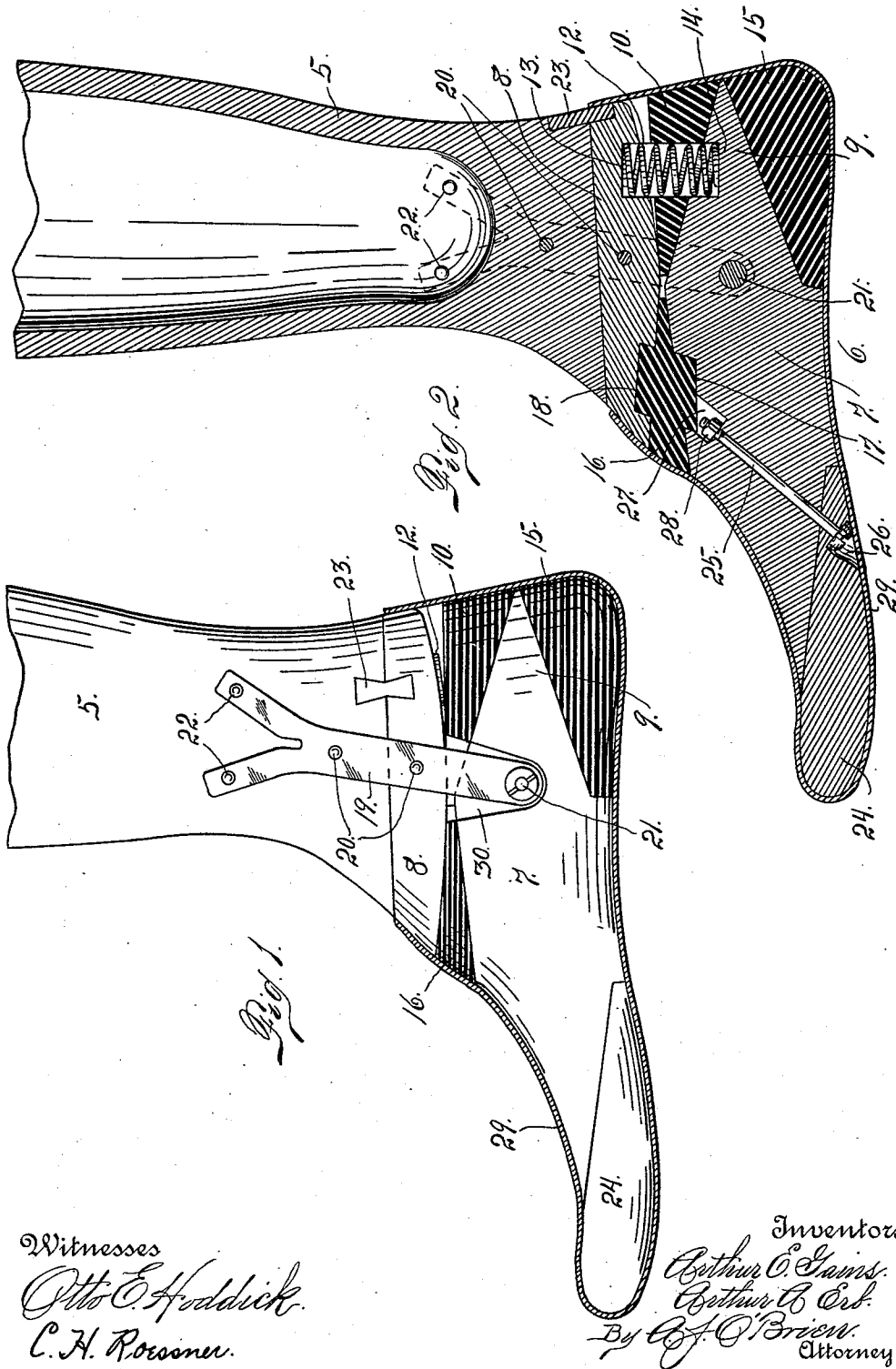


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ARTIFICIAL LIMB.
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Patented Nov. 7, 1911.



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To all whom it may concern:

Be it known that we, ARTHUR E. GAINES and ARTHUR A. ERB, citizens of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Artificial Limbs; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Our invention relates generally to improvements in artificial limbs, but more specifically to the foot part of the limb, our object being to provide a foot which shall so far as possible permit of the movement of the natural or normal foot during the operation of walking or other exercise of the limb.

In carrying out our invention, the foot is equipped both in the front and rear with a rubber cushion, the foot being pivotally connected with the limb by the use of metal parts on opposite sides. The foot is permitted to rock or turn to a limited degree upon a transverse pivot pin or bolt, to which the lower extremities of the metal connecting parts are attached. The rigid part of the foot has an extension projecting rearwardly beyond the pivot and interposed between two rubber or cushion parts. A coil spring is also placed between the said rearwardly extending part and the rear portion of the upper part of the foot, the extremities of the spring being seated in the said parts, both of which are solid or rigid, being composed of wood or other suitable material.

The object of the special construction of foot above outlined, is to absorb or take up the vibrations incident to walking or other use of the foot, whereby the body is relieved of the concussion or jar which would otherwise result from the use of an artificial foot.

In addition to the foregoing features, we also provide a flexible covering for the foot which is preferably composed of leather. This covering conceals all of the joints and gives the foot a smooth and natural appearance, without interfering in any way with the movements necessary in the use of the foot as heretofore stated.

Having briefly outlined our improved construction we will proceed to describe the same in detail, reference being made to the accompanying drawing in which is illustrated an embodiment thereof.

In this drawing: Figure 1 is a side elevation of an artificial limb equipped with our improved foot, the covering for the foot being shown in section. Fig. 2 is a central longitudinal section taken through the foot and lower part of the limb.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the lower part of an artificial limb above the foot, the latter being designated in its entirety by the numeral 6. This foot is provided with a rigid body member 7, and an upper rigid member 8. The member 7 has a rearwardly extending part 9 which tapers to a point as it extends rearwardly. Interposed between the part 9 and the rear portion of the member 8, is a wedge-shaped cushion 10, preferably composed of india rubber. Also interposed between the parts 8 and 9 is a coil spring 12 which is so disposed that its axis occupies a vertical position. The extremities of this spring enter seats 13 and 14 formed respectively in the parts 8 and 9 of the foot. Below the part 9 is a cushion member 15 which forms the heel portion of the foot. Interposed between the forward portion of the member 8 and the adjacent portion of the body member 7 is a cushion member 16, which is thickest at its forward end, and tapers to a point at its rear extremity. The rear end of the member 16 occupies a position close to the forward pointed extremity of the cushion member 10. In order that the member 16 may have no tendency to slip out of place, the two rigid members 7 and 8 are provided with recesses 17 and 18 into which the upper and lower parts of the cushion extend, thus forming a sort of locking means for retaining the cushion in place.

The foot is connected with the lower part 5 of the limb by means of metal straps 19, one on each side. These straps are secured to the parts 5 and 8 by means of pins 20 passing transversely through the limb, one of the said pins passing through the lower portion of the part 5 while the other pin passes through the central portion of the part 8 of the foot. The lower extremities of the parts 18 are pivotally connected with a

bolt 21 which passes through the body portion of the foot, between the cushion members 10 and 15. This bolt is located approximately in the central portion of the upper part of the foot, so that the body portion of the foot is allowed to turn or rock upon the bolt during the operation of walking or other similar exercise.

As illustrated in the drawing the upper portion of each metal strap 19 is bifurcated, the parts of the bifurcated portion being connected with the lower part of the limb 5 by means of suitable fastening devices 22.

In order to further connect the upper portion of the foot with the lower portion of the limb above the foot, a dove-tailed block 23 is placed in a recess of counterpart shape formed partly in the part 5 and partly in the member 8. Our improved foot is provided with a flexible toe member 24 which is connected with the body member 7 by means of a fastening device 25. This device as illustrated in the drawing consists of a small bolt whose head is countersunk in a recess 26 formed in the flexible member 24, while its opposite extremity projects into a recess 27, which is large enough to permit the securing nut 28 to enter the recess, below the cushion member 16. The part 24 may be composed of felt or other suitable yielding or flexible material adapted to bend or yield sufficiently for the purpose.

In order to conceal all of the joints of the foot and give the latter a natural finished appearance, and also to provide additional means for retaining the assembled parts securely in place, the foot is equipped with a covering 29, which may be composed of leather or other suitable material. This covering may be stained or otherwise treated to give the appearance of a natural foot.

In order to permit the body of the foot the necessary rocking movement upon the straps 19, the body portion of the foot is provided with a recess 30 on each side thereof, the lower portion of the recess being large enough to receive the lower extremity of a metal strap 19. These recesses increase in width as they extend upwardly toward the member 8 of the foot, in order to permit the necessary or natural rocking movement.

Having thus described our invention, what we claim is:

1. In an artificial limb, the combination of a limb member whose lower surface is rocker shaped, front and rear wedge-shaped cushions interposed between the limb member and the foot member, a spring also interposed between the limb member and the foot member, the said spring passing through and supplementing the rear cushion, and a pivotal connection between the limb member and the foot member at a point approximately in alinement with the longitudinal center of the limb member, the axis of the pivot extending transversely through the foot member, substantially as described.

2. In an artificial limb, the combination of a limb member whose lower surface is rocker shaped, front and rear cushions interposed between the limb member and the foot member, a coil spring having its axis vertically disposed, arranged to supplement the rear cushion, and a pivotal connection between the limb member and the foot member at a point approximately in alinement with the longitudinal center of the limb member, substantially as described.

3. An artificial limb composed of two opposing, rocker-shaped members, a pivotal connection between the two members, and an independent, wedge-shaped cushion member interposed between the two rocker-shaped members on opposite sides of the two members.

4. An artificial foot, having a rearwardly extending, integrally formed, wedge-shaped member, whose point extends rearmost, and cushioning means applied to the foot member, both above and below the rearwardly extending, wedge-shaped member, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

ARTHUR E. GAINES.
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Witnesses:

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