# L. LEGRAN.

## ARTIFICIAL LEG.

No. 52,057. Patented Jan. 16, 1866.

Fig. 1

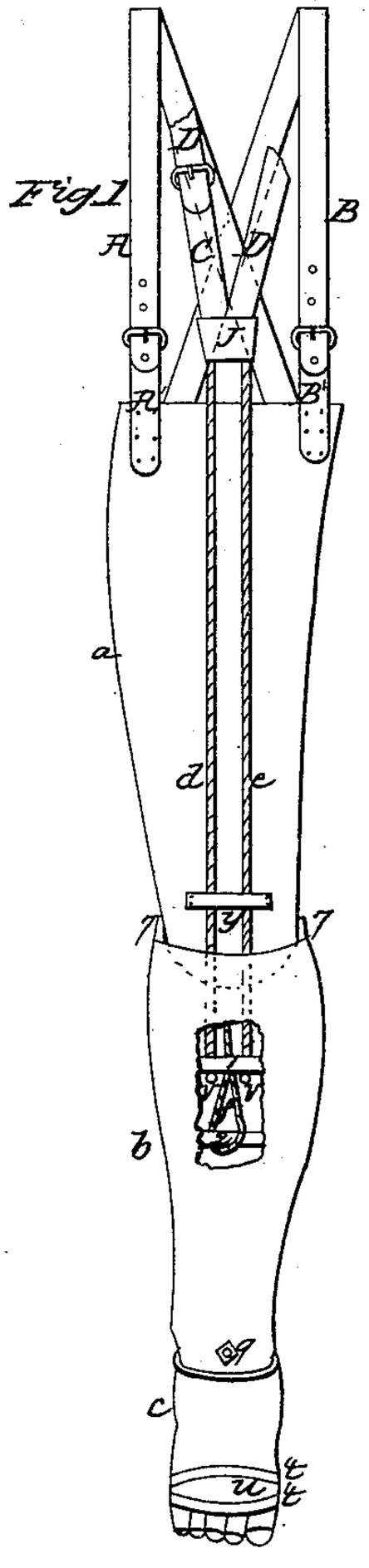



Fig. 2

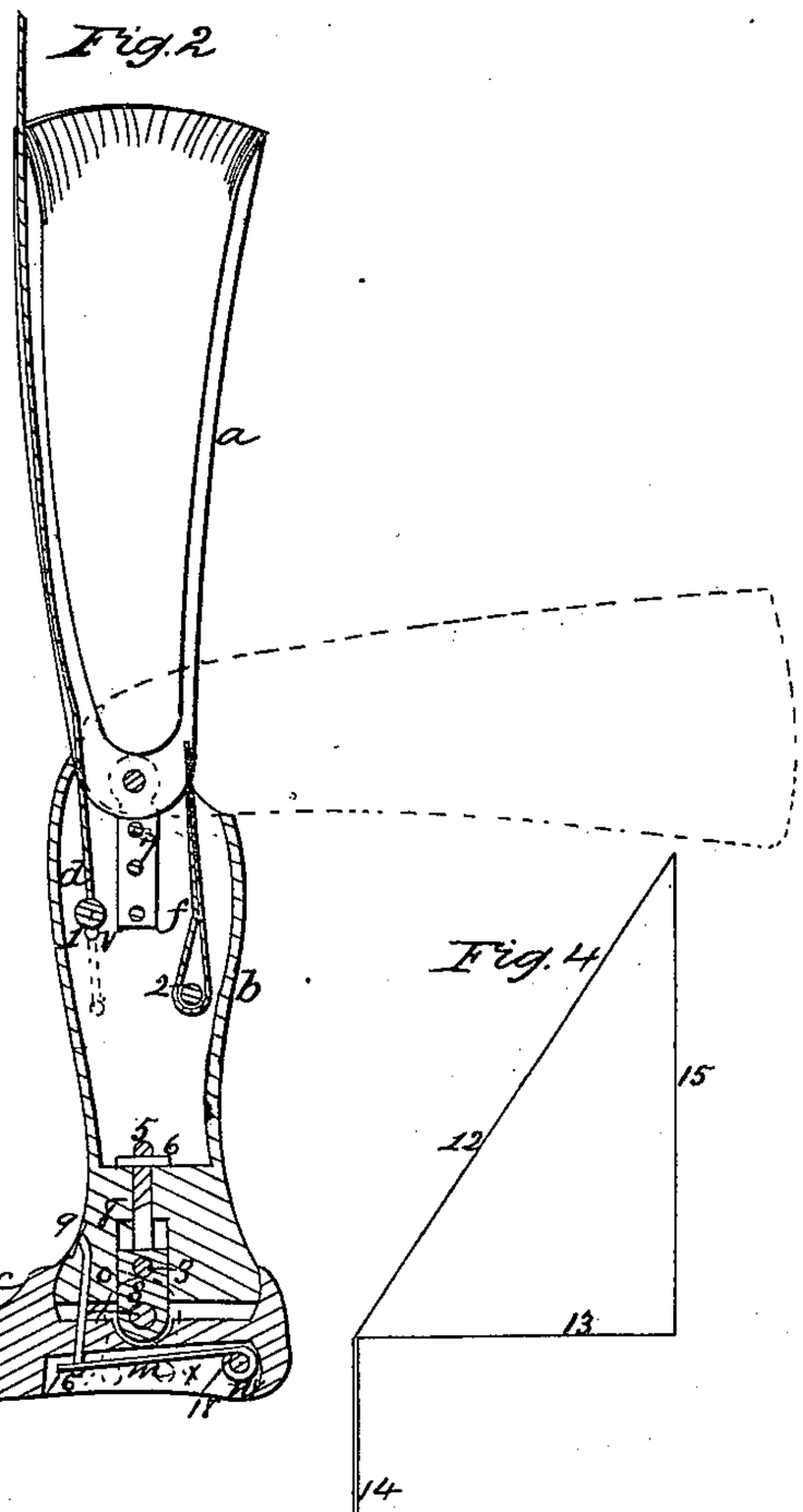
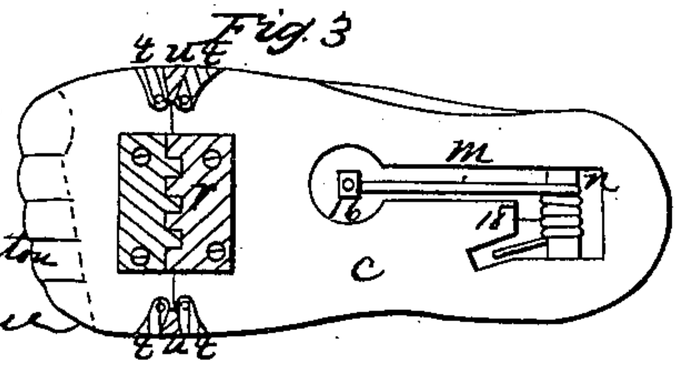



Fig. 3




Witnesses:

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN ARTIFICIAL LEGS.

Specification forming part of Letters Patent No. **52,057**, dated January 16, 1866.

*To all whom it may concern:*

Be it known that I, LEONHARD LEGRAN, of the city and county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Artificial Legs; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in the construction and arrangement of the various parts hereinafter described, said parts operating in the manner herein set forth.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the accompanying drawings, Figure 1 represents a front elevation of my improvement in artificial legs. Fig. 2 represents a longitudinal section of the same. Fig. 3 represents a bottom view of the foot. Fig. 4 represents a plan, which will be hereinafter explained.

In the drawings, *a* represents the part of the leg which is above the knee. *b* represents the part of the leg below the knee. These two parts are made of wood and constructed in the manner and form common to artificial legs, but have attached thereto the following parts: A A′ and B B′, which are attached to the upper part of the part marked *a*, and represent suspenders, which are used for holding the leg in its proper place to the body.

The cords *d* and *e* are attached to the breast-plate J, to which are attached supporter-straps D and C, which are used in connection with the cords *d* and *e* for bracing forward the lower part of the leg marked *b* and giving it the spring and force of the chest and shoulders of the wearer. The lower ends of the cords *d* and *e* pass through openings made in the cross-piece marked 1 in the part *b* of the leg, and on the ends of the cords are balls or knots, (marked *v*,) which prevent the cords from drawing through the piece marked 1 when a strain is brought on the cords *d* and *e* when the wearer is in an erect position, or is erect and leaning back.

To the lower end of the part of the leg marked *a*, and on the back part of it, is attached a cord marked *f*, on the lower end of which is a loop which passes around the cross-piece marked 2. This cord *f* is used for the purpose of preventing the part *b* of the leg from bending or coming forward of the upper part of the leg marked *a*, and is also used for preventing the cords *d* and *e* from drawing the part *b* forward of the desired position.

The foot (marked *c*) is secured to its place on the part *b* of the leg by means of a hinge, (marked *s*,) which is secured in a cavity, (marked 8,) and held firm in said cavity by means of the screw marked 5 and nut marked 6, the screw 5 being part of the hinge. The hinge *s* is secured to the foot *c* by means of a bolt, (marked 4,) the ends of which are secured in the side straps on the sides of the foot, below the ankle-joint. The form and position of these side straps are indicated by the dotted lines marked *x*. The hinge *s* is prevented from turning in the cavity 8 by means of the projections 3 on either side of the hinge.

In the bottom of the foot *c* is a cavity, 18, in which is placed a spring, *m*, which is coiled around a shaft or rod marked *n*. The long arm of this spring *m* is secured to a rod marked *o*, which is secured firmly in the lower part of the part of the leg marked *b* by means of a washer, (marked 9,) and the long arm of the spring *m* is bent around the lower end of the rod *o* and presses down on the washer 16 on the end of the rod *o*.

The toe part of the foot is secured to the main body of the foot by a hinge marked *r*, and between the toe part and the main body of the foot is an angle-shaped piece of gum-elastic or rubber, (marked *u*,) which is held in the desired position by the strips marked *t*, which strips are made of iron or copper.

The cords *d* and *e* move in grooves made in the front part of the part *a* of the leg, and are held in the grooves by a strip marked *y*.

The hinge *s*, when it wears loose on the bolt 4, or, in other words, if the bolt 4 wears loose in the hinge *s*, it may be tightened by screwing up the nut 6 on the screw 5 of the hinge *s*.

The operation of my improvement is as follows: Having all parts constructed, arranged, and combined as herein described and represented, I secure the leg (which in this case is a leg for the right side) to the body by means of the suspenders A A′ and B B′, the part of the suspender A being placed over the right shoulder and the part B of the suspender being placed over the left shoulder, and said parts secured to the parts A′ and B′. I then

pass the strap D up the left side of the breast and over the left shoulder, and then pass it across the back and under the right arm and buckle it to the strap C, which completes the process of securing the leg to the body. Now, by the proper effort, (which will vary very much with different persons, and cannot be well described,) the leg is moved forward and the heel of the foot first comes in contact with the ground, and the spring *m* will prevent any undue movement of the foot at its hinge *s* and give to it a natural motion, and as the foot comes down and the heel up the toe-piece yields to the pressure brought on it, and as the pressure is taken off the toe-piece the gum spring *u* and the spring *m*, in combination, will cause it and the main body of the foot to assume their normal condition and their relative position to the leg and its movements.

By means of the straps D and C and the cords *d* and *e*, in connection with the brace or cross-piece marked 1, the leg can be braced and held firm, and they also greatly assist in the movements of the leg by the movements of the body of the wearer.

The dotted lines *x'* represent the position of the leg when the wearer is in a sitting posture. The plan shown in Fig. 4 represents the lengthening or dropping down of the cords *d* and *e* when the wearer is in a sitting posture. Lines 14 and 15 represent the leg; line 15, the body of the wearer. Line 12 represents the cords *d* and *e*, and part of line 12, between the dotted lines 10 and 11, the portion of the cords which drops down.

Having thus described the nature, construction, arrangement, and operation of my improvement, what I claim as of my invention is—

The arrangement of the suspenders A A' and B B', straps D and C, cords *d*, *e*, and *f*, cross-pieces 1 and 2, hinge *s*, screw 5, nut 6, spring *m*, rod *o*, gum *u*, and hinge *r*, when used in connection with the foot *c* and the parts *b* and *a* of the leg, the whole being constructed, arranged, and operating substantially as herein described, and for the purpose set forth.

LEONHARD LEGRAN.

Witnesses:
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