No. 622,140. Patented Mar. 28, 1899.

W. E. GINN.

ARTIFICIAL LIMB.

(Application filed Aug. 15, 1898.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

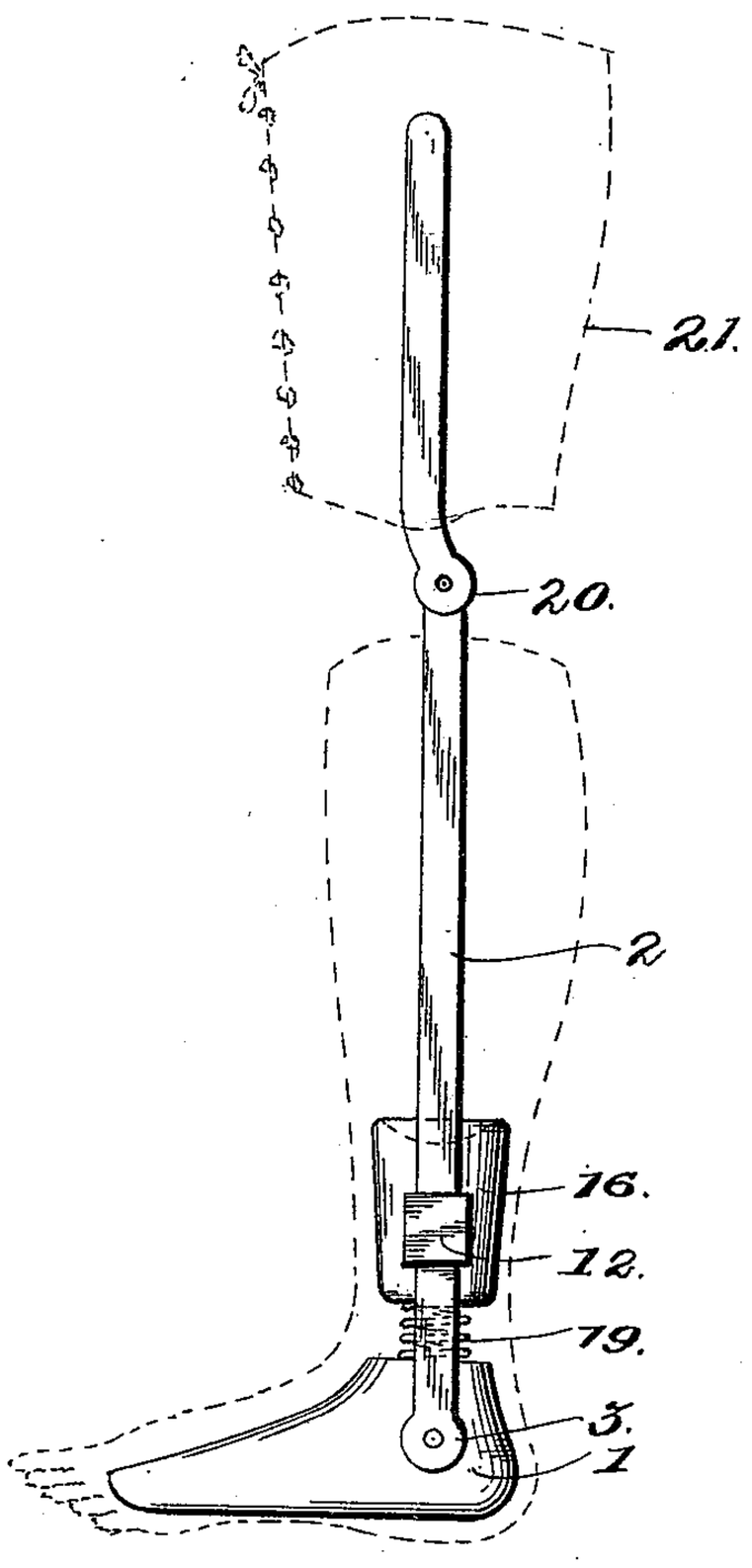
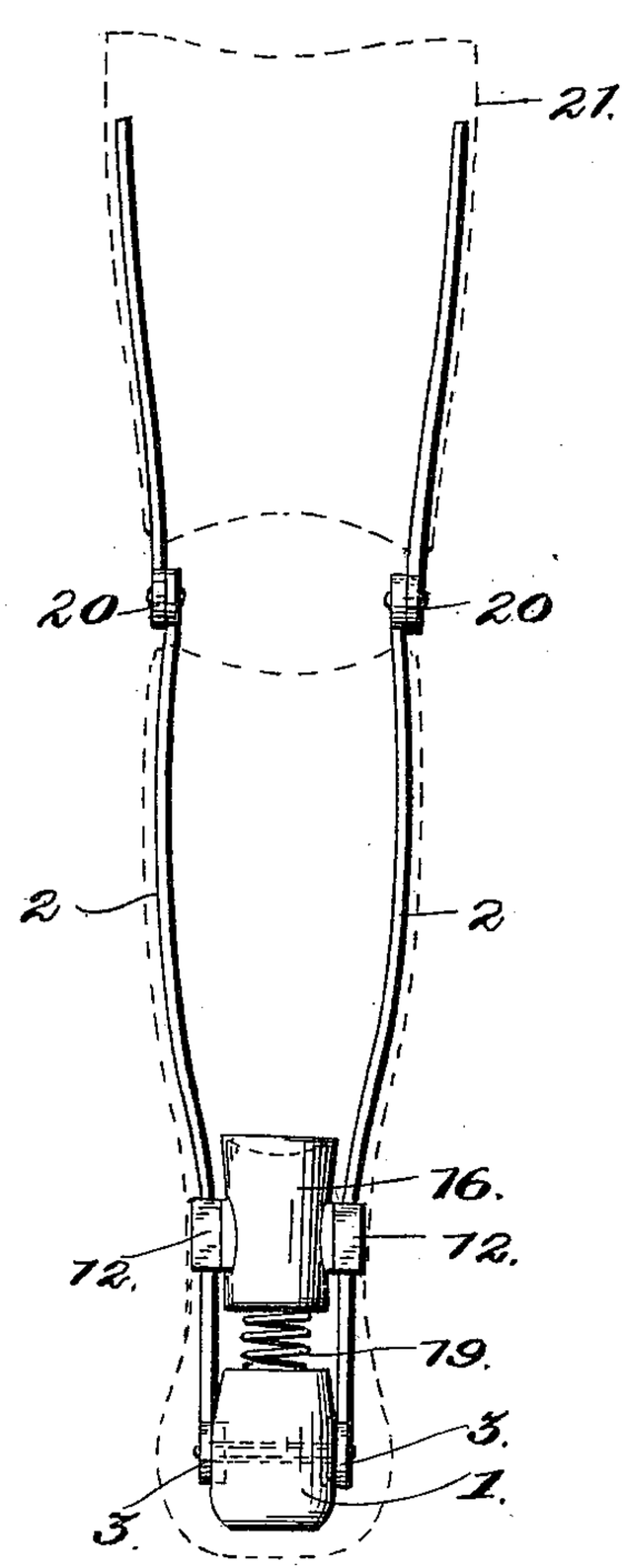


FIG. 2.



WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

FIG. 3.

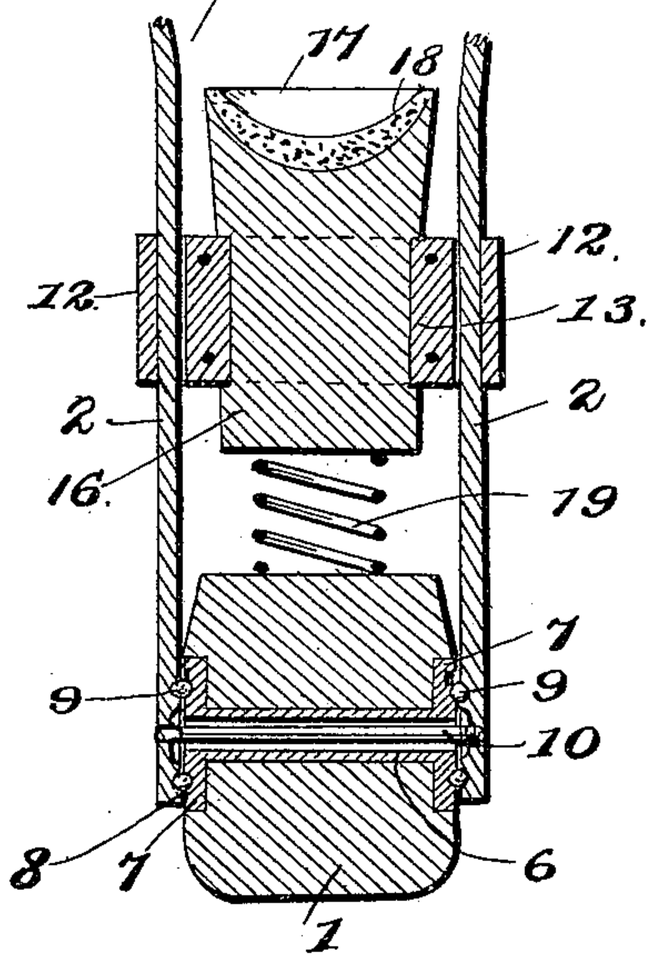


FIG. 4.

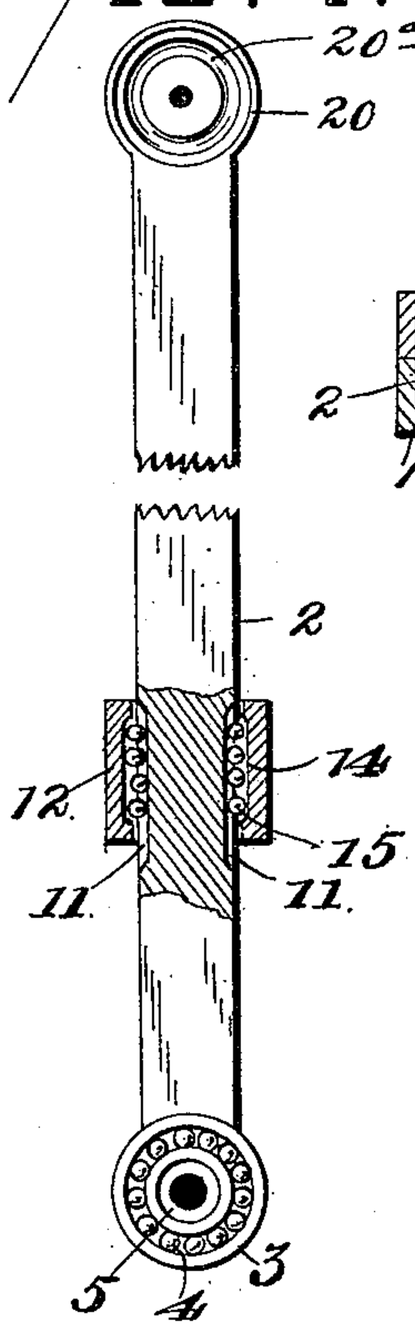


FIG. 5.

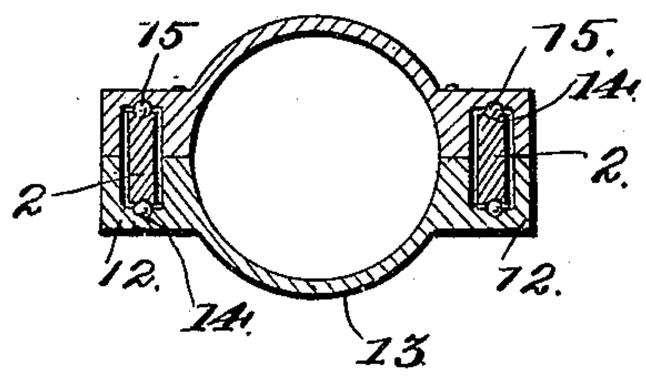


FIG. 6.

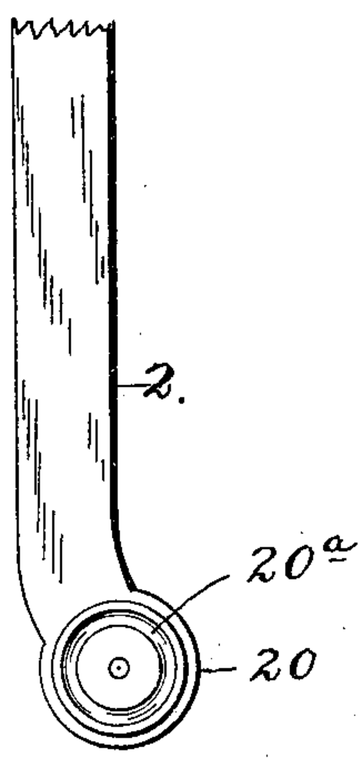
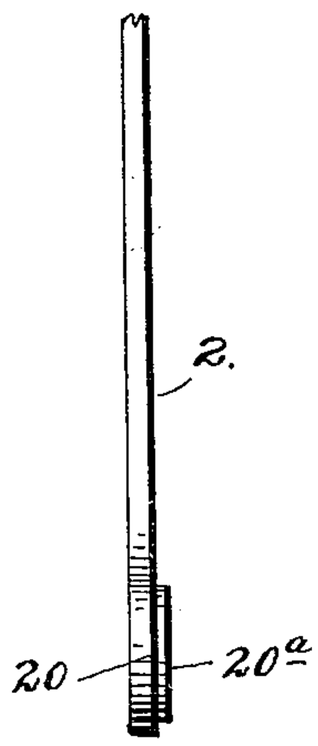


FIG. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM E. GINN, OF PERRY, IOWA.

ARTIFICIAL LIMB.

SPECIFICATION forming part of Letters Patent No. 622,140, dated March 28, 1899.

Application filed August 15, 1898. Serial No. 688,615. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. GINN, a citizen of the United States, residing at Perry, in the county of Dallas and State of Iowa, 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 it consists, essentially, of oppositely-disposed movable braces antifrictionally connected at their lower ends to a foot member and provided with edge grooves above said member to receive antifrictional balls over which slides have operation and connected to a stump-socket located between the braces.

The invention further consists of the details of construction and arrangement of the several parts, which will be more fully hereinafter described and claimed.

The object of the invention is to materially reduce the friction usually existing between the connected parts of artificial limbs and also to completely overcome the disagreeable noise incident to the movement of parts of devices of this character, as well as to produce a more comfortable attachment for the stump or deficient limb.

In the accompanying drawings, Figure 1 is a side elevation of an artificial limb embodying the invention. Fig. 2 is a rear end elevation of the same. Fig. 3 is a transverse vertical section through the lower part of the device. Fig. 4 is a detail view of one of the braces broken away. Fig. 5 is a horizontal section of the socket-holder. Figs. 6 and 7 are detail views of upper parts of the braces which are adapted to be attached to the hip-girth.

Referring to the drawings, wherein similar numerals are utilized to indicate corresponding parts in the several views, the numeral 1 designates a foot member, which may be of any form best adapted to the purpose, as shown by Figs. 1 and 2, and to which an upper leg extension may or may not be connected, as may be desired. The lower ends of oppositely-disposed braces 2 are movably attached to the foot member 1 by means of antifrictional devices. The inner part of the lower end of each brace 2 is formed with a ball-cup 3, comprising a circular ball-groove 4 and a central cavity 5. A tubular bearing 6 is mounted in the rear part of the foot member 1 and has opposite heads 7, which are fitted flush on opposite sides with the adjacent surfaces of the said foot member and have grooves 8 therein. Each groove 8 alines with a groove 4 in the cup 3 when the braces are properly applied, and engaging both grooves are a plurality of balls 9. After the balls 9 and the lower ends of the braces 2 are properly applied against opposite sides of the foot member an articulation is established by means of a transversely-extending rod 10, secured in the said braces and forming a pivot for the movement of the said foot member. A short distance above the antifrictional connection just described and at a suitable elevation above the upper termination of the foot member the braces have grooves 11 constructed in the opposite edges thereof, and over the said grooves and braces at this point slides 12, projecting from opposite portions of the socket-holder 13, are movably mounted and also have interior grooves 14. Antifrictional balls 15 are mounted and move in the grooves 11 and 14, and the length of the said grooves 11 is slightly greater than the said slides, so as to permit the latter to have a predetermined movement for a purpose which will be presently set forth.

The socket-holder 13 is made up of two parts for convenience in application to the braces 2 and also to a socket 16, having an upper recess or depression 17, with a cushion 18 therein to receive the lower end of the stump or deficient limb. The holder 13 surrounds the socket 16, and between the lower end of the latter and the top portion of the upper termination of the foot member 1 a coiled or other spring 19 is interposed to cushion the movement of the socket-holder and have a tendency to restore it to its normal position. The upper portion of the braces 2 have joints 20 of an antifrictional nature and located about the position of the knee of the stump or deficient limb, and to the upper

parts of the said braces a hip-girth 21 is adapted to be secured, as shown in dotted lines, Figs. 2 and 3. In Figs. 4, 6, and 7 the opposite ball-cups 20^a of the joints 20 are clearly shown.

In operation the pressure of the stump or deficient limb on the socket 16 causes the slides 12 to move on the braces 2 and against the resistance of spring 19, and also the swing of the foot member 1 will be accomplished on the pivot-rod 10, both the socket and the foot member having an easy movement through the antifrictional devices operating therewith. The addition of the antifrictional devices to the general arrangement of the parts as heretofore set forth increases the strength and durability of devices of this character and at the same time preserves an exceptional lightness of structure. The form of artificial limb shown is intended to be applied to a stump or deficient limb produced by amputation at a point below the knee-joint, and where the device is to be applied to a stump or deficient limb produced by amputation above the knee-joint the joint will be correspondingly arranged and increased, if necessary, under various conditions and at the same time preserve all the advantages of the antifrictional attachments.

It is obviously apparent that changes in proportions, dimensions, and minor details of construction may be resorted to without departing from the nature or spirit of the invention or sacrificing any of the advantages thereof.

Having thus described the invention, what is claimed as new is—

1. In an artificial limb, the combination of a foot member and bearing-tube mounted therein having heads at opposite ends provided with ball-grooves, opposite braces having ball-cups on the lower ends thereof, balls in said cups, a connecting-rod passing through the cups and heads, a stump-socket carried by said braces, and means for the attachment of the latter.

2. In an artificial limb, the combination of a foot member, oppositely-disposed braces pivotally attached thereto and having grooves in opposite edges above said member, a socket-holder having slides on opposite sides moving over the grooves in said braces, balls in the said grooves, a socket carried by the said holder, a spring between the lower end of the holder, and a foot member and means for fastening the brace to the deficient limb.

3. In an artificial limb, the combination of a foot member, opposite braces with upper antifrictional joints and also antifrictionally and pivotally connected to said foot member and having grooves in the opposite edges above said member, a yielding socket member having slides attached thereto engaging said braces and formed with grooves therein, balls held in the edge grooves of the braces and the grooves of the slides, and means for attaching the braces to the deficient limb.

4. In an artificial limb, the combination with a foot member, of braces movably attached thereto and having grooves in opposite edges, a socket-holder having slides engaging said braces and also provided with grooves, and balls fitted in grooves in the braces and slides.

5. In an artificial limb, the combination with a foot member, of braces movably connected thereto, a socket-holder movable on said braces and located above said foot member, and a spring interposed between and bearing upon the highest surface of the foot member and the bottom of the socket-holder.

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

WILLIAM E. GINN.

Witnesses:
S. M. THORNLEY,
E. F. ELLIOTT.