Dec. 17, 1935. H. G. FISCHER ET AL 2,024,351

THERAPEUTIC TABLE

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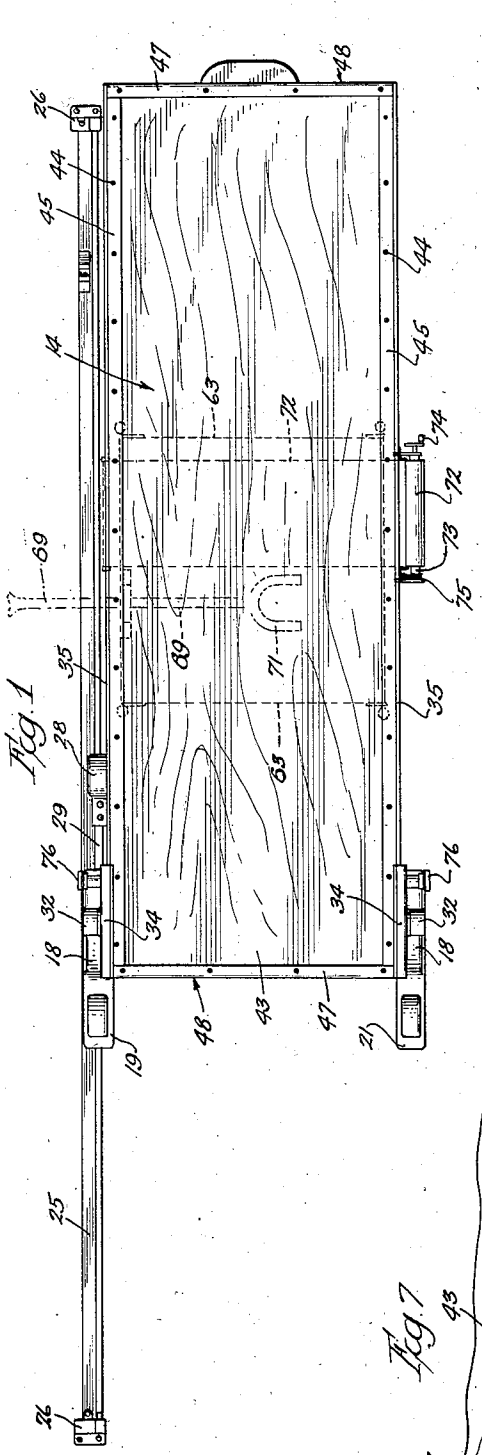


Fig. 1

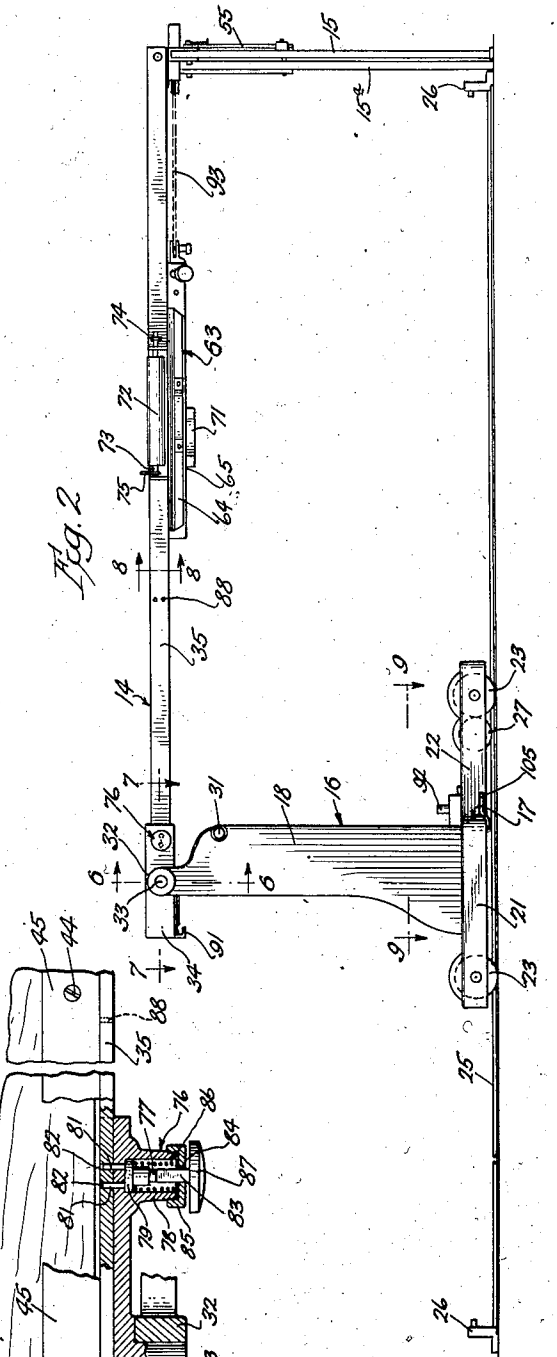


Fig. 2

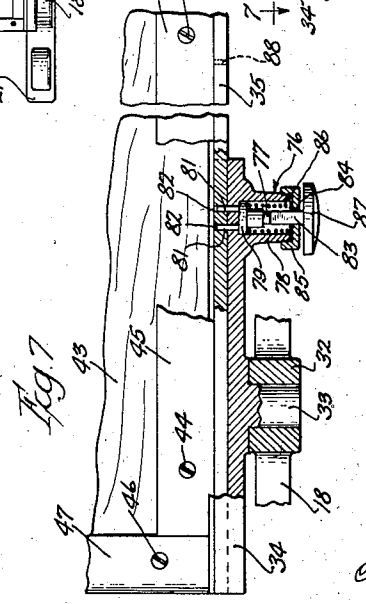


Fig. 7

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THERAPEUTIC TABLE

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Fig. 12

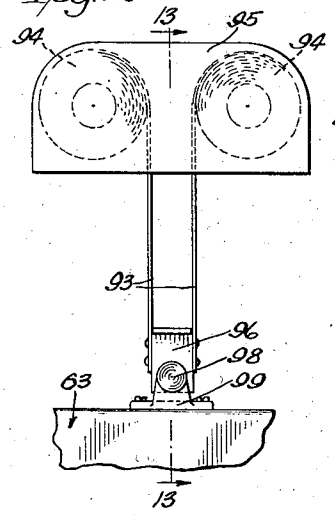


Fig. 13

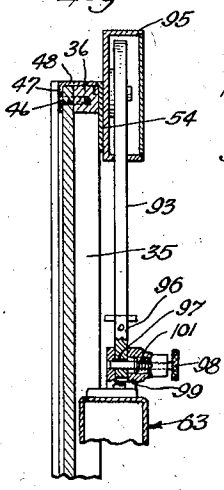


Fig. 5

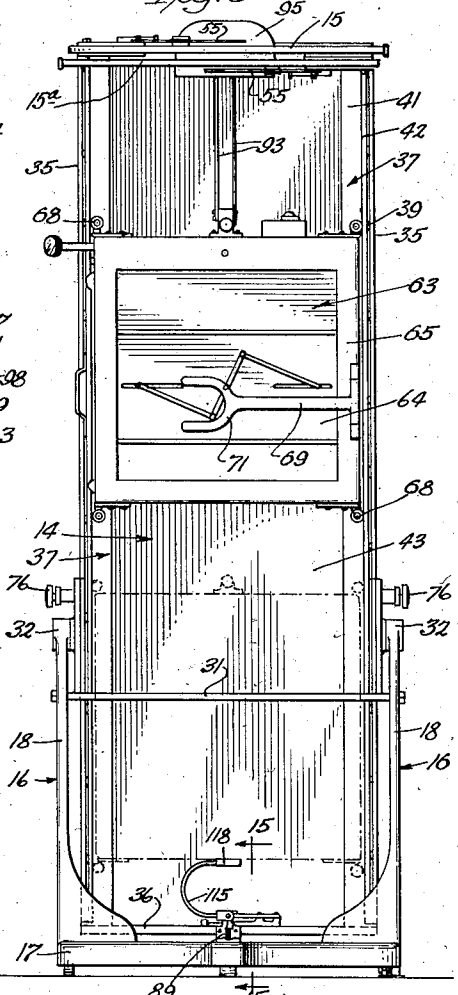


Fig. 3

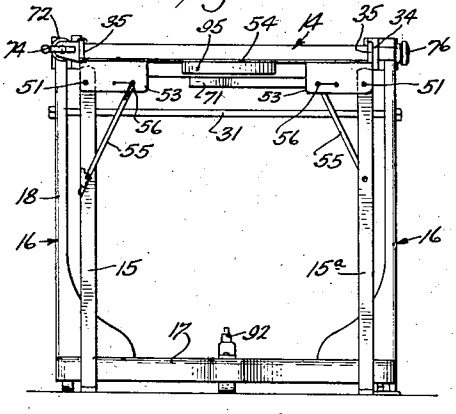


Fig. 11

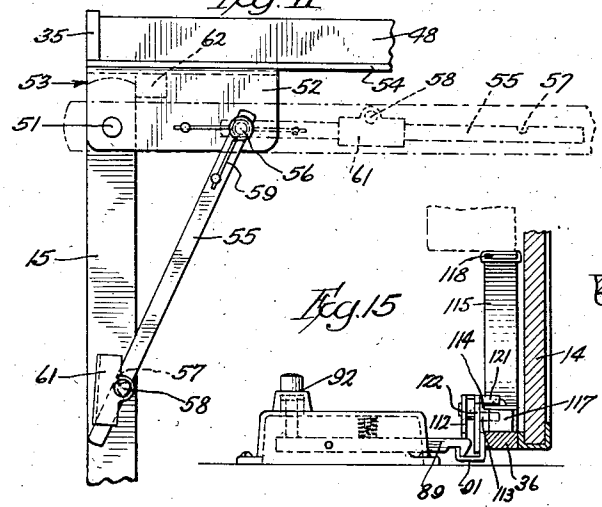
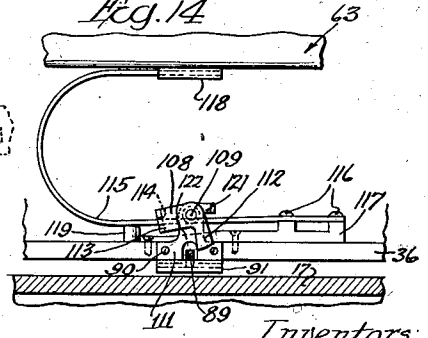


Fig. 15

Fig. 14



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Fig. 4

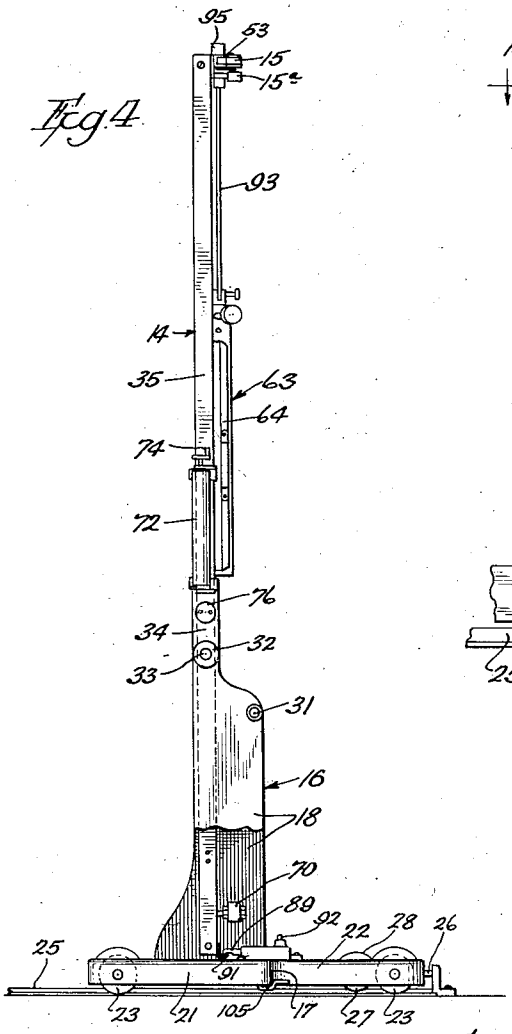


Fig. 9

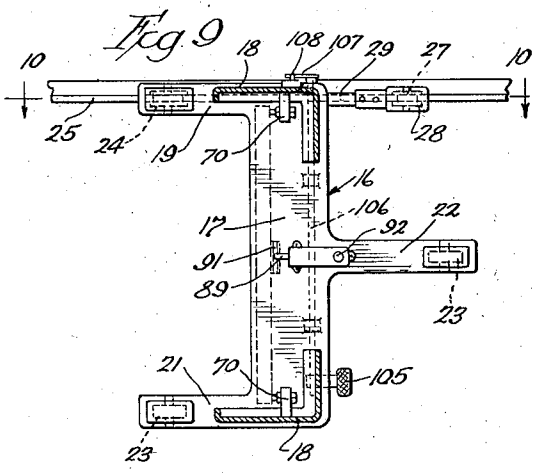


Fig. 10

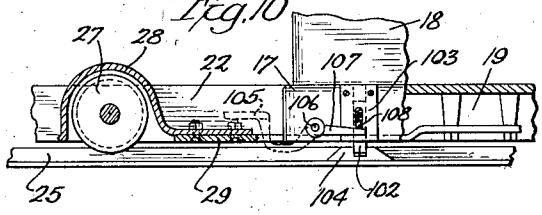


Fig. 8

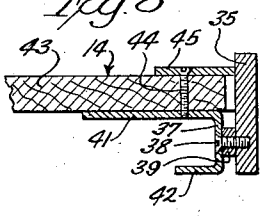
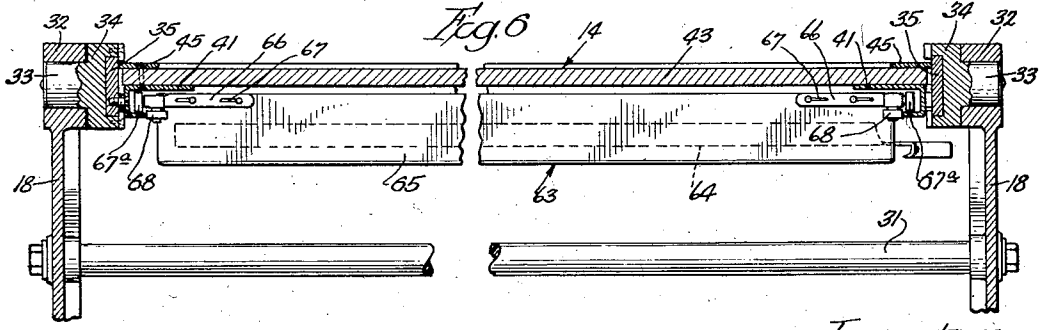


Fig. 6



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UNITED STATES PATENT OFFICE

2,024,351

THERAPEUTIC TABLE

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Application December 7, 1933, Serial No. 701,303

13 Claims. (Cl. 250—34)

This invention relates to tables and has more particular reference to tables employed for therapeutic purposes. While the invention will hereinafter be described as used for radiographic or fluoroscopic purposes, it will readily be appreciated that it has valuable and advantageous use for other purposes.

A principal object of the invention is the provision of a table of the class described, of sturdy and compact construction, which may be swung into upright position when not in use so as to occupy a minimum amount of space.

Another important object of the invention is the provision of a table of the class described, which is mounted for swinging movement between horizontal and vertical positions for use in either position and which has a novel locking mechanism for securing the table in a desired position.

A further important object of the invention is the provision of a table having a pair of foldable legs at one end and a stand or carriage at the other end which may, if desired, be mounted upon a track for longitudinal movement of the table.

A still further object of the invention is the provision of a therapeutic table having a Bucky diaphragm adjustably mounted thereon for use when the table is employed for radiographic purposes and movable out of the range of the rays when the table is employed for fluoroscopic or other purposes.

Another object of the invention is the provision of means for counterbalancing a Bucky diaphragm mounted on the table, to maintain the diaphragm in a desired position when the table is employed for vertical radiography.

Still another object of the invention is the provision of means for accurately locating the Bucky diaphragm with respect to an X-ray apparatus when the table is being used for horizontal radiography.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, when taken in connection with the accompanying drawings, illustrates a preferred embodiment thereof.

Referring to the drawings,

Figure 1 is a plan view of a therapeutic table constructed in accordance with the present invention;

Fig. 2 is a side elevation of the structure shown in Fig 1;

Fig. 3 is an end elevation of the table as viewed from the right hand end of Fig. 2;

Fig. 4 is a side elevation, with parts broken away, of the table when the same is swung to its vertical position;

Fig. 5 is an end elevation of the table viewed from the right in Fig. 4, and illustrating the bottom construction of the table top and the associated Bucky diaphragm;

Fig. 6 is an enlarged transverse section taken substantially on line 6—6 of Fig. 2;

Fig. 7 is an enlarged fragmentary view, partly in plan and partly in horizontal section, taken substantially on line 7—7 of Fig. 2;

Fig. 8 is an enlarged view of the right hand portion of Fig. 6;

Fig. 9 is a horizontal section taken substantially on line 9—9 of Fig. 2;

Fig. 10 is a view, partly in side elevation and partly on the line 10—10 of Fig. 9;

Fig. 11 is an enlarged fragmentary end view of the table, and illustrating the pivotal connection between the top and leg elements;

Fig. 12 is an enlarged fragmentary view of the means for counterbalancing the Bucky diaphragm;

Fig. 13 is a vertical section taken substantially on the line 13—13 of Fig. 12;

Fig. 14 is an enlarged detail, partly in section, of the latching mechanism; and

Fig. 15 is a section of the latching mechanism taken substantially on the line 15—15 of Fig. 5.

A therapeutic table embodying the present invention is shown on the drawings as comprising a table having a top 14, folding legs 15 and 15a at one end, and a stand 16 at the other end. The stand 16 comprises a hollow base 17 of metal or other suitable material and two upright side members 18 suitably secured thereto.

The base 17 is provided with two horizontally disposed extensions 19 and 21 on one side and a single centrally located extension 22 on the opposite side (Fig. 9). Extensions 21 and 22 are provided with smooth rollers 23 for direct contact with the floor and extension 19 is provided with a grooved roller 24 for engagement with a flanged rail 25. This rail is adapted to be secured to the floor and bumpers or stops 26 are provided at its ends to limit the longitudinal movement of the stand 16.

A grooved guide roller 27 is mounted in a housing 28 carried by a relatively heavy leaf spring 29 secured to the base 17. The guide roller traverses rail 25 and is maintained on said flanged rail by the leaf spring 29.

It will be apparent from this construction that should either of the rollers 23 encounter a hollow or other irregular spot in the floor as the stand 16 is moved longitudinally of the rail, the leaf spring will urge said guide roller toward the rail and maintains its contact therewith to insure that the base travels in parallelism with the rail under all floor conditions.

The upright side members 18 are secured together adjacent their upper ends by a tie rod 31, and their upper extremities are provided with bearings 32 in which are journalled trunnions 33 formed on vertically swinging channel shaped guide members 34 upon which one end of the top 14 rests.

The top 14 comprises a pair of longitudinally extending side rails 35 slidably mounted in the guide members 34 and connected together at their ends by transverse spacing bars 36. A longitudinally extending channel bar 37 is secured to the inner face of each of the side rails 35 and in spaced relation thereto by means of screws 38 and spacing washers 39, and is formed with a relatively wide upper flange 41 and a relatively narrow lower flange 42. The upper flanges 41 of these channel bars 37, together with the transverse spacing bars 36, constitute the support for a flat wooden panel 43.

The panel 43 is secured to the flanges 41 by the channel bars 37 along its longitudinal edges by means of bolts 44 passing through plates 45 extending along the side edges of the upper face of the panel in abutting relation to the side rails 35 and into threaded engagement with the upper flange 42 of the channel bars 37. The ends of the panel 43 are secured to the transverse spacing bars 36 by means of bolts 46 which pass through overlapping flanges 47 of end members 48 of channel construction for threaded engagement with the spacing bars 36.

The legs 15 and 15a are transversely floldable and are pivotally mounted at their upper ends, at 51, between depending flanges 52 of a pair of brackets 53 of substantially U-shape in cross section. The brackets 53 are welded or otherwise secured to a transversely extending plate 54 on the under side of the adjacent spacing bar 36 and are offset in a direction longitudinally of the top 14 to provide clearance for the legs 15 and 15a when the same are folded.

Each of the legs 15 and 5a is releasably maintained in its vertical supporting position by a brace 55 pivotally connected at its upper end to the outermost depending flange 52 of the associated bracket 53 by a pin 56.

The brace 55 is formed with a notch 57 for releasable engagement with a pin 58 provided on the leg 15. This brace is yieldably urged downwardly against the pin 58 by a spring 59 embracing the pivot pin 56 and having one of its ends fixed to the flange 52 of the bracket 53 and its other end fixed to the brace 55. A retaining clip 61 is pivotally mounted on the pin 58 and passes around the brace 55 to prevent the displacement of the brace from operative relation to the pin 58, but at the same time permitting a certain degree of movement between these parts to enable the notch 57 to be disengaged from the pin 58 when it is desired to fold the leg 15. Suitable stops 62 are provided between the flanges 52 of the brackets 53 to arrest the movement of the legs when they are swung to vertical position.

A Bucky diaphragm, of well known commercial type and indicated in its entirety at 63, is mounted beneath the top 14 of the table for co-operation with an X-ray apparatus (not shown) when the table is employed for radiographic purposes. This Bucky diaphragm comprises a drawer 64 adapted to hold a sensitized plate, which drawer is supported by a frame or tray 65.

According to the present invention the frame 65 is mounted for longitudinal movement beneath the top 14 and is provided with brackets 66 having slots 67 formed therein for adjustable attachment to the sides of the frame adjacent the sides of the table. Each of the brackets 66 is provided with a vertically disposed roller 67a for supporting engagement within the channel bar 37 and with a horizontally disposed roller 68 for engagement with the edge of the lower flange 41 of the channel bar 37 to maintain the Bucky diaphragm centrally located when moved longitudinally of the table.

An arm 69 is hinged at one end to the under side of the frame 65 of the Bucky diaphragm and is provided with yoke 71 at its opposite end for releasable engagement with the standard of the X-ray apparatus previously referred to. When the table is not employed for radiography, this arm may be folded back beneath the frame 65 (as shown in dotted lines in Fig. 1) and the Bucky diaphragm shifted longitudinally of the table to a position at one end thereof where it will be out of the way in the event it is desired to employ the table for fluoroscopy.

Under certain conditions it may be found desirable to hold selected portions of the body of a patient immobile. This may be accomplished by drawing over the patient a strip of cloth 72 from a spool 73 which is slidably mounted on one of the side rails 35. The free end of this strip of cloth is secured to the side rail 35 on the opposite side of the table. The spool may then be rotated by a crank handle 74 to draw the strip taut. This crank handle is locked against backward rotation by a suitable ratchet mechanism 75.

The table is locked in the extended horizontal position shown in Figs. 1 and 2 by means of latches 76 carried by the guide members 34 for engagement with the side rails 35 of the table. These latches are of the two-position type and each is illustrated in Fig. 7 having a stem 77 which is both slidably and rotatably mounted in a boss 78 formed on the guide members 34. The stem 77 is provided with a collar 79 at its inner end, which carries a pair of diametrically spaced pins 81 for engagement with a pair of horizontally disposed, spaced apertures 82 in the side rail 35 of the table top. The outer end of the stem is formed with a squared portion 83 for slidable engagement with a square opening 84 in a cap 85 which is threaded onto the boss 78. The latch 76 is urged inwardly by a coil spring 86 surrounding the stem 77 between the collar 79 and the cap 85 and may be retracted against the action of this spring by a knob or handle 87 secured to the outer end of the stem 77.

When it is desired to swing the table to a substantially upright position either for use in connection with radiography or fluroscopy or to move the table to the side of the room where it will be out of the way when not in use, the latches 76 are first retracted to disengage the pins 81 from the apertures 82. This movement of the latches also disengages the squared portions 83 of the stems 77 from the squared openings 84 in the caps 85. The latches are then ro-

tated through an arc of 90°, or until the pins 81 assume vertical positions, whereupon they are released, permitting the squared portions 83 to re-enter their squared openings 84, but displaced one-quarter turn with respect to their initial positions. This causes the pins 81 to bear against the side rails 35 at points out of registry with the apertures 82. The pins 81 are maintained in this position through the engagement of the squared portions 83 of the stems 77 within the squared openings 84 in the caps 85. The top of the table is then slid longitudinally through the guide members 34 until a second pair of apertures 88, located in each of the slide rails 35 at a predetermined distance from the end of the table and disposed in spaced relation in vertical alinement, register with the pins 81 and are engaged thereby under the action of the spring 86.

The advantage of the above described construction is that the latches 76 may be retracted separately and then released without reengaging the apertures from which they are withdrawn. Also, they may be turned to positions for registration with either the apertures 81 or 88 without danger of the latches becoming displaced while the table is being moved longitudinally. The top 14 of the table and the parts carried thereby are then swung about the axis of the trunnions 33 to the position shown in Fig. 4, and this swinging movement is arrested by engagement with a pair of adjustable stops 70 provided one on each of the side frame members 18 of the stand 16. The legs 15 and 15a are then folded inwardly in the overlapping parallel relation shown in Fig. 5. The table is releasably maintained in its vertical position by a spring operated latch 89 carried by the base 17, which latch is engageable with a flange 91 secured to the bottom surface of the adjacent spacing bar 36 by suitable fastening means 90 and releasable by a manually operated plunger 92.

The Bucky diaphragm 63 is supported or counterbalanced in its adjusted position when the table occupies a vertical position by a pair of flexible steel straps 93, the upper ends of which are wrapped around a pair of spring controlled spools 94 rotatably mounted in a housing 95 suitably secured to the under side of the plate 54.

The lower ends of the straps 93 are secured to the opposite sides of a block 96 formed with a bore 97 for releasable engagement with a pin 98 carried by a bracket 99 fixed to the side of the Bucky diaphragm 63. The pin 98 is urged into locking engagement with the block 96 by means of a spring 101 which may be retracted in order to release the block 96 when the table occupies a horizontal position. When thus released, the steel straps 93 are automatically wound upon the spools 94.

The table hereinabove described may be maintained immobile in predetermined desired positions along the rail 25 by means of a spring operated latch 102 slidably mounted in a guide 103 carried by the base 17 for releasable engagement with recessed stops 104 located at intervals along the rail 25. This latch may be retracted by a manually operated lever 105 fixed to a shaft 106 journalled in the base 17 and is provided at its opposite end with an arm 107 for engagement with a transversely extending pin 108 carried by the latch 102 (Fig. 10).

Means are provided at the lower end of the table top 14 (viewing Fig. 3) to prevent swinging of the table from vertical position to horizontal position until the steel straps 93 have been released from the Bucky and wound upon the spools 94.

A latch member 108 is pivotally mounted at 109 on a bracket 111 which is suitably secured to the bottom surface of the adjacent spacing bar 36 by the fastening means 90 which also secure flange 91 to the spacing bar. This latch member has an engaging arm 112 adapted to normally engage the upper edge of spring operated latch 89 to hold this latch in engagement with flange 91.

A lateral extending arm 113 is slotted at 114 and a spring member 115, suitably secured at 116 to a bracket 117 suitably fastened to the spacing bar 36, is positioned within the slotted portion 114. The free end of the spring member 115 is or may be provided with a suitable cushion 118 of rubber or the like.

When the steel straps 93 have been released and the Bucky lowered, the weight of the Bucky on the free end urges the spring member downward and against the lower portion of slotted arm 114 and moves the engaging arm 112 out of engagement with the latch 89 which is then releasable from the flange 91 by pressing the plunger 92. A stop 119 is secured to the spacing bar 36 to limit the downward movement of the spring member 115 and a laterally extending portion 121 of a plate 122 rigidly connected to the spacing bar 36 is provided to limit its upward movement.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

We claim:

1. A therapeutic table comprising a stand having guiding means pivotally mounted thereon for vertical swinging movement, a table top supported at one end by said stand and adapted to be mounted within said guiding means for longitudinal sliding movement, and means for supporting the other end of said table top.

2. A therapeutic table, comprising a stand, guiding means pivotally mounted thereon for swinging movement about a horizontal axis, a table top mounted in said guiding means and supported at one end by said stand in a horizontal position, said top being adapted to be moved longitudinally in said guiding means to a predetermined location relative to said axis to permit said top to be swung about said axis while occupying such location to a substantially vertical position, and means for supporting the other end of said table top.

3. A therapeutic table, comprising a stand, guiding means pivotally mounted thereon for swinging movement about a horizontal axis, a table top mounted in said guiding means and supported at one end by said stand in a horizontal position, said table top being adapted to be moved longitudinally in said guiding means to a predetermined location relative to said axis to permit said top to be swung about said axis while occupying such location to a substantially vertical position, means for support-

ing the other end of said table top, and locking means for releasably maintaining said table top against displacement from said guiding means when said top occupies a horizontal position.

4. A therapeutic table, comprising a stand, guiding means pivotally mounted thereon for swinging movement about a horizontal axis, a table top mounted in said guiding means and supported at one end by said stand in a horizontal position, said top being adapted to be moved longitudinally in said guiding means to a predetermined location relative to said axis to permit said top to be swung about said axis while occupying such location to a substantially vertical position, means for supporting the other end of said table top, and locking means for releasably maintaining said table top against displacement from said guiding means when said top occupies either a horizontal or a vertical position.

5. A therapeutic table, comprising a stand, guiding means pivotally mounted thereon for swinging movement about a horizontal axis, a table top mounted in said guiding means and supported at one end by said stand in a horizontal position, said top being adapted to be moved longitudinally in said guiding means to a predetermined location relative to said axis to permit said top to be swung about said axis while occupying such location to a substantially vertical position, means for supporting the other end of said table top, and a latch for releasably maintaining said table top in said vertical position.

6. A therapeutic table, comprising a stand, a top carried by said stand, a pair of rollers journaled in said stand for rolling contact with the floor, a track rail, and another pair of rollers journalled on said stand for engagement with said rail to guide said stand and top in parallelism with said rail when moved longitudinally thereof, one of the rollers of said last mentioned pair of rollers being mounted for yieldable vertical movement to compensate for the vertical displacement of either of the rollers of said first pair of rollers caused by irregularities in the surface of said floor.

7. A therapeutic table, comprising a stand, a top carried by said stand, a pair of rollers journalled in said stand for rolling contact with the floor, a track rail, another pair of rollers journalled on said stand for engagement with said rail to support and guide said stand and top in parallelism with said rail when moved longitudinally thereof, and manually operable means for positively locking said stand in predetermined positions along said rail.

8. A therapeutic table, comprising a stand, a top carried by said stand, a pair of rollers journalled in said stand for rolling contact with the floor, a track rail having stops arranged at intervals therealong, another pair of rollers journalled on said stand for engagement with said rail to guide said stand and top in parallelism with said rail when moved longitudinally thereof, and means on said stand to positively lock said stand in predetermined positions along said rail.

9. A therapeutic table, comprising a support, a top carried by said support for swinging movement between substantially horizontal and vertical positions, a Bucky diaphragm mounted for longitudinal adjustment on said top, and spring means for counterbalancing said diaphragm when said top occupies its vertical position.

10. A therapeutic table, comprising a support, a top carried by said support for swinging movement between substantially horizontal and vertical positions, a Bucky diaphragm mounted for longitudinal adjustment on said top, and spring means detachably connected to said diaphragm for counterbalancing the same when said top occupies a vertical position.

11. A therapeutic table, comprising a support, a top carried by said support for swinging movement between substantially horizontal and vertical positions, a Bucky diaphragm mounted for longitudinal adjustment on said top, and means for counterbalancing said diaphragm when said top occupies a vertical position, said means including a flexible strap and a spring controlled reel for automatically winding said strap thereon.

12. In a therapeutic table having a top adapted to be positioned horizontally or vertically and having a Bucky diaphragm mounted for longitudinal movement thereon, means for counterbalancing said diaphragm when said table top occupies its vertical position, and means to prevent movement of said table top from the vertical position to the horizontal position until said counterbalancing means has been released from said diaphragm.

13. In a therapeutic table having a top adapted to be positioned horizontal or vertically and having a Bucky diaphragm mounted for longitudinal movement thereon, means for latching said table top in vertical position, means for counterbalancing said diaphragm when said table top occupies its vertical position, and means for preventing release of said latching means until said counterbalancing means has been released from said diaphragm.

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