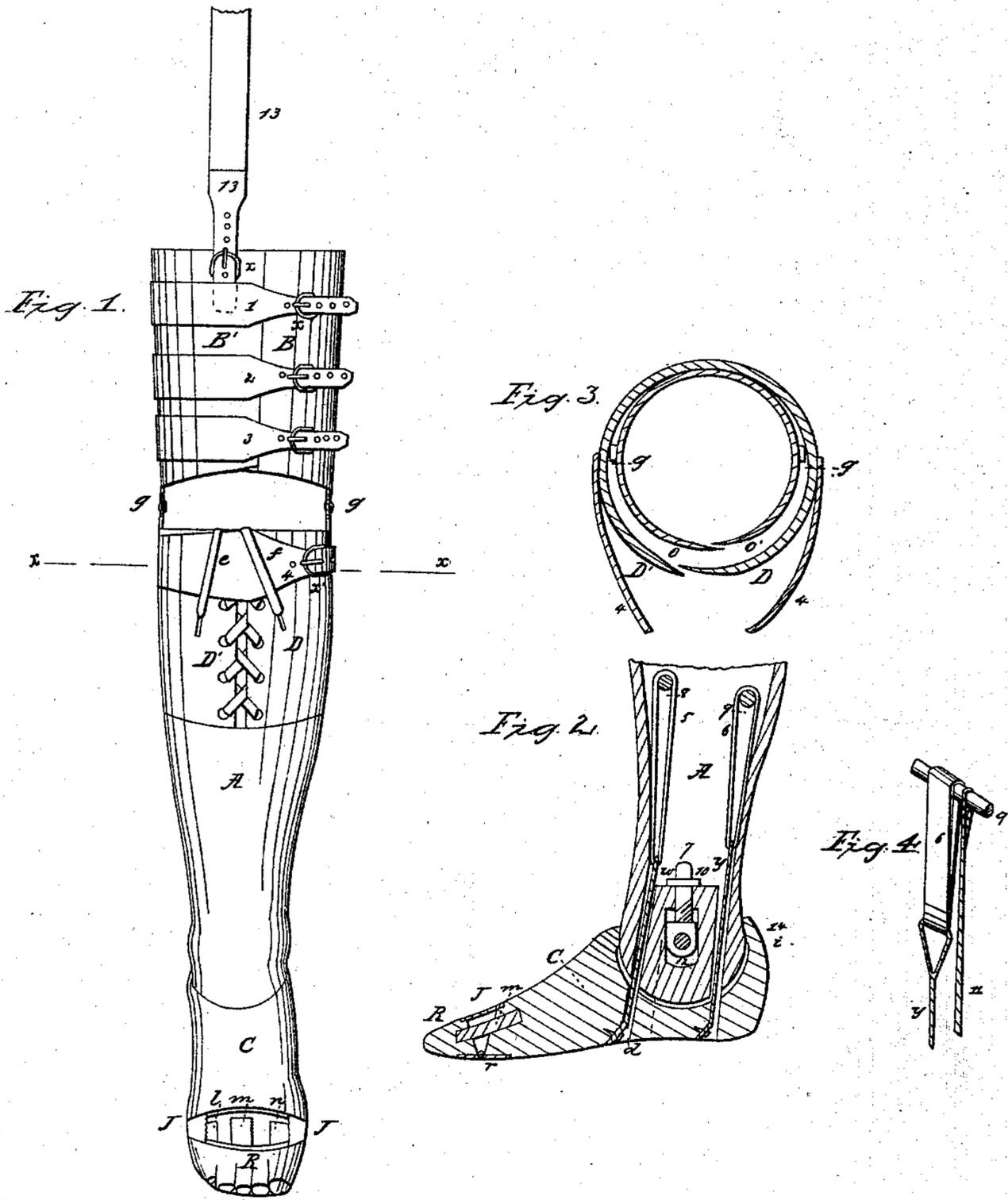


*L. Legran,
Artificial Leg,*

Nº 68,758,

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United States Patent Office.

LEONHARD LEGRAN, OF ALLEGHENY CITY, PENNSYLVANIA.

Letters Patent No. 68,758, dated September 10, 1867.

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, LEONHARD LEGRAN, of the city and county of Allegheny, and State of Pennsylvania, have invented a new useful Improvement in Artificial Legs; and I do hereby declare the following to be 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 providing artificial legs with a series of flaps or pads, for the purpose of adapting them to the varied conditions of the "stump" of the amputated limb of the wearer. My invention also consists in the use and arrangement of a series of springs, bands, and cords for the purpose of giving to the foot and leg the desired tension and flexion, the whole being arranged, constructed, and operating in the manner hereinafter described.

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, which form part of my specification—

Figure 1 represents a front elevation of my improved artificial leg.

Figure 2 represents a longitudinal section of the foot and the lower part of the leg, showing the arrangement of the toe-springs, elastic bands and cords, and their relation to the foot and leg.

Figure 3 represents a transverse section of the series of flaps or pads cut through at line *x*, (see fig. 1.)

Figure 4 represents a perspective view of the elastic bands and cords, as arranged on the cross-bar, for the hind part of the leg.

In the drawing, A represents the lower part of the leg, which is made of wood or other suitable material, and is constructed in any of the known forms and by any of the known means. In the lower part of the leg is an adjustable hinge, 14, provided with a screw, 7, and a screw-nut, 10, which screw and nut are used for taking up the slack when the joint of the hinge wears loose. This hinge is placed in a cavity made in the leg and marked 12. The foot C is also constructed of wood or other suitable material, and is secured to the leg by means of two side straps of iron, the form of which is clearly indicated by the dotted lines in fig. 2. Through these straps and the hinge 14 passes a rod or bolt, *i*, which, in connection with the hinge, serves as the pivot-point or ankle-joint for the foot and leg. The toe-piece R is secured to the body of the foot C by means of a hinge, *r*; and between the body of the foot and toe-piece is a V-shaped cavity marked *t*, which is covered by a band of leather marked J. In the toe-piece R and the body of the foot C are made recesses into which are compressed three elastic springs made of India rubber. The form and arrangement of the recesses and springs, and their relation to the foot and toe-piece, will readily be understood by reference to figs. 1 and 2, at the points marked *l*, *m*, and *n*. The leg A is provided with two cross-pieces or bars, 8 and 9, around which are placed elastic bands 5 and 6, to which are attached cords *w* and *y*, which are attached to the foot C at the points marked *d*. In the foot C and leg A are recesses or grooves for the cords *w*, *y*, and 11. The cord 11 is used for a check-cord to prevent any undue strain on the bands 5 and 6 and cords *w* and *y*, and also for preventing the foot C from any undue motion or flexion with relation to the leg. The arrangement of the recesses or grooves and cords is clearly shown in fig. 2. To the leg A is attached a series of flaps or pads marked O' O, D D', and 4, and two hinges, *g*. To the upper part of these hinges are attached flaps B and B', to which are attached straps 3, buckles *x'*, and the shoulder-strap or suspender 13.

The object of my improvement is to impart to the artificial leg that tension and flexion which resembles the natural leg. This I accomplish by the use of the compressed toe-springs *l*, *m*, and *n*, elastic bands 5 and 6, and cords *w*, *y*, and 11, and their arrangement with relation to the foot and leg.

Another and a very important part and object of my invention is to provide for the swelling and shrinking of the "stump" of the amputated limb. Every man who has had any experience in furnishing or wearing artificial legs knows that the "stump" of the amputated leg often swells, and then again will shrink or shrivel up, and that the artificial leg made for the "stump" when swollen will not answer for the same "stump" when it shrinks or shrivels up, and that an artificial leg, when made and adapted to a "stump" when it is in its contracted and shrivelled condition, will not suit the same "stump" when it swells and becomes inflamed, which is very often the case. Now, my improved artificial leg meets any and all of these conditions of the stump of the amputated limb. If it is enlarged by inflammation or other cause, the flaps or pads can be adjusted and

"let out" to suit the size and condition of the "stump," and if it shrinks and shrivels the flaps or pads can be contracted to suit that condition. This I accomplish by the use of a series of flaps or pads, which are folded around the "stump" and then laced and buckled in accordance with the condition of the "stump."

The operation of my improvement is as follows: Having all parts constructed and arranged as herein described and represented, I adjust the artificial leg to the "stump" of the amputated limb. I then adjust the flaps or pads O' and O to the "stump," folding them around it so as to fit closely and neatly. (These flaps or pads should be made of soft leather and cushioned in such manner that will be soft and smooth.) I then fold the flaps or pads D and D' over the flaps or pads O' and O, and lace them together by the laces *f* and *e*. (The flaps D and D' are made of a good firm leather, but not hard or stiff.) I then buckle around these flaps or pads the flap 4, which is made narrower than the others, so as not to extend below the "stump." After the flaps or pads O' O, D' D, and 4 are properly adjusted, folded, laced, and buckled to the "stump," I then fold the flaps B and B around the upper part of the leg; and with the straps 1, 2, and 3, buckle them firmly to it. I then place the strap or suspender over the shoulder, which will complete the process of securing the artificial leg to its place on the "stump" of the amputated limb.

In the process of walking with my artificial leg the toe-piece R yields to the pressure brought on it, but always having a tendency to press back, thereby giving to it a natural flexion. This result is obtained by the use of the compressed gum springs *l*, *m*, and *n*. As the toe-piece yields or bends the body of the foot C moves or works on the hinge 14 at the ankle-joint; but in moving or working, the bands 5 and 6 and cords *w* and *y* impart to the foot C and leg sufficient tension to impart to them a flexion which very much resembles the tension and flexion of the natural leg. The cord 11 will check and hold the foot C and leg A from bending beyond the desired point. Thus, by the combination and arrangement of the toe-springs *l*, *m*, and *n*, and cords *w*, *y*, and 11, a natural tension and flexion are imparted to the artificial leg; and by the use of the flaps or pads O' O, D D', and 4, it can be applied to and worn on the "stump" of the amputated limb in every condition, and with ease and comfort to the wearer.

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

The arrangement of the toe-springs *l*, *m*, and *n*, hinge 14, elastic bands 5 and 6, cords *w* and *y*, cross-pieces 8 and 9, and check-cord 11, when used in connection with the leg A and foot C, the whole being constructed, arranged, and operating substantially as herein described and for the purpose specified.

LEONHARD LEGRAN.

Witnesses:

JAMES J. JOHNSTON,
ALEXANDER HAYS.