(No Model.)

A. E. TULLIS.

ARTIFICIAL LEG.

No. 598,452. Patented Feb. 1, 1898.

Fig. 1.

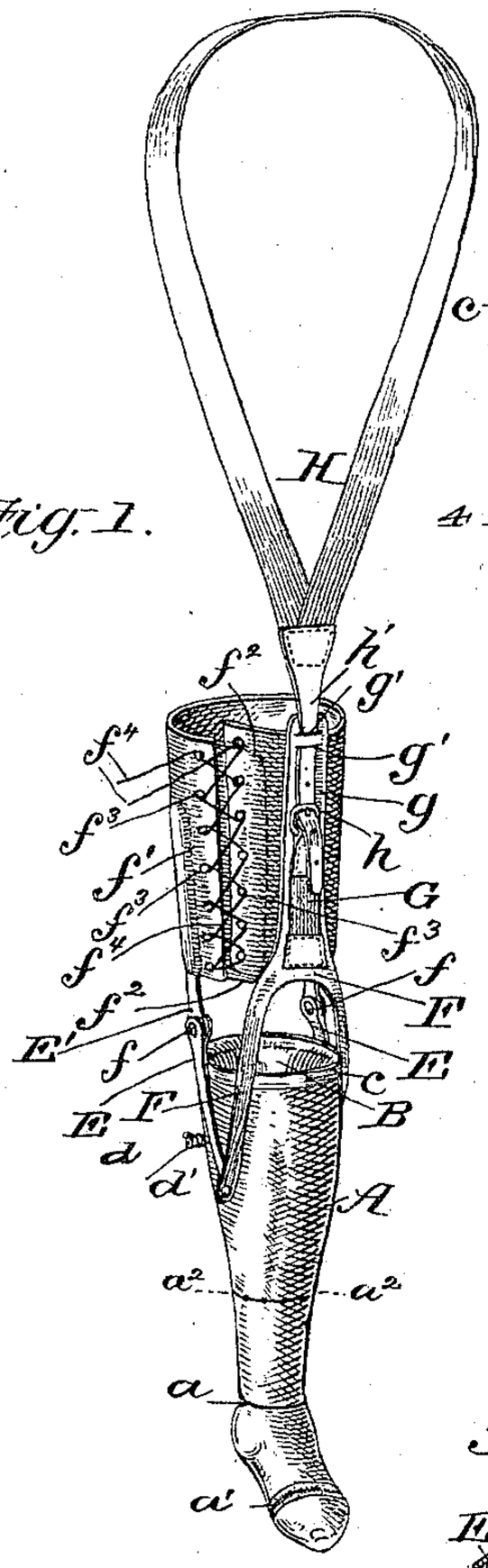


Fig. 2.

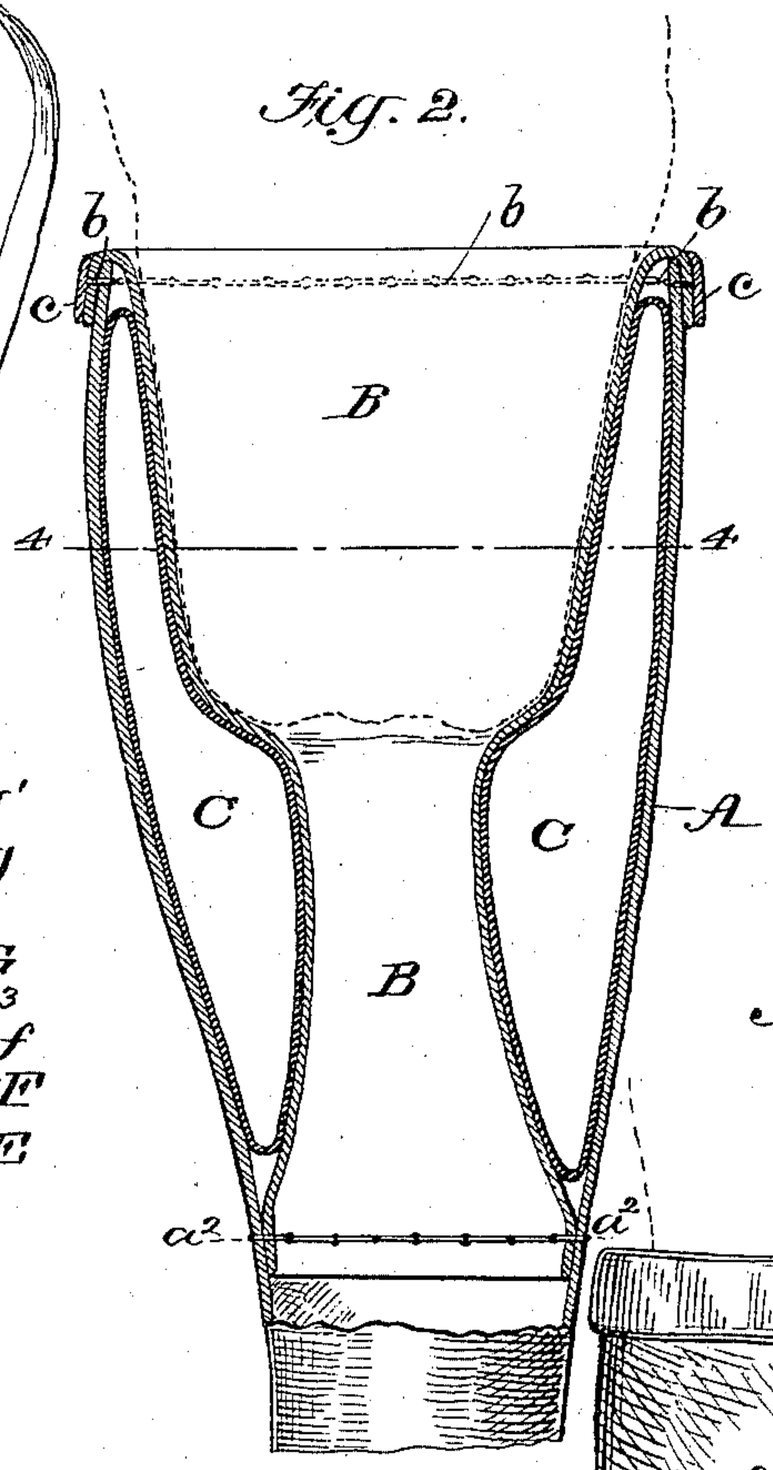


Fig. 3.

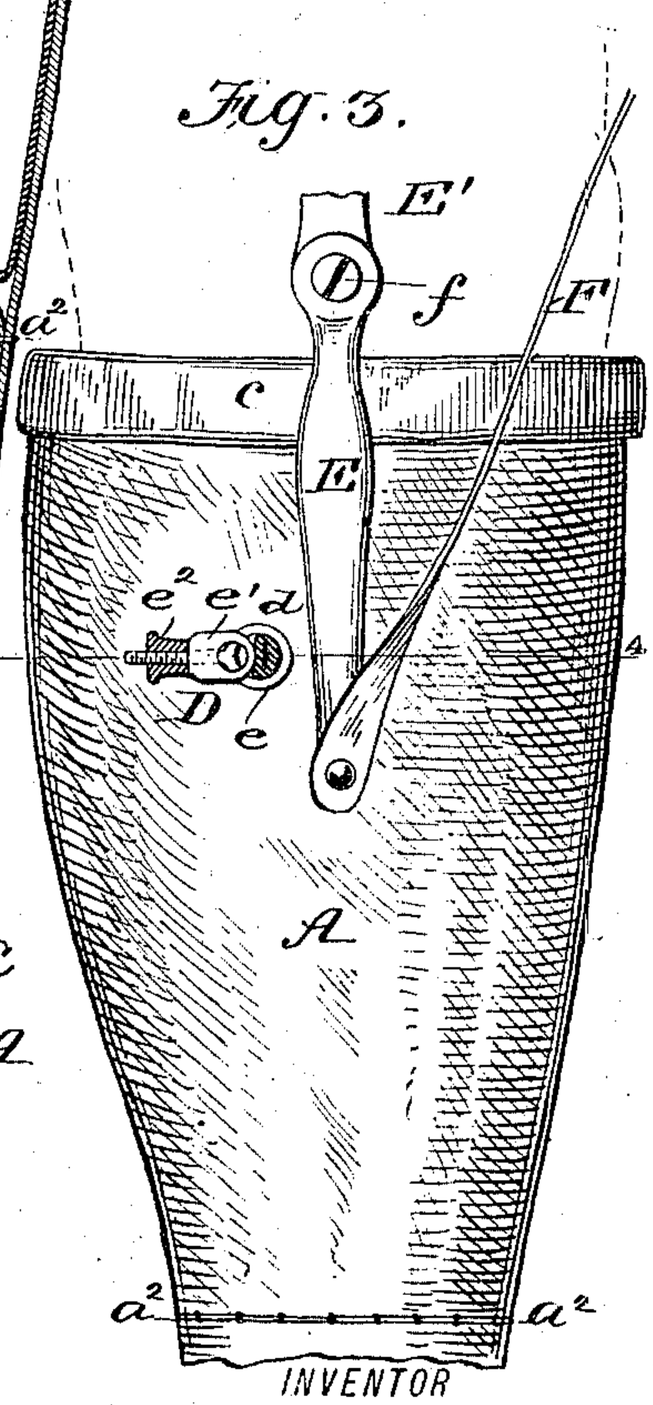
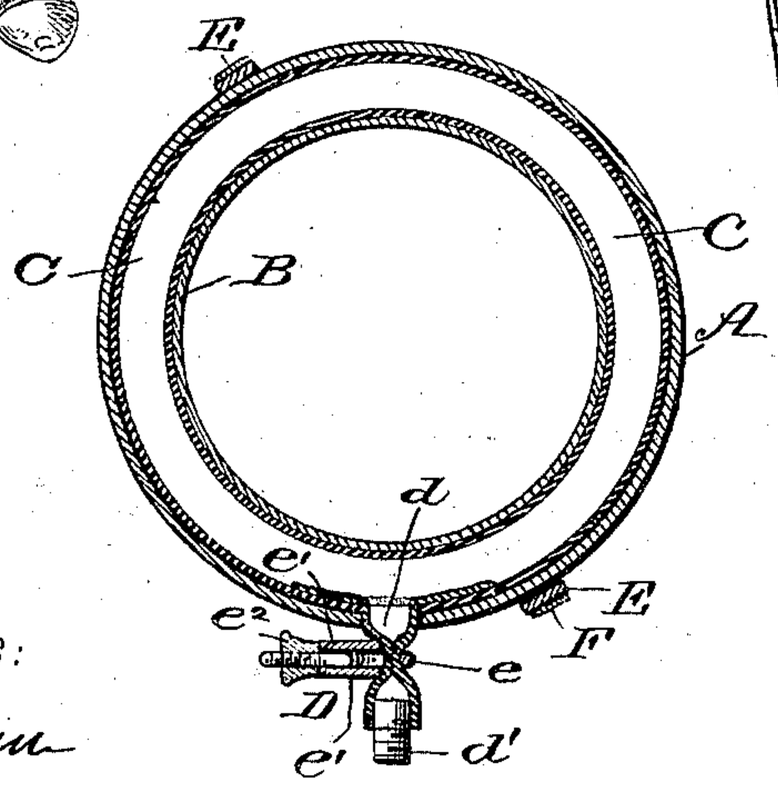


Fig. 4.



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ARTIFICIAL LEG.

SPECIFICATION forming part of Letters Patent No. 598,452, dated February 1, 1898.

Application filed July 6, 1897. Serial No. 643,582. (No model.)

To all whom it may concern:

Be it known that I, AMOS E. TULLIS, of Fargo, in the county of Cass and State of North Dakota, have invented a new and useful Improvement in Artificial Legs, of which the following is a specification.

The object of my invention is to provide a light and comfortable artificial leg which may be conveniently fitted to place and worn without injury or discomfort to the stump of the limb and which may be securely held thereon and easily repaired without being sent back to the manufacturer.

It consists in the peculiar construction and arrangement of the parts of the leg which I will now proceed to describe, reference being had to the accompanying drawings, in which—

Figure 1 is a general view of the entire leg with the straps, belts, &c., for attaching it to the body. Fig. 2 is an enlarged side view of the portion of the leg below the knee-joint, shown in section and with the outline of the amputated limb indicated in dotted lines. Fig. 3 is a side view of the same parts, and Fig. 4 a cross-section on line 4 4 of Fig. 2.

In the drawings, A represents the external shell of the portion below the knee. This is made of rawhide for the purpose of strength and lightness and for its non-conduction of heat or cold, metal shells being productive of dampness and involving chilling effects which exagerate the pain and diseased condition of the amputated limb, which effects are entirely avoided by the use of rawhide without sacrificing strength. This lower shell or external portion of the lower limb is provided with the usual articulation and spring-hinge at the ankle a and also at the ball a' of the foot. As these form no part of the novel features of my invention it is not necessary to describe them in detail.

Within the rawhide shell A and extending from a point a little above the ankle to the knee there is a leather lining B of considerable fulness, adapted to receive between it and the rawhide shell an inflatable soft-rubber air-cushion C. This leather lining is secured at its lower end to the inner walls of the rawhide shell on a horizontal transverse line a a little above the ankle, the rawhide being perforated with holes to permit of the attachment by a row of stitches or a lacing-cord, while its upper edge is bent or folded over the top of the rawhide shell and is detachably laced thereto by a cord b passing through a row of holes in the upper edge of the rawhide shell. An external marginal band c of leather forms a binding for the lapped edge of the lining and makes a sightly connection and secure finish for said upper edge. Between the leather lining and the rawhide shell is retained the soft-rubber inflatable cushion C, which is completely housed within the lining—*i. e.*, it cannot drop down or get out of place, since the lower edge of the lining is secured to the shell to make a completely-closed chamber for said air-cushion. The air-cushion is inflated to the desired degree by an ordinary pocket air-pump, such as is used by bicyclists in inflating their rubber tires, and for this purpose a short tube d extends from the air-cushion out through a hole in the rawhide shell and is provided with a screw-nipple d', fitting the pump, and has a clamp D for closing the tube after the bag has been inflated. This clamp consists of a screw-eye e, whose eye embraces the tube, and a forked clamp-jaw e', embracing the screw-eye and forced down against the rubber tube by a nut e^2, turning on the screw-stem of the eye.

To each side of the rawhide shell A is firmly bolted a metal shank E, which are articulated at f to metal shanks E', secured in sheaths f' in a stiff-leather sleeve, which receives the thigh of the wearer and is open in front and provided with a lap-section f^2 and a row of lacing-hooks f^3 on each meeting edge, which are adapted to be fastened together detachably and adjustably by a lacing-cord f^4, the lap-section or flap f^2 serving to make a smooth inner surface for the thigh or a lap-joint connection.

The leg is held to the wearer by a bifurcated strap F, whose two lower ends are secured to the opposite sides of the rawhide shell and whose upper portion is continued as a single broad tongue g, with two transverse slits g' g' at its upper end. At the junction of the broad tongue g with the lower branches an elastic rubber strap G is firmly attached, and its upper end is provided with a buckle h, fastening to a strap h' of a suspender portion or sling H, that goes over the

shoulder. The strap h' is laced through the slits g' g' in the tongue g, so as to hold the latter up and in place.

In applying the artificial leg the thigh-sleeve is unlaced and the stump placed in the socket or cushioned opening in the top of the rawhide shell, and the inflatable air-cushion is then blown up until it presses inwardly and forces the soft-leather lining to an accurate fit of the reduced lower end of the stump, so as to form a snug but comfortable support for the same. The thigh-sleeve is then laced up and the supporting-strap placed over the shoulder and adjusted as to length.

In defining my invention with greater clearness I would state that I am aware that an inflatable air-cushion has been heretofore used in artificial legs to form a pliant socket for the stump, and I therefore confine my invention to the peculiar construction and arrangement of parts shown, which prevents the air-cushion from ever getting out of place, and it may be easily inspected or removed if repairs are needed.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An artificial leg consisting of a shell, an inner flexible lining made full as described and permanently connected at its lower edge to the inner wall of the shell a little above the ankle, and detachably connected to the upper edge of the shell as described and a detachable inflatable soft-rubber air-bag arranged between the shell and the lining and completely housed within the same, and having a filling-tube and nipple protruding through the side of the shell substantially as and for the purpose described.

2. The combination in an artificial leg, of the external shell, an inner inflatable air-cushion having a tube and nipple protruding through the shell, and a clamp for closing said tube comprising a screw-eye embracing the tube, a bifurcated jaw embracing the screw-eye, and a nut on the screw-stem of the eye adapted to bear against and force the jaw against the tube substantially as and for the purpose described.

3. The combination with an artificial leg; of a bifurcated strap F having its lower branches attached to the lower part of the leg, and its upper part made in the form of a broad tongue g with transverse slits g' g' near the end, an elastic strap G fastened at one end to the junction of the broad tongue with the bifurcated lower ends, and having a buckle at its upper end, and a suspender or sling H with perforated strap h' laced through the transverse slits of the tongue and secured to the buckle substantially as and for the purpose described.

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