

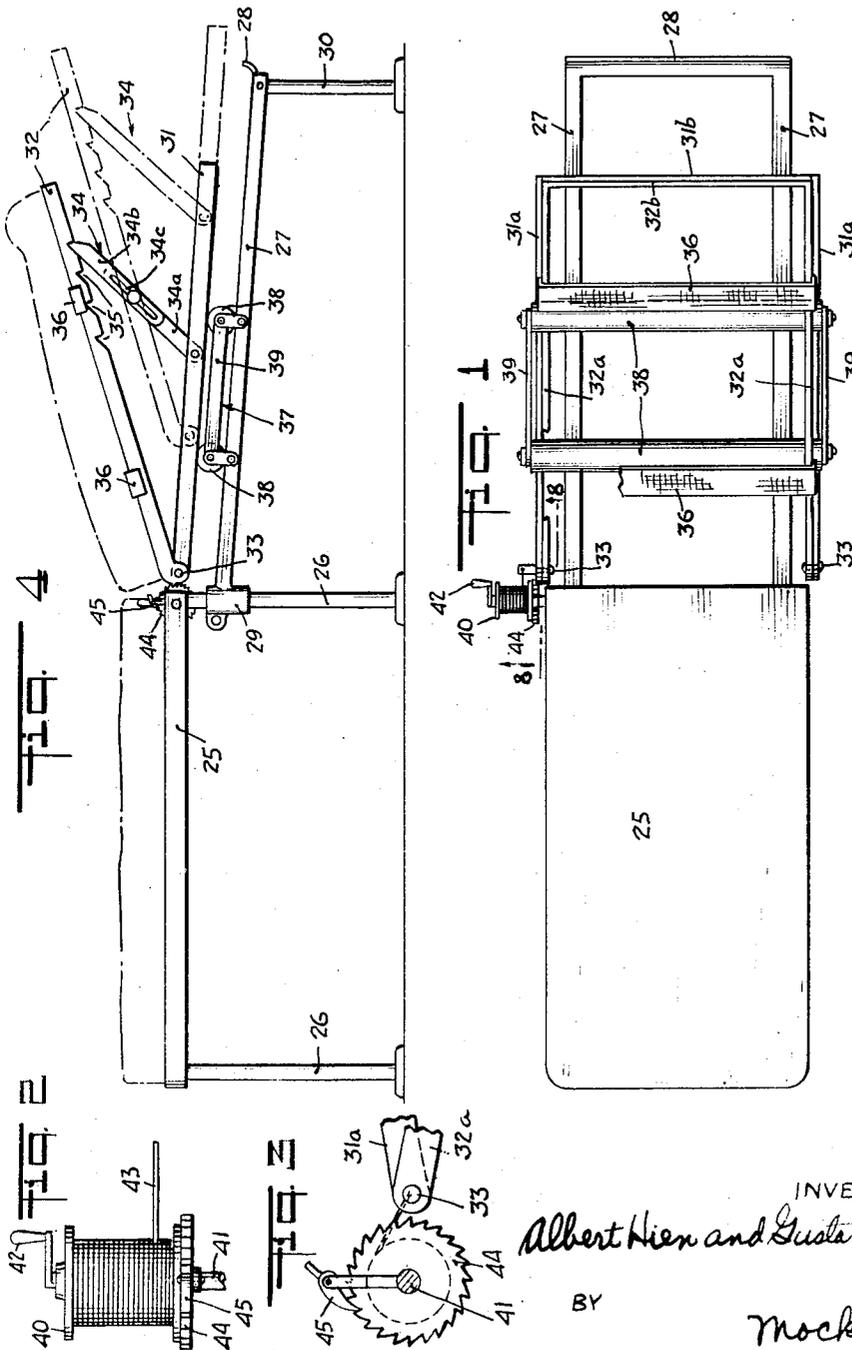
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TRACTION DEVICE

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TRACTION DEVICE

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This invention relates to improvements in traction devices used for the treatment of pathological conditions of the bones, ligaments, muscles and nerves, and more particularly for the treatment of defective spinal conditions of this nature.

Effective therapy in certain defective spinal conditions such as osteoarthritis generally requires exercise of the affected parts. More frequently than not, however, exercising is not feasible for the patient regardless of whether the patient assumes an erect, a sitting or a supine position.

A supine position prevents exercises in the direction of support while exercises in a plane parallel to the support are hindered by friction. The only available direction in which free exercises are feasible is in a plane vertical to the supporting plane or, in other words, in a direction away from the support and toward an erect position. However, an erect position is maintained only by the coordinated contraction of many muscles which, being attached to the bones, press the articular surfaces of joints together whenever they contract. In pathological conditions, this otherwise normal articular pressure gives rise to discomfort and pain, which increase considerably when attempts are made to perform exercises under such conditions. In addition, muscle spasms frequently occur resisting any change in position. Gravity further augments the pressure on joints thereby aggravating pain particularly in such parts as normally sustain the greatest weight.

Heretofore, the common procedures in alleviating pain and eliminating spasm have been to place the patient in traction either by means of orthopedic stretching devices or by means of a brace corset worn by the patient for the same purpose. Both of these procedures immobilize the patient to a greater or lesser extent with the considerable attendant disadvantage of atrophy of the unused muscles. Very frequently these muscles can no longer successfully perform their normal function when after weeks or months traction or bracing is discontinued, thereby resulting in stiffening of the joints and great pain and discomfort to the patient.

From the foregoing it is apparent that it is highly desirable, in treating pathological conditions of the nature indicated, for the patient to carry out exercises in the absence of weight bearing or pressure on the articular surfaces. Underwater exercises are ideal in this respect since buoyancy eliminates weight bearing almost en-

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tirely and further provides unrestricted movement in all directions. However, because of the excessive cost of installation and maintenance of swimming pools, this form of treatment is of limited availability for patients in general, usually being accessible only to patients residing in large cities.

Accordingly, it is a primary object of the invention to provide a simple, inexpensive device for placing a patient under traction and for simultaneously allowing exercises under traction, thereby minimizing pressure on articular surfaces of joints.

Another object of the invention is the provision of a traction device designed and constructed in such a manner as to achieve traction solely by utilizing the weight of the body of the patient without employing external weighting means and intricate and cumbersome harnesses or the like.

A further object of the invention is the provision of a traction device having a main body-supporting frame and additional frame sections associated therewith and pivotally adjustable to vary the amount and direction of tension at different portions of the body of the patient, the entire device being tiltable to suspend the patient in inverted position and to achieve traction by utilizing the weight of the body of the patient.

An additional object of the invention is the provision of a traction device which may be attached to an ordinary exercising table in a hospital, physician's office etc. for applying traction and permitting exercising in a horizontal position, traction being achieved solely by the weight of the patient placed upon the exercising table and attached device.

The foregoing objects as well as additional objects and advantages of the invention will be readily understood in the course of the following detailed description, taken in connection with the accompanying drawings, which illustrate several preferred embodiments of the invention, and wherein:

Fig. 1 is a top plan view of a preferred form of the invention for applying traction and permitting exercises in a horizontal position, parts being broken away to illustrate details of construction;

Fig. 2 is an enlarged detail view of the retracting means for the device;

Fig. 3 is a sectional view taken on line 8-8 of Fig. 1;

Fig. 4 is a side elevation of the preferred form of Fig. 1;

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Fig. 5 is a side elevation of a modification of the traction device.

For the purpose of exercising under traction in a substantially horizontal position the preferred form of the device illustrated in Figs. 1-4 may be effectively employed. This embodiment of the invention may be considered as comprising a stationary horizontal portion, such as a couch or table, and an adjustable angularly inclined slidable frame portion. This device may be fabricated either as an attachment to a conventional hospital table or couch or as a complete unit.

Referring specifically to Figs. 1 to 4 the stationary horizontal portion 25 may take the form of a table or couch supported on upright legs 26. A pair of spaced, downwardly and rearwardly inclined rails 27 having a transverse terminal connecting member 28 may be secured to each of the legs 26 of table 25 in any suitable manner as indicated at 29. The lower end portion of each of the rails 27 may be supported on upright standards 30.

The slidable frame includes a base member 31 which is preferably rectangular in shape and is defined by a pair of sides 31a and a cross member 31b. A body-supporting member 32 comprising a pair of sides 32a and a cross-member 32b is pivoted at 33 to said base member 31. Member 32 may be adjustably inclined to said base member in any desired manner. A convenient arrangement for accomplishing this result involves the use of a pair of adjustable arms 34 pivoted at one end preferably to the medial portion of each of the sides 31a of base member 31 and selectively insertable within notches or recesses 35 formed on the bottom surface of each of the sides 32a of body-supporting member 32. Each of the adjustable arms 34 is preferably formed of two sections 34a and 34b, one of said sections having an elongated longitudinal slot 34c for the reception of a screw and clamping nut (not shown) to vary the effective length of said arm in the operation of adjusting the angular inclination of body-supporting member 32. Member 32 may be reinforced by transverse braces 36 secured to and extending between sides 32a thereof.

The frame unit comprising base member 31 and adjustably pivoted body-supporting member 32 is slidable upon the pair of inclined rails 27 as by means of a carriage 37 comprising a pair of rollers 38 interconnected by means of a pair of spacing members 39 or a carriage comprising two pairs of wheels or casters.

In order to limit the rearward motion of the slidable frame portion of the device and to retract said frame portion to the initial inoperative position in contact with the rear edge of table or couch 25, suitable locking and retracting means is provided. This means may take the form of a rotatable reel 40 mounted on a shaft 41 secured to horizontal portion 25 of the device, said reel being provided with a crank 42 and carrying a cable 43 secured to either base member 31 or inclined member 32 of the slidable frame portion.

A ratchet 44 may be mounted on shaft 41 and secured to reel 40 for cooperation with a pawl 45 for fixing the rearward motion of the slidable frame at any desired point depending upon the amount of traction required in any given case.

It will be understood that straps (not shown) or the like may be secured to the stationary horizontal portion or table 25 and to the slidable body-supporting member 32 to fasten the

respective portions of the body of the patient to the device. The patient will be positioned on the device initially with his legs and pelvis on table 25 and with his lumbar region, thorax and head supported on slidable member 32. The weight of the body combined with the downward inclination of rails 27 will operate to move rearwardly the slidable frame portion of the device including the slidable body-supporting member 32, thereby placing the spine and surrounding musculature under traction. However, by judicious disposition of fastening straps the upper part of the body will not be immobilized but merely supported and sufficient freedom may be allowed for the patient to perform exercises having therapeutic value while under traction, thereby stimulating and improving the tone of impaired muscles to the end of alleviation of pain and the defective spinal condition.

Fig. 5 illustrates a modification of the invention similar to the embodiment illustrated in Figs. 1-4 in operation but adapted particularly for fabrication as a separate unit to be associated easily and readily with a conventional hospital table or couch designated by reference numeral 70. The traction unit comprises a base 71a adjacent the rear end of which a pair of spaced upwardly and forwardly inclined rails 71 may be pivotally secured. The underside of each of said rails may be provided with a plurality of notches or recesses 72 for selectively engaging the free end of an adjustable lever 73 pivoted adjacent the forward end of base 71a to vary the angular inclination of said pair of rails.

A movable frame portion is provided comprising an adjustable body-supporting member 74 pivoted and inclinable to a lower member 75. Members 74 and 75 may each be of rectangular shape having sides 74a and 75a respectively. The upper surface of each of the sides 75a of lower member 75 may be provided with a plurality of recesses or notches 76, for selectively engaging the free end of a lower section 77a of an adjustable arm 77 having an upper section 77b pivotally secured to each of the sides 74a of body-supporting member 74. One of the sections 77a or 77b of adjustable arm 77 is preferably provided with an elongated longitudinal slot 77c for the reception of a clamping element (not shown) to vary the effective length of each of said arms, thereby also varying the angular inclination of body-supporting member 74.

Lower member 75 is slidably engaged on rails 71 as by means of a carriage 78 comprising a pair of rollers 79 interconnected by a pair of spacing members 80. Suitable retracting means, such as a reel and a cable (not shown) secured to either member 74 or 75 may be provided for restoring said members to the inoperative position illustrated in Fig. 5. Suitable locking means, which may take the form of ratchet wheel 81 and pawl 82, may also be provided for limiting the rearward movement of the slidable frame comprising body-supporting member 74 and lower member 75.

It is obvious that the modification of the invention illustrated in Fig. 5 is ideally suited for functioning as a traction device in conjunction with a conventional hospital table or couch since the slidable frame including body-supporting member 74 is compactly mounted on a self-supporting base 71a which may be operatively disposed adjacent a hospital table without requiring any mechanical engagement therewith

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with the exception of the reel, cable and ratchet 82.

Since certain modifications may be made in the traction or sliding device of the invention without departing from the scope thereof, it is intended that all matter contained in the foregoing specification and shown in the accompanying drawings be interpreted merely as illustrative and not in a limiting sense.

What is claimed as new is:

1. A traction device for stretching the spine, said device comprising a stationary horizontal body-supporting member, a supporting frame attachable to said horizontal member and inclined downwardly and rearwardly with respect thereto, an adjustably inclined, slidable body-supporting member mounted on said supporting frame and combined retracting and locking means secured to said horizontal member for limiting the rearward motion of said slidable member under the weight of the body of a patient positioned upon the device and for retracting said slidable member from the operative, traction position to the inoperative position.

2. A traction device for stretching the spine, said device comprising a stationary horizontal body-supporting member having upright legs, a pair of spaced, downwardly and rearwardly inclined rails secured to a pair of said upright legs, a carriage comprising a pair of spaced rollers or two pairs of wheels or casters mounted on said pair of rails, an adjustably inclined, slidable body-supporting member mounted on said carriage for motion toward and away from said horizontal member and combined retracting

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and locking means secured to said horizontal member and operatively connected with said slidable member for limiting the rearward motion of said slidable member under the weight of the body of a patient positioned upon the device and for retracting said slidable member from the operative, traction position to the inoperative position.

3. A traction device in accordance with claim 2, said combined retracting and locking means comprising a rotatable reel carrying a cable secured to said slidable member, a ratchet wheel secured coaxially to said reel and a pawl cooperating with said ratchet wheel to fix the effective length of said cable.

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