintains rails 1 spread. The arch provides ample strength combined with sufficient resilience to provide a comfortable yet firm support for the mattress.

The side rails, guard rails, bows and posts constitute a bed frame each end of which is the same and each side of which is the same. Either end, therefore, may be used as head or foot and connected to either cross head.

Cooperating with this bed frame are a set of hangers 6. Each hanger, in the preferred form, is a U-shaped pipe, tube or rod. One arm of the hanger is of very slightly less outside diameter than the inside diameter of an end of the side rail 1 so that it may be readily slipped into such end. The remaining arm is adapted to pass freely through a suitable opening in a cross head 7 which, for strength, economy and convenience may be made of ordinary angle iron. To provide desirable bearing surfaces or journals for the hangers 6 where they pass through the cross heads 7, thimbles 8 are seated in the openings. A simple and easy way of securing these thimbles in place is by lock nuts 8' turned up on their opposite ends and against the face of the cross head. Should there be any tendency of the hangers to work out from the rails or the cross head this may be prevented by threading the outer end and turning thereon a nut so that it engages the end of the corresponding thimble. Or the projecting end of the hanger may be punched to receive a cotter pin, or a clip or any other well known holding device may be used.

With the four hangers in position and the cross heads 7 horizontal, the bed frame will be suspended in a free swinging or oscillating position. The possible length of this swing, of course, depends upon the distance between the side arms or branches of the U-shaped hangers. Increasing that distance increases the swing while decreasing it decreases the swing, as will be obvious. In the case illustrated and found very satisfactory, the length is a little less than that of the posts 4, but a little greater than that of the thickness of the particular mattress shown. As will be clear, the hangers are all interchangeable. Any one may be freely substituted for any other, and those for one bed may be used in place of those of any other bed of the same size and style.

In the position shown in Figs. 1 and 2, with the cross heads horizontal, the bed frame, of course, gravitates to its lowest position with the guard rails 2 in a plane parallel with the cross heads and the side rails in another plane also parallel with the cross heads. Suppose we push inwardly toward the center, from one side. Each hanger swings on an arc centered about its connection with the respective cross head. This will raise the side rail at the side where the push is made and lower it at the opposite side. And, with the

push from the opposite side corresponding movements of rails 1 result.

Suppose that, with the cross heads 7 horizontal, the hangers would lie in vertical planes—i. e. planes at right angles to the cross heads. In that case, the pivotal connection between each hanger 6 and the respective side rail would lie directly vertically below the pivotal connection between that hanger and its cross head and the hanger portion extending between those points would be a vertical radius of the arc of swing or oscillation of the bed frame. In such an arrangement, as the bed is swung, it will rise equally at both sides toward the cross head. Likewise, when allowed to return, it will fall equally, as it gravitates to final position. Briefly, with such a construction the bed frame will be kept parallel with the cross heads 7. If, instead of pushing the frame from one side or the other, to rock it, the cross heads 7 are pivotally mounted at their centers, the whole assembly may be tilted or rocked from the horizontal toward either side. Suppose that is done, and with the same construction and arrangement of hangers as above described. The only difference is that the bed frame will gravitate to a position corresponding to the one to which it was pushed. It will move in a plane parallel to that of the cross head 7. The result is that the bed frame rocks or tilts with the cross head and only to the same extent as the cross head.

An important feature of the present invention is an arrangement whereby the sides of the bed frame move oppositely on their hangers 6 relatively to their cross heads 7, instead of as above. By such an arrangement it is possible to use the oscillation or swinging movement to appreciably automatically increase the tilting or rocking movement of the bed frame. In this invention, each cross head, in assembled position in its carriage, extends appreciably beyond both sides of the bed frame, and the connection between the cross head and the respective hanger is at a point outwardly beyond the bed frame and beyond the respective post 4. Consequently, the horizontal distance along the cross head between the hanger connections thereto is greater than the corresponding distance between the hanger connections to the rails 1. This brings the hangers 6 inwardly toward each other at their lower ends. They slant inwardly toward the center of the bed frame from their upper connections. Consequently, when the cross heads 7 are horizontal the hangers will not be in vertical planes but in planes inclined toward the longitudinal center of the bed frame. That raises each hanger connection to its side rail above its lowest point.

Each cross head is pivotally mounted at 9 in the upper part of a suitable end frame 10. The end frame may be constructed in any suitable manner. One preferred construction is that shown, which is triangular, made of heavy bars provided with suitable castors 9'. The two end frames are connected by strong flat bars 11 and braces 12. The members 10, 11 and 12 constitute a carriage in which the bed frame rocks and may be rolled about as desired. With the above construction and arrangement, tip or rock the cross head 7. That rocks one side of the bed frame up and the opposite side down. At the same time, the lower end of each hanger 6 at the higher side swings toward the cross head and raises that side of the bed frame just that much more, relatively to the cross head. But, the lower end of each hanger 6 at the opposite

or lower side of the bed frame moves away from the cross head or gravitates to a lower position, relatively to the cross head. That lowers that side of the bed frame correspondingly at that side. Thus, it will be seen that the tilting or rocking effect available through the cross heads is considerably automatically increased by the oscillating or swinging movement. Should it be desired to rock, without swinging and to not increase the rocking movement beyond that resulting from the tipping of the cross heads 7, it is only necessary to insert the bolts 13 or similar stops in the ends of the hangers 6. Preferably, all four stops should be inserted. They will engage posts 4 and prevent movement of the bed frame relatively to the cross heads 7. They will compel the bed frame to rock with and to the same extent as the cross heads 7. If two such stops are used, one in the hanger near each end of one cross head or one in the hanger near one end of one cross head and the other in the hanger near the opposite end of the other cross head that will be sufficient. However, all four stops hold the bed frame more solid, as will be clear. Preferably, the stops are simple bolts or tube sections. They may be of a diameter to fit snugly and forced in, or they may be threaded to be turned into interior threads cut into the ends of the hangers 6. The stops will operate effectively if only seated in hangers 6, without being secured therein. Clearly, a number of other simple devices operating substantially in the same way, could equally well be used as stops.

As stated, the ends of the bed frames may be interchangeably used as head or foot, as to their mountings in the carriage. Likewise, any bed frame of like size and type may be interchanged with any other, in the same carriage.

A preferred means for rocking the cross heads 7 and bed frame mounted therein comprises a power shaft 14 journaled in suitable bearings mounted in any suitable and well known manner in the end frames 10 and provided with cranks 15 to each of which is suitably connected one end of a pitman rod 16. The opposite end of each pitman rod is pivotally connected to one of the cross heads at a point between its pivotal mounting 9 and one end. Rotation of shaft 14, rocks cross heads 7 and the bed frame. This connection between the cross head and the pitman rod is so disposed as to rock the bed frame back and forth to the desired extent. The degree or extent of the rock may be regulated by providing a plurality of openings or perforations longitudinally spaced in the cross heads, if desired. By seating the connecting pivot bolt selectively in one or another of these openings, the amount of tilt or rock may be varied accordingly. The same would be true of lengthening the crank 15, providing it with a plurality of perforations and selectively connecting the pitman rod 16 to it. Obviously, other adjustable connections could also be used. Of course, the connections are such that the two cross heads are rocked to the same extent, in the same direction and at the same time, to avoid any possible twisting.

As a simple, efficient and economical means of rotating shaft 14, a small electric motor 17 may be used, mounted on the bars 11. This motor through usual and well known gearing drives worm 18 fixed to shaft 14. The gear ratio is such, relatively to the R. P. M. of the motor, as to rock the cross heads 7 of the carriage at the

desired speed, of course. This, of course, is all a matter of simple mathematics and readily determinable in advance.

In order to have the bed under the complete control of the user, the switch 19 for starting and stopping the motor is in an ordinary extension cord 20 which reaches easily to any point in the user's bed. In this construction, the rocking or tilting reverses at each half rotation of shaft 14, of course, automatically. If it should be desired to reverse the rocking movement before it reaches the end of its traverse in any one direction, it is only necessary to substitute a well known type of reversing switch for that shown. These reversing switches are well known on the market and it is not thought either necessary or advisable to illustrate or describe them in detail. At any point in the travel of the bed, the user simply reverses the motor by first moving the switch to neutral and then to reverse, in well known manner.

In order to give the user all possible space or room on the mattress, the guard rails 2 are spaced apart laterally somewhat more than the side rails. This inclines posts 4 toward the longitudinal center of the bed frame where they are cleared by the stops 13, when the bed is in horizontal position, so that the stops 13 will be on the outside of the posts 4. Consequently, the user may roll clear to the side rail 1, before he will be intercepted by the guard rails 2.

As the bed is rocked, the occupant, of course, turns from the higher side toward the lower side, his weight assisting in oscillating the bed frame on the hangers 6 so that it gravitates to a considerably greater degree of swing or incline than it would reach by simple rocking of the cross head 7. At the same time, the guard rails 2 are amply high enough to prevent a large patient rolling off or falling out of the bed. In this way, the user's position is changed when desired, in the way desired and without the need of a nurse.

While an electric motor has been shown as one preferred power unit, it will be understood that purely mechanical means may be used, with any suitable means under the control of the user for starting, stopping and reversing the same. It will also be clear that the rocking may be reversed by reversing the rotation of the shaft. Many such arrangements and constructions are well known and readily adaptable to this invention. It is not believed either necessary or desirable to go into detail as to any of them.

In assembling, it is only necessary to raise the bed frame between the end members of the carriage and slip the four hangers in place. In dismounting, the operation is the reverse. The bed frame, dismounted, may then be set aside. Also, it may be readily used as a stretcher.

Many changes may be made in the construction, arrangement and disposition of the several parts of the invention, within the scope of the appended claims, without in any degree departing from the field of the invention and it is meant to include all such within this application where-in only one preferred form has been illustrated purely as an example and with no intent to limit the claims thereby.

Having thus described my invention, what I claim and wish to protect by Letters Patent is:—

1. In combination, a carriage, cross heads rockably mounted therein, means for rocking said cross heads, a bed frame, and hangers swingingly suspending said bed frame from said

cross heads, the connections between the respective hangers and bed frame being nearer the longitudinal center of the bed frame than the connections between the same hangers and the cross heads.

2. In combination, a carriage, cross heads rockably mounted therein, a bed frame, means for rocking said cross heads about the approximate longitudinal axis of said bed frame, and gravity actuated means swingingly suspending said bed frame from said cross heads and automatically tilting said bed frame in the direction of rock of said cross heads and relatively to said cross heads.
3. In combination, a carriage, cross heads rockably mounted in said carriage, a bed frame, hangers pivotally connected to said cross heads and to said bed frame, respectively, the connections to the bed frame being nearer the longitudinal center of said frame than the connections to the cross heads, causing the bed frame to swing and rock relatively to the cross heads as the cross heads are rocked, and means for preventing movement of said bed frame relatively to said cross heads.
4. In combination, a carriage, cross heads pivotally mounted in said carriage, a bed frame comprising spaced parallel side rails, and interchangeable oscillating U-shaped hangers one end of each hanger having a fixed pivotal connection with a corresponding end of a cross head while the other end of each hanger is pivotally connected to the corresponding end of a side rail, the horizontal distance from the cross head pivot to the hanger connection with cross head being greater, when the cross head is in horizontal position, than the horizontal distance from the cross head pivot to the hanger connection and rail.
5. In combination, a carriage, cross heads pivotally mounted in said carriage, a bed frame comprising spaced parallel side rails, interchangeable oscillatable U-shaped hangers one end of each hanger having a fixed pivotal connection with a corresponding end of a cross head while the other end of each hanger is pivotally connected to the corresponding end of a side rail, the horizontal distance from the cross head pivot to the hanger connection with cross head being greater, when the cross head is in horizontal position, than the horizontal distance from the cross head pivot to the hanger connection and side

rail, and means removably carried by said hangers and engaging said bed frame and preventing swinging of said frame relatively to said cross heads.

6. In combination, a carriage, a shaft revolvably mounted in said carriage, means for driving said shaft, rocking heads pivotally mounted in said carriage, crank and pitman connections between each of said rocking heads and one end of said shaft for rocking said heads; a bed frame comprising side rails, guard rails spaced thereabove, end members connecting said guard rails in spaced relation, and corner posts connecting said guard rails to said side rails in spaced relation; and means for removably connecting said bed frame to said rocking heads to rock therewith.
7. In combination, a carriage, a shaft revolvably mounted therein, means for driving said shaft, rocking heads pivotally mounted in said carriage, crank and pitman connections between each of said rocking heads and one end of said shaft for rocking said heads; a bed frame comprising side rails, guard rails spaced thereabove, end members connecting said guard rails in spaced relation, and corner posts connecting said guard rails to said side rails in spaced relation; and means for removably suspending said bed frame from said rocking heads to simultaneously rock therewith and swing relatively thereto.
8. In combination, a carriage, rocking heads mounted therein and adapted to removably receive bed frame hangers, a bed frame having hanger receiving sockets, hangers simultaneously insertable into and removable from said bed frame and said rocking heads to suspend said bed frame from said rocking heads, and means carried by said hangers and engaging said bed frame to prevent relative movement between said frame and said heads.
9. In combination, a carriage, rocking heads mounted therein and adapted to removably receive bed frame hangers, a bed frame having hanger receiving sockets, hangers simultaneously insertable into and removable from said bed frame and said rocking heads to suspend said bed frame from said rocking heads, and means removably mounted in said hangers and engaging said bed frame to prevent relative movement between said frame and said heads.

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