

No. 750,884.

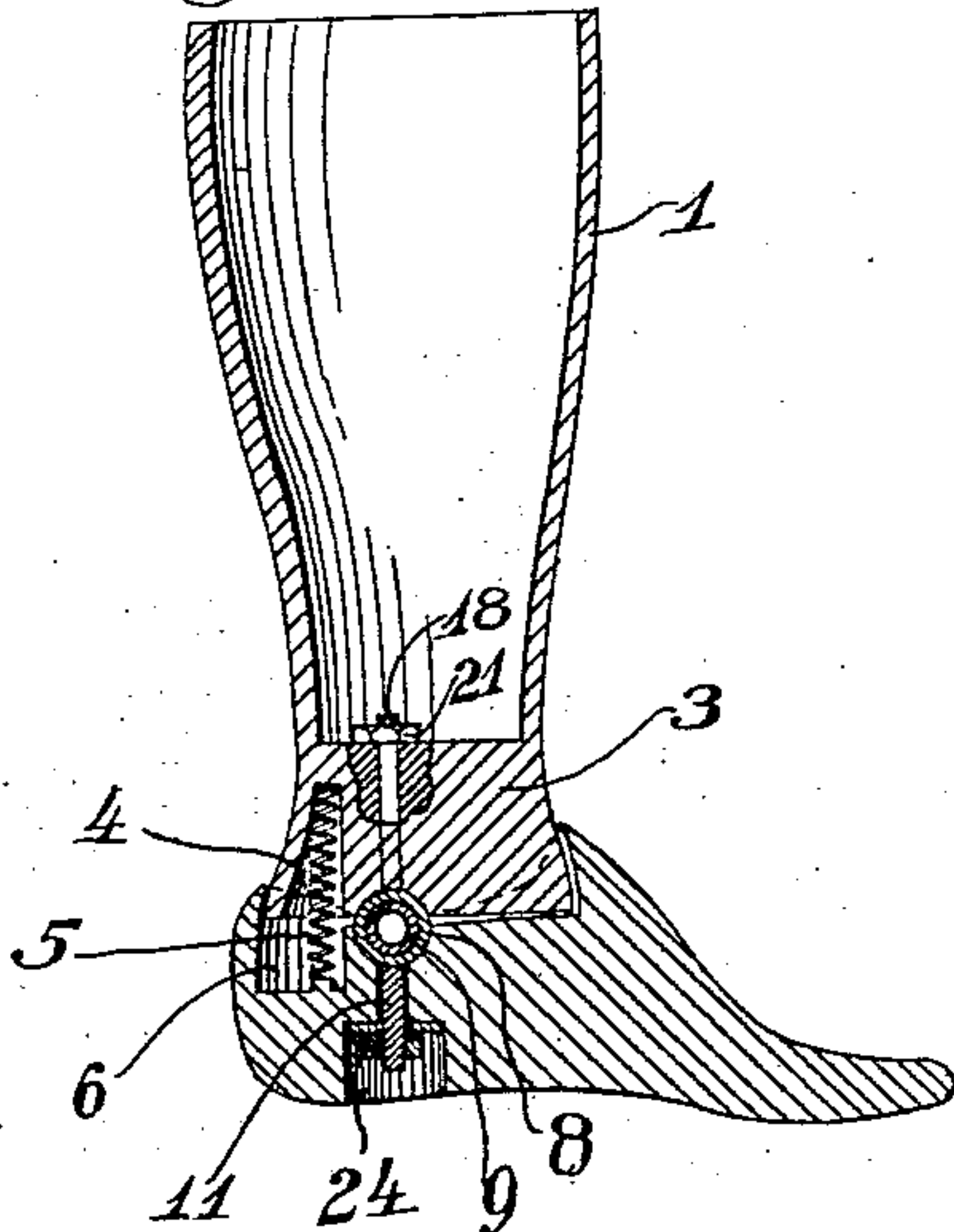
PATENTED FEB. 2, 1904.

J. A. McKNIGHT.  
ANKLE JOINT.

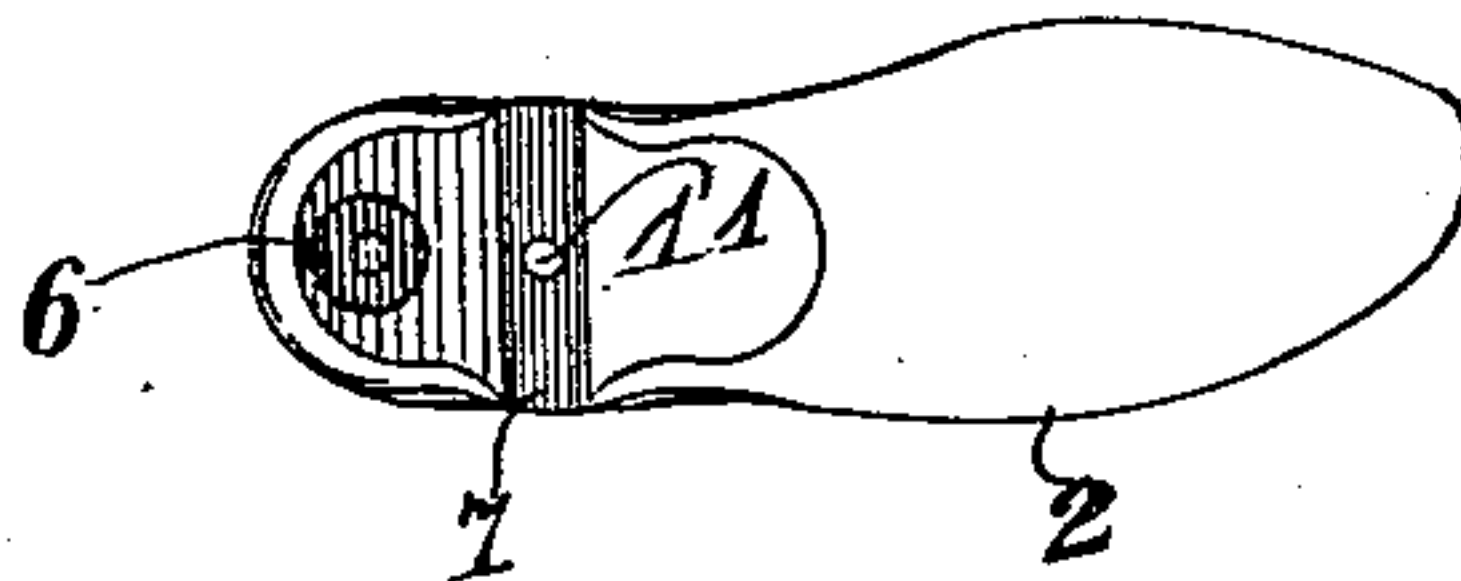
APPLICATION FILED JAN. 26, 1903.

NO MODEL.

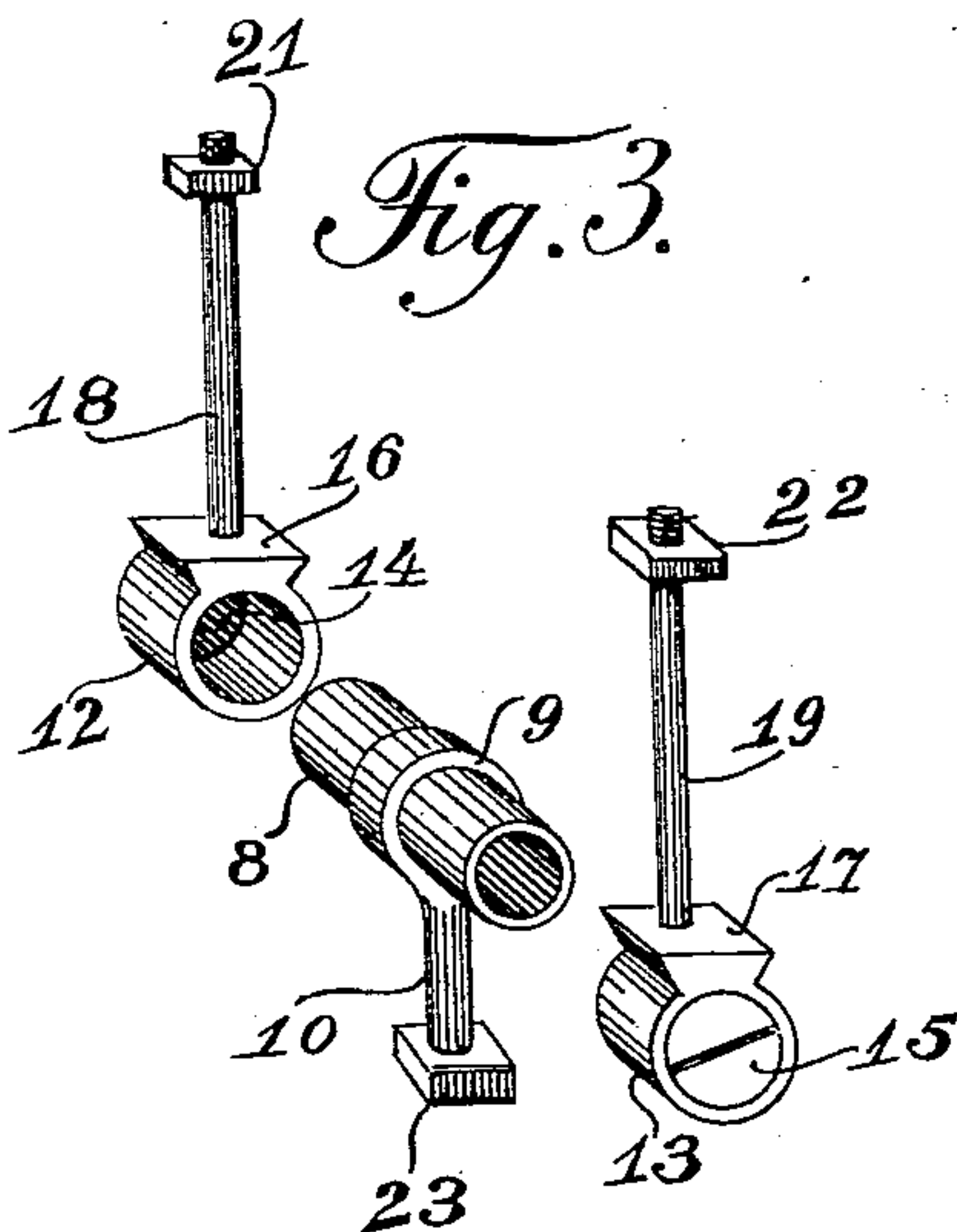
*Fig. 1.*



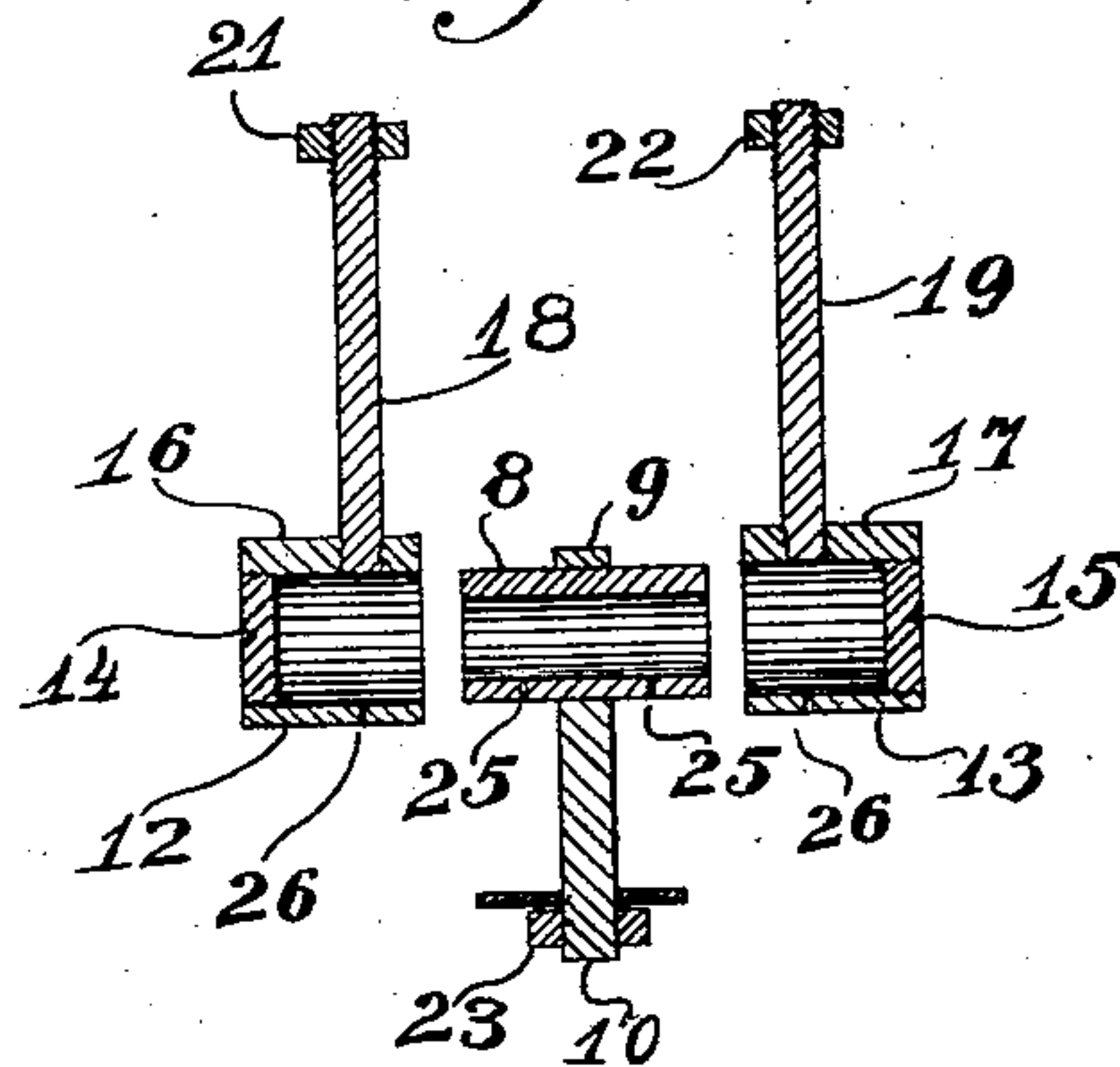
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

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## ANKLE-JOINT.

SPECIFICATION forming part of Letters Patent No. 750,884, dated February 2, 1904.

Application filed January 26, 1903. Serial No. 140,683. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN A. McKNIGHT, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Ankle-Joints; 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.

My invention relates to ankle-joints for artificial limbs, and has for its object the provision of a joint which embodies a reservoir for oil or other lubricants.

It consists of a central tubular shaft, a concentric outer shaft at each end of said central shaft, removable means for closing the ends of said outer shafts, means for securing the central shaft to one member of the limb, and means for securing the outer shafts to the other member of the limb.

It also consists of certain other constructions, combinations, and arrangements of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a vertical longitudinal section through the calf portion and foot of an artificial limb and through said ankle-joint. Fig. 2 is a top plan view of the foot portion of said limb. Fig. 3 is a perspective view of my said ankle-joint, the members thereof being separated to more clearly show the construction. Fig. 4 is a vertical longitudinal section of the same.

In the drawings, 1 is the calf portion of an artificial limb, and 2 is the foot portion thereof. The calf portion is hollowed out in the upper part to lessen the weight, leaving a solid portion or core 3 at the lower end thereof. Said solid portion is recessed, as at 4, to receive the upper end of a spring 5, the lower end of which extends into a recess 6, formed in the heel of said foot portion 2, and which spring in operation tends to press said heel downward away from said calf portion, thereby tending to elevate the toe of said foot. Said foot portion is horizontally grooved transversely of said foot, as at 7, which groove is adapted to receive the lower halves of the

hereinafter-described shafts forming part of said ankle-joint. Said joint consists of an inner tubular shaft 8, to which is secured a centrally-arranged collar 9, upon which is formed a downwardly-projecting bolt 10, adapted to project through an aperture 11, extending through said foot portion and connecting with said groove. Exterior tubular shafts 12 and 13 are loosely mounted upon said shaft 8 respectively at opposite sides of said collar and preferably cover the portions of said inner shaft which are not covered by said collar and preferably extend slightly beyond the ends of said inner shaft. The outer ends of said outer shafts are stopped by any suitable removable means, as by screw-plugs 14 and 15, respectively, and said outer shafts have preferably formed thereon external shoulders, as at 16 and 17, respectively, which shoulders are adapted to receive and secure the lower ends of bolts 18 and 19, respectively. Said bolts are adapted to extend upwardly within the hollow portion of said calf portion through apertures formed in the lower end of said calf portion and are secured in said apertures by terminal nuts 21 and 22, respectively, bearing against the upper face of said solid portion. A terminal nut 23 is also mounted upon the lower end of said bolt 10 and is adapted to lie within a recess 24, formed in the sole of said foot portion, and to bear against the roof of said recess to retain said bolt 10 in said foot portion. The lower end of said calf portion is horizontally grooved transversely of the same to receive the upper half of said shafts. Apertures or ports 25 are preferably formed in said inner shaft, through which lubricant may flow from the inner shaft to the interior of the outer tubes, and apertures or ports 26 are preferably formed in each of said outer tubes, through which part of said lubricant may flow to the groove in said foot portion. Said apertures 25 may, however, if desired, be omitted and the lubricant left to find its way around the ends of said inner tube.

In operation said parts are assembled into the positions described and shown in Fig. 1. One of said screw-plugs is then removed, and the shaft 8 is then filled with oil or other



lubricant and said plug is replaced. The joint will then form a self-oiling hinge, connecting said calf portion and said foot portion. In practice I prefer to locate said hinge portion 5 in rear of the central vertical line of said calf portion; but it is obvious that such position may be altered and that said bolt 10 may, if desired, be secured directly to said shaft 8, omitting said collar, and that, if desired, said 10 plugs may be secured in the ends of said inner shaft instead of in the ends of said outer shafts to substantially the same effect, and that other minor modifications may be made in said construction, all within the scope of 15 my said invention.

Having now described my said invention, what I claim, and desire to secure by Letters Patent, is—

20 In an ankle-joint, the combination with the ankle and foot members of an artificial limb of a transverse horizontally-arranged tubular shaft having downwardly-directed ports formed in the wall thereof, and a centrally-

arranged external annular rib, a bolt secured to said rib and to one of said members of said 25 limb, outer tubular shafts, concentric with the first said shaft and loosely mounted thereon in alinement with each other and extending in opposite directions beyond the ends of the first 30 said shaft and adapted to abut against said rib, and having downwardly-directed ports formed in their walls, bolts secured to said outer shafts and to the other of said members of said limb, and removable plugs adapted to 35 close the outer ends of said outer shafts, whereby the inner shaft is adapted to operate as a reservoir to contain lubricating liquids and to distribute said lubricants through said 40 ports to adjoining parts, substantially as described.

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

JOHN A. McKNIGHT.

Witnesses:

JAMES T. WATSON,

WELLINGTON M. BLEWETT.