April 21, 1931. H. A. GARTNER 1,801,769

FOOT EXERCISER

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FIG. I.

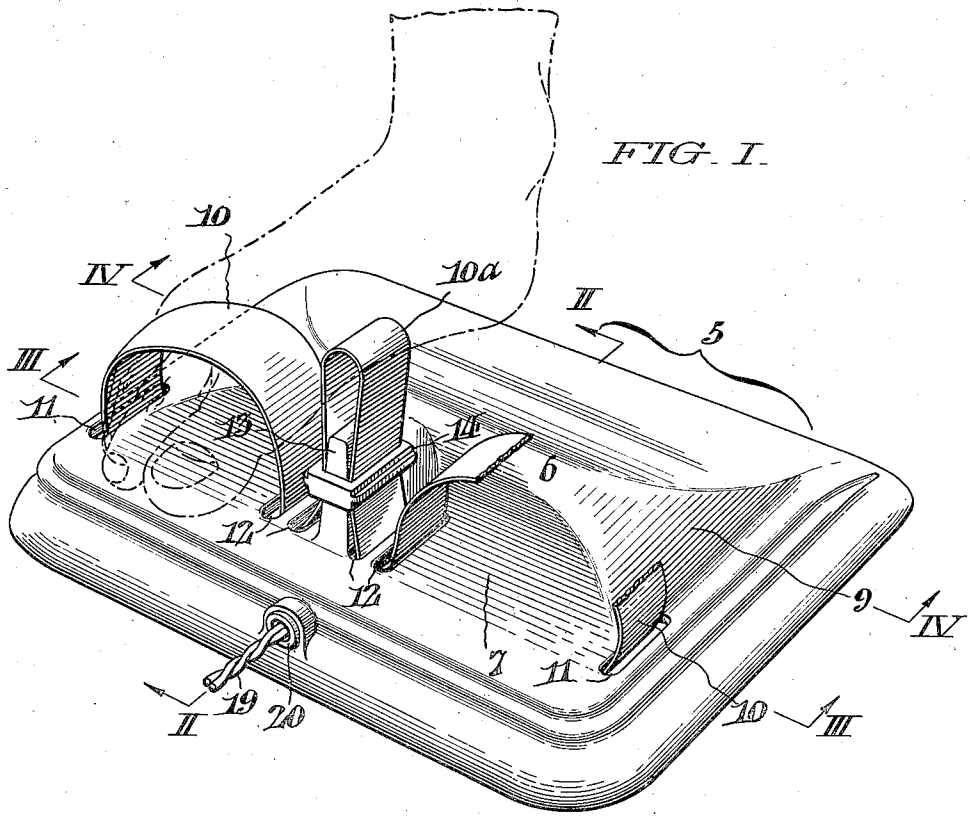
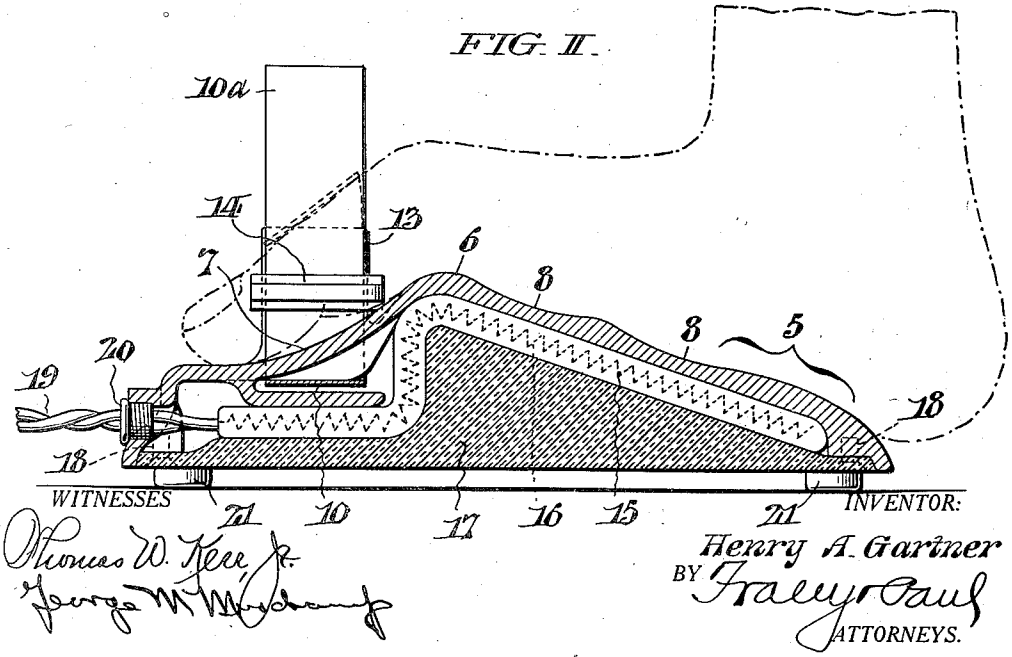


FIG. II.



WITNESSES

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FIG. III.

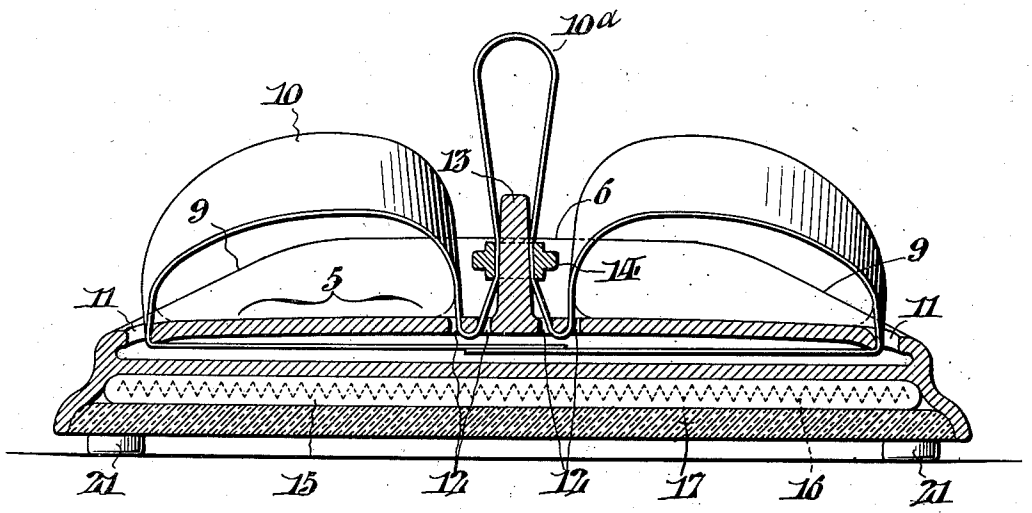
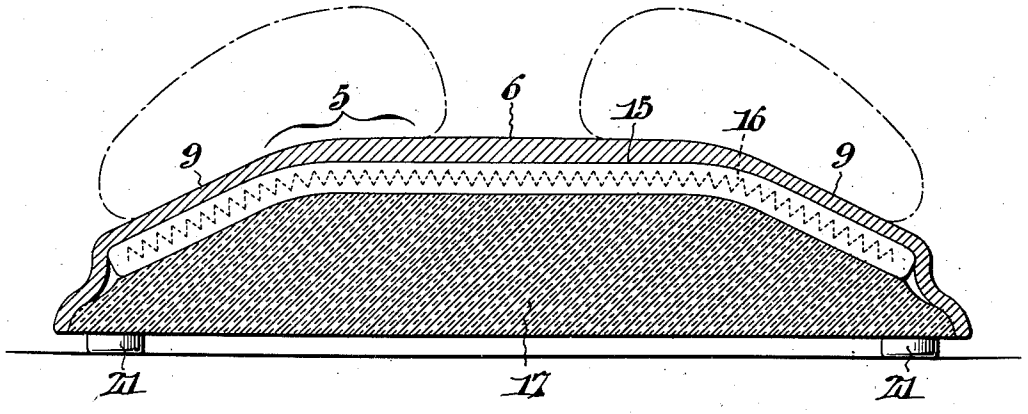


FIG. IV.



WITNESSES

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UNITED STATES PATENT OFFICE

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FOOT EXERCISER

Application filed May 4, 1929. Serial No. 360,556.

This invention relates to devices useful in connection with therapeutic treatment of foot ailments.

My invention is concerned with the correction of deformities such as fallen or weakened arches, with strengthening and restoring strained and enfeebled voluntary and involuntary muscles of the feet and legs, etc., incident to the performance of certain exercises; and its object is to provide a simple and inexpensive device useful in promoting the curative effects of such exercises.

In the drawings Fig. I is a perspective view of my improved foot exerciser.

Fig. II is a longitudinal sectional view of the device taken as indicated by the arrows II—II in Fig. I; and,

Figs. III and IV are transverse sections taken respectively as indicated by the arrows III—III and IV—IV in Fig. I.

As herein depicted, the exerciser has the form of a hollow rectangular plate 5 which may be cast from metal or molded from a suitable composition, as found most convenient or expedient in practice. The top surface of the plate 5 it will be noted, is counter conformative to the contour of the foot soles, that is to say; it is characterized by a rounded transverse ridge or hump 6 which rises rather abruptly, through a mergent reverse curvature as at 7 in Fig. II, from the forward edge of the plate 5, and recedes toward the rear at a more gradual and easy slope which is interrupted by slight undulations at 8, 8, the recession toward the side edges of the plate being likewise at a comparatively easy slope as seen to the best advantage at 9, 9 in Fig. IV.

During performance of certain exercises such as fully explained hereinafter, it is desirable that the toes of the feet be firmly held down. To this end I provide the exerciser with a strap 10 which is continuously threaded through suitably allocated slots 11, 12 in the top of the plate 5, respectively at the sides and middle adjacent the front edge, the ends of the strap being joined by sewing or otherwise within the hollow of the plate as indicated in Fig. III. In securing the toes, the excess length of the strap 10 is gathered into the form of a loop 10*a* around a wedge post 13 upstanding centrally from the plate 5 intermediate the slots 12, 12, and made fast by a clip 14 which is adapted to engage over the top of said post with the sides of the loop clamped between.

To adapt the exerciser for treatments where the application of heat is beneficial, I place within its hollow an electric heating element 15 which may embody a resistance coil or coils 16 embedded in suitable insulation, as conventionally shown in Figs. II–IV. This heating element 15 is held in place by a removable bottom plate of thermal insulation 17 fastened by suitable securing means such as screws 18. The leads 19 from the coils 16 of the heating element 15 are brought out through a bushing 20 centrally of the front edge of the plate 5.

The device is also equipped with feet 21 of rubber or the like to prevent slippage incidental to use.

For exercise and development of the foot and leg muscles, the exerciser is used as follows: with the subject either sitting or standing and heels elevated, the toes of the feet are secured by means of the strap 10 provided for the purpose. This preparatory step being made, the voluntary toe muscles are moved so that the toes "grip" downward on the exerciser, and the heels are thereupon gradually lowered while pressure or weight is thrown to the outside of the feet and the latter concurrently twisted or rolled inward toward each other by ankle motion. In the course of this action, the muscles of the main transverse arches, as well as the lower arches, and the longitudinal arches of the feet are successively stretched and said arches forced upward as contact is made with the counter conformative curved top surface of the plate 5. Also, as the heels are brought to bear on the plate, the leg calf muscles are likewise stretched or tensioned. Repeated rocking of the feet on the toes, and, at the same time laterally in the manner explained, is attended by beneficial exercising of the coordinated foot and leg muscles; and persistent practice of such exercise over an extended period will obviously re-

sult in strengthening and developing said muscles and reestablishing weakened or broken down arches.

For voluntary exercise of the foot muscles, use of the strap is dispensed with and the feet simply placed on the plate 5 so that the balls rest on the highest portion of the transverse ridge or hump 6. In this case the heels are to act as the base with the highest point of the ridge 6 as the fulcrum, while the toes supply the power. Then with the heel pressed firmly down and so held by the powerful flexor muscles of the plantar fascia and with the outer arch raised by the voluntary muscles on the outer side of the plantar fascia under aid of the curves on the exerciser, the muscles of the toes are activated, and, with assistance of certain of the leg muscles, flexed over the rise 6 of the plate 5 to the end that the transverse arch is raised through cooperation of the curves on the exerciser. The toes are firmly relaxed by the plantar muscles whereupon the dorsal muscles function in preparation for repetition of the exercise. Here again, various coordinated foot and leg muscles are brought into play and thus benefited and strengthened after a time for capacity to support the arches of the feet and to function in the normal way.

My exerciser may also be employed for development of the muscles controlling individual toes, as well as for the correction of other ailments and deformities in a manner obvious without further explanation herein.

Having thus described my invention, I claim:

1. A therapeutic exerciser of the character described having the form of a plate with its top surface counter-conformative to the natural contours of the foot soles, said surface embodying a transverse ridge rising abruptly through a mergent reverse curvature and having flanking side recessions, said exerciser being adapted, as the feet descend incident to rocking on either the toes or the heels or sidewise, to raise and support the longitudinal and transverse arches and at the same time strengthen coordinated muscles of the feet and legs.

2. A therapeutic exerciser of the character described having the form of a plate with its top surface counter-conformative to the natural contours of the foot soles, said surface embodying a transverse ridge rising abruptly through a mergent reverse curvature at the front of the plate and receding to the rear at a more gradual and easy slope with flanking downwardly directed side recessions, said exerciser being adapted, as the feet descend incident to rocking on the toes, to raise and support the longitudinal and transverse arches and at the same time strengthen coordinated muscles of the feet and legs, and means for holding down the toes during exercise as aforesaid.

3. A therapeutic exerciser of the character described having the form of a plate with its top surface counter-conformative to the natural contours of the foot soles, said surface embodying a transverse ridge rising abruptly through a mergent reverse curvature at the front of the plate and receding to the rear at a more gradual and easy slope interrupted by slight undulations with flanking downwardly directed side recessions of comparatively easy slope, said exerciser being adapted, as the feet descend incident to rocking on the toes, to raise and support the longitudinal and transverse arches and at the same time strengthen coordinated muscles of the feet and legs, and a strap threaded continuously through suitably allocated holes in the plate so as to crosswise overlie and hold down the toes during exercise as aforesaid.

4. A therapeutic exerciser of the character described having the form of a plate with its top surface counter-conformative to the natural contours of the foot soles, said surface embodying a transverse ridge rising abruptly through a mergent reverse curvature at the front of the plate and receding to the rear at a more gradual and easy slope interrupted by slight undulations with flanking downwardly directed side recessions of comparatively easy slope, said exerciser being adapted, as the feet descend incident to rocking on the toes, to raise and support the longitudinal and transverse arches and at the same time strengthen coordinated muscles of the feet and legs, a strap threaded continuously through suitably allocated holes in the plate so as to crosswise overlie and hold down the toes during exercise as aforesaid, and a clip engageable over a central upstanding lug on the plate to clamp and secure the strap in adjusted positions.

5. A therapeutic exerciser of the character described having the form of a hollow plate with its top surface counter-conformative to the natural contours of the foot soles, said surface embodying a transverse ridge rising abruptly through a mergent reverse curvature at the front of the plate and receding to the rear at a more gradual and easy slope interrupted by slight undulations with flanking downwardly directed side recessions of comparatively easy slope, said exerciser being adapted, as the feet descend incident to rocking on either the toes or heels or sidewise, to raise and support the longitudinal and transverse arches and at the same time strengthen coordinated muscles of the feet and legs, and means for heating the plate.

6. A therapeutic exerciser of the character described having the form of a hollow plate with its top surface counter-conforma-

tive to the natural contours of the foot soles, said surface embodying a transverse ridge rising abruptly through a mergent reverse curvature at the front of the plate and receding to the rear at a more gradual and easy slope interrupted by slight undulations with flanking downwardly directed side recessions of comparatively easy slope, said exerciser being adapted, as the feet descend incident to rocking on either the toes or heels or sidewise, to raise and support the longitudinal and transverse arches and at the same time strengthen coordinated muscles of the feet and legs, and a heating means within the hollow of the plate.

In testimony whereof, I have hereunto signed my name at 327 9th St., Brooklyn, N. Y., this 27th day of April, 1929.

HENRY A. GARTNER.