S. M. LANGWORTHY.

SURGICAL TABLE.

APPLICATION FILED JAN. 3, 1905.

978,760.

Patented Dec. 13, 1910.

2 SHEETS—SHEET 1.

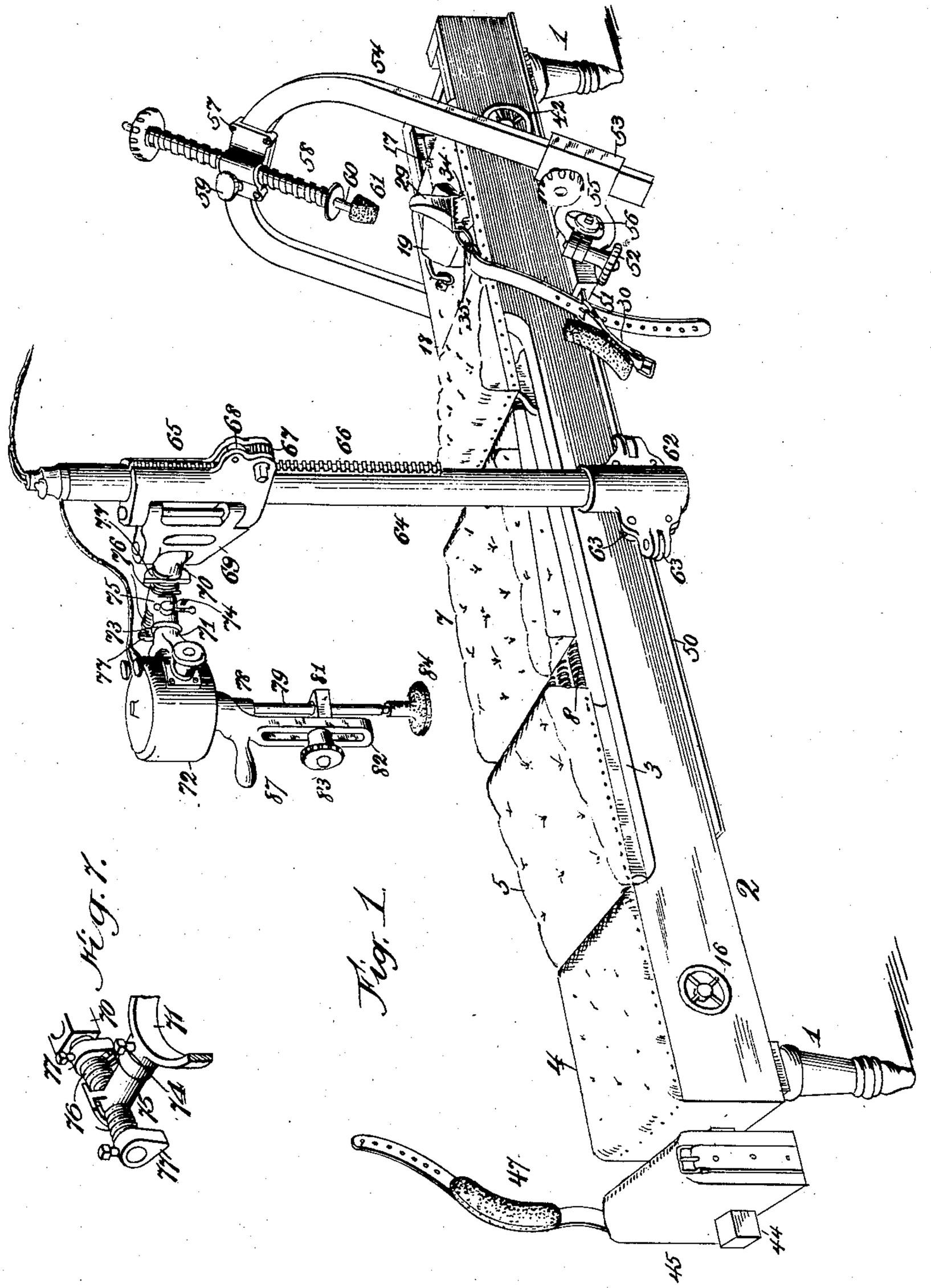

Fig. 1.

Fig. 7.

Witnesses

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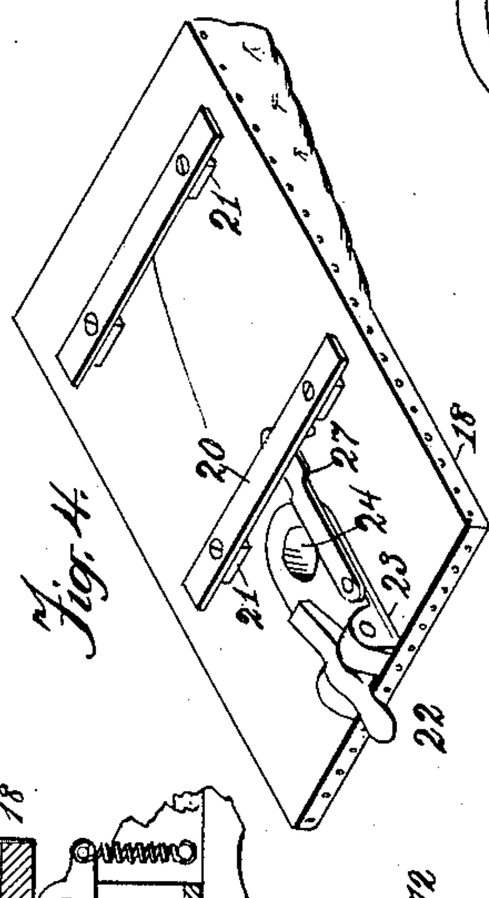

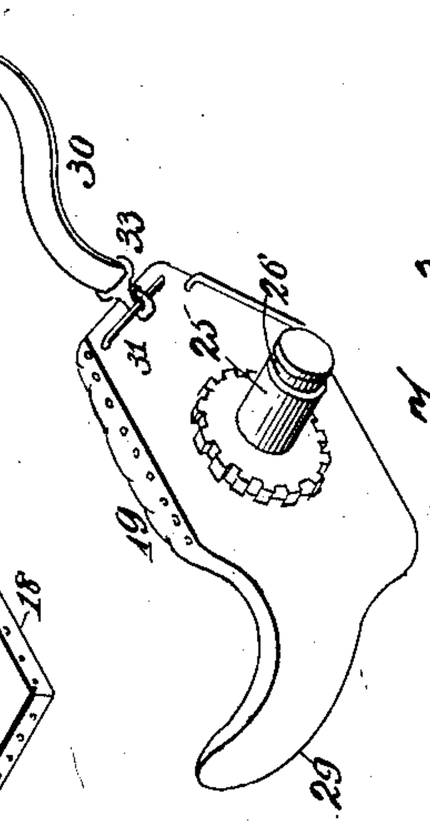

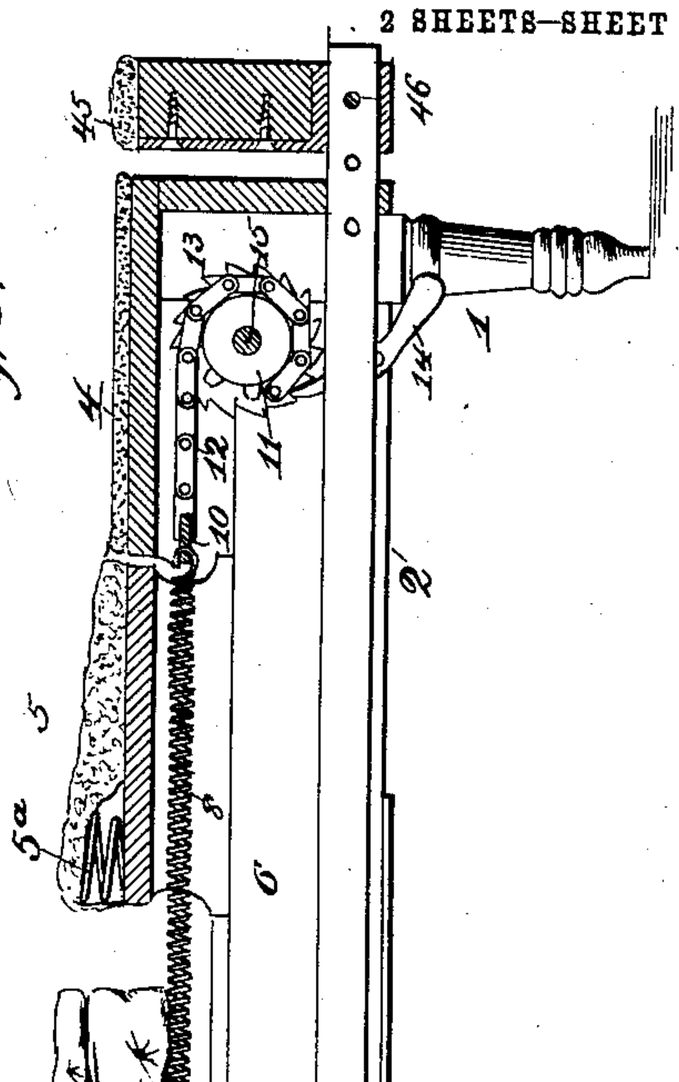

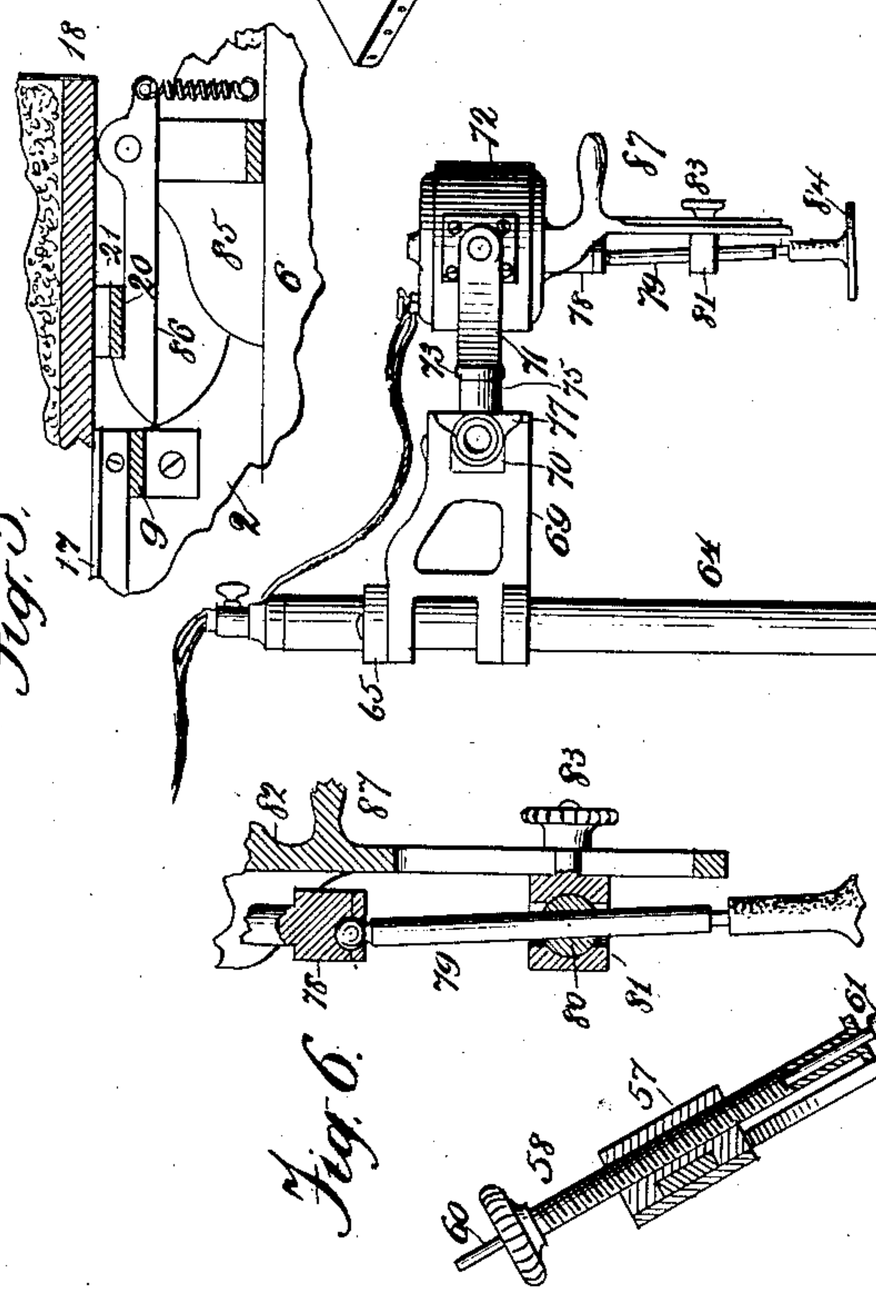

Witnesses.

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UNITED STATES PATENT OFFICE.

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SURGICAL TABLE.

978,760. Specification of Letters Patent. Patented Dec. 13, 1910.

Application filed January 3, 1905. Serial No. 239,584.

To all whom it may concern:

Be it known that I, SOLON M. LANGWORTHY, a citizen of the United States, residing at Cedar Rapids, in the county of Linn and State of Iowa, have invented certain new and useful Improvements in Surgical Tables, of which the following is a specification.

This invention relates to appliances for the treatment of diseases by osteopathic or analogous methods, and has for its object to produce a treating or operating table, with mechanism, adapted for the mechanical operations of stretching, pushing, vibrating, and so forth, to take the place of the usual manual movements corresponding thereto.

The nature of the invention will fully and clearly appear by reference to the accompanying drawings, in connection with the description and claims following.

In the drawings, forming a part of this specification, Figure 1 is a view in perspective of my improved operating table and its appliances. Fig. 2 is a central, longitudinal section of the same. Fig. 3 is the head rest as seen from the under side. Fig. 4 is a similar view of the sliding platform carrying the head-rest. Fig. 5 is a fragmentary and sectional view of a sliding support for one end of said platform. Fig. 6 is a sectional view, showing details of the vibrator mechanism. Fig. 7 is a fragmentary view showing detail of the mounting for the vibrator.

On suitable legs 1 is mounted a frame 2, preferably cut away at 3 to allow for free movement of cushions on which the body of the patient rests, and which will be later referred to in detail. At the foot end the frame is covered over by a fixed, padded platform or top 4. The remainder is left practically open for parts to be placed adjustably therein. One of these is a sliding cushion 5, with springs 5ª in the nature of a stool, and preferably with an inclined top, as shown, forming an extension of the foot platform, and serving as a support for the patient's hips. The feet of this stool rest on ledges 6 inside the main frame, and may slide endwise thereon, as occasion may require. A pair of tapered cushions 7 serve to support the body, as above mentioned, the height being regulated by simply shifting the cushions with respect to each other, as shown in Fig. 1. These cushions rest on a number of coil springs 8 connecting at one end with a cross-bar 9 secured to the head part of the frame, and at the other end to a free cross-bar 10. The tension of these springs is regulated by a winch near the foot of the frame, comprising a sprocket 11, chain 12 connecting with the free cross-bar, a ratchet 13 and pawl 14, a shaft 15 to which the ratchet and sprocket are attached, and a hand-wheel 16 to turn the same. The pawl has a depending tail to hold it in engagement by gravity, and by means of which it may be disengaged. This gives a soft and yielding support for the abdominal portions of the body, and thereby aids and enhances the effects produced by the other appliances, to be described presently.

Provision is made for stretching the vertebral column in whole or in part, as follows: At the head end of the frame, near the upper edge, is secured a pair of guides 17. On these guides slides the platform 18 which carries the head-rest 19 and is upholstered similarly to the cushion 5 with springs 18ª. The bottom of the platform is provided with cross-bars 20, raised from the platform by space-blocks 21 to admit the guides between said bars and platform. The same side of the platform is also provided with a pawl 22 hung to a casting 23 secured to the platform. This casting and the platform are bored at 24 to take the head-rest pivot 25. This is grooved at 26 to engage a latch 27, by which it is held from disengagement. The head of the pivot-iron is flanged where it is fastened to the head-rest, and the rim of the flange is notched for the engagement of a latch 28 on the upper side of the platform. By this means the head-rest may be turned to any desired position, and securely held there. At one side of the head-rest is an upturned horn 29 to take under the patient's occiput, the head being secured firmly by a padded strap 30, one end of which connects with a stirrup 31 on the under side of the head-rest and the other buckles to a stirrup 34 secured to the platform, and which is in the nature of a buckle. To the same stirrup, one of which is provided at each side of the platform, is attached a ring 35, and to this may be hooked other or additional straps, as the same may be required. A little below the platform, in guides 36, is mounted a slide-bar 37, provided on its upper side with a ratchet rack 38, and on the under side with a gear rack 39. The ratchet engages the pawl 22, and

the gear rack with a pinion 40 on a transverse shaft 41 provided with a hand-wheel 42. This pinion also engages a rack 43 on a slide-bar 44, similarly mounted, and connecting at the foot end with a foot-block 45 by a detachable pin 46. The top of the foot-block is suitably padded, and is provided with a padded strap 47 by which the patient's ankles are securely attached thereto. On the shaft adjacent to the pinion is a ratchet wheel 48, and to the frame near it is hung a pawl 49 to hold the slide-bars in stretching position. The stretching, as will be apparent, is effected by turning the hand-wheel 42 shown in Fig. 1. On the table so constructed is mounted a device for applying tension laterally, which will now be described.

To the bottom edge of the frame on each side is secured a guide-rail 50. Sliding on these guide-rails to any desired point, is a carriage 51, to which are clamped by a suitable set-nut 52 on one or both, a pair of guide-blocks 53 mortised to take the straight arms of a yoke 54. It will be understood that the guide-block not shown is similar to the one shown. The yoke may be adjusted to any desired height, by means of a set-screw 55, and tilted to any desired angle on the trunnions 56 of the carriage, as above indicated. On the curved part of this yoke is mounted a slide-block 57 carrying a hollow screw 58, and adjustable on the yoke to any desired fixed position by means of a set-screw 59. In the bore of the screw is mounted a removable plunger 60, tipped at the lower end with a cushioned applicator 61, the shape of which may be such as conditions require.

To give vibratory treatment, the following device is provided: On the guide-rails 50 is mounted a carriage 62, which should preferably be provided with anti-friction rollers 63 for ease of movement, as there is considerable overhanging weight on the carriage. From one side of this carriage rises a standard 64 provided with a slide 65 adjustable up and down, preferably by means of a rack 66 attached to the standard, and a pinion 67 and pawl 68 to engage it, as clearly shown in Fig. 1. Jointed to swing laterally on this slide-block is an arm 69, and to this is similarly jointed a pivot arm 70. Mounted on this arm to swing in a vertical plane is a yoke 71, to which is pivoted a small electric motor 72. The yoke is jointed at 73, so that the motor may be tilted sidewise, a set-screw 74 fastening it in any desired position. To the knuckle portion of the yoke, 75, is attached at each side a coil spring 76, the other ends of which connect with adjustable collars 77. The spring serves as a counterbalance to the weight of the motor and its connected parts, but allows them to yield up or down as much as circumstances require. To the spindle of the motor is connected a short crank-head 78 driving a spindle 79 having a ball-and-socket connection therewith. The body of this spindle passes through a ball 80 socketed in a slide-block 81 adjustable up or down on a vertical bracket 82 secured to the lower head of the motor, a threaded stem of the slide-block passing through a slot in the bracket, and taking a set-nut 83. The lower end of this spindle is adapted to take applicators 84 of any desired form or material, soft rubber being commonly used. The spindle need not revolve, but the applicator is carried around in a circle bodily, the circle being greater or less according to the position of the slide-block 81. Pressed down on the body of the patient, with more or less force, this massage device, gives to the affected parts a rapid kneading and vibratory action, and the beneficial results incident to such treatment.

In Figs. 1, 2 and 5 is shown a support for the lower end of the head platform, when drawn down some distance toward the foot. This is in the nature of a bridge sliding on the ledges 6, the end-blocks 85 serving as feet for the platform. The support connects with the platform by a hook 86 engaging one of its cross-bars. When the platform is pushed back to normal position the inclined end of the hook passes under the cross-bar 9, and the parts are thus automatically disengaged.

In the use of the machine the patient is placed in position, the head and feet secured as described, and then the body is extended by means of the stretching device. The spinal column is then tense and in suitable condition for the treatment of any particular vertebra so as to adjust it to a proper position. The lateral tension device is accordingly set so that the applicator will bear on the part in question, and at precisely the right angle. Then by slow pressure, as by the turning of the screw, or a sudden thrust, as by striking the applicator rod with a rubber mallet, the faulty member is forced to a proper position. The adjuster yoke and its connections may be slipped out of its guides and set aside, when not needed.

The manner in which the vibrator is used has already been indicated. It is preferably employed while the body is tense. The universally jointed arms admit of application in any desired way, a handle 87 enabling the operator to move it at will in any direction. In practice it is found that the use of springs under the patient is very beneficial, the reaction of the springs under the shoulders, body and hips being of material aid to the operator in producing the results desired.

When it is desirable not to draw the legs downward, as is sometimes the case, the pin

46 may be withdrawn. The ankles being secured to the foot-block, the latter will be drawn against the foot end of the frame and stop, when of course all the extension of the body will be upwardly.

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

1. In a surgical table, the combination of a frame provided with guides for a detachable head platform, a platform adapted to slide thereon, a pawl attached to said platform, a slide-bar mounted in guides attached to the frame, a ratchet thereon to engage with said pawl, a gear rack, and a pinion and means for turning the same, substantially as and for the purpose set forth.

2. In a surgical table, the combination of a frame, a sliding head platform therefor, a rotatable head-rest mounted thereon, and means for latching the same in engagement with the platform and for locking it radially, means for holding the feet, and means for moving the head platform back and forth.

3. In a surgical table, the combination of a sliding platform adapted to be locked at any desired place, a rotatably adjustable head-rest mounted thereon and provided with an upturned horn to engage the patient's occiput, a strap to bind the head thereon, connections for said strap on the platform and head-rest, in combination with means for holding the feet, and means for moving the platform back and forth.

4. A surgical table having an open space or gap between the head and foot, a series of coil springs stretched across it, means for adjusting the tension of said springs, cushions to rest on said springs and support the patient's body, a head supporting platform, means for moving the same back and forth, and means for holding the feet.

5. In a surgical table, the combination of a frame, a head platform adapted to slide thereon, a supplemental support for one end of the platform when drawn down toward the foot, means for automatically detaching the same when the platform is pushed back to normal position, means for holding the head and feet, and means for moving the platform back and forth.

6. In combination with a surgical table, a device for applying tension laterally, comprising a semicircular yoke adapted to straddle the table, tilting guides adapted to hold the legs of the yoke adjustably as to height and angle, a slide-block mounted on the curved part of the yoke, a massage device movable in said slide-block, means for applying pressure to said massage device, and means for simultaneously applying traction with said pressure.

7. In a surgical table, the combination of a frame, guide rails thereon, a sliding carriage mounted on said rails, a massage device mounted adjustably on said carriage, and body-stretching mechanism mounted on said frame, and adapted for use concurrently with said massage device.

In testimony whereof I affix my signature in presence of two witnesses.

SOLON M. LANGWORTHY.

Witnesses:

J. M. St. John,

Judson A. Kramer.