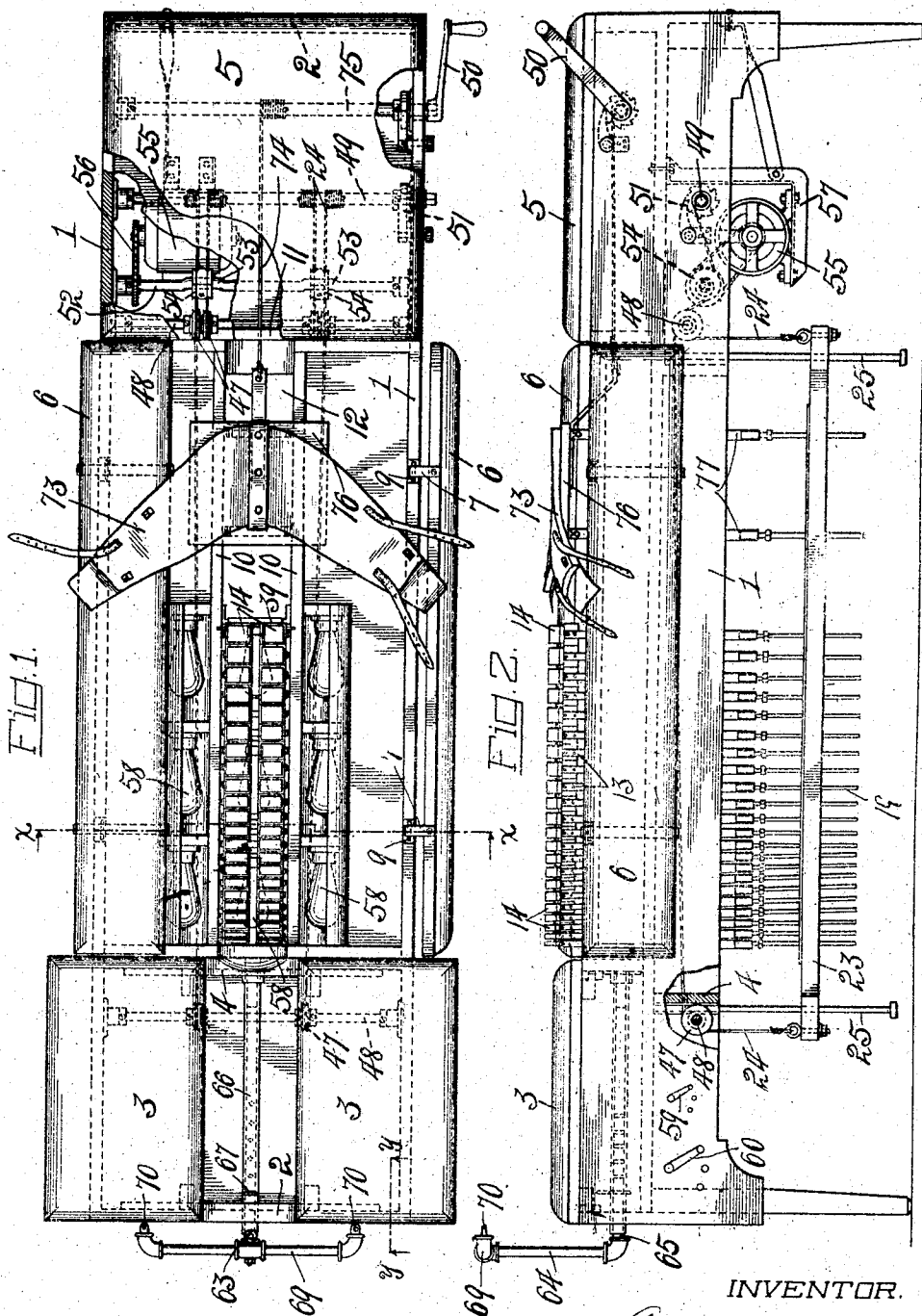


A. A. POOL.
SPINAL ADJUSTING AND STRETCHING APPARATUS.
APPLICATION FILED SEPT. 7, 1915.

1,173,306.

Patented Feb. 29, 1916.

3 SHEETS—SHEET 1.



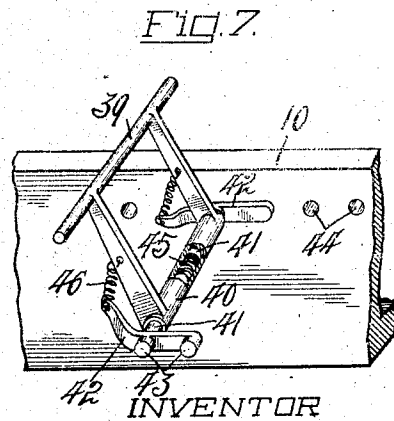
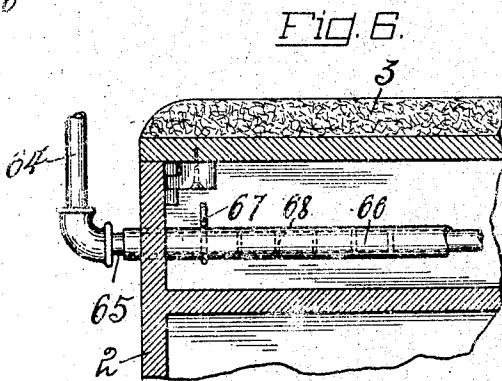
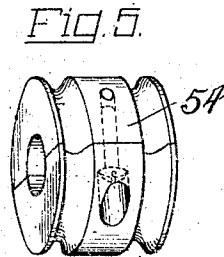
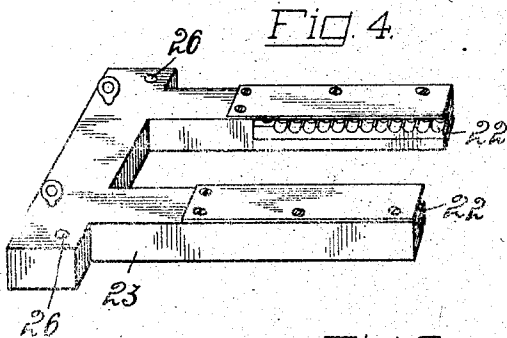
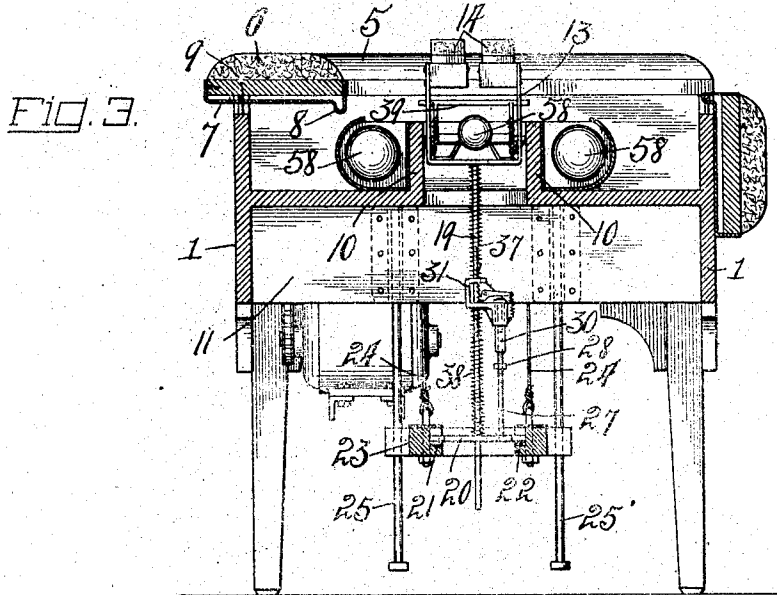
INVENTOR.
Arnold A. Pool,
By Owen, Owen & Crampton,
His attys.

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3 SHEETS—SHEET 2.



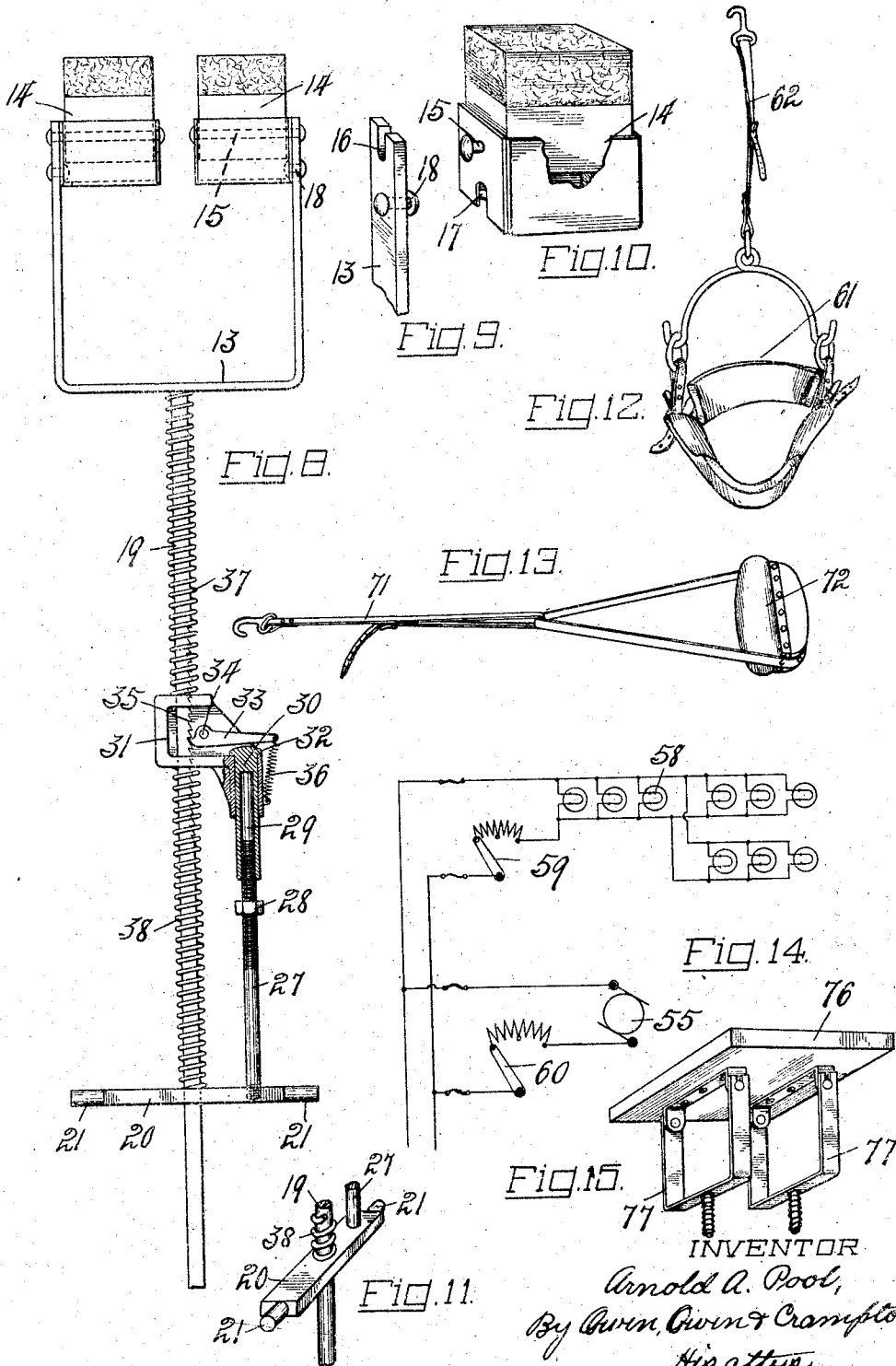
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3 SHEETS—SHEET 3.

1,173,306.



UNITED STATES PATENT OFFICE.

ARNOLD A. POOL, OF TOLEDO, OHIO, ASSIGNOR OF ONE-HALF TO JOSEPH W. KONZ, OF TOLEDO, OHIO:

SPINAL ADJUSTING AND STRETCHING APPARATUS.

1,173,306.

Specification of Letters Patent.

Patented Feb. 29, 1916.

Application filed September 7, 1915. Serial No. 49,267.

To all whom it may concern:

Be it known that I, ARNOLD A. POOL, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Spinal Adjusting and Stretching Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to apparatus used in connection with the treatment of the spine, and particularly to a table or apparatus adapted for use in stretching, vibrating and adjusting the spine whereby to restore or correct structural defects therein and to prevent a thinning of the intervertebrae cartilages and the results engendered thereby.

The object of my invention is the provision of an improved apparatus of the class described which is comparatively simple in its construction and operation and easily and quickly adjustable to apply pressure to the body at opposite sides of the spine and in a properly distributed manner to suit the requirement of the particular case under treatment, whereby to enhance the practicability and commercial value of such apparatus.

A further object of my invention is the provision in an apparatus of the class described, of separate vertebrae supporting members corresponding in number to the vertebrae of the patient and relatively adjustable to suit the requirements of the case, and also relatively movable to permit a separating thereof as the vertebrae supported thereby separate under a stretching tension.

A further object of my invention is the provision of means, in combination with the vertebrae supporting pads, for imparting vibratory movements to the pads to facilitate the stretching action.

Further objects and advantages of the invention will be apparent from the following detailed description thereof.

While the invention in its broader aspect is capable of embodiment in numerous

forms, a preferred embodiment thereof is illustrated in the accompanying drawings, in which,—

Figures 1 and 2 are top plan and side views of an apparatus embodying my invention with portions broken away. Fig. 3 is a vertical cross-section on the line *x, x* in Fig. 1. Fig. 4 is an enlarged perspective view of one end portion of the frame which adjustably supports the vertebrae pads. Fig. 5 is an enlarged perspective view of a roller on the shaker frame. Fig. 6 is an enlarged section on the line *y, y* in Fig. 1. Fig. 7 is an enlarged perspective view of the adjustable bracing member for the vertebrae pads. Fig. 8 is an enlarged elevation of one of the vertebrae pads and its supporting parts. Fig. 9 is an enlarged perspective view of the free end portion of one of the legs of the pad supporting yoke. Fig. 10 is a perspective view of one of the pads removed from the supporting yoke and with a part broken away. Fig. 11 is a perspective view of the lower cross-arm of the pad supporting means. Figs. 12 and 13 are views of the head and arm harnesses. Fig. 14 is a diagrammatical view of the electric wiring for the motor and electric heating elements of the apparatus, and Fig. 15 is a perspective view of a portion of the hip supporting means.

Referring to the drawings, 1, 1 designate the sides and 2, 2 the ends of a table or couch frame provided on its top with the two head rest parts or pads 3, 3, which are placed side by side on the couch frame and are preferably adjustable transversely of the frame to permit a placing of the same in spaced or close relation. The edges of the pads 3, which are disposed toward the foot of the couch, are disposed over and rest upon a transverse partition piece 4 of the couch frame. A foot pad or leg support 5 is mounted on the foot portion of the couch and is preferably removable therefrom. Body supporting wings 6 are mounted on the top side edge portions of the couch frame intermediate the head and foot rests 3 and 5, and are adjustable transversely of the couch to vary the distance therebetween, and may also be swung downward to inoperative position at the sides of the couch frame, as shown at one side of each of Figs. 1, 2 and 3. In order to permit such adjustment of the side wings 6 each is pro-

vided at its under side with a metal strap 7, which extends from one edge to the other thereof in slightly spaced relation to the under side of the wing and is provided at its inner end with an outwardly projecting looped portion 8, as best shown in Fig. 3. A hinge staple 9 is secured to the upper edge of the adjacent couch side 1 for each strap 7 and loosely embraces the portion of the strap beneath the wing for sliding and pivotal movements relative thereto. When the wing has been moved outward a sufficient distance to place the staple 9 in register with the loop 8 the wing can be swung downward at the side of the couch frame, as is apparent.

10, 10 designate partition members which extend lengthwise of the couch frame intermediate the head partition member 4 and foot partition member 11, which latter is disposed transversely of the frame at the inner edge of the foot-piece 5 and are arranged in transversely spaced relation to form a narrow elongated central opening 12 in the couch frame between the cross partition members 4 and 11. The upper edges of the members 10, 10 are disposed below the top plane of the couch, as best shown in Fig. 3.

Mounted vertically within the space 12 are a plurality of U-shaped yokes 13, which are disposed side by side and form a set of relatively movable vertebrae supporting members that extend lengthwise of the space 12 for a considerable distance from the head end thereof. These yokes 13 preferably correspond in number to the number of vertebrae in the spine and each carries a pad 14 at the outer end of each of its legs at the inner side thereof, as best shown in Figs. 3 and 8. The pads 14 for each yoke are transversely spaced to permit the pads to bear against the opposite side portions of a vertebra in supporting relation thereto. Each pad 14 is pivotally carried by the respective leg of the yoke 13 by reason of a pivot pin or other shaft like part 15 projecting transversely through the solid portion of the pad and from one end thereof to adapt such projected end to be removably inserted into a bearing notch 16 in the outer end of the yoke leg, the extreme outer end of the part 15 being headed to prevent an axial withdrawal thereof from the bearing notch. The lower end of the pad is notched at the outer side edge thereof, as at 17, to fit over a stud 18 on the leg of the yoke below the notch 16 when the pivot pin 15 is inserted in the notch 16. The notch 17 is wider than the stud 18 to permit a limited rocking of the pad on the pivot pin 15, thereby enabling the pad to automatically adjust itself to the formation of the vertebra as the weight of the body is exerted thereon. The top surface of each pad

14 is preferably faced with a soft or cushion-like material, such for instance as felt, and the pads are graduated or vary in width in accordance with the narrowing of the successive vertebrae of the spine.

Each yoke 13 is supported by a stem 19 which extends downward from the looped portion thereof and projects loosely at its lower end through a cross-arm 20, the ends of which are provided with trunnions 21 for seating in axially registering bearing recesses 22 provided in the opposite side portions of a rectangular supporting frame 23. The frame 23 is adjustably suspended below the couch frame by a set of four cables 24 as hereinafter more fully described, and the vertical movements of the frame 23 are guided by rods 25 projecting downward from the under side of the couch frame and loosely through registering corner openings 26 in the frame 23. The bearing recesses 22 are closely arranged in successive order along the respective sides of the frame and enable the cross-arms 20 to be moved lengthwise of the frame 23 and placed in a desired set of bearing recesses to suit the desired spacing of the pad carrying yokes 13.

A rod or stem-like member 27 rises rigidly from each cross-arm 20 at one side of its stem 19 and has its upper end threaded to adjustably carry a stop nut 28. The upper end of the rod 27 above the nut 28 projects into the socket 29 in the lower end of a plunger member 30 and is adapted to have free reciprocatory movements in such socket. The plunger 30 projects loosely down through a registering socket in a head part 31, and is provided at its upper end with a shoulder or plunger 32 for limiting its downward movement through the head socket, as is apparent by reference to Fig. 8. The head 31 has a vertical opening through which the stem 19 loosely projects and carries a lever form of pawl 33, which is fulcrumed in the head adjacent to one side of the stem, as at 34, and has its short inner arm in the form of a tooth for upward engagement with a registering one of a set of ratchet teeth 35 on the adjacent side of the stem 19. The outer or long arm of the pawl 33 extends outward over the top of the plunger 30 in adjacent relation thereto and is connected at its outer end with a downwardly projecting coiled contractile spring 36 to a subjacent portion of the head 31. The spring 36 resists a movement of the pawl 33 which will release it from engagement with a registering tooth on the stem 19. A coiled compression spring 37 is carried by the stem 19 between the yoke 13 and head 31 with its respective end thrusts thereagainst and a similar spring 38 is carried by the stem 19 between the cross-arm 20 and head 31 to maintain the same in yielding spaced relation.

It is evident that when the yoke 13 is in its normal raised position the pawl 33 is in engagement with a tooth of the set 35 and maintains the yoke 13 in rigid spaced relation to the head 31. When the yoke 13 is lowered by the application of a downward pressure thereon the spring 37 remains inactive and the spring 38 alone permits a yielding downward movement of the yoke and its stem. When the stem and head 31 have lowered a sufficient distance to move the lower end of the plunger 30 into stop engagement with the nut 28 said plunger then stands still during a continued lowering of the stem and head, so that the head lowers thereon, thereby moving the long arm of the pawl lever 33 into trip engagement with the plunger and effecting a tripping of the pawl from engagement with the teeth 35. The releasing of the head 31 in this manner with respect to the stem 19 brings the spring 37 into play and neutralizes the compression between it and the spring 38, thus reducing the upward pressure on the yoke 13. The purpose of this construction is to enable an equalizing of the pressure of the several vertebræ supporting yokes against the respective vertebræ so as to compensate for curvature in the spine. For instance a patient might have quite a decided spinal curvature so that when placed on the table the curvature of the spine would cause some of the supporting yokes to be lowered a much greater extent than others, thereby applying a greater pressure against some vertebræ than others. With my compensating feature the nuts 28 of different supporting units are set to effect a tripping of the respective pawls 33 as the particular formation of the spine may require so that if one supporting yoke is lowered more than others the pawl 33 thereof will be tripped to effect a neutralizing of the spring action between the two springs 37 and 38, thus reducing the inward pressure of the particular supporting yoke against the spine so that its pressure more nearly approaches the pressure of the other supports.

It is evident that the yokes 13 are permitted to have relative swinging movements lengthwise of the couch about the respective cross-arm trunnions; that the pads 14 have oscillatory movements relative to the respective supporting yokes 13 to permit an automatic adjustment of the pads to the surface encountered at each side of the spine, and that the pads and yokes are also permitted to have yielding vertical movements so that the different pads of the set will automatically adjust themselves to the curvature or form of the back as the weight of the body is applied thereto.

In order to prevent the yokes 13 at the foot end of the set from swinging rearward

or into the unoccupied portion of the space 12 when a patient is being placed on the apparatus, a bracing or holding member 39 is mounted preferably in an adjustable manner between the partition members 10, 10 within the space 12 in position to bear against the outer yoke 13 and hold it and its companions in substantial upright position at the forward or head end of the space 12, as shown in Figs. 1 and 2. The member 39 is mounted for adjustment lengthwise of the space 12 as the desired spacing or number of yokes 13 employed may require, it being understood that the spacing of the yokes is changed for bodies of different lengths, and that in some cases the number of vertebræ in the spine vary from the customary number so that it is necessary to either remove one of the yokes or insert additional ones to suit the particular case. In the present instance, the bracing member 39 is provided at its inner end with a hub part 40 having an axial opening there-through, and mounted in each end of such opening for reciprocatory movements therein is a trunnion part 41 that is provided at its outer end with a cross-arm 42, which is provided with two studs 43 for inserting into a desired pair of a set of openings 44 provided in the respective partition member 10, as best shown in Fig. 7. A coiled compression spring 45 is mounted within the hub opening of the member 39 and bears outward in opposite directions against the inner ends of the trunnions 41 to normally force such trunnions outward to retain the studs 43 within the respective openings 44. A coiled contractile spring 46 connects the forward end of each arm 42 to a registering leg of the member 39 and serves to yieldingly cause such member to bear forward against the rear or foot end of the yoke set.

The cables 24 which carry the frame 23 extend upward from the respective corners of said frame over vertically registering sheaves 47 secured on cross-shafts 48 that are suitably mounted in the lower portion of the couch frame transversely thereof as shown in Figs. 1 and 2. The cables 24 extend rearward of the couch frame with the forward pair passing over a set of sheaves on the rear shaft 48 and with both pair then winding on the windlass shaft 49, which is journaled in the foot portion of the couch frame transversely thereof and has one end projecting without the frame and adapted for receiving a crank-handle 50. A pawl and ratchet 51 coact to prevent a back turning or unwinding of the windlass shaft 49.

52 designates a shaft that is mounted transversely in the foot portion of the couch frame between the shafts 48 and 49 and has two crank or eccentric portions 53 at points above the cables 24. Mounted loosely on each of these eccentric portions is

a pulley 54, which is peripherally grooved to adapt it to bear down on the adjacent cables 24 so as to cause the cables to take a zig-zag course between the shafts 48 and 49. It is apparent that a rotation of the shaft 52 will impart a vibratory action to the cables 24 and frame 23 and effect a consequent vibration of the yokes 13 and pads carried thereby. The shaft 52 is driven, in the present instance, by a motor 55, which is mounted under the foot portion of the couch frame and has chain and sprocket-wheel connection 56 with the shaft 52. The motor 55 is shown as being mounted on a bracket 57 beneath the foot end portion of the couch frame.

It is found that the application of heat to the spine and adjacent portions of the body causes a relaxation of the muscles and renders the treatment more effective. This is accomplished by arranging a set of electric heating elements within the upper portion of the couch at the outer side of each partition member 10, and also a set of heating elements within the space 12 so that heat is not only applied to the body at each side of the spine but also directly to the spine between the set of pads 14. In the present instance, the heating elements are in the form of incandescent lamps 58 with the elements of the intermediate set carried by certain of the yokes 13, as best shown in Fig. 3. The heating elements are shown, in the present instance, as being wired in series and having a rheostatic switch control 59, as illustrated in Fig. 14. In this figure, 60 designates the rheostatic switch control for the motor 55.

The head harness 61, which may be of any suitable form for attaching to the head is connected preferably in an adjustable manner by a strap 62 to an eye 63 on a standard 64, which is vertically disposed at the forward or head end of the couch and which, in the present instance, is carried or rises from the outer end of the rearwardly extending bar 65 that is loosely inserted into a pipe form of socket member 66 that is secured within the head end portion of the couch longitudinally thereof. The bar 65 is adjustable lengthwise of the member 66 and is held in adjusted position by the insertion of a pin 67 through an opening in the pipe member 66 and one of a series of openings 68 in the bar as best shown in Fig. 6. The upper end of the standard 64 is provided with a cross-arm 69, each end of which is provided with an eye 70 to which an arm engaging strap 71 may be attached. Each strap 71 is provided at one end with a stirrup member 72 for engaging under the shoulder blades.

A body strap 73 for engaging around the hips of a person is connected by a cable 74 to a windlass 75 to the shaft of which the

crank handle 50 may be applied. The body embracing strap 73 is attached to the top of a hip supporting table 76 that is mounted on a pair of supports 77, each of which is the same as the yielding vertebræ supports except that the table 76 is pivotally carried at the upper end of each in place of the pads 14. The supports 77 are also yieldingly, swingingly and adjustably carried by the frame 23 the same as the vertebræ supports, thus enabling the table to vertically yield as the weight of the body is applied thereto, to swing lengthwise of the couch frame in accordance with any stretching or lengthwise movement of the body, and to be adjusted with respect to the couch frame to suit the length of the patient's body.

The operation of my invention is as follows: The body carrying yokes 13 having been adjusted in proper position to suit the length of the patient's body, the patient is placed on the couch with his hips resting on the table 76, his head disposed between the head pieces 3, 3 and with the pads 14 disposed under the respective vertebræ of the spine, a pair of pads being provided for each vertebra and being narrowed to suit the size or width of the vertebra which it is intended to support. The head and arm engaging parts 61 and 72 and the hip straps 73 are then placed in engagement with the respective parts of the patient, the head strap being anchored to the center eye 63 and the arm straps to the respective eyes 70 at the outer ends of the cross-arms 69. This having been done, and the electricity having been turned into the heating elements 54 to heat and cause a relaxing of the muscles so that they will submit more readily to treatment, the operator slowly turns the windlass 75 to wind the cable 74 thereon and effect a consequent stretching of the body and separating of the vertebræ, the vertebræ supporting pads 14 moving with the respective vertebræ as they separate. If, as sometimes happens, it is desired to apply a separating strain more particularly to two adjoining vertebræ, the spine supporting members 13, 14 are strapped together in two sets, the sets being divided at the desired point of separation so that a separation of such members will occur only at the dividing point between the sets. It will, of course, be understood that the weight of the body on the supporting members 13, 14 and hip supporting table 76 causes a greater or less lowering of such members against the tension of their supporting springs and enables the members to conform to the shape or curvature of the spine. If it is desired to facilitate the stretching action by imparting vibratory movements to the spine, the motor 55 is started, thereby causing the eccentric rollers 54 to impart a vibratory movement to the frame supporting cables which

movement is imparted to the spine supporting pads and the table 76 by the frame 23. The capability of the different vertebrae supporting members to have relative opening and closing movements lengthwise of the couch, and relative yielding vertical and vibratory movements, and also the capability of the pads 14 to have movements relative to the supporting yokes admirably adapts the apparatus for the purpose for which it is intended and enables it to be put to a variety of uses in connection with the correction of spinal troubles, as will be apparent to persons skilled in the art.

While I have herein shown and described one specific embodiment of my invention for illustrative purposes, and have disclosed and discussed in detail the construction and arrangement incidental to one specific application thereof, it is to be understood that the invention is not limited to the mere detail or relative arrangement of the parts but that deviations from the illustrated form or embodiment of the invention may be made without departing from the spirit of the claims.

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

1. In an apparatus of the class described, a frame, a horizontally disposed member carried by said frame for rocking movements in a plane lengthwise thereof, a standard rising from said member for yielding longitudinal movements relative thereto, and means carried by said standard at its upper end for engaging a single vertebra at opposite sides of its longitudinal center and serving as a support therefor.

2. In an apparatus of the class described, a vertebra supporting member having transversely spaced vertebra supporting parts for simultaneously acting on a vertebra, and means supporting said member for swinging movements lengthwise of the axis of the vertebra which it supports.

3. In an apparatus of the class described, a vertebra supporting member having pivotally movable vertebra coacting parts which are spaced to engage and simultaneously support opposite side portions of a vertebra.

4. In an apparatus of the class described, a vertebra supporting member having transversely spaced vertebra supporting parts for simultaneously acting on a vertebra, and means supporting said member for movements lengthwise of the vertebra axis which it supports.

5. In an apparatus of the class described, a vertebra supporting member having spaced vertebra supporting parts, and means supporting said member for yielding vertical movements.

6. In an apparatus of the class described, a vertebra supporting member having spaced

vertebra engaging parts, and means supporting said member for yielding vertical movements and limited oscillatory movements.

7. In an apparatus of the class described, a vertebra supporting member having separate vertebra supporting parts which are movable relative to the member and to each other and removable from the member.

8. In an apparatus of the class described, a yoke having upstanding arms, spaced vertebra parts carried by the arms of said yoke, and means supporting said yoke for limited horizontal and yielding vertical movements.

9. In an apparatus of the class described, a yoke having upstanding parts, separate vertebra supporting parts movably carried by the upstanding parts of the yoke, and means supporting said yoke for limited horizontal and yielding vertical movements.

10. In an apparatus of the class described, a member for supporting engagement with a vertebra at opposite sides thereof, and means yieldingly supporting said member.

11. In an apparatus of the class described, a horizontally movable member for supporting engagement with a vertebra at opposite sides thereof, and means for supporting said member for yielding vertical movements.

12. In an apparatus of the class described, a member for supporting engagement with a vertebra at opposite sides thereof, and vertically adjustable means carrying said member.

13. In an apparatus of the class described, a yoke, means movably carried by said yoke for transversely spaced supporting engagement with a vertebra, and vertically adjustable means supporting said yoke for yielding vertical and oscillatory movements.

14. In an apparatus of the class described, a vertically adjustable frame, a member yieldingly supported by said frame and having a vertebra supporting part at its upper end.

15. In an apparatus of the class described, a vertically adjustable frame, a member yieldingly supported by said frame and having spaced vertebra supporting portions at its upper end.

16. In an apparatus of the class described, a vertically adjustable frame, a member mounted on said frame for oscillatory and yielding vertical movements, and having a vertebra supporting portion at its upper end.

17. In an apparatus of the class described, a frame, a part pivotally carried by said frame, a vertically disposed stem movably projected through said part, a vertebra engaging member carried by said stem at its upper end, and means for yieldingly supporting said member above said part.

18. In an apparatus of the class described, a vertically movable stem, means guiding the movements of said stem and coacting therewith to yieldingly support the stem and

operable to trip and release the stem at a predetermined point in its lowering movement and a vertebra supporting member carried by said stem at its upper end.

- 5 19. In an apparatus of the class described, an individual vertebra supporting member mounted for a plurality of different movements, and means for vibrating said member.
20. In an apparatus of the class described, 10 an individual vertebra supporting member mounted for horizontal and yielding vertical movements, and means for imparting vibratory movements to said member.
21. In an apparatus of the class described, 15 a frame, a vertebra supporting member carried by said frame, and means for vibrating said frame and member.
22. In an apparatus of the class described, a vertically adjustable frame, a vertebra 20 supporting member carried by said frame for adjusting movements therewith, and means for vibrating said frame and member in any position of adjustment thereof.
23. In an apparatus of the class described, 25 a frame, cables supporting said frame, and means operable in coaction with said cables to vibrate said frame and member.
24. In an apparatus of the class described, a frame, means having flexible parts sup- 30 porting said frame and operable to vertically adjust the same, a vertebra supporting member carried by said frame, and means operable to coact with the flexible parts of said first means to impart vibrat- 35 ing movements to said frame and member.
25. In an apparatus of the class described, a set of relatively movable vertebrae sup- 40 porting members.
26. In an apparatus of the class described, 40 a set of relatively movable vertebrae supporting members, one for each vertebra.
27. In an apparatus of the class described, a set of individual vertebrae supporting 45 members mounted for relative separating movements.
28. In an apparatus of the class described, a set of individual vertebrae supporting members mounted for relative horizontal separating and vertical movements.
- 50 29. In an apparatus of the class described, a set of individual vertebrae supporting members mounted for relative horizontal separating and yielding vertical movements.
- 55 30. In an apparatus of the class described, a plurality of individual vertebrae supporting members, and means supporting said members for horizontal and yielding vertical movements.
31. In an apparatus of the class described, 60 a plurality of individual vertebrae supporting members, and means supporting said members for yielding vertical movements and for relative swinging movements in a common plane toward and away from each 65 other.
32. In an apparatus of the class described, a vertebra supporting member for each vertebra of the body, said members being arranged in successive order, and means supporting said members for movements to- 70 ward and away from each other to vary the space therebetween and for vertical yielding movements.
33. In an apparatus of the class described, a plurality of vertebrae supporting members, 75 and means carrying said members for relative separating movements and for yielding vertical movements.
34. In an apparatus of the class described, a frame, a plurality of vertebrae supporting 80 members carried by said frame for relative separating movements and being relatively adjustable lengthwise of the frame to vary the spacing therebetween.
35. In an apparatus of the class described, 85 a frame, standards supported by and yieldingly rising from said frame, said standards having vertebrae supporting parts at their upper ends and being adjustable lengthwise of the frame to vary the spacing between 90 the standards.
36. In an apparatus of the class described, a vertically adjustable frame, standards supported by and yieldingly rising from said 95 frame, said standards having vertebrae supporting parts at their upper ends and being adjustable lengthwise of the frame to vary the spacing between the standards.
37. In an apparatus of the class described, 100 a plurality of individual vertebrae supporting members, and means for vibrating said members.
38. In an apparatus of the class described, a plurality of individual vertebrae supporting 105 members mounted for relative horizontal and yielding vertical movements, and means for imparting vibratory movements to said members.
39. In an apparatus of the class described, 110 a frame, a plurality of vertebrae supporting members carried by said frame, and means for imparting vibratory movements to the frame.
40. In an apparatus of the class described, 115 a frame, means for vertically adjusting the frame, a plurality of relatively movable vertebrae supporting members carried by said frame, and means coacting with said first means for imparting vibratory movements to said frame.
41. In an apparatus of the class described, 120 a set of relatively movable vertebrae supporting members each adapted to straddle and support a respective vertebra at opposite sides of its longitudinal center.
42. In an apparatus of the class described, 125 a plurality of relatively movable members, and vertebrae supporting pads movably carried by said members.
43. In an apparatus of the class described, 130

a plurality of relatively movable upright members each member having pads for supporting engagement with a respective vertebra at opposite sides of its longitudinal center.

44. In an apparatus of the class described, separate vertebrae supporting members, and means carrying said members for movement together and relative to each other lengthwise of the apparatus.

45. In an apparatus of the class described, separate relatively movable vertebrae supporting members, and means for vibrating said members.

46. In an apparatus of the class described, separate relatively movable members each having transversely spaced vertebrae engaging parts, and means for applying heat between the parts of said members.

47. In an apparatus of the class described, a plurality of members having transversely spaced vertebrae engaging parts, and electrical heating elements carried by some of said members for applying heat between the vertebrae engaging parts thereof.

48. In an apparatus of the class described, a couch, a plurality of relatively movable vertebrae supporting members arranged in a set extending lengthwise of the couch, said members being adjustable lengthwise of the couch, and means for supporting the members in upright position in any position of adjustment thereof.

49. In an apparatus of the class described, a couch having a longitudinally extending space therein, a plurality of upright members rising through said space and having individual vertebra supporting parts, means supporting said members for yielding vertical and for swinging and relative adjusting movements lengthwise of the couch, and means adjustable within said space lengthwise thereof for resisting an outward swinging of said members at one end of the set in any position of adjustment thereof.

50. In an apparatus of the class described, a frame, a plurality of vertebrae supporting members and a hip supporting member carried by said frame, and means for imparting vibratory movements to the frame.

51. In an apparatus of the class described, a frame, a plurality of relatively movable vertebrae supporting members and a hip supporting member carried by said frame for adjustment lengthwise thereof.

52. In an apparatus of the class described, a vertically adjustable frame, a plurality of relatively movable vertebrae supporting members and a hip supporting member carried by said frame for yielding vertical movements relative thereto.

53. In an apparatus of the class described, a frame, a plurality of relatively movable

vertebrae supporting members and a hip supporting member carried for vertical yielding movements by said frame.

54. In an apparatus of the class described, a frame, a plurality of relatively movable vertebrae supporting members and a hip supporting member yieldingly carried by said frame for relative adjustment lengthwise thereof.

55. In a machine of the class described, a vertically adjustable frame, a plurality of relatively movable vertebrae supporting members and a hip supporting member carried by said frame for yielding vertical movements, and means for imparting vibratory movements to said frame.

56. In an apparatus of the class described, a vertebra supporting member, and means yieldingly supporting said member and operable to reduce the upward pressure against the member when the member has been lowered a predetermined extent.

57. In an apparatus of the class described, a supporting yoke, a spring means yieldingly supporting said yoke, a second spring means for supporting said yoke and normally being inactive, and means operable to bring the second spring means into action when the yoke has been lowered a predetermined extent.

58. In an apparatus of the class described, a vertebra supporting member having a downwardly projecting stem provided with ratchet teeth, a slide head mounted on said stem, a pawl carried by said head and normally engaging said teeth to cause the yoke and head to have downward movements together, a compression spring interposed between said head and yoke, a second compression spring interposed below said head, a subjacent support for said spring, and means for effecting a tripping of said pawl to release the stem when the yoke and stem have been lowered a predetermined extent, thereby neutralizing the lowering pressure on the yoke between said springs.

59. In an apparatus of the class described, a vertically adjustable frame, and an individual vertebra supporting member yieldingly carried by said frame for adjustment therewith.

60. In an apparatus of the class described, a plurality of relatively movable vertebrae supporting members, and vertically adjustable means carrying said members.

61. In an apparatus of the class described, a vertically adjustable frame, and a plurality of relatively movable vertebrae supporting members yieldingly carried by said frame.

In testimony whereof, I have hereunto signed my name to this specification.

ARNOLD A. POOL.