

## **Specification of John Henry Johnson : artificial legs and feet.**

### **Contributors**

Johnson, John Henry.

### **Publication/Creation**

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A.D. 1858, 17th MAY. N° 1092.

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S P E C I F I C A T I O N

OF

JOHN HENRY JOHNSON.

ARTIFICIAL LEGS AND FEET.

LONDON:

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,

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1858.





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A.D. 1858, 17th *MAY*. N° 1092.

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**Artificial Legs and Feet.**

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**LETTERS PATENT** to John Henry Johnson, of 47, Lincoln's Inn Fields, in the County of Middlesex, and of 166, Buchanan Street, in the City of Glasgow, North Britain, Gentleman, for the Invention of "**IMPROVEMENTS IN THE CONSTRUCTION OF ARTIFICIAL LEGS AND FEET.**"—A communication from Douglas Bly, of Rochester, in the United States of America.

Sealed the 16th November 1858, and dated the 17th May 1858.

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**PROVISIONAL SPECIFICATION** left by the said John Henry Johnson at the Office of the Commissioners of Patents, with his Petition, on the 17th May 1858.

I, JOHN HENRY JOHNSON, of 47, Lincoln's Inn Fields, in the County of Middlesex, and of 166, Buchanan Street, in the City of Glasgow, North Britain, Gentleman, do hereby declare the nature of the said Invention for "**IMPROVEMENTS IN THE CONSTRUCTION OF ARTIFICIAL LEGS AND FEET,**" a communication from Douglas Bly, of Rochester, in the United States of America, to be as follows:—

10 This Invention relates to a peculiar construction and arrangement of artificial legs and feet, whereby their actions are made to assimilate nearer to those of the natural limb than has hitherto been effected. According to this Invention a lateral and diagonal fluxion of the foot at the ankle joint is provided for, as well as the ordinary forward fluxion. This is accomplished  
15 by connecting the foot to the leg by means of two sets of cords and springs

*Johnson's Improvements in the Construction of Artificial Legs and Feet.*

in combination with a universal or ball-and-socket joint; these two sets of cords and springs operate antagonistically to each other, one set being placed on each side of the ball-and-socket joint; hence it is obvious that a perfectly universal fluxion of the foot is obtained in any direction. The springs used serve as muscles, and are made of india-rubber tubes, whilst the cords serve 5 as sinews, and are so connected to the springs as to be capable of adjustment by nuts and screws, so that their tension may be regulated with the greatest nicety. Cords and india-rubber springs are also employed for connecting the toe or point of the foot to the body, so as to allow of free play at that part when required. 10

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**SPECIFICATION** in pursuance of the conditions of the Letters Patent, filed by the said John Henry Johnson in the Great Seal Patent Office on the 16th November 1858.

**TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JOHN HENRY JOHNSON,** of 47, Lincoln's Inn Fields, in the County of Middlesex, 15 and of 166, Buchanan Street, in the City of Glasgow, North Britain, Gentleman, send greeting.

**WHEREAS** Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Seventeenth day of May, in the year of our Lord One thousand eight hundred and fifty-eight, in the twenty-first year of Her 20 reign, did, for Herself, Her heirs and successors, give and grant unto me, the said John Henry Johnson, Her special license that I, the said John Henry Johnson, my executors, administrators, and assigns, or such others as I, the said John Henry Johnson, my executors, administrators, or assigns, should at any time agree with, and no others, from time to time and at all 25 times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**IMPROVEMENTS IN THE CONSTRUCTION OF ARTIFICIAL LEGS AND FEET,**" (a communication from Douglas Bly, of Rochester, in the United States of America,) upon the 30 condition (amongst others) that I, the said John Henry Johnson, by an instrument in writing under my hand and seal, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the 35 said Letters Patent.

*Johnson's Improvements in the Construction of Artificial Legs and Feet.*

NOW KNOW YE, that I, the said John Henry Johnson, do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement, reference being had to the accompanying Drawings, and  
5 to the letters and figures marked thereon, that is to say:—

The said Invention relates to a peculiar construction and arrangement of artificial legs and feet, whereby their actions are made to assimilate nearer to those of the natural limb than has hitherto been accomplished. According to this Invention a lateral and diagonal flexion of the foot at the ankle joint is  
10 provided for, as well as the ordinary forward flexion. This is accomplished by connecting the foot to the leg by means of two sets of cords and springs, in combination with a universal or ball-and-socket joint. These two sets of cords and springs operate antagonistically to each other, one set being placed on each side of the ball-and-socket joint; hence, it is obvious that a perfectly  
15 universal flexion of the foot is obtained in any direction. The springs used serve as muscles, and are made of india-rubber tubes, whilst the cords serve as sinews, and are so connected to the springs as to be capable of adjustment by nuts and screws, so that their tension may be regulated with the greatest nicety. Cords and india-rubber springs are also employed for connecting the  
20 toe or point of the foot to the body, so as to allow of free play at that part when required.

And in order that the said Invention may be fully understood, I shall now proceed more particularly to describe the same, and for that purpose I shall refer to the several Figures on the Sheet of Drawings hereunto annexed, the  
25 same letters of reference indicating corresponding parts throughout all the Figures.

Figure 1 of the annexed Sheet of Drawings represents a side elevation of an artificial leg constructed according to this Invention; Figure 2 is a vertical section of the same, taken in the direction of the length of the foot; and  
30 Figure 3 is a vertical section, taken at right angles to Figure 2.

A, A<sup>1</sup>, are the two sets of antagonistic cords and springs. The springs *a*, *a*<sup>1</sup>, may be composed of short lengths of vulcanized india-rubber, and serve the purpose of the muscles of the human leg, whilst the cords *b*, *b*<sup>1</sup>, answer the purpose of the tendons. These cords and springs are secured by nuts *c*, *c*,  
35 which afford facility also for adjusting their tension, and are disposed in two sets, one set on each side of the universal joint B, which is composed of a ball fitting between corresponding cavities formed in the foot and leg, so that the combination of the whole will afford facility for bending or turning the leg upon the foot in a lateral and diagonal, as well as in a forward and backward

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direction; and as the foot is connected with the leg by the intervention of a ball-and-socket joint, it follows that the foot can be moved or flexed in any direction around the whole circle, which is a very great advantage in many cases, as, for example, in walking or standing on sidelong ground, such as the side of a steep hill, or when accidentally treading upon a stone or other 5 obstacle or irregularity of surface likely to twist the foot laterally or diagonally, or when one leg is required to be placed at some distance apart from the other, in all which cases the power of lateral and diagonal flexure of the leg upon the foot will be found highly advantageous. I do not confine myself to any particular form of or mode of attaching the springs, cords, and ball joint, so 10 long as the combination is such that the several springs and cords, or artificial muscles and tendons, will act antagonistically to each other on opposite sides of the joint, and permit of a lateral and diagonal play or action thereof.

Having now described and particularly ascertained the nature of the said Invention, and the manner in which the same is or may be used or carried 15 into effect, I would observe in conclusion that I do not confine or restrict myself to the precise details or arrangements which I have had occasion to describe or refer to, as variations may be made therefrom without deviating from the principles or main features of the said Invention; but what I consider to be novel and original, and therefore claim as the Invention secured 20 to me by the herein-before in part recited Letters Patent is,—

First, the system or mode of providing for the lateral and diagonal flexion of the foot on artificial legs, substantially in the manner herein-before described.

Second, the combination in artificial legs and feet of side cords and 25 springs, with a spherical joint or its equivalent, for the purpose herein-before referred to.

In witness whereof, I, the said John Henry Johnson, have hereunto set my hand and seal, this Fifteenth day of November, One thousand eight hundred and fifty-eight. 30

J. HENRY JOHNSON. (L.S.)

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LONDON :

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A. D. 1858, MAY 17, N° 1092  
JOHNSON'S SPECIFICATION.

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FIG. 1.

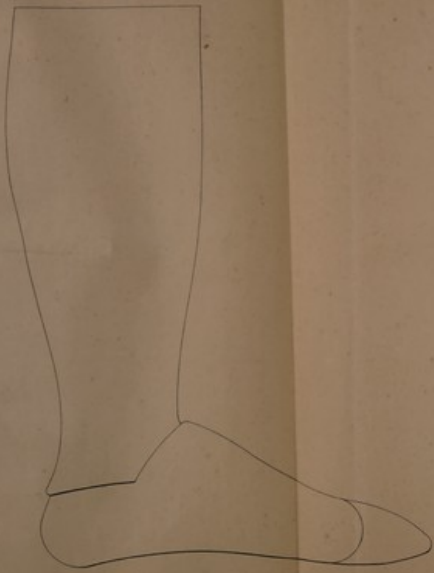
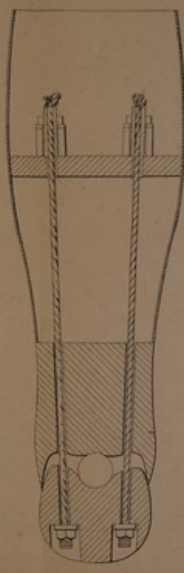


FIG. 2.



FIG. 3.



The filed drawing is partly colored.

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