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PHYSICAL THERAPY TREATMENT TABLE

Filed May 8, 1957

3 Sheets-Sheet 1

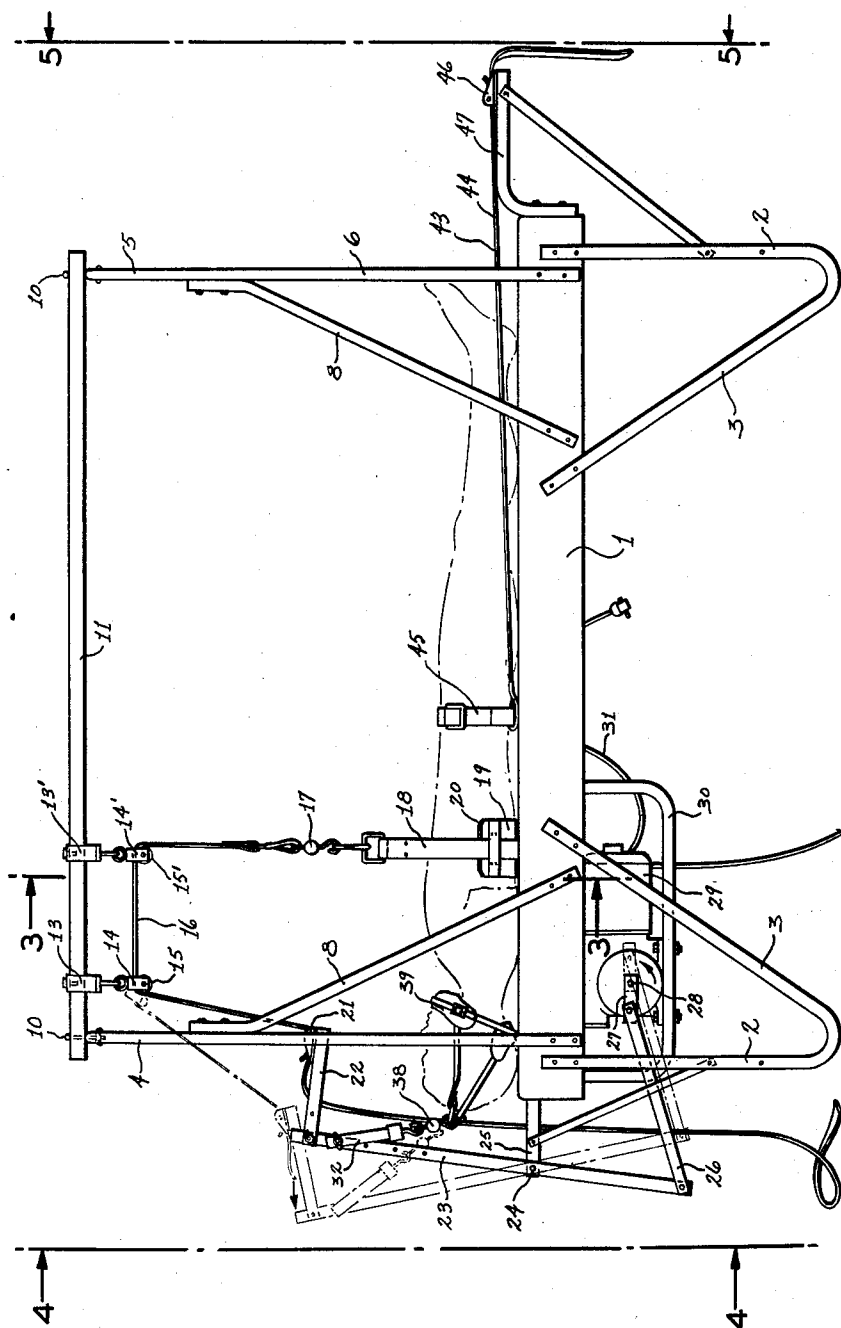


FIG. 1

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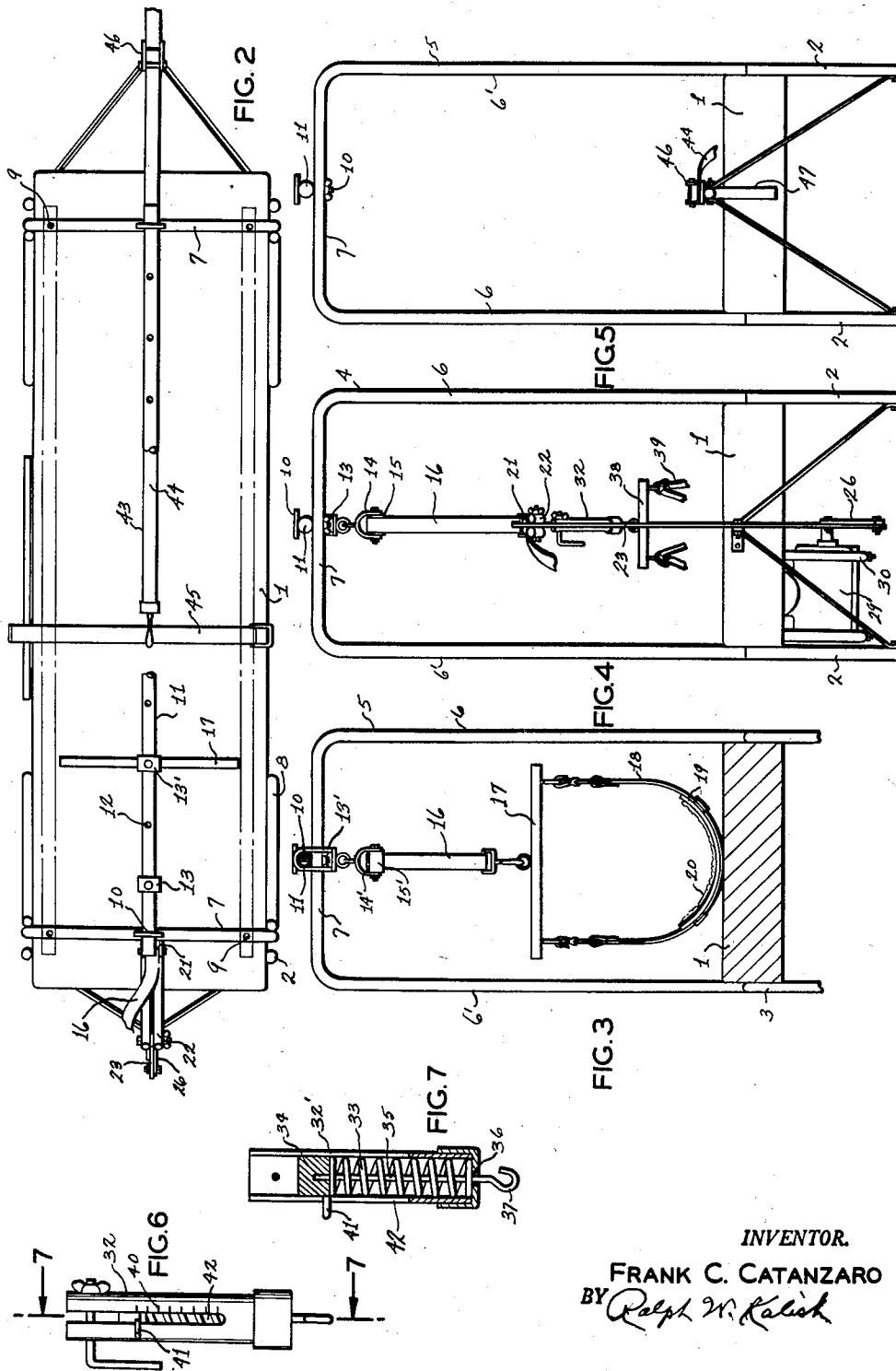
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3 Sheets-Sheet 2



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PHYSICAL THERAPY TREATMENT TABLE

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This invention relates in general to physical therapy and, more particularly, to certain improvements in treatment tables for use therefor.

With the ever increasing advancements made in the field of medicine it is generally recognized that many of the diseases and discomforts which afflict the human body result from derangement of bodily mechanisms such as bones, blood vessels, connecting tissue, and the like; that is, especially, wherein the reduced mobility or operation of a body part results from a functional or mechanical disturbance. A correction of such faulty body mechanisms of this type may be effected through indicated exercising of the body part or parts involved for securing additional mobility thereof, thereby producing the desired relief from pain and restoration of the part to normal function. Innumerable abnormal conditions are amenable to such treatment, as, for instance, curvatures of the spinal cord, sciatica, arthritic conditions, muscle spasms, neuritis and neuralgia, slipped discs, etc. Within this field of therapy would also be included the treatment of conditions induced by nervous strain, tension, and stress, wherein uncomfortable local symptoms are caused, such as predominantly, with migraine headaches. Heretofore, the provision of the appropriate exercise for the afflicted body parts have been for the most part accomplished by subjecting the patient to a routine of exercise of the calisthenic nature or manual manipulation by a skilled and highly trained therapist. In addition to the foregoing, some use had been made of static traction for treatment of certain conditions, such as for effecting stretching of the spine. However, the exertion of a constant pull of predetermined force upon the body obviously is devoid of the beneficial dynamic type of exercising so vital for restoration of the particular area to normal state. It is apparent that through normal human inertia many patients will not be consistent in following through with the exercises prescribed and with professional manipulation it is evident that the forces of the manipulation may vary, such as through fatigue of the therapist.

Therefore, it is an object of the present invention to provide a physical therapy treatment table incorporating novel means for effecting exercising of any bodily portion by the intermittent application of force thereto pursuant to a predetermined pattern.

It is another object of the present invention to provide a physical therapy treatment table having novel means for simultaneously effecting indicated rhythmic manipulation of the various portions of the human body and at varying rates.

It is a further object of the present invention to provide a physical therapy treatment table incorporating mechanical means for simultaneously effecting dynamic traction for suspension of different portions of the human body and wherein the force of the traction may differ from that of the suspension.

It is an additional object of the present invention to provide a physical therapy treatment table incorporat-

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ing automatic operable means for effecting the exercising of bodily parts which obviates the necessity of the patient laboriously undertaking a routine of prescribed calisthenic exercises and the need for manipulation of afflicted areas by professional therapists, and wherein the patient is accorded maximum comfort during such treatment.

It is a further object of the present invention to provide a physical therapy treatment table of the character stated which comprises a simplicity of parts; is readily and easily adapted for effecting treatment of any indicated portion of the body; which may be operated at predetermined rates of speed so as to apply force to the body for the beneficial periodicity; which table is reliable and durable in usage; and which may be economically produced.

These and other detailed objects are obtained by the structures illustrated in the accompanying drawings (three sheets) in which—

Figure 1 is a side elevation of a treatment table constructed in accordance with and embodying the present invention, illustrating the same in position for treating the cervical and lumbar portions of a patient by traction and suspension effectively.

Figure 2 is a top plan view.

Figure 3 is a vertical transverse view taken on the line 3—3 of Figure 1.

Figure 4 is a head end view taken along the line 4—4 of Figure 1.

Figure 5 is a foot end view taken on the line 5—5 of Figure 1.

Figure 6 is an enlarged view of the spring of a traction unit.

Figure 7 is a vertical transverse section taken on the line 7—7 of Figure 6.

Figure 8 is a side elevation of the treatment table illustrating the means associated therewith for treating the abdominal portion of the human body.

Referring now by reference characters to the drawings which illustrate the preferred embodiment of the present invention, 1 indicates a padded, rectangular treatment table supported at each of its corners by legs 2 which preferably may be formed from light-weight, sturdy, tubular stock, and have integral brace portions 3 for enhanced stability of table 1. Provided on table 1 is a superstructure comprising a pair of U-shaped end supports 4, 5 located at the normally head and foot end of table 1, respectively, each support 4, 5 having its legs 6, 6' secured at their lower ends to the side faces of table 1 and with their upper or central portions 7 in elevated, transverse, planar-parallel relation to table 1. A brace member 8 is provided for rigidifying legs 6, 6' of end supports 4, 5 in position with each brace member 8 being secured at its upper end to the associated legs 6 or 6' at a point above the midpoint thereof and at their lower ends to sides of table 1 spacedly from the points of securement of the lower ends of legs 6, 6'. Each support 4, 5 along its central, transverse portion is provided with a plurality of spaced openings 9 for selected securement upon said portion 7, as by means of bolts 10, with one end of an overhead rod 11 extending between said end support 4, 5, and disposed lengthwise of table 1. It will be seen that by proper arrangement overhead rod 11 may be secured in position by bolts extending between corresponding, aligned openings in central portion 7 of end members 4, 5 so that said rod 11 will be in axially parallel relation to table 1 but may be located to either side of the axis of table 1 or in alignment therewith. Also said rod 11 may be secured so as to extend in a generally diagonal or oblique manner between said central portions 7 of end supports 4, 5, for purposes presently appearing. Said overhead rod is

provided throughout its extent with a plurality of spaced apart, vertical openings 12 for selected disposition therealong, in a generally straddling manner, of a pair of pulley supports 13, 13', each of which swingably carries a clevis member 14, 14' in the arms of which is journaled the ends of a shaft for a pulley 15, 15', respectively. Across said pulley 15, 15' extends a belt 16, one end of which projects downwardly from pulley 15', for detachably carrying in its proximate end portion a spreader bar 17 having hooks or eyelets at its opposite ends for engaging the clasps of a sling-type body-engaging member 18. With reference to Figures 1 and 3 it will be seen that spreader bar 17 will be disposed in a substantially transversely extending relationship to table 1, whereby member 18 will depend downwardly therefrom toward table 1 for supportingly receiving body portion, such as the various spinal regions, as the lumbar or thoracic, as shown in Figure 1, or the abdominal area, as indicated in Figure 8 which will be discussed hereinbelow. Said member 18 is provided with a relatively widened central section as at 19 being fabricated preferably of leather or other durable material with the inner or body confronting portion suitably padded as at 20 for preventing unpleasant, frictional contact with the patient's skin. Outwardly of pulley 15 belt 16 is led downwardly and in a direction endwise of table 1 for securement within a clamp 21 mounted on the forward end of an arm 22 the rearward end of which is secured as by bolts to the upper end portion of a rocker arm 23. Said rocker arm 23 in its central portion is pivotally secured as at 24 to a bracket 25 extending from the adjacent end of table 1 whereby said rocker arm 23 is adapted to swing in a vertical plane, axially normal to the plane of table 1. The lower end of rocker arm 23 is engaged to the outer end of a Pitman 26, the inner or forward end of which is secured to a crank head 27, carried on the end of a shaft 28 operably engaged by suitable gearing (to a motor 29) disposed beneath the head end portion of table 1 being supported by a mounting assembly 30. It will thus be seen that upon operation of motor 29 rocker arm 23 will be caused to be reciprocatingly swung about its pivot 24 so that its upper end portion, which extends above table 1 will be swung forwardly toward said table 1 and then backwardly therefrom (as indicated in dotted lines in Figure 1) and thus continue to swing back and forth during the operation of the motor. It is apparent that the frequency of the back and forth cycle will determine upon the rate of speed of the motor so that by varying the speed of operation thereof to conventional means the rate of swing of rocker arm 23 may be easily controlled. It should be pointed out that rocker arm 23 is aligned with the median of table 1 so that during operation no unbalanced stress-producing forces will be developed.

For convenience a lead 31 may be provided from motor 29 which lead will carry an operating switch so that the patient may turn the motor on and off at his pleasure.

Upon operation of motor 29 with consequent reciprocal swinging movement of rocker arm 23 belt 16 will be pulled rearwardly as rocker arm 23 swings rearwardly and will be moved forwardly, during forward swinging of rocker arm 23 under the gravitational pull of the portion of the patient's body supported by member 18. Accordingly, the system comprised of the continuously swinging rocker arm 23 and the elevated belt 16 and body support member 18 permits a rhythmic suspension to be accorded the portion of the body being treated. Thus, with reference to Figure 1, it will be noted that as rocker arm 23 is swung outwardly in its upper portion the thoracic spinal portion of the patient received in member 18 will be subjected to a lifting force while the adjacent portions of the spine will remain substantially supported on table 1 so that a stretching of the spine, muscles, and the connecting tissue of the cervical and upper dorsal area will be effected,

as well as producing a hyperextension of the dorsal spine. Therefore, the reciprocal suspending or lifting of the thoracic spinal portion and the lowering of same will produce a mobilization to the area involved and thereby effectively treat muscular, neuritic, or radicular pains resulting from muscular or facial tension, as well as any curvature of the upper spinal portion. In view of the foregoing it is readily recognized that by proper disposition of pulley supports 13 along overhead rod 11 body receiving member 18 may be disposed for receiving any portion of the body which would be amenable to treatment through the rhythmic suspension provided by the present invention. Consequently, if pulley supports 13 were placed more closely together member 18 would be positioned for receiving the upper or cervical spine, or with said pulley supports 13, 13' being moved commensurately away from each other, body receiving member 18 could be disposed for receiving the lumbar spinal portion or any portion of the patient's legs or pelvic region, with the patient remaining upon his back on table 1. The reciprocal elevating and lowering of portions of the body in the manner described will thus provide the exercise indicated for a specific region of the body to produce the desired mobilization. Thus, only that area of the body which is involved is exercised while the other portions of the body remain substantially at rest, thereby assuring that maximum beneficial exercise is attained. The stretching and relaxing of the muscles, connecting tissue, ligaments, and bony articulations of the body portions being treated is reliably presented by the machine of the present invention so that functional and mechanical disturbances are effectively alleviated.

With reference to Figure 8, the extreme versatility of the treatment table is illustrated for therein is shown the use the suspension system for treating portions of the human body when the patient is disposed in a face-downward position upon table 1. In this instance the patient is presented with his head toward the foot end of table 1 and pulley supports 13, 13' are spaced apart along overhead rod 11 so that member 18 is engaged under the abdomen of the patient; it being noted that member 13' is located at a point upon overhead rod 11 so as to be nearer the proximate end of table 1 than the patient's abdomen so that the elevating operation will also comprise a forward component to effect upward rhythmic excursions of the abdominal viscera and diaphragm with intermittent compression of the abdominal muscles. It has been found that in addition to the suspension operation many conditions necessitate a rotative movement be caused the body area involved. To provide this type of exercise, overhead 11 may be disposed to either one side or the other of table 1, or obliquely, so that the belt system will be commensurately presented in eccentric relationship to the patient whereby the engaged portion of the body will be subjected to a horizontal rocking or rotative movement simultaneously with the alternating elevating and lowering effected by operation of rocker arm 23.

With reference to Figures 1 and 8 it will be seen that rocker arm 23 in its upper portion is provided with a series of vertically spaced openings so that arm 22 may be positioned at any convenient point therealong for effecting the desired pull upon belt 16 for the particular treatment in question. It will be seen that from clamp 21 belt 16 is led downwardly and permitted to rest upon any convenient surface such as the floor, with the length thereof being adequate for accommodating the distance between pulley supports 13, 15' in their various positions of adjustment.

Swingably secured in the upper portion of rocker arm 23 is the outer end of an adjustable pressure arm 32 which comprises a housing 32' within which is disposed a compression spring 33 one end of which bears against the inner or table-adjacent end wall of said housing 32', while the other end bears against a head 34 engaged to

an end of a piston-forming rod 35; said rod 35 extends longitudinally through spring 33 and projects through an opening 36 in the said inner end wall; with a hook 37 being formed at the projecting end extremity for engagement to a spreader bar 38, supporting at its ends a body engaging member, which, for instance, may be preferably a two-piece head halter, as shown in Figure 1 at 39. A scale 40 is suitably inscribed or otherwise provided on the exterior of housing 32' and a marker or index finger 41 is carried upon head 34, projecting through an elongated, slot 42 formed in the wall of housing 42'. The body engaging member 39 may be contoured for comfortable yet reliable and firm engagement of the body part being treated for the purpose of effecting rhythmic traction thereon. The head halter presented as an example of such body receiving member is specially contoured for eliminating painful pressure on the chin or occiput and is heavily padded so as to provide maximum comfort. Upon the rocking of arm 23 into outward position as indicated in dotted lines in Figure 1, a pulling force will be effected upon the part being treated with the force being relaxed as rocker arm 23 moves inwardly so that intermittent pulling and relaxing effect will be developed resulting in a rhythmic traction having a periodicity determined by the rate of operation of motor 29. With the head and chin of the patient so engaged operation of the present invention will produce a stretching and relaxing of the cervical spine as well as the longitudinal exercising of the cervical musculature with a gentle breaking of the compression fixations thereof and normalizing the stretch function of the muscles involved. Also, such traction will produce a local stretching of ligaments and fascia. This mobilization accorded this portion of the body has proved most beneficial in the treatment of migraine and tension type headaches, cervico-occipital neuralgia, distortions and curvature of the upper spine, brachial neuritis, and numerous other conditions. The particular force of the traction is also controlled by a selected tension placed upon spring 33 so that as the patient progresses in the treatment increasingly greater stress may be applied to spring 33. To prevent undesired longitudinal, bodily movement of the patient consequent to the pulling component of the traction operation there is provided a counter-traction unit indicated generally at 43 and comprises a belt 44 engageable at one end to a waist-encircling strap 45 and at its other end to a clamp 46 disposed at the outer end of an arm 47 secured to the adjacent, foot end of table 1 and extending outwardly therefrom. In usage, strap 45 is secured snugly about the patient, preferably at the waist, and the outer end of belt 44 is gripped in clamp 46 so as to anchor the patient's body and hence resist any tendency of the body to be pulled in the opposite direction under the applied traction. Although the drawings illustrate the traction unit for operation primarily upon the cervical spine, it is to be recognized that various types of body engaging members may be provided for engagement to arm 47 so that the rhythmic traction may be accorded other bodily areas. For instance, a body encircling member may be disposed about the area to be treated such as the pelvic zone, or the thoracic spine, with connecting strap members engaging the same at spaced points to the opposite ends of spreader bar 38, with the patient being suitably anchored by the counter-traction unit 43 so that the reciprocal pulling and relaxing will be applied to the portions requiring treatment. Thus, it will be seen that the present invention will produce, what might be termed, dynamic traction, as distinguished from the static traction heretofore utilized, wherein a constant pull was effected by the use of weights. By the traction of the present invention a mobilization is produced which will restore the treated areas to normal functioning.

By use of the physical therapy treatment table above described any portion of the body may be suitably treated

in a manner diagnostically indicated so that if the afflicted zone requires exercising of one type or the other it may be readily accorded such. Thus, if alternating suspension and lowering will provide exercise for the afflicted body portion, then the said suspension system may be brought into active operation. On the other hand, if dynamic traction is indicated, then the patient may be readily subjected to that by the necessary engagement to the related system. However, it is readily seen that if both traction and suspension is called for, then the patient may be simultaneously provided both types of treatment. As brought out hereinabove, the rate of exercise to either suspension or traction, may of course be determined by the speed of motor 29 and the related gearing so that it is within the scope of the operation of the present invention to permit a course of exercises wherein the rate of movement may be increased as the course of treatment progresses.

Furthermore, it should be particularly noted that through the unique mechanical means provided, the periodicity of the traction or suspension provided by the present invention will be constant and thereby assure proper beneficial manipulation of the disturbed or malfunctioning parts of the patient. It will be recognized that during treatment a patient need only lie upon table 1 and while in such passive state will receive the exercising needed and thereby be obviated the necessity of undertaking a routine of rigorous calisthenics which generally entail exercising of other portions of the body than those requiring attention.

The constituent elements of the present invention are relatively simple so that the systems of operation provided will be reliable and durable during usage. Further, the controls will be readily convenient to the patient so that at the termination of the treatment period the motor 29 may be disconnected so that a skilled therapist might devote attention to numerous patients concurrently rather than remain in constant attendance upon a single patient during the particular treatment.

It should be understood that changes and modifications in the formation, construction, arrangement, and combination of the several parts of the physical therapy treatment table may be made and substituted for these herein shown and described without departing from the nature and principle of my invention.

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

1. Physical therapy treatment apparatus comprising a surface for support of a patient thereon, a rocker arm provided adjacent one end of said surface and disposed for movement in a vertical plane, means for effecting continuous rocking of said rocker arm, a first member for engaging a portion of the patient's body connected to the upper portion of said rocker arm whereby an alternating pulling and relaxing will be accorded the portion of the patient's body engaged by said first member, a support structure provided above said surface, a second member for engaging a portion of the patient's body suspended from said support structure, means connecting said second member to the upper portion of said rocker arm whereby upon operation of the latter an alternating lifting and lowering will be effected upon the engaged body portion so that simultaneous rhythmic traction and suspension will be produced.

2. Physical therapy treatment apparatus comprising a horizontal surface for supporting of a patient thereon, a rocker arm provided at one end of said surface and disposed for movement in a vertical plane normal to that of the horizontal surface, means for effecting continuous rocking of said rocker arm, a first member for engaging a portion of the patient's body connected to said rocker arm whereby an intermittent pulling, in a direction longitudinally of the surface, will be effected upon the portion of the patient's body engaged by said first member, a

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support structure provided above said surface, a second member for engaging a portion of the patient's body suspended from said support structure, means connecting said second member and said rocker arm whereby upon operation of the latter an alternating lifting and lowering will be effected upon the engaged body portion so that simultaneous rhythmic traction and suspension will be produced, and anchoring means for resisting travel of the patient during traction and suspension to cause mobilization to be provided only the engaged body portions.

3. Physical therapy treatment, apparatus comprising a table for supporting a patient, support structure provided above said table, spaced apart pulleys depending from said support structure for disposition above the patient and in alignment lengthwise thereof, a belt trained over said pulleys, a member for engagement by a portion of the patient's body depending from one end of said belt toward said table, a rocker arm provided at one end of said table, an arm adjustably positionable on the upper portion of said rocker arm, clamping means carried on said arm for engaging said belt at a preselected point

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thereon, means for effecting continuous reciprocal swinging of said rocker arm, said rocker arm being presented for swinging in a vertical plane whereby said belt will be intermittently pulled by said arm and said rocker arm for effecting an alternate raising and lowering of the body portion engaging member to cause beneficial mobilization thereof, and means whereby the spacing between said pulleys may be selected for disposing said body portion engaging member for convenient engagement of any body portion of the patient.

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