J. CONDELL.

ARTIFICIAL LEG.

No. 48,792. Patented July 18, 1865.

Fig: 3.

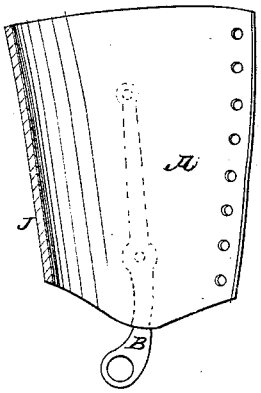


Fig: 4.

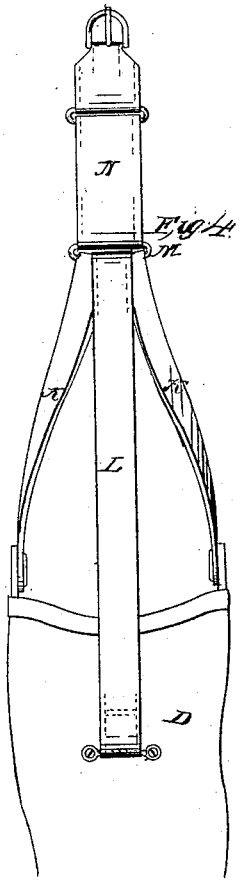


Fig: 5

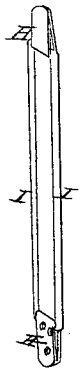


Fig: 1

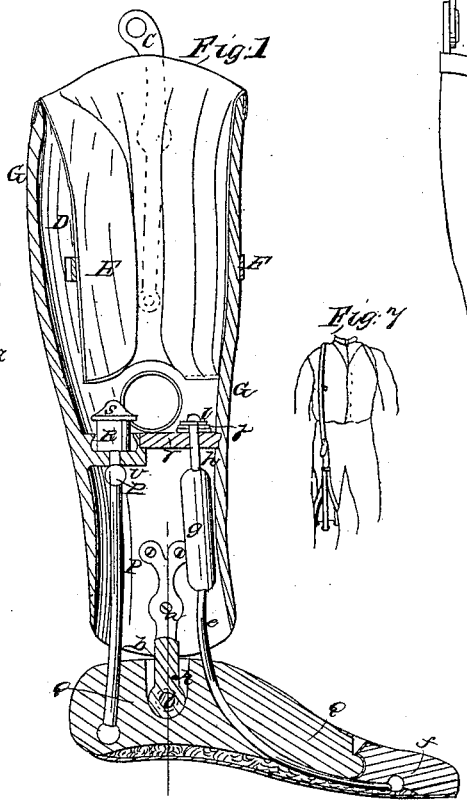


Fig: 6

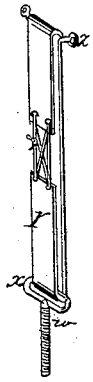
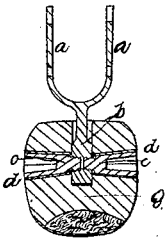


Fig: 7

Fig: 2.



UNITED STATES PATENT OFFICE.

JOHN CONDELL, OF MORRISTOWN, NEW YORK.

IMPROVEMENT IN ARTIFICIAL LEGS.

Specification forming part of Letters Patent No. **48,792**, dated July 18, 1865.

To all whom it may concern:

Be it known that I, JOHN CONDELL, of Morristown, in the county of St. Lawrence and State of New York, have made certain new and useful Improvements in Artificial Legs; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, reference being had to the annexed drawings, which are made part of this specification, and in which—

Figure 1 is a vertical sectional view of the leg from front to rear. Fig. 2 is a vertical section from right to left through the axial bolt of the foot on the line *x x*, Fig. 1. Fig. 3 is a vertical section of the lacing thigh-piece, which is united to the leg-socket by the strap-hinge. Fig. 4 is the appendage by which the leg is supported and held up to the stump. Fig. 5 shows the method of suspension of the leg by elastic straps from a yoke.

Similar letters of reference indicate corresponding parts in the several figures.

This artificial limb is intended for amputations below the knee; and the special points of improvement are, first, in the attachment by which the leg is suspended; secondly, in the central bar whose oscillations give the ankle-joint motions, and which is secured by means of a bolt from each side of the foot.

To enable others skilled in the art to which my invention appertains to fully understand and use the same, I will proceed to describe its construction and operation.

A is the thigh-piece, which is laced to the thigh of the patient, and to it are attached two bars, B, and the fellow to it, (not shown,) which are jointed to C and its fellow, which project from opposite sides of the leg-socket D.

The socket is provided with a plate, E, which is capable of being drawn against the stump by the strap F as the stump shrinks, or to adapt it to the varying sizes of stumps.

When the stump has a sufficient length, so that the motions of the knee can be controlled by it, the artificial leg is supported entirely by the appendage shown in Fig. 4, which consists of straps K K, which are secured to the sides of the socket D, and an elastic band, L, which is secured in the front of the socket, the straps K K and elastic band L uniting in a keeper, M, from which a stronger elastic strap, N, passing upward, is suspended from a yoke, which is shown in outline in Fig. 7. The action of the straps is to admit of the backward motion of the thigh and the leg, the buckle O, from the way in which it is supported by the yoke-strap over the shoulder, being practically a rigid point. The strap L bends over the knee as the limb is flexed, and assists in the forward motion of the leg when the thigh is moved forward by the wearer.

a a are the branches, and *b* the trunk, of a central bar, which is secured on both sides of the lower end of the leg-frame G. The trunk *b* projects downwardly into a socket, *k*, in the upper side of the foot-piece Q, and has a threaded hole through it, which is occupied by two bolts, *c c*, which are inserted from the respective sides of the foot through sockets bushed with leather, *d*, and are screwed into the said threaded eye of the trunk *b*. By means of this arrangement the trunk *b* has a backward and forward motion without lateral deflection to the extent of the respective anterior and posterior ends of the socket K; but this motion, which is primarily induced by the vibration of the leg and limited in the way stated, is influenced in regard to the foot by the heel-cord P and its spring R, and by the spring *g* and its tendons *e h*. These spring-connections, under ordinary circumstances, prevent such a rearward deflection of the foot relatively to the leg as will bring the trunk *b* in contact with the ends of the socket, but at the same time the said contact presents an ultimate point of deflection and prevents an inordinate pressure or tension upon the said springs which would tend to rupture them. The easy and smooth movement of the joint, with the required pressure to attain that object, is obtained by screwing up the bolts *c* in the sockets, which rotate in immediate connection with the leather bushing *d*.

The heel-cord P is attached at its lower end to the foot Q, and at its upper end is secured by a nut, *s*, which rests upon a spring, R, imposed upon a ledge, U, which forms a part of the frame G, or is attached thereto. An enlarged socket in the upper side of the ledge U retains the spring in its compressed state, and at its extreme depression the nut *s* rests upon the ledge U to prevent the inordinate pressure which might twist the spring. A stopper, T, prevents the jumping of the spring when suddenly relaxed.

The forward spring consists of the muscular portion *g* and the upper and lower tendons, *h e*. The upper tendon is secured to a ledge or rod in the inside of the frame G, and the lower end passes through a channel in the foot Q to the hinged foot-piece *f*. By means of this through-connection a unanimity of motions between the ankle and toe joint is secured.

I do not regard it possible within the moderate limits of a specification to anticipate all the varying requirements of different patients. I have mentioned one that has reference to the size of the stump which is provided for by the plate E; but there are many cases where the length of the stump is such that the ledges U and V would interfere with the end of it. In such a case it becomes necessary to abandon the whole interior of the leg-frame G to the use of the stump, and the springs are located outside.

Having thus fully, clearly, and exactly described the nature, construction, and operation of my improved artificial leg, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The supporting appendage consisting of the straps K K and elastic straps N L, substantially as and for the purpose described.

2. The central bar, *a a b*, in combination with a socketed axial bolt or bolts, *c*, substantially as described.

JOHN CONDELL.

Witnesses:
EDWARD H. KNIGHT,
R. I. GATLING.