

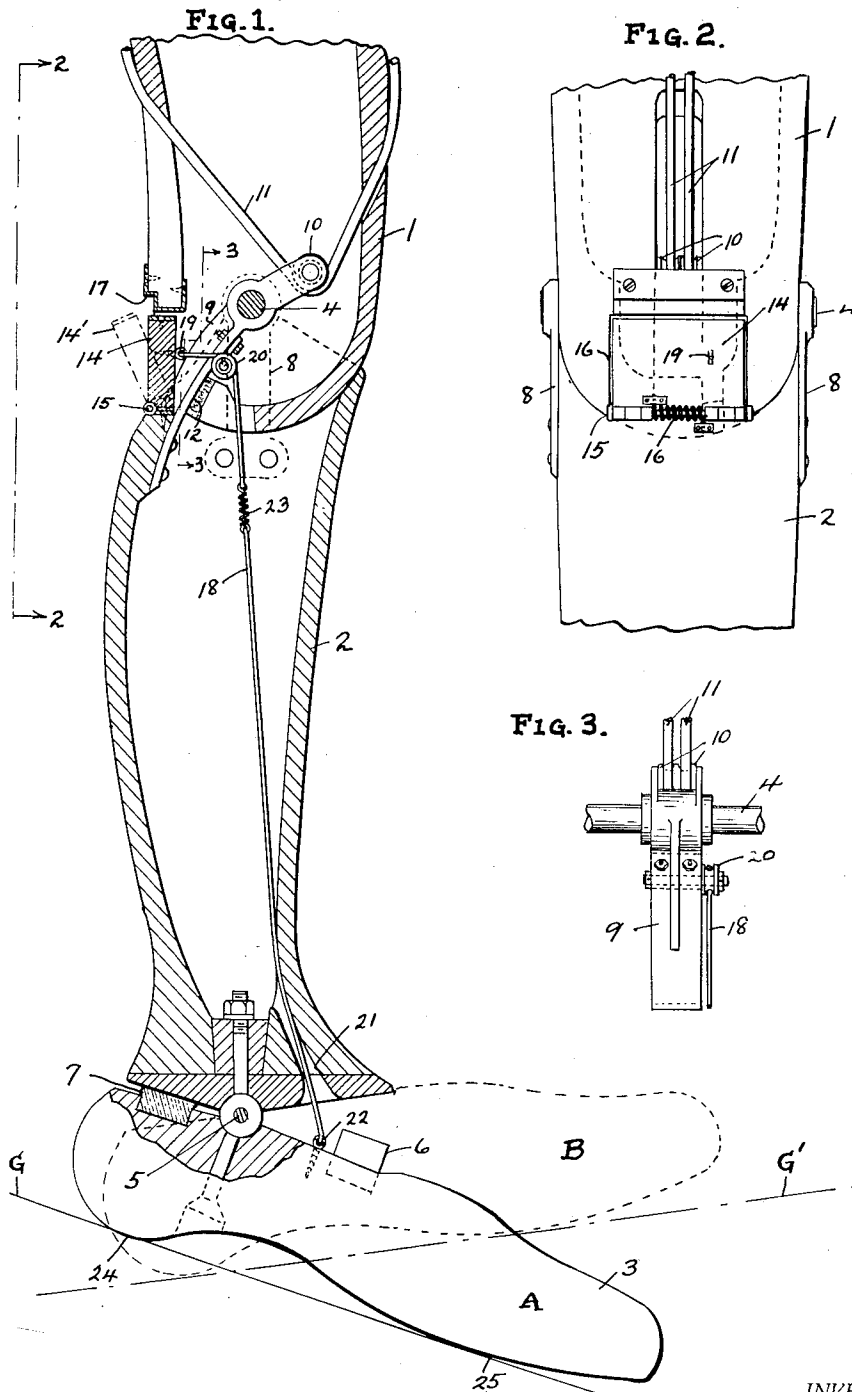
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1,934,210

ARTIFICIAL LEG

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ARTIFICIAL LEG

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1 Claim. (Cl. 3—2)

This invention relates to artificial legs and has for its object improvements in the construction of such legs whereby a better control is had of the movement of the lower part of the leg.

My improved construction is shown in the accompanying drawing in which Fig. 1 is a vertical section of an artificial leg equipped with my invention. Fig. 2 is a rear view of portion of the leg as seen from the line 2—2 of Fig. 1, and Fig. 3 is a detail of the knee bolt and adjacent structure as seen from the line 3—3 of Fig. 1.

The invention applies to artificial legs in which the amputation has been made above the knee so that control of the leg below the knee must be carried out entirely by artificial devices, and the principal feature of my improved construction is the provision of a positive stop against the lower part of the leg swinging in a rearward direction at a time when the wearer is about to place his weight upon the leg. Also such a stop which will be automatically operated with no attention on part of the wearer.

In the drawing 1 is the thigh portion or stump socket, 2 the lower leg, and 3 the foot. These members may be of conventional construction, with sections 1 and 2 transversely pivoted on a knee bolt 4, and the foot pivoted on an ankle bolt 5 and stopped at both limits of rocking motion by some resilient means such as the soft rubber pads 6, 7. The downward limit of tipping of the foot being shown in full lines and designated A, and the upward limit being drawn in dotted lines and designated B.

The lower leg section 2 is pivoted to the ends of the knee bolt by strap hinge members 8 and is internally supplied with a bracket arm 9 which is rigidly secured to the lower leg, pivotally embraces the knee bolt to beyond the same and carries at its end a pair of small grooved rollers 10 under which passes the suspender straps 11 which extend over the shoulders of the wearer for general control of the lower leg by body movements in the well understood way.

This bracket or lever 9 is generally termed a back-stop as it strikes a shoulder 12 or lower edge of the cut-out in the lower end of the stump socket in which it works so as to prevent the knee from collapsing rearwardly when the wearer's weight is placed upon the leg.

However, apart from the tendency of the knee

to double up backwards, is another very undesirable tendency in such structures and this is the tendency for the lower leg to swing or bend backward from the knee bolt as a pivot just before the weight is placed upon the leg in taking a forward step, as the harness or straps 11 will not positively prevent this.

To overcome this deficiency I provide a positive lock which takes the form of a small hinged block 14 pivoted at 15 to the lower leg portion and fitting within a corresponding recess 16 formed in the thigh portion 1 when the leg is straightened, a small coiled spring 16 on the hinge pin serving to normally resiliently urge the block out of the recess to the dotted position 14' so as not to interfere with the bending of the leg.

The upper edge of the recess is made with a step at 17 and shod with a metal plate to protect it from wear, as is also the upper edge of the block 14, and a cord 18 extends from an eyelet 19 in the block over a small grooved pulley 20 carried on the back-stop arm 9 and thence downward through the hollow lower leg and a guide hole 21 in the lower end thereof to connect to an eyelet 22 secured in the foot section 3 forward of the ankle bolt 5.

The cord 18 may have its resiliency increased by incorporating intermediate its length a small but fairly stiff tension spring 23.

In operation, (the block 14 being open to dotted position) upon a forward step the heel 24 of the foot first comes in contact with the ground which occupies a position G relative to the position of the foot in A position, and this throwing the toe portion 25 downwardly pulls the cord 18 and draws the block 14 into the recess so as to positively lock the lower leg against backward movement until the body is thrown sufficiently far forward to raise the toe (relative to the lower leg) to release the tension on cord 18 so that spring 16 throws the block 14 out of the recess.

The position of the toe relative to the lower leg and ground line when rocking over the toe and with heel raised from the ground as the leg is about to swing backward is shown in dotted lines and wherein the relative position of the ground line is designated G'.

If, upon a forward step the weight of the body

is thrown forwardly too soon for the block to have fully entered the recess, it nevertheless will have entered the step 17 and overcome the danger of a fall.

15 In considering my invention it will be evident to those expert in the art that it is applicable to various forms of artificial legs as it will cooperate with almost any arrangement of other working parts incorporated in artificial legs, and also
10 that while I show a pivoted block entering a recess at the rear of the knee joint to automatically lock the lower leg at a certain portion of the step, the invention may assume other forms within the spirit of the invention and scope of
15 the appended claim.

I claim:—

An artificial leg for above the knee amputation comprising a stump socket, a lower leg section and a foot section pivotally connected together, means positively locking the lower leg against rearward swinging upon initially placing the weight of the body thereon in taking a forward step, said means comprising a movable stop at the rear of the knee joint and means connecting the foot and the stop adapted to positively move the stop into locking position when the toe only is depressed relative to the lower leg and means automatically releasing the stop from locking position upon elevation of the toe.

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