(No Model.)

E. CHAPMAN.

ARTIFICIAL LEG.

No. 534,198. Patented Feb. 12, 1895.

Fig. 9.

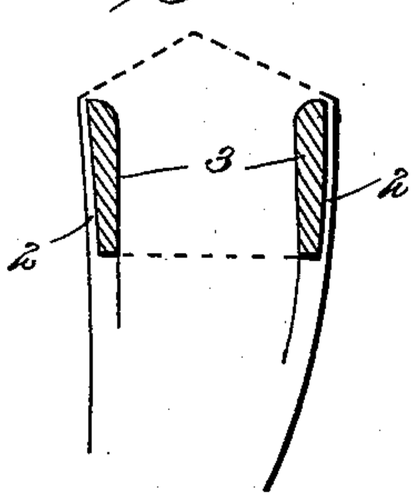
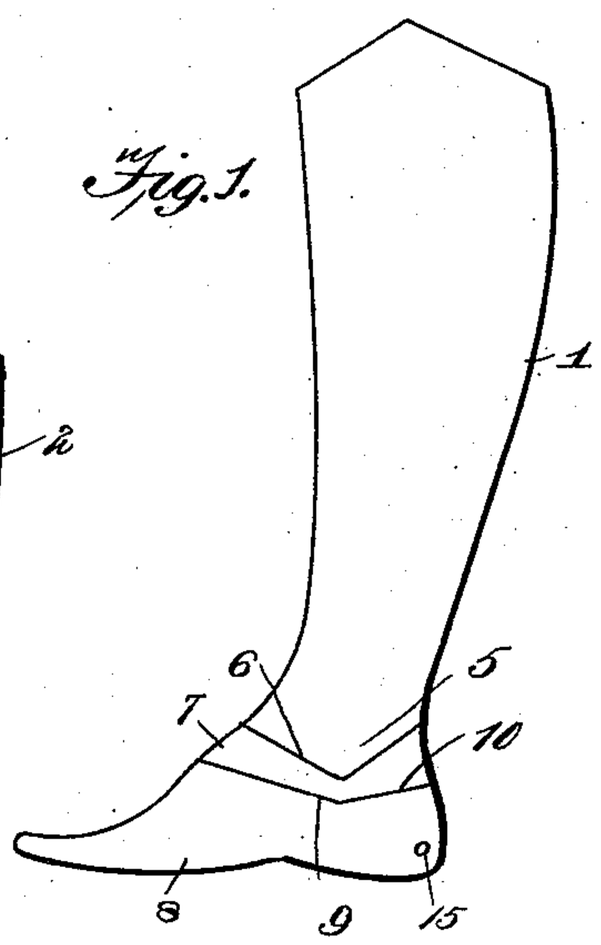


Fig. 1.



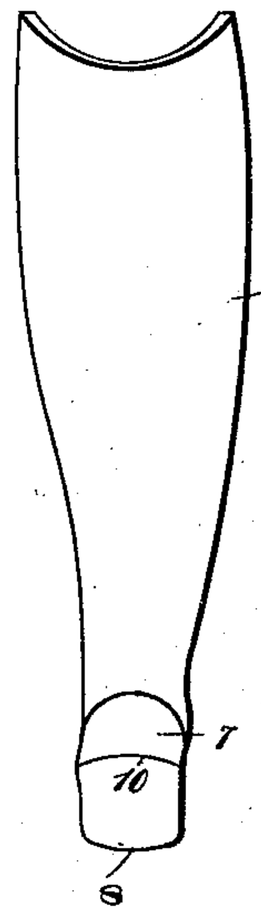


Fig. 2.

Fig. 3.

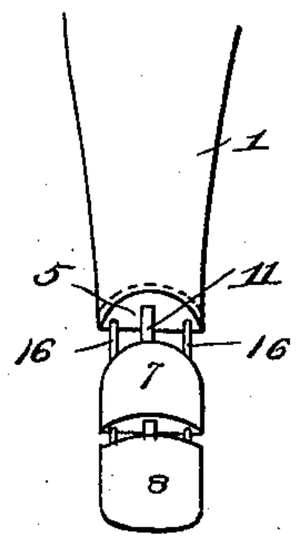


Fig. 4.

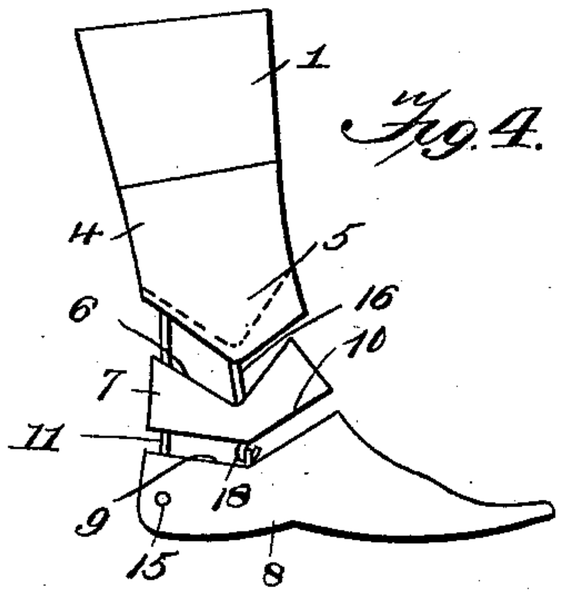


Fig. 8.

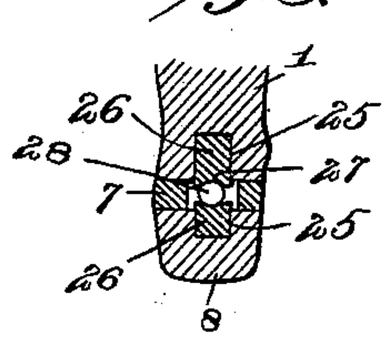


Fig. 6.

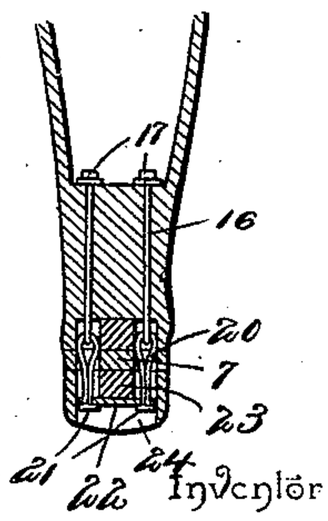


Fig. 7.

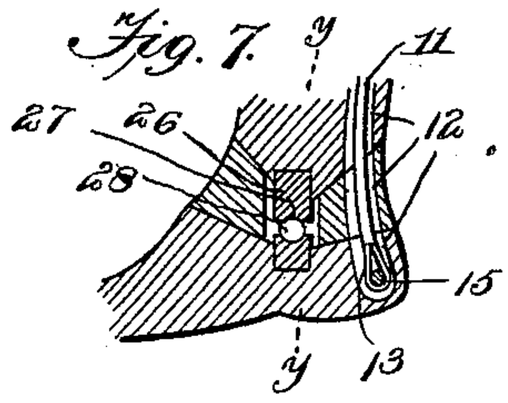
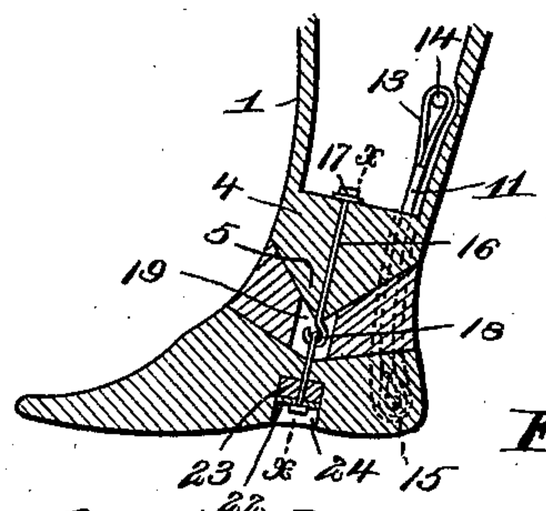


Fig. 5.



Witnesses

John C. Shaw.

L. R. Wollaupter

Inventor

Edward Chapman,

By Its Attorneys.

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

EDWARD CHAPMAN, OF DALLAS, TEXAS.

ARTIFICIAL LEG.

SPECIFICATION forming part of Letters Patent No. 534,198, dated February 12, 1895.

Application filed January 2, 1894. Serial No. 495,355. (No model.)

To all whom it may concern:

Be it known that I, EDWARD CHAPMAN, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Artificial Legs, of which the following is a specification.

This invention relates to artificial legs; and it has for its object to effect certain improvements in apparatus of this character wherein the ankle joint and the socket for receiving the stump of the amputated member shall be rendered more efficient in their functions.

To this end the main and primary object of the present invention is to provide an artificial leg, the ankle joint of which will have sufficient motion for walking without any lost motion from the time the heel is placed upon the ground until the weight of the body is changed to the ball of the foot, and to provide an ankle joint that will assist in bringing the weight of the body from the heel to the toe, and in fact making provision for universal movement in any direction.

The invention also contemplates a comfortable and yielding bearing for the stump of the amputated member.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the accompanying drawings:—Figure 1 is a side elevation of an artificial leg constructed in accordance with this invention. Fig. 2 is a rear view thereof. Fig. 3 is a similar view showing the leg socket, the foot, and the interposed cushion block therebetween, slightly separated from each other. Fig. 4 is a side elevation showing the leg socket, the foot and the interposed cushion block there between, slightly separated from each other. Fig. 5 is a vertical sectional view of the artificial leg at one side of the center. Fig. 6 is a detail sectional view on the line *x*—*x* of Fig. 5. Fig. 7 is a detail sectional view of the foot portion of the leg showing the ball and socket joint. Fig. 8 is a detail sectional view on the line *y*—*y* of Fig. 7. Fig. 9 is an enlarged detail sectional view of the upper portion of the leg socket.

Referring to the accompanying drawings, 1 designates a hollow leg socket having the configuration of the lower part of a person's limb and which is made of any suitable material ordinarily employed for the manufacture of artificial limbs. The hollow leg socket 1, is provided at the upper end thereof with the interior annular recess 2, that is adapted to snugly receive therein the pad band 3. The pad band 3, preferably consists of a rubber band or ring lined with a good quality of oil tanned leather, and said pad band is formed by being molded around a plastic cast of the stump of the amputated leg, and provides a comfortable yielding rest for such stump.

The hollow leg socket is provided with a lower solid portion 4, beveled at its lower side to form a V-shaped point 5, that registers in the V-shaped socket 6 in the upper side of the cushion block 7, interposed between the lower solid end of the leg socket and the foot 8, of the leg. The foot 8, is made solid and of any suitable material, and of a size proportionate to the person, and said foot 8, is provided in the upper side thereof with a V-shaped recess 9, in which registers or fits the double beveled or V-shaped lower side 10, of the intermediate cushion block 7. The intermediate cushion block 7, is made of any suitable elastic material, preferably rubber, to provide a yielding joint between the leg, or more properly speaking, the leg socket and the foot, and at the heel or rear side of the foot, the leg socket, cushion block, and foot are connected together by the anti-friction heel cord or string 11, that is arranged within the aligned openings 12 in the lower solid portion 4 of the leg socket 1, the cushion block 7 and the foot 8, and said anti-friction heel cord or string is provided with upper and lower loop ends 13, that are passed over the securing pins 14 and 15 arranged respectively in the leg socket above its lower solid portion, and in the heel of the foot 8. The heel cord or string 11, while providing for properly securing the foot to the lower end of the leg socket, at the same time admits of any adjustment the foot may assume when walking, and therefore does not interfere with the universal adjustment of the foot.

In adjusting the foot and cushion block

onto the lower end of the leg socket the lower side of the cushion block is cemented into the V-shaped recess 9, in the upper side of the foot 8, and these parts are additionally secured to the lower solid end of the leg socket by the side securing rods 16. The side securing rods 16, are mounted in suitable openings in the lower solid portion 4, of the leg socket and are retained therein by the securing nuts 17, engaging the upper threaded ends of the rods, and the lower ends of the side rods 16, are provided with the eyes 18, that are disposed within openings 19 formed in the cushion block 7, and are engaged with the upper looped ends of the short antifriction connecting loops 20, the lower ends of which are provided with the securing heads 21, arranged to bear on the metallic wear plates 22, interposed adjacent to the under side of the elastic washer plug 23, that is fitted within a washer recess 24 formed centrally in the under side of the solid foot 8, and said side connections 16 and 20, not only firmly retain the several parts of the leg properly in position but at the same time admit of any side or backward and forward movement of the foot that may be occasioned by walking.

At a central point the extreme lower end of the leg socket 1 and the upper side of the foot 8, are provided with the block sockets 25, in which are fitted the opposed socket blocks 26, provided in their adjacent ends with the bearing recesses 27, that accommodate therein the joint ball 28 which together with the blocks 26 provide a center ball-and-socket joint between the foot and the leg proper, whereby a universal adjustment is provided for.

From the above it is thought that the construction, operation and many advantages of the herein-described artificial leg will be readily apparent to those skilled in the art, but at this point attention is directed to the operation wherein as the weight of the body brings the heel flat upon the ground, the rear portion of the cushion block 7, is necessarily compressed, and by its own elasticity assists in moving the weight of the body from the heel to the toe, while the front part of the cushion block 7, affords a yielding support for the leg as the weight of the body is brought forward, and said cushion block therefore provides sufficient motion for walking without any lost motion. The elastic washer plug 23 and flexible connections with the elastic cushion block 7, permit a free side motion, and the ball and socket joint prevents a displacement of parts while the leg and foot are securely held together at the ankle joint, and at the same time admits of universal movement.

Having described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In an artificial limb, the combination of the leg socket, the foot, a ball and socket joint connection between the leg socket and the foot, a cushion block interposed between the leg socket and the foot, and a flexible connection between the leg socket and the foot, substantially as set forth.

2. In an artificial limb, the combination of the leg socket provided with a lower solid end having a V-shaped under side, the foot provided with a V-shaped recess in its upper side, an elastic cushion interposed between the leg socket and the foot and having a V-shaped socket in its upper side and a double beveled pointed lower side, and flexible connections between the leg socket and the foot to hold the cushion in a registering position between the socket and the foot to prevent the displacement thereof, substantially as set forth.

3. In an artificial limb, the combination of the leg socket and the foot provided with opposed sockets, socket blocks removably fitted in said sockets and provided with bearing recesses in their adjacent ends, a joint ball arranged between said socket blocks, an elastic cushion block interposed between the leg socket and said foot, and flexible connections between the leg socket and the foot, substantially as set forth.

EDWARD CHAPMAN.

Witnesses:
A. I. HUDSON,
EWD. A. STUART.