

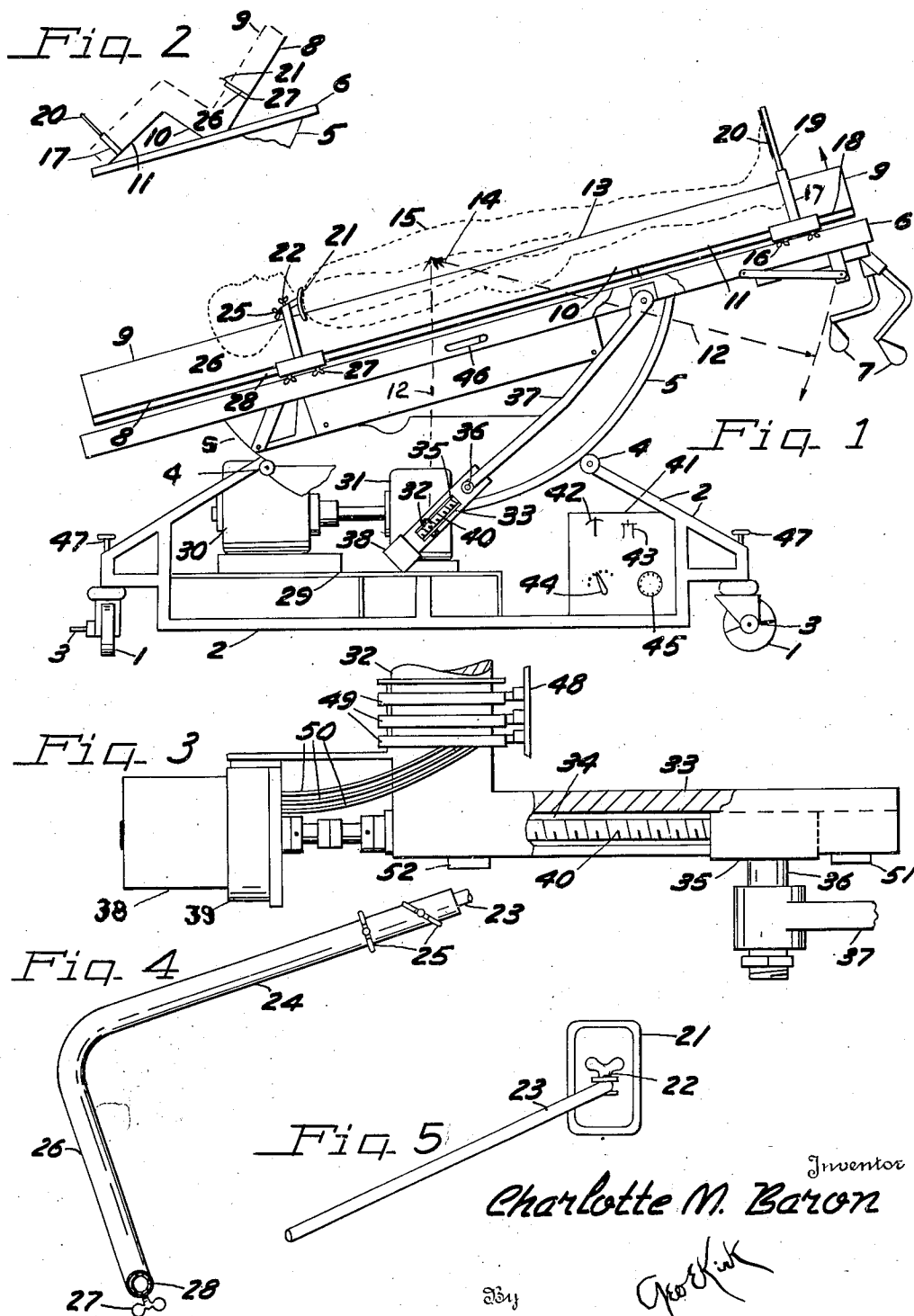
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EXERCISING HUMAN INTERNAL ORGANS

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EXERCISING HUMAN INTERNAL ORGANS

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This invention relates to establishing, developing and maintaining physical responses in an individual to approximate normal functioning. The direct action is evidenced in the promotion of respiration. However, values arise therefrom helpful to disturbed nervous conditions, as well as strengthening organs and muscles in healthful control.

This invention has utility when incorporated in a support for the torso, especially in a position for relaxation and rest. Nevertheless, movements or shiftings, at least for definite periods are developed in such harmony with a condition of quiet for the patient, or one undergoing treatment, that there seems to be supplemental ease. To this end, advantage is taken of the general location of the diaphragm having chest-ward therefrom the respiratory organs and circulatory system center, and the other way or toward the bowels, having the digestive organs of stomach and intestines. The general departure from non-rigid conditions for these organs has advantage taken thereof by the applicant. In standing or upright posture, the weight of the chest organs tends to depress the diaphragm and thus reduce the volume of the organs therebelow. Not necessarily to stand upon one's head, but to swing the head downward upon the hips as a pivot allows the weight of the stomach and intestines to act upon the diaphragm side to move it toward the lungs.

The diaphragm is located near the crest of the ilium. Applicant has taken this region as a fulcrum point. With an individual or patient placed comfortably upon a support, and tilted back and forth, say twenty-eight times per minute, the diaphragm may function as a sort of piston, for exhalation to occur at down position of the head and inhalation upon head rise. This makes, for the unaffected, breathing more easy than normal, while for one hurtfully away from normal respiration, there is provided a non-irritating gentle control, toward adding pleasure in the making of a life worth living.

Referring to the drawings:

Fig. 1 is a side elevation, in a tilt position, with parts broken away, of an embodiment of the invention in a bed or support, adapted to carry out the treatment of the invention of applicant;

Fig. 2 is a fragmentary diagrammatic showing of an adjusted position of the support away from having the lower limbs in the plane of the direction of the torso;

Fig. 3 is a detail view on an enlarged scale, and partially in section, of the adjustable crank hav-

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ing ranges of automatic control for rocking distance, frequency and intermissions;

Fig. 4 is a fragmentary detail, on an enlarged scale of the shoulder or arm rest mounting portion; and

Fig. 5 is the extension from the mounting portion of Fig. 4, adapted to carry terminally the shoulder engaging pad, when used for the patient in prone position; while at a sitting-up posture, the pad may be located as a comfort rest for the arm of the patient.

Swivel casters 1 support a frame 2 for ready shifting about over a floor. When the structure is brought to a position for rest, brake means 3 are set to preclude shifting. Four rollers 4 provide an anti-friction support for a pair of parallel arc regions 5, at the opposite sides of a bed frame 6. Mechanism operable from cranks 7 may thrust upward a section 8 for a desired sitting-up position of a patient upon a mattress 9. Operation of the other crank may move sections 10, 11, relatively to the frame 6 to raise the knees of the patient thereon. In the event the frame 6 be tilted to lower the foot portion 11, the bed portion 10 may approximate a seat similar to that of a chair.

The arc regions 5 have radius direction 12 extending above a top side 13 of the mattress 9 to an axis 14 at the crest of the ilium region of a patient or individual 15 on the mattress 9. In order to bring the patient 15 to this position for optimum result, wing nuts 16 may lock uprights 17 to a side rail tube section 18. Telescopically in the upright arms 17 extension rods 19 carry a plate or footboard 20. This footboard is adjusted to have the individual 15 so reclining prone on the mattress 9 that the crest of the ilium of the individual 15 is at the axis 14. At this position, the diaphragm of the patient 15 may act as a piston at this neutral point.

The patient 15 is kept from sliding lengthwise of the mattress 9 away from the footboard 20, by shoulder pads or rests 21. A wing screw set clamp 22 permits rocking of the pad 21 into a snug fitting position at the shoulder of the patient. From the offset carrying the pad 21, there is a rod 23 telescopically adjustable in an overhanging arm 24, adapted to be locked by wing screws 25. From the arm 24 is a portion 26 terminating in a clamp set screw 27 adapted to hold with a frame tube section 28. The upward or downward tilt direction of the sleeve portion 24 for locating the pad 21 at a desired distance away from the frame 6, is achieved by rocking the upright 26 out or in away from vertical.

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The range of this adjustment for the pad 21 lends to its field of use for an arm rest, when the patient be in sitting up position, then there is not necessity for holding the shoulder toward the footrest. The shoulder pad 21, at its position for such use may be snugly set to approach even relation across the bed, and aid the patient in taking a correct posture.

For children or persons of different stature, the footrest and shoulder pads, have range for bringing the crest of the ilium to the axis 14. The mattress is adjusted or selected to conform to this condition, even for use with infants. The patient is fully exposed at all times for own convenience and accessibility for nurse attention.

A deck 29 in the frame 2 mounts a motor 30 to a variable speed transmission in a housing 31, from which a reduced speed shaft 32 protrudes. The shaft 32 has a crank arm 33 with a slideway 34 therein for a wristpin or crank pin carrying block 35. A crank pin 36 from the block 35 has a link 37 therefrom to a mid pivot connection between the sides of the frame 6. The axis of the shaft 32 is directly below the axis 14. This means that the rotation of the crank arm 33 determines rocking up and down symmetrically at the opposite sides of the axis 14.

The extent of the rocking desirably may be in the range of say 15° or even 20° away from horizontal each way. Reduction of this rocking extent is controlled with the support in operation, thru a motor 38 connected thru a speed reduction 39 to a screw 40 along the crank arm 33 and in the guide 34 upon which the block 35 moves as a nut. A control panel 41 has control means 42 for operating the motor 38 in either direction and for limited operation extent. The control means 42 may be specific to bring the support to a horizontal position, with the motor 30 still running. Adjustment of the means 42 one way therefrom may operate the motor 38 to a stop position say at 10° rocking each way from a horizontal. A control 43 will start or stop the motor 30. A further control 44 determines the rotations per minute of the shaft 32, say in the range of from 15 to 40. Intermission control means 45 serves to time the cutting out of the motor 30. Thereby there is provided non-rocking periods. Preferably there is a leveling means switch 46 to bring the support to horizontal position at a cessation of rocking interval. This has automatic value in establishing confidence in the patient. Even one afflicted with deficient respiratory control, has a build up unconsciously of normal breathing as developed from the diaphragm pumping operation. With such developed at the normal respiration rate, the organs are educated to keep on at the non-rocking interval. The automatic control 45 may determine the quiet periods from a minute or more every 10 or 15 minutes, up to a major stop periods.

The general dimension of the support or bed and base may be standard for adults and youth, while for minors of less stature and infants, a considerably smaller unit may be adopted, with advantages for more ready placement. As the unit is brought to location for attention, the footbrake 3 across the caster axle, depressible at one side for locking and the other side for release, may be stepped on for the locking. The bed or unit is thus anchored readily in position for installing a patient thereon, or locating the unit against casual shifting. The electrical connections may be from a wall or floor outlet, say for 60 cycle 110 volt current. Manually caster

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adjustment means 47 may be checked at the liquid level 46.

The throw or rock adjustment is thru the control 42. The electric power current is supplied thru brushes 48 to slip rings 49 on the shaft 32. Conductor lines 50 from the slip rings 49 to the motor 38 provide reversal driving therefrom to the screw 40, as well as stop. The speed reduction transmission 39 may be, say 45:1 for around 72 R. P. M. drive for the screw 40. From a central or off position, the control 42 may be thrown to the right to cause the screw 40 to move the block 35 outward, in effecting greater rock for the bed of support. As the desired angle is reached, the control 42 may be brought to the mid off position. The angle of friction of the screw 40 holds the block 35 to maintain this range of rocking. In the event the outward throw holding of the control 42 takes the block 35 to its outer limit, a switch 51 provides an automatic cut out. For shortening the angle or rocking, the control 42 is shifted to the left or counterclockwise until the desired stroke shortening occurs, from the opposite direction of rotation for the motor 38 in pulling the block 35 inward for shorter circle radius of operation. Upon the desired lesser rocking angle for the bed being reached, the control 42 is brought to center to cut off the motor 38. Excess shortening distance causes the block 35 to operate a cut out switch 52 at no rock throw for the bed. The bed is thus brought to level.

The control 44 is effective thru the variable speed transmission 39. The manual adjustment here determines the number of oscillations or rockings per minute to be given the bed. The rate may be sub-normal, normal, or beyond, as occasion may arise wherein it be deemed benefit may be derived therefrom. At whatever rate the control 44 be set, such is maintained as a uniform frequency, whether the rocking be thru a wide or narrow angle. As in most cases the purpose be to adjust the patient to comfort activity, the respiration rate as proper for such individual is adopted for the control 44, which in practice may have graduations to show the rate per minute.

The liquid level 46 may advantageously be a mercury switch type with which the control 45 is interconnected. The control 45 may be of a range to have stop periods of say from ¼ min. up to 59 min. per hour. To carry out this program this unit may be of the type of General Electric Co. TSA-10 timer. This is an important factor in the educational program for the patient, automatically coming and going, and thereby not one of annoyance. In so happening, it may not even be detected at once or at all times by the patient. Therefrom, unconsciously the patient may step into usual normal healthful breathing practice. A step to this end, is in having the stop interval considerably minor as to the rocking, say off for one minute in five or ten. At all non-rocking intervals, the intercontrol with the switch 46 has the non-rock position horizontal. There is thus no diaphragm load strain either way to affect the lung inflation and deflation. When the patient begins to realize ability to respire on one's own, a confidence is established, not only for the bed, but by the individual as really going somewhere along the highway of mending physique. The course then of cooperation is at what intervals and for how much longer the non-rock opportunities may be made helpfully available for the convalescent. With the patient thus out-in-

the-open, tryouts are next in order to be clear of the bed. Treatments of ones afflicted with infantile paralysis or poliomyelitis have brought commendable results in getting the patients back on their own.

What is claimed and it is desired to secure by Letters Patent is:

1. Counter atrophy apparatus for internal organs of a human being animate torso, comprising a normally horizontal support of prone length of the torso, a mounting for the support upon which the support is mounted for oscillation about a horizontal axis above the level of the support to provide a substantially neutral non-oscillatable region at approximately the crest of the ilium of a torso located on the support, an actuator coacting between the mounting and the support for oscillating the support less than quadrant angles away from said normal horizontal plane of the support, a rate controller connected with the actuator for controlling the frequency of oscillation, and a regulator connected with the rate controller to modify the extent of oscillation.

2. Breathing cycle promotion equipment for inciting the diaphragm of human beings to act as a pump, said equipment including a normally horizontally extending support, a base, a mounting connection between the support and base including bearing means for the support oscillation about a horizontal axis above the level of the support to provide a substantially neutral non-oscillatable region at approximately the crest of the ilium of a human being located prone on the support, adjustable foot and shoulder means for the human being to hold the human being from shifting away from said axis region for the ilium, an actuator coacting between the base and the support for oscillating the support in a range up to 20° each way away from said normal horizontal plane of the support, a rate controller connected with the actuator for controlling the frequency of oscillation, and an intermission device coacting with the controller and including a stop for the support at horizontal position for the support for undisturbed normal action by the diaphragm of the human being on the support at said neutral region axis.

3. Respiration educational apparatus comprising a bed, a mattress cushion on the bed, a base, a mounting connection between the bed and base including bearing means for the bed oscillation about a horizontal axis above the level of the bed to provide a substantially neutral non-oscillatable region at approximately the crest of the ilium of a human being located prone on the bed cushion, said mounting connection for the bed being

downward from horizontal plane position of the bed to leave full lateral clearway for access by an attendant to the human being on the bed, an actuator coacting between the base and the bed for oscillating the bed head end to move downward an equal distance as upward from a horizontal plane thru said axis in providing an oscillation cycle for the bed, a rate controller connected with the actuator for controlling the frequency of said cycles to approximate a breathing cycle for the human being on the bed, and a regulator connected with the rate controller including adjustment means for progressively reducing the oscillations of the bed toward bed quiescent condition in a horizontal plane.

4. Apparatus for exercising human being internal organs comprising a normally horizontal support of prone length of the human being, a base, a mounting connection between the support and base including bearing means for the support oscillation about a horizontal axis above the level of the support to provide a substantially neutral non-oscillatable region at approximately the crest of the ilium of a human being on the support, an actuator coacting between the base and support for oscillating the support, said actuator including a drive shaft having an axis fixed with the base, parallel to said horizontal axis and in a vertical plane therewith, and a link connection between the shaft and the support, adjustment means for varying the throw length effectiveness for the link to change the extent of oscillation for the support uniformly as away from horizontal for the support, and additional adjustment means for varying the speed of rotation of said shaft.

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