

*F. W. Neubert,
Artificial Leg,*

No. 45,169,

Patented Nov. 22, 1864.

Fig. 3

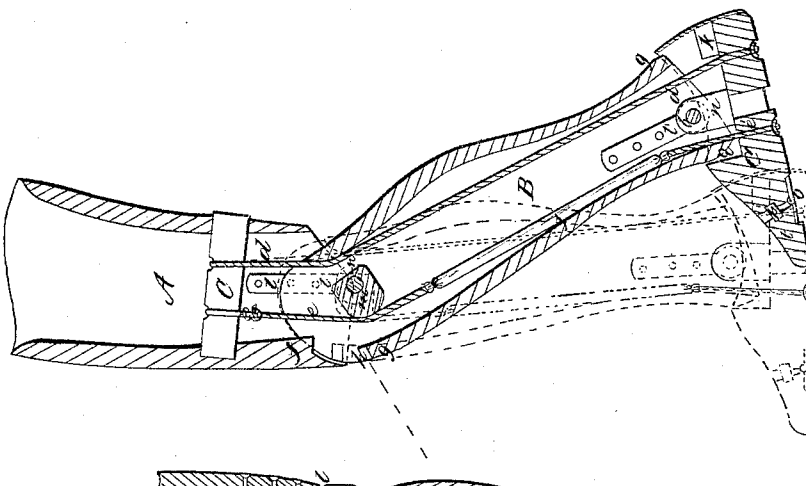


Fig. 4

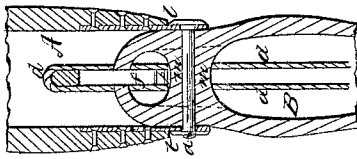


Fig. 2

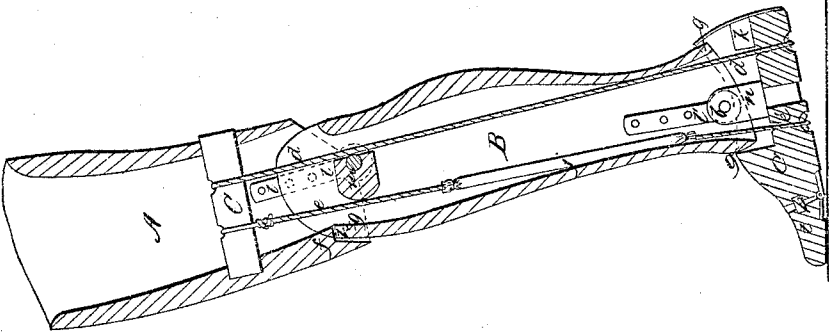
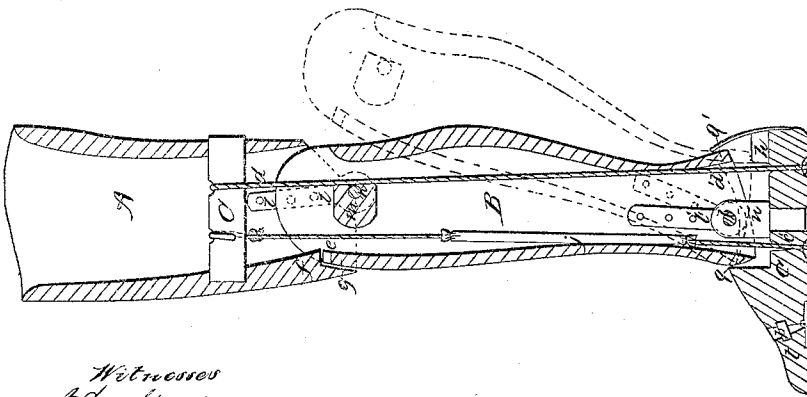


Fig. 1



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UNITED STATES PATENT OFFICE.

F. W. NEUBERT, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN ARTIFICIAL LEGS.

Specification forming part of Letters Patent No. 45,169, dated November 22, 1861.

To all whom it may concern:

Be it known that I, F. W. NEUBERT, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Artificial Legs; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, and of which—

Figures 1 to 3 represent vertical sections through the leg, showing it in different positions, and Fig. 4, a transverse vertical section of the knee-joint.

In all these figures the same letters of reference designate like parts.

A is the upper part of the leg; B, its lower part; C, the foot. *a* is the knee-joint pin; *b*, the ankle-joint pin. The upper leg, A, is provided with a bridge, *c*, to which are attached the cords *d d* and *e e'*, which extend and are fastened to the sole of the foot, the cord *e e'* being made elastic by a piece of india-rubber, *j*, connecting the part *e* of the cord with the part *e'*.

f is a projection or stop at the upper part of the leg, which, when the leg is straight, rests on a shoulder, *g*, of the lower part, B, as shown in Figs. 1 and 2, the contact being cushioned by a piece of india-rubber, *h*, fastened on the shoulder *g*.

The knee-joint is made in the usual way (excepting the position of the fulcrum, which is farther back than in other constructions.) Its pin, *a*, passes through the eyes *l l*, riveted to the part A and the block of wood *m* of the part B of the leg. The ankle-joint is made in a similar manner, its pin *b* passing through the eyes *l' l'*, riveted to the part B and the block of wood *n*, fastened to the foot C.

The butt-end *g g'* of the part B is made so as to enter, all around its circumference, into the corresponding recess in the foot, in contradistinction to the usual mode in which the fore part, *g*, of the butt-end enters into the foot, and the rear part, *g'*, over the heel of the foot. *k* is a block of india-rubber fastened into the heel end of the recess in the foot, forming a cushion for the heel end *g'* of the part B when the leg is in a position as indicated by red lines in Fig. 1.

o is the toe joint, *t*, the toe-piece, made elastic by a piece of india rubber, *p*, inserted between it and the fore part of the foot.

The nature of my improvement consists in the arrangement of the stop *f* and cushioned shoulder *g*, for the purpose of preventing the knee from springing or bending forward beyond a straight position, in combination with the elastic cord *e e'* and cord *d d*, for the purpose of throwing the lower leg forward and giving a slight motion to the foot in stepping forward, as will be more fully shown in the following description of the action of these parts, which, in their combination, produce all the proper steadiness, elasticity, and motions required to make an efficient artificial leg.

The Figs. 1 to 3 exhibit the action, position, and motions of the different parts constituting my improvement, when a person using the leg is in the act of walking. Thus, in Fig. 1 the leg is in a straight and perpendicular position, and the weight of the person rests on it. In Fig. 2 it is in an inclined position before the knee is bent, when a portion of the weight of the person may still rest on it, and in Fig. 3 the leg is shown when the knee (by the action of the stump of the natural leg) is bent. In this position no weight of the body rests on the leg, and being thus relieved of any pressure on it, the action of the elastic cord *e e'* will immediately throw the lower part, B, of the leg forward, as indicated by red lines in Fig. 3, until it acquires again a straight but inclined position as indicated by red lines in Fig. 1. The body in moving forward will bring the leg into the perpendicular position again, as represented in Fig. 1.

The strain of the elastic cord *e e'* has a constant tendency of keeping the leg straight. When the knee is bent, this cord *e e'* lays over the block *m* of the knee-joint, and, being extended thereby, its strain will be still more increased. This cord *e e'*, being attached to the foot in front of the ankle-joint fulcrum, will also constantly keep the fore part of the foot raised up as far as the non-elastic cord *d d* (which is attached to the foot, back of the ankle-joint fulcrum) will permit it. By bending the leg the cord *d d* would get slack without the action of the elastic cord *e e'*; but as soon as the cord *d d* yields the cord *e e'* forces the fore part of the foot up, and the cord *d d* is

under strain again. Thus it will be seen that the fore part of the foot is raised to some degree as long as the knee remains bent. In consequence hereof the fore part of the foot or toes is prevented from rubbing on the ground when the person using the leg is stepping forward.

The mode of constructing the butt-end *g g'* of the part B so as to enter into the foot all around its periphery (as represented in the drawings and described above) has the advantage that a shoe drawn over the foot sits firmly and immovably, while in the ordinary constructions, in which the butt-end *g'* of the lower leg is made to project over the heel of the foot, a friction is produced between said butt-end and the shoe, which prevents a free

action of the foot and is a source of annoyance in walking.

Having thus fully described my improvement, what I claim herein as new, and desire to secure by Letters Patent of the United States, is—

The arrangement of the stop *f* and cushioned shoulder *g* in front of the knee-joint, in combination with the elastic cord *e e'* and cord *d' d'*, arranged and operating substantially as herein described, and for the purpose set forth.

F. W. NEUBERT.

Witnesses:

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