W. E. STILES.

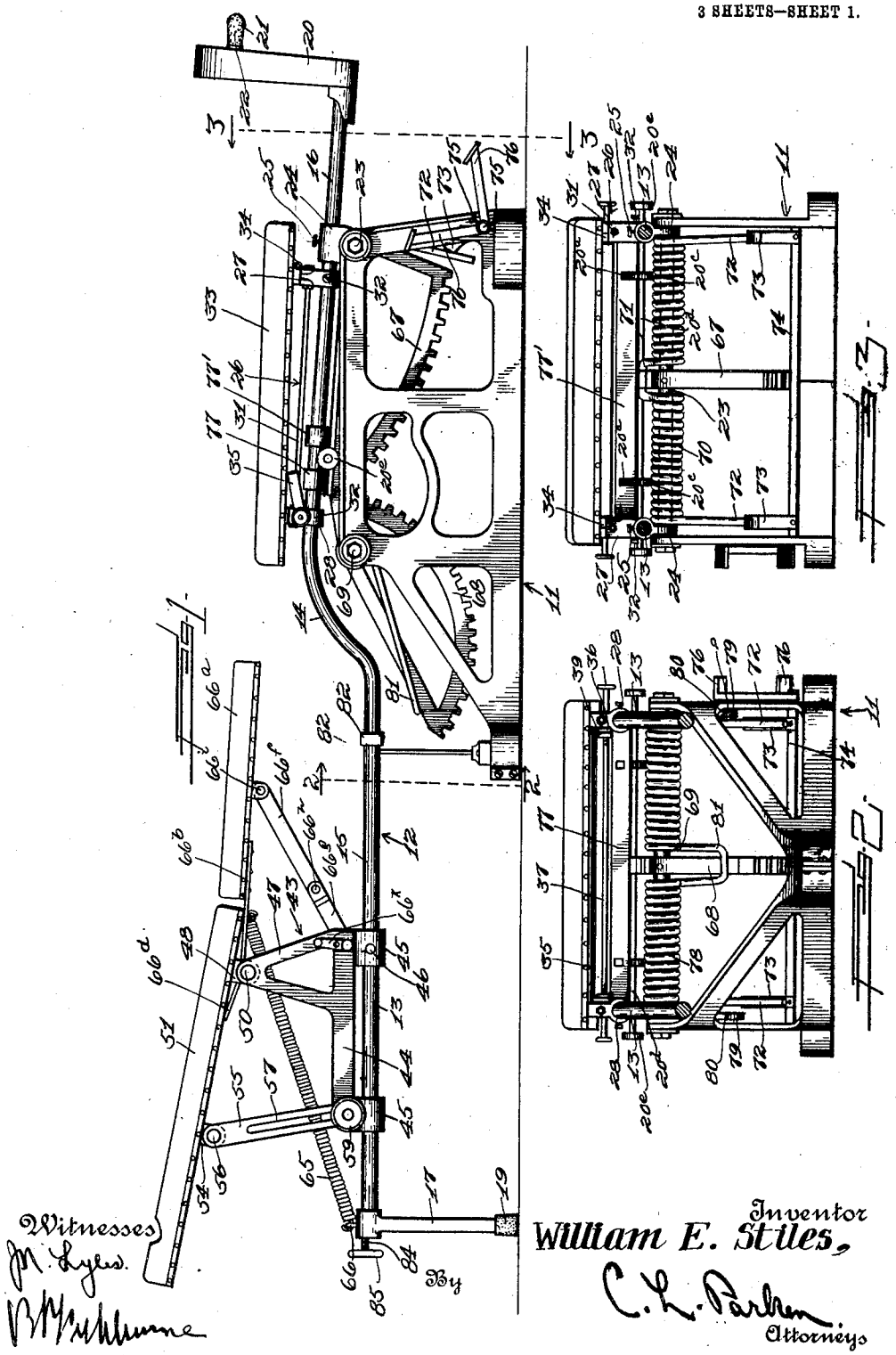
OPERATING TABLE.

APPLICATION FILED JUNE 2, 1913.

1,088,476.

Patented Feb. 24, 1914.

3 SHEETS—SHEET 1.



Witnesses
M. Lyles.
B. W. Williams

Inventor
William E. Stiles,
C. L. Parker
Attorneys

W. E. STILES.

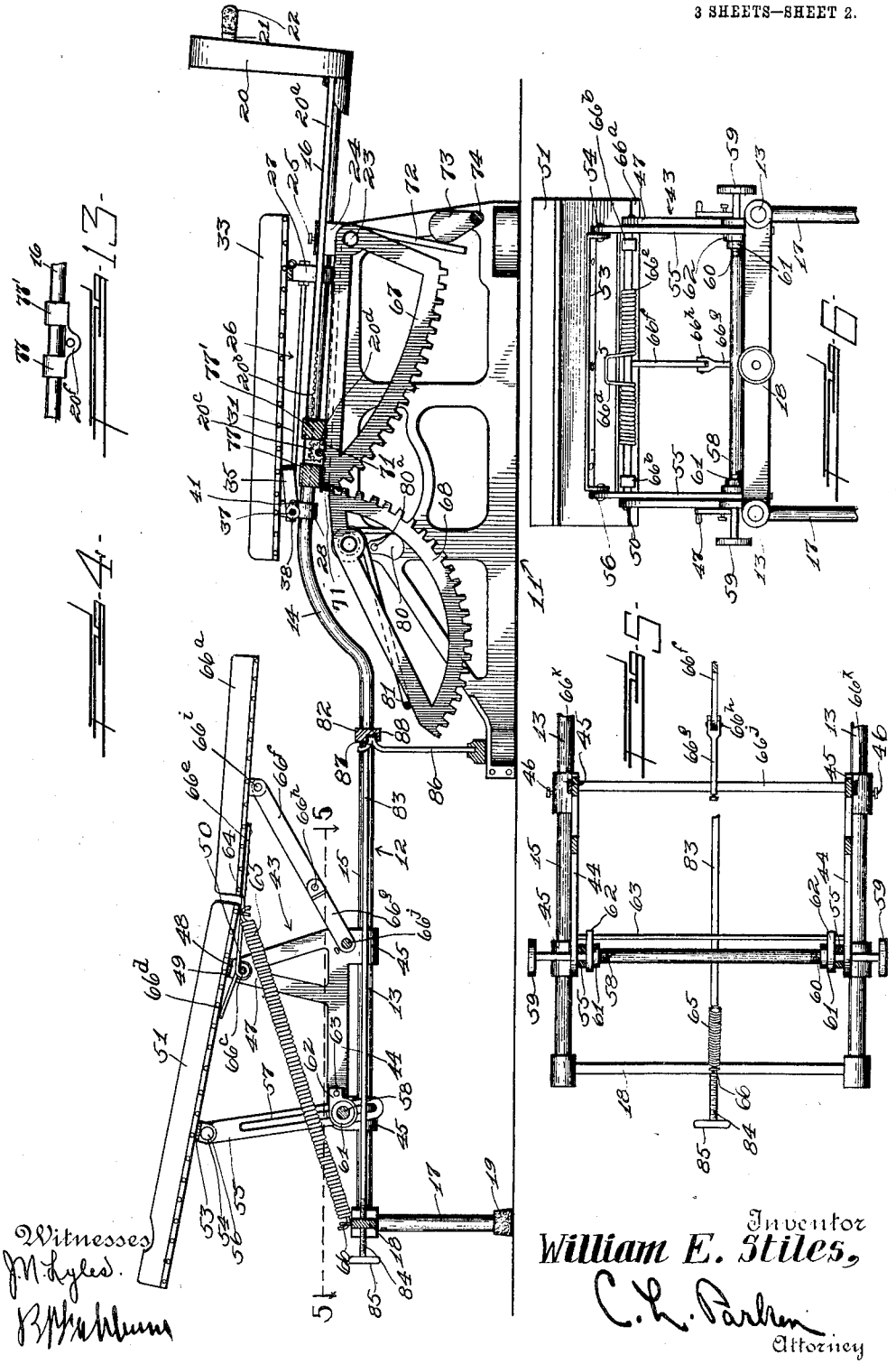
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J. M. Lyles.

B. B. Hall

Inventor

William E. Stiles,

C. L. Parker

Attorney

W. E. STILES.

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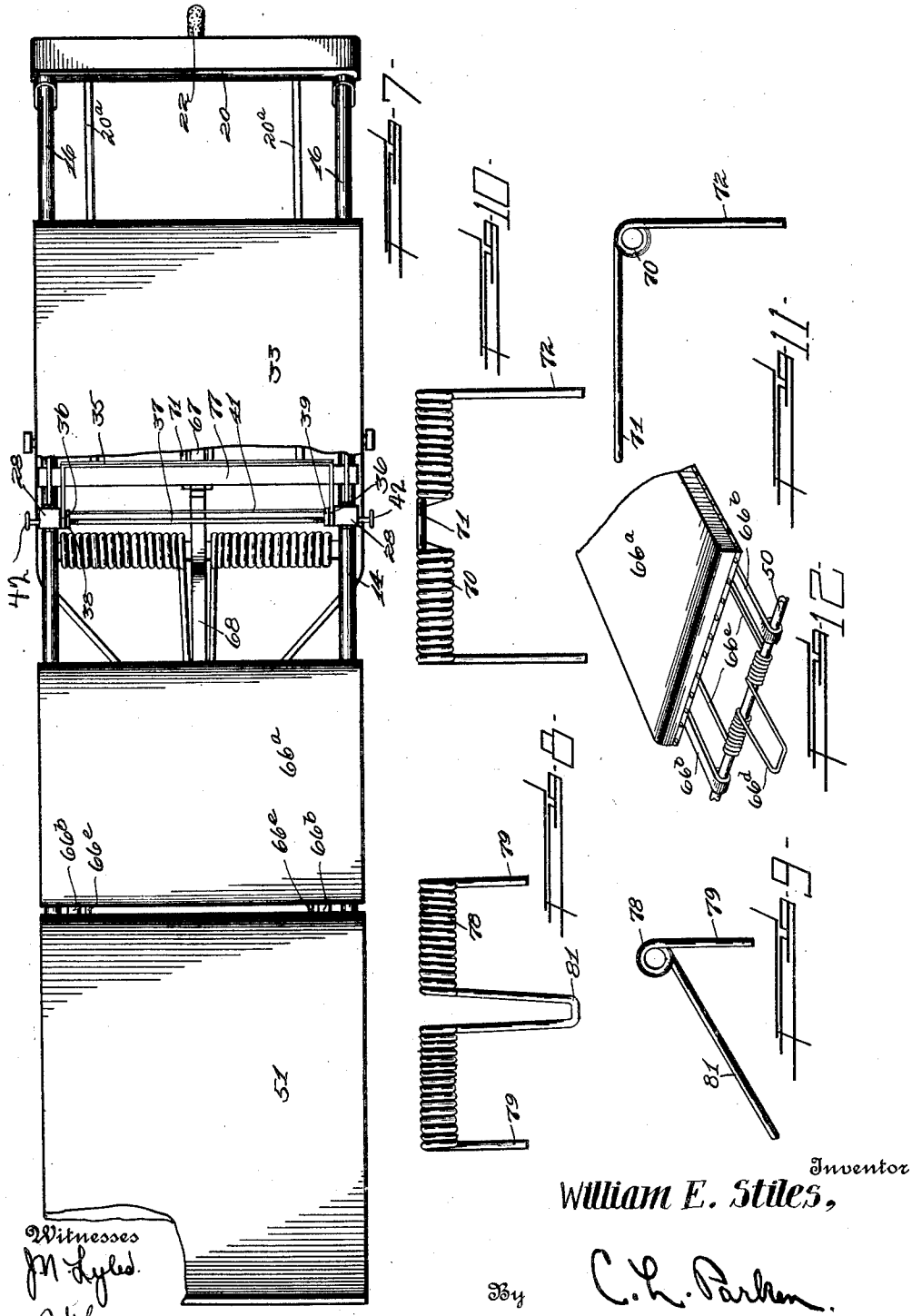


FIG. 10.

FIG. 11.

FIG. 12.

FIG. 9.

FIG. 8.

Witnesses

J. M. Lyles.

B. B. Wilkinson

Inventor

William E. Stiles,

By C. L. Parker.

Attorney

UNITED STATES PATENT OFFICE.

WILLIAM ENOS STILES, OF DAVENPORT, IOWA, ASSIGNOR TO MABEL H. PALMER, OF DAVENPORT, IOWA.

OPERATING-TABLE.

1,088,476. Specification of Letters Patent. Patented Feb. 24, 1914.

Application filed June 2, 1913. Serial No. 771,212.

To all whom it may concern:

Be it known that I, WILLIAM E. STILES, a citizen of the United States, residing at Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Operating-Tables, of which the following is a specification.

My invention relates to operating tables to be used by surgeons, osteopaths, chiropodists, or the like.

An important object of this invention is to provide a table of the above mentioned character, which may be readily adjusted to move the patient to a horizontal or vertical position with the least effort upon the part of the surgeon or the like.

A further object of this invention is to provide a table of the above mentioned character, including supports or table tops which are longitudinally movable or adjustable so that the same will conveniently support patients of different heights.

A further object of this invention is to provide novel means for angularly adjusting the table top or tops.

A further object of this invention is to provide means to counter-balance the vertically swinging supporting structure, whereby the same may be swung to a vertical position with the least effort on the part of the surgeon or the like.

A further object of the invention is to provide a table of the above mentioned character, which is simple in construction, convenient in use, strong and durable.

A further object of my invention is to provide a novel form of sternum support.

A further object of the invention is to provide means to rigidly lock the sternum support in its upper position and means to yieldingly support the sternum support upon the release of the locking means.

A further object of the invention is to provide means to effect the longitudinal movement or adjustment of the foot rest with relation to the swinging supporting structure.

Other objects and advantages of this invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same, Figure 1 is a side view of the complete table, Fig. 2 is a transverse sectional view taken on line 2—2 of Fig. 1 and looking in the direction of the arrow, Fig. 3 is a similar view taken on line 3—3 of Fig. 1 and looking in the direction of the arrow, Fig. 4 is a central vertical longitudinal sectional view through the complete table, Fig. 5 is a horizontal sectional view taken on line 5—5 of Fig. 4, Fig. 6 is an end view of the front table top, Fig. 7 is a plan view of the complete table, Fig. 8 is an end view of a forward spring, parts being broken away, for the sake of illustration, Fig. 9 is a side view of the same, Fig. 10 is an end view of a rear spring, Fig. 11 is a side view of the same. Fig. 12 is a perspective view of the sternum support and associated elements, and, Fig. 13 is a detailed view of a bearing.

In the drawings, wherein for the sake of illustration, is shown a preferred embodiment of my invention, the numeral 11 designates a stationary supporting frame, as a whole, preferably having the design, as shown.

The numeral 12 designates a vertically swinging supporting structure, as a whole, comprising spaced longitudinally extending tubes or tubular rods 13. Each tubular rod 13 is bent between its ends, forming a curved portion 14, which connects a forward horizontal portion 15 and a rear slightly inclined portion 16, as clearly shown in Figs. 1 and 4. Connected with the forward end of the longitudinally extending tubular rods 13 are depending feet 17, the upper ends of which are connected by a transverse rod or bar 18. These feet 17 are preferably provided at their lower ends with caps 19, which may be formed of rubber or other similar material. Longitudinally movably mounted upon the rear ends of the longitudinally extending tubular rods 13 is a foot rest or support 20, which is preferably formed of iron or some other heavy material to counterbalance the vertically swinging supporting structure 12, as will be hereinafter apparent. Connected with the outer surface of the foot rest or support 20 are

legs 21, carrying caps 22 which are formed of rubber or other similar material. Connected with the inner surface of the laterally extending foot rest 20 are longitudinally extending rack-bars 20^a, provided at their free end portions with teeth 20^b, which are engaged by pinions 20^c, which are in turn rigidly mounted upon a transverse shaft 20^d. This transverse shaft 20^d is provided at both ends with handles or wheels 20^e, by means of which the same may be turned. It is thus seen that by rotating the shaft 20^d in the desired direction, the laterally extending foot rest 20 may be made to travel longitudinally of the tubular rods 13. Any suitable means may be employed to prevent the improper or accidental rotation of the shaft 20^d. The shaft 20^d is mounted through bearings 20^f, disposed between transverse bars 77 and 77′ and rigidly attached thereto, said transverse bars being provided with apertures for receiving the portions 16 of the longitudinally extending rods 13. Connected with the rear end of the stationary supporting frame 11 is a transverse shaft 23, upon which are pivotally mounted brackets 24, the same being provided with openings for receiving the portions 16 of the longitudinally extending tubular rods 13, such portions 16 being rigidly held therein by means of clamping bolts 25 or the like. It is thus seen that the supporting structure 12 will swing or turn in a vertical plane upon the shaft 23 as a pivot, the foot rest or support 20 passing downwardly between the sides of the stationary supporting frame 11, so that the supporting structure 12 may assume a substantially vertical position, with the feet 21 in engagement with the floor.

The numeral 26 designates a rear auxiliary frame, which is longitudinally movably mounted upon the portions 16 of the longitudinally extending tubular rods 13. This rear auxiliary frame comprises brackets 27 and 28. The brackets 27 and 28 are connected by longitudinally extending rods 31, as shown. Any one of the brackets 27 and 28 may be provided with a clamping bolt 32, to lock the rear auxiliary frame 26 to the portions 16 in adjustment at desired longitudinal positions with relation thereto. Disposed above and supported by the brackets 27 and 28 is a rear table top 33, which is preferably padded or upholstered in any desired preferred manner. The forward brackets 28 have no connection with the forward end of the rear table top 33, while the rear brackets 27 are hinged to the table top 33, as shown at 34. It is thus seen that the rear table top 33 is capable of being angularly adjusted or swung in a vertical plane, upon the hinge 34 as a pivot, with relation to the rear auxiliary frame 26. Disposed adjacent the forward brackets 28 is a vertical adjusting element 35, disposed below the forward end of the rear table top 33 and extending transversely thereof in engagement therewith. This vertically swinging adjusting element 35 is provided with apertured ears 36, through which extend a transverse rod 37, the same also passing through openings formed in the brackets 28. This transverse rod 37 is provided with right and left screw-threads, carrying nuts 38 and 39 which are adapted to clamp the apertured ears 36 against the brackets 28, to lock the element 35 in adjustment at desired angular positions. The nuts 38 and 39 are provided with apertured extensions, receiving a rod 41, attached to the brackets 28, for preventing the rotation of said nuts. The rod 37 is provided at both ends with operating handles or wheels 42, as shown. It is thus seen that by unscrewing the transverse rod 37, the rear table top 33 having its forward end elevated to the desired position, the adjusting element 35 may be swung upwardly in engagement therewith, subsequently to which the transverse shaft 37 may be turned to lock the element 35 against downward movement.

The numeral 43 designates a forward auxiliary supporting frame as a whole, which is longitudinally adjustable upon the forward portions 15 of the tubular rods 13. This forward auxiliary supporting frame comprises spaced side pieces 44, carrying depending sleeves 45, which receive the portions 15 of the tubular rods 13 therethrough. Clamping bolt or bolts 46 may be employed to lock the auxiliary supporting frame 43 in adjustment at desired positions with relation to the longitudinal tubular rods 13. The side pieces 44 comprise upwardly extending inverted V-shaped supports 47, disposed outwardly of ears 48, formed upon a transverse strip 49, these parts being pivotally connected by bolts 50 or the like. The transverse strip 49 is rigidly connected with the lower surface of a forward table top 51, by means of screws or bolts 52 or the like. This forward table top is preferably suitably padded or upholstered. Rigidly connected with the lower surface of the forward table top 51 forwardly of and spaced from the transverse strip 48, is a transverse strip 53, carrying depending apertured ears 54, which are pivotally connected with depending links 55, by means of transverse bolts 56, as shown. The links 55 are provided with longitudinally extending slots 57, for receiving therethrough a transverse rod 58. This transverse rod 58 is rotatably mounted through the upper portion of the forward sleeves 45. The rod 58 is provided at both ends with handles or wheels 59. The rod 58 is provided adjacent and inwardly of the links 55 with right and left screw-threads 60, receiving thereon clamp-

ing nuts 61, provided with extensions 62, which are apertured to slide upon a transverse rod 63, which is in turn attached to the side pieces 44, as shown. It is thus seen that by turning the transverse rod 58, the clamping nuts 61 may be moved into engagement with the links 55, to hold the same against movement. It is obvious that by turning the rod 58 in the proper direction, the links 55 may be released, whereby the forward table top 51 may be swung upwardly or downwardly to assume the desired angular position, subsequently to which the rod 58 may be turned to lock the links against movement. Connected with the rear end of the table top 48, as shown at 64, is a suitably stiff retractile coil spring 65, having its opposite end connected with the cross bars 18, as shown at 66.

The numeral 66[a] designates a sternum support, which is preferably suitably upholstered or padded. This sternum support is pivoted or hinged to the forward table top 51, and for this reason the same has forwardly extending bars 66[b] attached to the lower surface thereof, which bars are provided at their forward ends with apertures for receiving the transverse shaft 50. Surrounding this transverse shaft is a suitably stiff coil spring 66[c], having a central U-shaped portion 66[d] which engages the lower surface of the forward table top 51 while the free ends 66[e] of the same engage the lower surface of the sternum support 66[a], thus serving to yieldingly support the same. Means are provided to lock or rigidly hold the sternum support in its horizontal or upper position, the same comprising links 66[f] and 66[g], which have a knee-joint, as shown at 66[h], whereby the links are capable of being swung upwardly to assume an angular position but cannot be swung downwardly below the position shown in Fig. 4. The upper end of the link 66[b] is pivotally connected with the sternum support 66[a], as shown at 66[i], while the lower end of the link 66[g] is rigidly connected with a transverse shaft 66[j]. The ends of the shaft 66[j] are journaled through portions of the side pieces 44 and extend outwardly therebeyond to be rigidly connected with cranks 66[k]. When the links 66[f] and 66[g] are moved to their locked positions, pressure upon the sternum support 66[a] will tend to hold them in this position, until they are swung upwardly by manipulation of the shaft 66[j].

Pivotally mounted upon the transverse shaft 23 to swing in a vertical plane, is a main toothed parabolic sector 67, which permanently engages a forward locking toothed parabolic sector 68, which is pivotally mounted to swing in a vertical plane upon a transverse shaft 69, as shown. Surrounding the transverse shaft 23 is a suitably stiff coil spring 70, having a centrally arranged U-shaped portion 71, which is attached to the free end of the main parabolic sector 67. The free end portions 72 of this spring extend downwardly and are engaged by cams 73, which are rigidly mounted upon a rock-shaft 74. This rock-shaft is normally held against turning movement by clamping bolt or bolts 75. Rigidly connected with the opposite ends of the rock-shaft 74 are bell-crank levers 76, adapted to be moved in either direction by the foot. The spring 70 is always under tension so that the same tends to swing the supporting structure 12 upwardly, the free end of the sector 67 engaging transverse bar 77, the ends of which are apertured for receiving the portions 16 of the tubular rods 13. By swinging the bell-crank lever 76 in either direction, the cams 73 will engage the end portions 72 of the spring 70, whereby the tension of the spring may be altered or adjusted.

The numeral 78 designates a suitably stiff coil spring, which surrounds the shaft 69, with the end portions 79 thereof extending downwardly to engage adjusting stops or cams 80. Each of these cams 80 is pivotally connected with the upper portion of the frame 11 by means of clamping bolts 80[a], whereby said cams may be angularly adjusted and locked in the desired position, for regulating the tension of the spring 78. The coil spring 78 is provided with a central U-shaped portion 81, which engages the free end portion of the sector 68, tending to turn the same in the direction for turning the sector 67 whereby the latter will swing the supporting structure upwardly.

Longitudinally movably mounted upon the forward portions 15 of the tubular rods 13, is a transverse bar 82, to which is swiveled a longitudinally extending operating rod 83, having a screw-threaded portion 84, operating within a screw-threaded opening formed through the transverse bar 18. At its outer end the rod 83 is provided with a handle or hand wheel 85, as shown. It is thus seen, by turning the hand wheel 85 the rod 83 will be moved longitudinally to move the transverse bar 82 longitudinally of the portions 15 of the rods 13. Connected with the forward end of the stationary frame 11 is an upwardly extending spring latch 86, the upper end of which is bent in the form of a head 87, adapted for insertion within a recess 88 formed in the transverse bar 82. It is thus seen that when the supporting structure 12 is swung downwardly the transverse bar 82 will automatically move the spring latch 86 laterally so that the head 87 thereof may enter the opening 88. By proper rotation of the hand wheel 85 the bar 82 may be moved longitudinally of the portions 15, of the rods 13 to

move the head 87 out of the openings 88, whereby the supporting structure will be free to be swung upwardly.

The operation of the apparatus is as follows:—When the vertically swinging supporting structure 12 is swung to its horizontal or lowermost position, the same will be held in such position by the spring latch 86. By proper manipulation of the hand wheel 85 the supporting structure 12 may be released whereby the same may be swung to a vertical position or to a desired angular position. It is obvious that both of the table tops 33 and 51 may be angularly adjusted and also moved longitudinally of the vertically swinging supporting structure 12. The sternum support 66a may be locked in its uppermost position or yieldingly supported in any desired angular position below the uppermost position.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having described my invention, I claim:—

1. In apparatus of the character described, the combination with a supporting structure, of a body supporting element longitudinally movably mounted upon the supporting structure, a sternum support connected with the body supporting element to move longitudinally therewith, and means whereby the sternum support may be moved in a substantially vertical plane with relation to the body supporting element.

2. In apparatus of the character described, the combination with a supporting structure, of a plurality of body supporting elements mounted thereon, near the opposite ends thereof, means whereby each of the body supporting elements may be moved longitudinally and angularly adjusted with relation to the supporting structure, and a sternum support connected with one body supporting element to move longitudinally therewith.

3. In apparatus of the character described, the combination with a supporting structure, of a carriage longitudinally movably mounted thereon, a body supporting element pivotally connected with the carriage to be swung in a substantially vertical plane, a spring connected with the supporting structure and one end of the body supporting element to swing the opposite end thereof upwardly when released, and means to control the swinging movement of this end of the body supporting element.

4. In a table of the character described, the combination with a supporting frame, of a supporting structure pivotally connected therewith to swing in a substantially vertical plane, toothed sectors pivotally mounted within the supporting frame and engaging for swinging the supporting structure in one direction, a spring engaging one toothed sector to swing the same in one direction, adjustable means for regulating the tension of the spring, a second spring engaging the other toothed sector to swing the same in one direction, and means to normally hold the supporting structure against swinging movement.

5. In a table of the character described, the combination with a supporting frame, of a supporting structure pivotally connected therewith to swing in a substantially vertical plane, toothed sectors pivotally connected with the supporting frame and engaging for swinging the supporting structure in one direction, a spring engaging one toothed sector to swing the same in one direction, adjustable means for regulating the tension of the spring, and a latch to normally hold the supporting structure in its lower position.

6. Apparatus of the character described, comprising a relatively stationary support, a supporting structure pivoted to the support to be swung in a substantially vertical plane with relation thereto, a body-supporting member mounted upon the supporting structure and spaced from one end thereof, and a combined foot rest and weight longitudinally movably mounted upon said end of the supporting structure in spaced relation to the end of the body-supporting member and movable toward and away from the same and extending laterally therebeyond.

7. In apparatus of the character described, the combination with a relatively stationary frame, of a supporting structure pivotally connected therewith to swing in a substantially vertical plane, a plurality of gears in mesh and serving to swing the supporting structure upwardly, and springs to automatically turn the gears in one direction.

8. In a table of the character described, the combination with a relatively stationary supporting frame, of a supporting structure pivotally connected therewith and adapted to be swung in a vertical plane whereby the patient may be moved to the desired position, a plurality of body supporting elements mounted on the vertically swinging supporting structure to be moved longitudinally thereof toward and away from each other, and a relatively heavy foot rest longitudinally movably mounted upon that end of the vertically swinging structure adjacent the pivot thereof and extending laterally outwardly beyond the body supporting elements for a considerable distance, whereby the same prevents the longitudinal movement of the patient when occupying an upright position and may be adjusted whereby

the vertically swinging structure will be more evenly balanced when supporting patients of different weights.

9. In a table of the character described, the combination with a relatively stationary supporting frame, of a supporting structure pivotally connected therewith to be swung in a vertical plane for assuming approximately vertical and horizontal positions, a body supporting element longitudinally movably mounted upon the vertically swinging supporting structure, independently operated means whereby the body supporting element may be swung in a vertical plane to assume the desired angular position, and a relatively heavy foot rest longitudinally movably mounted upon that end of the vertically swinging supporting structure adjacent the pivot point thereof and extending laterally and outwardly beyond the body supporting element for a considerable distance.

10. In a table of the character described, the combination with a relatively stationary supporting frame, of a supporting structure pivotally connected therewith to be swung in a substantially vertical plane, a body supporting element longitudinally movably mounted upon the vertically swinging structure, independently operated means whereby the body supporting element may be swung in a substantially vertical plane to assume desired angular positions with relation to the vertically swinging supporting structure, means to lock the body supporting element in adjustment at a desired angular position, and a relatively heavy foot rest longitudinally movably mounted upon the vertically swinging supporting structure adjacent the pivot thereof and extending laterally and outwardly beyond the body supporting element for a considerable distance.

11. In appartus of the character described, a vertically swinging supporting structure, a table top angularly adjustably mounted thereon, a laterally extending foot rest mounted upon the supporting structure to be moved longitudinally thereof, and means to effect the longitudinal movement of the laterally extending foot rest.

12. In apparatus of the character described, the combination with a relatively stationary frame, of a supporting structure pivotally connected therewith to swing in a substantially vertical plane, body supporting elements mounted upon the supporting structure, a plurality of gears in mesh and serving to swing the supporting structure upwardly, spring means to automatically turn the gears in one direction, and a latch to hold the supporting structure in its lower position.

13. In apparatus of the character described, the combination with a vertically swinging supporting structure, of a latch bar slidably mounted thereon, a latch element to engage the latch bar, and means to effect the movement of the latch bar.

14. In apparatus of the character described, the combination with a relatively stationary frame, of a vertically swinging supporting structure pivotally connected therewith, a latch bar slidably mounted upon the vertically swinging supporting structure and provided with a recess, means to effect the movement of the latch bar, and a spring latch connected with the relatively stationary frame and provided with a head to enter the recess of the latch bar.

15. In apparatus of the character described, the combination with a vertically angularly adjustable supporting structure, of table tops mounted upon the same near the opposite ends thereof, and an independently vertically angularly adjustable sternum support disposed between the table tops.

16. In apparatus of the character described, the combination with a supporting structure, of table tops mounted upon the same near the opposite ends thereof, and a sternum support hinged to one of the tops to swing in a vertical plane.

17. In apparatus of the character described, the combination with a supporting structure, of table tops mounted upon the same near the opposite ends thereof, a vertically swinging sternum support disposed between the table tops and pivoted to one of them to move longitudinally therewith, and means to lock the sternum support in its upper position.

18. In apparatus of the character described, the combination with a supporting structure, of a plurality of table tops vertically angularly adjustably mounted upon the same near the opposite ends thereof, a swinging sternum support mounted upon the supporting structure and disposed between the table tops and hinged to one of them to move longitudinally thereof, and yielding means adapted to force the sternum support upwardly.

19. In apparatus of the character described, the combination with a supporting structure, of a plurality of angularly adjustable table tops mounted upon the same near the opposite ends thereof, a vertically swinging sternum support mounted upon the supporting structure and disposed between the table tops, yielding means adapted to force the sternum support upwardly, and means to rigidly lock the sternum support in its upper position.

20. In apparatus of the character described, the combination with a relatively stationary support, of a supporting structure pivotally connected with the relatively sta-

tionary support to be swung in a substantially vertical plane with relation thereto, and a relatively heavy foot rest longitudinally movably mounted upon the vertically swinging supporting structure and adapted to aid in swinging the same in one direction and to be moved toward and away from the pivot point of the vertically swinging supporting structure depending upon the weight of the patient arranged upon the vertically swinging supporting structure.

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

WILLIAM ENOS STILES.

Witnesses:
J. P. NABSTEDT,
Mrs. A. BERGMAN.