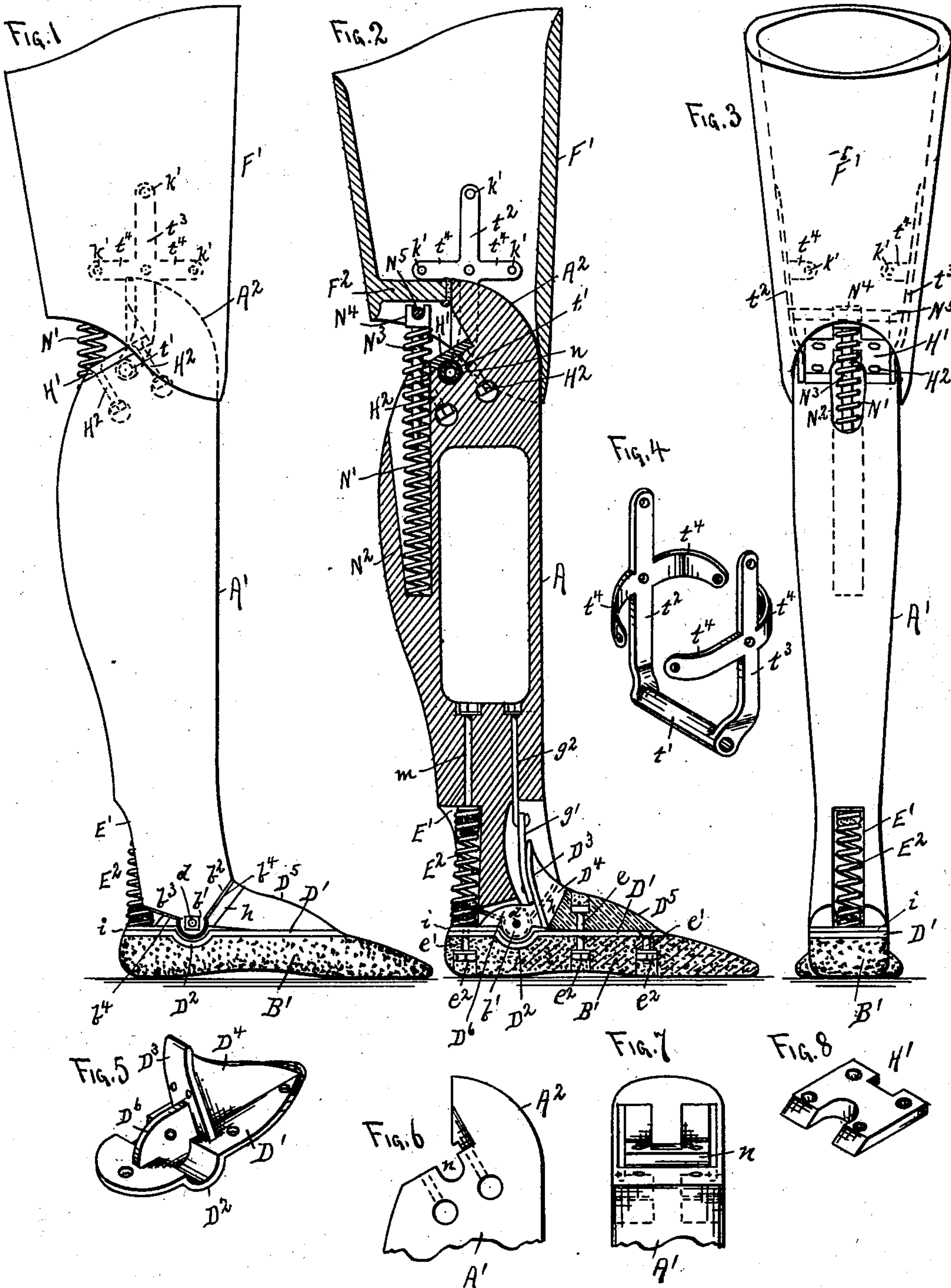


A. GAULT.
ARTIFICIAL LIMB.

(Application filed Nov. 7, 1899.)

(No Model.)



WITNESSES.

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ARTIFICIAL LIMB.

SPECIFICATION forming part of Letters Patent No. 668,634, dated February 26, 1901.

Application filed November 7, 1899. Serial No. 736,167. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER GAULT, a citizen of the United States, residing at Medford, in the county of Steele and State of Minnesota, have made certain new and useful Improvements in Artificial Limbs, of which the following is a specification.

This invention relates to artificial limbs; and it consists in the construction, combination, and arrangement of parts, as hereinafter shown and described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a side elevation of an artificial limb with my improvements embodied therein. Fig. 2 is a longitudinal sectional elevation, and Fig. 3 is a rear elevation, of the same. Fig. 4 is a detached perspective view of the knee-joint clip. Fig. 5 is a detached perspective view of the ankle-joint clip. Fig. 6 is a side view, and Fig. 7 is a rear view, of the upper part of the lower-limb section disassociated from all its attachments. Fig. 8 is a perspective view of the knee-joint-holding plate detached.

A' represents the lower-limb section, which will be of the ordinary material or of any special material, as may be preferred. The lower end of the section A' is formed into a semicircular transverse rib b' at the point corresponding to the ankle-joint, and with the forward part b^2 and the rear part b^3 cut away, as shown, and the three parts b' b^2 b^3 covered with a sheet-metal wear-plate b^4 , as shown.

The "sole" portion B' of the foot will preferably be formed of felt and be provided with a top plate D', preferably of aluminium or some other suitable light strong metal, and secured to the felt portion by bolts e' , with the nuts e^2 embedded in the felt, so as not to project therefrom. The front or toe portion of the flexible sole B' extends beyond the forward end of the top plate D', so that the toe portion will yield in walking, and thereby correspond to the action of the natural foot, the flexible sole portion bending upward over the outer end of the top plate D', the outer end of the top plate thus serving to form a "hinge" connection at a point corresponding to the toe-joint in the natural foot. By this simple means an action is produced in walking which is closely analogous to the action of the nat-

ural foot. In the upper part of the plate D' is a transverse socket D² for the transverse rib b' of the lower-limb section A', the movement of the rib in its socket providing for the ankle movement of the limb, the cut-away portions b^2 b^3 allowing a free forward-and-backward movement of the section A' upon the foot-section. Rising from the plate D' is a curved arm D³, to which a leather or other flexible strap g' is attached, from the upper part of which a hooked rod g^2 rises and is secured in the section A', as shown, the strap g' serving to limit the backward movement of the leg-section.

D⁴ is a "fin" running forward from the arm D³ and conforming to the shape of the upper part of the foot and serving to support the arm D³. Filling-pieces D⁵, of wood, will be supplied at the sides of the fin D⁴ to complete the symmetrical outline of the foot, some of the bolts e' being utilized to secure the filling-pieces D⁵ to the plate D'. The rear ends of the filling-pieces D⁵ are cut away, as at h , to conform to the cut-away portion b^2 of the leg-section A' to permit the proper "play" to the latter. A smaller fin D⁶ runs backward from the arm D² and also down, into, and across the socket D² and is provided with a hole corresponding to the center of the circle of the socket D².

The limb-section A' is formed with a recess in its lower part to embrace the fin D⁶, the fin D⁶ thus serving the threefold purpose of a brace to the arm D³, a support to the lower part of the limb-section A', and to prevent any lateral movement thereto. The fin thus serves to complete the ankle-joint by affording a support for the holding-bolt d , as shown.

The socket D² will be lined with leather, as at i , to receive the impact and wear of the joint, so that no noise will occur when the joint is moved.

In the rear of the lower part of the lower-limb section A' is a cavity E', in which a coiled spring E² rests, the upper end of the spring being secured to the leg-section A' by a bolt m and the lower end being secured to the foot-section by one of the bolts e' . The bolts m and e' will be firmly embedded in the spring E², as by vulcanizing, so that the spring will act both when compressed and dis-

tended, and thus serve to retain the foot-section in its normal position with relation to the leg-section.

F' represents the upper-leg section or the part adapted to be attached to the thigh and will be of the ordinary or some special material and will be united to the lower-limb section by a hinged joint at a point corresponding to the knee-joint. This knee-joint is of peculiar construction and is one of the features of my invention.

The lower-limb section A' is provided with a semicircular cross-cavity *n*, in which a journal *t'* fits, this journal being preferably hollow to decrease the weight. Rising from this journal *t'* at either end are arms *t*² *t*³, curving outward and forward and passing upward inside the thigh-section F' and secured thereto, as by bolts *k'*, the arms having lateral branches *t*⁴ to support and strengthen the connection.

The upper forward part of the section A' is rounded, as shown at A², the center of the rounded portion being the center of the journal *t'*, so that as the thigh portion F' is bent backward in the act of operating the knee-joint no "break" will occur between the parts A' and F'.

H' is a plate, preferably of vulcanite, attached by bolts H² across the journal *t'* and adapted to retain it in place and prevent its displacement when the strains are upward.

N' is a coiled spring, with its lower end fitting into a socket N² in the leg-section A' and with its upper end supporting a pin N³, the latter provided on its upper end with a socket N⁴, fitting a cross-rod N⁵ through the thigh-section F'.

Branching from the interior of the thigh-section F' at the rear is a stop F², which rests against the rear upper portion of the "head" A² of the limb-section A' and limits the forward movement of the thigh-section. The stop F² will be armed with a felt cap to prevent any noise from the contact between the parts.

The spring N' serves to keep the thigh-section pressed forward against the lower-limb section by its stop F² and yieldable when required in using the limb.

When thus constructed, an artificial limb is produced which will perform all its functions in a very natural manner and not permit any of the jerky unnatural movements so common in artificial limbs.

Having thus described my invention, what I claim as new is—

1. In an artificial limb, the lower-limb section having its lower end transversely rounded and with a central vertical recess across said transverse rounded lower end, the foot-section formed with a felt sole and with a metal top plate, said metal top plate having a transverse socket to receive and support said transverse rounded lower end of said lower-limb section and with a vertical web adapted to enter said vertical recess, and means whereby said transversely-rounded end may be secured movably in said socket and upon said vertical web, to secure the requisite ankle-joint movement, and prevent lateral displacement, substantially as shown and described.

2. In an artificial limb, the lower-limb section having its lower end transversely rounded, the foot-section formed with a felt "sole" and with a metal top plate secured to said felt sole and provided with a transverse socket adapted to receive and support the transverse rounded lower end of said lower-limb section, a curved arm rising from said top plate, and flexibly connected to the front part of said lower-limb section, a spring rigidly connected by its lower end to the rear of the foot-section and rigidly connected by its upper end to the rear of said lower-limb section, whereby the requisite flexible ankle movement is secured, substantially as shown and described.

3. In an artificial limb, the lower-limb section having a rounded upper end and with a transverse recess in the rear part of said rounded end, a transverse circular cavity in the bottom of said recess, the upper-limb section having a central cavity and fitting over said rounded upper end of said lower-limb section, a transverse shaft fitting said transverse circular cavity and secured therein as by cap-plate H', and provided at its ends with upwardly-projecting arms connected to said upper-limb section, and a stop F² projecting inwardly from the rear of said upper-limb section and adapted to engage the upper end of said lower-limb section to limit its rearward motion, substantially as shown and described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ALEXANDER GAULT.

Witnesses:

C. N. WOODWARD,
W. B. STOUT.