G. R. E. MILLIGAN.

ARTIFICIAL LIMB.

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1,090,327.

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Fig. 1.

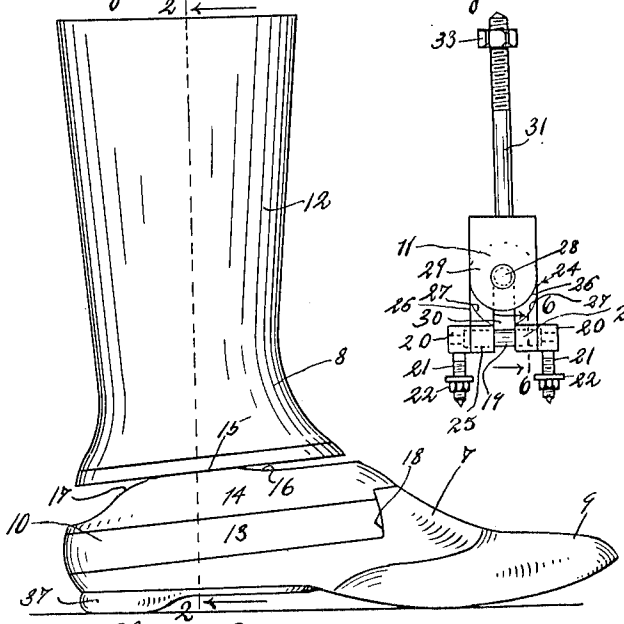


Fig. 5.

Fig. 2.

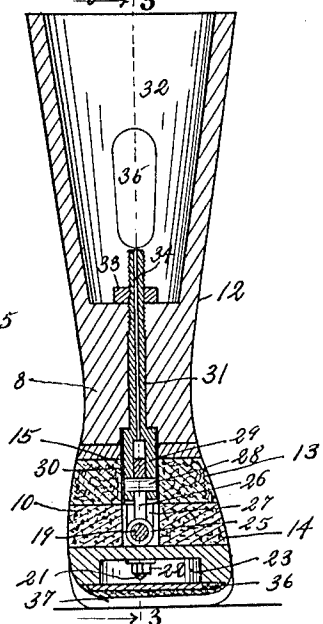


Fig. 3.

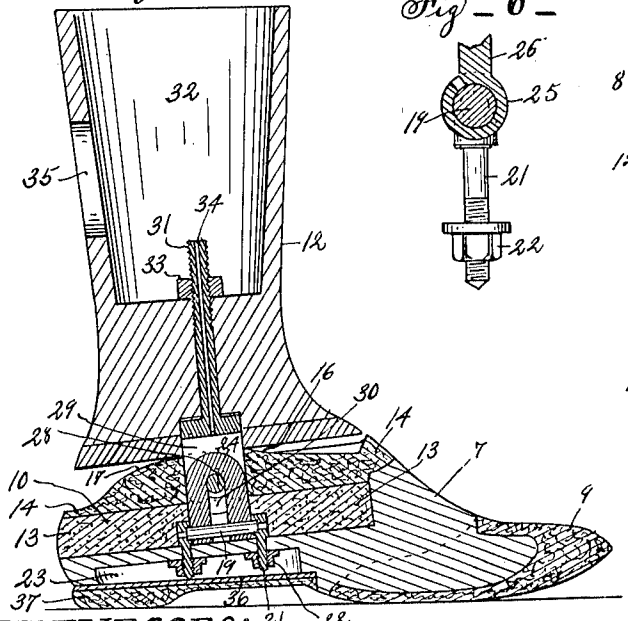
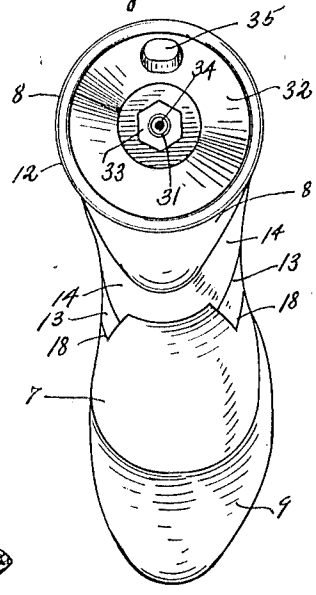


Fig. 6.

Fig. 4.



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ARTIFICIAL LIMB.

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To all whom it may concern:

Be it known that I, GEORGE R. E. MILLIGAN, a citizen of the United States of America, residing at Los Angeles, county of Los Angeles, State of California, have invented a certain new and useful Artificial Limb; 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 may be said to consist in the provision of the novel and advantageous features and in the novel and improved construction, arrangement, and combination of parts and devices as will be apparent from the description and claims which follow hereinafter.

Objects of the invention are to provide a novel and improved ankle joint which is strong and durable, constructed to provide a comparatively large bearing surface and to avoid wear or any loose, wabbly, or imperfect action of the joint when the weight of the user is thrown on the foot portion, affords a firm and secure connection between the leg and foot portions of the artificial limb, effective in action, and formed to permit oiling of the parts at will.

Further objects of the invention are to provide a novel and improved artificial limb which is simple in construction, economical to manufacture, maintain, and use, easy and comfortable to use, noiseless, efficient in service, and possessed of features which make it more satisfactory in use than other devices of this class.

Other objects and the advantages of the invention will be apparent to those skilled in the art from a consideration of the following description of the preferred form of construction embodying the invention, taken in connection with the accompanying drawings in which—

Figure 1 is a side elevational view of the artificial limb; Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1; Fig. 3 is a sectional view of the artificial limb taken on the line 3—3 of Fig. 2; Fig. 4 is a top plan view of the artificial limb; Fig. 5 is an elevational view of the improved universal ankle joint mechanism; and Fig. 6 is an enlarged partly broken and sectional view taken on the line 6—6 of Fig. 5.

The foot portion 7 of the artificial limb 8 is formed with a flexible toe portion 9 and it has on its upper part the improved cushioning means 10 through which passes the improved universal ankle joint 11 which is connected with the foot portion 7 and with the leg portion 12 of the artificial limb.

The cushioning means 10 consists of a rubber block 13 which rests on the foot portion 7 and has secured fast thereon a block 14 of compressed felt or the like which is formed with a raised portion 15 and with downwardly inclined portions 16 and 17 at the front and to the rear of the raised portion 15; the forward end portions of the blocks 13 and 14 being preferably rounded and disposed in a recess 18 formed in the foot portion 7 to aid in holding the cushioning means in place on the foot portion 7.

As shown, the ankle joint 11 consists of a comparatively long pivot pin 19 arranged in the lower part of the cushioning means 10 in longitudinal relation to the foot portion 7 and having the end portions thereof mounted on the preferably flattened upper end portions 20 of vertical bolts 21 which latter pass through the foot portion 7 and are secured to the foot portion by nuts 22 on the lower ends of the bolts in a recess 23 formed in the underside of the foot portion 7. A U-shaped link 24 has the lower portion 25 of the legs 26 thereof enlarged and pivotally mounted on the pin 19 adjacent to the upper end portions 20 of the bolts 21; said lower portions 25 being formed with curved shoulders 27 thereon. Between the legs 26 is movably arranged a round bar 28 which is connected to the cheek plates 29 disposed adjacent to the opposite sides of the U-shaped link 24; the lower ends of the cheek plates 29 being rounded and adapted to contact with the shoulders 27 when the weight of the user is thrown on the artificial limb. The upper end portions of the cheek plates 29 are slidably arranged in a slot 30 in the lower end portion of the leg portion 12, and they are connected with a stem 31 which extends into the lower part of a cavity 32 in the leg portion 12 and which is secured to the leg portion 12 by a nut 33 which is screwed on the stem 31 into engagement with the bottom wall of the cavity 32. To permit oiling of the ankle joint 11 at will, the stem 31 is provided with a duct 34 through which the oil may pass to the cheek plates 29, thence to the round bar 28 and link 24 to the pin 19.

An opening 35 may be provided in the portion 12 to permit ready access to the cav-

ity 32 for adjusting the nut 33 or introducing oil into the duct 34.

The recess 23 may be covered by the plate 36 which may have affixed thereon a suitable flexible heel 37.

From the foregoing it will be understood that the leg portion 12 normally rests on the raised portion 15 of the cushioning means, and that the construction and arrangement of the ankle joint 11 in connection with the cushioning means 10 permits relative movement between the leg portion 12 and the foot portion 7 in a vertical direction and also in forward or backward or lateral directions. Also it will be noted that the form and arrangement of the cushioning means 10 is such that it is adapted to act most effectively to yieldingly support and cushion the limb and weight of the user in all possible positions of the limb and of the leg portion 12 and foot portion 7. When the user flexes his limb to step forward, the forward ends of the cheek plates 29 move against the cushioning means 10 and the leg portion 12 bears on the inclined portion 16 of the cushioning means. When the forward step is made, the rear ends of the cheek plates 29 move against the cushioning means 10 and the leg portion 12 bears on the inclined portion 17 of the cushioning means.

I claim:

1. An artificial limb comprising a foot portion, a leg portion, cushioning means interposed between the foot portion and the leg portion, and an ankle joint passing through the cushioning means and consisting of a comparatively long pin arranged in the lower part of the cushioning means in longitudinal relation to the foot portion, vertical bolts provided with flattened upper end portions in which the end portions of the pin are mounted, said bolts passing through and secured on the underside of the foot portion, a U-shaped link having the lower portions of the legs thereof enlarged and pivotally mounted on the pin adjacent to the upper end portions of the bolts, said lower portions being formed with curved shoulders thereon, cheek plates disposed adjacent to opposite sides of the U-shaped link and having the upper portions thereof slidably mounted in the lower part of the leg portion, said cheek plates having the lower ends thereof rounded and adapted to contact with said shoulders, a round bar movably arranged between said legs and connected to the cheek plates, and a stem connected with the cheek plates and secured to the leg portion, said stem provided with an oil duct therethrough, substantially as described.

2. An improved artificial limb comprising a foot portion, a leg portion, cushioning means consisting of a block of rubber resting on the foot portion, a block of compressed felt secured fast on the top of the block of rubber and formed with a raised portion on which the leg portion normally rests and with downwardly inclined portions at the front and to the rear of the raised portion, and an ankle joint passing through the cushioning means and consisting of a comparatively long pin arranged in the lower part of the cushioning means in longitudinal relation to the foot portion, vertical bolts provided with flattened upper end portions in which the end portions of the pin are mounted, said bolts passing through and secured on the underside of the foot portion, a U-shaped link having the lower portions of the legs thereof enlarged and pivotally mounted on the pin adjacent to the upper end portions of the bolts, said lower portions being formed with curved shoulders thereon, cheek plates disposed adjacent to opposite sides of the U-shaped link and having the upper portions thereof slidably mounted in the lower part of the leg portion, said cheek plates having the lower ends thereof rounded and adapted to contact with said shoulders, a round bar movably arranged between said legs and connected to the cheek plates, and a stem connected with the cheek plates and secured to the leg portion, said stem provided with an oil duct therethrough, substantially as described.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses at Los Angeles, county of Los Angeles, State of California, this 12th day of August A. D. 1913.

GEORGE R. E. MILLIGAN.

Witnesses:

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ELLA SCOTT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."