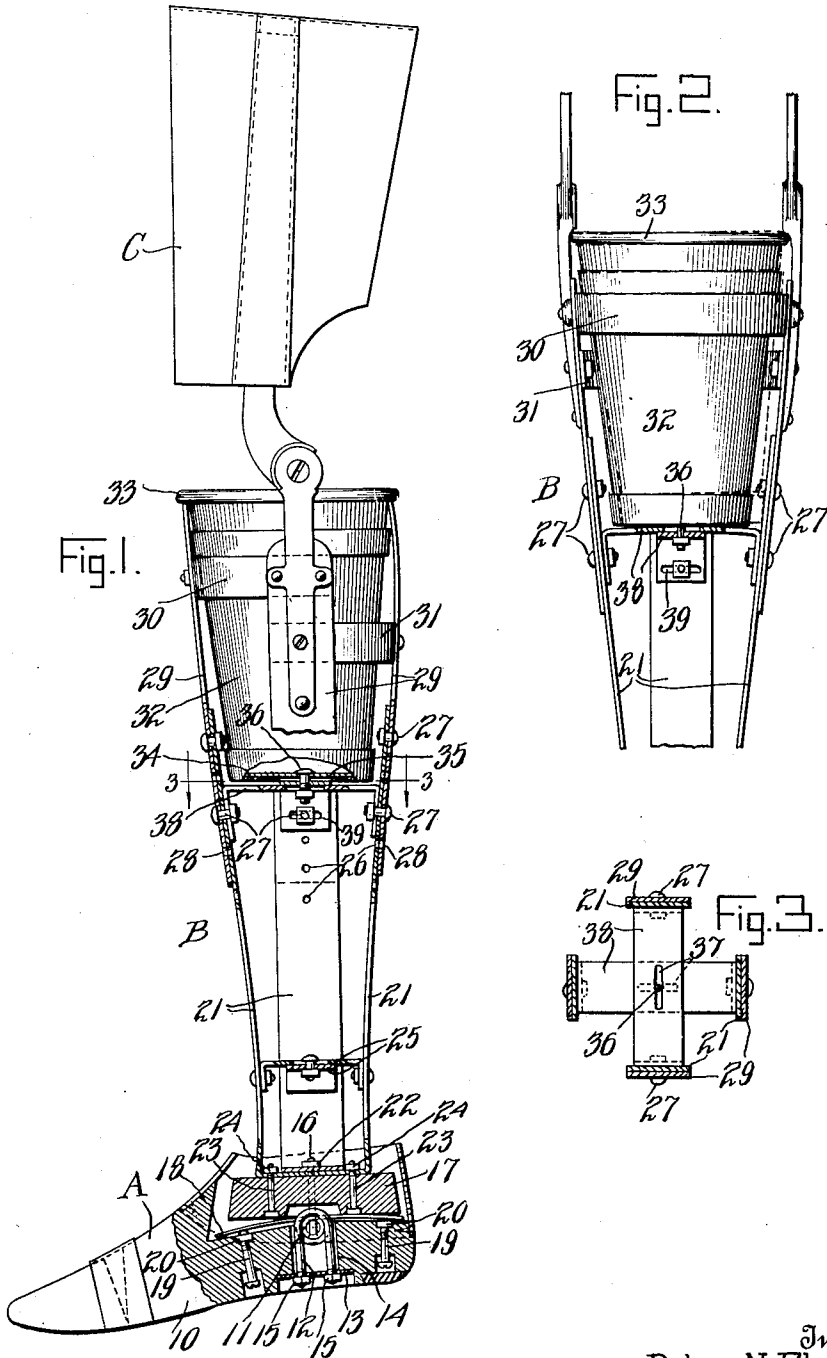


R. N. FLANAGAN.
ARTIFICIAL LIMB.
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1,370,299.

Patented Mar. 1, 1921.



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ROBERT N. FLANAGAN, OF CHARLOTTESVILLE, VIRGINIA.

ARTIFICIAL LIMB.

1,370,299.

Specification of Letters Patent.

Patented Mar. 1, 1921.

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To all whom it may concern:

Be it known that I, ROBERT N. FLANAGAN, a citizen of the United States, residing at Charlottesville, in the county of Albemarle and State of Virginia, have invented certain new and useful Improvements in Artificial Limbs, of which the following is a specification.

My said invention relates to artificial limbs and more particularly to leg members, and consists in various improvements in the details of construction and arrangement of parts hereinafter described and claimed; and further in the method of fitting employed to secure the desired results.

Referring to the accompanying drawings which are made a part hereof and on which similar reference characters designate similar parts,

Figure 1 is a side elevation of a limb constructed in accordance with my invention, with the lower portion broken away to more clearly illustrate its structure,

Fig. 2, a front elevation of a portion of the device, and

Fig. 3, a detail cross section taken on the dotted line 3—3 in Fig. 1.

In said drawings the portions marked A represent the foot portion, B the calf portion, and C the thigh portion of the limb.

The foot portion A is composed of the foot form 10 of wood or other suitable material, which is hinged to the calf portion B by means of a transverse shaft 11 which lies in sockets formed in the sides of the foot form 10 and which is secured therein by means of an inverted U-shaped bolt 12 whose ends pass through perforations in a plate 13 mounted in a socket 14 in the under side of the foot 10. Nuts 15 are mounted upon the ends of said bolt 12 and bear against the lower side of said plate 13 thereby firmly holding said shaft 11 but allowing it to have a slight rotary movement. Bolts 16 pass through alining openings in the shaft 11 and upwardly through a block 17 which joins the extreme lower part of the calf portion B as will be described further on. A bowed leaf spring 18 is interposed between the portions 10 and 17 with its central portion bearing on the shaft 11 and its ends supported on tension screws 19 threaded into nuts 20 embedded into the member 10. The block 17 is held firmly against the spring 18 by means of the bolts 16 before mentioned, which pass through perforations

in one of a pair of U-shaped members 21 forming the frame of the calf portion B and upon which nuts 22 are threaded. Similar bolts 23 pass upward through the block 17 and through perforations in the other U-shaped member 21 and are provided with nuts 24 for securely holding the member to the block 17. Cross braces 25 connect the upstanding portions of the members 21 slightly above the foot portion thereof to prevent spreading of the members. Perforations 26 are equally spaced adjacent the upper ends of the members 21 and are adapted to receive bolts 27 which pass through similar perforations 28 in members 29 which carry bands 30 and 31 holding a bucket 32 which is of frusto-conical form, provided with a roll rim 33 at its upper edge and an inturned flange 34 at its lower edge. A plate 35 rests on the said flange 34 and is provided with a central opening through which extends a bolt 36 which also passes through a pair of slots 37 formed in a pair of cross braces 38 which in turn are provided with down turned ends horizontally slotted at 39 to receive one of the bolts 27 which also secure the braces to the frame members 21 and 29.

It will therefore be readily understood from the above description that the degree of tension on the spring 18 may be easily adjusted to vary the movement of the foot portion A with relation to the member B and that the said member B may be adjusted in regard to its length to meet any necessary requirements, also, the manner of mounting the bucket 32 which permits of its being secured at various degrees from the perpendicular to permit adjustment to secure the comfortable wearing regardless of the condition of the wearer's limb, as should the wearer's leg be bowed either in or out, as indicated by the dotted line position in Fig. 2 of the drawings.

While I have shown the limb as adapted for attachment at the knee it will be understood, of course, that it may be constructed for attachment wherever required by each individual case, and my invention is as readily adapted for artificial limbs designed for attachment to a leg amputated near the thigh as one near the knee. In all such instances, the "stub" is apt to be more or less deformed and the attachment of the artificial limb to the abnormal or deformed condition, so as to bring the main part of the

limb to a normal or natural position, is what constitutes a leading feature of my invention. I therefore employ a special method for fitting the limbs, which I consider essential in order to secure the most perfect results and an important part of my invention. Said method consists in making a cast of the stub, to which the limb is to be fitted, out of plaster of Paris, or other suitable material, and then making from this cast a form by filling the cast or mold with melted metal, thus reproducing the stub in the metal. Around this metal form I fit the aluminum bucket, into which the stub is to rest, and so adjust the parts as to bring the artificial limb into natural position. By this method I am able to fit my improved artificial limb to stubs of the most difficult and abnormal shapes and still maintain a substantially natural, and consequently the most comfortable, position for the limb.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent, is:

25 1. An artificial limb comprising a foot member, and a member adapted to be attached to the leg, said two members being

connected by a rocking joint, and said joint being controlled by a leaf spring adjustable as to tension and between the two parts, substantially as set forth. 30

2. The method of fitting artificial limbs which consists in making a cast or mold upon the stub to which the limb is to be attached, casting in said mold a metal matrix conforming with the stub, conforming a ductile sheet of metal upon said matrix and employing the same as the bucket part of an artificial limb. 35

3. In an artificial limb comprising a skeleton frame, a bucket secured to the top of the frame and provided with means to allow the vertical axis of the bucket to be inclined at various angles to, and in various planes containing the vertical axis of the skeleton frame. 40 45

In witness whereof, I, have hereunto set my hand and seal at Charlottesville, Virginia this 1st day of April, A. D. nineteen hundred and nineteen.

ROBT. N. FLANAGAN. [L. s.]

Witnesses:

R. L. RODES,

R. C. NICHOLAS.