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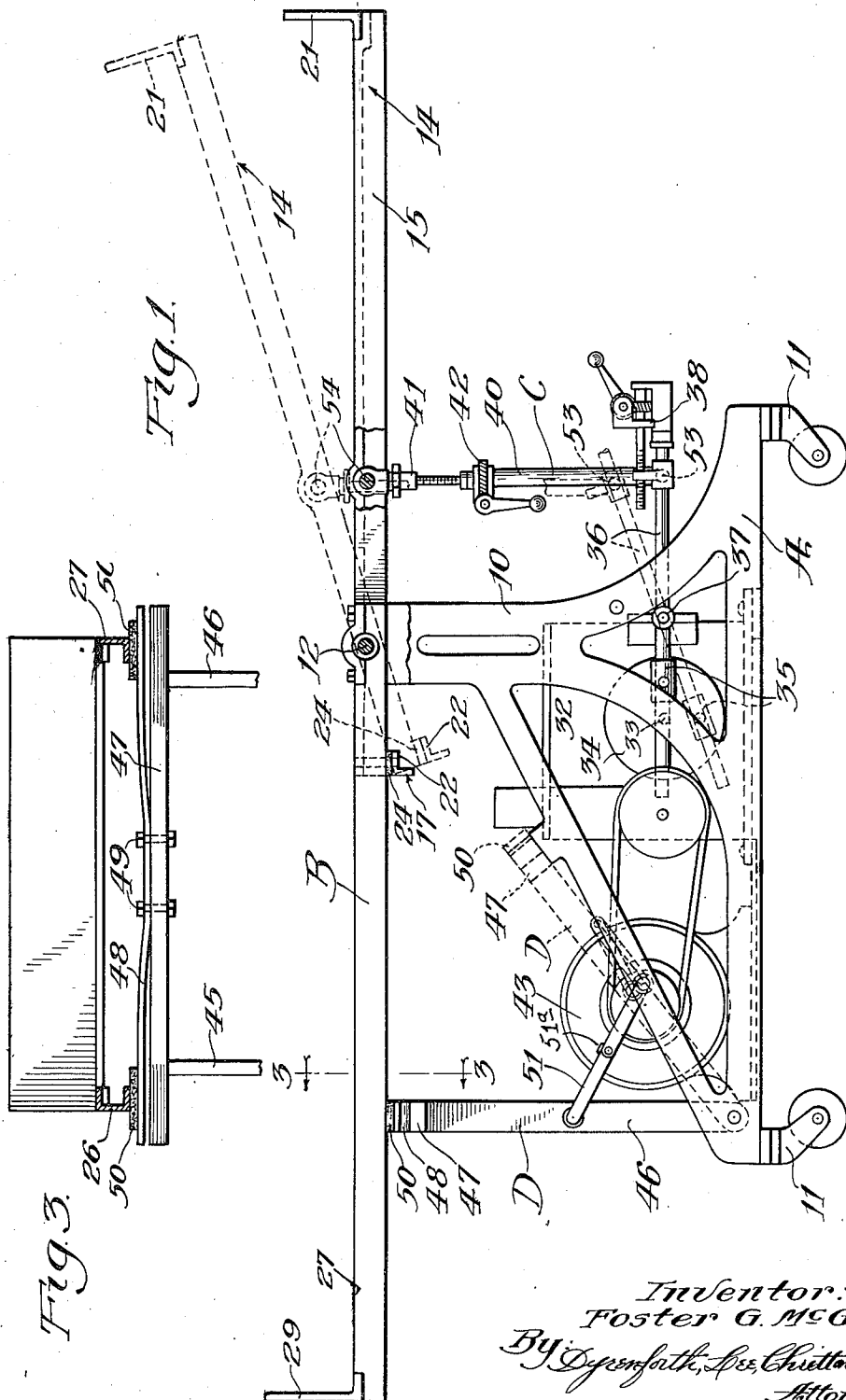
F. G. McGAW

2,110,069

THERAPEUTIC APPLIANCE

Filed Dec. 14, 1936

2 Sheets-Sheet 1



Inventor:
 Foster G. McGaw,
 By Greenleaf, Lee, Chittin & Wills
 Attorneys

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F. G. MCGAW

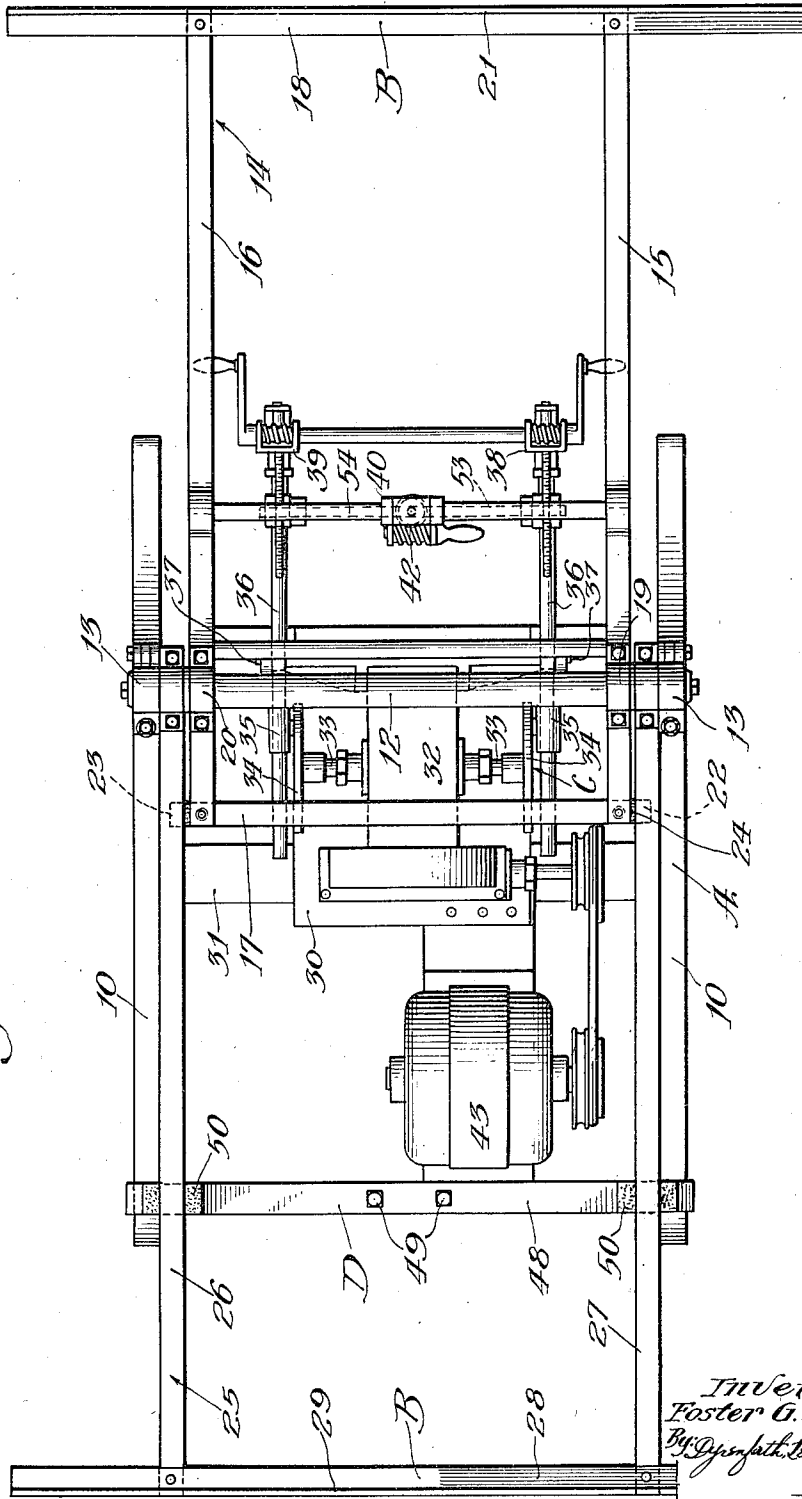
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Fig. 2.



Inventor:
Foster G. McGaw,
By D. J. Smith, Esq., Attorney & Counselor
Attorneys

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THERAPEUTIC APPLIANCE

Foster G. McGaw, Evanston, Ill., assignor to
American Hospital Supply Corporation, a corporation of Illinois

Application December 14, 1936, Serial No. 115,878

10 Claims. (Cl. 128—49)

This invention relates to a therapeutic appliance and more particularly to an appliance wherein a bed frame or support is caused to rock or oscillate. Such appliances are utilized to assist heart action and improve blood circulation, and are particularly valuable in the treatment of patients whose physical condition prevents their taking exercise. Such devices may be effectively used in the treatment of any disease which may be relieved by thorough and complete blood circulation.

An object of the invention is to provide an appliance which automatically produces a tilting movement of a support or bed so that the inclination of the patient's body is changed, but which will not throw the patient's head below his body.

A further object is to provide a tiltable support or bed so arranged that as the foot end of the support is swung to an upwardly inclined position, the head end will not be swung to a downwardly inclined position but will be resiliently maintained in a substantially horizontal position. It is also desired to provide a tiltable support in which the head and foot portions are moved in alignment except when the head portion is restrained by stop means from assuming a downwardly inclined position.

A further object is to provide an appliance which is easily adjustable to yield a desired movement and in which stop means for limiting the head movement may be utilized when desired by the operator.

In other appliances of this type whenever movement takes place to cause the patient's feet to be elevated, this movement also causes the patient's head to be lowered. In many cases the lowering of the patient's head below the rest of his body is not desired, and has been known to produce injurious results. Elevation of the feet and the lowering of the head produces an unnatural and extremely heavy blood pressure in the head, which is injurious to some types of patients.

I overcome this objection by providing a stop which will prevent the head portion of the device from being lowered below an approximately horizontal position while at the same time allowing the foot portion to be swung both above and below horizontal positions.

A preferred embodiment of my invention is illustrated in the accompanying drawings, in which:

Figure 1 is a view in side elevation of the device; Fig. 2, a plan view; and Fig. 3, a detail end view showing the head support member resting on the stop means.

As illustrated, A designates a base frame; B, a bed or patient support, including a head member and a foot member; C, mechanism for oscillating the patient support, and D, stop means for preventing the head member from moving below horizontal position.

The frame A may be of any suitable construction. As here shown, it includes the rigid side members 10 which are supported on casters 11 to enable the device to be easily moved about. In the upper ends of the sides is journaled a transverse shaft 12. The ends of shaft 12 may be journaled in any suitable bearings, such as those provided by bearing caps 13 bolted to the top of the frame.

The patient support B is illustrated as a substantially rectangular framework to which a spring structure or bed may be attached. For clearness of illustration, only the framework is here shown, it being understood that any suitable sort of spring or mattress structure may be attached thereto. The support comprises a foot member 14 which includes the side bars 15 and 16, and the cross bars 17 and 18. Bars 15 and 16 are provided with caps 19 and 20 by which they are secured to shaft 12. This member 14 may be rocked about shaft 12 and the end cross bar 18 moved through a relatively wide arc.

The end cross bar 18 is extended somewhat beyond the side bars 15 and 16 for convenience in attaching a bed or spring structure, and is provided with a retaining flange 21. Cross bar 17 is attached on the underside of the side bars 15 and 16 and has its ends extending beyond these bars to provide dogs 22 and 23 for engaging the head portion of the support. Firm rubber pads 24 may be secured to the top of dogs 22 and 23 if desired.

Support B comprises also a head member 25. Side bar 26 of this member is bearinged at its one end on shaft 12 between one of frame sides 10 and side bar 16 of foot member 14. Similarly side bar 27 of member 25 is bearinged on shaft 12 between frame side 10 and side bar 15. At their other ends, side bars 26 and 27 are attached to end piece 28, which is equipped with a retaining flange 29.

The side and cross bars of support B may be of any suitable material. It is suggested that the side bars be of channel irons, and the cross bars of angle irons, as such materials are readily available. Attachment may be made by the use of rivets extending through the bars.

A platform 30 is secured upon cross piece 31 of the base frame and serves as a support for

mechanism C. Driving mechanism C includes a housing 32 in which is journaled a cross shaft 33 equipped at each of its ends with disks 34. At the outer sides of disks 34 are swiveled sleeve wrist pins 35. Rods 36, extending longitudinally of the structure and through wrist pins 35, are fulcrumed on pivots 37 secured to housing 32, and are capable of rocking on their pivots with their inner end portions sliding in pins 35. The outer end portions of rods 36 are connected to the end portions of cross shaft 53 by means of toggle connections 38 and 39, which provide easy means of adjustment to change the points at which the rods 36 are secured to the cross shaft 53. A vertical connecting member 40 is attached centrally of cross shaft 53 and connects with rod 41 through an adjustable worm and wheel connection 42. Rod 41 is attached to a bar 54 having its ends pivoted in side members 15 and 16. An electric motor 43 is a convenient source of power and may have its shaft connected through a suitable gearing to drive the cross shaft 33 at a rather slow rate of speed. It has been found most desirable that the shaft 33 be driven at a rate of about one revolution every three or four minutes.

The stop means D comprises two upright pieces 45 and 46 which have their lower ends pivotally attached to the lower portions of the base sides 10. At their upper ends, pieces 45 and 46 are attached to a cross piece 47, to which is attached a spring 48 secured to cross piece 47 at its central portion by bolts 49. Spring 48 extends upwardly at each end and is provided at the top of its end portions with rubber pads 50. A pair of links 51 connects each of pieces 45 and 46 to base frame A. Links 51 serve to brace stop D in its vertical position and also may be folded to allow stop D to be turned into lowered or inoperative position, as shown in dotted lines in Fig. 1.

Operation

Actuated by motor 43 through its appropriate gearing, shaft 33 turns disks 34 and wrist pins 35 to rock rods 36 about pivots 37. This causes connecting member 42, rod 41, and consequently foot member 14 of support B to be raised and lowered. The dotted lines of Fig. 1 show rods 36 moved to a tilted position, and show the foot member 14 in a correspondingly tilted position.

The initial or starting inclination of support B may be varied by adjusting the worm and wheel connections 42 to either raise or lower foot member 14. The amplitude or range of movement may be varied by adjusting the toggle connections 38 and 39 to move cross shaft 53 longitudinally of rods 36.

When the stop means D is in folded or inoperative position, as shown by dotted lines in Fig. 1, the head and foot members of support B remain aligned and rock in unison about shaft 12, the weight of head member 25 serving to keep it always in engagement with dogs 22 and 23 of foot member 14. With the stop D in this position, the head member is free to be tilted either upwardly or downwardly from the horizontal, and a patient being treated may have his head thrown downwardly as well as upwardly.

When stop means D is pulled to its vertical or operative position, the links 51 become aligned and rigid, the shoulder 51^a on one link of each pair engaging the other link to lock them in rigid position. The vertical position of stop D is retained until an operator wishes to move it to inoperative position; this may be accomplished by

pressing upwardly on the central portion of links 51 to break their alignment and allow the stop to be turned forwardly.

Assuming that operation of the stop means is desired for keeping the patient's head from being thrown downward, the oscillating mechanism may be actuated as before and the foot member of support B given the same rocking action as before described. But in this case when the foot member is moved from a downwardly inclined position to a horizontal position, the head member 25 will contact the stop means D, the side bars 26 and 27 impinging against the rubber pads 50 on ends of spring 48. Further elevation of foot member 14 causes dogs 22 and 23 of foot member 14 to depart from the side bars 26 and 27 of head member 25, the head member remaining horizontal and resiliently supported by stop D. When the mechanism C moves to again lower foot member 14 to horizontal position, dogs 22 and 23 again engage the head member 25 and upon further lowering of the foot member cause the head member to be elevated to an upwardly inclined position.

An important advantage is gained in that the stop means is here so constructed as to provide a resilient engagement with the head member. Rubber pads 50 and spring 48 of stop D operate to relieve the sudden shock that would otherwise obtain were the head member allowed to engage the stop means suddenly and solidly. This structure, then, eliminates possible injury to the patient caused by sudden stopping or jarring of his head.

In addition to the improvement of the patient's blood circulation, this appliance is beneficial in providing a mild exercise for the patient's legs, for here the patient's legs are moved with respect to the trunk of his body. This feature is more valuable where the patient's condition does not permit him to walk.

If desired, this appliance may be adjusted so that the head member remains always supported by the stop means and only the foot member is moved by the driving mechanism. When so adjusted, the head of the patient may remain in fixed position while his feet are raised and lowered.

While in the foregoing description I have described specific structures in detail, it will be understood that many changes may be made in the construction without departing from the spirit of my invention.

The foregoing detailed description has been given for clearness of understanding only and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

I claim:

1. A therapeutic device comprising a frame, a patient support mounted in said frame and adapted to rock about a transverse axis, said support including a foot portion and a head portion, driving means for rocking said support about said axis, and stop means for engaging said head portion to limit its movement independently of said foot portion.

2. A therapeutic device comprising a frame, a patient support mounted in said frame and adapted to rock about a transverse axis, said support including a foot portion and a head portion in pivotal relation, means for rocking said support about said axis, and stop means for lim-

iting the movement of one portion of said support independently of the other portion.

3. An appliance of the character set forth comprising a frame, a patient support mounted in said frame and adapted to rock about a fixed axis, said support including a front portion and a head portion in pivotal relation, means for rocking said support about said axis, and stop means for arresting the movement of said head portion as it approaches horizontal position.

4. An appliance of the character set forth comprising a frame, a patient support pivotally mounted in said frame, said support including a foot member and a head member which is pivoted with respect to said foot member, said foot member being equipped with means for normally maintaining said members in alignment, and stop means for holding said head member in substantially horizontal position while said foot member is in an upwardly inclined position.

5. An appliance of the character set forth comprising a frame, a patient support pivotally mounted in said frame and adapted to rock about said pivotal mounting, said support including a foot member and a head member, said head member being pivoted with respect to said foot member and so engaged with said foot member as normally to rock in unison with said foot member, and stop means for resiliently engaging said head member to prevent its moving to a downwardly inclined position.

6. An appliance of the character set forth comprising a frame, a patient support pivotally mounted in said frame and adapted to rock about said pivotal mounting, said support including a foot member and a head member, said head member being pivoted with respect to said foot member and so engaged with said foot member as normally to rock in unison with said foot member, rotating driving means for rocking said support about its pivot, said driving means being connected to said foot member and arranged to swing said foot member to an upwardly inclined position, and stop means for maintaining said head member at a substantially horizontal position when said foot member is in an upwardly inclined position.

7. An appliance of the character set forth

comprising a frame, a patient support mounted in said frame and adapted to rock about a transverse axis, said support including a foot member and a head member, said head member being pivoted with respect to said foot member, means for rocking said support to swing its ends through relatively wide arcs, said means being adjustable to vary the initial tilt of the support and also to vary the number of degrees or range through which the support is rocked, and stop means for resiliently engaging said head member to prevent its moving to a downwardly inclined position, said stop means being movable to an inoperative position.

8. An appliance of the character set forth comprising a frame, a patient support mounted in said frame and adapted to rock about a transverse axis, said support including a foot member and a head member in pivotal relation, means for rocking said support about said axis, and stop means holding said head member in substantially horizontal position when said foot member is rocked to an upwardly inclined position, said stop means being equipped with means for resiliently engaging said head member to hold said member in substantially horizontal position and being readily movable into an inoperative position.

9. An appliance of the character set forth comprising a frame, a cross shaft mounted in said frame, a patient support mounted on said cross shaft, said support including a foot member and a head member in pivotal relation to each other, means engaging said foot member for rocking said support about said shaft, and stop means for limiting the movement of said head member.

10. An appliance of the character set forth comprising a frame, a cross shaft mounted in said frame, a patient support including a head member and a foot member each rockably mounted on said cross shaft, said foot member being equipped with dogs for engaging said head member to maintain said members in alignment while said foot member is moved to a downwardly inclined position, and stop means for resiliently engaging said head member to prevent its movement below a horizontal position.

FOSTER G. MCGAW.