

A. P. RIDDLE, EXECUTRIX.

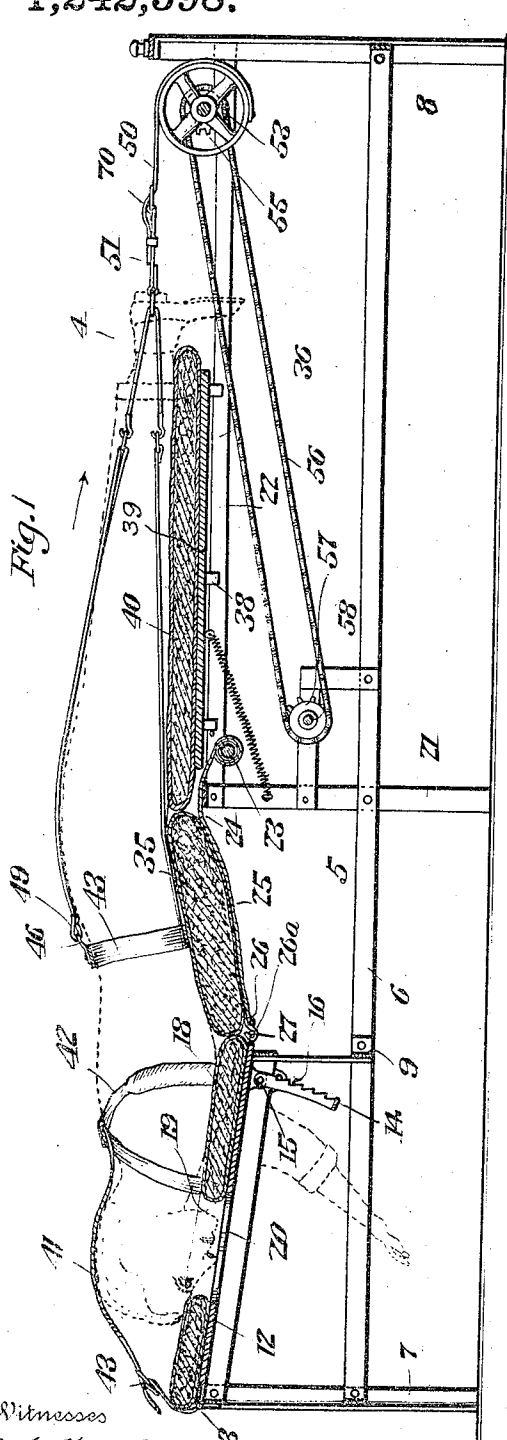
TRACTION COUCH,

APPLICATION FILED SEPT. 27, 1916.

1,242,598.

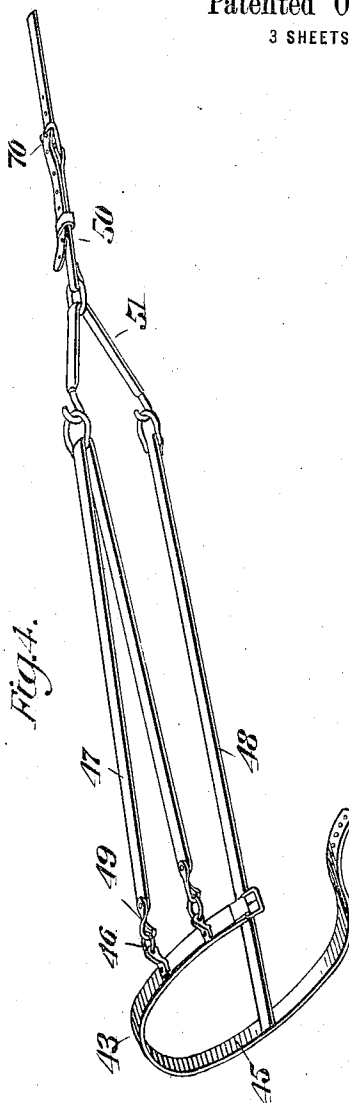
Patented Oct. 9, 1917.

3 SHEETS—SHEET 1.



Witnesses

W. A. Shreve



Inventor

James W Riddle

By

Victor J. Evans.

Attorney

J. W. RIDDLE, DEC'D.

A. P. RIDDLE, EXECUTRIX.

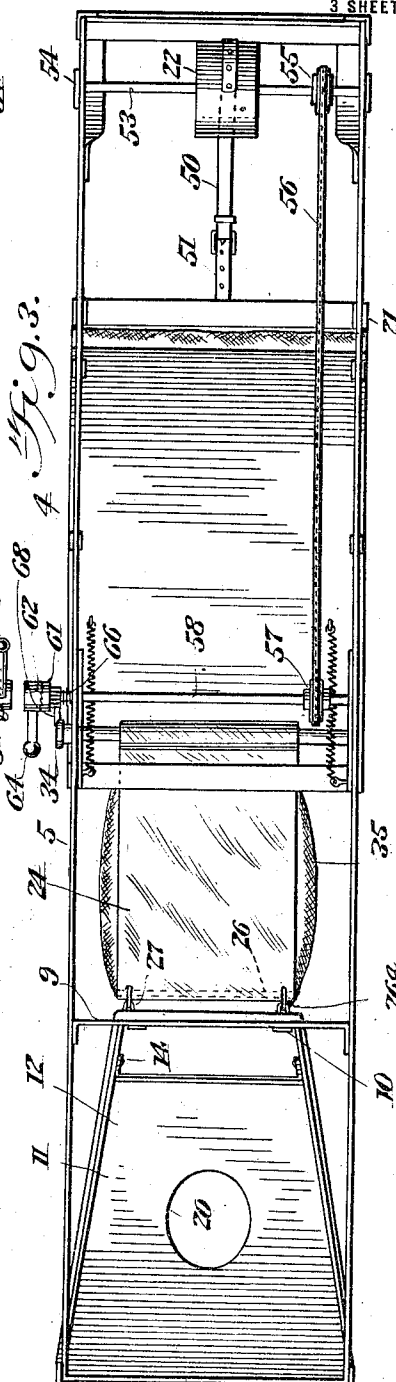
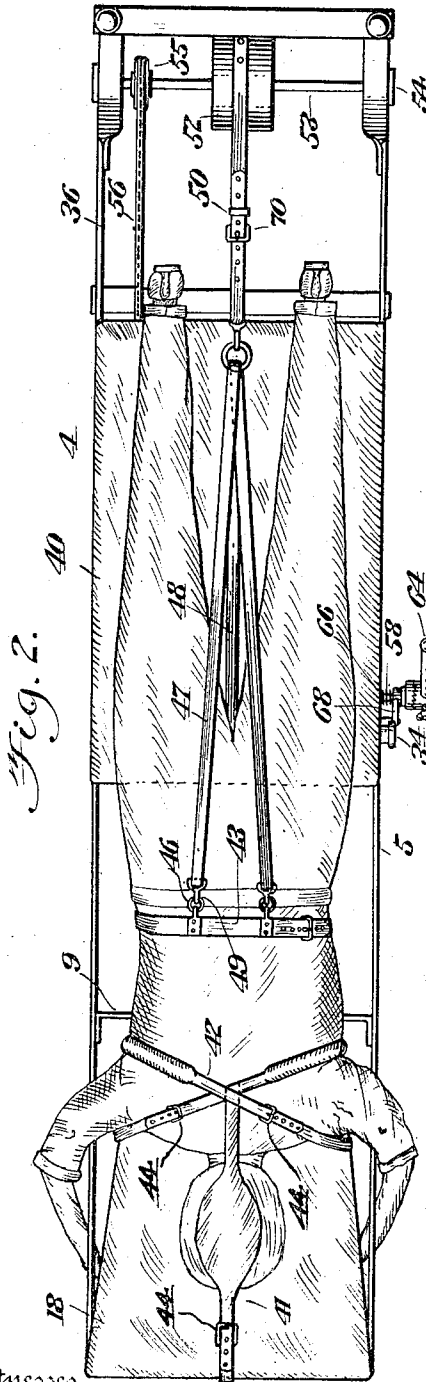
TRACTION COUCH.

APPLICATION FILED SEPT. 27, 1916.

1,242,598.

Patented Oct. 9, 1917.

3 SHEETS—SHEET 2.



Witnesses

M. S. McLowell

Inventor

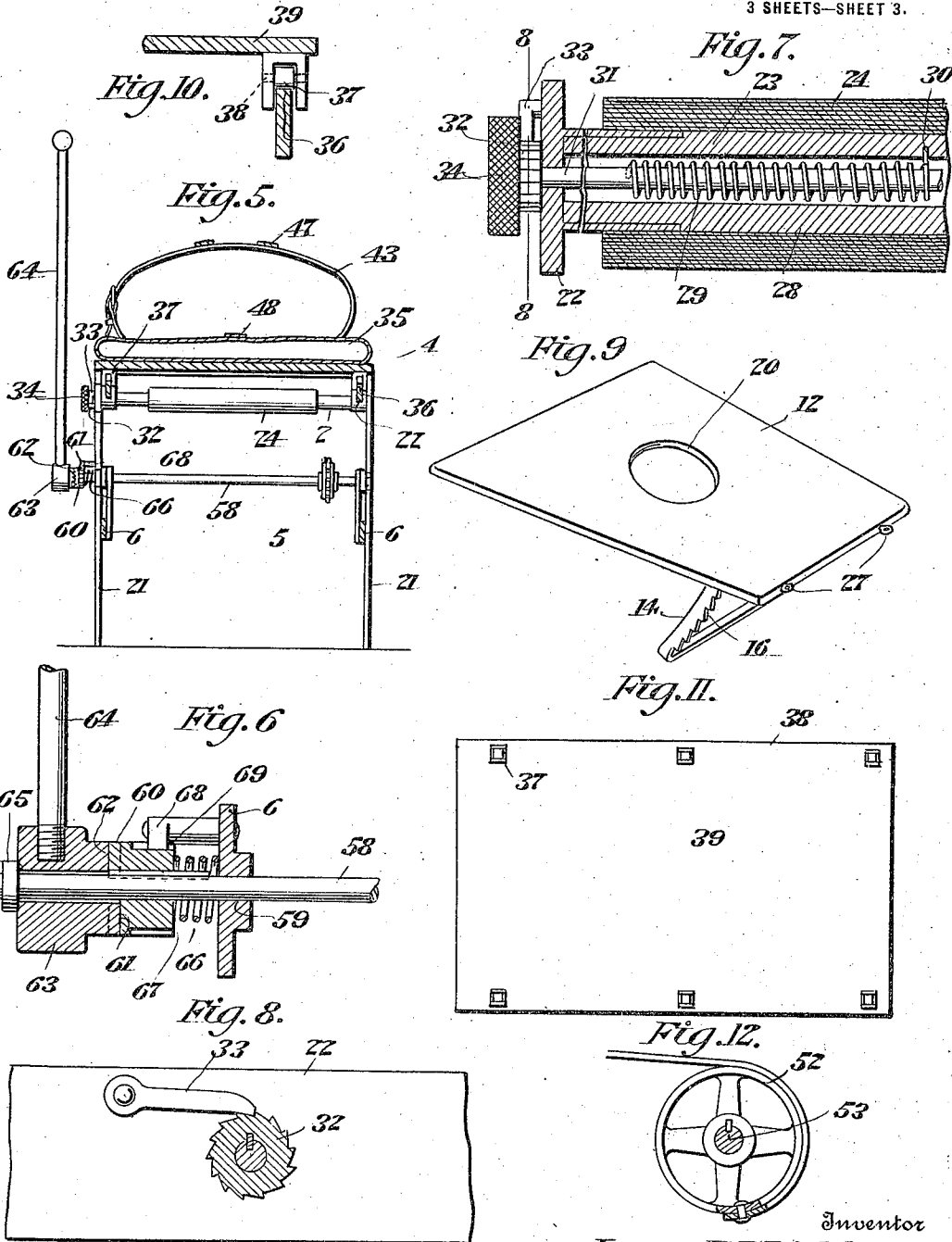
James W. Riddle
By *Victor J. Evans*

Attorney

J. W. RIDDLE, DEC'D.
A. P. RIDDLE, EXECUTRIX.
TRACTION COUCH.
APPLICATION FILED SEPT. 27, 1916.

1,242,598.

Patented Oct. 9, 1917.
3 SHEETS—SHEET 3.



Witnesses

M. D. Skiff

Inventor
James W. Riddle

By *Victor J. Evans*

Attorney

UNITED STATES PATENT OFFICE.

JAMES W. RIDDLE, OF VALLEY FORGE, PENNSYLVANIA; ANNA PEARL RIDDLE
EXECUTRIX OF SAID JAMES W. RIDDLE, DECEASED.

TRACTION-COUCH.

1,242,598.

Specification of Letters Patent.

Patented Oct. 9, 1917.

Application filed September 27, 1916. Serial No. 122,452.

To all whom it may concern:

Be it known that I, JAMES W. RIDDLE, a citizen of the United States, residing at Valley Forge, in the county of Chester and State of Pennsylvania, have invented new and useful Improvements in Traction-Couches, of which the following is a specification.

This invention relates to traction couches and has particular reference to the type used in the treatment of spinal and vertebral disorders.

One of the principal objects of the invention resides in providing an efficient device of the above character for use in hospitals, physicians' offices or in sick rooms, so that scientific aid may be had in the treatment of spinal ailments, including curvature of the spine, vertebral displacements and other similar diseases and their resultant disorders.

Another object of the invention resides in combining a traction couch with the features of construction hitherto found in the usual form of physicians' "adjusting stools," so that the traction couch comprising the present invention while not only possessing all the desirable features found in a traction couch will also have, in addition, the features of the adjusting stools, this construction being particularly advantageous as it combines both machines into homogeneous unity and eliminates the necessity of a patient being transferred from one machine to the other when being treated.

A further object of the invention resides in a machine for the above purpose in which a patient is harnessed thereon, the harness being connected with means for tensely straining the patient, so that the bones of the spine will be rendered more pliable in order that their condition can be readily disclosed, said tension means being so disposed upon the machine that the physician may operate the same with one hand and have the other within convenient reach of the patient, so that he may note the effects of the machine and accurately determine the condition of the patient, and thus, by being able to note the condition of the vertebræ, the physician will be able to accurately decide the exact tension which he may wish the patient to be placed under, in order that the treatment will be more effective.

Other objects and advantages will be in part obvious and in part pointed out hereinafter.

In the annexed drawings, forming a part of the specification, and in which similar characters of reference denote corresponding parts in all the views thereof,

Figure 1 is a vertical longitudinal sectional view of the traction couch comprising the present invention,

Fig. 2 is a top plan view thereof, illustrating the position of a patient thereon,

Fig. 3 is a bottom plan view of the machine,

Fig. 4 is a perspective view of the harness employed in securing the patient upon the machine,

Fig. 5 is a transverse sectional view, taken on the line 5—5 of Fig. 2,

Fig. 6 is an enlarged vertical section of the operating lever and associated clutch mechanism,

Fig. 7 is a vertical sectional view of the curtain shaft utilized in retaining the curtain bridging the head and foot sections,

Fig. 8 is a detail on the line 8—8 of Fig. 7,

Fig. 9 is a perspective view of the head section and its connected elevating rack.

Fig. 10 is a detail sectional view of the anti-friction bearing used in supporting the foot section,

Fig. 11 is a bottom plan view of the foot section, and

Fig. 12 is a detail elevation of the tension pulley.

Referring more particularly to the accompanying drawing, the traction couch 4, comprising the preferred form of the present invention, includes a main supporting frame 5, the latter comprising parallel side rails 6, which connect vertical head bars 7 with similarly extending foot bars 8. A transversely disposed rail 9 connects the side rails 6, contiguous to the head of the frame 5, and to which is secured vertically extending bars 10, the bars 10 and the head bars 7 are secured to a substantially trapezoidal frame 11, upon which is mounted a similarly formed head section or plate 12.

The plate 12 may be formed from any suitable material and is hinged to the frame 11 as at 13, said hinges being provided in order that the free end of the plate may be elevated to different levels, to conform to

the physical requirements of different patients. An arcuate bail shaped ratchet bar 14 is pivoted as at 15 to the under side of the plate 12 and is provided with ratchet teeth 16 which are adapted, when the plate is elevated, to engage with one edge of the frame 11, so that the plate will be supported and retained in different elevated positions, as will be clearly understood.

A cushion 18, of any desired formation, is fastened upon the plate 12 and is provided with a central opening 19, the latter being positioned in alinement with a similarly formed opening 20 in the plate 12, so that when a patient when reclining upon the couch, in the position illustrated in Fig. 1, that is face downwardly, the patient will be allowed perfect freedom in breathing, and need not resort to an unnatural cramped position to permit of this function. The cushion 18, is of course, employed to render the couch as comfortable as possible to the patient.

The foot section of the frame 5 consists of the side rails 6, the foot bars 8, intermediate vertically extending side rails 21 and an upper rectangular frame 22, the latter being supported by said foot bars 8 and the side rails 21, as clearly disclosed in the drawings. Journaled in the forward part of the frame 22, and extending transversely of the latter, is a spring actuated curtain supporting roller 23. Wound about and secured to the roller is a flexible curtain or apron 24, preferably formed from strong canvas, the latter being employed to bridge the gap 25, found between the head and foot sections of the supporting frame 5. The free extremity of the curtain 24 is provided with a rod 26 attaching to hooks 26' which are adapted, when the curtain is in operation, to engage with eyes 27, secured to the plate 12, in order that the curtain will be capable chiefly of furnishing a sense of security to the body of the patient. The curtain 24 is preferably used in place of a rigid plate, as it provides more elasticity and enhances the comfort of the couch. When the curtain is not in use, the same is disengaged from the eyes 27 and is wound up upon the roller 23.

The roller 23, in action, may be likened to the usual form of shade roller, and consists of a tubular body 28 in the center of which is located a helical spring 29, the latter having its inner terminal 30 connected with the body 21 and its opposite extremity secured to a supporting shaft 31, the normal tendency of the spring being to wind the curtain, about the roller 23, so that the same will be hidden from an exterior view point within the frame 22. When the curtain is in a stretched position it will be prevented from sagging, when a patient's weight is placed thereon, by the

action of a ratchet wheel 32, which is made fast on the shaft 31, said ratchet wheel cooperating with a pawl 33 which prevents the shaft 31 from rotating in one direction. A hand wheel 34 is, also, secured to the shaft 31 and is employed to draw the curtain to a taut position after it has been connected with the eyes 27. Upon releasing the curtain from the eyes 27 and by disengaging the pawl 33 from its engagement with the ratchet 32, the curtain will be automatically rolled up upon the roller 23 by the action of the spring 29. The curtain 24 is provided with a pillow or cushion 35 to increase the comfort of the patient resting upon the couch.

The frame 22 is formed with trackways 36 to receive ball bearings or other anti-friction devices 37, which are mounted upon the depending brackets 38, formed on the under surface of a rectangular foot section 39, the bearings 37 being provided in order that the plate 37 may move more freely upon the frame 22 for a reason to be more fully set forth. A limb receiving cushion 40 is secured or placed upon the foot plate 39 for an obvious purpose.

The patient is strapped or harnessed to the couch by providing head, shoulder and waist embracing straps 41, 42 and 43 respectively. The straps 41 and 42 are connected with the head plate 12 and are adapted to encircle the head and shoulders of the patient in the manner disclosed in Figs. 1 and 2 of the drawings, buckles 44 being provided at suitable points in the straps 41 and 42 to facilitate the operation of fastening the head and shoulders of the patient in an immovable manner to the stationary head plate 12. The patient's hands are supposed to be folded underneath the plate 12, as shown in Fig. 1, allowing the upper portion of the body to rest firmly on the plate.

In order that the body of the patient may be tensely strained, a strong leather or fabric belt 45 is buckled around the waist, above the hips, so that the belt will be capable of withstanding a strong, continued rearward pull without slipping or giving. The belt is provided with eyes or rings 46 to which are attached upper straps 47 by means of snap hooks or an equivalent 49, while the lower strap 48 is attached directly to the belt 45. The rearward extremities of the straps 47 and 48 are connected to a common tension belt 50 by means of a connecting strap 51, as clearly disclosed in Fig. 4.

The belt 50 extends rearwardly and is secured to the periphery of belt pulley 52, the latter being keyed to a horizontally extending shaft 53, mounted in bearing 54, on the foot end of the frame 22. By this construction, the rotation of the pulley 52 will result in placing the straps 47 and 48 under

tension, as will be obvious. In order to rotate the pulley 52, the shaft 53 has splined or otherwise secured thereto a sprocket wheel 55, having an endless chain 56 trained thereover and extending to a similar sprocket 57, secured to an operating shaft 58. The shaft 58 is journaled in bearings 59, secured to the side rails 6 and to the rails 21 at a point beneath the frame 2. One extremity of the shaft 58 extends beyond one of the bearings 59 and has keyed thereto a sliding ratchet collar 60, the latter being provided with a clutch face 61, which is adapted to engage with a similar face 62 formed on hub 63 of an operating lever 64, said hub being loosely mounted on the shaft 58, and held in position by a groove in the shaft and set screw in the hub thus serving also to retain the collar 60 in its proper position upon said shaft.

A helical spring 66 surrounds the shaft 58 and is interposed between the bearing 59 and the inner face 67 of the collar 60, said spring being utilized to maintain the clutch faces 61 and 62 in an interlocking relation. A pawl 68 is pivoted to the bearing 59 and normally gravitates into engagement with ratchet teeth 69 formed on the collar 60.

The operating lever 64 is held in its position at any length by a thumb-screw in the hub, is employed for rotating the shaft 58, and is used in place of a hand wheel inasmuch as it permits of a greater leverage, thus enabling the operator of the machine to apply greater power to the stretching harness and is capable of being more conveniently operated. It will be noted that the connection between the shaft 58 and the lever 64 will permit the latter to operate with a ratchet motion about the shaft 58, that is, when the lever 64 is rocked in the direction of the arrow B the movement will be imparted to the shaft 58, due to the fact that the clutch faces 61 and 62 of the ratchet collar and the lever hub are interlocked, however, after the lever has been moved a certain distance in the direction of the arrow B it may be restored to its initial position without disturbing the partially rotated shaft 58. This is due to the fact that when the lever 64 is moved in the direction opposite to the arrow B, the clutch face 62 of the hub 63 will slide over the face 61 of the keyed ratchet collar, as the latter will be prevented from rotating by the action of the pawl 68. After the lever has reached its initial position, the spring 66 will again force the ratchet collar into engagement with the hub 63. By this construction it will be seen that the shaft 58 can be conveniently rotated and that the location of the lever 64 is situated so that the operator of the couch may simultaneously operate the stretching mechanism and can devote his attention to the patient strapped to the couch.

From the foregoing it will be seen that when a patient is placed upon the couch, the head and breast will lie upon the cushioned plate 12, the lower part of the body and limbs upon the foot plate 39 and the abdomen rests upon the cushion 35 of the curtain 24. The cushioned plate 12 may be raised or lowered at its free end to bring the body of the patient to a position which will be the most advantageous in assisting the physician in accomplishing his functions. The opening of the cushioned head plate 12 is disposed to receive the face of the patient, as it is through this opening that the patient is enabled to breathe and see.

The belt 50 is provided with a buckle or the like 70, which is employed to eliminate any slack found in the belt after the same has been applied to a patient, and caused by differences in stature of the latter. The slack may be readily taken up and the belt 50 tightened before the pulley 52 is rotated.

The lever 64 may be operated with a single and easy motion so that the patient will be tensely strained. The pawl 68 will retain the belt in its taut position and will prevent the same from slipping thus enabling the physician to remove his hand from the lever 64 and devote his entire attention to the patient. In certain instances, however, the pawl is thrown out of engagement entirely with the ratchet collar in order that the patient may be alternately stretched and relaxed, the tension on the harness automatically producing the relaxing force as the lever is operated.

It will thus be seen that there is provided a traction couch in which the objects of the present invention have been achieved, and that all of the advantageous features above mentioned are, among others, present. The device is of single construction, positive in operation, and the parts thereof are so constructed that, when actuated, they will not be liable to slip or become out of order. The couch presents an attractive appearance and forms a distinct and valuable improvement or addition to the equipment of a physician's office or to medical hospitals. In the preferred form of the present invention which has been described and illustrated, it is, of course, understood that various modifications may be made in the construction and design of the couch without departing from the scope of the invention or the spirit of the accompanying claims. For instance, while the device has been shown to be operated by hand, it is also possible to operate the same by any other source of power, either mechanical or electrical, or that various separate parts may be formed integral or vice versa.

Having described my invention, what I claim as new and patentable is:—

1. A traction couch comprising a frame, 130

head and foot sections carried by said frame, a flexible section interposed between said head and foot sections, means for securing the head and shoulders of a patient to said head section, straps connected with the waist line of a patient, and means carried by said frame and having connection with said straps for tensely straining the body of said patient, said means being capable of being gradually applied and maintained in a strained condition.

2. A traction couch comprising a base frame, head and foot sections carried by said frame, an intermediate section interposed between said head and foot sections, fastening means for securing the upper body portion of a patient to said head section, tension straps adapted to be buckled to the lower body portion of said patient, rotatable means connected with said tension straps and means for revolving said rotatable means so that the body of said patient will be tensely strained.

3. A traction couch comprising a base frame, head and foot sections carried by said frame for receiving a patient, said head section being hinged to said base frame, means for retaining said head section in various elevated positions, a cushioned surface formed on said head section and provided with a centrally located opening, a flexible section interposed between said head and foot sections, means for securing the head and shoulders of a patient to said head section and tension means carried by said frame and connected with the waist of said patient to tensely strain the body of the latter.

4. A traction couch comprising a supporting frame, a patient supporting table carried by said frame, said table comprising cooperating head, intermediate and foot sections all of which being suitably cushioned, said foot section being provided with depending longitudinally extending flanges, said flanges resting upon anti-friction bearings carried by said frame, also provided with spiral springs adapted to produce return action, means for rigidly securing the head and shoulders of said patient to said head section, a waist encircling belt adapted to surround the waist of said patient, straps secured to said belt, means for extending or decreasing the length of said straps, a pulley journaled upon said supporting frame and adapted to have the free extremity of said straps secured to the periphery thereof and

means for rotating said pulley whereby said straps will be placed under tension to impart tensile movement to a patient secured to said head section.

5. A traction couch comprising a supporting frame, a patient receiving table carried by said frame, said table comprising cooperating head, intermediate and foot sections, means for securing the shoulders and head of a patient to the forward portion of said couch, a belt adapted to be secured to the waist of said patient, straps connected with said belt and extending to a rotatable member, a shaft for supporting said rotatable member, means for transmitting power from said shaft and rotatable member to a drive shaft, journaled on said frame, an operating lever for rotating said drive shaft, means for locking said drive shaft against undue movement when the same is under tension, and clutch mechanism associated with said operating lever to permit the same to be oscillated when revolving the drive shaft.

6. A traction couch comprising a main supporting frame, a head section hinged to the supporting frame, a foot section, flexible body supporting means disposed between said head and foot section, straps secured to said head section and adapted to embrace the head and shoulders of a patient, whereby the latter will be securely connected to the traction couch, a waist belt adapted to be secured to the waist of a patient, straps connecting said belt with a tensioning mechanism, and means for controlling the operation of said tensioning mechanism, said means being located within convenient reach of the body of a patient when the latter is supported upon the couch.

7. A traction couch comprising a supporting frame provided with side rails, an adjustable head section hingedly connected at one of the extreme ends of the supporting frame, a foot section slidably mounted upon the side rails of the frame, a tension roller journaled in the side rails, a curtain secured to said roller and having detachable connection with the free end of said head section, a rotatable member journaled in the side rails of said frame, operating means for said member, and means having connection at one end with said member and at its opposite end with a patient for tensioning the body of said patient.

In testimony whereof I affix my signature.

JAMES W. RIDDLE.