

No. 676,553.

Patented June 18, 1901.

G. A. ERICKSON & E. NILSON.

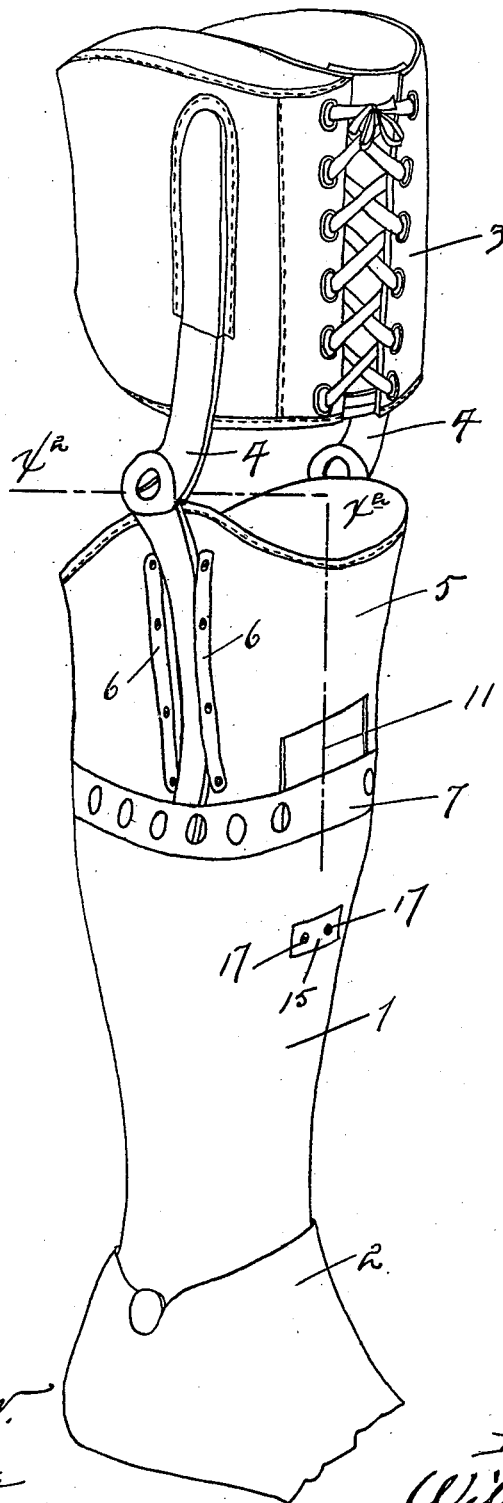
ARTIFICIAL LEG.

(No Model.)

(Application filed Feb. 9, 1901.)

3 Sheets—Sheet 1.

Fig. 1.



Witnesses.  
C. H. H. H.  
Harry Kilgus

Inventors  
Gustaf A. Erickson  
Emil Nilson.  
By their Attorneys  
William S. Merckel

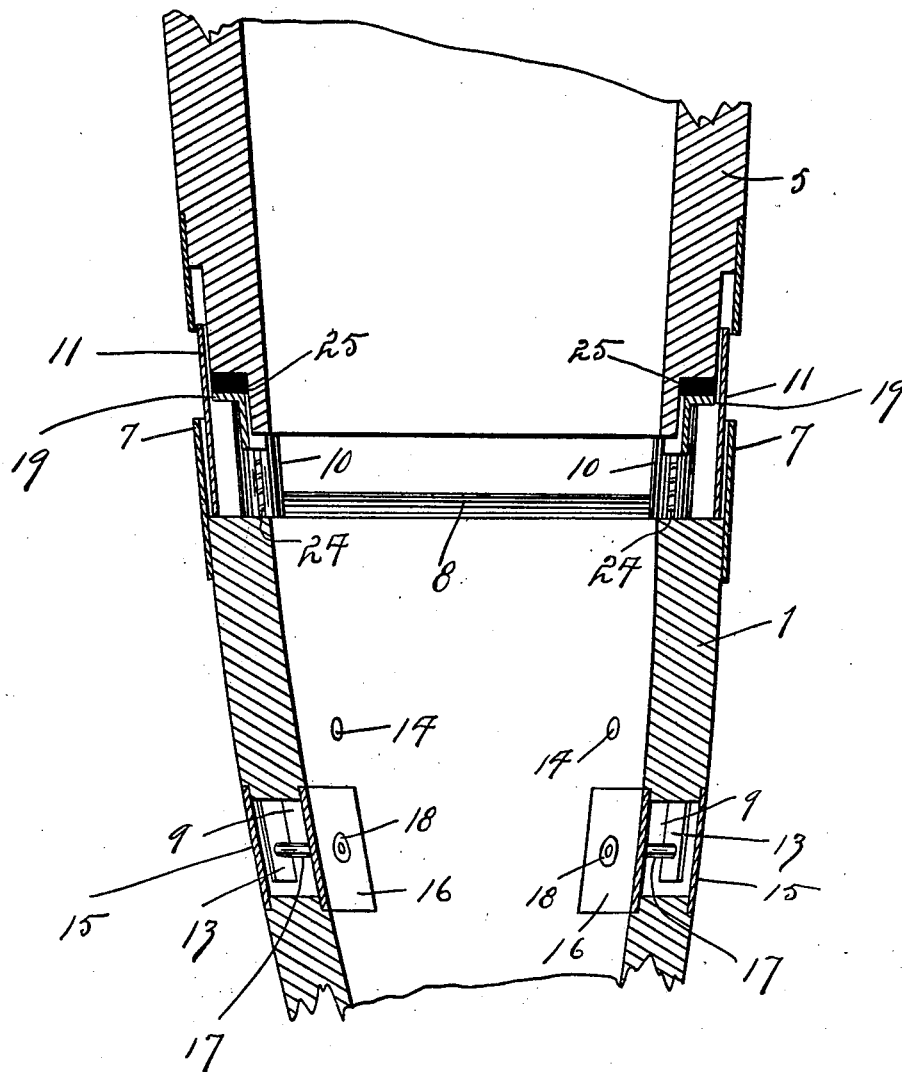
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Fig. 2.



Witnesses:  
*C. H. Brown.*  
*Harry Kilgore.*

Inventors.  
*Gustaf A. Erickson.*  
*Emil Nilson.*  
By their Attorneys  
*William M. Merchant*

G. A. ERICKSON & E. NILSON.  
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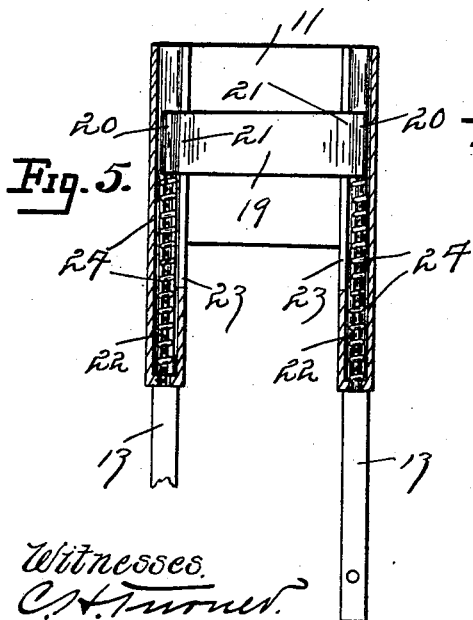
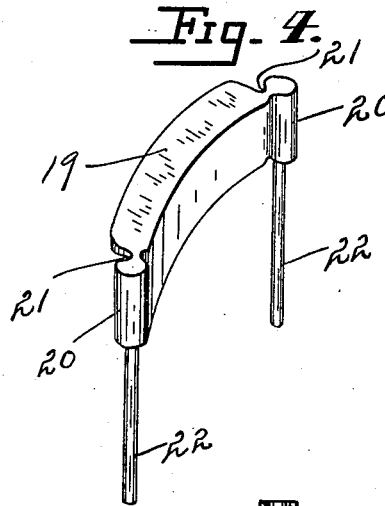
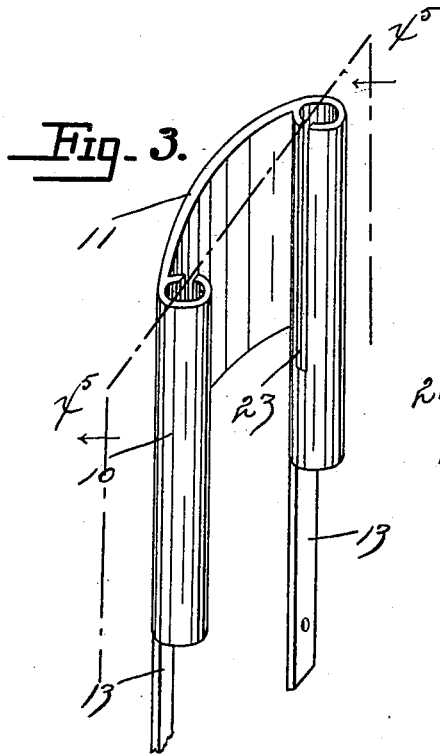
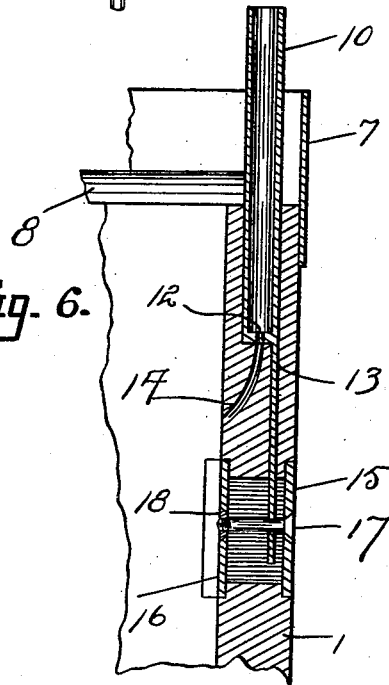


Fig. 6.



Witnesses.  
C. H. Turner.  
Harry Kilgus.

Inventors.  
Gustaf H. Erickson.  
Emil Nilson.  
By their Attorneys.  
Williamson & Merchand

# UNITED STATES PATENT OFFICE.

GUSTAF A. ERICKSON AND EMIL NILSON, OF MINNEAPOLIS, MINNESOTA.

## ARTIFICIAL LEG.

SPECIFICATION forming part of Letters Patent No. 676,553, dated June 18, 1901.

Application filed February 9, 1901. Serial No. 46,595. (No model.)

*To all whom it may concern:*

Be it known that we, GUSTAF A. ERICKSON and EMIL NILSON, citizens of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Artificial Legs; and we 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.

Our invention relates to artificial legs, and is directed to the improvement of the cushioning devices, which take up the jars and prevent pounding of the leg-stump in walking.

To the above end the invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a perspective view with some parts broken away, showing a leg constructed in accordance with our invention. Fig. 2 is a vertical section taken approximately on the plane indicated by the lines  $x^2 x^2$  on Fig. 1. Fig. 3 is a perspective view of one of the so-called "socket-yokes." Fig. 4 is a perspective view of the follower, which is spring-mounted in the said socket-yoke. Fig. 5 is a section on the plane indicated by the lines  $x^5 x^5$  on Fig. 3 and showing the socket-yoke and coöperating spring-follower put together, and Fig. 6 is a vertical section through one prong of one of the socket-yokes and through a portion of the leg.

The numeral 1 indicates the body or lower section of the artificial leg, and the numeral 2 indicates the foot, both of which parts may be of any suitable material, but are preferably formed of wood, which is dug out or hollowed.

The numeral 3 indicates the thigh strap or socket, which is of usual construction and is connected to the lower limb-section 1 in the customary way by metal straps 4, rigidly secured to the said members and hinged at the knee-joint.

The numeral 5 indicates the so-called "slip-socket," which is fitted to the stump of the

severed limb and is provided at its side with a laterally-spaced guide-strip 6, which embraces the lower sections of the straps 4, thereby holding the said slip-socket against rotation or lateral displacement, while permitting the same the required slight vertical movement.

Our improved cushion devices are applied directly between the leg-section 1 and the slip-socket 5. As shown, the lower leg-section 1 has secured to its upper edge a metal band 7, and to its upper edge, inward of said band, it is provided with ordinary rubber stop-strip 8, against which the lower end of the socket 5 will strike when forced downward to its extreme limit. At its front and rear portions, some distance below the band 7, the leg-section is cut away, as shown at 9. Above each of these passages 9 is a so-called "yoke-socket," (best shown in detail in Fig. 3,) which comprises a pair of vertical tubular sockets 10, that are rigidly connected at their upper ends by a segmental web or tie plate 11. The lower ends of the sockets 10 are closed, except for central perforations 12, and they are provided with depending anchor-straps 13 for a purpose which will hereinafter appear. When the yoke-sockets are applied in working position, one in the front and the other in the rear of the upper portion of the leg-section 1, as best shown in Figs. 2 and 6, the sockets or tubular sections 10 fit snugly into suitable seats formed in the said leg-section 1, and the anchor-straps 13 thereof extend on downward through the shell-like body of the said leg-section and terminate within the openings 9. When thus positioned, the perforations 12 in the bottoms of the sockets 10 register with passages 14 in the said leg-section 1, the said passages and perforations then serving to permit the escape of dirt or dust which may collect within the said sockets. Clamping-plates 15 and 16 embrace and close the openings 9, the former being countersunk into the outer surface of the leg-section 1 and the latter being countersunk into the inner surface thereof, as best shown in Figs. 2 and 6. Short bolts 17, provided with nuts 18, are passed through the clamping-plates 15 and 16 and through the depending end of each anchor-strap 13 of the sockets 10. In this manner the yoke-sockets are securely

anchored in working position, but may nevertheless be readily removed. It will be noted by reference to Fig. 6 that the heads of the bolts 17 are countersunk within the plates 15, while the nuts 18 are countersunk into the plates 16.

For coöperation with each yoke-socket there is a segmental follower or supporting-block 19, provided at its ends with cylindrical heads 20, connected with the body of the block 19 by vertically-extended and transversely-contracted neck portions 21. Preferably the heads 20 are provided with depending plungers or stems 22. When the parts of the cushion devices are put together, as shown in Figs. 2 and 5, the heads 20 work within the sockets 10 and the neck portions 21 work through vertically-extended slots 23, cut in the sockets 10 from their tops nearly but not quite to their bottoms. Coiled springs 24, placed around the stems 22, are compressed between the follower-heads 20 and the bottoms of the sockets 10.

The slip-socket 5 rests upon the followers or supporting-blocks 19, and for direct engagement therewith it is preferably provided with soft-rubber cushions 25, as best shown in Fig. 2.

As is evident when the slip-socket 5 is forced downward in the walking action the movement is cushioned by the four springs 24. If this downward movement is sufficient, the said socket will strike the rubber stop 8 and will be further cushioned thereby. When the plungers 22 are forced downward to extreme position, they pass through the perforations 12 in the bottoms of said sockets, and thereby positively force outward there-through any dirt or foreign material which may have accumulated within said socket.

It will of course be understood that our invention is capable of modification in its details of construction and arrangement of parts. For instance, the cushion devices made up of the yoke-sockets and coöperating parts might in some cases be located in the sides of the leg, although this would not by any means be the full equivalent of the arrangement illustrated. So far as we are aware it is broadly new to place cushion devices one in the front and one in the rear of

the leg, and this is a very important feature, inasmuch as the cushion devices are thus disposed to best resist the walking strain. In walking it is evident more or less of a rocking motion in a vertical plane intersecting the front and rear of the leg is thrown upon the leg by the act of stepping from heel to toe.

What we claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In an artificial leg, the combination with the lower leg-section and the slip-socket, of one or more cushioning devices, each comprising the yoke-like sockets having the slotted barrels 10 connected by plate 11, the supporting-blocks or followers 19, 20, the heads of which work in the sockets, and the springs 24 compressed between said heads and the bottoms of said sockets, substantially as described.

2. The combination with a leg-section 1 and thigh-socket 3 connected by the hinged straps 4 of the slip-socket 5 guided by the lower sections of said straps 4, and the cushioning devices each involving the slotted sockets 10 connected by plate 11, and provided with depending anchor straps or sections 13, the head or follower 19 having the heads 20 working in said sockets, the springs 24 within said sockets, the clamping-plates 15 and 16, and the clamping-bolts 17 serving to clamp said plates 15 and 16 onto the leg-section 1, and passed through said anchor-straps 13, substantially as described.

3. In an artificial leg, the combination with the lower leg-section and a coöperating slip-socket, of one or more cushioned devices between the said parts, each cushion device comprising a socket 10 having a perforation 12 in its bottom, a spring 24 in said socket, and a follower 20 also working in said socket and provided with a depending stem or rod 22 which works through said spring and through the perforation 12 in the bottom of said socket, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

GUSTAF A. ERICKSON.  
EMIL NILSON.

Witnesses:

MABEL M. MCGRORY,  
F. D. MERCHANT.