(No Model.)

G. A. INGRAM.

ARTIFICIAL LIMB.

No. 288,239. Patented Nov. 13, 1883.

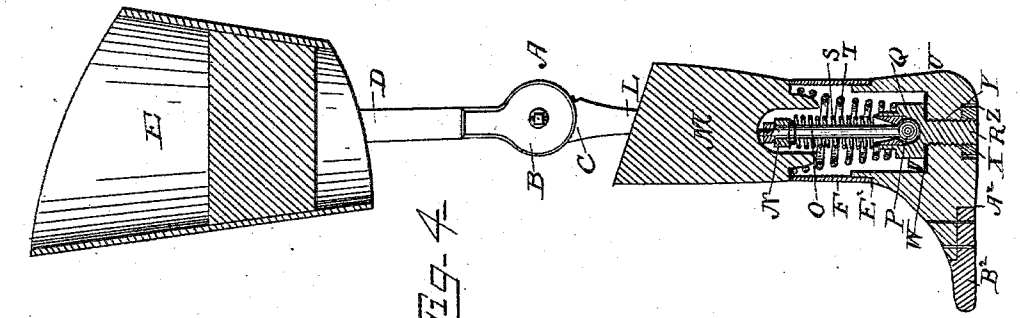

Fig. 4.

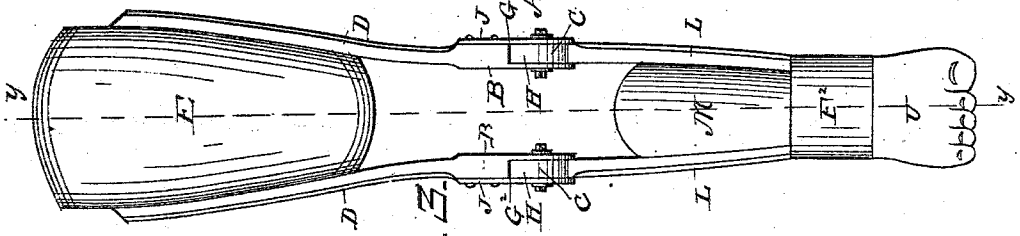

Fig. 3.

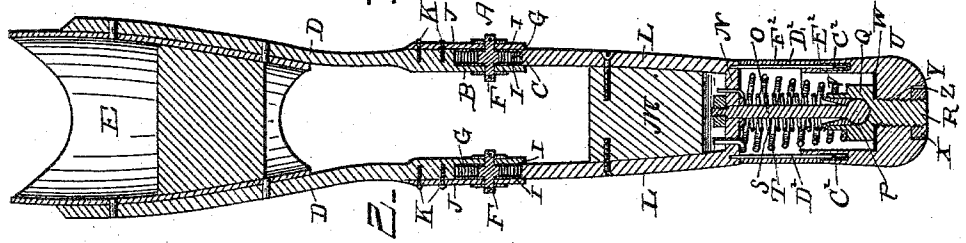

Fig. 2.

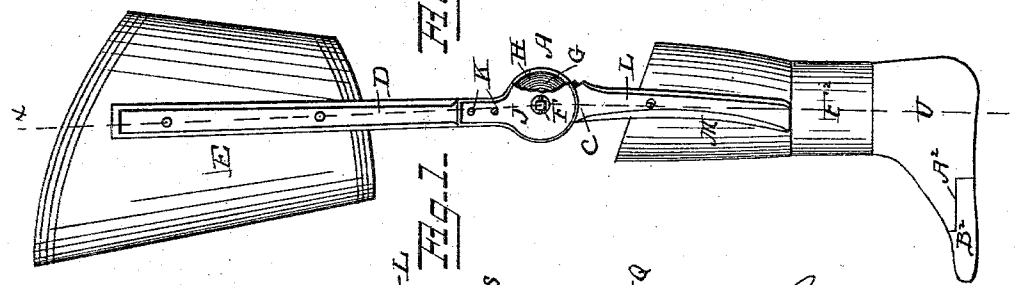

Fig. 1.

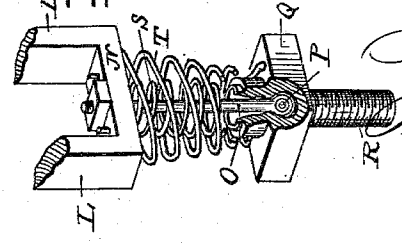

Fig. 5.

WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE A. INGRAM, OF PLYMOUTH, PENNSYLVANIA.

ARTIFICIAL LIMB.

SPECIFICATION forming part of Letters Patent No. 287,239, dated November 13, 1883.

Application filed September 10, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. INGRAM, a citizen of the United States, residing at Plymouth, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Artificial Limb, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to artificial legs; and it has for its object to produce an improved artificial leg which shall possess, in a superior degree, that elasticity of action and ease of motion which is so particularly desirable in surgical apparatus of this class.

A further object of this invention is to provide an easy and convenient lateral and oscillating motion of the foot at the ankle-joint; and a still further object of my invention is to protect the several joints against moisture and the evil effects resulting therefrom.

To accomplish the several purposes of my invention, the same consists in the improved construction and arrangement of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a side view of an artificial leg embodying my invention, parts having been broken away for the purpose of illustrating the invention more clearly. Fig. 2 is a vertical transverse sectional view on the line *x x* in Fig. 1. Fig. 3 is a front view. Fig. 4 is a vertical sectional view on the line *y y* in Fig. 3, and Fig. 5 is a detail view illustrating in perspective certain parts of my invention.

The same letters refer to the same parts in all the figures.

In the drawings hereto annexed, A designates the knee-joint, which is composed of the parts B and C, the former of which consists of a plate having an upwardly-extending arm, D. The arms D D at each side of the leg are secured in the usual well-known manner to the hip-piece E. In the construction of the upper part of the leg embodying these features no novelty is herein claimed. The plates B of the knee-joint are provided with axial joints or spindles F, to which are secured the inner ends of coil-springs G, the outer ends of which are secured to the cylindrical cases H, which are formed upon the parts C of the knee-joints. These coil-springs are protected and covered by means of washers I and plates J, which latter are secured to the arms D by means of screws or other suitable fastenings, K. The plates C of the knee-joints are provided with downwardly-extending arms L, between which the leg-pieces M are secured. The said leg-pieces, as will be seen in Fig. 4 of the drawings, are forked at their lower ends and supported upon a bridge-piece, N, which connects the lower ends of the arms L. By this construction great rigidity and security are attained, while at the same time unnecessary material is dispensed with and the weight of the limb correspondingly lessened. The bridge-piece N is provided with a downwardly-extending screw-threaded rod, O, the lower end of which has a ball, P, socketed in a block or casting, Q, which latter is provided with a downwardly-projecting screw-threaded stem, R.

S and T are springs, which are respectively attached to opposite sides of the bridge-piece N, and coiled in opposite directions around the rod O, their lower ends being attached to the plate or casting Q, in which the lower end of the said rod O is socketed. The spring S is by preference coiled within the spring T, as has been shown in the drawings hereto annexed; but it may sometimes be found desirable to intercoil the springs, and this may be done without departing from the spirit of my invention.

U designates the foot-piece, which is provided with a recess, V, in which the plate or casting Q is nicely fitted. Between the bottom of the recess V and the plate Q a washer, W, of rubber or other suitable material, is interposed in order to exclude moisture, which, if permitted to gain access to this part of the device, would soon prove detrimental to its durability and efficiency. The foot-piece is secured in position by means of a nut, X, which is adjusted upon the stem R, which projects through an opening, Y, in the said foot-piece, the under side of the latter being countersunk, as at Z, to receive the said nut. The under side of the front end of the foot-piece is provided with a recess, A^2, in which is secured a toe-piece, B^2, which is made of rubber, leather, or any other suitable elastic material. The

function of this toe-piece is to permit a lateral or swinging motion of the foot when resting upon the toe, and I would have this device understood as being distinctly different from artificial feet heretofore patented, in which the entire sole has been formed of rubber or other elastic material, these being incapable of performing the functions herein set forth efficiently and satisfactorily. The sides of the foot-piece U are provided with vertical sockets C^2, to receive the lower ends of vertical elastic rods D^2, the upper ends of which are socketed in the lower ends of the side pieces, L, of the leg. These elastic rods, while they do not interfere with the free and elastic action of the foot, serve to materially brace the latter and prevent the patient wearing my improved artificial leg from being upset or tripped up by such obstructions as may be met with. The upper edge of the foot-piece U is provided with an annular shoulder, E^2, serving to receive the lower end of an elastic sleeve or tube, F^2, which is fitted around and serves to protect the springs S T, the upper end of said sleeve being fitted tightly around the lower end of the leg-piece M. By this construction I absolutely exclude moisture from the foot-piece and from the springs, which are the parts of this device that are most easily affected by moisture and changes in the temperature. I also provide the ends of the cylindrical cases H of the plates B at the knee-joints with rubber cushions G^2, which may abut against the ends of the arms C, and thus form moisture-proof joints, whereby the springs at the knee-joints shall be fully protected.

The operation and advantages of this invention will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed. The construction of this device is simple, and the objects set forth at the beginning of the specification are effectually accomplished.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. In an artificial leg, the knee-joints composed, substantially as herein described, of plates having upwardly-projecting arms and provided with axial bolts or spindles, cylindrical cases journaled upon the said bolts, coiled springs connecting the said bolts with the said cases, and arms projecting downwardly from the said cases, substantially as set forth.

2. In an artificial leg, the combination, with the knee-joint, constructed substantially as herein described, of elastic cushions interposed between the cylindrical cases of the lower leg-pieces and the shoulders formed upon the upper arms, substantially as set forth.

3. In an artificial leg, the ankle-joint constructed, substantially as herein described, of a pair of springs coiled or intercoiled around a central rod in opposite directions, substantially as set forth.

4. In an artificial leg, the combination, with the lower leg pieces, of a bridge-piece connecting the same, a rod projecting downwardly from the said bridge-piece and jointed universally to the foot-piece, and a pair of springs coiled in opposite directions around the said connecting-rod, and connected to the foot-piece and the leg-piece, substantially as set forth.

5. In an artificial leg, the combination of the leg-piece, forked at its lower end, as herein described, with the side arms, the lower ends of which are connected by a bridge-piece, substantially as set forth.

6. In an artificial leg, the combination of the leg-piece, a connecting-rod, a socket jointed universally to the same, oppositely-coiled connecting-springs, the foot-piece, and a pair of elastic connecting-rods connecting the sides of the foot-piece with the side arms of the leg-pieces, substantially as set forth.

7. In an artificial leg, the combination of the leg-piece, the foot-piece, intermediate connecting-springs, and a tubular elastic connecting-sleeve serving to exclude moisture, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

GEORGE AUGUSTUS INGRAM.

Witnesses:

J. A. OPP,

J. B. SHAVER.