(No Model.) 2 Sheets—Sheet 1.

L. D. HARDING.

SHOE FOR DEFORMED FEET.

No. 453,475. Patented June 2, 1891.

Fig 1.

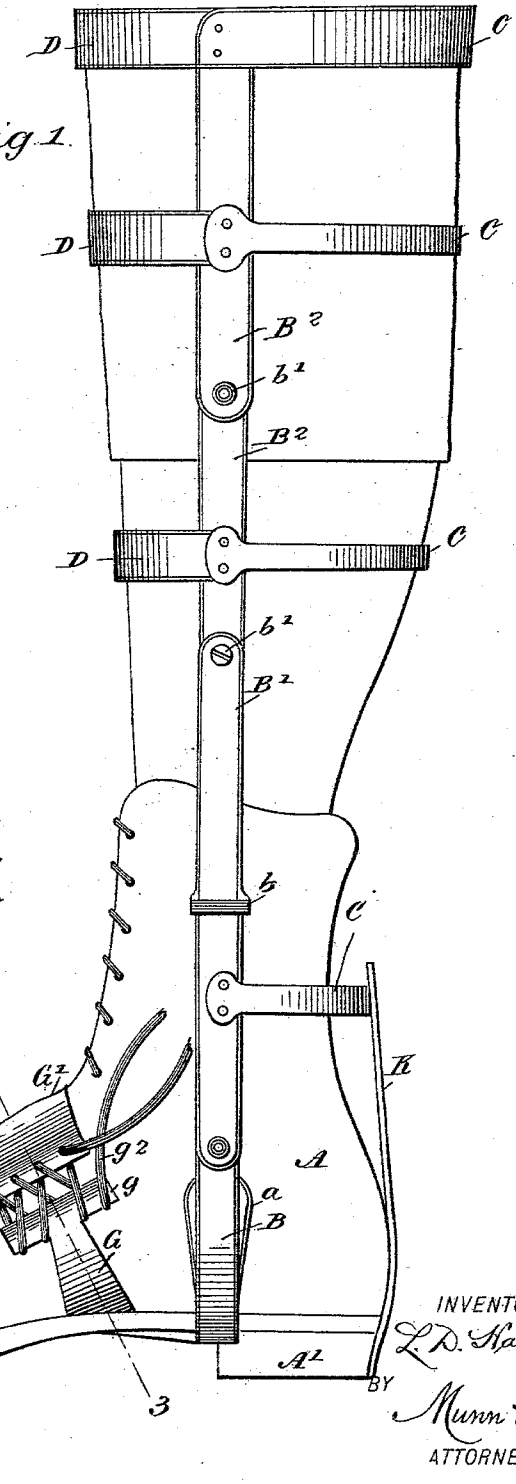


Fig 2

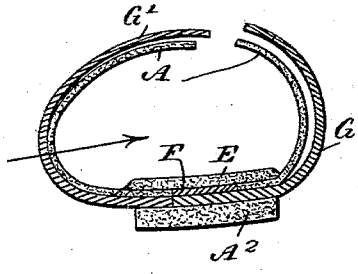
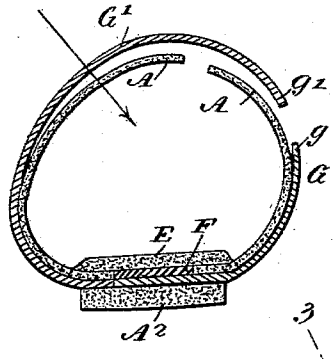


Fig 3



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(No Model.) 2 Sheets—Sheet 2.

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Fig 6.

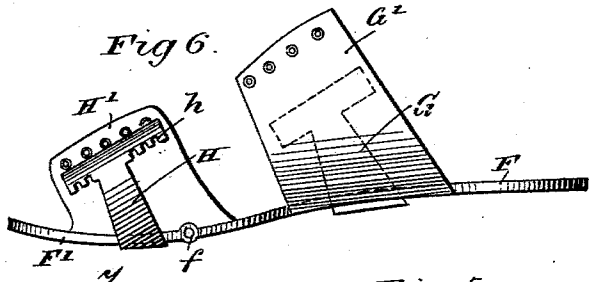


Fig 5.

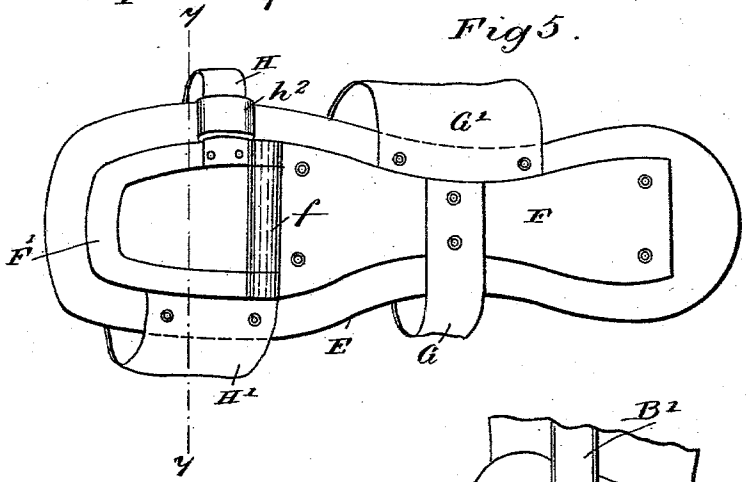


Fig 7.

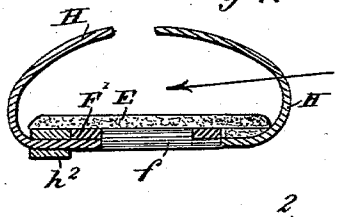


Fig 4.

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UNITED STATES PATENT OFFICE.

LEGRAND D. HARDING, OF COLFAX, WASHINGTON.

SHOE FOR DEFORMED FEET.

SPECIFICATION forming part of Letters Patent No. 453,475, dated June 2, 1891.

Application filed February 3, 1891. Serial No. 380,037. (No model.)

To all whom it may concern:

Be it known that I, LEGRAND D. HARDING, of Colfax, in the county of Whitman and State of Washington, have invented a new and Improved Shoe for Deformed Feet, of which the following is a full, clear, and exact description.

My invention relates to improvements in that variety of shoes which is provided with suitable splints, stays, straps, &c., and are intended to remedy and give proper shape to deformed feet; and the objects of my invention are to produce a shoe which will be more efficient and less painful than the shoes commonly used for the purpose described, to provide means for preventing the sole of the shoe from curving or bending outward or inward, to prevent the sole of the shoe from twisting, to allow the sole to spring or bend in a proper manner at or near the ball, to apply the pressure in the right direction, to provide means to increase or diminish the pressure when necessary, to apply the pressure to a considerable surface on the ball of the foot, and to provide means whereby the part impinging against the foot at or near the ball is automatically adapted to conform to the shape of the foot as it changes by growth, or under the influence of treatment.

To this end my invention consists in certain features of construction and combinations of parts which will be hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a shoe embodying my improvements, the shoe and its attachments being shown as applied to the foot and limb of a person. Fig. 2 is a transverse section on the line 2 2 in Fig. 4. Fig. 3 is a transverse section on the line 3 3 in Fig. 1. Fig 4 is a broken side elevation of the shoe, taken from the opposite side to that shown in Fig. 1. Fig 5 is an inverted plan of the shoe with the outer sole removed. Fig. 6 is a detail side elevation of the sole-plate and the straps and stays connected therewith; and Fig. 7 is a cross-section on the line 7 7 in Fig. 5.

The shoe is provided with an upper A of the ordinary form, which is preferably laced in front, as shown, but which may be secured to the foot in any of the well-known ways; and the shoe is provided with the ordinary heel A′ and outer sole A^2, and extending upward from the sole are the splints B, B′, and B^2, which are hinged together, as shown, the lower splint and the one above being secured by a rivet and a slip-joint *b* in the ordinary way. The lower splint B has a metallic strap *a* between it and the shoe, the strap being secured to the sole of the shoe and located immediately in front of the heel, the object of the strap being to hold the heel in position.

The splints are provided with the usual stays C, which extend around a back portion of the leg, and the splints and stays are held in place by straps D, secured to the splints and adapted to be fastened around the leg in any well-known manner.

The shoe is provided with an insole E, between which and the outer sole is a strengthening-plate F, which is suitably secured to the insole, and near the ball of the shoe the plate F terminates, and is provided with an extension F′, which extends forward nearly to the toe, the two parts F and F′ being hinged together, as shown at *f*; and it will thus be seen that the plate will be flexible, so that it will conform to the movements of the foot, and at the same time it will prevent the inner and outer soles from being turned or twisted out of shape.

Near the shank of the shoe on the inner side is a stay or support G, which is secured to the plate F and extends upward therefrom, the support being curved to conform to the shape of the foot and so placed as not to press thereon, and terminating on one side of the shoe in a head *g*, which adapts it to be secured to a strap G′, which is attached to the shoe on the opposite side between the two soles, and is passed upward over the instep and terminates in a free end *g*′, which is perforated, as shown, and the strap and support are fastened together by a lacing g^2, although any suitable means of fastening them may be provided.

When arranged as described the pressure on the foot will be in the direction of the arrow in Fig. 3; but instead of having the strap and support secured together on the side of the foot they may be secured at the top, as

shown in Figs. 2 and 4, thus bringing the pressure from a different direction, as indicated by the arrow in Fig. 2.

It is not essential that the support and strap be held to the shoe in the exact manner described, as it is obvious that they may be applied in several ways, and they may be attached to different portions of the shoe, so as to bring the pressure on a desired part of the foot.

Near the toe of the shoe on one side is an upwardly-extending support H, which is similar to the support G, already described, and has a head h at the top, and on the opposite side of the shoe is a strap H′, which is held between the sole and insole at the bottom, and the top of which is perforated and provided with lacings h', by means of which the strap and support may be fastened together, thus bringing the necessary pressure on the foot. It will be readily seen that the supports G and H and their corresponding straps may be attached to either side of the shoe, and that the length and curvature of the supports may be changed to adapt them to the particular deformity of the foot. The stay H is provided with a rubber thimble h^2, which fits closely upon it, and is adapted to rest beneath the insole, as shown in Fig. 7, the thimble serving as a cushion to allow the extension F to slide between and to give elasticity to the soles without loosening the joint.

As described, the shoe is especially intended for club-feet of various kinds, and for certain kinds of foot diseases the shoe is provided with an elastic strap J, as shown by dotted lines in Fig. 4, which strap is secured at one end to the sole of the shoe near the ball, and at the other end to one of the side splints near the ankle, and the pressure of the strap has a tendency to hold the ball in an elevated position. For other kinds of foot diseases the back strap K, which is preferably of rubber, is secured at the lower end to the heel of the shoe, and at the upper end to the lower stay C, said stay having a stud c thereon to facilitate the attachment of the elastic strap to it.

From the foregoing description it will be seen that the straps which are fastened around the shoe may be made wide enough so that the pressure may be maintained on a considerable portion of the foot that the pressure may be easily increased or diminished, and that the shoe, by reason of the flexible strengthening-plate in the sole, will easily adapt itself to the movements of the foot, so that the shoe will be less painful than the ordinary shoes of this character.

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

1. A shoe for deformed feet, comprising an upper having the usual outer and in soles, a strengthening-plate held to the soles and hinged near the ball, and straps and supports secured to the sole and adapted to fasten over the foot, substantially as described.

2. The combination, with a shoe of the character described, of a support secured to the strengthening-plate on one side of the shoe and shaped to stand off from the foot, a strap held on the opposite side of the shoe, and means for fastening the strap and support together, substantially as described.

3. The combination, with a shoe of the character described, of a support secured to the strengthening-plate on one side of the shoe and curved to stand off from the upper, said support having at its upper end an elongated head, and a strap secured to the opposite side of the shoe and having its free end perforated to adapt it for attachment to the head of the support, substantially as described.

4. In a shoe of the character described, the combination, with the insole and strengthening-plate, of a stay extending from the plate between the soles, and a flexible thimble mounted on the strap, substantially as described.

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E. K. HANNA.