

# ARTIFICIAL LIMB.

APPLICATION FILED MAY 31, 1910.

Patented Nov. 15, 1910.



Arleta Adams  
James E. Spruell.

Inventor

Theodore M. Lawrence

ਭੈਰਵ

Adams & Brooks

Attorneys



# UNITED STATES PATENT OFFICE.

THEODORE M. LAWRENCE, OF SEATTLE, WASHINGTON, ASSIGNOR OF FORTY-NINE ONE-HUNDREDTHS TO GEORGE H. McDANNEL, OF SEATTLE, WASHINGTON.

## ARTIFICIAL LIMB.

975,439.

Specification of Letters Patent. Patented Nov. 15, 1910.

Application filed May 31, 1910. Serial No. 564,305.

*To all whom it may concern:*

Be it known that I, THEODORE M. LAWRENCE, a citizen of the United States of America, and a resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Artificial Limbs, of which the following is a specification.

My invention relates to artificial limbs, having more particular reference to the ankle sections thereof, and has, for its primary object to provide an improved construction which permits of the foot section having a comparatively natural rocking action in forward, rearward and lateral directions.

With the above and other objects in view, to be referred to as the description progresses, my invention resides in the features of construction, arrangements and combinations of parts hereinafter described and succinctly defined in my annexed claims.

Referring to the accompanying drawing, wherein like numerals of reference indicate like parts throughout: Figure 1 is a longitudinal section of an artificial foot and ankle constructed in accordance with my invention. Fig. 2 is a section taken on line 2—2 of Fig. 1, and Fig. 3 is a detail view in perspective of my ankle block.

Reference numeral 1 indicates the shell of my improved ankle which is composed of tough resilient material, as rubber or a composition thereof, the same receiving the lower end portion of leg section 2 and the rear end portion of body portion 3' which body portion is formed of a relatively hard material, as wood, and forms a portion of the sole and instep of the foot section. Body portion 3' has in integral rearwardly projecting horizontal extension 4 extending beneath the lower end of leg section 2 and bearing on the inner face of a heel 3'', provided by suitably forming the lower wall of said shell.

Reference numeral 5 indicates an ankle block, which in conjunction with a connecting rod 10 forms the ankle joint, connecting the foot section for both lateral and forward and rearward rocking. Ankle block 5, which is preferably of aluminum, is provided on its lower face with a depending longitudinally disposed journal part 6 rotatably seated for lateral rocking in a bearing 7, formed in the upper face of extension 4, and provided in its

upper face with a transversely disposed seat 8 rotatably receiving a journal part 9 fixed to the lower end of leg section 2.

Connecting rod 10 comprises an intermediate section 10<sup>a</sup> of angular cross sectional formation, normally arranged in a correspondingly formed opening 11 of ankle block 5, and thereby tending to hold the same from twisting, and pivoted end sections 10<sup>b</sup> one of which extends upwardly into leg section 2 and the other through extension 4, where they are provided on their free end portions with securing nuts 12, as shown. In the present embodiment of my invention, intermediate section 10<sup>a</sup> has bifurcated end portions, in which the adjacent end portions of end sections 10<sup>b</sup> are received and pivoted by pins 13, the respective joints thus provided being on opposite sides of ankle block 5 with the pins 13 disposed longitudinally of the adjacent journal parts and concentrically to the bearing surfaces thereof.

Bearing 7 which is preferably provided with a suitable bushing, as shown, is in the form of a groove extending longitudinally of extension 4 and terminates at the base of the rear wall of body portion 3' in an enlarged depression, receiving the enlargement 6<sup>a</sup> of journal part 6 and thereby preventing endwise movement of the latter.

Journal part 9 is in the form of an extension of leg section 2, provided by suitably reducing the lower end portion thereof and providing the same with a wear plate 9<sup>a</sup>, as shown. Rearwardly of journal part 9, I provide leg section 2 with a cushion 14, in the form of a block of rubber, which during longitudinal rocking of the foot section, will engage ankle block 5, and thereby obviate clicking.

To bring the edge portions of shell 1 flush with body portion 3' and leg section 2 and form joints which exclude foreign substances, I form the two last named parts with external seats 15 in which the adjacent edge portions of the shell are received and preferably cemented.

Reference numeral 16 indicates the heel cord consisting of a rod seated in and secured, by a pin 17, to the rear end portion of extension 4, and extending upwardly through an opening 18, in which it is free to slide during forward and rearward rocking movement of the foot section, into the leg section



2 where it is provided with a stop 19, consisting of a nut, as shown, to limit movement of the heel cord in a downward direction, as will be readily understood.

5 A toe section 20 of felt or other suitable material is secured to the forward end of body portion 3' in any suitable manner, a convenient way however, consists in employing a screw 21, directed in said body portion  
10 3' from the underside of the toe section, in conjunction with one or more pins 22 supported in the toe section and having projecting rear end portions adapted to be received in sockets provided therefor in the  
15 body portion.

Reference numeral 23 indicates an oil duct extending from the outer face of leg section 2 to rod 10 in proximity to the upper joint thereof, through which oil can be fed to the  
20 several joint members.

By the construction of my improved ankle joint, tightening of both joints thereof can be readily effected by properly adjusting the upper nut 12.

25 Having thus described my invention what I claim as new, and desire to secure by Letters Patent of the United States of America, is:

1. An artificial limb comprising a leg section, a foot section, and an ankle joint between said leg and foot sections comprising an ankle block provided on its under side with a journal part rotatably seated on said foot section and formed in its upper face  
35 with a bearing extending at right angles to said journal part, a journal part on the lower end of said leg section engaging in the bearing of said ankle block, and means for securing said foot section and ankle block to  
40 said leg section.

2. An artificial limb comprising a leg section, a foot section, an ankle block provided with a depending journal part rotatably seated on said foot section and formed in  
45 its upper face with a bearing extending at right angles to said journal part, said leg section having its lower end reduced to form a second journal part arranged to engage in the bearing of said ankle block, and an articulated rod extending through said ankle  
50 block and secured to leg and foot sections.

3. An artificial limb comprising a leg section, a foot section including a body portion having an extension projecting rearwardly

beneath said leg section and formed with a longitudinal bearing, an ankle block having a depending journal part engaged in the bearing of said extension, and a joint between said ankle block and said leg section permitting of rocking of said foot section in forward and rearward directions.

4. An artificial limb comprising a leg section, a foot section including a body portion having an extension projecting rearwardly beneath said leg section and formed with a longitudinal bearing, an ankle block having a depending journal part engaged in the bearing of said extension, said ankle block being formed in its upper face with a bearing extending at right angles to said journal part, a journal part on said leg section engaged in the bearing of said ankle block, and an articulated rod extending through said ankle block and being secured to said leg and foot sections.

5. An artificial limb comprising leg and foot sections, and a joint therebetween including an ankle block having joint parts arranged at an angle to one another and engaging coöperating joint parts on said leg and foot sections, and a rod comprising an intermediate section formed angular in cross section and engaging in a correspondingly formed opening in said ankle block, and end sections pivotally connected to said intermediate section on opposite sides of said ankle block, one of said end sections being secured to said foot section and the other extending upwardly into said leg section and being provided on its upper end with a securing means.

6. An artificial limb comprising a leg section, a foot section including a shell of resilient material receiving the lower end portion of said leg section, a transversely disposed journal part on the lower end of said leg section, an ankle block rotatably engaged on said foot section for lateral rocking and provided in its upper portion with a transverse bearing receiving said journal part, and means securing said ankle block to said leg and foot sections.

Signed at Seattle, Washington this 17th day of May 1910.

THEODORE M. LAWRENCE.

Witnesses:

A. A. BOOTH,  
FRANK E. ADAMS.