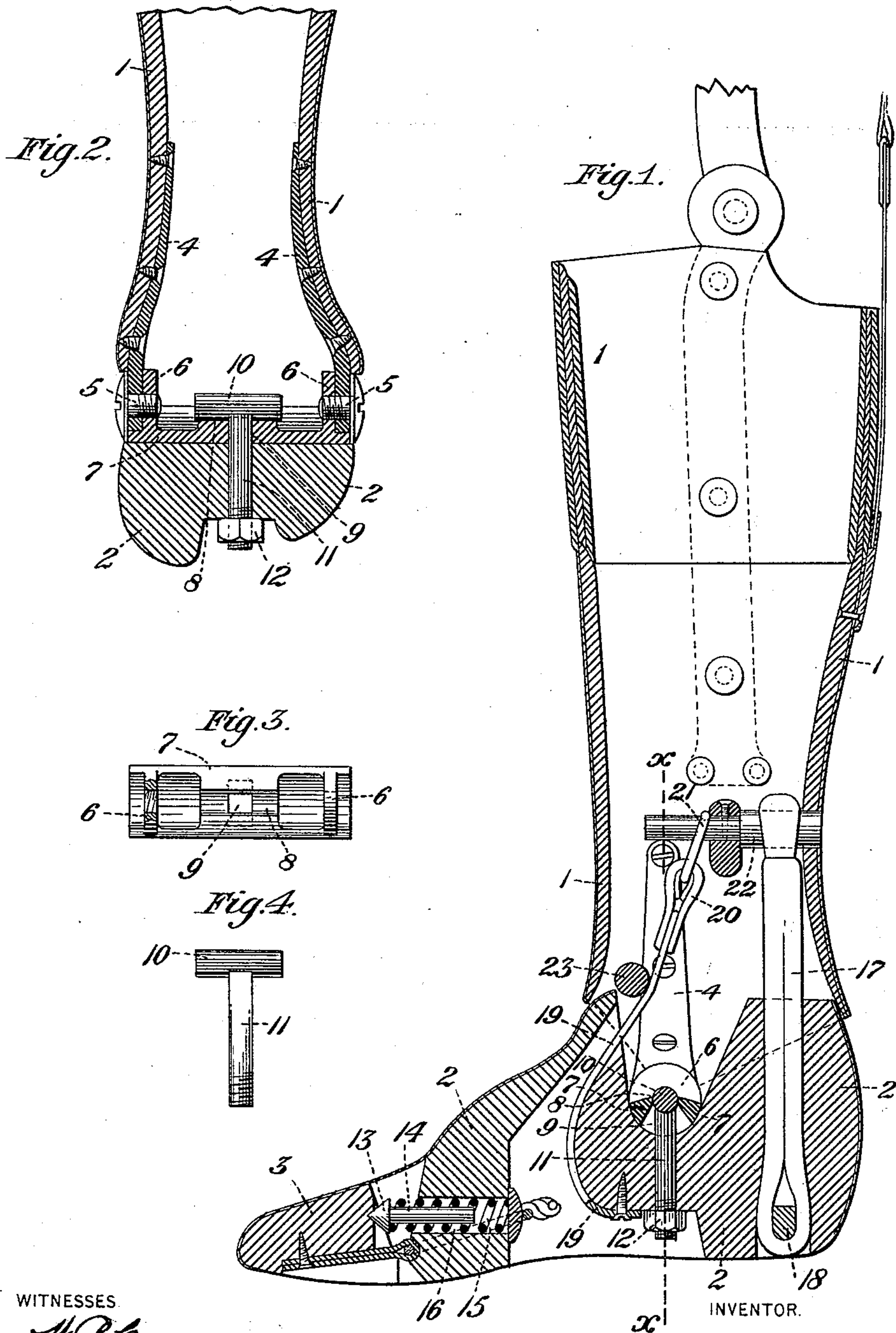


(No Model.)

F. W. NEUBERT.  
ARTIFICIAL LIMB.

No. 450,297.

Patented Apr. 14, 1891.



WITNESSES

*H. B. Cannon,*  
*Wm A Stone*

INVENTOR.

*Fredrick W. Neubert*  
*by H. P. Potter, his atty.*



# UNITED STATES PATENT OFFICE.

FREDRICK W. NEUBERT, OF PITTSBURG, PENNSYLVANIA.

## ARTIFICIAL LIMB.

SPECIFICATION forming part of Letters Patent No. 450,297, dated April 14, 1891.

Application filed January 23, 1891. Serial No. 378,758. (No model.)

*To all whom it may concern:*

Be it known that I, FREDRICK W. NEUBERT, of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered  
5 a new and useful Improvement in Artificial Limbs; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this  
10 specification, in which, like figures indicating like parts—

Figure 1 is a vertical central section of an artificial limb, showing the arrangement of the internal mechanism thereof, and in particular showing in part elevation my improved joint, which may be termed the “ankle-joint.” Fig. 2 is a cross-section taken in the line *x x* of Fig. 1, and also showing more in detail my improved joint. Fig. 3 is a detail  
20 plan view of the socket-joint. Fig. 4 is a view in elevation of the T-headed bolt which passes through and has a bearing in the socket of the joint, as shown at Fig. 3.

My improvement relates to artificial limbs; and it consists, chiefly, in the provision of a new joint for the ankle and an improvement in the spring of the toe-joint.

In the use of artificial limbs, one of the chief items of expense is the repair of the  
30 parts which wear out and give way, and no part is so apt to wear out as the ankle-joint, owing to the constant movement in the limb at this point; and in the form of joint heretofore generally in use its replacement has  
35 been a very troublesome and expensive matter, and as a matter of fact it often caused the destruction of a portion of the limb itself to effect the replacement of the joint. It has been my object to provide a detachable joint,  
40 one that might be easily removed when worn out and be as easily replaced with a new one.

In order that my improvement may be fully understood by those familiar with the manufacture of artificial limbs, I will proceed to  
45 describe it in connection with the drawings.

The outside casing of the limb is shown in the various figures at 1, and 2 is the principal part of the foot.

In Fig. 2, 5 represents a screw at each end  
50 of the joint, which fastens it to the ankle-piece, which in turn is secured to the leg.

6 is the flange of the socket into which the screw 5 taps.

7 is the socket in the joint.

8 is the seat in the socket for the head of the bolt, which passes through it and downward to the bottom of the foot, and 9 is the hole through which the bolt passes.

10 is the head of the bolt, which is cylindrical in form, and 11 is the bolt itself.

12 is the nut on the end of the bolt, which is put on the bottom of the foot.

13 is the cone-head or point of the wooden pin, which is inserted in the spring in the toe-joint.

14 is the wooden pin itself.

15 is a spiral spring into which the wooden pin 14 is inserted.

16 is the socket in which the pin and spring actuating the toe-joint are placed.

17 represents the tendon of the heel.

18 is a wooden pin holding the tendon in place at the lower end.

19 is a strap whose office is to draw the foot upward into normal position in the act of stepping, and this strap is provided with the spring 20 and a hook 21, secured to pin 23, and it also passes around an anti-friction roller 23.

The greater part of the details herein shown and pointed out of the construction of artificial limbs are of course well known, and no claim of invention to them is herein made, my improvement being confined to the joints of the ankle and the toe. An inspection of the drawings in connection with the description of the various parts which has just been made will show the working of the improved ankle-joint.

The body of the limb and foot is generally composed of willow wood, covered with the outside casing shown at 1, which is generally composed of rawhide. The back muscle shown at 17 is to keep the foot from going forward, and the strap 19 is to keep the foot from going too far backward and to pull it in place after being drawn backward. This movement of the foot backward and forward turns upon the ankle-joint, and it is at this point that the chief wear occurs.

In my improvement I have constructed a joint which appears clearly in detail in Figs.



2, 3, and 4. The joint passes laterally through the foot, and is fastened at each side of the foot to metal straps extending upward to the leg by screws or rivets 5, which tap into the flanges 6 of the joint. These metal straps connecting with the leg are arranged to fit snugly against the main part of the joint and hold it securely in place by means of shoulders, which prevent any turning or any movement to cause wear in the main part of the joint. Then through an opening 9, suitably prepared in such a manner as to permit of a slight play backward and forward in a rocking motion, I pass a bolt 11, with a cylindrical head 10, adapted to be seated in the socket 8 of the joint. The lower end of the bolt is provided with a nut 12, which may be readily tightened at any time from the bottom of the foot, if the joint becomes too loose. Should any part of the joint become too much worn, it is an easy matter to unscrew the bolt 12 at the bottom of the foot and the screws 5 at the sides and slip the whole joint out, when it can be readily replaced by a new one. These joints can be made in standard sizes and kept in stock for use as needed.

Heretofore it has been the practice to use a spiral spring to straighten out the toe-joint in the act of stepping; but it was always difficult to keep the spring straight, and the

constant tendency was to curl or double up. I have remedied this defect by the insertion of a wooden pin or block. (Shown at 14.) This pin bears, by means of the shoulder back of its conical head or point, against the spiral spring, and its body, running straight back through the spring, prevents any twisting or curving of the spring and holds it in line, so that as soon as the pressure from the bending of the toe-joint is removed the force of the spring comes in play and the toe-joint is at once straightened out.

Having thus described my improvement, I claim herein and desire to secure by Letters Patent of the United States—

As a new article of manufacture for artificial limbs, a detachable ankle-joint composed of a main part adapted to be seated in the wood-work of the limb and having flanges at each end into which screw-fastenings may be tapped, and a socket adapted to receive a cylindrical T-headed bolt by which the joint is fastened to the wood-work of the foot, substantially as shown and described.

In testimony whereof I have hereunto set my hand.

FREDRICK W. NEUBERT.

Witnesses:

W. B. CARSON,  
WM. A. STONE.