

T. Uren,
Artificial Leg,

No 39,599,

Patented Aug. 18, 1863.

Fig. 1

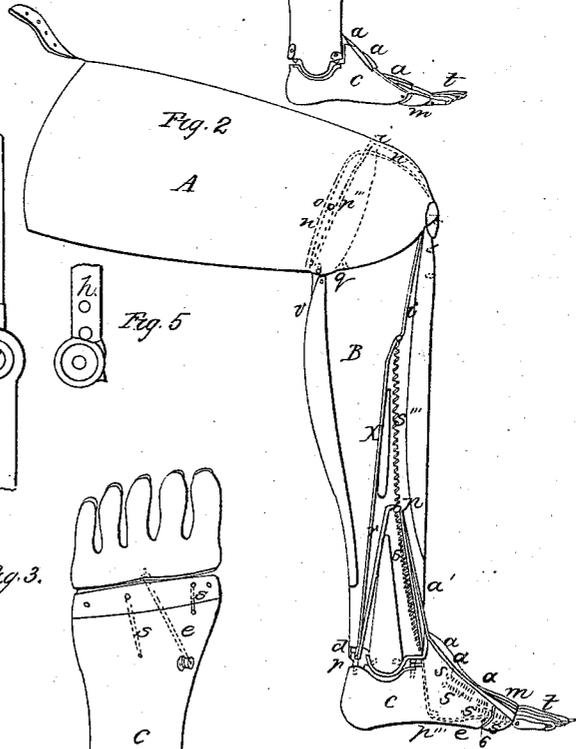
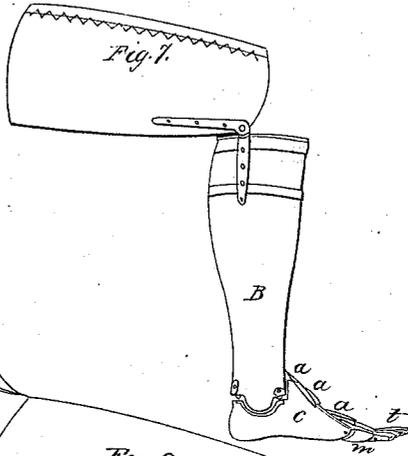
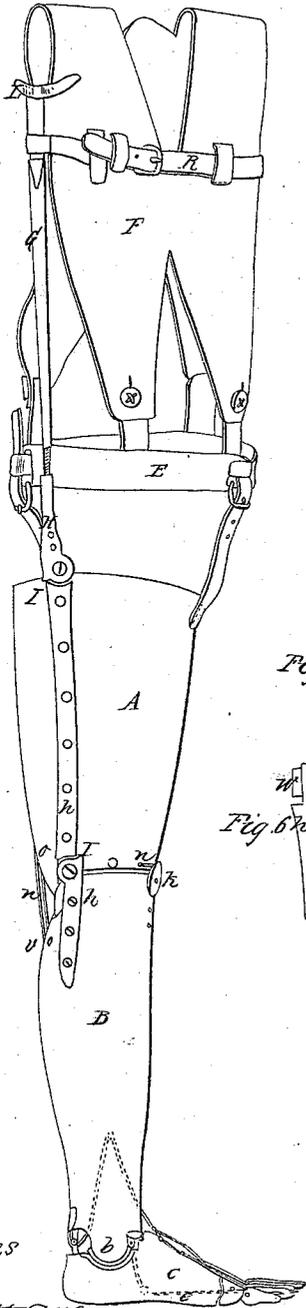
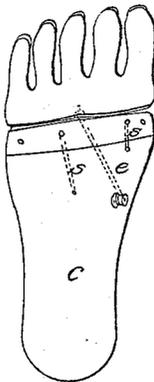


Fig. 4.



Fig. 5

Fig. 3.



Witnesses
J. L. Dimeau
Chas. R. Bond

Inventor,
Thomas Uren

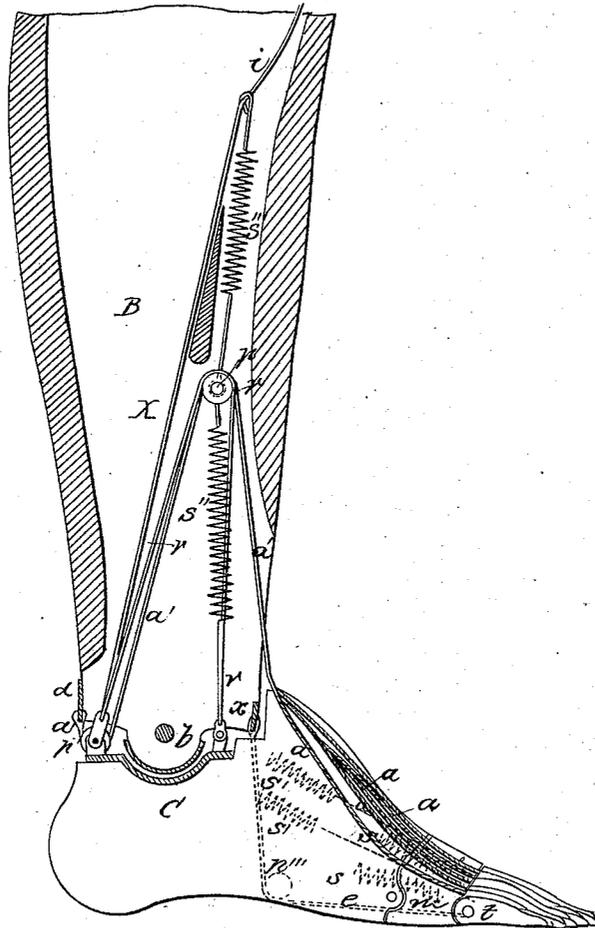
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Fig. 8.



Witnesses:

Wm. D. Dimmock.

Chas. H. Bond.

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Thomas Uren.

UNITED STATES PATENT OFFICE.

THOMAS UREN, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN ARTIFICIAL LEGS.

Specification forming part of Letters Patent No. 39,599, dated August 18, 1863.

To all whom it may concern:

Be it known that I, THOMAS UREN, of the city and county of San Francisco, and State of California, have invented a new and Improved Artificial Leg; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 represents an artificial leg and thigh with the various attachments. Fig. 2 represents the leg and thigh with a portion of the lower limb removed, so as to show the internal arrangement. Fig. 3 represents the sole of the foot. Figs. 4, 5, and 6 represent portions of the joints or hinges. Fig. 7 represents an artificial leg to be used when amputation has taken place below the knee. Fig. 8 represents an enlarged view of the foot and leg represented in Fig. 2.

A is a leather socket to fit upon the thigh. The lower end of this socket terminates in a block of wood of hemispherical form.

B is the leg attached to the socket or thigh A by the strap-hinges *h*. The lower extremity of the leg, as shown at *b*, is convex in form and fits into a corresponding cavity in the foot C.

C is the foot, and is formed in three parts—viz., the main foot, a portion, *m*, corresponding to the metatarsal bones, and the toes *t*—each part being hinged to its corresponding part by joints formed of a convex surface working upon a corresponding concave surface, hinged horizontally in the center, so as to give an upward and downward motion similar to that of the natural joints.

m represents the metatarsal joint, and *t* the toes.

s s are spiral springs connecting the lower part of the metatarsal joint *m* with the foot C. *s s* are also spiral springs connecting the upper part of the toe-joint with the foot.

a a a are cords representing tendons, attached at their lower ends to the upper side of the toes *t*, and at their upper ends to a strap, *a'*, which strap passes upward over a pulley, *p*, in the leg, thence downward round the pulley *p'*, attached to the heel of the foot, thence upward, and is fastened to the lower and hinder part of the leg at *d*. A cord or strap, *e*, is attached to the under side of the toes *t*, passes thence round the pulley *p'''*, thence upward to

the front and lower part of the leg, to which it is attached at *x*.

r is a cord or strap attached at its lower end to the instep, thence passing upward over the double pulley *p*, thence downward to the heel, where it is fastened. The foot is attached to the leg by a pin at *b*, which passes through a staple in the center of the joint. The convex part of this joint is a little thicker in its center, so as to allow of a very slight lateral motion, and between the two surfaces of the joint a piece of leather is placed, so as to prevent any rattling.

s'' is a spiral spring attached at its upper end to the same pin which holds the pulley *p*, and at its lower end to the instep. *s'''* is also a spiral spring, attached at its lower end to the pin of the pulley *p* and terminating at its upper end with a strap, *i*, which strap passes over the knee and across the upper surface of the wooden block forming the knee, and is fastened by a screw at *q*, or any other convenient point. Attached to the upper and front part of the leg is a double cord or strap, *n*, the two parts of which pass thence to the knee-cap *k*, to which they are fastened; thence they pass one on each side through the thigh over pulleys *o*, and are attached to the upper and hinder part of the leg, as shown at *v*.

x is a strap or cord, known as the "tendo Achilles," for raising the heel when the wearer is in a sitting posture.

The hinges *h* are of a peculiar construction, one portion being countersunk, forming a sort of a cup, as shown in Fig. 5. The other part of the hinge has a corresponding shoulder, as shown at *W* in Fig. 6, which represents an end view. The parts are held together by screws or rivets. All the wear is upon the outer edge of the shoulder *W*, and upon the inside face of the cup, entirely relieving the screw or rivet both from strain and wear.

E is a belt, to be worn above the hips, to which the socket or thigh A is attached by straps.

To prevent the weight of the leg dragging too much upon the hips, a jacket, F, is used, to which the belt E is buttoned, or otherwise fastened.

Another and valuable part of my invention is the crutch G, formed in three parts, made of steel or other suitable material. The lower part, H, is hinged to the upper part of the socket

or thigh A by the shoulder and socket hinge hereinbefore described, the projection or catch I preventing the crutch from falling backward. A screw-thread is cut in the upper end of the part H, also a corresponding thread upon the lower end of G for the purpose of lengthening or shortening the crutch. The head L of the crutch turns on a swivel, to accommodate itself to the movement of the shoulders.

R is a belt, for the purpose of keeping the upper part of the crutch in place.

The leg or lower limb, as shown in Fig. 7, is similar to what has been above described, except that the spring s''' , the cord or strap X, the knee-block, and straps or cords connected therewith are dispensed with.

Operation: The socket A is fitted to the stump of the thigh, and is attached to the belt E, which may be used either with or without the jacket F and crutch G, or either of them, the belt R being used only when the crutch is used. When walking, the pressure upon the heel throws the instep down, drawing upon the cord e , bringing the toes firmly down upon the ground. In lifting the foot to step forward, the spring s'' draws up the instep, and the springs $s' s'$ raise the toes, so that in stepping they clear the ground, allowing the wearer in walking upon level ground or up stairs to do so without the usual awkward lateral swinging motion so common in using artificial legs. The cord or strap r is useful in giving steadiness to the ankle-joint. The cords $a a a$ and cord or strap a' are useful in case the springs $s' s'$ should give way. They also, when covered, contribute to the symmetry of the foot, representing the natural tendons. When the knee is bent, as in the act of sitting, the strap i is drawn taut, the spring s''' is dis-

tended, the cord or tendo Achilles x raises the heel, and the toes are brought firmly to the ground, as in the act of walking. When the wearer is in a sitting posture, by bending the knee the cords n draw the knee pan k hard against the strap i in the manner of a brake, holding the joint in whatever position the wearer desires.

The cords n are useful in keeping the knee-joint firm. All the straps and cords can be shortened whenever necessary.

The leg, when finished, should be covered with leather or other suitable material.

I claim—

1. In combination with the toe and metatarsal joints, the cord e and springs s and s' , for raising and lowering the toes and metatarsal joint, substantially as herein described.

2. The cords a and strap or cord a' , in combination with the pulleys p and p' , substantially in the manner and for the purpose set forth.

3. In combination with pivoted foot C, the strap r , passing over pulley p , for the purpose of giving steadiness to the ankle-joint, substantially as herein described.

4. The knee-pan K, in combination with the cords n and pulleys o , for the purpose of retaining the leg in any desired position while in a sitting posture, substantially in the manner herein described.

5. In combination with the tendo Achilles strap X, the strap i , and spring s''' , substantially in the manner and for the purpose herein set forth.

THOMAS UREN.

Witnesses:

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