(No Model.)

G. E. MARKS.

ARTIFICIAL LIMB.

No. 470,431. Patented Mar. 8, 1892.

Fig. 1.

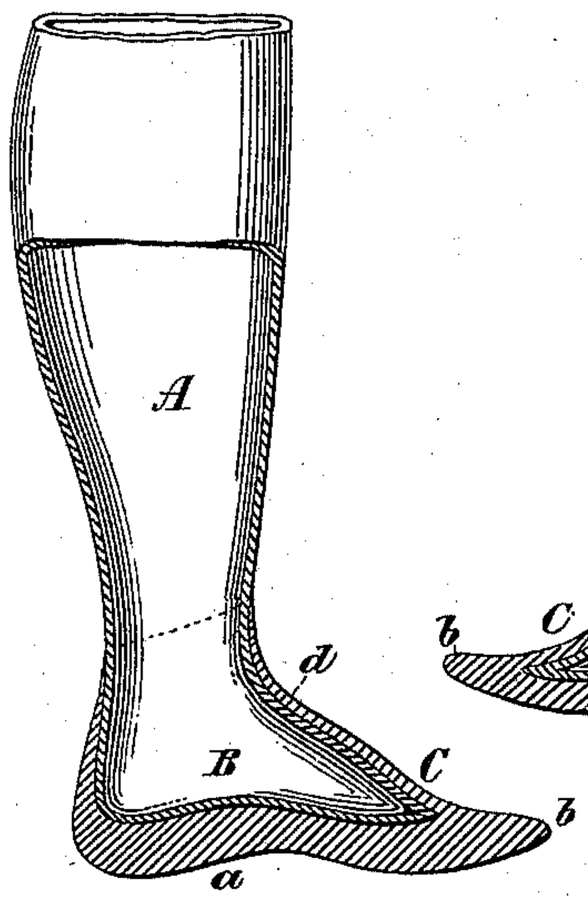


Fig. 2.

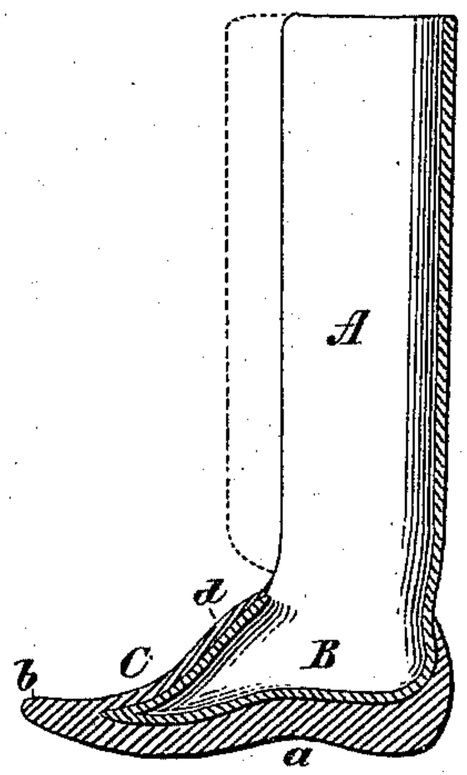


Fig. 3.

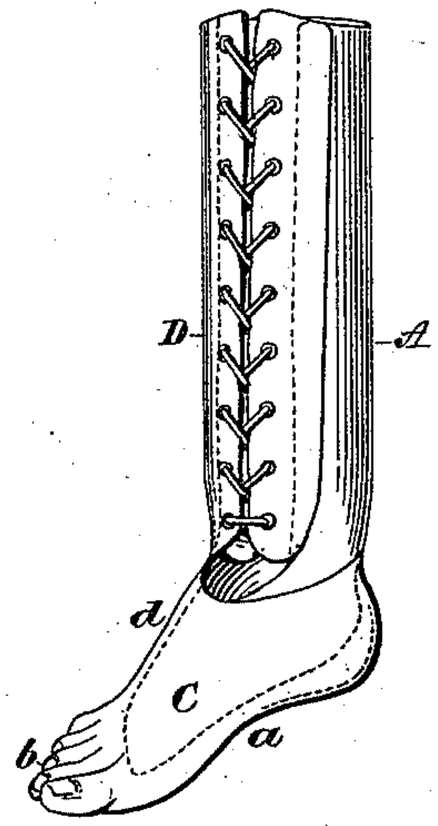


Fig. 4.

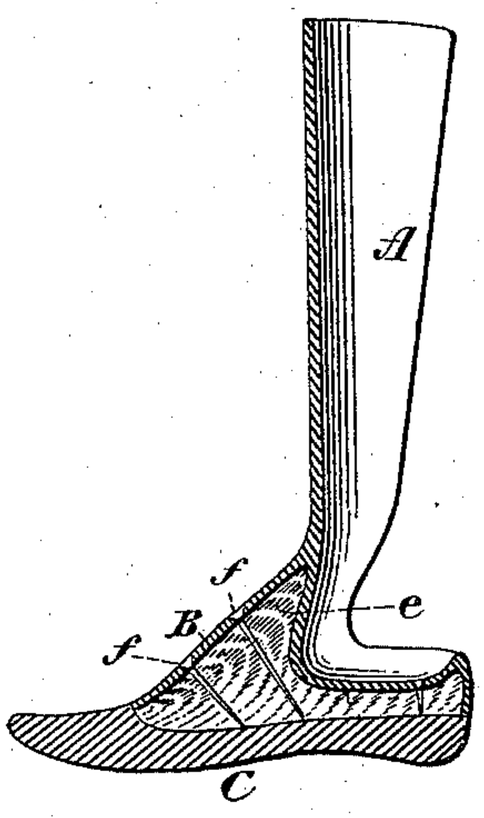


Fig. 5.

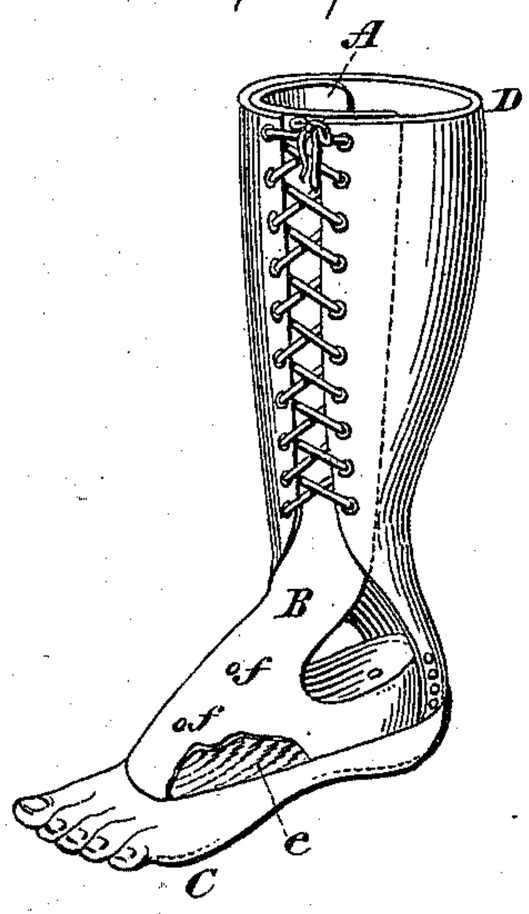
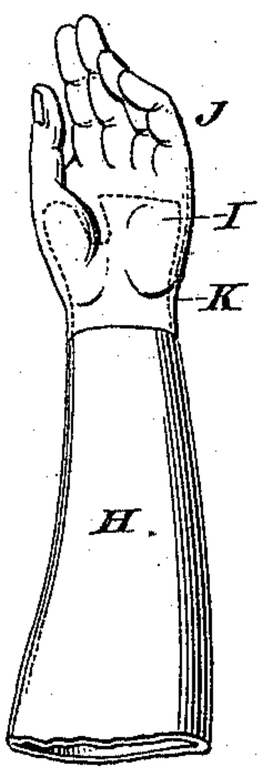


Fig. 6.



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UNITED STATES PATENT OFFICE.

GEORGE E. MARKS, OF NEW YORK, N. Y.

ARTIFICIAL LIMB.

SPECIFICATION forming part of Letters Patent No. 470,431, dated March 8, 1892.

Application filed March 18, 1891. Serial No. 385,488. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. MARKS, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Artificial Limbs, of which the following is a specification.

The invention relates to improvements in artificial limbs; and it consists, first, of an artificial limb having the body or socket or the socket and core made of aluminum, and, second, of an artificial limb having at its end a core combined with a rubber or other pliable hand or foot adapted to be removably secured on said core, the whole being constructed and arranged as hereinafter more particularly described.

The objects of the invention are to secure strength and durability in the limb, to render it water-proof and noiseless in use, and to produce a limb which will neither become foul nor decay, which will effectually resist the action of the moisture from the stump and of climatic influences, and which will materially promote the health and comfort of the wearer.

A further object of the invention is to produce a rubber foot which may be attached to the core of the leg by the wearer without difficulty, and thus enable the user when one rubber foot has become worn to replace it by another without incurring the expense and delays incident to the methods heretofore known of applying a new foot to an artificial leg.

The limb constructed in accordance with the invention is of great benefit and utility, and is the result of careful and long-continued study and experiment.

Referring to the accompanying drawings, Figure 1 is a side elevation, partly in section, of an artificial leg embodying the invention; Fig. 2, a central vertical section of a modified form of leg constructed in accordance with the invention; Fig. 3, a perspective view of same; Fig. 4, a central vertical section of a further modified form of artificial leg embodying the invention; Fig. 5, a perspective view of same, partly broken away; and Fig. 6 is a plan view of an artificial arm embodying certain features of the invention.

Figs. 2 to 5, inclusive, illustrate artificial legs particularly adapted for such amputations as Symes', Pirogoff's, Chopart's, and Hey's, Fig. 1 presenting an inclosed socket for the stump of the wearer, Figs. 2 and 3 a socket which is open in front, and Figs. 4 and 5 a socket which opens rearwardly.

The body of the leg A and its core B are integral, and consist of a hollow cast shell of aluminum, the core B being adapted to receive and afford a bearing for the end of the stump and to carry the rubber foot C.

As above indicated, the body of the leg A (shown in Fig. 1) incloses the stump on all sides, while in the use of the leg illustrated in Figs. 2 to 5, inclusive, the stump is partly inclosed by the sections of laced leather D.

The rubber foot C (shown in Figs. 1, 2, and 3) is made hollow with an interior whose outline conforms to that of the core B, which is closely enveloped by the foot. The sole *a* and toe portions *b* of the foot C are of appropriate thickness, and from these parts there extends upward over the core B the thinner inclosing-casing *d*, which firmly binds upon the core and sustains the foot in place.

The foot C advantageously dispenses with the use of ankle-joints in the legs, and is of great importance in that its core-enveloping portion *d* renders the same readily removable from the leg, and hence when one foot has become worn the user may easily and at small expense substitute another for it.

The core B of the leg shown in Figs. 4 and 5 is cast with a cavity to receive the wooden core *e*, which is held in place by rivets *f* and carries the rubber foot C, the latter being cemented or otherwise secured to the wooden core. For a leg of the form shown in Figs. 4 and 5 the use of the wooden core *e* is rendered desirable, since thereby the minimum amount of aluminum need be used, and a satisfactory surface is provided for the attachment of the rubber foot. It will be observed that the aluminum and rubber completely inclose the wooden core *e* and that the latter is effectually protected from moisture.

In the construction of all of the legs presented in the drawings my object has been to secure strength and durability in the leg and health and comfort to the wearer at the minimum expense. The aluminum leg or socket I have discovered to be of prime importance in the art to which the invention pertains, since it will neither foul, corrode, or decay

under the action of moisture from the stump or the effect of external dampness or climatic influences. It is clean, healthful, durable, and of great benefit and advantage to the cripple. The rubber foot shown in Figs. 1, 2, and 3 may be easily applied by the wearer without the expenses, discomfort, and delays incident to sending the leg to the manufacturer for repairs.

In the use of the legs shown there will be no rattling noises and no joints to give way or become loose. The legs will stand the great strain to which, particularly when worn by laboring-men, they are subjected, and may be worn with comfort for a great many years without repair or expense.

In Fig. 6, H designates an arm-socket, made of an aluminum shell, having the core I, indicated by dotted lines, and carrying the rubber hand J, which has a thin enveloping portion K closely binding the core I and affording a means whereby the hand may be detachably secured to the arm, if desired.

The aluminum socket H presents all of the advantages described above with respect to the socket for the leg, although it may be mentioned that in regard to the leg the socket is compelled to and does meet certain requirements not necessarily incident to the arm.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. An artificial limb the socket of which consists of a shell of aluminum, substantially as set forth.

2. An artificial limb the socket and core of which are integral and consist of a shell of aluminum, substantially as set forth.

3. An artificial leg consisting of the socket and core in one piece, combined with the detachable rubber foot having the solid sole and toe portion, and a thinner section enveloping said core, substantially as and for the purposes set forth.

Signed at New York, in the county of New York and State of New York, this 17th day of March, A. D. 1891.

GEORGE E. MARKS.

Witnesses:

CHAS. C. GILL,

ED. D. MILLER.