F. J. LOWRY.

ARTIFICIAL LIMB.

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1,351,955.

Patented Sept. 7, 1920.

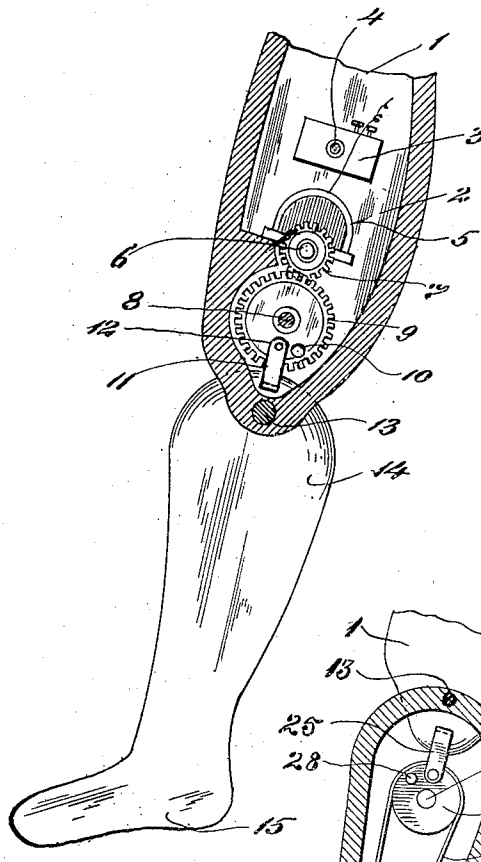


Fig. 1.

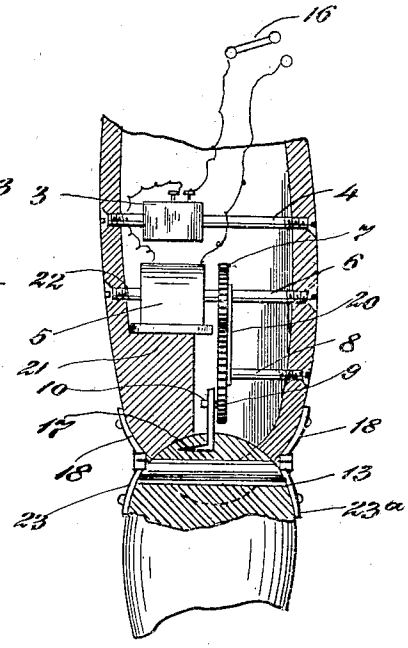


Fig. 2.

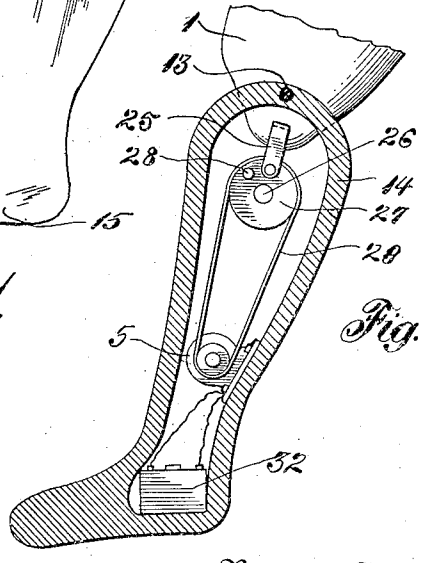


Fig. 3.

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UNITED STATES PATENT OFFICE.

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ARTIFICIAL LIMB.

1,351,955. Specification of Letters Patent. Patented Sept. 7, 1920.

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To all whom it may concern:

Be it known that I, FRANK J. LOWRY, citizen of Poland, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Artificial Limbs, of which the following is a specification.

This invention relates to artificial limbs, and more particularly to means for actuating the same so as to imitate a natural limb when in motion.

The main object of the invention is to provide a mechanism for actuating an artificial leg so that it will imitate a natural leg when in motion.

Another object of the invention is the provision of such a mechanism which is simple in design and construction, and simple in operation and manipulation.

The above and other objects will become apparent in the description below, in which characters of reference refer to like-named parts in the accompanying drawings, which form a part of this application.

Referring briefly to the drawings, Figure 1 is a sectional view of an artificial leg equipped with my device and constructed in accordance with the same.

Fig. 2 is another sectional view of the same, taken on a plane at right angles to that shown in Fig. 1.

Fig. 3 is a view of an alternative structure.

Referring now in detail to the drawings, the numeral 1 represents the upper or calf portion of an artificial leg, which is hollow to the extent shown at 2. A screw 4 passes through and retains a battery 3 in the hollow of said leg. A similar screw 6 passes through said leg below the screw 4, and, together with the screw 8, supports the frame 20. An electric motor 5 is mounted upon the platform or base 21 in the leg 1, being supported also by said frame 20 and the screw 22. A gear 7 is rigid to the shaft of said motor, and engages a gear 9 pivoted to the screw shaft 8. A pin 10 is rigid to the latter gear, near the periphery thereof.

The lower leg portion 14 is pivoted to the upper portion 2 by means of the pin or shaft 13. Plates 18, 18ª, 23, and 23ª surround the exterior of said joint or knuckle to strengthen the same.

A vertical pin 11 is mounted in the upper part of the portion 14, being embedded and secured therein by means of a horizontal spike-like end 17. This pin is prolonged to pass over the lower part of the gear 9 so as to be engaged by the pin 10 in the latter's periphery.

The electric motor 5 is connected, as shown in Fig. 2, connected in series with the battery 3 and the switch 16, the latter being illustrated only conventionally, and being preferably concealed in any convenient position in the clothing or body of the wearer. On closing said switch, the motor 5 will be actuated, thus causing rotation of the gears 7 and 9. It is apparent that such rotation of the gear 9 will cause an intermittent rocking motion of the lower leg 14, owing to the intermittent contact between the pin 10 and the pin 11. Thus, by a proper adjustment of the speed of the motor, or the length of the pin 11, the artificial leg may be caused to move in imitation of a normal leg, and, for a person who has one natural leg and the other artificial and equipped with my device, it will appear as though he has both natural legs.

Referring to Fig. 3, in which I have illustrated a modification of my device, the actuating mechanism of the lower limb is all contained in said lower limb. The battery 32 is contained in the hollow of the foot portion, and the motor 5 is secured to the wall of the inside of the lower leg. A pin wheel 27 is mounted rotatably upon a shaft 26 in the upper portion of the lower limb 14, said wheel having a rigid pin 28 on its face, which rotates with said wheel. The latter is rotated by the belt 29 driven from the motor 5. The pin or lug 25 is secured to the upper leg 1, as shown, below the joint 13, and said pin projects into the orbit of the pin 28. It is apparent that, upon rotation of said pin 28, during a part of each rotation the same will strike the lug 25 and thereupon cause the lower leg portion to rise forward about the joint 13, and so continue to rise until the pin 28 has cleared the lug 25, whereupon the lower leg 14 will again fall. This repeated motion will give a motion to the lower leg in imitation of that of a man's leg in walking.

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

1. In an artificial leg, means for actuating the lower portion thereof in imitation of a natural limb comprising an electric motor, a source of electrical energy, and means actuated by said motor to impart intermittent

motion to said limb comprising a member rigid to said leg on one side of the knee joint, a member rotatably mounted in said leg on the other side of said joint, and means on said last-named member for intermittently engaging said rigid member during rotation of said last-named member.

2. In an artificial limb, comprising an upper portion and a lower portion pivoted to said upper portion, the said upper portion being hollow, an electric motor and battery mounted therein, gears rotated by said motor, a horizontal pin on the lowermost of said gears, a vertical pin embedded in the said lower portion and passing upward so that said vertical pin engages said horizontal pin during rotation of said lowermost gear, said rotation thereby imparting intermittent motion to the said lower portion of the limb.

3. In an artificial limb, comprising an upper portion and a lower portion pivoted to said upper portion, the said upper portion being hollow, an electric motor and a battery mounted therein, gears rotatable by said motor, a horizontal pin on the lowermost of said gears, a vertical pin embedded in the said lower portion and passing upward so that said vertical pin engages said horizontal pin during rotation of said lowermost gear, said rotation thereby imparting intermittent motion to the said portion of the limb, a shaft providing said aforementioned pivotal connection between said upper and lower portions, braces on the outside of said portions about said pivot, and screw supports for said motor, battery, and gears.

4. In an artificial limb, comprising an upper portion and a lower portion pivoted to said upper portion, the said upper portion being hollow, an electric motor and a battery mounted therein, gears rotatable by said motor, a horizontal pin on the lowermost of said gears, a vertical pin embedded in the said lower portion and passing upward so that said vertical pin engages said horizontal pin during rotation of said lowermost gear, said rotation thereby imparting intermittent motion to the said lower portion of the limb.

In testimony whereof I affix my signature.

FRANK J. LOWRY.