R. H. Nicholas,

Artificial Leg.

No. 56,983. Patented Aug. 7, 1866.

Fig. 1

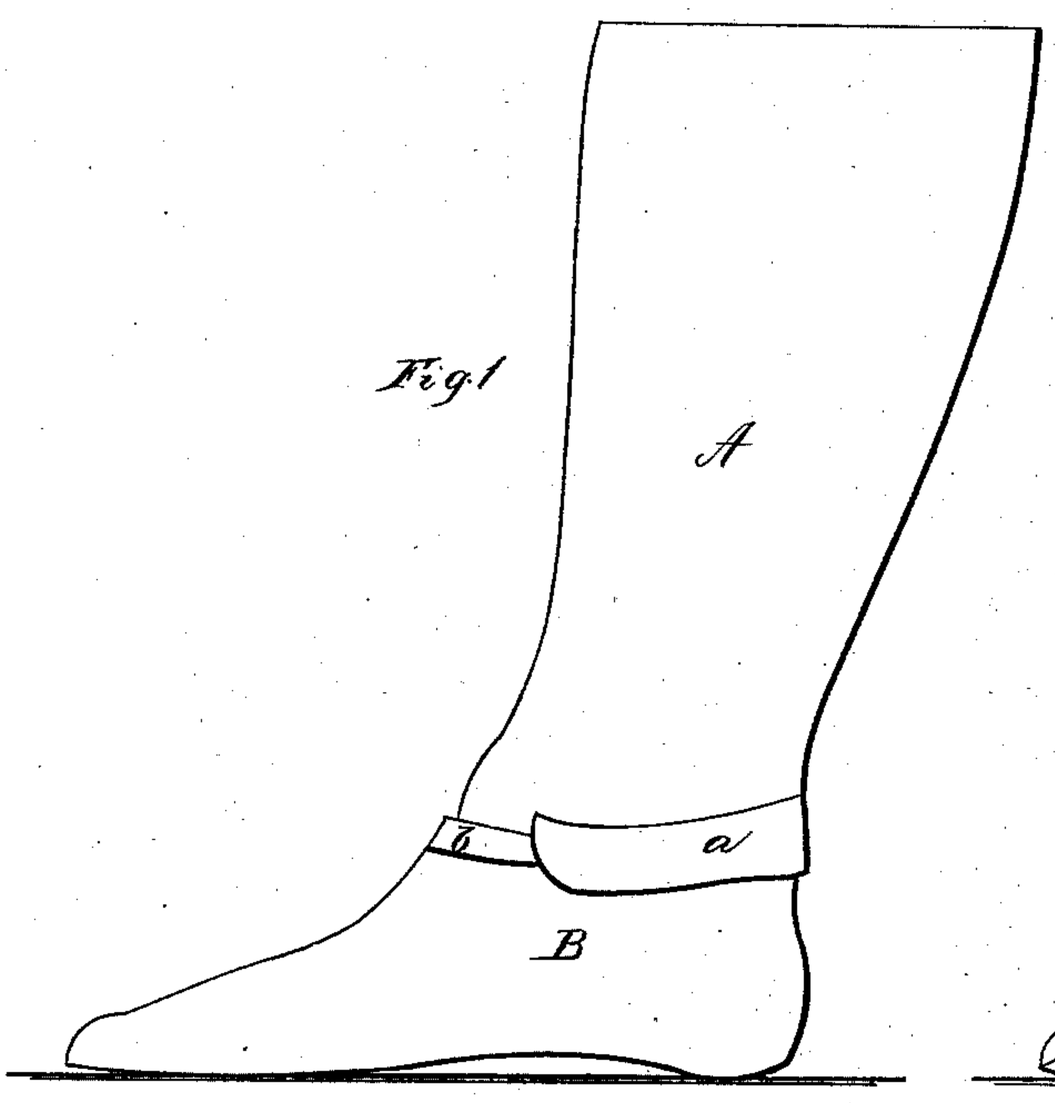


Fig. 2

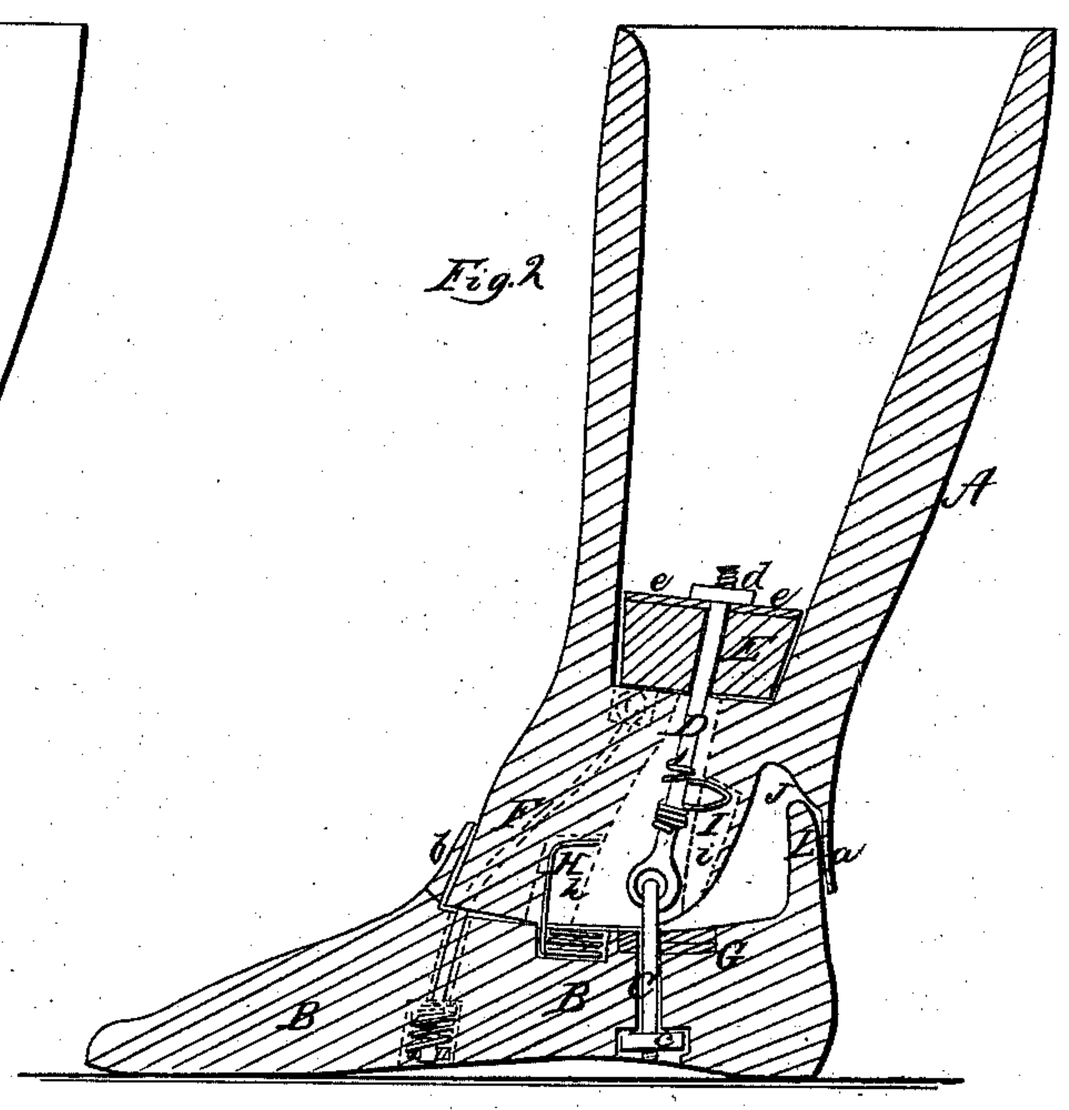


Fig. 3

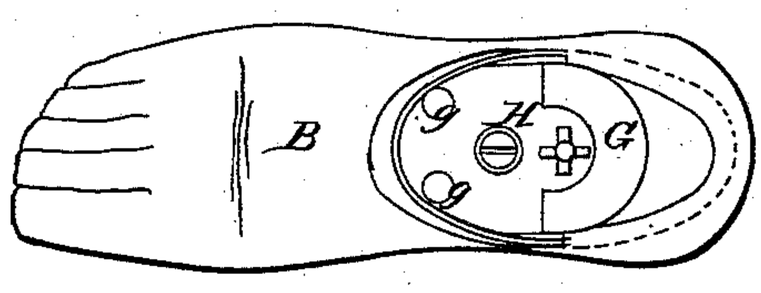
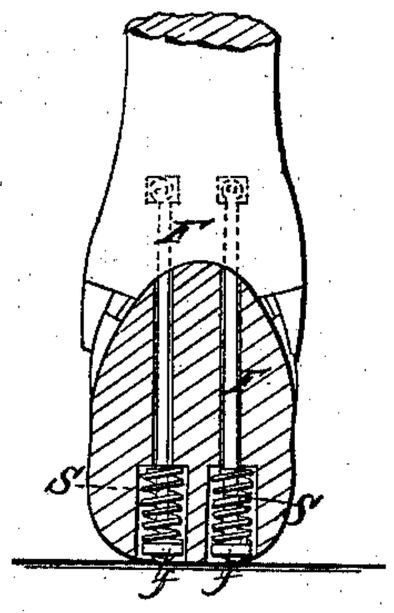


Fig. 4



Witnesses
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UNITED STATES PATENT OFFICE.

ROBERT H. NICHOLAS, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN ARTIFICIAL LEGS.

Specification forming part of Letters Patent No. **56,983,** dated August 7, 1866.

To all whom it may concern:

Be it known that I, ROBERT H. NICHOLAS, of Chicago, in the county of Cook and State of Illinois, 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 same, reference being had to the accompanying drawings, and the letters and figures marked thereon, which form part of this specification.

My said invention relates to the construction of the ankle-joint, or the connection between the foot and leg of an artificial limb; and it consists in a novel mode of forming and connecting said joint, whereby it has substantially all the adjustability and flexibility of the natural joint, allowing a free movement to the foot, so as to adapt it to the natural positions thereof under the varied circumstances and positions in which the limb or leg may be placed.

To enable those skilled in the art to understand how to construct and use my said invention, I will proceed to describe the same with particularity, making reference in so doing to the aforesaid drawings, in which—

Figure 1 represents a side elevation of my invention; Fig. 2, a central vertical section of the same; Fig. 3, a plan or top view of the foot, the leg being detached, and Fig. 4 a sectional view taken at *x*, in Fig. 3.

Similar letters of reference in the different figures denote the same parts of my invention.

A represents the leg, and B the foot, which are connected together by means of the jointed rod C D and the cords F, as shown, in such a manner as to permit a free forward or backward and lateral movement of the leg while the foot remains flat upon the ground, as desired.

The rod C passes down through the foot, and is properly secured by a nut, *c*, as shown. The rod D passes up through the solid end of the leg into a cavity, where it passes through a rubber block, E, or other suitable spring, when a washer, *e*, is placed over said spring, and a nut, *d*, screwed upon the end of the rod, thus firmly and securely connecting the parts together, while at the same time the spring gives a suitable elasticity to the joint, as desired.

G represents a bed or cushion of rubber, or other suitable elastic support, upon which the end of the leg rests, thereby affording a yielding in the joint similar to the natural joint when the weight of the person is brought upon the limb, as in walking.

Thus, by the arrangement of the cushion G in the cavity of the foot and the spring E in the cavity of the leg, as shown, the one giving an elasticity to the joint when the weight of the wearer is brought upon the limb, as in walking, and the other giving a suitable elastic tension in the joint when the foot is flexed, a perfect and natural action of the joint is produced, and one which has not yet been attained by any of the artificial legs now in use.

The cords F have arranged above the nuts *f*, which secure them to the foot, springs S, as shown, which yield so as to allow the leg to incline backward upon the foot, but which serve to bring the foot back to the proper position when raised up from the ground.

H I represent springs, one secured or attached to the foot and one upon the rod D, as shown, which enter appropriate slots in the end of the leg, (marked *h* and *i*,) and act to bring the foot back to its proper position, should it by any means be turned or twisted to one side, turning the toe outward or inward.

When the legs are spread apart the nature of the joint permits the foot to remain flat upon the ground, and the springs S S upon the cords F, alternately, to restore the foot to the proper position with respect to the leg when the pressure which gives the lateral or inclined position to the leg is removed.

In the lower end of the leg, as shown at J, there is a cavity into which the upper part of the heel L slides when the leg is extended forward, allowing a backward movement of the leg upon the joint for a certain distance and until the heel strikes the upper part or top of said recess, which serves as a stop to the farther backward movement upon the joint. The said cavity or recess J also extends around upon the sides of the leg, so as to permit like lateral movements, as aforesaid, to be limited in the same manner.

a represents an elastic band upon the lower end of the leg, which fits down over the joint, as shown, *b* being a similar band upon the foot, covering the joint at the front, as shown.

Having described the construction and operation of my invention, I will now specify what I claim and desire to secure by Letters Patent:

1. The combination of the jointed connection C D, the cushion G, and spring E, arranged and operating in the manner and for the purposes specified and shown.

2. The combination of the cushion G, spring E, jointed rod C D, and the springs H I, arranged and operating as and for the purposes set forth.

3. In combination with a jointed connection, C D, allowing a free movement of the foot, the arrangement of the two cords F and springs S, operating substantially as and for the purposes described.

4. The combination and arrangement of the connection C D, cushion G spring E cords F and springs S, operating substantially as set forth, and for the purposes specified.

5. The recess L, in the lower part of the leg, when extending around upon the sides thereof, as described, in combination with the heel L, constructed with a corresponding projection extending around upon the sides of the foot, arranged and operating as specified, and for the purposes set forth.

ROBERT H. NICHOLAS.

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