J. F. CORDELL.
ARTIFICIAL LIMB.
APPLICATION FILED MAR. 21, 1912.

1,043,509.

Patented Nov. 5, 1912.

2 SHEETS—SHEET 1.

FIG. 1

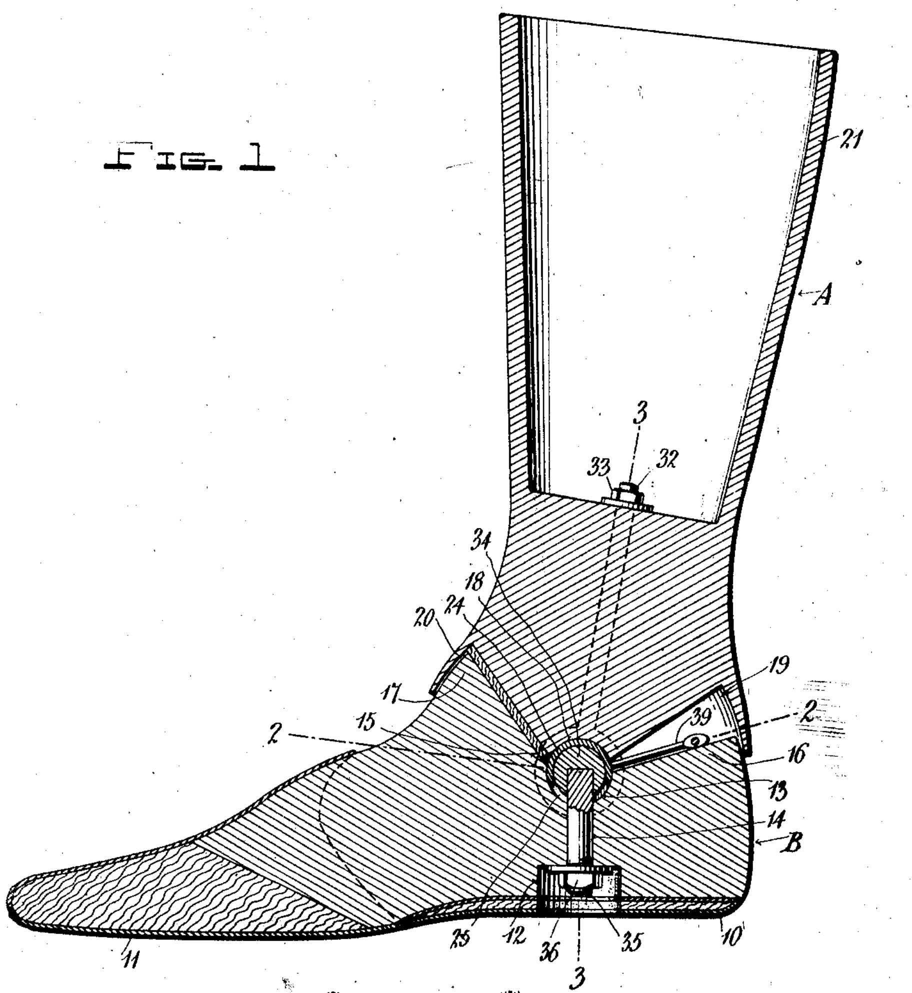
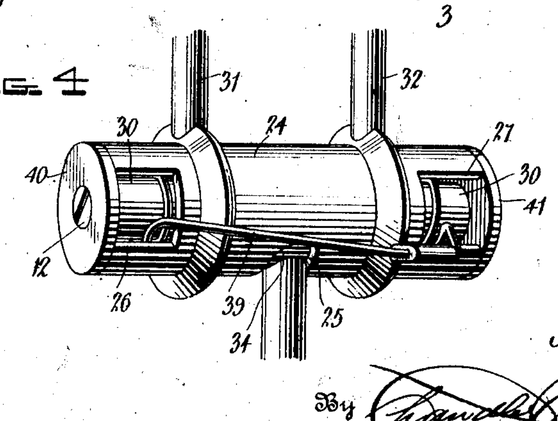


FIG. 4



Witnesses

Henry T. Bright

Inventor

J. F. Cordell

By

Attorneys

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2 SHEETS—SHEET 2.

FIG. 2

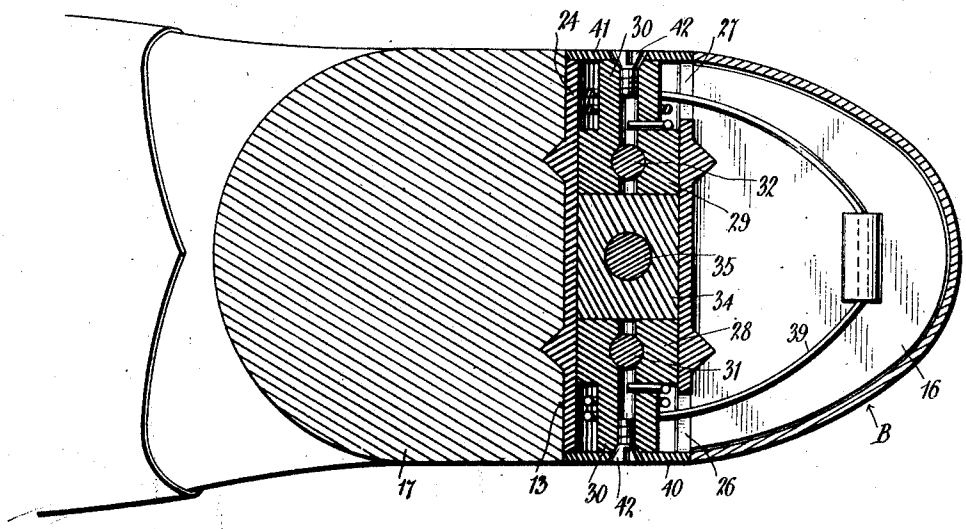


FIG. 3

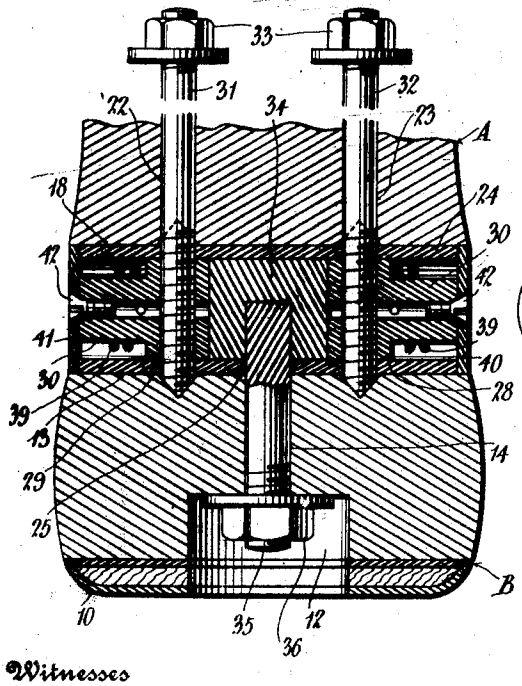
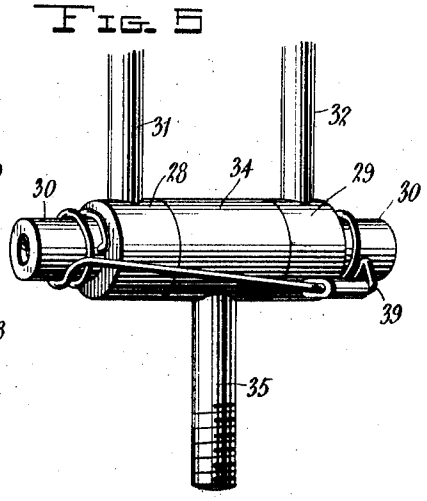


FIG. 5



Witnesses

P. E. Borson

Henry T. Bright

Inventor

J. F. Cordell

By Pierce & Pierce

Attorneys

UNITED STATES PATENT OFFICE.

JOHN F. CORDELL, OF SALT LAKE CITY, UTAH.

ARTIFICIAL LIMB.

1,043,509. Specification of Letters Patent. Patented Nov. 5, 1912.

Application filed March 21, 1912. Serial No. 685,162.

To all whom it may concern:

Be it known that I, JOHN F. CORDELL, a citizen of the United States, residing at Salt Lake City, in the county of Salt Lake, State of Utah, have invented certain new and useful Improvements in Artificial Limbs; and I do hereby 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.

This invention relates to artificial limbs, and more particularly to the joint between the leg member and the foot member of the limb.

The object of the invention resides in the provision of an improved joint for connecting the foot member and leg member of an artificial limb which will be simple in construction, durable, and which affords an efficient cushion for the weight of the body when same is applied to the heel portion of the foot section of the limb.

A further object of the invention resides in the provision of an improved joint between the leg section and the foot section of an artificial limb which will readily permit said sections to be separated from each other for repair or replacement of parts.

With the above and other objects in view, the invention consists in the details of construction and in the arrangement and combination of parts to be hereinafter more fully described and particularly pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawings, wherein like characters of reference denote corresponding parts in the several views, and in which—

Figure 1 is a vertical section of a portion of an artificial limb embodying the invention, Fig. 2, an enlarged section on the line 2—2 of Fig. 1, Fig. 3, an enlarged section on the line 3—3 of Fig. 1, Fig. 4, a detail perspective view of the joint removed, and Fig. 5, a detail perspective view of the parts of the joint contained within the outer tubular member of said joints.

Referring to the drawings the limb is shown as comprising a leg section A and a foot section B, the latter being provided with the usual flexible heel and toe portions 10 and 11 respectively, and a recess 12 in the bottom of its heel portion opening through the flexible portion 10. Formed in the foot section B directly above the recess 12 is a transverse groove 13 which is connected with the recess 12 by a vertical passage 14. The upper end of the foot section B is provided with a V-shaped recess 15 forming angular portions 16 and 17 and merging at its inner end into the transverse groove 13. The leg section A is provided at its lower end with a transverse groove 18 which mates with the groove 13 of the foot section B. Rearward of the groove 18 the leg section A is provided with a recess 19 while another recess 20 is formed forward of the groove 18, the angular portions 16 and 17 of the foot section B being adapted to travel in the recesses 19 and 20 respectively when the foot section is moved relatively to the leg section during the use of the limb. The leg section A terminates at its upper end in a tubular portion 21 the interior of which communicates with the groove 18 by means of vertical passages 22 and 23 formed in the solid lower portion of the leg section.

The joint between the leg section A and the foot section B is shown as comprising a tubular member 24 which is seated between the leg and foot sections in the passage formed by the mating grooves 13 and 18. This tubular member 24 is provided centrally with a transverse slot 25 while the terminals thereof are provided at corresponding points with cut away portions 26 and 27 all for a purpose that will presently appear.

Disposed within the tubular member 24 at each end are tubular cores 28 and 29, each of which have their outer ends reduced as at 30. These cores 28 and 29 are held against removal from the tubular member 24 by bolts 31 and 32 which are threaded through the tubular member transversely and through the inner end of said cores respectively. These bolts 31 and 32 are disposed in a common plane passing through the longitudinal axis of the tubular member 24, and extend respectively through the passages 22 and 23 in the leg section A. Nuts 33 are threaded on the upper ends of the bolts 31 and 32 respectively and serve to positively connect the joint to the leg section. Rotatably mounted in the tubular member 24 between the inner ends of the cores 28 and 29 is a cylindrical block 34 which has anchored therein the inner end

of a bolt 35 which projects through the slot 25, rotation of said block 34 being limited by the engagement of the bolt 35 with the ends of the slot 25. This bolt 35 extends through the passage 14 in the foot member and has threaded on its outer end a nut 36 through the manipulation of which the foot section is secured to the joint as will be apparent. Coiled about the reduced portions 30 are the ends of a spring wire 39, the terminals of said ends being anchored to the inner ends of the reduced portions 30 respectively. The intermediate portion of the spring wire 39 is extended laterally of the tubular member 24 in substantially U-shape and one arm of said lateral extension bears against an edge of the cutaway portion 26 under tension while the other arm of the lateral extension bears against a corresponding edge of the cutaway portion 27 under tension. When the leg section A and foot section B are connected together by the joint the intermediate U-shape portion of the spring wire 39 bears against the rearmost side of the recess 15 of the foot section B and constantly tends to move the heel of the foot section B out of the recess 19 of the leg section. However, in use of the limb when the weight of the body is thrown upon the heel of the U-shape section the U-shape portion of the spring wire 39 will yield so as to cushion the jar that would naturally result if the movement of the heel of the foot section into the recess 19 were unrestrained. The ends of the tubular member 24 are closed by caps 40 and 41 respectively which are secured in place by means of screws 42 threaded into the bores of the cores 28 and 29 respectively.

What is claimed is:

1. In an ankle joint, the combination with the leg and foot sections of an artificial limb, of a tubular member disposed between the leg and foot sections and non-rotatably secured to the former, a cylindrical block rotatably mounted in said tubular member and secured to the foot member whereby said foot member is adapted for a limited rotation about the longitudinal axis of said tubular member and a spring wire having its terminals anchored in the tubular member and its intermediate portion directed laterally of the tubular member and engaging the rear end of the top of the foot section under tension whereby the rear end of the foot section is yieldingly held against movement toward the adjacent portion of the leg section.

2. In an ankle joint, the combination with the leg and foot sections of an artificial limb, a hinge joint between said leg and foot section, and a spring anchored to said hinge connection and engaging the rear end of the top of the foot section under tension whereby the rear end of the foot section is yieldingly held against movement toward the adjacent portion of the leg section.

In testimony whereof, I affix my signature, in presence of two witnesses.

JOHN F. CORDELL.

Witnesses:

ORVILLE D. RYAN,

LEVY E. SANDERSON.