

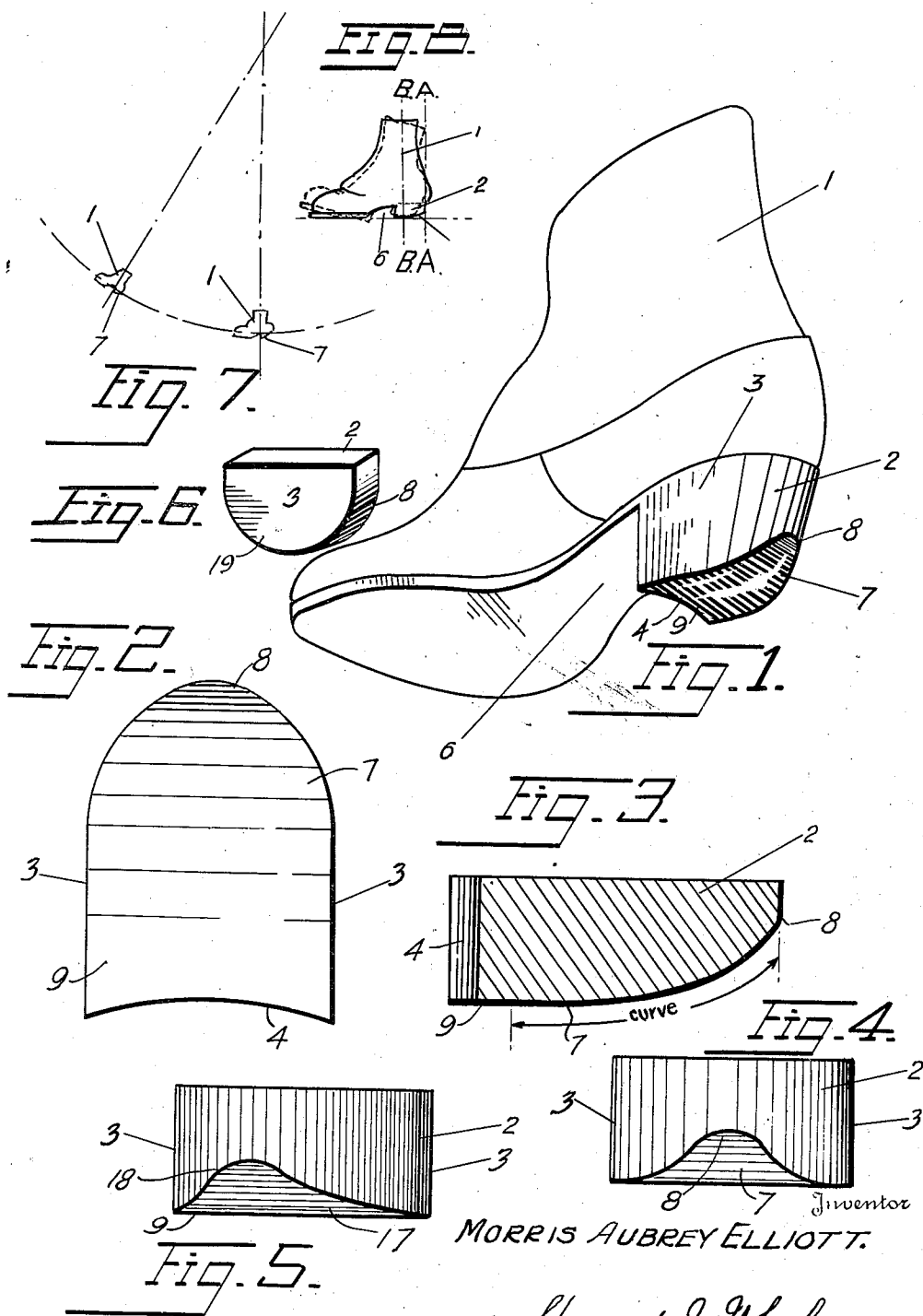
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CONFORMATION HEEL

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CONFORMATION HEEL

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1 Claim. (Cl. 36—34)

This invention refers to shoes and boots and more particularly to improved forms of heels. It has among its objects to provide a form of heel that will facilitate walking; that will afford less injurious stresses on the foot, and incident muscles; that may be adaptable for the correction of erratic methods of walking and placing the feet on the ground and that will make the walk of persons with such shoes on, less striking and jarring. Another object is to provide for the uniform and even wear of shoes.

Other objects will become apparent as the invention is more fully set forth.

The conventional form of shoe is based on the original idea of protecting the foot against stones, cuts and wear, with the additional feature of attractiveness and character that will afford the wearer the personality that his choice provides and classifies him in. In this invention, the heel of the shoe is designed for the analytical considerations of the user's feet and comfort. The shoe heel considers the movement of the leg and ankle in general. The arc of travel of the foot in each step is considered, together with the bend of the sole and the twist of the lower leg, as well as its natural straightness or crookedness. Then the heel is developed accordingly to meet such conditions as exist in this regard. A certain amount of allowance is also made to make the heel flexible to variable conditions of the terrain, covered by the user in walking, as empirically found to be more suitable. The heel can be used as a correctional element for the foot that works continuously, yet unnoticeably. It relieves the muscles that are stretched and tensioned and tightens up on the ones that are loosened. It specifically meets the conditions of each individual case. The stress required to bend the leather sole of the shoe is appreciably less, since the removal of excess portions of the heel allows the shoe to roll and avoid unnecessary bending. In its general form, the shoe heel tread is curved on a cycloidal contour from the back to the front, or close to the latter. The curve, meeting the rounded shape of the heel forms an arch, which does not detract from the aesthetic appearance of the shoe. Where the sharp rectangular edge at the rear of the conventional shoe is used as an axis to roll on, the jar on the front portion of the heel is relatively sharp and sudden. In this invention, the heel rolls on a series of points, like the cycloidal travel of the tooth of one gear on another, with the axis function varying over a considerable spread, and becoming so gradual in action as to entirely

eliminate any jar. This makes the use of the shoe more comfortable and easy on the feet.

In the drawing, which illustrates an example of this invention:

Figure 1 is a view in perspective, indicating a shoe with a heel embodying this invention thereon,

Figure 2 is a view looking up on the underneath or tread surface of the heel shown in Figure 1,

Figure 3 is a sectional view through the middle of the heel,

Figure 4 is a rear elevation of the heel,

Figure 5 is a rear elevation of a modified form of heel, intended for persons who run-over on their heels towards the sides,

Figure 6 is another modified form of heel using a heel completely rounded on the continuation of the curve on which the rear portion of the heel is contoured,

Figure 7 is a diagrammatic view of the leg movement and shoe, and

Figure 8 is a detail diagrammatic sketch indicating the movement of the shoe during walking.

Similar reference characters refer to similar parts throughout the drawing.

In the drawing 1 represents a conventional form of shoe, with a heel 2 having its side walls 3 of normal shape and design. The surface adjacent the instep portion of the shoe, however, is preferably curved on the arc 4, circumferentially described from a center located on or adjacent to the border line of the instep 6 opposite to that at the heel. The under surface of the heel curves on an arc 7, beginning at the central rear line or axis of the heel and with a cycloidal contour downwardly towards the front curve 4 of the heel, but preferably flattening out at 9 about one-fifth the distance of the length of the heel from its front portion 4. This makes the rear portion of the contour 8, where it meets the circular periphery of the heel, of an arch form. This form is developed from the characteristic walk of an individual and in relation to the stress brought about on the various muscles on the leg and foot.

The individual, in walking, swings his leg from its hinge at the thigh. Disregarding the effects and actions at the knee joint, the walking action is similar to that of a wheel with its hub at the hinge, and the periphery at the sole of the foot. The swing of the leg is circumferential. Since the conventional shoe has a flexible sole, and the heel projects beyond the peripheral circle, it is desirable to have the heel rounded off to approxi-

mately coincide with this arc, and yet have a cycloidal form modified to suit the foot movement during the walk and the other conditions arising. This arrangement of the heel takes the tendency to stretch and stress off the rear muscles above the heel of the foot, which the ordinary shoe heel produces, since the heel structure is high and has no "give." At the same time, the muscles below the shin tighten to a normal condition, instead of being loosened in the usual manner by the heel. This is because, in this invention, the rear portion of the shoe heel does not project out, and prevent a normal bending of the foot. At the same time, the torsional twists and sidewise bends of the user's foot are avoided by the centralizing and symmetry of the curve 7 in the form of the heel indicated. Where it is desired to overcome the tendency of some people's feet to run-over on a side portion, and this is specifically known, the heel is modified as indicated in Figure 5 by changing the position of the heel curve 17 and 18 over to the side opposite that which the wearer reacts, and thereby offset his run-over tendency. This curve is formed in a wave form that leads back toward the center line of the flat portion 9, and does not distort the shape of the heel conspicuously.

In other general respects, the heel uses the same principles as in the original form described. These heels remove the tendency of persons to scuff their shoes on the ground, as their feet roll naturally on a fulcrum provided by the ball of the foot. The result is, the user of the shoes with these heels becomes less tired, and walks with less effort. The length covered by the shoe is appreciably longer and thereby reduces the pressure per unit area exerted on the ground in a step.

The leverage action of the shoe is substantially changed by the rounding of the heel. Actually it relocates the fulcrum on which it hinges, in the conventional type of shoe, from the rear border line of the heel, to a point adjacent the front of the heel in the present invention. In addition, there is a cycloidal rolling fulcrum due to the curve provided on the tread of the heel. The changing of this fulcrum also changes the value of the moments. The pressure exerted on the toe of the shoe is less effective in stressing the back

muscles of the leg when the fulcrum points are closer to it on the heel than when the fulcrum is at the rear border line of the heel. The effect is appreciated more fully by the user of such heels on his shoes, when he is walking uphill on hilly highways. The roll on the heels afforded by the curved contour described, adjusts the foot to the road and allows the walker to assume a more natural position. The effect of the straight heel enforces a forward position on the leg of the user and the extra stress on the muscles of the leg entailed coincidentally. The changing of position in the fulcrum is indicated in the diagram in Figure 8; A showing the conventional heel location, and B that of this invention, from which the effects above noted may be considered.

In Figure 6, is shown a modified form of heel, that has its front or instep portion rounded at 19 on the continuation of the rear curve. This curve may be on a circular arc or slightly modified to meet empirical conditions. Its purpose is to continue the rolling action of the heel, and offer less resistance to the bending forward of the shoe.

While but 3 forms of the invention are shown in the drawing, it is not desired to limit this application for patent, to the particular forms indicated, otherwise than limited by the prior art, as it is appreciated that other constructions might be developed that would use the same principles, and come within the scope of the appended claim.

Having thus described the invention, what is claimed is:

In a heel of the class described, the combination of a heel structure formed with its bottom tread portion rounded and chamfered off downwardly from the rear line towards the front line on a cycloidal curve terminating approximately one-fifth of the distance from the front line towards the rear line of the heel and completing the tread with a surface flat at right angles to the proximate axis of the shoe, the front portion of the heel being concavely cut about a vertical plane from one side of the heel to the other, the concavity being receded back to about one-half the distance of the flat portion in the middle of the front line, substantially as described.

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