April 19, 1938. O. O. SHAFER 2,114,322

ORTHOPEDIC APPARATUS

Filed Dec. 10, 1935 4 Sheets-Sheet 1

Fig. 1

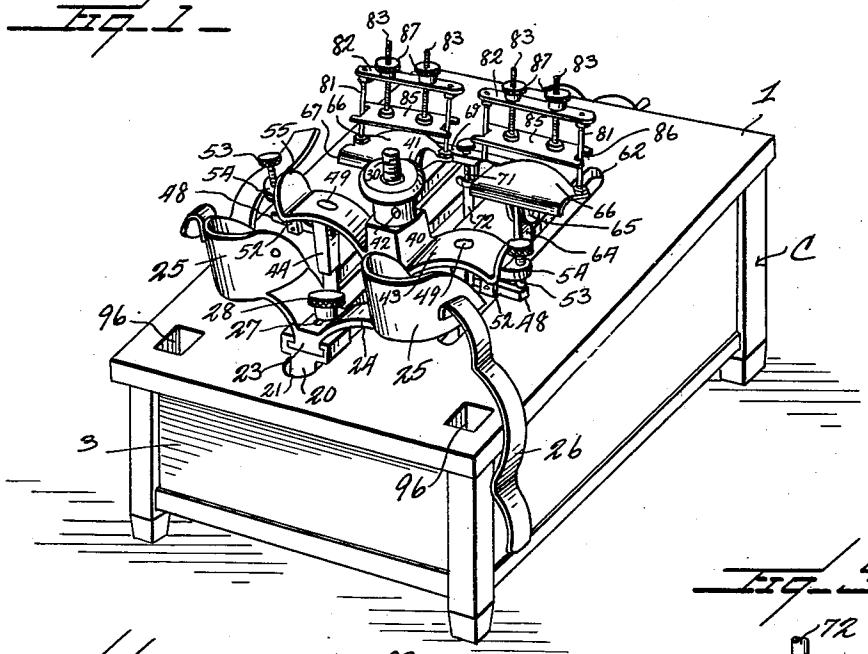


Fig. 3



Fig. 2

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ORTHOPEDIC APPARATUS

Filed Dec. 10, 1935 4 Sheets-Sheet 2

Fig. 4.

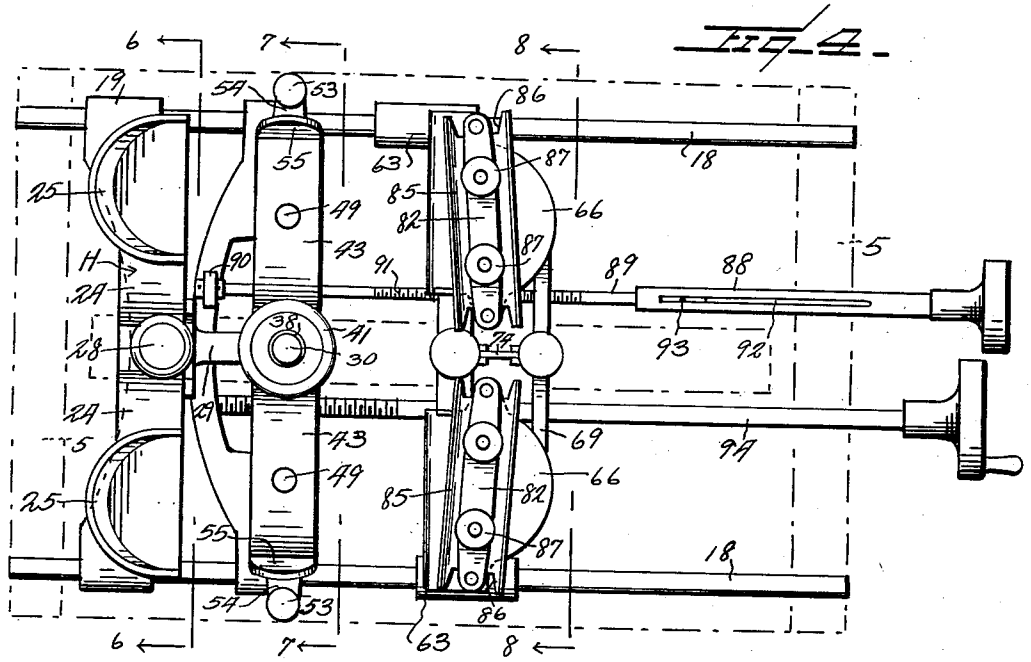
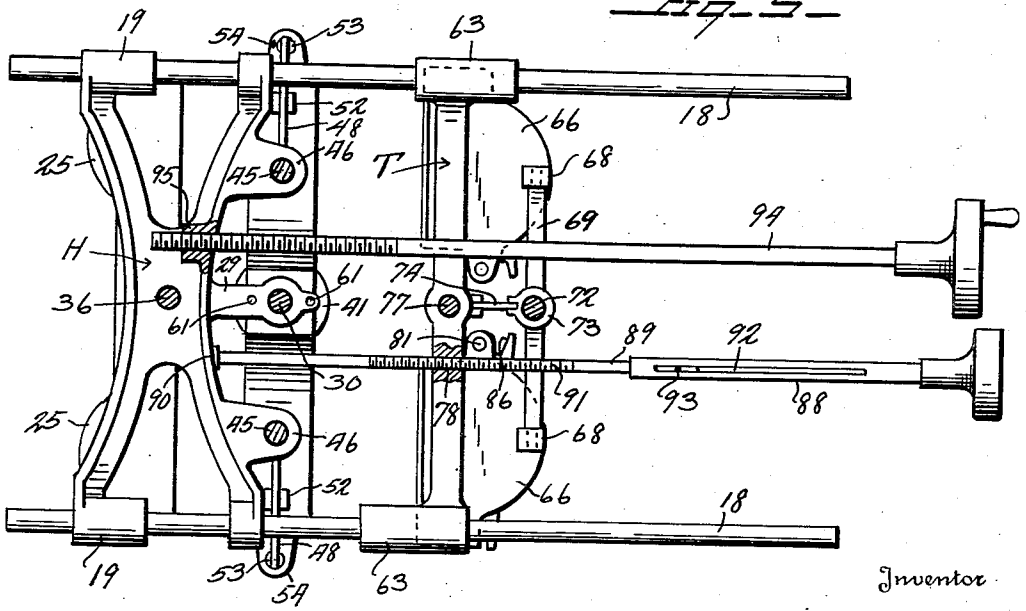


Fig. 5.



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ORTHOPEDIC APPARATUS

Filed Dec. 10, 1935 4 Sheets-Sheet 3

Fig. 10

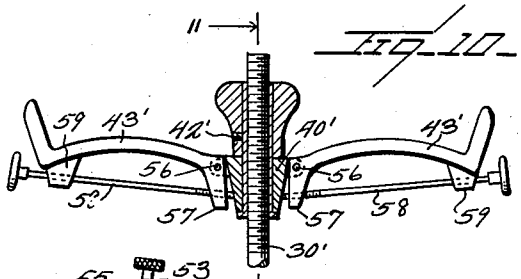


Fig. 7

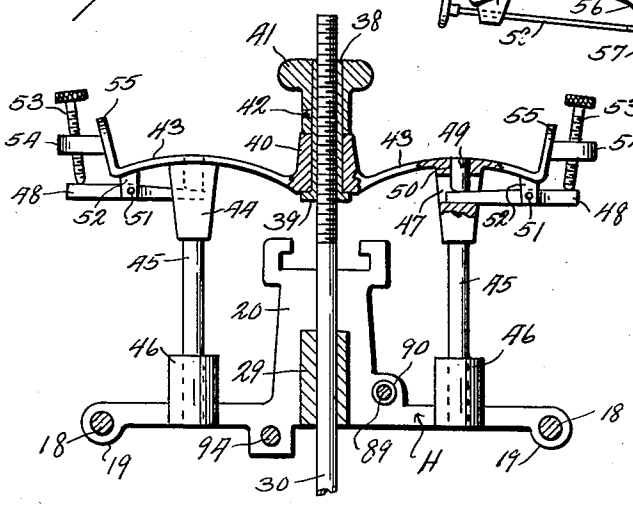


Fig. 9

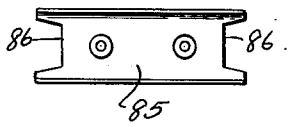


Fig. 8

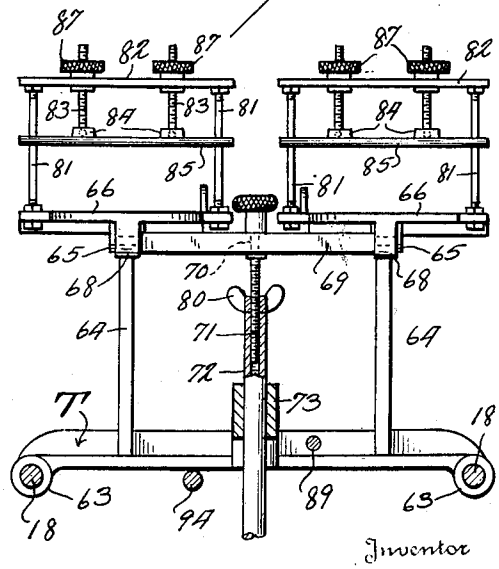


Fig. 6

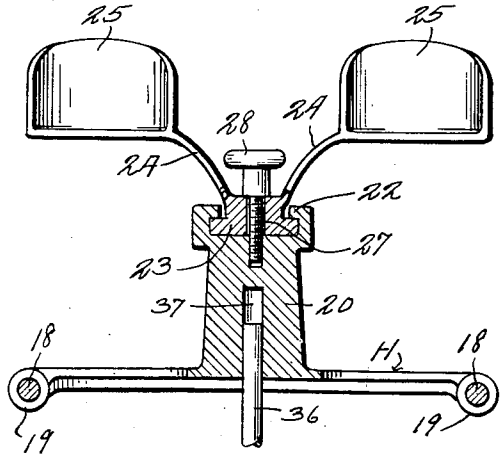
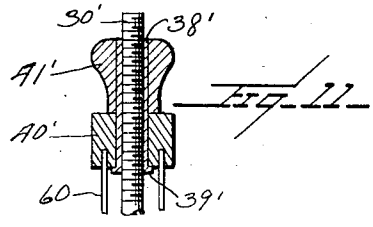


Fig. 11



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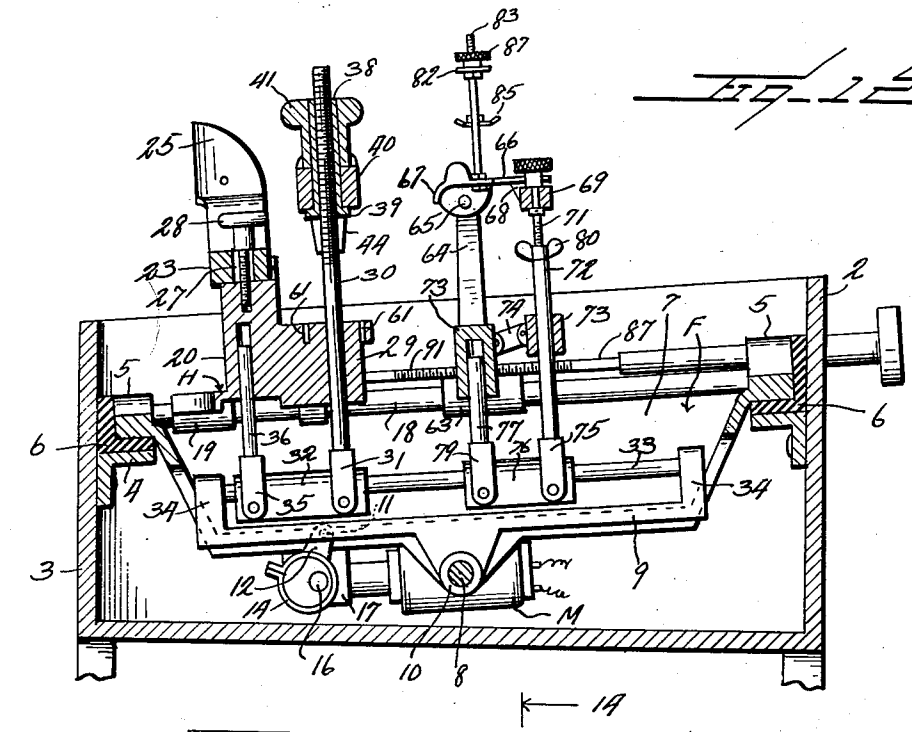
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April 19, 1938. O. O. SHAFER 2,114,322

ORTHOPEDIC APPARATUS

Filed Dec. 10, 1935 4 Sheets-Sheet 4

Fig. 12.



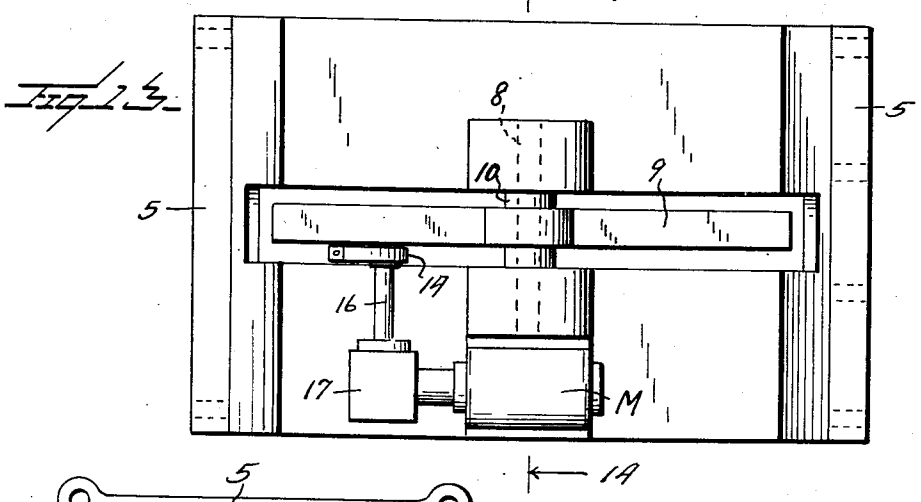


Fig. 13.

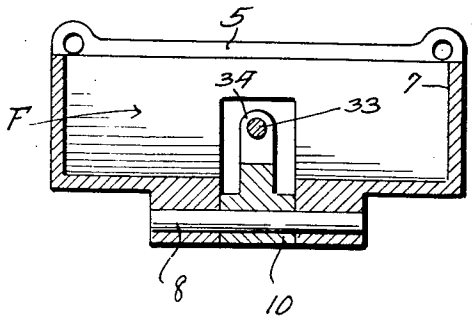


Fig. 14.

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Patented Apr. 19, 1938

2,114,322

UNITED STATES PATENT OFFICE

2,114,322

ORTHOPEDIC APPARATUS

Orlen O. Shafer, Tiffin, Ohio, assignor to Master Arch, Inc., Tiffin, Ohio

Application December 10, 1935, Serial No. 53,800

16 Claims. (Cl. 128—80)

This invention relates to an orthopedic apparatus of an osteal adjusting type, and it is an object of the invention to provide an apparatus of this kind which can be advantageously used to adjust and stretch the muscles and ligaments of the foot to correct such misplacements as may be present in the metatarsal and instep bones of the human foot.

It is already known that the various ligaments of the foot serve to hold the bones in their proper placement and when these ligaments become irritated by overstrain the bones become displaced with a resultant impingement of the nerves which pass through the bones. Another object of the invention is to correct this condition by massaging and stretching.

A further object of the invention is to provide an apparatus of this kind which operates to replace displaced bones of the foot and thereby relieving the pressure on the nerves and restoring free circulation of the blood veins including all the arteries of the foot and its digital branches and at the same time bringing into proper and normal action the muscles, ligaments and veins of the feet and legs, thighs and hips.

It is also an object of the invention to provide a machine for the manipulation of the bones, muscles and tissues of the feet to remove the well known disorders of the feet which result in such diseases as arthritis, rheumatism, neuritis, pains in the sciatic nerves, soreness and stiffness in the legs and thighs, cramps, cold feet, headaches, nervousness, eye strain, backache, lumbago and tired and aching feet.

A further object of the invention is to provide a machine for the manipulation of the foot comprising a plurality of foot contacting members spaced apart for contact with portions of the foot at separate points from heel to toe.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved orthopedic apparatus whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:—

Figure 1 is a view in perspective of an apparatus constructed in accordance with an embodiment of my invention;

Figure 2 is a vertical sectional view taken fore and aft through the device as illustrated in Figure 1 with the top of the cabinet removed and said figure being somewhat enlarged;

Figure 3 is a fragmentary view partly in section and partly in elevation illustrating the connection between one of the posts or standards and a slide block as herein disclosed;

Figure 4 is a view in top plan of the structure as illustrated in Figure 2 with the cabinet removed and the frame for the mechanism diagrammatically indicated by broken lines;

Figure 5 is a view in bottom plan of the structure as illustrated in Figure 4 with portions in section;

Figure 6 is a sectional view taken substantially on the line 6—6 of Figure 4 looking in the direction of the arrows;

Figure 7 is a sectional view taken substantially on the line 7—7 of Figure 4 looking in the direction of the arrows;

Figure 8 is a sectional view taken substantially on the line 8—8 of Figure 4 looking in the direction of the arrows;

Figure 9 is a view in top plan of one of the toe or digit engaging plates unapplied;

Figure 10 is a fragmentary view partly in section and partly in elevation illustrating an arch supporting structure constructed in accordance with a further embodiment of the invention;

Figure 11 is a sectional view taken substantially on the line 11—11 of Figure 10;

Figure 12 is a vertical sectional view with parts in elevation taken through substantially the transverse center of Figure 1;

Figure 13 is a view in bottom plan of the frame as herein comprised showing the motor and the parts directly associated therewith in applied position upon the frame;

Figure 14 is a sectional view taken substantially on the line 14—14 of Figure 13.

As disclosed in the accompanying drawings, C denotes a cabinet of desired dimensions and configuration with the top plate 1 thereof disposed on a predetermined incline from the front downwardly toward the rear. The rear wall 3 and the front or forward wall 2 of the cabinet have suitably affixed to their inner surfaces the brackets 4 which provide a support for the frame F. This frame F is removably insertable within the cabinet C and its front and rear cross members 5 rest from above upon the brackets 4 but there

is preferably interposed between said brackets 4 and members 5 and also between the members 5 and the walls 2 and 3 suitable cushioning elements 6 preferably of rubber to absorb the vibrations incident to the use of the apparatus.

Each of the side members 7 of the frame F constitutes a plate which has its lower marginal portion terminating a material distance below the front and rear members 5. Disposed transversely of the frame F is a rod 8, each end portion of which being operatively supported by the lower marginal portion of a side member or plate 7 of the frame. Extending substantially in parallelism with the side members of the frame and at substantially the transverse center of said frame F is an elongated rigid member 9, the central portion of which having a depending lug 10 through which the rod 8 is freely directed whereby the member 9 is supported for rocking movement. To one side of its lug 10 the member 9 has operatively connected therewith, as at 11, an arm 12 radiating from a strap 14 surrounding an eccentric 15. This eccentric 15 is mounted for rotation with a shaft 16 rotatably carried by the frame F. This shaft 16 is also in driven connection through a reduction gear indicated generally at 17 with a motor M. This motor M is of an electrical type and is also carried by the frame F. This motor M has leading therefrom in a conventional manner the conductors *a* for desired connection with a suitable source of electrical energy.

The end members 5 of the frame F have engaged with the opposite end portions thereof the extremities of the parallel supporting bars 18 which constitute trackways for the heel carriage H and the toe carriage T. The heel carriage H comprises a substantially X-shaped body the extremities of which being provided with the sleeves 19 slidably mounted on the rods or trackways 18. The central portion of the carriage H is provided with an upstanding post 20 of a height to terminate above the applied top plate 1 as is particularly illustrated in Figure 1. This top plate 1 at substantially its transverse center is provided with an elongated slot 21 disposed fore and aft of the cabinet C and through which the post 20 extends. The upper or top face of the post 20 is formed to provide the spaced parallel guideways 22 with which engages a slide 23 positioned between said guideways 22 and resting upon the flat top face or surface of the post 20. The guideways 22 are disposed in a direction to permit the slide 23 to be adjusted in a direction lengthwise of the slot 21 or fore and aft of the cabinet C, and extending upwardly and laterally in opposite directions from the slide 23 are the arms 24.

The outer or upper extremities of these arms 24 carry the heel rests 25 and, as illustrated in Figure 1, each of these rests 25 has associated therewith a strap 26 to be employed in a conventional manner to hold the heels of the feet of the patient securely upon such rests.

The slide 23 has disposed therethrough in a direction parallel to the trackways 22 the slot 27 through which is directed the shank of a clamping member 28, said shank threading within the upper portion of the post 20. This slot 27 permits the slide to have adjustment independently of the post 20 to vary the position of the heel rest 25 as may be desired and, of course, the member 28 serves to hold the slide 23 in its selected adjustment. The central portion of the carriage H is provided with a projecting block 29 disposed in a direction toward the toe carriage and slidably disposed through said block 29 is a vertically directed bar 30. This bar 30 extends down below the block 29 and is provided at its lower extremity with a yoke 31 which straddles an end portion of a slide 32 mounted for movement upon a rod 33 disposed lengthwise of the member 9 and supported in desired spaced relation above the member 9 by direct engagement with the upstanding arms 34 carried by the extremities of the member 9. Therefore, as the member 9 is caused to rock the bar 30 will be reciprocated and, of course, the extent of such reciprocation will depend upon the position of the pivotal connection between the yoke 31 and the slide 32 with respect to the mounting for the member 9.

The slide 32 is also straddled by a second yoke 35, said yoke being pivotally connected with the slide 32. This yoke 35 is carried by an end portion of an upstanding rod 36 which is freely and snugly engaged within an axial bore 37 extending from below up into the post 20. This rod 36 serves as a guiding medium and particularly to assure the maintenance of the rod 33 in its effective working position.

The upper extremity of the rod or bar 30 has threaded thereon an elongated sleeve 38 as is particularly illustrated in Figure 7 of the drawings, and the lower end portion of this sleeve is defined by an outstanding surrounding flange 39. Insertable over the sleeve 38 for contact with the flange 39 is a head 40 which is held in desired position upon the sleeve 38 by an applied knob 41 fixed to the sleeve 38 by a binding screw 42 or otherwise as may be preferred. By rotation of the knob 41 the sleeve may be adjusted lengthwise of the bar 30 and thereby raise or lower the head 40 as the requirements of practice may necessitate. Extending laterally and in opposite directions from the head 40 and preferably the lower portion of such head are the elongated rigid members 43 which are adapted to engage from below the instep portion of a foot. Each of these members 43 is disposed on a special curvature with its outbow upwardly disposed for the correction of all conditions in the anterior arch and the metatarsal arch. The central portion of each of the members 43 has formed therewith and depending therefrom a relatively heavy arm 44 which is continued by an elongated bar 45. This bar 45 is of a length to allow its lower end portion to be snugly and slidably received within a vertically disposed guiding barrel 46 carried by the heel carriage H. These bars 45 serve to hold the members 43 and their heads 40 against turning movement around the sleeve 38 and thus assuring the maintenance of the members 43 in effective position irrespective of any vertical adjustment thereof.

Each of the arms 44 closely adjacent to its member 43 has disposed transversely therethrough an opening 47 and extending within said opening 47 is an end portion of a lever arm 48. This end portion of the arm 48 also underlies and has contact from below with a pin 49 insertable from above within an opening 50 through the central portion of the adjacent member 43 and which opening 50 has communication with the opening 47.

The lever arm 48 is pivotally connected intermediate its ends, as at 51, with a bracket 52 depending from the outer end portion of the associated member 43. The outer extremity of this

lever arm 48 is engaged from above by the lower extremity of a shank 53 threading through a bracket 54 extending outwardly from an upstanding lip 55 at the outer end of the member 43. This pin 49 or plunger as it may also be called, is adapted to be raised upon proper rotation of the shank 53 to exert pressure on the sole of the foot to replace the second and third cuneiform bones of the transverse arch.

Instead of using the pins or plungers 49, the arrangement may be used as illustrated in Figures 10 and 11 of the drawings. In this form the head 40' has hingedly connected thereto, as at 56, the inner end portions of the members 43' disposed lengthwise on the same curvature as hereinbefore explained in connection with the members 43. The inner or pivoted end portions of these members 43' are provided with the depending lugs 57 through which are threaded the inner ends of the rods 58. These rods 58 underlie the members 43' and have their outer end portions freely disposed through the brackets 59 depending from the outer extremities of the members 43'. The inner ends of the rods 58 have direct contact with the head 40' and upon turning of these rods the members 43' will be caused to raise or lower as may be required to obtain the desired action on the foot. This hinge arrangement for the members 43' is of particular advantage as it may be that the feet of a patient are not exactly alike in the bone displacement and, therefore, independent adjustment can be had of the members 43' to permit proper arrangement of the member 43' to suit the foot. This adjustment is to assure the proper pressure on the tibial bone to place it in the proper position and to relieve pressure.

As is illustrated in Figure 11, the head 40' is elongated to extend beyond the flange 39' at the lower end of the sleeve 38' and with which the head 40' contacts. The upper portion of this sleeve 38' has keyed thereto, as at 42', a knob 41' whereby the sleeve 38' may be adjusted lengthwise of the bar 30' as the requirements of practice may demand.

The head 40' at opposite sides of the sleeve 38' and its flange 39' has depending therefrom bars 60 which, when the attachment as illustrated in Figure 10 is used, are snugly and slidably received in the pockets or recesses 61 provided in the upper or top flat face of the block 29. These bars 60 serve to hold the head 40' against rotation while the depth of the pockets or recesses 61 is such as to permit unhampered adjustment of the sleeve within reasonable extent lengthwise of the bar 30'.

As is illustrated in Figure 1, the members 43 or 43' and their associated parts are positioned above the top or cover 1 of the cabinet C with, of course, the bar 30 extending up through the slot 21.

The top plate 1 at opposite sides of the slot 21 is also provided with the supplemental slots 62 substantially parallel with the slot 21 and which slots 62 allow for the entrance of the rods 45 into the cabinet C.

The toe carriage T at its extremities is also provided with the barrels 63 through which the rods or trackways 18 are freely and snugly directed whereby the carriage T may have endwise movement along said rods or trackways 18.

Extending upwardly from the carriage T are the parallel posts 64 which pass up through the slots 62 and the upper end portion of each of these posts 64 is pivotally connected, as at 65, with the forward marginal portion of a bottom toe clamping plate 66, said forward marginal portion 67 of which being disposed on a downward curvature to eliminate injury to the toes. Each of these plates 66 extends a desired distance toward the high end of the cover plate 1 and depending from said end portions of the plates 66 at substantially the transverse centers thereof are the lugs 68. Bridging the space between these lugs 68 is a bar 69, the extremities of which being reduced and rotatably engaged within the lugs 68. The central portion of the bar 69 has disposed therethrough and in swivelled connection therewith, as at 70, a shank 71 extending a considerable distance below the bar 69. This lower portion of the bar 69 threads within the upper portion of a rod 72 which is freely disposed through a holding collar 73. This collar 73 has pivotally connected thereto a rigid link 74 which is also in pivotal connection with the carriage T as is more particularly illustrated in Figure 5 of the drawings.

The lower portion of the rod 72 carries a yoke 75 which straddles a slide 76 movably mounted on the rod 33 carried by the rock member 9.

The rod 72 passes through the slot 21 of the top plate 1 of the cabinet C and also passing through said slot 21 is a rod 77 freely and snugly entering from below an opening 78 provided in the central portion of the carriage T. This rod 77 carries at its lower end a yoke 79 which straddles and is pivotally connected with the slide 76. This rod 77 serves to assure the desired maintenance of the slide 76 and the carriage T in assembled relation.

Threading upon the shank 71 is a lock nut 80 contacting with the upper end of the rod 72 and which nut is herein disclosed as of a wing type. The nut 80 serves as a convenient medium for locking the shank 71 in its various endwise adjustment in accordance with the desired or selective inclination of the associated toe clamping plate 65.

Extending upwardly from each of the plates 65 at the opposite ends thereof are the posts 81, the upper end extremities of which being connected by a rigid head strip 82. Freely extending through the head strip 82 are a pair of vertically disposed threaded shanks 83. The lower extremities of these shanks 83 are in swivelled connection, as at 84, with a top toe clamping plate 85. Each of these plates 85 is interposed between a pair of posts 81 with the end portions of the plate cut out, as at 86, to receive said posts 81. By this means the plate 85 is effectively maintained in desired position for movement toward or from the lower plate 66.

A member or nut 87 is threaded on each of the shanks 83 in swivelled connection with the head strip 82 whereupon upon desired rotation of said member or nut 87 the shank 83 may be raised or lowered in accordance with the desired adjustment of the plate 85 with respect to the associated plate 66.

Extending through the side wall of the cabinet C at the high end thereof is an elongated tubular operating member 88 which telescopically receives an elongated rod 89. The outer end of this rod 89 is in swivelled connection, as at 90, with the carriage H while the intermediate portion 91 of the rod 89 threads through the carriage T. The wall of the member 88 as herein disclosed has an elongated slot 92 which receives a pin 93 carried by the end portion of the rod 89 within the member 88. By this means

the members 88 and 89 are keyed for unitary rotation but permitting the rod 89 to have endwise movement independently of the member 88. The member 88 is rotatably held by the wall of the cabinet C through which it passes so that upon rotation of the member 88 with the resultant rotation of the member 89 the carriage T may be caused to slide along the rods or trackways 18 independently of the carriage H whereby a selective adjustment of the carriage T may be effected in accordance with the necessities of practice. The threading of the intermediate portion 91 of the rod 89 through the carriage T together with the swivelled connection 90 between the rod 89 and the carriage H permits unitary movement of both the carriages H and T along the rods or trackways 18 in the same direction. As herein disclosed this unitary movement is effected by an elongated rod 94 also disposed through and rotatably held by the side wall of the cabinet C at the high end thereof. This rod 94 is of a length to permit a portion 95 thereof to be threaded through the carriage H as is particularly illustrated in Figure 5 of the drawings.

As illustrated in Figure 1, the low end of the cover plate 1 at opposite sides thereof is provided with the sockets 96 to receive the lower portions of the front legs of a chair whereby it will be assured that the patient to be treated will be properly seated to assure effective action of the apparatus upon the feet of the patient.

The patient places the heel portions of his feet within the supports 25 with the members 43 or 43' properly positioned below the arches of the feet and, of course, with the toes of the feet clamped between the plates 66 and 85. The various adjustments hereinbefore referred to allow the operator to adjust these various parts in accordance with the individual patient. The members 43 or 43' and the toe clamping plates 65 and 85 are vertically reciprocated or vibrated upon operation of the motor M. The relative movement of such members 43 or 43' and toe clamping plates 65 and 86 is changeable or adjustable so that at one time by the conjoining action of the members 43 or 43' and the clamping plates 65 and 85 there may be flexible bending of the foot in opposite directions from the heel to the toes or, if desired, the means for vibrating or reciprocating the members 43 or 43' may be made ineffective so that action will be had only on the toes of the patient. The action of the plates 43 or 43' is to set in normal or natural positions all of the twenty-six bones of the foot from heel to toe that may be displaced and thus restoring natural arch. These members 43 or 43' will deliver to the patient an adjustment from one ounce to five hundred pounds without the slightest injury or discomfort. An important result of this action upon the feet is that the tibial nerve (which runs from the feet to the spinal column) which may be impinged upon by the bones between which it passes is freed from pressure and the well known disadvantages of such pressure obviated.

The toe clamping plates 65 and 85 grip all of the toes from the great toe to the little toe so that the up and down motion of the toes with the instep resting on the plates 43 or 43' breaks up callouses on the ball of the foot, or the metatarsal, and forces the cartilage back into normal position in the metatarsal and thus free the foot from callouses. Such action of the toes also breaks up adhesions in the muscles at the top of the foot which sometimes cause the toes to turn upward.

From the foregoing description it is thought to be obvious that an orthopedic apparatus constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice except as hereinafter claimed.

I claim:—

1. An orthopedic apparatus comprising a plurality of foot engaging members, means for supporting said members in position to engage the foot at spaced points from heel to toe, means for vertically reciprocating certain of said members for flexing the foot, means for bodily shifting all of said members in unison along the supporting means therefor, and means for independently shifting certain of the members with respect to the remainder.

2. An orthopedic apparatus comprising a frame, a supporting structure therefor, trackways carried by the frame, a carriage slidably supported by the trackways, a heel rest arranged on said carriage, a rigid member supported by the carriage for vertical reciprocation, said member being of a length to extend across the foot in contact with the sole at the instep portion of the foot, said member being curved from substantially one end to the other with its outbow upwardly directed, and means for reciprocating said member.

3. An orthopedic apparatus comprising a frame, a supporting structure therefor, trackways carried by the frame, a carriage slidably supported by the trackways, a heel rest arranged on said carriage, a rigid member supported by the carriage for vertical reciprocation, said member being of a length to extend across the foot in contact with the sole at the instep portion of the foot, said member being curved from substantially one end to the other with its outbow upwardly directed, means for reciprocating said member, and means arranged at the central portion of the rigid member for imposing pressure on the sole of the foot.

4. An orthopedic apparatus comprising a frame, a supporting structure therefor, trackways carried by the frame, a carriage slidably supported by the trackways, a heel rest arranged on said carriage, a rigid member supported by the carriage for vertical reciprocation, said member being of a length to extend across the foot in contact with the sole at the instep portion of the foot, said member being curved from substantially one end to the other with its outbow upwardly directed, means for reciprocating said members, a pin freely disposed from below through the rigid member for contact with the sole of the foot, and means for forcing the pin upwardly to exert pressure on the foot.

5. An orthopedic apparatus comprising a frame, a supporting structure therefor, trackways carried by the frame, a carriage slidably supported by the trackways, a heel rest arranged on said carriage, a rigid member supported by the carriage for vertical reciprocation, said member being of a length to extend across the foot in

contact with the sole at the instep portion of the foot, said member being curved from substantially one end to the other with its outbow upwardly directed, means for reciprocating said member, said rigid member being supported for vertical swinging movement, and means for swinging said member to a selected point about its pivot.

6. An orthopedic apparatus comprising a frame, a supporting structure therefor, trackways carried by the frame, a carriage slidably supported by the trackways, a heel rest arranged on said carriage, a rigid member supported by the carriage for vertical reciprocation, said member being of a length to extend across the foot in contact with the sole at the instep portion of the foot, said member being curved substantially from one end to the other with its outbow upwardly directed, means for reciprocating said member, and means for vertically adjusting said rigid member independently of its reciprocatory movement.

7. An orthopedic apparatus comprising, in combination, a trackway, a carriage slidably supported by the trackway, a heel rest mounted upon the carriage, a vertically disposed rod movable with the carriage and slidably disposed through the carriage, means for reciprocating the rod, and foot engaging means carried by the rod above the carriage and in advance of the heel rest.

8. An orthopedic apparatus comprising, in combination, a trackway, a carriage slidably supported by the trackway, a heel rest mounted upon the carriage, a vertically disposed rod slidably engaged with the carriage, means for reciprocating the rod, foot engaging means carried by the rod, a second carriage slidably supported by the trackway, a vertically disposed rod slidably engaged with the second carriage, toe clamping means carried by said last named rod, and means for reciprocating said last named rod.

9. An orthopedic apparatus comprising, in combination, a trackway, a carriage slidably supported by the trackway, a heel rest mounted upon the carriage, a vertically disposed rod slidably engaged with the carriage, means for reciprocating the rod, foot engaging means carried by the rod, a second carriage slidably supported by the trackway, a vertically disposed rod slidably engaged with the second carriage, toe clamping means carried by said last named rod, means for reciprocating said last named rod, means for moving both of the carriages in unison along the trackway, and means for moving one of the carriages along the trackway independently of the other carriage.

10. An orthopedic apparatus comprising, in combination, a trackway, a carriage slidably supported by the trackway, a heel rest mounted upon the carriage, a vertically disposed rod slidably engaged with the carriage, means for reciprocating the rod, foot engaging means carried by the rod, a second carriage slidably supported by the trackway, a vertically disposed rod slidably engaged with the second carriage, toe clamping means carried by said last named rod, means for reciprocating said last named rod, said toe clamping means being supported independently of its rod for rocking movement.

11. An orthopedic apparatus comprising, in combination, a trackway, a carriage slidably supported by the trackway, a heel rest mounted upon the carriage, a vertically disposed rod slidably engaged with the carriage, means for reciprocating the rod, foot engaging means carried by the rod, a second carriage slidably supported by the trackway, a vertically disposed rod slidably engaged with the second carriage, toe clamping means carried by said last named rod, means for reciprocating said last named rod, said toe clamping means being supported independently of its rod for rocking movement, and means for swingingly adjusting the toe clamping means with respect to its operating rod.

12. An orthopedic apparatus comprising a member of a length to extend across the foot in contact with the sole at the instep portion of the foot, said member being curved from substantially one end to the other with its outbow disposed in a direction for direct engagement with the sole of the foot, means for supporting said member for reciprocation, means for reciprocating the member, and means carried by the member for imposing at a selected location pressure on the sole of the foot independently of the action of the member.

13. An orthopedic apparatus comprising a member of a length to extend across a foot for contact with the sole at the instep portion of the foot, a supporting means for said member, and means arranged at the central portion of said member constructed and arranged for operation independently of the member for imposing pressure on the sole of the foot.

14. An orthopedic apparatus comprising a member of a length to extend across a foot for contact with the sole at the instep portion of the foot, a supporting means for said member, a pin carried by the member for contact with the sole of the foot, and means for forcing the pin to exert pressure on the foot.

15. An orthopedic apparatus comprising, in combination, a carriage, supporting means for said carriage, a heel rest mounted upon the carriage, means for engaging the sole of a foot at the instep portion thereof constructed and mounted for reciprocating movement, and toe clamping means constructed and mounted for oscillation, and means for oscillating the toe clamping means.

16. An orthopedic apparatus comprising, in combination, a carriage, supporting means for said carriage, a heel rest mounted upon the carriage, means for engaging the sole of a foot at the instep portion thereof constructed and mounted for reciprocating movement, toe clamping means constructed and mounted for oscillation, and means common to the sole engaging means and the toe clamping means for reciprocating the former and oscillating the latter.

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