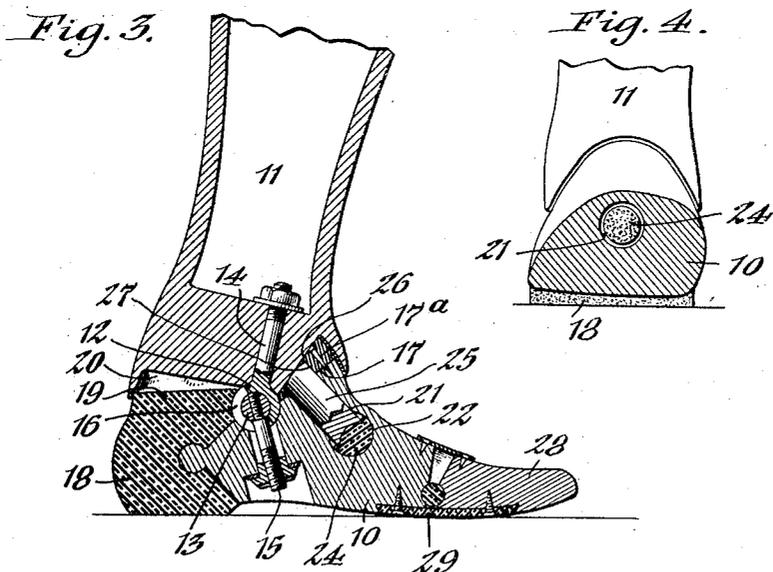
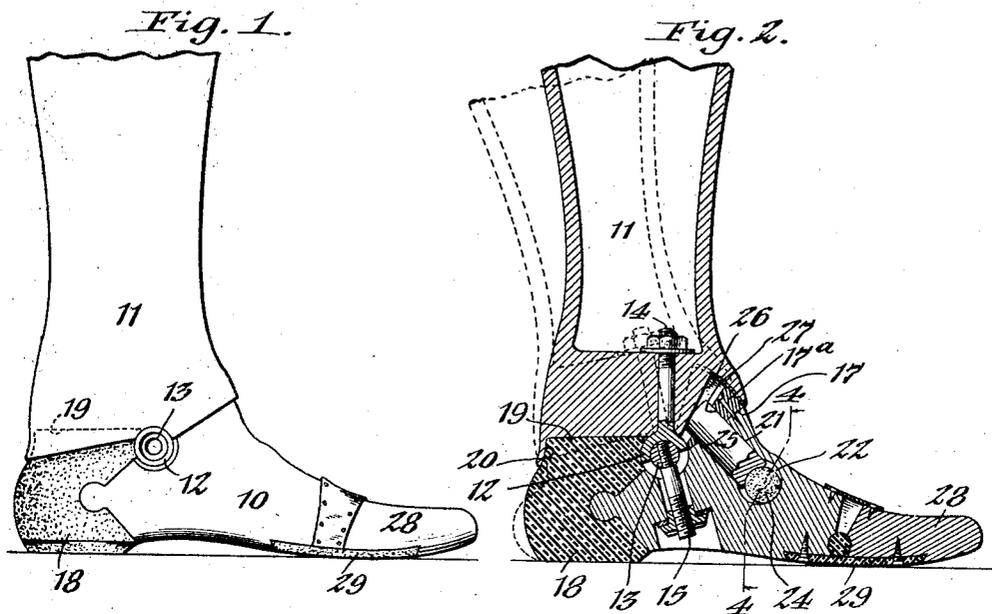


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ARTIFICIAL LEG.
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ARTIFICIAL LEG.

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To all whom it may concern:

Be it known that I, CHESTER B. WINN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Artificial Legs, of which the following is a specification.

This invention relates to the devices employed in artificial legs for cushioning the forward and backward movements of the jointed leg and foot members.

One of the objects of the invention is to so construct the leg that one and the same part performs the double function of an elastic heel and a spring for returning the foot to its normal position, thus simplifying the leg and reducing its cost.

A further object is the improvement of the spring or cushion on the front side of the ankle joint or journal with a view to relieving it from undue wear and stress and lengthening its life, as well as preventing breakage of the cushion and the foot.

In the accompanying drawings:

Figure 1 is a side elevation of an artificial leg embodying the invention showing the parts in their normal position. Fig. 2 is a sectional elevation showing the parts in the same position by full lines. Fig. 3 is a sectional elevation showing the leg-members tilted forward and the foot in a level position. Fig. 4 is a cross section on line 4-4, Fig. 2.

Similar characters of reference indicate corresponding parts throughout the several views.

10 indicates the foot, and 11 the leg member or shin section, which parts are jointed together by an ankle journal of any suitable construction. In the example shown, this journal comprises the usual transverse sleeve 12 seated in a concave cavity in the upper rear portion of the foot, and a pin 13 passing through the sleeve, the latter being secured to the leg member by a bolt 14 and the pin being fastened to the foot member by a bolt 15. In its bottom and its rear side this sleeve has the usual transverse slot 16 for the passage of the lower bolt 15.

Arranged on the front side of the ankle-journal and interposed between the front portion of the leg member and the opposing inclined face 17 of the foot is the customary stop or cushion 17^a of leather or other appropriate material which limits the forward

movement of the leg member and the upward movement of the foot. This stop-cushion may be nailed or otherwise fastened to the foot, and the adjacent portion of the leg member may be socketed as usual to receive said cushion.

Applied to the rear portion of the foot is a block 18 of soft rubber or other suitable material constructed to form a combined elastic heel and a spring for returning the foot to its normal position when the leg member is tilted backward on the ankle-journal. For this purpose, the upper portion 19 of said heel block extends well up into the base of the leg member which is preferably provided with a socket 20 for its reception. This block is glued or otherwise secured to the rear end of the foot, but is detached from the leg-member. In its preferred construction the block extends forwardly to the ankle-journal, as shown.

The upper portion of the foot is provided just in front of said journal with a socket or cavity 21 having an enlarged bottom portion 22 which is occupied by a spring cushion or spring—preferably in the form of a soft-rubber ball 24. In the upper portion of said socket, which is preferably cylindrical, slides a plunger 25 of a hard, durable material, such as wood or metal, which is interposed between said ball and the inclined front face 26 of the leg member, so as to move forward with the leg member and compress the spring ball, causing the latter by its reaction to return the foot to its normal position. The plunger is of the proper length for this purpose, and passes through an opening 27 in the stop cushion 17^a. Very satisfactory results have been obtained by disposing the plunger and its socket at an angle of about forty-five degrees, as shown, but I do not wish to be limited to that particular arrangement, as the same may be varied more or less without sacrificing the advantages of the improvement.

The toe portion 28 of the foot is preferably jointed thereto by the usual strip 29, but it may obviously be rigid and integral with the main part of the foot, if desired.

In the use of the artificial leg when the weight of the wearer is placed thereon, the spring rubber heel-block 18 is compressed, largely relieving the jar that usually accompanies this movement in artificial legs of ordinary construction. When the leg mem-

ber is tilted backward, as shown by dotted lines in Fig. 2, said rubber block again comes into play, being compressed and by its recoil returning the foot to its normal position. 5 This rubber block thus serves not only as a spring heel, but also as a return-spring for the foot. By thus combining these two functions in a unitary member, the construction of the leg is materially simplified and 10 its cost of manufacture lessened accordingly.

When the leg member is tilted forward relatively to the foot, the thrust is first received by the plunger 20 which exerts it 15 against the elastic ball or front cushion 24, and when this forward movement is completed the compressed ball reacts and through the plunger returns the foot to normal position.

As the wear and contact incident to the forward action of the leg is received by the plunger instead of the rubber ball or equivalent cushion, the life of this front cushion is considerably lengthened, and a material 25 saving in repairs is effected. At the same time, crushing or excessive pressure on this front cushion is prevented by the limiting cushion 17^a which serves as a protecting stop for the ball, thus further increasing its durability. 30

It will be understood from the foregoing that one of the important features of my invention consists in so constructing and arranging the parts that the rubber ball or 35 equivalent member acts only as a return spring for the foot, and not as a combined front stop for the leg-member and a return spring for the foot, that stop function being performed by the separate and less elastic 40 limiting cushion 17^a, thus relieving the ball-spring 17 from the otherwise excessive pressure which soon impairs its elasticity and in

a comparatively short time causes it to crumble, if of rubber, or to break if of metal. Moreover, by relieving the bottom of the ball and plunger socket from such severe 45 pressure, the adjacent portion of the foot is subjected to less strain and is not liable to breakage.

By making the heel-block 18 separate 50 from the leg member, as shown, the foot, including the heel-block, can be detached from the leg member upon removing the journal-pin 13. This enables the top of the heel-block and the base of the leg-section, as well 55 as the front stop cushion 17^a and the leg-section face 26, to be shaped or shimmed to obtain the desired adjustment or range of motion of the leg and foot members relatively to each other to closely imitate the 60 action of the natural leg and foot in walking.

The construction herein shown and described also dispenses with separate devices such as cords or tendons, for checking the 65 articulating movements of the parts.

I claim as my invention:

1. An artificial leg, comprising a leg-member, a foot jointed thereto, and an elastic block secured to the rear end of the foot and 70 extending upwardly against the base of the leg-member, said block being detached from said leg-member and forming a combined heel and return-spring for the foot.

2. An artificial leg, comprising a leg-member, a foot jointed thereto by an ankle-journal, the foot being provided in front of said 75 journal with a socket, a cushion seated in said socket, and a rigid plunger guided in said socket and interposed between said 80 cushion and the lower front portion of the leg-member.

CHESTER B. WINN.