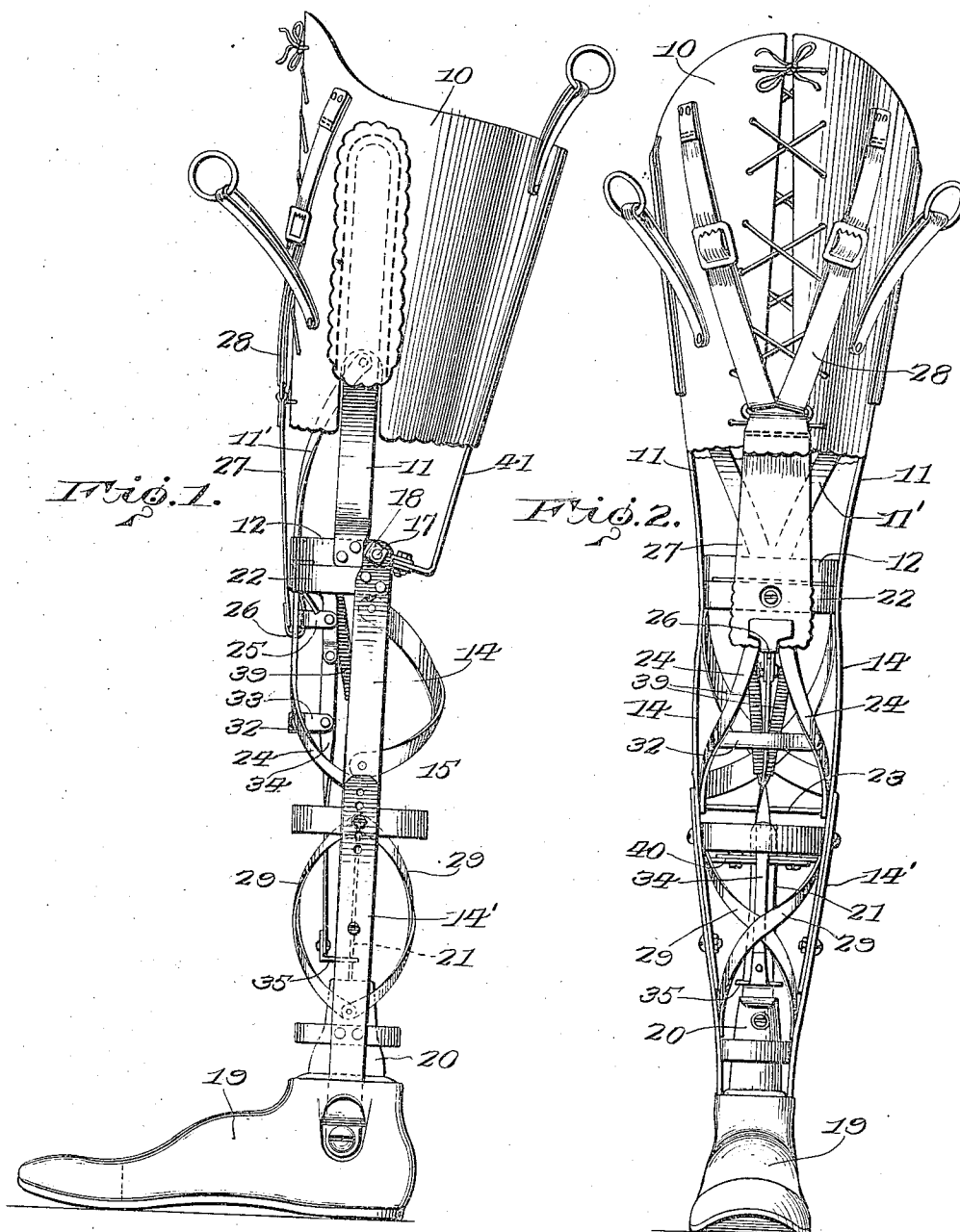


Jan. 2, 1923.

W. I. BURNS.
ARTIFICIAL LEG.
FILED MAR. 29, 1922.

1,440,816.

2 SHEETS—SHEET 1.



Inventor

William I. Burns

By *Ernest C. [Signature]*

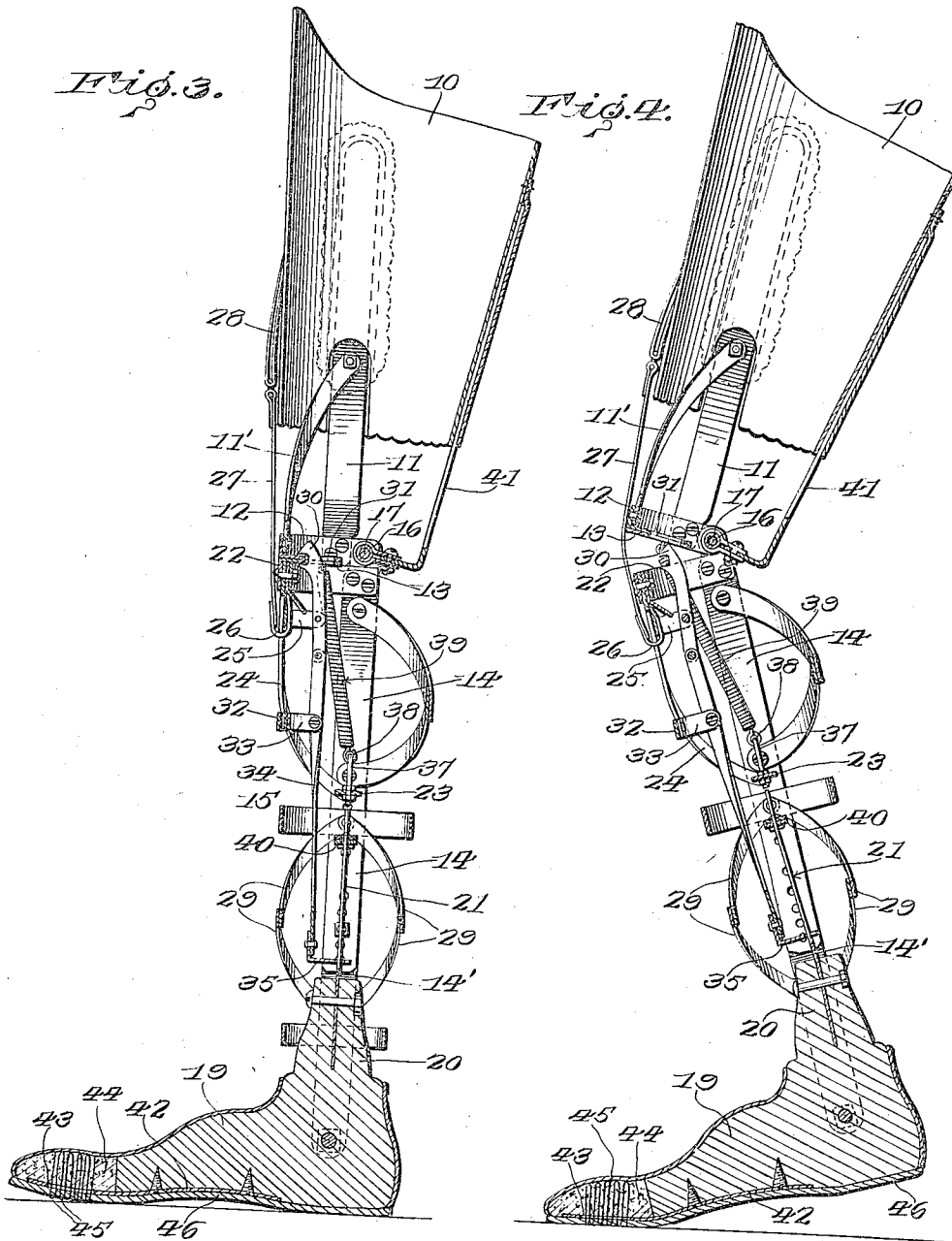
Attorney

Jan. 2, 1923.

W. I. BURNS.
ARTIFICIAL LEG.
FILED MAR. 29, 1922.

1,440,816

2 SHEETS—SHEET 2



Inventor

William I. Burns

By *Grace C. Hinkle*

Attorney

UNITED STATES PATENT OFFICE.

WILLIAM I. BURNS, OF PARNELL, MISSOURI.

ARTIFICIAL LEG.

Application filed March 29, 1922. Serial No. 547,902.

To all whom it may concern:

Be it known that I, WILLIAM I. BURNS, a citizen of the United States, residing at Parnell, in the county of Nodaway and State of Missouri, have invented certain new and useful Improvements in Artificial Legs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in artificial limbs and particularly to artificial legs.

One object of the invention is to provide an artificial leg having a knee joint with improved means for locking the joint when the leg is in standing position, and for releasing the joint when the weight of the wearer is shifted, as in taking a step.

Another object of the invention is to provide an artificial leg of this character which is adjustable in length and wherein this adjustment does not interfere with the mechanism of the knee locking, wherein the knee lock does not need to be adjusted.

Other objects and advantages will be apparent from the following description when taken in connection with the accompanying drawing.

In the drawing:

Figure 1 is a side elevation of an artificial leg, made in accordance with the invention.

Figure 2 is a front elevation of the same.

Figure 3 is a vertical longitudinal sectional view on the line 3—3 of Figure 2, showing the leg in standing position.

Figure 4 is a section on the same line as that of Figure 3 but showing the knee joint bent.

Referring particularly to the accompanying drawing 10 represents a stump socket formed of leather, and provided with means for connection of a harness, not shown, and means for lacing the socket around the stump.

Secured to the opposite sides of the stump socket are the downwardly and inwardly extending metal strips 11, the same being connected to the vertical flange 12, of the horizontal half disk 13. Curved strips 11' extend downwardly and forwardly from the upper ends of the strips 11 to the front portion of the flange of the disk to which they are connected. The flange 12 extends rear-

wardly and the ends thereof are apertured and register with the upper apertured ends of the side bars 14 of the lower leg portion 15.

Disposed between the ends of the flange is a metal tube 16, and disposed through the registered portions of the frame of the leg, and through the tube is a pivot bolt 17. This bolt is provided with a nut 18, which is tightened sufficiently to hold the bolt against rotation, the ends of the flange rocking on the ends of the bolt. The tube is secured within the ends of the flange of the disk so that it also rotates on the bolt. Adjustably connected to the lower ends of the side bars 14 are the lower sections 14', and to the lower ends of these lower sections is connected the foot 19. This foot has a central forwardly extended stump or ankle 20, disposed between the lower ends of the bars 14', and secured in the upper end of this ankle portion and extending vertically upward therefrom is a spring plate 21, to which reference will be made later herein.

A curved strip 22 has its ends secured to the upper ends of the bar 14, below the bolt 17, and having the same curvature as the flange of the disk 13. Extending transversely between the bars 14, intermediate their lengths is a bar 23, and extending from the ends of this bar upwardly and curving outward are the bars 24, their upper ends being secured to the strip 22. A bracket 25, is secured to and extends between these bars or braces 24, just below the member 22 and engaged with this bracket is the hook 26 carried by the lower end of a strap 27, which is connected to the stump socket by means of the elastic straps 28.

Curved spring bands 29 are secured to the lower sections 14' to form the lower part of the leg and ankle. Pivotaly mounted on the bracket 25, inwardly of the members 24, is a hook 30, the upper end of which extends upwardly through a slot 31 in the disk 13, said hook being arranged to engage the forward end wall of said slot to hold the knee joint against bending. Extending between the lower portions of the braces 24 is a transversely extending and outwardly bowed brace 32, and secured to this brace, and extending inwardly therefrom is a bracket 33. Pivoted intermediate its length on this bracket is a long spring strip 34, the

upper ends being pivotally connected to the hook member 30, below the pivoted mounting thereof. The lower end of this spring strip 34 is provided with an inwardly extending horizontal member 35, which embraces the lower portion of the spring plate 21, as is clearly seen in the sectional views.

Disposed through the bar 23 is a screw or bolt 36, the same having nuts 37 disposed thereon, above and below the bar 23 respectively, while the upper end is formed with a hook 37. Connected to the lower face of the disk 13 at their upper ends, and at their lower ends to hook 38, are coil springs 39, which exert pull on the disk and on the lower leg portion to restore them to normal position with the hook 30 connected with the wall of the slot. The lower ends of the members 14' are connected with the opposite sides of the body by means of a stationary bolt passing through the foot so that the foot will rock, as in the act of walking. The springiness of the plate 21 and the spring member 31 serve to resiliently maintain the foot in proper position with respect to the lower leg portion.

When the leg is in normal vertical position as when standing, the knee joint will not bend, but when weight is advanced forward so that the foot rocks on the lower ends of the bars 14', the spring plate 21 will be flexed rearwardly pulling the lower end of the spring strip 34 so that it will rock on its pivotal connection with the bracket 33. This results in the hook 30 being rocked to disengage it from the wall of the slot of the disk 13, thus permitting the knee to bend. Then as the wearer advances forward and lifts the leg slightly above the ground, the coil spring 39 will lift and swing the lower leg portion forward with the result that the knee joint will close and lock thus permitting the wearer to throw the weight of his body forward on the leg. Then as the body moves forward the weight of the body will rest on a rigid structure without danger of the knee joint breaking. Thus there is no danger of the knee joint bending except when weight is applied to the leg in such relation to the foot as to cause the foot to move the hook mechanism to leave the same.

Below the transverse bar 23, is a slotted bar 40, through which the upper end of the spring plate 21 is slidably disposed. This transverse bar holding the upper end of the plate to permit proper flexing thereof by the ankle of the foot.

An additional brace 41 is secured to the rear of the stump socket and extends downwardly and inwardly therefrom where it is connected to the central portion of the tube 16.

Secured to the bottom of the foot 19, by means of screws, is a flat metal spring 42, the same extending forwardly past the

front end of the foot. The forward end of the foot is cut off, and beyond this end, to form the toe, is a pad 44, of felt layers, which will readily yield, or bend, when the weight of the wearer is moved forwardly. The forward end of the spring 42 is formed with a longitudinal opening 43, and stitches 45 are passed vertically through the felt pad and the sole 46, of the foot, and through the opening 43, to hold the parts together. This opening 43 is of considerable width, so that the felt pad may flex straight forward, or sidewise, when the weight is applied to either side of the foot.

What is claimed is:

1. An artificial leg comprising an upper and a lower leg portion having a knee joint therebetween, a foot having an ankle movably connected with the lower leg portion, a resiliently held lock for the joint, a flexible lever connected with the lock, and means rigidly carried by the ankle for movement therewith and loosely engaged with the flexible lever.

2. An artificial leg including upper and lower leg portions connected by a knee joint, a hook pivotally carried by the lower leg portion and spring held in engagement with the upper leg portion, a foot pivotally mounted on the lower leg portion, a flexible lever pivotally carried by the lower leg portion and pivotally connected with the hook, and a member rigidly carried by and movable with the foot and slidably engaged with the flexible lever for movement of the lever and release of the hook upon pivotal movement of the foot.

3. An artificial leg including an upper leg portion and a lower leg portion, a knee joint between the leg portions, the portion of the knee joint carried by the upper leg portion including an apertured disk, a hook pivotally mounted on the lower leg portion and engaging with one wall of the opening of the disk to hold the joint against movement, a foot pivotally mounted on the lower end of the lower leg portion and having an upwardly extending ankle portion, a pivoted spring lever mounted on the lower leg portion and pivotally connected with the hook, and a spring plate carried by the ankle portion and engaging with the pivoted lever for movement of the lever upon pivotal movement of the foot.

4. An artificial leg including an upper leg portion and a lower leg portion, pivotal connections between the leg portions, a slotted disk carried by the upper leg portion, a hook pivotally supported on the lower leg portion and extending through the slot of the disk for engagement with one wall thereof, a resilient lever pivotally supported on the lower leg portion and pivotally connected to the hook, a foot pivot-

ally carried by the lower end of the lower leg portion and having an upwardly extending ankle, a transverse slot guide on the lower leg portion, a vertically extending resilient plate carried by the ankle and slidable through the guide, and an inturned portion carried by the lower end of the lever slidably engaging with the plate for movement thereby to release the hook upon the pivotal movement of the foot. 10

In testimony whereof, I affix my signature, in the presence of two witnesses.

WILLIAM I. BURNS.

Witnesses:

BRYANT MITCHELL,
FRED MESSRAIGE.