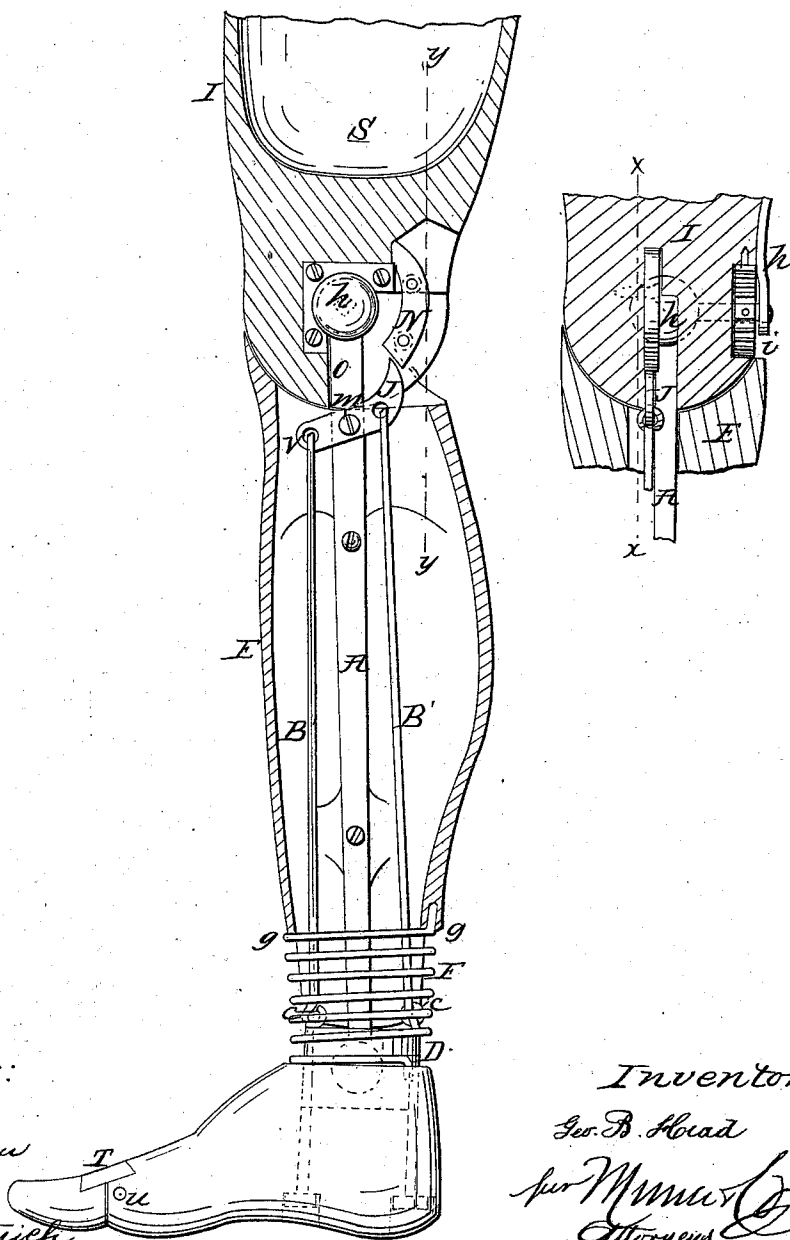


*G. B. Heald,*  
*Artificial Leg.*  
*N<sup>o</sup> 83,496.      Patented Oct. 27, 1868.*



*Witnesses:*

*Amos Morgan*

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*per Wm. L. G.*  
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# United States Patent Office.

GEORGE B. HEAD, OF ALBANY, NEW YORK.

Letters Patent No. 83,496, dated October 27, 1868.

## IMPROVED ARTIFICIAL LEG.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, GEORGE B. HEAD, of Albany, in the county of Albany, and State of New York, have invented a new and useful Improvement in Artificial Limbs; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to the construction of artificial legs, and consists in the construction and arrangement of the parts by which the necessary movements are produced, but more particularly in the method of operating the knee-joint.

Figure 1 is a longitudinal section of the limb, through the line *x x* of fig. 2, showing the operating-parts, and the method of their arrangement.

Figure 2 is a sectional detached view through the line *y y* of fig. 1.

Similar letters of reference indicate corresponding parts.

A is the metallic stand or main bar, which is attached to the foot by a ball-and-socket joint.

B B' represent rods, which at their bottom ends are connected to the box of the socket-joint by eyes, as seen in the drawing at *c c*.

D is the box of the socket-joint, which is attached to the foot by screw-rods and nuts, as seen in dotted lines in the drawing.

E represents the lower part of the leg, which is connected with the foot and with the knee by the stand A.

F represents a spiral spring, which surrounds the ankle and the upper portion of the box D.

It also encloses and keeps in place the lower end of the part E, which has a shoulder around it, as seen at *g*, which bears on the spring.

By this arrangement of the spring E, the required flexibility of the foot and ankle is secured, and the motions of the natural foot are obtained.

The upper end of the stand A is secured at the knee by a flat disk-joint, *h*, which, like all joints of this description, only allows of a motion in a direction parallel with the sides of the disk.

The pivot on which the joint is made, is square through the disk, and at its other end it is connected to a coil-spring, *i*, which is placed in a recess on the opposite side of the knee, as seen in the view given in fig. 2.

When the knee-joint is bent, (as in the act of stepping,) so that the upper part, I, of the leg stands at an angle with the lower part, E, the spring *i* will be strained or coiled by the action of bending the knee.

This is for the purpose of throwing forward the leg when the foot is raised from the ground.

When the leg is straight, or in the position seen in the drawing, it is stiff, or locked by the short bar J.

This bar is secured to the stand A by a pivot-hinge, *m*, on which it turns or rocks in the act of walking.

It will be seen that the upper ends of the rods B B' are loosely attached to this bar J, and that the toe of the bar J is in contact with the stop-plate N, which plate is secured in a recess in the knee.

While the toe of the bar J and the stop-plate N are thus engaged, the knee-joint is stiff, as before stated,

and the knee must assume this position at every step or every time the lower leg E is thrown forward by the recoil of the spring *i*.

The bar J and stop N are disengaged, by bearing upon the toes or ball of the foot in the act of walking.

This action (which is allowed by the flexibility of the ankle) draws down the rod B', and releases the toe of the bar J from the stop-plate N.

This disengagement continues until the foot is raised from the ground, when the recoil of the spring *i* throws the leg forward into the position shown in the drawing, or locks it back again, ready for another step.

The knee-joint is so formed, that the stand A acts as a stop for the upper part of the leg I, at the point marked O.

The outer end of the pivot on which the knee-joint is formed, is supported by a metallic strip, *p*, as seen in the drawing.

S represents the socket for the stump.

The upper and the lower parts, E and I, as well as the foot, may be made of wood or of any other suitable material.

The interior or working parts are made of steel or other suitable metal or material.

The toe of the bar J, as well as the end of the plate N, should be well hardened, to prevent unnecessary friction.

T represents a spring, of rubber or other elastic substance, for obtaining flexibility to the toe.

The toe is jointed to the foot by a pivot-pin, *u*, as seen in the drawing.

By this method of constructing an artificial leg, all the necessary motions or movements are obtained in a very simple manner, and with the employment of but few parts.

By the use of a spring, connected with the end, *v*, of the bar J, arranged in a proper manner, the rod B may be dispensed with, but I prefer the arrangement shown.

I claim as new, and desire to secure by Letters Patent—

1. The bar J, in combination with the stand A, connected with the foot by one or more rods, and operated for unlocking the knee-joint, substantially as shown and described.

2. The combination of the bar A, and the disk-joint *h*, and its square pivot, with the coiled spring *i*, whereby the leg is thrown forward, substantially as described, for the purpose specified.

3. The stop N, in combination with the bar J, substantially as and for the purposes set forth.

4. The combination of the bar J and rods B B' with the stand A, knee-joint and foot, whereby the pressure of the toe or ball of the foot upon the ground, in the act of walking, relieves or unlocks the knee-joint, substantially as described, for the purpose specified.

The above specification of my invention signed by me, this 24th day of August, 1868.

GEORGE B. HEAD.

Witnesses:

FRANK BLOCKLEY,  
ALEX. F. ROBERTS.