To all whom it may concern:

Be it known that I, CHARLES H. SANFORD, a citizen of the United States, and a resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Combined Fracture and Orthopedic Operating-Tables, of which the following is a specification.

The device, the subject of this invention is intended as a particularly efficient and simple means for treating dislocations of the hip which are either very difficult or impossible by manual manipulation alone, and to maintain the reduction during the application of the plaster of Paris dressing. With my construction it is not necessary to remove the patient from the table for or during the application of the plaster dressing.

My device is also well adapted for the treatment of fractures or for a treatment of the limbs for any cause. It is my intention to construct my device in a particularly simple manner and thus to reduce the number of assistants required, and yet to hold the patient in proper and in a convenient position during the entire treatment.

The general construction of the table makes it especially valuable for all fracture work of the legs or arms whether by the open or closed method of treatment and it enables the surgeon to make the reduction by traction and maintain it accurately during a repair or the application of the dressing and without disturbing the relationship of the fragments, so apt to occur when an assistant holds the parts.

The traction apparatus is so designed that the surgeon has free access to all aspects of the limb and changes in the position or degree of traction are possible without limiting the field of operation or interfering with the aspesis.

The body supports are so proportioned and arranged that a full spica may be applied which will include the foot and extend well up on the chest while the patient is held upon the table.

All of the parts are quickly removable thus they present no obstacle to the free application of the bandage and I have even arranged that though certain parts are included in the bandage they may be removed without cutting, thus maintaining the full strength of the plaster.

The construction and operation of my table and the many advantages to be derived therefrom, together with the methods of operation will be set forth as the specification progresses.

The following is what I consider the best means of carrying out this invention.

The accompanying drawings form a part of this specification, in which—

Figure 1 shows a plan view of my table upon which is secured only a sufficient portion of a body and legs to illustrate the operation of the device. Fig. 2 is a side elevation of the table. Figs. 3, 4, 5, 6, 7 and 8 show parts removed. Fig. 3 shows the adjustable clamping means for the iliac bones. Fig. 4 shows the hand wheel for adjusting these clamps. Fig. 5 shows the trochanteric push. Fig. 6 shows the traction arm. Fig. 7 the adjustable clamp for the trochanteric push and Fig. 8 the dial by the means of which addition and abduction is maintained.

Similar reference numerals indicate like parts in the figures where they appear.

The table proper I construct of tubing, joining the separate parts with standard or special couplings, elbows or T's as the occasion may require. The table is supported by a plurality of legs 1 and 2 and I arrange a leg at each corner of the table making four in all. These legs may be of any convenient height, but I have found that a table about thirty four inches high will be convenient for use under most conditions.

I arrange my table so that it will have an upper and a lower frame as shown at 3 and 4. Supported near one end of the upper frame and slidably mounted thereon is the body rest 5, held at a convenient height by the brackets 6 and 7. A thumb screw 8, enables me to adjust the position of the body rest to any point desired and it also enables me to remove the body rest when it is no longer wanted. Upon this rest the main portion of the body or the trunk will be supported. For convenience in applying the dressing and for obtaining an uninterrupted manipulation of the limbs I may taper the inner end of the body rest as indicated at 9 10 and for purpose of a closer application of the plaster bandage I prefer that the body rest 5 should be concaved at the tapered end and its concave side should be uppermost.

Immediately in front of the tapered end of the table I arrange the sacral rest 11,
supported upon a post 12 which is adjustably secured to the lower frame 4. This sacral rest is thin and preferably constructed of sheet metal and is shaped to closely fit the body. Upon the post 12, I arrange a clamp 13 which is shown in plan and on a larger scale in Fig. 7. This clamp is adjustable longitudinally upon the post 12 and is adapted to be secured thereon by means of a bolt 16 and handle 17. Between the jaws 15 I place the ball 18 through which a screw-threaded rod 19 is free to pass, and upon the upper end of the rod 19 I arrange the trochanteric push 20. From this construction it will be observed that the angle or position of the trochanteric push may be changed and adjusted at will and I provide a thumb-nut 21 for adjusting the height of the trochanteric push or for changing the height when occasion may demand.

Supported upon a cross bar 22 and adjustably thereon I arrange a plurality of obliquely projecting members or bars 23 and 25 and adjustably secured to each of the bars is a clamp 24 operated by means of a suitable bolt and a hand wheel 25. Secured to the bolt and normally arranged one upon each side of the body are clamps 26 between which the body is securely held against a sidewise, vertical or longitudinal motion to prevent tilting of the pelvis. These clamps are so shaped that they fit the anterior superior spine and the crest of the iliac bones. Because of the construction of the blocks 24 these clamps are adjustable in all of their actions, that is they are rotatable upon the rods 23 and 25 adjustably longitudinally thereon and the clamps may, because of the rounded portion 26 of the block 24 and the operation thereon of a similarly rounded block be partially rotated on a transverse axis, thus the upper end of each clamp may be caused to extend to a greater or less distance over the adjacent portion of the body. It will be noted that the cross bar 22 is adjustable longitudinally upon the upper frame 3, for a purpose that will appear obvious.

At 28 I have shown what I am pleased to call a perineal post, this member however is a plurality of posts set two in front and one behind upon a block which is adjustable towards or away from the perineum. The forward posts are each provided with a roller or easily rotatable sleeve to prevent abrasion of the skin when traction is used. The other post may carry a plate to support and steady the symphysis pubis is found necessary or desirable. The block 29 that supports these posts is arranged upon a plurality of parallel and angle bars 30, which are engaged in a clamp 31, upon a conveniently angled portion of the frame. This clamp is operated by means of a suitable bolt 32, and lever 33 and the adjustment is such that the perineal posts may be raised or lowered at will. And now referring to Fig. 4, I show corner castings 34 and 35 and each corner of the device is secured by means of a similar casting. Each of these castings has a square perforation as indicated at 36, and a thumb nut as indicated at 37, and the parts that are intended to fit into the perforations 36 are each provided with a square shank such as is shown at 38 in Fig. 6. At 39 I show an arm which is intended to hold the sound extremity and which is, by means of the turn-stile 40 adjustable for adduction and abduction only. The sound extremity is secured to the arm 39 by means of a cuff 41 provided with thongs 42 which are secured to the bow 43. The width of this bow is sufficient so that when the necessary tension is applied to the thongs 42 they will not cut into or compress the foot. A certain limited traction may be obtained upon this sound extremity by turning the nut 44, which is upon the bolt 45 which secures the bow 43.

The device to which the dislocated or fractured extremity is secured is of a more complicated construction. It consists of an arm 46 pivoted at its inner end to a sector 47 which is in turn secured to a rotatable plate 48, the upper plate of a pair. The lower plate of the pair is indicated at 49 and a plan view thereof will be seen in Fig. 8. The turning of the plate 48 produces the desired amount of adduction and abduction and when this point is reached, the pin 50, which may be a spring operated pin, is caused to engage in one of the perforations 51, in the plate 49. By means of the sector 47 I am enabled to obtain flexion and extension and I may maintain the flexion or extension by causing the pin 52 to engage one of the perforations 53, in the sector 47.

The means for obtaining and controlling the traction is shown at the other end, the outer end of the bar 46, this consists of a post 54 rotatable in the upwardly extending end 55 of the bar 46, the upper end of the post 54 is forked and receives a tubular member 56 provided with a collar 57, secured to the collar is a split nut 58, the parts of which are engaged by the latch 59. An extended bolt 60 having a hand operated means 61 at its outer end, extends through the split nut 58 and collar 56 and pivotally supports at its inner end a bow 62.

It will be observed that the bar 46 is subject to an operation or movement in addition to those thus far described. This movement is a rotation upon its longitudinal axis.

It will be noted that the bar 46 is tubular and that it is received upon a forked member which pivotally engages the sector 47. It will also be observed that the bar or tube 46 is secured to the plug by means of a
pin 46'. It is evident then that the removal of the pin 46' will allow the bar 46 to be rotated upon its longitudinal axis and this movement is important as it will allow the leg being treated to be turned to an extent that will oft times be found sufficient to locate the femur into the acetabulum.

Thus far I have described the mechanical parts of my device and I believe with sufficient clearness so that they may be fully understood and appreciated. I will now detail the method of procedure of treating an ordinary congenital dislocation, referring to the parts employed by the reference characters that they have been given.

A patient that has been anesthetized is placed upon the table, the attendant supporting the limbs, the trunk is placed upon the body rest 5 with sacrum resting upon the member 11. The clamps 26 are then caused to bear fairly and very firmly upon the anterior superior spines and the crest of the iliac bones. The perineal post is then brought forward and is caused to bear firmly upon the perineum, it having been adjusted to the proper height so that a portion of the post will project to a safe distance upward. The cuffs 41 and 41' are next placed upon the limbs and the thongs 42 are engaged upon the bow 43, these thongs must next be tightened to a sufficient extent to draw the perineum firmly against the post 28 and the body and limb will then be found to be confined in such a manner that the diseased leg may be manipulated without disturbing the sound leg or the body. The thongs 42' are next engaged upon the bow 62 and the split nut 88 being loose the bolt 60 is drawn through the thimble 56 until a medium tension is obtained, the nut 58 is now closed and latched in position, and if sufficient traction has not been obtained a few turns of the hand operating member 61 will quickly obtain it. The plug 50 may now be lifted and may be secured in a raised position by means of a pin 50', the plate 48 may now be moved or rotated until the proper angle of traction is obtained, the pin 50 is then dropped into position and traction is continued to the desired extent.

At A. I have shown the acetabulum into which the upper rounded end of the femur rests and at B. I have shown a femur in the position in which it will usually be found in dislocations. The application of traction to the leg will bring the femur down to a line with the socket into which it is to engage but not in position for engagement as the femur will usually be found behind the acetabulum. When it is in this position and sufficient traction has been obtained I adjust the trochanteric push so that it will impinge upon the great trochanter, I then raise the trochanteric push until the femur is in a direct line with the socket, if at this time it does not assume its proper position within the socket I once more release the pin 50 and abduct the limb by moving the foot end outward on the dotted line C. I may also remove the pin 46' and partially rotate the bar 46. This will cause a slightly greater traction, and it will also cause the femur to assume its proper position. I now remove the clamps 26 from the sides of the body and I may also remove the perineal post entirely away from the table, I will then move the limb to an abnormal abduction, but it may be found to do this will again dislodge the femur, if this is so I will replace it either by manual manipulation or by abduction produced by the partial rotation of the arm 46. In bandaging I will commence as low as it seems necessary and I will employ an ordinary plaster dressing, carrying the dressing upward upon the body to a sufficient extent to obtain a complete fixation. I include in the dressing the sacral rest 11, the trochanteric push 30 and the lower end of the body rest 5. After the dressings has been completed and is sufficiently set to allow removal the attendant lifts the body and the operator releases and removes the body rest 5 and the remainder of the fastenings, the patent may then be placed face down on another table, bed, or suitable support. The sacral rest 11 may then be removed through the perineal opening, the post 20' is then unscrewed from the trochanteric push and the plate of this member may be withdrawn through the perineal opening. The removal of all of these supports from the spica is accomplished without cutting or without loosening the bandaging and thus the full strength of the bandage is maintained.

For treatment of a fracture the operation progresses only to the extent of obtaining the necessary traction to bring the ends of the fracture into close approximation, before or after which the necessary insertion may be made to remove the splinters and to place the ferrule, after which medication and bandaging may proceed in the ordinary manner.

My device will also be found particularly advantageous in any treatment where a stretching operation is desirable, such for instance as in the operation of arthrodesis of the knee joint or contractures of the hip.

Thus far I have described my device as used for treatment of the lower extremities but from its very construction it will appear obvious that by placing the members 39 and 46 at the upper end of the table, treatment of the arms and shoulders for fractures or dislocation may be readily accomplished.

Another feature of my invention not before described is the means for obtaining...
hyperextension particularly of the leg, this is accomplished by turning the stem 38 so that the vertical side of the sector 47 will be toward the traction obtaining means. The traction obtaining means and the arm 46 may then be rotated by the removal of the pin 46' so that the projection 55 will extend upward. Now to obtain hyperextension, the outer end of the arm is depressed and the extreme movement is obtained when the notch K is engaged in the recess L. It will be noted that I have provided an angle Z in the construction of my frame and this angle is provided solely for the purpose of obtaining this extreme extension.

Although I have described my device constructed and operating in a manner that I have found extremely satisfactory it is obvious that modifications may be made within the scope of the appended claims without departing from the principle or sacrificing the advantages of this invention.

Having carefully and fully described my invention what I claim and desire to secure by Letters Patent is—

1. A device for treating fractures and dislocations consisting of a body rest, a sacral rest, trochanteric push perineal post, and a traction obtaining means all combined for joint operation as herein specified.

2. A device of the character described comprising a body rest, a plurality of clamps adjacent thereto for securing the pelvis against lateral and vertical movement, an adjustable trochanteric push, and a traction obtaining means as herein specified and for the purpose set forth.

3. A device of the character described comprising a body supporting means, a body retaining means, a traction obtaining means and a plurality of adjacent and perforated plates one rotatable upon the other for obtaining adduction and a spring operated pin passing into any of said perforations for holding said plate to retain said adduction or abduction as and for the purpose set forth.

4. An operating table having a body rest, and arranged adjacent thereto a plurality of inclined upright members, blocks slidable upon said inclined members and clamps adapted to be adjusted in said blocks and over and to secure the anterior superior spines.

5. An operating table having an independently adjustable perineal restraining means consisting of an adjustable plate having a plurality of vertical posts certain of which are provided with rollers and traction obtaining means operating in opposition to the perineal restraining means for the purpose set forth.

6. An operating table having body supporting and restraining means in combination with a mechanically operable trochanteric push supported by a ball and socket and adjustable vertically and radially for the purpose set forth.

7. An operating table having an oblong frame an extended concave and tapered body rest adjustable longitudinally and adapted to support the body, shoulders and head of a patient and adapted to be partially included in a bandage to be removed from said frame, and body securing and traction obtaining means supported by said frame for the purpose set forth.

8. An operating table having a frame, a body rest upon said frame, and a plurality of clamps adapted to engage the anterior superior spines, said clamps being adjustable longitudinally, transversely and obliquely upon said frame for the purpose set forth.

9. An operating table having a frame, a body rest upon said frame, a sacral rest adjustable longitudinally upon said frame, and a plurality of body clamps consisting of obliquely arranged members adjustable toward and away from the body and rotatable plates carried thereby all combined and supported by said frame for the purpose set forth.

10. An operating table having a frame, a body rest upon said frame, a body clamping and restraining means upon said frame and a perineal engaging and restraining means consisting of a plurality of posts supporting vertical rollers and adjustable longitudinally upon said frame for the purpose set forth.

11. An operating table having a frame, body rests and restraining means adjustable upon said frame, means cooperating with said body rests and restraining means for supporting a limb, and a bar rotatable on its horizontal axis and traction obtaining means for another limb supported by said bar as and for the purpose set forth.

12. An operating table having a frame, body rests and restraining means adjustable upon said frame, means cooperating with said body rests and restraining means for supporting a limb, a bar rotatable through its longitudinal axis and vertically and horizontally adjustable and a traction obtaining means for another limb supported by said bar and operable therewith as and for the purpose set forth.


CHAS. H. SANFORD.

Witnesses:

G. E. STERRITTE,
ARTHUR PHELPS MARR.