

June 22, 1954

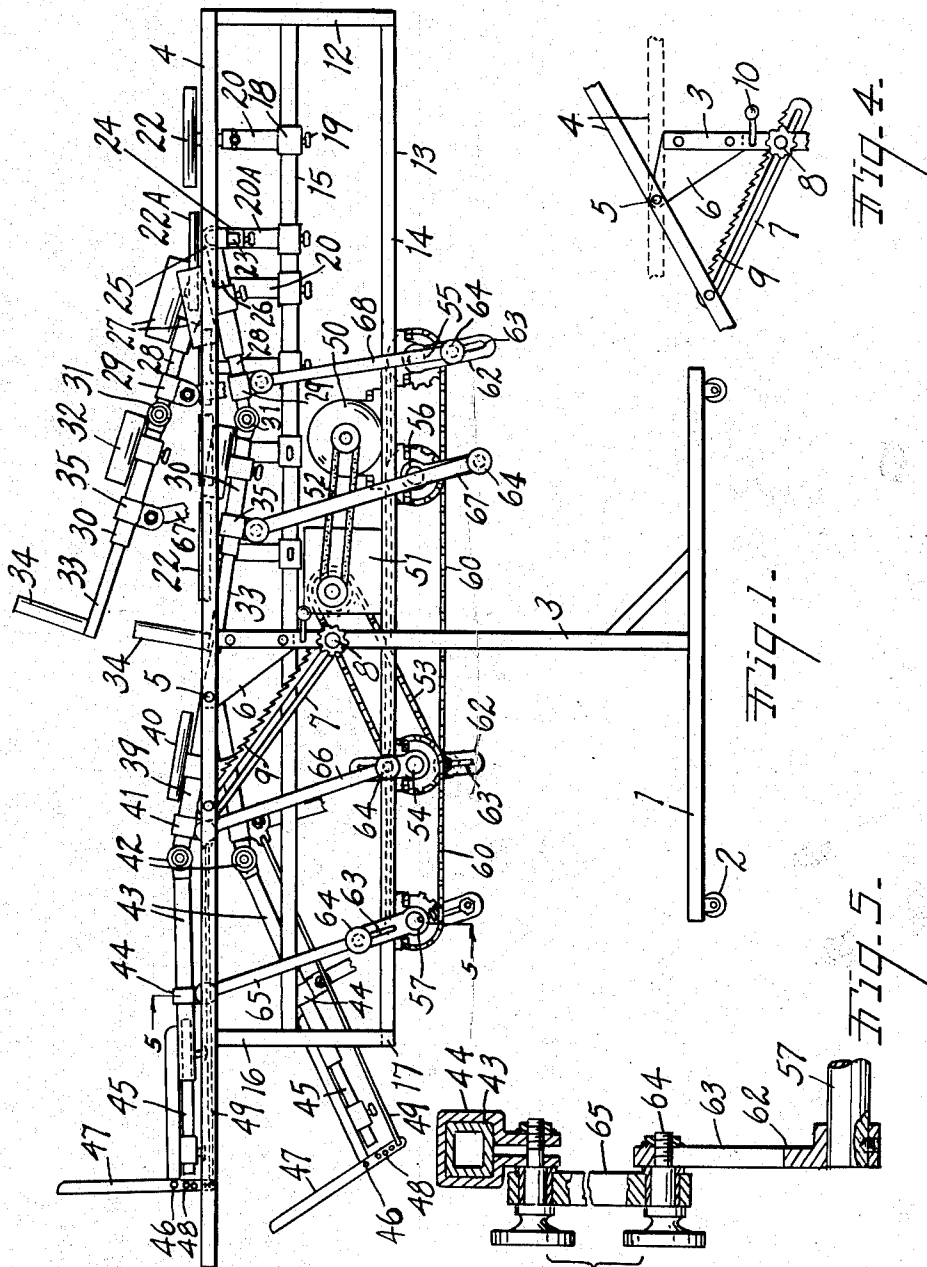
R. B. GOSS

2,681,650

MUSCULAR TREATMENT DEVICE

Filed July 30, 1953

3 Sheets-Sheet 1



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June 22, 1954

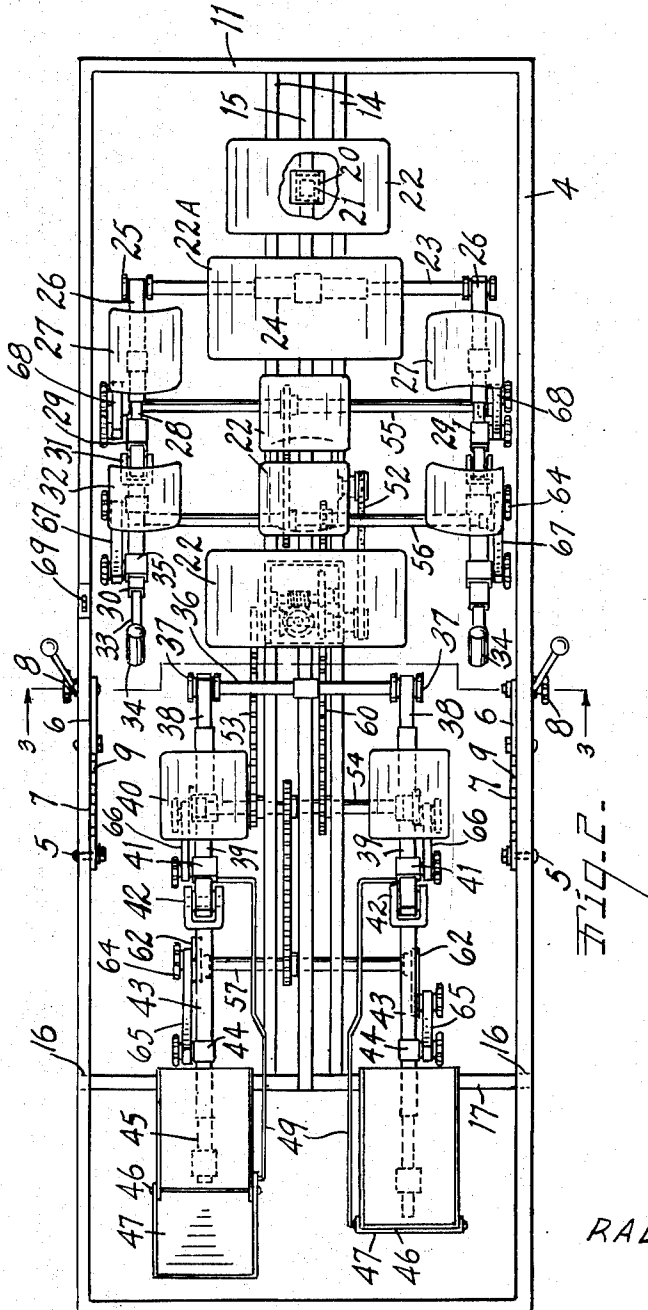
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MUSCULAR TREATMENT DEVICE

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3 Sheets-Sheet 2



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MUSCULAR TREATMENT DEVICE

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3 Sheets-Sheet 3

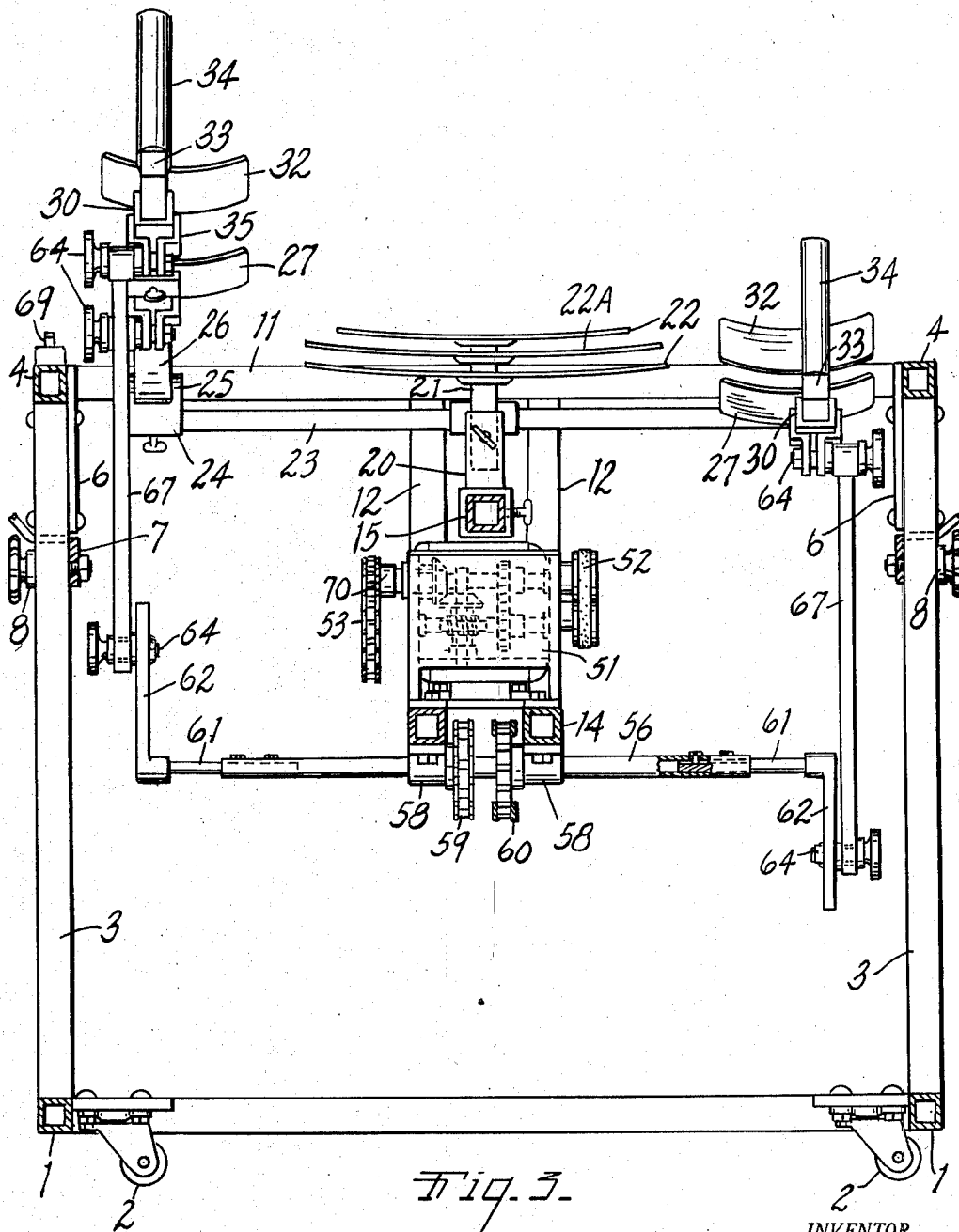


Fig. 3.

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MUSCULAR TREATMENT DEVICE

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Application July 30, 1953, Serial No. 371,266

18 Claims. (Cl. 128—33)

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This invention relates to improvements in a muscular treatment device. The principal objects of this invention are:

First, to provide a device designed primarily for the treatment of patients suffering from polio to manipulate the limbs of the patient by power operated means.

Second, to provide a treatment device which simulates the natural motion of walking and swinging the arms by power driven means so that a patient on the device will perform these motions even though lacking the strength and muscular control to perform the same for himself.

Third, to provide a treatment device that is adjustable to operate with the patient in prone or upright, or inclined, positions.

Fourth, to provide a device for moving the arms and legs of a patient, which device is readily adjustable to accommodate patients of different stature.

Fifth, to provide a mechanical treatment device for moving the arms and legs of a patient in varying degrees of movement.

Other objects and advantages of the invention will be apparent from a consideration of the following description and claims. The drawings, of which there are three sheets, illustrate a highly practical form of the treatment device.

Fig. 1 is a side elevational view of the device.

Fig. 2 is a plan view of the device.

Fig. 3 is a transverse vertical cross sectional view taken along the plane of the line 3—3 in Fig. 2 and looking in the direction of the arrows.

Fig. 4 is a fragmentary side elevational view of a portion of the frame of the device illustrating adjustment of the frame to inclined position.

Fig. 5 is a fragmentary cross sectional view through one of the operating cranks and connecting rods of the device taken along the plane of the line 5—5 in Fig. 1.

As is indicated in the objects, the invention comprises structure for movably supporting the arms and legs of a patient. Support for the body of the patient is also provided. The device includes generally a base 1 which is desirably rendered mobile by the casters 2. A pair of uprights 3 extend above the base and support a generally rectangular frame 4. The frame 4 is pivotally connected at 5 to triangular plates 6 secured to the upper ends of the uprights. A brace bar 7 extends adjustably between each side of the frame and a clamp 8 on the uprights to hold the frame in angularly adjusted positions as is apparent from a consideration of Figs. 1 and 4. Desirably

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one edge of the brace is toothed as at 9 to coact with a locking pawl connected to the handle 10.

Connected to the top or head cross bar 11 of the frame 4 are depending hangers 12 which support the upper ends of a mechanism frame 13 below the level of the main frame 4. The mechanism frame 13 includes longitudinally extending transversely spaced lower rails 14 and a longitudinally extending body support rail 15 positioned between the rails 14 and the frame 4. The lower or foot end of the mechanism frame is connected to lower hangers 16 and a lower cross bar 17. The lower hangers 16 are secured to the sides of the main frame 4 in spaced relationship from the lower end of the main frame.

Longitudinally adjustably mounted on the body support rail 15 are a plurality of collars 18 which can be clamped in position by thumb screws 19. Each of the collars 18 carries an upright column 20 having a telescopically adjustable upper end 21. The upper ends of the columns carry body support plates 22 that may thus be adjusted longitudinally and vertically to support the head, shoulders, back and hips of a patient. One of the collars, 20-A, carries a transversely extending bar 23 that is positioned just below the level of the main frame 4 and under the shoulder support plate 22-A. The ends of the transverse bar 23 are provided with laterally adjustable couplings 24 having shoulder pivots 25 thereon. Pivotally secured to the shoulder pivots 25 are upper arm rods 26 having arm support plates 27 longitudinally adjustable thereon. The upper arm rods 26 have telescopically and longitudinally adjustable lower ends 28 provided with coupling sleeves 29. Lower arm rods 30 are connected to the rods 28 by elbow pivots 31 and are provided with longitudinally adjustable lower arm support plates 32. The lower arm rods 30 have telescopically and longitudinally adjustable lower ends 33 with hand grips 34 thereon. Coupling sleeves 35 are also provided on the lower arm rods below the pivots 31.

A second transverse bar 36 (see Fig. 2) is secured to the body support rail 15 near the mid-section thereof. The bar 36 carries hip pivots 37 at its ends and hip rods 38 have their upper ends connected to these pivots. The hip rods 38 have longitudinally and telescopically adjustable lower end portions 39 with hip support plates 40 adjustable thereon. The lower end portions 39 of the hip rods are further provided with coupling sleeves 41 and knee pivots 42. Lower leg rods 43 have their upper ends connected to the pivots 42 and are provided with coupling sleeves

44. Lower telescopically extensible extensions 45 on the leg rods are pivotally connected at 46 to foot plates 47 extending angularly from the lower leg rods. The foot plates 47 have rearwardly extending arms 48 with a series of holes therein adapted to selectively receive the lower end of a link 49 that extends upwardly to the coupling sleeve 41 on the hip rod.

In order to control the motion of the several arm and leg rods just described, the lower rails 14 of the mechanism frame support an electric motor 50 and a gear box or transmission 51. The transmission 51 is driven from the motor by a belt 52 and has an output shaft connected by the chain 53 to a first crank shaft 54 rotatably mounted below the hip rods 39 on the mechanism frame. An upper arm actuating crank shaft 55 and a lower arm actuating crank shaft 56 and a lower leg actuating crank shaft 57 are similarly mounted in spaced relationship along the mechanism frame by means of a bearing 58 best illustrated in Fig. 3. The several crank shafts are provided with sprockets 59 and are interconnected for simultaneous rotation by chains 60.

The several crank shafts 54, 55, 56 and 57 are provided with adjustably extensible end portions 61 (see Fig. 3) having crank arms 62 on their outer ends. The crank arms on each crank shaft are disposed angularly oppositely and are slotted as at 63 to adjustably receive crank pins 64 on the lower ends of connecting rods 65, 66, 67 and 68. The connecting rods 65 connect the lower leg actuating crank shaft 57 with the coupling sleeves 44 on the lower leg rods 43. The connecting rods 66 connect the hip actuating crank shaft 54 with the coupling sleeves 41 on the hip rods 39. The connecting rods 67 connect the lower arm actuating crank shaft 56 with the coupling sleeves 35 on the lower arm rods 36. The connecting rods 68 connect the upper arm actuating crank shaft 55 with the coupling sleeves 29 on the upper arm rods 28.

A switch 69 is electrically connected to control the motor 50 and is positioned on one of the side rails of the main frame 4 adjacent the position of the patient's hand. Desirably the driving connection between the transmission 51 and the chain 53 includes an overrunning clutch 70 (see Fig. 3) so that the patient may operate the mechanism independently of and faster than the transmission when the patient acquires sufficient strength to thus move his limbs independently of the motor for short periods of time.

From a consideration of the foregoing description it should be apparent that a patient positioned on the device with his body supported by the body plates 22 and with his limbs supported on the arm and leg plates will have his arms and legs moved in natural walking and arm-swinging motion by operation of the motor 50. The arm and leg rods oscillate oppositely. That is, the right leg and left arm move downwardly while the left leg and right arm move upwardly. The magnitude of the motion can be adjusted to suit the patient's needs by adjusting the crank pin connections in the slots 63 of the crank arms. The connection of the link 49 between the hip rod and foot plate of each leg support causes the foot to bend downwardly and flex the ankle joint as the leg is lowered. The device will thus simulate substantially all the motions of the human body in walking so that a severely paralyzed patient can have his muscles repeatedly flexed in this way without effort as an aid to restoring the muscles and muscular control. It will be understood that

the several support plates can be suitably padded and that the various parts of the patient's body can be tied or strapped to the device as is necessary. When the condition of the patient warrants it, the frame 4 can be tilted to inclined or upright positions as previously mentioned. When desired this tilting adjustment may be used to position the legs in a bath or tank of water.

Various modifications and adjustments of the device illustrated may be made without departing from the spirit and theory of the invention as defined in the following claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A treatment device comprising, a base, spaced uprights on said base, a frame tiltably supported at its mid-section between said uprights, a mechanism frame including a body support rail supported longitudinally below said first frame and tiltable therewith, a plurality of upright columns adjustably secured to said rail at longitudinally adjustable positions thereon, body support plates vertically adjustably secured to the tops of said columns, a transverse bar secured to one of said columns and adjustable longitudinally of said rail therewith, shoulder pivots on the ends of said transverse bar, upper arm rods pivoted to said shoulder pivots and swingable in longitudinal vertical planes, elbow pivots longitudinally adjustably connected to the ends of said upper arm rods, lower arm rods pivoted to said elbow pivots and swingable in vertical longitudinal planes, hand grips on the swinging ends of said lower arm rods, a second transverse bar secured to said rail near the mid-section thereof and towards the foot thereof from said columns, hip pivots on the ends of said second bar, hip rods pivoted on said hip pivots and swingable in vertical longitudinal planes, knee pivots longitudinally adjustably mounted on the swinging ends of said hip rods, leg rods pivotally connected to said knee pivots and swingable in vertical longitudinal planes, foot plates longitudinally adjustably and pivotally mounted on the swinging ends of said leg rods and projecting at an angle thereupon, links connecting each foot plate with its associated hip rod and adjustably connected at variable distances from the knee pivot and the pivotal connection of the foot plate on the opposite side thereof from the foot plate, a motor and connected gear box on said mechanism frame, four transverse crank shafts mounted on said mechanism frame at longitudinally spaced points, means connecting said shafts to said gear box for simultaneous rotation by said motor, said shafts having oppositely disposed throws, an overrunning clutch in said connecting means between said gear box and said shafts, longitudinally adjustable connecting rods connected to said throws at radially adjustable points, the connecting rods from one shaft being connected to said leg rods at longitudinally adjustable positions therealong, the connecting rods from another of said shafts being connected to said hip rods at variable distances from said knee pivots, the connecting rods from another of said shafts being connected to said lower arm rods at longitudinally adjustable positions thereon, the connecting rods from the last of said shafts being connected to said upper arm rods at variable distances from said elbow pivots, the throws on said shafts being angularly disposed so that the leg rods on one side and the arm rods on the other side are elevated simultaneously.

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2. A treatment device comprising, a base, spaced uprights on said base, a frame tiltably supported at its mid-section between said uprights, a mechanism frame including a body support rail supported longitudinally below said first frame and tiltably therewith, a plurality of upright columns adjustably secured to said rail at longitudinally adjustable positions thereon, body support plates vertically adjustably secured to the tops of said columns, a transverse bar adjustable longitudinally of said rail, shoulder pivots on the ends of said transverse bar, upper arm rods pivoted to said shoulder pivots, elbow pivots longitudinally adjustably connected to the ends of said upper arm rods, lower arm rods pivoted to said elbow pivots, a second transverse bar secured to said rail near the mid-section thereof, hip pivots on the ends of said second bar, hip rods pivoted on said hip pivots and swingable in vertical longitudinal planes, knee pivots longitudinally adjustably mounted on the swinging ends of said hip rods, leg rods pivotally connected to said knee pivots and swingable in vertical longitudinal planes, foot plates longitudinally adjustably and pivotally mounted on the swinging ends of said leg rods and projecting at an angle therefrom, a motor and connected gear box on said mechanism frame, four transverse crank shafts mounted on said mechanism frame at longitudinally spaced points, means connecting said shafts to said gear box for simultaneous rotation by said motor, said shafts having oppositely disposed throws, connecting rods connected to said throws at radially adjustable points, the connecting rods from one shaft being connected to said leg rods, the connecting rods from another of said shafts being connected to said hip rods, the connecting rods from another of said shafts being connected to said lower arm rods, the connecting rods from the last of said shafts being connected to said upper arm rods, the throws on said shafts being angularly disposed so that the leg rods on one side and the arm rods on the other side are elevated simultaneously.

3. A treatment device comprising, a base, spaced uprights on said base, a frame tiltably supported at its mid-section between said uprights, a mechanism frame including a body support rail supported longitudinally below said first frame and tiltably therewith, a body support plate secured to said rail over the upper end thereof, a transverse bar adjustable longitudinally of said rail near the upper end thereof, shoulder pivots on the ends of said transverse bar, upper arm rods pivoted to said shoulder pivots, elbow pivots longitudinally adjustably connected to the ends of said upper arm rods, lower arm rods pivoted to said elbow pivots, a second transverse bar carried by said rail near the mid-section thereof, hip pivots on the ends of said second bar, hip rods pivoted on said hip pivots and swingable in vertical longitudinal planes, knee pivots longitudinally adjustably mounted on the swinging ends of said hip rods, leg rods pivotally connected to said knee pivots and swingable in vertical longitudinal planes, foot plates longitudinally adjustably and pivotally mounted on the swinging ends of said leg rods and projecting at an angle therefrom, a motor and connected gear box on said mechanism frame, four transverse crank shafts mounted on said mechanism frame at longitudinally spaced points, means connecting said shafts to said gear box for simultaneous rotation by said motor, said shafts having oppositely disposed throws, and connecting rods connected to said

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throws at radially adjustable points, the connecting rods from one shaft being connected to said leg rods, the connecting rods from another of said shafts being connected to said hip rods, the connecting rods from another of said shafts being connected to said lower arm rods, the connecting rods from the last of said shafts being connected to said upper arm rods, the throws on said shafts being angularly disposed so that the leg rods on one side and the arm rods on the other side are elevated simultaneously.

4. A treatment device comprising, a base, spaced uprights on said base, a frame tiltably supported at its mid-section between said uprights, a mechanism frame including a body support rail supported longitudinally below said first frame and tiltably therewith, a body support plate secured to said rail over the upper end thereof, a transverse bar adjustable longitudinally of said rail near the upper end thereof, shoulder pivots on the ends of said transverse bar, upper arm rods pivoted to said shoulder pivots, elbow pivots connected to the ends of said upper arm rods, lower arm rods pivoted to said elbow pivots, a second transverse bar carried by said rail near the mid-section thereof, hip pivots on the ends of said second bar, hip rods pivoted on said hip pivots and swingable in vertical longitudinal planes, knee pivots mounted on the swinging ends of said hip rods, leg rods pivotally connected to said knee pivots and swingable in vertical longitudinal planes, foot plates mounted on the swinging ends of said leg rods and projecting at an angle therefrom, a motor and connected gear box on said mechanism frame, four transverse crank shafts mounted on said mechanism frame at longitudinally spaced points, means connecting said shafts to said gear box for simultaneous rotation by said motor, and connecting rods connected to said throws at radially adjustable points, the connecting rods from one shaft being connected to said leg rods, the connecting rods from another of said shafts being connected to said hip rods, the connecting rods from another of said shafts being connected to said lower arm rods, the connecting rods from the last of said shafts being connected to said upper arm rods.

5. A treatment device comprising, a base, spaced uprights on said base, a frame tiltably supported at its mid-section between said uprights, a body support plate secured to said frame, a transverse bar carried by said frame, shoulder pivots on the ends of said transverse bar, upper arm rods pivoted to said shoulder pivots, elbow pivots connected to the ends of said upper arm rods, lower arm rods pivoted to said elbow pivots, a second transverse bar secured to said frame near the mid-section thereof, hip pivots on the ends of said second bar, hip rods pivoted on said hip pivots, knee pivots mounted on the swinging ends of said hip rods, leg rods pivotally connected to said knee pivots, foot plates mounted on the swinging ends of said leg rods and projecting at an angle therefrom, a motor and connected gear box on said frame, four transverse crank shafts mounted on said frame at longitudinally spaced points, means connecting said shafts to said gear box for simultaneous rotation by said motor, and connecting rods connected to said shafts at radially adjustable points, the connecting rods from one shaft being connected to said leg rods, the connecting rods from another of said shafts being connected to said hip rods, the connecting rods from another of said shafts being connected to said lower arm rods, the connecting rods from the last of said shafts being connected to said upper arm rods.

shafts being connected to said lower arm rods, the connecting rods from the last of said shafts being connected to said upper arm rods, the throws on said shafts being angularly disposed so that the leg rods on one side and the arm rods on the other side are elevated simultaneously.

6. A treatment device comprising, a base, a frame supported on said base, a body support plate secured to said frame, a transverse bar carried by said frame, shoulder pivots on the ends of said transverse bar, upper arm rods pivoted to said shoulder pivots, elbow pivots connected to the ends of said upper arm rods, lower arm rods pivoted to said elbow pivots, a second transverse bar secured to said frame near the mid-section thereof, hip pivots on the ends of said second bar, hip rods pivoted on said hip pivots, knee pivots on the swinging ends of said hip rods, leg rods pivotally connected to said knee pivots, foot plates mounted on the swinging ends of said leg rods and projecting at an angle therefrom, a motor and connected gear box on said frame, four transverse crank shafts mounted on said frame at longitudinally spaced points, means connecting said shafts to said gear box for simultaneous rotation by said motor, and connecting rods connected to said crank shafts at radially adjustable points, the connecting rods from one shaft being connected to said leg rods, the connecting rods from another of said shafts being connected to said hip rods, the connecting rods from another of said shafts being connected to said lower arm rods, the connecting rods from the last of said shafts being connected to said upper arm rods.

7. A treatment device comprising, a base, spaced uprights on said base, a frame tiltably supported at its mid-section between said uprights, a body support rail supported longitudinally below said frame and tiltably therewith, a plurality of upright columns adjustably secured to said rail at longitudinally adjustable positions thereon, body support plates vertically adjustably secured to the tops of said columns, a transverse bar carried by and adjustable longitudinally of said rail, shoulder pivots on the ends of said transverse bar, upper arm rods pivoted to said shoulder pivots, elbow pivots longitudinally adjustably connected to the ends of said upper arm rods, lower arm rods pivoted to said elbow pivots, hand grips on the swinging ends of said lower arm rods, a second transverse bar secured to said rail near the mid-section thereof, hip pivots on the ends of said second bar, hip rods pivoted on said hip pivots, knee pivots longitudinally adjustably mounted on the swinging ends of said hip rods, leg rods pivotally connected to said knee pivots, foot plates longitudinally adjustably mounted on the swinging ends of said leg rods and projecting at an angle therefrom, a motor and connected gear box on said frame, four transverse crank shafts mounted on said frame at longitudinally spaced points, means connecting said shafts to said gear box for simultaneous rotation by said motor, said shafts having oppositely disposed throws, an over running clutch in said connecting means between said gear box and said shafts, and connecting rods connected to said throws at radially adjustable points, the connecting rods from one shaft being connected to said leg rods, the connecting rods from another of said shafts being connected to said hip rods, the connecting rods from another of said shafts being connected to said lower arm

rods, the connecting rods from the last of said shafts being connected to said upper arm rods.

8. A treatment device comprising, a base, spaced uprights on said base, a frame tiltably supported at its mid-section between said uprights, a body support rail supported longitudinally below said frame and tiltably therewith, a plurality of upright columns adjustably secured to said rail at longitudinally adjustable positions thereon, body support plates secured to the tops of said columns, a transverse bar carried by and adjustable longitudinally of said rail, shoulder pivots on the ends of said transverse bar, upper arm rods pivoted on said shoulder pivots, elbow pivots connected to the ends of said upper arm rods, lower arm rods pivoted to said elbow pivots, a second transverse bar secured to said rail near the mid-section thereof, hip pivots on the ends of said second bar, hip rods pivoted on said hip pivots, knee pivots mounted on the swinging ends of said hip rods, leg rods pivotally connected to said knee pivots, foot plates mounted on the swinging ends of said leg rods and projecting at an angle therefrom, a motor and connected gear box on said frame, four transverse crank shafts mounted on said frame at longitudinally spaced points, means connecting said shafts to said gear box for simultaneous rotation by said motor, and connecting rods connected to said crank shafts, the connecting rods from one shaft being connected to said leg rods, the connecting rods from another of said shafts being connected to said hip rods, the connecting rods from another of said shafts being connected to said lower arm rods, the connecting rods from the last of said shafts being connected to said upper arm rods.

9. A treatment device comprising, a body support, hinged arm and leg supports pivotally connected to said body support at longitudinally spaced and relatively adjustable positions and swingable in longitudinal planes parallel to the body support, connecting rods connected to the upper and lower portions of said hinged arm and leg supports, a plurality of crank shafts rotatably mounted on said device and connected to separately and variably oscillate the connecting rods, the crank shafts having oppositely extending crank arms connected to the connecting rods of opposite arm and leg supports, and a motor connected to simultaneously rotate said crank shafts.

10. A treatment device, comprising, a body support, hinged arm and leg supports pivotally connected to said body support at longitudinally spaced and relatively adjustable positions and swingable in longitudinal planes parallel to the body support, connecting rods connected to the upper and lower portions of said hinged arm and leg supports, a plurality of crank shafts rotatably mounted on said device and connected to separately oscillate the connecting rods, and a motor connected to simultaneously rotate said crank shafts.

11. A treatment device comprising, a body support, hinged arm and leg supports pivotally connected to said body support at longitudinally spaced positions and swingable transversely of the plane of the body support, connecting rods connected to the upper and lower portions of said hinged arm and leg supports, a plurality of crank shafts rotatably mounted on said device and adjustably connected to oscillate the connecting rods, and a motor connected to simultaneously rotate said crank shafts.

12. A treatment device comprising, a body sup-

port, longitudinally adjustable hinged arm and leg supports pivotally connected to said body support at longitudinally spaced positions and swingable transversely of the plane of the body support, connecting rods connected to the upper and lower portions of said hinged arm and leg supports, a plurality of crank shafts rotatably mounted on said device and adjustably connected to variably oscillate the connecting rods, and a motor connected to simultaneously rotate said crank shafts.

13. A treatment device comprising, a base, spaced uprights on said base, a frame tiltably supported at its mid-section between said uprights, a body support plate secured to said frame, a transverse bar carried by said frame, shoulder pivots on the ends of said transverse bar, upper arm rods pivoted to said shoulder pivots, elbow pivots connected to the ends of said upper arm rods, lower arm rods pivoted to said elbow pivots, a motor and connected gear box on said frame, transverse crank shafts mounted on said frame at longitudinally spaced points, means connecting said shafts to said gear box for simultaneous rotation by said motor, and connecting rods connected to said shafts at radially adjustable points, the connecting rods from one of said shafts being connected to said lower arm rods, the connecting rods from the other of said shafts being connected to said upper arm rods.

14. A treatment device comprising, a base, spaced uprights on said base, a frame tiltably supported at its mid-section between said uprights, a body support plate secured to said frame, a transverse bar secured to said frame near the mid-section thereof, hip pivots on the ends of said bar, hip rods pivoted on said hip pivots, knee pivots mounted on the swinging ends of said hip rods, leg rods pivotally connected to said knee pivots, a motor and connected gear box on said frame, transverse crank shafts mounted on said frame at longitudinally spaced points, means connecting said shafts to said gear box for simultaneous rotation by said motor, and connecting rods connected to said shafts at radially adjustable points, the connecting rods from one shaft being connected to said leg rods, the connecting rods from another of said shafts being connected to said hip rods.

15. A treatment device comprising, a base, spaced uprights on said base, a frame tiltably supported at its mid-section between said uprights, a body support plate secured to said frame, a transverse bar carried by said frame, shoulder pivots on the ends of said transverse bar, upper arm rods pivoted to said shoulder pivots, elbow pivots connected to the ends of said upper arm rods, lower arm rods pivoted to said elbow pivots, a second transverse bar secured to said frame near the mid-section thereof, hip pivots on the ends of said second bar, hip rods pivoted on said hip pivots, knee pivots mounted on the swinging ends of said hip rods, leg rods pivotally connected to said knee pivots, a motor and connected gear

box on said frame, transverse crank means mounted on said frame, means connecting said crank means to said gear box for rotation by said motor, and connecting rods connected to said crank means at radially adjustable points, the connecting rods being connected separately to said leg rods, hip rods, lower arm rods and upper arm rods.

16. A treatment device comprising, a base, a frame tiltably supported at its mid-section on said base, a body support plate secured to said frame, a shoulder pivot on said frame near the head end thereof, upper arm rods pivoted to said shoulder pivots, elbow pivots connected to the ends of said upper arm bars, lower arm rods pivoted to said elbow pivots, hip pivots on said frame near the middle thereof, hip rods pivoted on said hip pivots, knee pivots mounted on the swinging ends of said hip rods, leg rods pivotally connected to said knee pivots, a motor and connected gear box on said frame, transverse crank means mounted on said frame, means connecting said crank means to said gear box for rotation by said motor, and connecting rods connected to said crank means at radially adjustable points, part of the connecting rods being connected to said leg rods, others of the connecting rods being connected to said hip rods, still others of the connecting rods being connected to said lower arm rods, and still others of the connecting rods being connected to said upper arm rods.

17. A treatment device comprising, a body support, longitudinally adjustable hinged arm and leg supports pivotally connected to said body support at longitudinally spaced positions and swingable transversely of the plane of the body support, connecting rods connected to the upper and lower portions of said hinged arm and leg supports, a plurality of crank shafts rotatably mounted on said device and adjustably connected to the connecting rods, and means connecting the crank shafts for simultaneous rotation.

18. A treatment device comprising, a base, a frame supported on said base, a body support plate secured to said frame, a shoulder pivot on said frame near the head end thereof, upper arm rods pivoted to said shoulder pivots, elbow pivots connected to the ends of said upper arm bars, lower arm rods pivoted to said elbow pivots, hip pivots on said frame near the middle thereof, hip rods pivoted on said hip pivots, knee pivots mounted on the swinging ends of said hip rods, leg rods pivotally connected to said knee pivots, transverse crank means mounted on said frame, and connecting rods connected to said crank means at radially adjustable points, part of the connecting rods being connected to said leg rods, others of the connecting rods being connected to said hip rods, still others of the connecting rods being connected to said lower arm rods, and still others of the connecting rods being connected to said upper arm rods.

No references cited.