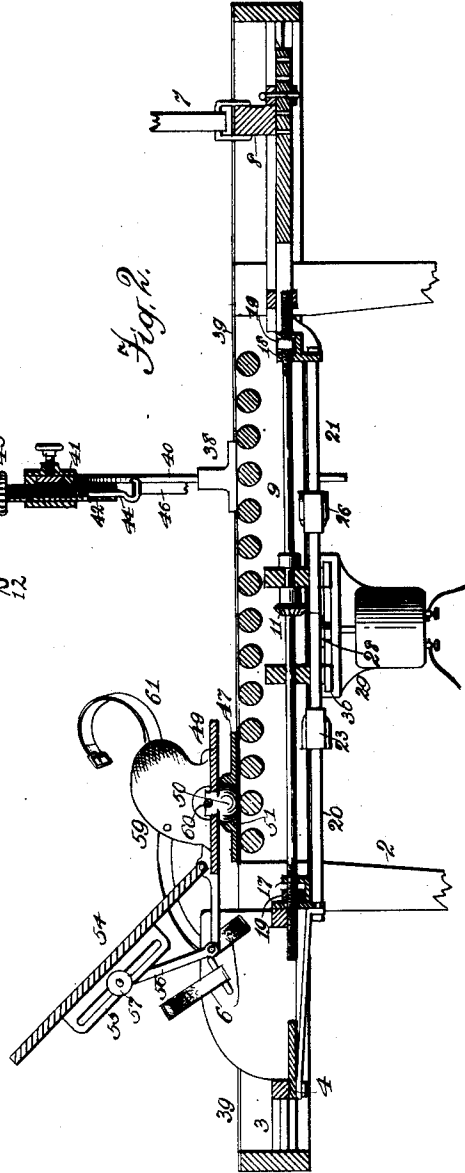
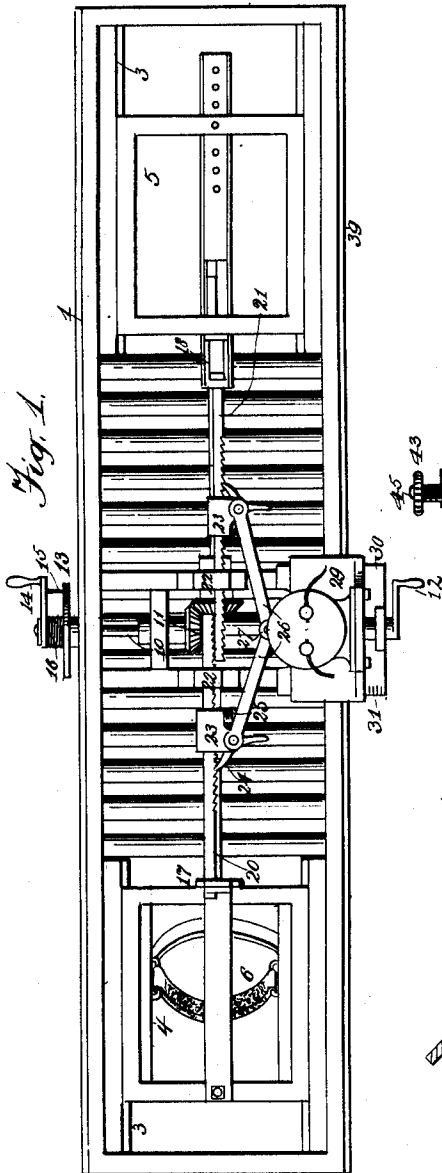


S. M. LANGWORTHY.  
SURGICAL TABLE.  
APPLICATION FILED MAR. 10, 1906.

901,628.

Patented Oct. 20, 1908.

2 SHEETS—SHEET 1.



Witnesses.

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2 SHEETS—SHEET 2.

Fig. 3.

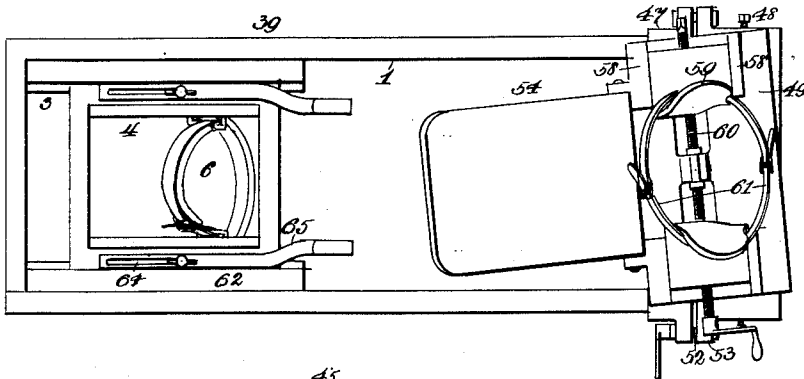


Fig. 4.

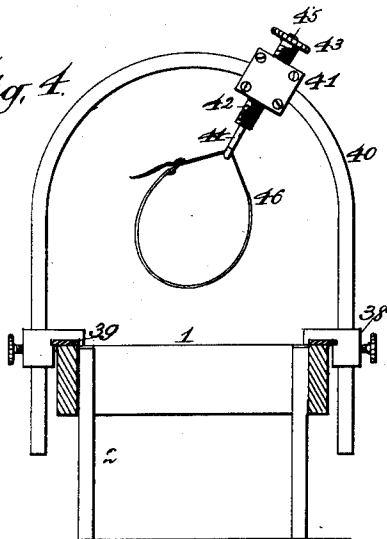


Fig. 6.

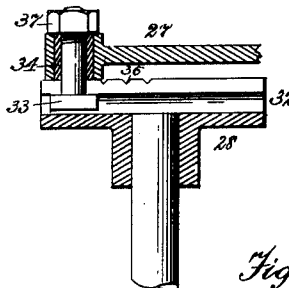


Fig. 7.

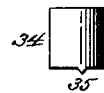


Fig. 8.

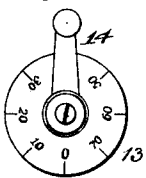
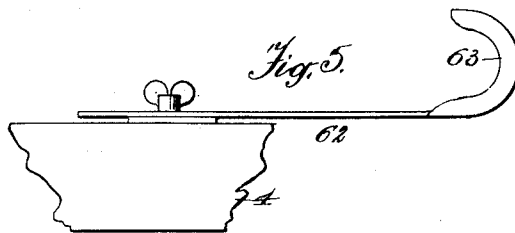


Fig. 5.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## SURGICAL TABLE.

No. 901,628.

Specification of Letters Patent.

Patented Oct. 20, 1908.

Application filed March 10, 1906. Serial No. 305,404.

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 surgical tables arranged for applying traction to the vertebral column, and other parts of the body, and embraces various improvements upon the vertebral stretcher for which Letters Patent were granted to me on the 29th of November, 1904, numbered 776,335.

One of the objects of this invention is to not only apply traction to the patient, but also rapid longitudinal vibration while under tension, to stimulate nervous action and aid nutrition, more especially with reference to intervertebral cartilage.

A further object is to provide for lateral stress while the body is under longitudinal tension.

Another object is to provide mechanism whereby the body may be held firmly at one angle while a leg is drawn or pushed at another angle. This feature is more especially applicable to cases of hip dislocation in which the head of the femur lies out of the hip socket, the object being to turn the pelvis at such an angle to the line of pull or push on the leg that the head of the femur is drawn or pushed parallel with the pelvic bone instead of against it, as from the peculiar formation of the pelvis must be the case if the femur is drawn straight down in the normal line of the body.

Other objects will be disclosed in the description and claims following.

In the accompanying drawings, forming a part of this specification, Figure 1 is a view of my improved surgical table as seen from the under side, with the vibrator in position, but without the lateral stretcher. Fig. 2 is a central longitudinal section of the same, looking down, and also showing the lateral stretcher and the hip holding device above referred to. Fig. 3 is a fragmentary top view, showing the head and hip holding devices. Fig. 4 is a cross section, showing the lateral stretcher. Fig. 5 is a side view of a shoulder stirrup adjustably attached to the head holding carriage. Fig. 6 is a section of the vibrator crank and its connec-

tions. Fig. 7 is a thimble forming the crank-wrist of the vibrator. Fig. 8 shows an indexed dial and crank to denote any desired degree of tension.

The apparatus in the main is similar to that shown in my former patent above referred to, and comprises a rectangular frame 1 supported on legs 2, and provided with guides 3 to take a head carriage 4 and a foot carriage 5. These are provided with suitable means for holding the head and feet, respectively, as indicated by padded straps 6 and a foot-strap 7 to secure the ankles to the bolster 8, as shown in detail in said former patent. The carriages are moved back and forth by a right and left screw 9 actuated by a transverse shaft 10 engaging it by miter gears 11, and provided with a suitable crank 12. An improvement in this part of the apparatus is shown in the registering tension device illustrated in Figs. 1 and 8. A graduated dial 13 is secured near the outer end of the cross-shaft, and outside of this is loosely mounted a crank 14 provided with an index finger 15. The dial and crank are attached to opposite ends respectively, of a torsion spring 16. It is evident that the stress on this spring, as indicated on the dial, will determine the relative tension on the body of a patient, and by this means the tension may be applied accurately from time to time, and with such variations as the nature of the case may make desirable.

To coöperate with the main stretching apparatus above described are certain special appliances, which will now be described.

In Figs. 1 and 2 is shown a device for imparting short and rapid vibrations to the body while under tension, and in the line of tension. To the head and foot carriages are secured iron brackets 17 and 18, respectively, with pockets to take nuts 19 engaging the screw 9. It will be noted that the pockets are wider than the nuts, which allows a limited movement of the carriages independently of the screw. To the same brackets are secured ratchet bars 20 and 21, respectively, sliding in suitable bearings 22. The bars are provided with slide-blocks 23, to which are pivoted pawls 24 to engage the notches of the bars, suitable springs 25 serving to hold them normally in engagement. To the same slides are also pivoted links of a toggle 26, which at the middle connect

with a short link 27 connecting at its other end with a crank 28. This is attached to the spindle of an electric motor, or other suitable revolving mechanism, mounted on a slide 29, and movable in and out on a guide-plate 30 attached to the under side of the main frame. The slide is moved by a cranked screw; in a simple and well known way. The guide-plate is preferably graduated at 31, so that the position of the slide may be accurately noted at any time. By moving the slide in or out length of stroke may be varied slightly, as may also terminal thrust. For greater variations of stroke the radius of the crank may be changed by shifting the wrist, as indicated in Fig. 6. For this purpose the crank has a tee-slot 32 to take a wrist-bolt 33. Over this bolt slips a sleeve 34 with a lip 35 to engage notches 36 in the face of the crank, and prevent any possible slip. The sleeve is secured by a nut 37.

The operation of this part of the apparatus is briefly described as follows. The patient's head and feet, or any other two separated parts of the body to which the mechanism is applicable are secured to the respective carriages, and the proper tension-applied by turning the crank 14. In so doing the pawls of the vibrator automatically engage the ratchet bars as the latter move outward through the slide-block. When the desired tension is secured, as indicated by the index finger on the dial, the screw is stopped, and the motor moved inward a little, so as to free the nuts 19 from contact with the brackets at either end of the stroke, unless it may be desirable to utilize the jar which such contact would impart, in which case the motor needs little or no inward movement. Current now being given the motor the body under tension is subjected to a rapid vibration, of greater or less length of stroke, and in the line of tension. The physiological benefits arising from this special vibration are believed to be superior to that derived from any other kind of vibration, in many cases, but as the reasons for this are not necessary to a proper understanding of the invention they need not here be set forth.

In Figs. 2 and 4 is shown a device by which the body of a patient may be drawn sidewise or upward at any desired angle, while under longitudinal tension. In suitable slides 38 running on guide-rails 39 attached to the top of the frame, is adjustably mounted a semi-circular yoke 40, the elevation of which may be varied at pleasure. On the yoke is adjustably mounted a slide 41, and through this runs a screw 42 movable by a hand-wheel 43. Through the center of this screw, which is tubular, runs a hooked rod 44, headed at 45, but free to turn in the screw. The hook takes a strap 46, which

may pass around the body or a limb at any point, as the apparatus may be slid from end to end of the main frame. The adjustment of the slide 41 makes it possible to apply the lateral stress at any desired angle, a downward lateral pull not being required.

In Figs. 2 and 3 is shown a device adapted more specially for the reduction of hip dislocations. On the guide-rail 39 is mounted a slide 47, which may be set at any desired point, as by set-screws 48. On this slide is mounted a platform 49, which should, within certain limits, have a practically universal movement with respect to its support. A simple device for this purpose is a ball and socket, the ball 50 being formed on the under side of the platform, and the socket 51 in two halves of the slide 47. By means of screws 52 in lugs 53 the socket halves may be clamped tightly on the ball to hold the platform at any desired angle. The platform serves as a seat for the patient, being supplied with a suitable cushion, not shown. To the rear of the platform is pivoted a seat-back 54, adjustable to any desired angle by means of the slotted plate 55, arm 56, and clamping screw 57. In guides 58 of the platform are mounted opposing clamps 59 engaging right and left screw 60, the clamp being suitably curved at the face to fit approximately the curvature of the pelvic bone. The clamps are provided with straps 61, front and rear, to tighten about the patient's loins and hold the pelvis to its position between the clamps which, pressing firmly each side, prevent any lateral displacement. So held, the pelvis may be turned at an angle to the line of draft or thrust, as indicated in Fig. 3. In such a position a dislocated right hip may be pulled or pushed back to position by drawing or pushing the leg in line with the main frame, and in so doing the ball or head of the femur does not pull against bone, but parallel with the face of the pelvis, against which it rests.

In my said former patent the shoulder pulling device is a loop, into which the arm is slipped. In Figs. 3 and 5 an improved shoulder hold is shown. This is a hook of iron 62, padded at 63 to take the shoulder, and slotted at 64 for adjustable attachment, as by thumb-screw, to the head carriage. The inward curves at 65 adapt it to narrow shoulders, while for wider ones the pair may be spread to any desired distance. In practice the device is very comfortable, and much more convenient than the looped strap.

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

1. In a surgical table adapted to secure longitudinal traction, mechanism adapted to produce vibration in the line of such traction.

2. In a surgical table adapted for longi-

tudinal traction, a cooperating vibrator connecting with the traction devices, and producing vibration in the line of such traction.

3. In a surgical table, the combination of  
5 head and foot carriages adapted to hold two parts of the body, means for forcibly moving them toward and away from each other, and a vibrator connecting with said carriages, and adapted to move them in the line  
10 of traction.

4. In a surgical table having head and foot carriages adapted to hold two parts of the body, and means for forcing them in opposite directions, but permitting a limited  
15 independent movement, the combination of a reciprocating vibrator, and a connection thereof with the head and foot carriages.

5. In a surgical table, the combination of carriages adapted to hold two parts of the  
20 body, a right and left screw to give opposite movement to them, nuts on said screw having a limited slip connection with said carriages, a toggle adjustably connecting with the carriages, a crank connecting with said  
25 toggle, and means for rotating said crank.

6. In a surgical table, the combination of oppositely movable head and foot carriages adapted to hold two parts of the body, means for forcing said carriages in opposite direc-  
30 tions, but having a limited slip connection therewith, ratchet bars secured to said carriages ratchet slides thereon, a toggle connecting with said slides a rotating crank, and a connection thereof with said toggle.

35 7. In a surgical table, the combination of carriages adapted to hold two parts of the body, means for forcing them in opposite directions, and means for applying traction transversely while the body is under longi-  
40 tudinal stress.

8. Combined with a surgical table adapted to apply longitudinal traction to the body, a transverse stretcher, comprising a semicircular yoke, a slide thereon, a tubular screw  
45 in said slide, a hooked rod revoluble in said

screw, and means, such as a strap, for connecting said hook with the body.

9. Combined with the main frame of a surgical table having top guide rails and traction mechanism, substantially as described, a transverse traction device comprising  
50 slides on said rails, a semicircular yoke adjustable in said slides, a slide adjustable on said yoke, a tubular screw through said slide, and a hook revoluble in said screw, with a  
55 strap, or like means for connecting the hook with the body.

10. In a surgical table having a sliding foot carriage and means for fastening two parts of the body thereto, a hip-holder, comprising  
60 clamps to engage the pelvis each side, straps attached thereto to prevent disengagement, a platform carrying said clamps, adapted to be turned at any desired angle, and a slide to support said platform ad-  
65 justably.

11. In a surgical table having a sliding foot carriage to which a part of the body is secured, and means for moving the same, a hip-holder adapted to hold the pelvis  
70 rigidly in position and turn the same out of the normal angle with respect to the leg, whereby a dislocated femur may be pulled or pushed back to normal position parallel with, instead of against the face of the pelvis.  
75

12. In a surgical table adapted to apply traction to the leg, a hip-holder comprising a slide adjustable on the table frame, a platform adjustable to any desired angle on said  
80 slide, an adjustable back therefor, oppositely moving pelvis clamps, and means for holding the pelvis closely between them, substantially as specified.

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

SOLON M. LANGWORTHY.

Witnesses:

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F. J. KUBICEK.