Nov. 17, 1925. 1,562,266

M. E. TODD

APPARATUS FOR PRACTICING ORTHOPEDIA

Filed Feb. 25, 1922 3 Sheets-Sheet 1

Fig. 1

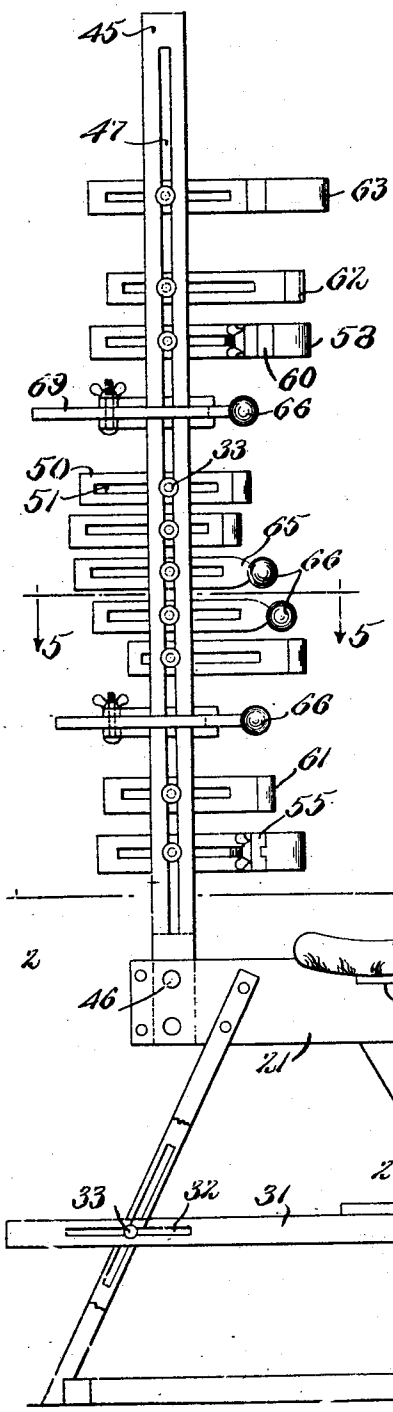


Fig. 2

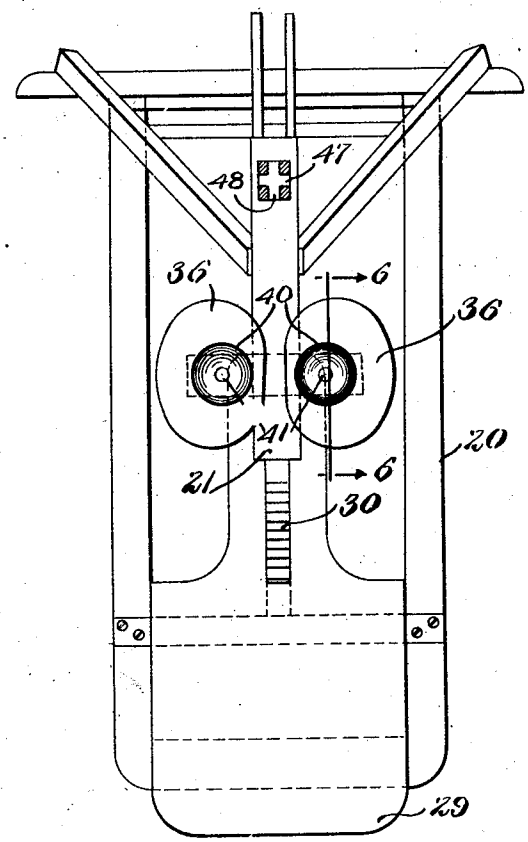


Fig. 12

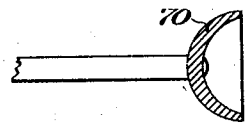
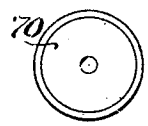


Fig. 13



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APPARATUS FOR PRACTICING ORTHOPEDIA

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Fig. 3

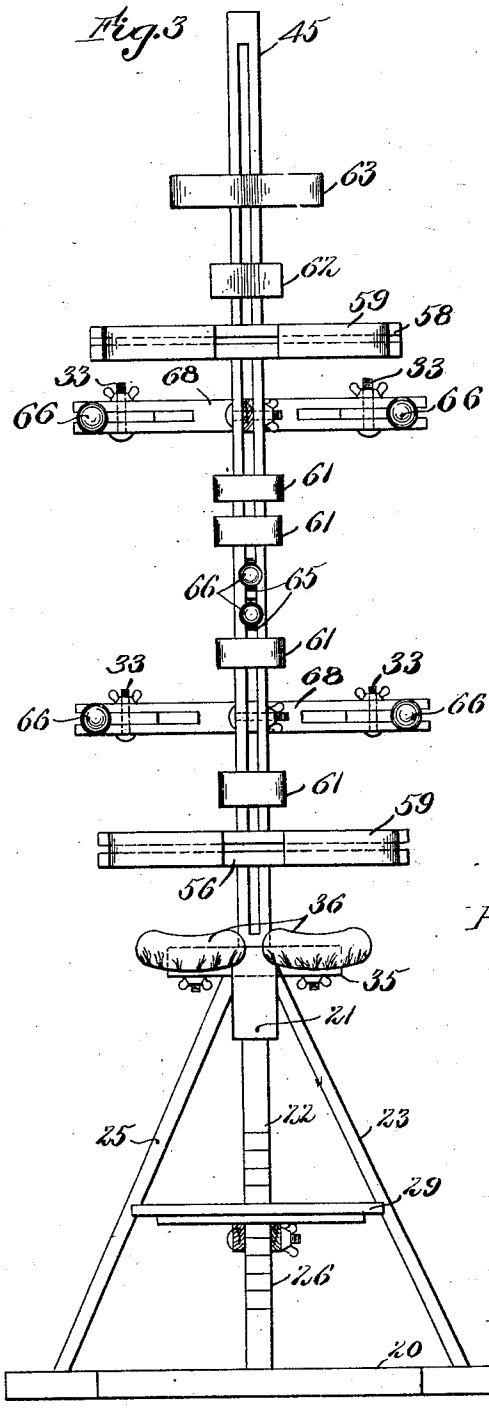


Fig. 14

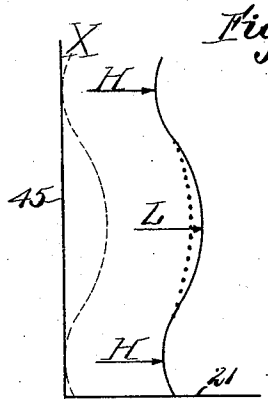


Fig. 15

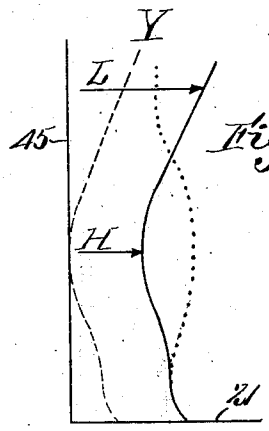
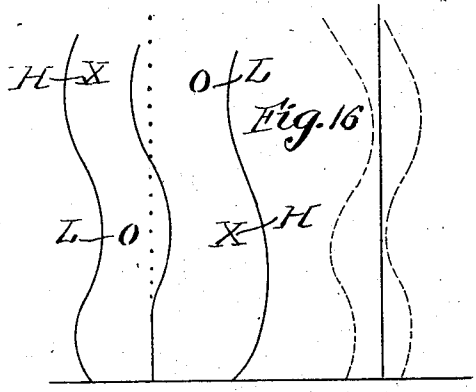


Fig. 16



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APPARATUS FOR PRACTICING ORTHOPEDIA

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Fig. 11

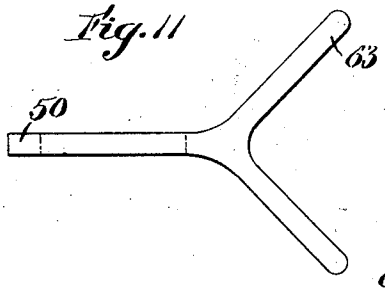


Fig. 9

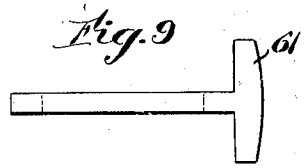


Fig. 8

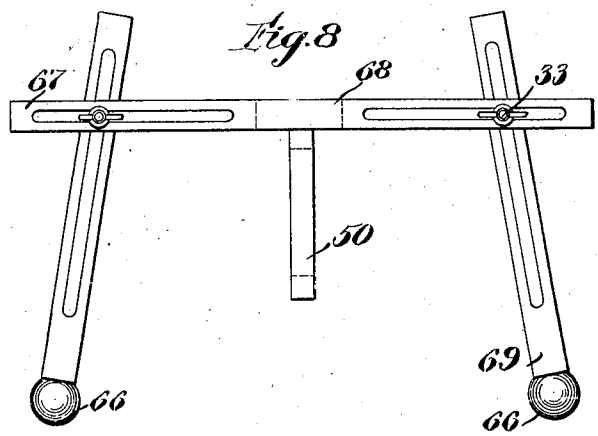


Fig. 10

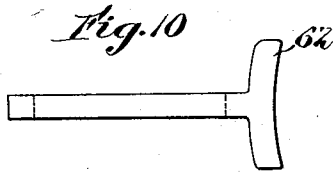


Fig. 5

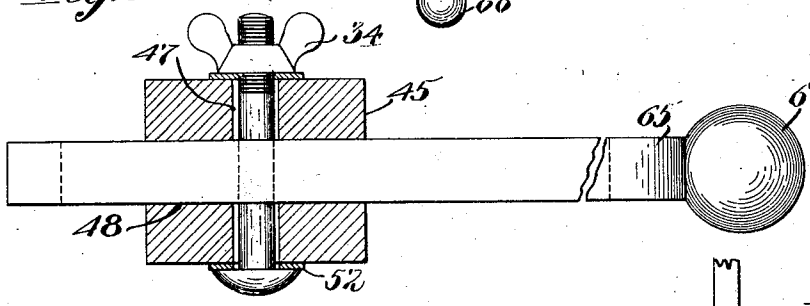


Fig. 7

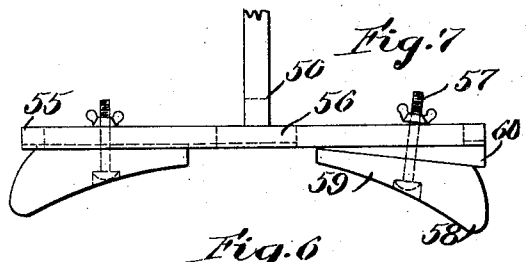


Fig. 4

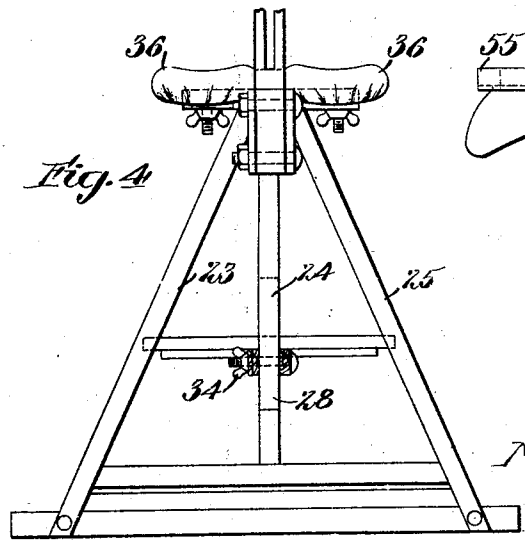
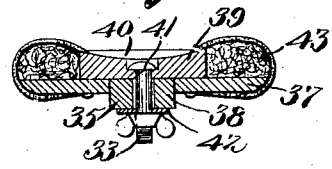


Fig. 6



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UNITED STATES PATENT OFFICE.

MABEL ELSWORTH TODD, OF BOSTON, MASSACHUSETTS.

APPARATUS FOR PRACTICING ORTHOPEDIA.

Application filed February 25, 1922. Serial No. 539,211.

To all whom it may concern:

Be it known that I, MABEL ELSWORTH TODD, a citizen of the United States of America, and resident of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Apparatus for Practicing Orthopedia, of which the following is a specification.

The invention consists of an apparatus for the practice of orthopedia. It is concerned with the correction of physical defects due to misplacement of parts of the bony framework of the body, such as spinal curvatures, anterior, posterior and lateral, round shoulders and sagging chest, tosis, etc., characterized by abnormally strained and weak muscles in the immediate vicinity of the defect and invariably resulting in a faulty adjustment of the weight of the various parts thereby imposing an unbalanced and strained condition upon the whole body. Such physical defects are ordinarily evidenced by incorrect posture of the afflicted individuals.

While it is possible as heretofore, by the external application of force, as by means of a suitable harness or jacket, usually worn for many years, or by the manipulation of a skilled operator, to cause the misplaced bones to assume a normal position; this imposition of a desired condition frequently subjects the patient to great discomfort if not actual pain and does not tend to effect a permanent cure. The reasons for this are inherent in the structure of the human body itself. The bones making up the framework of the body are not positively united by rigid fastening means such as bolts and nuts as in articles and machinery in common use, but may be considered rather as tied together with string, the string being the ligaments. These string connections permit relative movement of the bones and do not of themselves maintain the bones in any one particular position, but merely link the parts together. The real support or force by which the bones are enabled to function as a framework by being held in definite positions is provided by the muscles which are also fastened to the bones by strings or ligaments. A muscle can pull, hold or release, but cannot push. Hence muscles are mounted in pairs oppositely disposed, one to pull the bone in one direction, the other to reverse the movement of the bone by pulling in the other direction. When a muscle pulls it contracts or shortens, producing a thickening or bulging thereof.

Unlike the motive parts of a machine which wear and weaken with use, a muscle weakens when not use and can be restored to strength and vigor by exercise, provided it has not been unused for too long a period. A large percentage of structural physical defects is due to weakened or undeveloped muscles which are not strong enough to maintain the bones to which they are attached in normal position. The adjacent parts of the body accordingly become misalined and out of balance subjecting the other supporting muscles to undue strain and forcing the vital organs into positions into which it is difficult for them to function in a normal manner. A general weakening of the entire system often results.

The ability of a muscle to rebuild itself by exercise is completely ignored when a jacket or harness is used to provide an artificial and external support for the body. Such a device is effective in forcing the misplaced bones back to normal position but since it operates as a substitute for muscles, the muscles themselves are left without function and deprived of movement and exercise. Hence they become further weakened or entirely useless if the device is kept on for an extended period. The effect of such a device is accordingly more likely to be an aggravation than an alleviation of the trouble and when the device is removed the patient is usually worse off than before. While manipulation of the misplaced parts by a skilled operator is not so liable to cause permanent weakening of the muscles it is in the nature of an imposition from without rather than a building from within and the results after long periods of treatment are frequently very disappointing.

The objects of the invention are to correct physical defects by producing an equality of action of the structural muscles of the body which will bring the weights of the body back to central or symmetrical support, to attain this equality of action by guiding the patient in intelligent development of weak muscles by using them, to enable the patient to perform corrective exercises by himself without the constant supervision of a skilled attendant, to guide the patient in

the corrective movements of his body by the provision of differential contact pressures at selected points, to make provision for the readjustment from time to time of apparatus for applying differential pressure, to provide reference devices whereby the amount of correction of defects may be noted and measured and whereby normal posture of the body may be indicated, and to provide apparatus whereby the above objects may be attained which shall be simple and easy to operate and which may be manufactured and sold at a reasonable price.

The nervous system of the human body is so constituted as to render the surface of the body sensitive to pressure. This characteristic of the nervous system is made use of by this invention to inform the patient both as to what physical movements should be made and when the desired movement has been carried to the proper extent. While certain portions of the body, such as the back, are less sensitive than other portions due to the relative paucity of nerve cells, a high degree of accurate differentiation of pressure sensation is not essential to the successful utilization of the invention.

In its broader aspect the invention comprises the method of correcting orthopedic deformities characterized by applying physical pressure differential in character to selected parts of the body and so localizing the inferior pressure that muscular effort to equalize the pressure differential tends also to correct the deformity. In order effectively to confine the movements to the muscles which require to be strengthened, various parts of the body adjacent the deformity are fixed in normal position. The invention further provides apparatus for practicing the above method consisting of a frame adapted to receive or be attached to a human body and provided with a series of adjustable contact and pressure members. The contact members may be adjusted to fix the position of the body relative to the frame, and may also serve to indicate the normal contour of parts of the body, such as the curve of the spine, etc. Hence they fix planes of reference and points of reference for adjusting the pressure members.

For the purpose of illustrating the invention concrete embodiments of typical apparatus for practicing the herein disclosed method are shown, in which,—

Fig. 1 is a side elevational view;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1;

Fig. 3 is a front elevational view;

Fig. 4 is a rear elevational view of the lower portion of the apparatus;

Fig. 5 is an enlarged section on the line 5—5 of Fig. 1;

Fig. 6 is a section on the line 6—6 of Fig. 2;

Figs. 7, 8, 9, 10 and 11 are plan views of different forms of contact and pressure members;

Figs. 12 and 13 are respectively a section through and a front elevation of a modified form of tip;

Figs. 14, 15 and 16 are diagrammatical views illustrating the use of the apparatus;

The embodiment of the invention shown for the purpose of illustration consists of a frame having a base 20, a support or block 21, spaced in relation to base 20 by means of angularly disposed connecting members or legs, four in number, comprising member 22 at the front and members 23, 24 and 25 at the rear. The leg 22 is notched upon its forward edge as indicated at 26 and has an elongated slot 27 on its broad face disposed in parallelism with the axis thereof. Leg 24 has a similar slot 28. Mounted for adjustment upon legs 22 and 24 is a foot rest 29 having a deep groove 30 at the rear in which leg 22 is received, the portion of the rest 29 adjacent the inner end of the groove cooperating with notches 26 on leg 22. Attached to the under side of rest 29 and extending rearwardly therefrom are parallelly disposed members 31 receiving therebetween leg 24 and provided with a longitudinally disposed alined slot 32. The forward portion of members 31 have alined openings receiving a clamping bolt 33 which extends through slot 27 and is provided on its free end with a wing nut 34 for clamping members 31 against leg 22. A similar clamping bolt 33 is also provided with a wing nut 34 to clamp the rearward ends of members 31 upon leg 24 by extending through slots 28 and 32.

Block 21 is provided near its forward end with a cross piece 35 extending beyond the sides of the block as indicated in Figs. 3 and 4. This cross piece supports a saddle seat 36 in two parts, one part being disposed on each side of block 21. These parts as indicated in Fig. 6 comprise a plate 37 grooved or recessed as indicated at 38 to receive cross piece 35. Eccentrically disposed on plate 37 which may be of irregular shape as indicated in Fig. 2 is a thick disk 39 of relatively hard material such as wood, slightly concave upon its upper surface as indicated at 40. Through a centrally disposed opening 41 in the disk extends a clamping bolt 33 which is received in the slot 42 in cross piece 35 whereby the parts of saddle seat 36 may be adjustably positioned longitudinally of the cross piece. The upper surface of plate 37, surrounding disk 39 is provided with a cushion 43 having a cover of leather or other suitable material.

The rear portion of the block 21 is slotted to receive therein a post or upright 45 perpendicularly disposed in relation to the plane of the upper surface of the block and

rigidly held in place by bolts 46. This upright as shown in section in Fig. 2 has crossed longitudinal slots 47 and 48 continuous from a point near block 21 and terminating near the top of the upright. Mounted upon upright 45 is a series of contacting and pressure members each having an adjusting portion 50 which has a longitudinal slot 51. These adjusting portions are adapted to be received in slot 48 and are held in any desired position longitudinally as well as transversely of the upright 45 by the provision of clamping bolts 33 which are in all respects similar to the clamping bolts theretofore mentioned. Washers 52 are preferably provided adjacent the heads of the bolts 33 and adjacent the wing nuts 34 as indicated in Fig. 5 to prevent undue wear on the contacted portions of the frame. Different forms of contacting and pressure devices adapted to be used upon upright 45 are shown in plan in Figs. 7, 8, 9, 10 and 11 and will not be described in detail.

Each of these devices as previously indicated has a portion 50 for adjusting the device in two dimensions upon the upright. Contacting devices 55 of which two are shown in Fig. 1 and one in large scale in Fig. 7 are adapted to contact the hips and shoulders respectively of a human body supported on saddle seats 36. These devices comprise a cross piece 56 attached to adjusting portion 50 and having elongated slots through which clamping bolts 57 pass. Bolts 57 are longer than the previously described clamping bolts 33 and have their heads fast in members 58 substantially triangular in form and having a forwardly disposed curved surface 59 for fitting the contour of the body. By reason of the greater length of bolts 57 wedge members 60 may be inserted when desired between members 58 and cross piece 56 to provide adjustment in a third dimension in case deformity in these portions of the body is to be treated.

To contact the spine between the hips and the shoulders devices 61 comprising blocks having slightly convex outer faces as shown in Fig. 9 are provided. Contacting member 62 consists of a block having a slightly concave surface adapted to fit the neck of the person seated on the frame and is shown in plan in Fig. 10.

In Fig. 11 is shown contacting member 63 for receiving the head of the person seated on the frame. This member in combination with its supporting portion 50 is substantially Y-shaped.

The contacting members heretofore described are particularly devised for fixing the position and posture of the body received upon the frame or for indicating the normal contour thereof. For the purpose of correcting deformities other devices particularly adapted for applying pressure at localized points are provided. The members for applying pressure directly to the vertebræ making up the spine are indicated by the reference character 65 and shown in plan in Fig. 5. These members are provided with a tip 66 in the form of a ball, preferably of resilient material such as soft rubber. For applying differential pressure to opposite sides of the body in the same horizontal plane, devices 67 are provided, shown in plan in Fig. 8 and consisting of a cross piece 68 attached to adjusting portion 50 and slotted in two mutually perpendicular planes in the manner in which upright 45 is slotted to adjustably receive thereon members 69 also provided with soft rubber tips 66. Members 69 are received in the horizontal slots in members 68 and have axial slots in a vertical plane through which clamping bolts 33 extend for clamping the members in adjusted position. This arrangement permits the individual adjustment of members 69 in two dimensions and the adjustment of contacting devices 67 as a whole in a third dimension. As many of the above devices as are necessary or desirable may be mounted upon the upright 45. In Figs. 1 and 3 two devices 67 are shown and two devices 65. In case the portions of the body adjacent a deformity which is to be corrected are particularly sensitive to pressure a different form of contacting tip is used on members 65 and 69 instead of the ball 66 which applies the pressure to a very restricted portion. A preferred form of tip for such use is shown in Figs. 12 and 13 and comprises a hollow cup or semicircular disk 70 of resilient material such as soft rubber. When such a tip is in use the edge of the cup readily yields and forms an air cushion by trapping air within the cup, thus distributing the pressure over a considerable area.

A method of using the apparatus will now be explained and then reference will be had to the diagrammatical views. In placing a patient upon the apparatus the parts of saddle seat 36 are first adjusted so that the ischia bones are received within the concavities of the disks 39 to fix the position of the lower part of the body. The foot rest 29 is next adjusted so that the patient can sit with comfort upon the apparatus. Contact members 58 are next adjusted to contact the body in the region of the hips. By using a band, belt or strap attached to or passing around the upright 45 and then around the body in the vicinity of the hips the lower portion of the body of the patient may be still more securely fixed in position. The shoulder contacting members 58 are next properly positioned and thereafter the member 61 at intervals along

the spine, then the neck piece 62 and head piece 63. The contour of the bony support of the body is now indicated by the various contacting devices. If these devices are clamped in position to indicate the normal contour before the patient is seated on the apparatus a plane of reference and points of reference are provided for purposes of comparison.

In case of an anterior curvature of the spine the use of the apparatus is indicated in Fig. 14 in which the position of the post or upright 45 is indicated by a vertical line and the position of block 21 by another line at right angles thereto. The curve of the patient's back is indicated in full lines and the normal curve of the back where it departs from the curve of the back of the patient is indicated by a dotted line. The contact devices heretofore described are now so adjusted that strong pressure is applied at the points indicated by H which correspond to the region of the hips or lower lumbar spine, and to the region of the shoulders. In the central portion of the back where the curve of the back departs from the normal curve in an outward direction the contact devices are so adjusted as to apply an extremely light or a barely perceptible touching pressure. The patient is now encouraged, while holding the body against the contact members at the points H, to equalize the pressure between the parts of light pressure indicated at L and of heavy pressure indicated at H. In order to do this the patient will find it necessary to contract the structural muscles in the region of light pressure. This will pull the spine at the points of light pressure inwardly against the contact members. By using the device frequently without changing the adjustment of the contacting devices the weakened muscles which have permitted the central portion of the spine to be misplaced will be exercised and strengthened. Contacting members along the curve of deformity will be readjusted from time to time as the muscles become stronger and the deformity diminishes until the curve of the patient's back becomes normal.

For the purpose of graphically illustrating the pressure curve in a case of this kind ordinates of pressure may be measured from line 45 as an axis. Any arbitrary standard of measurement may be used but in this instance, lightness or delicacy of pressure is the standard. Hence the crest of the curve is opposite the regions of light pressure marked L. The pressure curve so constructed is indicated by dash line x and is in all respects both quantitatively and in aspect similar to the curve of deformity.

Fig. 15 illustrates a case in which the curvature is both anterior and posterior, similar indicia being used to indicate the relative position of the parts, 45 representing the upright, 21 the supporting block, a full line the curve of the body, a dotted line the departure of the normal curve of the body from the curve of deformity. The points of high pressure are near the center of the patient's back along the line of the posterior curvature with normal pressure near the hips, normal pressure being intermediate between high pressure and light pressure, light pressure is applied to the upper portion of the body near the anterior curvature indicated by L. The pressure curve made out with the same arbitrary standard of the greatest ordinate for the lightest pressure is indicated by y and shown in dash lines. This curve is likewise found to be similar quantitatively and in aspect to the curve of deformity.

In Fig. 16 is illustrated the method of using the device for correcting a compound lateral curvature, the normal plane of the spine being indicated by a dotted line, the curve of the spinal deformation by a heavy black line. The plane of reference along the line of the normal plane of the spine will be established on the apparatus by the use of contact members 58 for the hips and shoulders, contact members 61 and 62 for the spine, and 63 for the head. For the purpose of applying differential pressure to the sides of the body in horizontal planes in the regions of departure of the patient's spine from the normal pressure members 69 are used. In the diagram the areas of strong pressure are marked by an X and indicated by the letter H, the areas of the light pressure by circles indicated by L. As many of the pressure members 69 are used as are deemed necessary to produce the desired sensations of pressure. With the upper and lower portion of the trunk fixed in position, namely, the pelvis by saddle seats 36 and hip contact members 58 with or without a strap extending around the body as heretofore described, and the head, neck and shoulders fixed by other contact members 63, 62 and 58, the patient is encouraged to move his body until he feels an equality of pressures in the areas marked O and X. This sensation of equal pressure in view of the fixed position of the upper and lower parts of the body can take place only by the contraction of structural muscles in the areas of light pressure. The contraction of these muscles which produces a sensation of equal pressure tends to draw the misplaced vertebræ back into their proper location. At the left of Fig. 16 the pressure curves are indicated. Since pressure is applied at both sides of the plane of the spine two pressure curves are produced the ordinates of pressure on the right of the diagram being considered as positive, those on the left as negative. The two pressure curves

thus produced are similar in aspect to each other but substantially the reverse both in quantity and aspect to the curve of deformity.

In the apparatus here shown and above described for the purpose of exemplifying my invention, the base, legs and seat portions are specifically secondary or auxiliary; their function is to determine, or assist in determining, a fixed relation between the body of the person under treatment, and the differential pressure-contact apparatus, which also, in the example here shown, is fixed to and supported by, the framework comprising the seat, legs and base. Whether a patient be treated sitting, standing, or even while walking, the framework which carries the differential pressure contact members is to be, as a whole, fixed in relation to the body of the patient so as to constitute a mechanical standard of reference, in relation to displacements and deformities of corporeal structure which are under treatment for corrections by means of muscular efforts stimulated and guided by the pressure-sensations produced by local adjustments of the contact members of the apparatus.

To attain the best results with the herein disclosed apparatus corrective exercises properly guided by the contact members used as described, should be frequently performed. Hence the best results will be attained by using the apparatus in the home. A skilled physician or operator will first adjust the contact and pressure members to begin the correction of the deformity. The patient may then under the guidance of the device perform the exercises himself without supervision or, if very young, the parents may see that he maintains a proper position on the support when exercising. As the correction of the defect is gradually effected the operator or physician will from time to time change the adjustments until the cure is complete.

I claim:

1. Orthopedic apparatus comprising a frame, means on said frame for supporting a human body, including a saddle seat having two parts individually adjustable, and a series of members adjustably mounted on said frame and adapted to be selectively positioned to indicate the normal contour of the body supported by said frame.

2. Orthopedic apparatus comprising a frame, means on said frame for supporting a human body, including a saddle seat having two parts individually adjustable, and a foot rest adjustably mounted below said seat, and a series of members adjustably mounted on said frame and adapted to be selectively positioned to indicate the normal contour of the body supported by said frame.

3. Orthopedic apparatus comprising a frame for supporting a human body and a series of positioning members, each adjustable in more than one dimension for contacting the body at selected points whereby the position of the body relative to the frame may be fixed.

4. Orthopedic apparatus comprising a frame, a support for a human body on said frame, and a series of members adjustably mounted on said frame for contacting said body at selected points in the same plane whereby said support and said members combine to fix the position of the body relative to the frame.

5. Orthopedic apparatus comprising a frame, a support for a human body on said frame, a series of members adjustably mounted to contact said body at selected points in the same plane, and other members adjustably mounted for contacting the body at selected points not in said plane, certain of said members being adapted to position the body relative to said frame and other of said members being adapted to produce sensations of differential pressure on said body.

6. Orthopedic apparatus having a support for a human body, adjustable members adapted to be placed in position to define the normal curve of the body, and means for producing sensations of differential pressure on the body in the region of an abnormality to guide the patient in the exercise of his muscles to correct said abnormality.

7. Orthopedic apparatus comprising a plurality of positioning points adapted to contact with selected portions of the human body, and a plurality of adjustable pressure members, adapted to make contact with other portions of the body positioned by the positioning points.

8. Orthopedic apparatus comprising a frame and means for aligning it with a human body, contact members mounted on and adjustable with respect to said frame, and adapted to produce perceptible and differentiated pressures on selected regions of the body with relation to which the said frame is aligned.

9. Orthopedic apparatus comprising a frame having a support for a human body adapted to fix the position of the base of the trunk of said body relative to said frame, and a series of members adjustable on said frame, certain of said members having convex faces and others of said members having concave faces adapted to contact said body at selected points to further fix its position.

10. Orthopedic apparatus comprising a frame adapted to be aligned with a human body, a plurality of members adjustably mounted on said frame for contacting said

body at selected points substantially in the plane of the spine thereof, and other members adjustably supported on said frame for contacting said body at selected points spaced from the plane of the spine thereof.

11. Orthopedic apparatus comprising means for fixing the position of a human body and contact members adjustable relative to said means for applying differential pressure to selected points on said body while in fixed position.

12. Orthopedic apparatus comprising a base, a support in spaced relation to said base, members connecting said base and said support, a foot rest mounted for vertical adjustment on said members, a seat on said support, a post vertically disposed on said support, and a plurality of members adjustably mounted on said post for selectively contacting portions of a human body received on said seat.

13. Orthopedic apparatus comprising a base, a support in spaced relation to said base, members connecting said base and said support, a foot rest mounted for vertical adjustment on said members, a seat adjustably mounted on said support, a post vertically disposed on said support, and a plurality of members adjustably mounted on said post for selectively contacting portions of a human body received on said seat.

14. Orthopedic apparatus comprising a base, a support in spaced relation to said base, members connecting said base and said support, a foot rest mounted for vertical adjustment on said members, a saddle seat in two parts mounted on said support, a post vertically disposed on said support, and a plurality of members adjustably mounted on said post for selectively contacting portions of a human body received on said seat.

15. Orthopedic apparatus comprising a base, a support in spaced relation to said base, members connecting said base and said support, a foot rest mounted for vertical adjustment on said members, a saddle seat in two parts mounted on said support, each part being individually adjustable in a horizontal plane, a post vertically disposed on said support, and a plurality of members adjustably mounted on said post for selectively contacting portions of a human body received on said seat.

16. Orthopedic apparatus comprising a base, a support in spaced relation to said base, members connecting said base and said support, a foot rest mounted for vertical adjustment on said members, a seat on said support, a post vertically disposed on said support, said post having a longitudinally disposed slot, a plurality of members having portions extending into said slot for adjustment in at least one dimension, and means for retaining said members in adjusted position, whereby the same may be caused to contact a human body received on said seat at any desired points.

17. Orthopedic apparatus comprising a base, a support in spaced relation to said base, members connecting said base and said support, a foot rest mounted for vertical adjustment on said members, a seat on said support, a post vertically disposed on said support, said post having crossed slots longitudinally disposed therein, a plurality of members having portions extending into one of said slots for adjustment in at least one dimension, and means extending through the other slot for retaining said members in adjusted position, whereby said members may be positioned to contact at any desired points a human body received upon said seat.

18. Orthopedic apparatus comprising a base, angularly disposed legs extending upwardly therefrom, a support in the form of an elongate block fast on the free ends of said legs, a cross piece on said block adjacent one end thereof, an upright fast on the other end thereof, a saddle seat in two parts on said block, each part being individually adjustable toward and from said block, and means on said upright for applying physical pressures differential in intensity to selected portions of a human body supported on said seat.

19. Orthopedic apparatus comprising a frame having means for supporting a human body including a saddle seat in two parts adjustable toward and from each other.

20. Orthopedic apparatus comprising a frame having means for supporting a human body including a saddle seat in two parts individually adjustable toward and from a portion of said frame.

21. Orthopedic apparatus comprising a frame having means for supporting a human body including a saddle seat in two parts, said parts having concavities to receive the ischia bones of a patient.

22. Orthopedic apparatus comprising a frame having means for supporting a human body including a saddle seat in two parts adjustable toward and from each other, said parts having concavities to receive the ischia bones of a patient.

23. Orthopedic apparatus comprising a frame having means for supporting a human body including a saddle seat in two parts adjustable toward and from each other, said parts having concavities eccentrically disposed to receive the ischia bones of a patient.

24. Orthopedic apparatus comprising a frame having means for supporting a human body including a saddle seat in two parts adjustable toward and from each other, each

part having a disk having a concave upper surface to receive the ischium bone of a patient.

25. Orthopedic apparatus comprising a frame having means for supporting a human body including a saddle seat in two parts adjustable toward and from each other, each part comprising a cushion and a thick disk of relatively hard material having a concave upper surface for receiving a centering ischium bone of a patient.

26. Orthopedic apparatus comprising a frame having means for supporting a human body including a saddle seat in two parts, each part having a member with a concave upper surface to receive and center the ischium bone of a patient, and an opening at the base of the concavity for a clamping bolt cooperating with the frame for purposes of adjustment.

27. Orthopedic apparatus comprising a frame having an upright, means for supporting a human body in alignment with said upright, including a seat, and means for fixing the position of the body relative to said upright comprising members having broad contacting surfaces adjustably mounted on said upright and adapted to be positioned to contact said body at the hips, shoulders, and along the curve of the spine.

28. Orthopedic apparatus comprising a frame having an upright, means for supporting a human body in alignment with said upright, a plurality of members adjustably mounted on said upright for fixing the position of the body relative thereto and adapted to be positioned to contact said body at the hips, shoulders and along the spine, and means adjustably mounted upon said upright for applying physical pressure, differential in intensity to selected parts of said body.

29. Orthopedic apparatus comprising a frame having an upright, means for supporting a human body in alignment with said upright, means for fixing the position of the body relative to said upright, and pressure members having resilient tips adjustably mounted on said upright for applying physical pressure, differential in intensity to selected parts of said body.

30. Orthopedic apparatus comprising a frame having an upright, means for supporting a human body in alignment with said upright, means for fixing the position of the body relative to said upright, and pressure members having tips of resilient material, said members being adjustably mounted on said upright for applying physical pressure, differential in intensity, to selected parts of said body.

31. Orthopedic apparatus comprising a frame having an upright, means on said frame for supporting a human body in alignment with said upright, a cross piece adjustable vertically and horizontally of said upright, and spaced blocks adjustably mounted on said cross piece for selectively contacting spaced points of the body in the same horizontal plane.

32. Orthopedic apparatus comprising a frame having an upright, means on said frame for supporting a human body in alignment with said upright, a cross piece adjustable vertically and horizontally of said upright, and spaced blocks adjustably mounted on said cross piece for selectively contacting spaced points of the body in the same horizontal plane, said blocks being substantially triangular in form and having their outer faces slightly concave to substantially fit the contour of the body.

33. Orthopedic apparatus comprising a frame having an upright, means on said frame for supporting a human body in alignment with said upright, a cross piece adjustable vertically and horizontally of said upright, and spaced blocks adjustably mounted on said cross piece for selectively contacting spaced points of the body in the same horizontal plane, the attachment of said blocks to said cross piece being such as to permit the former to be supported in spaced relation to the latter, and wedge pieces adapted to be inserted therebetween to vary the angular relationship of the blocks to the cross piece to fit deformed portions of the body.

34. Orthopedic apparatus comprising a frame having an upright, means on said frame for supporting a human body in alignment with said upright, a cross piece mounted on said upright and having longitudinal slots, members mounted on said cross piece by means of clamping bolts passing through said slots, said members being adjustable longitudinally and transversely of said cross piece to contact selected portions of the body.

35. Orthopedic apparatus comprising a frame having an upright, means on said frame for supporting a human body in alignment with said upright, a cross piece mounted on said upright and having longitudinal slots, a member having a longitudinal slot and received in one of the slots in said cross piece, and a clamping bolt passing through the second slot in the cross piece and the slot in said member whereby said member may be clamped in any desired position in the plane of said cross piece.

36. Orthopedic apparatus comprising a frame having an upright, means on said frame for supporting a human body in alignment with said upright, a cross piece mounted on said upright and having vertically disposed intersecting longitudinal slots, an elongate member having a longitudinal slot and received in one of the slots

in said cross piece, and a clamping bolt passing through the second slot in the cross piece and the slot in said member whereby said member may be clamped in any desired position in the plane of said cross piece.

37. Orthopedic apparatus comprising a frame having an upright, means on said frame for supporting a human body in alignment with said upright, a cross piece mounted on said support and having vertically disposed, intersecting longitudinal slots, elongate members each having a longitudinal slot, received in certain of the slots in said cross piece, and clamping bolts passing through the slots in said members and others of the slots in said cross piece, to clamp said members in any desired position relative to said cross piece.

38. Orthopedic apparatus comprising a frame having an upright, means on said frame for supporting a human body in alignment with said upright, a cross piece mounted on said support and having vertically disposed, intersecting longitudinal slots at each end, elongate members each having a longitudinal slot, received in certain of the slots in said cross piece, and clamping bolts passing through the slots in said members and others of the slots in said cross piece, to clamp said members in any desired position relative to said cross piece, said members having tips of resilient material for contacting said body.

39. Orthopedic apparatus comprising a frame having an upright, means on said frame for supporting a human body in alignment with said upright, a cross piece mounted for adjustment vertically and horizontally of said upright, said cross piece having at each end longitudinal, intersecting slots disposed in horizontal and vertical planes, elongate members each having a longitudinal slot received in the horizontal slots of said cross piece, means extending through the slots in said members and the vertical slots in said cross piece for clamping said members in any desired position relative to said cross piece whereby differential pressures may be applied to said body in a horizontal plane.

40. Orthopedic apparatus comprising a frame having an upright, means on said frame for supporting a human body in alignment with said upright, a cross piece mounted for adjustment vertically and horizontally of said upright, said cross piece having at each end longitudinal, intersecting slots disposed in horizontal and vertical planes, elongate members each having a longitudinal slot received in the horizontal slots of said cross piece, means extending through the slots in said members and the vertical slots on said cross piece for clamping said members in any desired position relative to said cross piece whereby differential pressures may be applied to said body in a horizontal plane, said members having cup-shaped contact tips of soft rubber.

Signed by me at Boston, Massachusetts, this sixteenth day of February, 1922.

MABEL ELSWORTH TODD.