

S. R. ANDERSON.
ARTIFICIAL LEG.
APPLICATION FILED DEC. 2, 1912.

1,063,175.

Patented May 27, 1913.

Fig. 1.

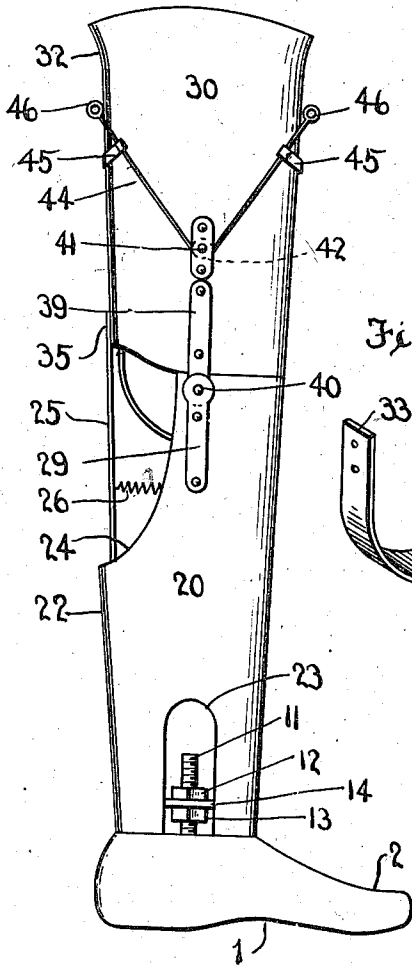


Fig. 2.

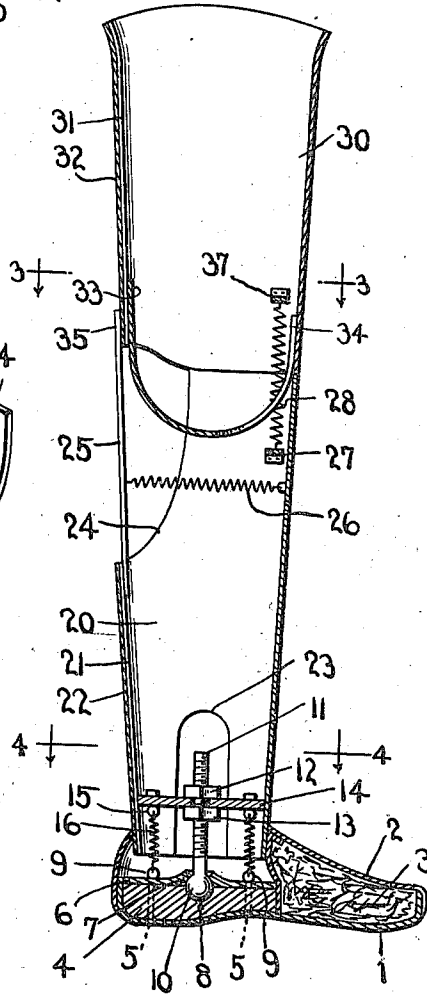


Fig. 5.

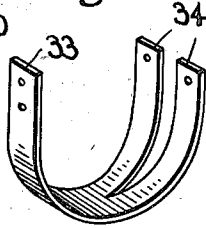


Fig. 3.

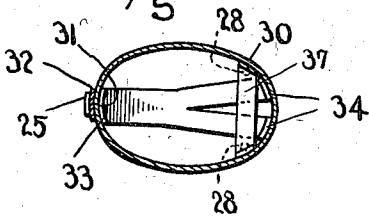
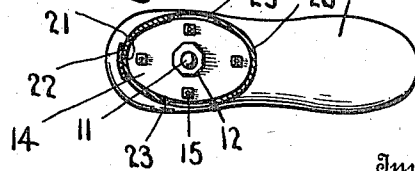


Fig. 4.



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UNITED STATES PATENT OFFICE.

SAMUEL R. ANDERSON, OF QUINCY, ILLINOIS.

ARTIFICIAL LEG.

1,063,175.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, SAMUEL R. ANDERSON, a citizen of the United States, residing at Quincy, in the county of Adams and State of Illinois, have invented certain new and useful Improvements in Artificial Legs; and I do 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 artificial limbs, and more especially to legs; and the object of the same is to produce improvements in the detailed construction thereof, as hereinafter more fully described and claimed, and as shown in the drawings wherein—

Figure 1 is a side elevation and Fig. 2 a central vertical section of this improved leg complete; Figs. 3 and 4 are cross sections on the lines 3—3 and 4—4 of Fig. 2; and Fig. 5 is a perspective detail of the Y-shaped guard hereinafter described.

The foot member of this improved artificial leg is stamped from aluminum into the shape of the lower half 1 of the human foot, whose open part is covered over with cloth 2 and whose interior is stuffed as indicated at 3, and therefore it is possible for the user to wear low-quarter shoes or slippers because the yielding upper side 2 of the foot simulates the top of the human foot. The ankle joint is made of two members whereof the lowermost is composed of a bottom plate 4 fitting closely within the shell-like foot 1 and secured thereto by counter-sunk screws 5, and an upper portion 6 having a central hole 7; and these two members are provided in their meeting faces with hemi-spherical sockets 8 as shown. At four points around said hole 7, the upper part 6 also carries hooks or eyes 9. The upper member of the ankle joint is a ball 10 fitting within the socket, and a shank 11 projecting loosely through said hole 7 and threaded to receive nuts 12 and 13 standing respectively above and below a plate 14 which is carried by the lower leg-section. This plate has eyes or hooks 15 connected with those on the lower member by means of short coiled springs 16, and the tension of these springs is so adjusted and maintained that the entire foot section is normally held at its proper or natural angle to the lower leg-section as shown. It is obvious that by adjusting the nuts 12 and 13

the shank 11 can be set higher or lower with respect to the plate 14, and the leg can be shortened or lengthened slightly at this point as desired. By removing the screws which fasten the lower part 4 to the foot 1, the latter can be taken off as for cleansing or repair.

The lower leg-section 20 is a shell of aluminum, by preference stamped originally from a flat sheet and brought together along the line 21 where the edges of the sheet are connected by a bracing strip 22 secured to outside of the completed leg in any suitable way, and this seam and strip are preferably at the back of the leg as shown. At both sides of the same, notches or openings 23 are left in the shell so that access may be had to the nuts 12 and 13 on the threaded shank 11 as above described. The back of the shell at its upper end is cut away as at 24 to produce a deep notch, and within the shell below the notch is secured a leather strap 25 which is drawn normally into the interior of this member by a contractile spring 26 connecting the front of the shell with the strap at about the center of the length of the latter as shown. Transversely across the interior of the shell is a metallic arch 27 which may be a rod or strap of metal constituting a cross bar to strengthen the shell at this point and to afford means for attaching the lower ends of contractile springs 28, whose upper ends are in turn attached to a similar cross bar 37 in the upper leg-section as will be described. Finally, the lower leg-section carries hinge elements as shown.

The upper leg-section is also made from a sheet of aluminum 30 bent into tubular shape and its rear seam 31 covered by a strip 32 secured to the outside thereof in any suitable manner; and this section carries hinge members 39 at its sides overlapping the hinge members 29 on the lower leg-section and pivotally connected therewith at the points 40 so that the leg can articulate at the knee joint in the usual and natural manner. The upper end of the strap 25 is connected to the lower end of the thigh-section at such point 35 that the leg may not bend in the wrong way. Internally this thigh-section carries a cross bar or strap 37 with which the upper ends of the contractile springs 28 are connected so that their tendency is to strengthen the leg in the usual manner. A feature of the invention lies in

the fact that the lower end of the thigh-section carries a guard which will simulate the knee-cap, and this guard is by preference formed from a Y-shaped piece of aluminum whose single end or shank 33 is secured inside the lower end of the shell 30 at the rear, and its double or forked end 34 is secured inside said shell at the front with the arms of the fork some distance apart. It follows that when the leg is straight this curved guard depends into the upper end of the lower leg-section, and when the leg is articulated the forked ends of the guard rise out of the upper end of the lower leg-section and prevent the trousers or other clothing from falling into the opening thus exposed and becoming caught therein, or at least mortifying the wearer.

I have purposely omitted all description and illustration of the usual strap and buckle employed for connecting the upper end of the thigh-section with the stump of the leg, because the same forms no part of the present invention.

A striking feature of this invention consists in the means for supporting the leg by a harness which leads upward either to the wearer's waist or shoulders, and which harness is not illustrated because it also forms no part of the present invention. To opposite sides of the thigh-section are secured pulley casings 41 in each of which is journaled a flat pulley 42 having a grooved periphery, and over the latter moves a fine wire cord or rope 44 whose center engages the pulley and whose arms diverge upward and pass through guides 45 which may themselves be flat aluminum loops secured to the outer side of the shell 30, these arms having eyes or other fastenings 46 at their upper extremities to which the said harness is attached. The construction is much like that of a suspender-end inverted, and with one of these members at the inside and another at the outside of the thigh-section, there are four loops or eyes 46 to which the harness can be attached; hence this artificial limb will be held in place with great force, and perhaps the ordinary strap and buckle around the stump can be omitted. Yet it will be observed that the leg can swing forward and backward without drawing on the harness at the belt line or over the shoulders because the ropes or cords 44 move under the pulleys 42 and through the guides 45. I prefer that said pulley casings and guides shall be quite flat and disposed on the exterior of the thigh-section, in plain sight and within easy reach, so that in case the ropes are caught, should become broken or stretched they can readily be replaced. Moreover, it is not usually the case that the clothing will come into such close contact with an artificial limb at its upper end as it does over the

knee or ankle; and in any event it is necessary for the wearer's comfort that the means for supporting the leg should be reliable and easy, light and accessible, and often should entirely avoid the use of the strap and buckle because in so many instances the stump has become sore or tender from the use thereof. If made of aluminum, this entire leg will weigh but little, cannot rust, and is exceedingly strong. The height to which the thigh-member is carried will of course depend on the length of the stump remaining.

What is claimed as new is:

1. In an artificial limb, the combination with an outer shell-like member having openings in each side at its outer end, and a plate secured across the interior of said member opposite said openings and pierced with holes; of another member forming the extremity of the limb and having an internal socket, a ball in said socket, a threaded shank projecting from the ball through the central hole in said plate, nuts on said shank at opposite sides of the plate and accessible through said openings, and yielding connections between the extreme member and the remaining holes in the plate of said outer member.

2. In an artificial leg, the combination with upper and lower leg-sections of shell-like configuration, the lower section having a deep notch in its rear side at its upper end, hinge members attached respectively to said sections and pivotally connected with each other, and a guard for the lower end of the thigh-section consisting of a metal strip having its rear end attached to the interior of this section, its body bent downward beneath the end thereof and standing within said deep notch, and its front end secured inside the front of said thigh-section; of a strap secured within the rear of the thigh-section with its body spanning said deep notch of the lower section and secured inside the same at the bottom of such notch, a spring connecting the front of the lower section with said strap between the ends of the latter, and yielding means for normally straightening the leg.

3. In an artificial leg, the combination with upper and lower leg-sections of shell-like configuration, hinge members attached respectively thereto and pivotally connected with each other, cross bars within said sections, and springs connecting said bars; of a strap secured at its lower end within the upper end of the lower leg-section and at its upper end within the lower end of the thigh-section, and a contractile spring connecting the strap between said points of attachment with the front portion of the lower leg-section.

4. In an artificial leg, the combination with upper and lower leg-sections of shell-

like configuration, hinge members attached
respectively thereto and pivotally connected
with each other, cross bars within said sec-
tions, and springs connecting said bars; of
5 means for limiting the bending of the lower
leg-section in one direction, and a guard for
the lower end of the thigh-section consisting
of a sheet of metal cut initially into Y-shape
with its single arm secured inside the rear
10 of said thigh-section, its body bent down-

ward beneath the end thereof, and its forked
end secured inside the front of said section,
substantially as described.

(In testimony whereof I have hereunto set
my hand in presence of two subscribing wit- 15
nesses.

SAMUEL R. ANDERSON.

Witnesses:

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