

(No Model.)

E. L. O'CONNOR.
EXTENSION FOOT.

No. 428,220.

Patented May 20, 1890.

FIG. 1.

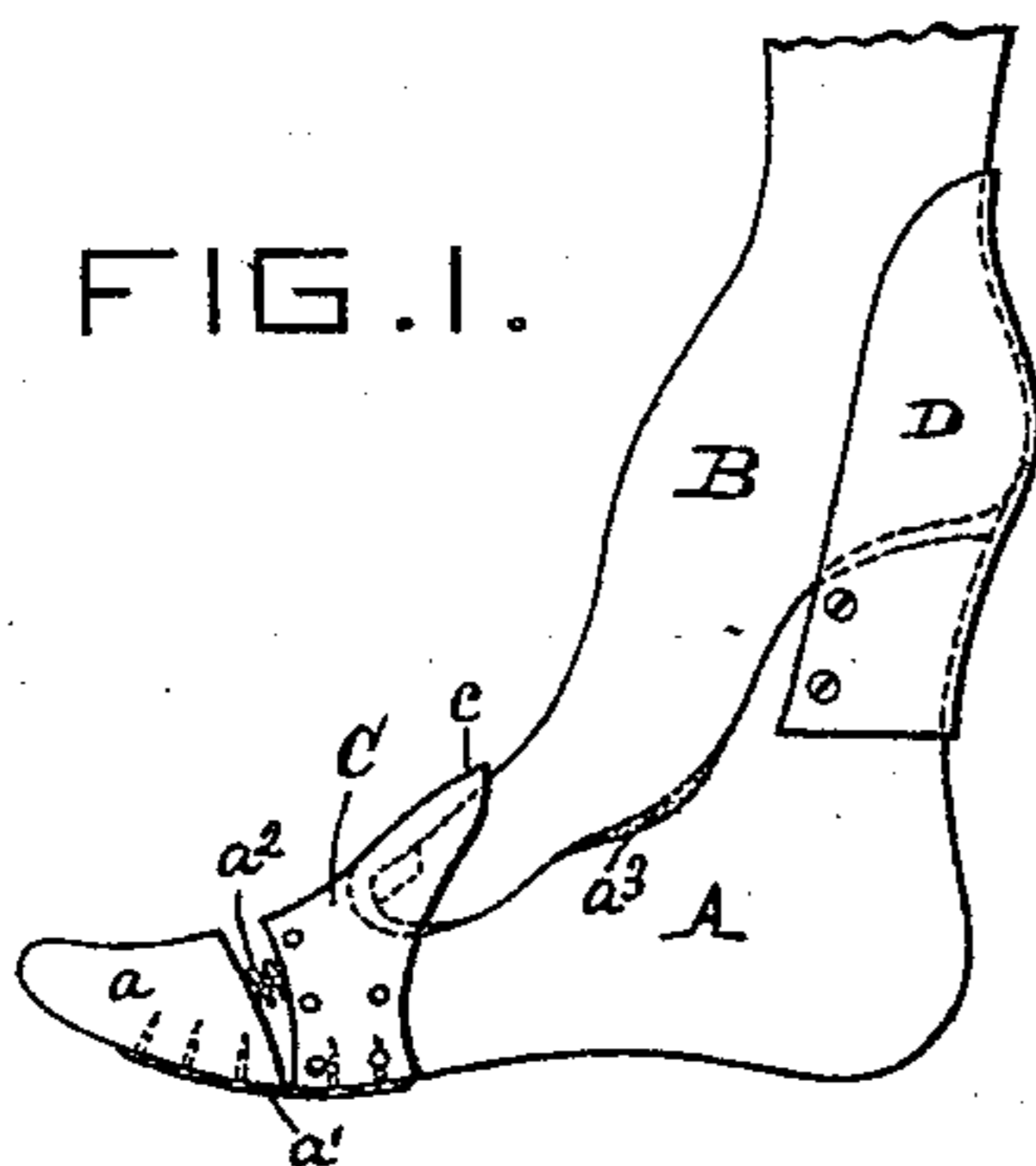


FIG. 2.



FIG. 3.

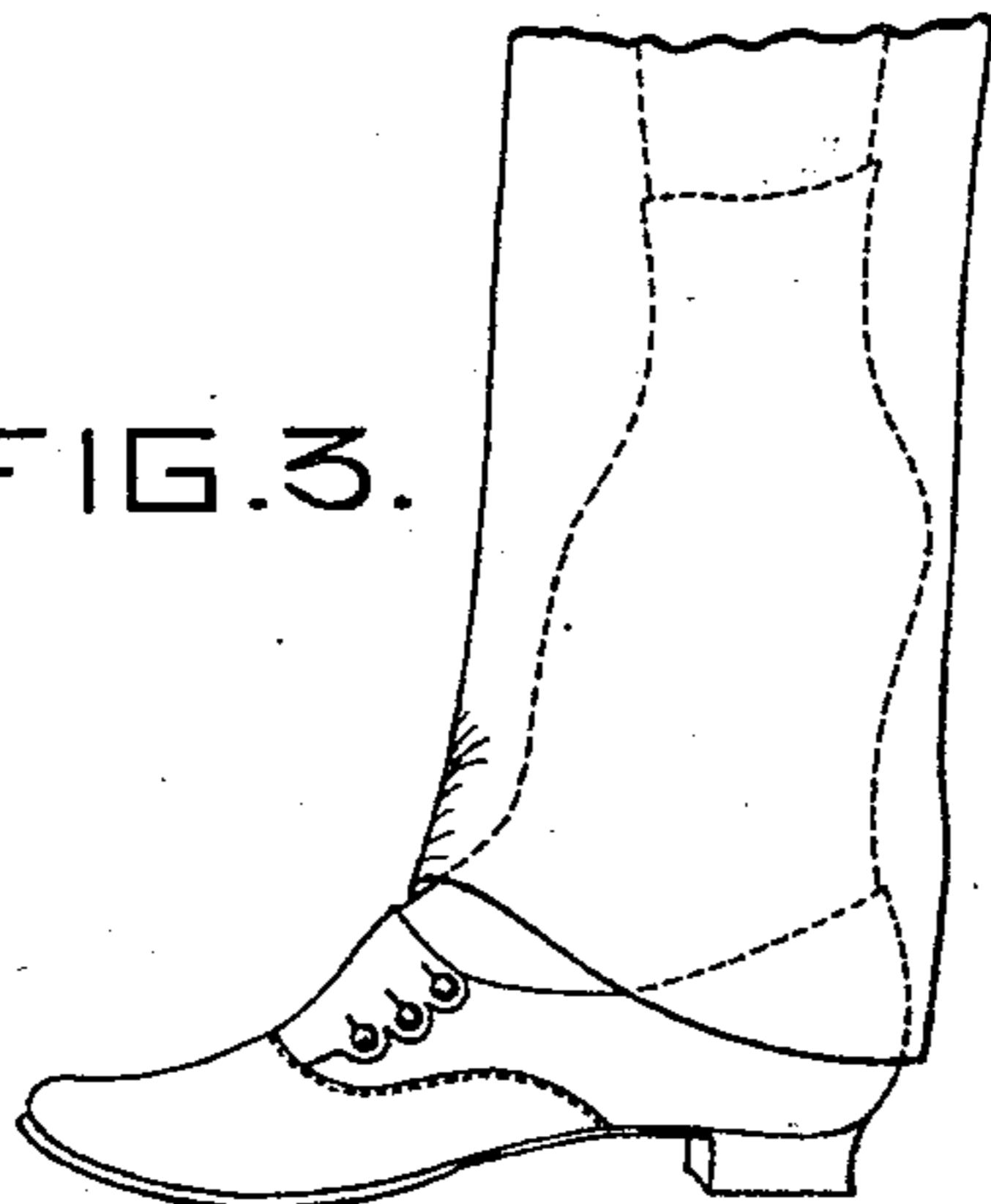


FIG. 4.

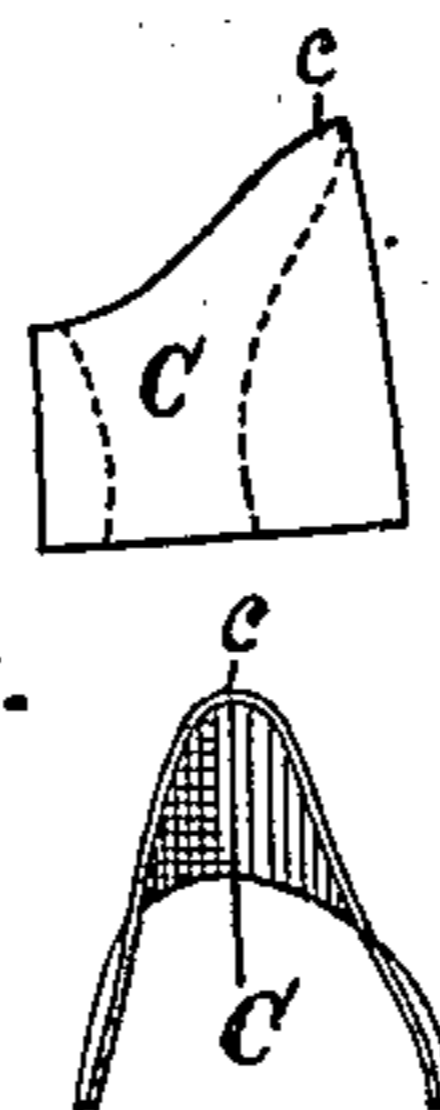


FIG. 5.

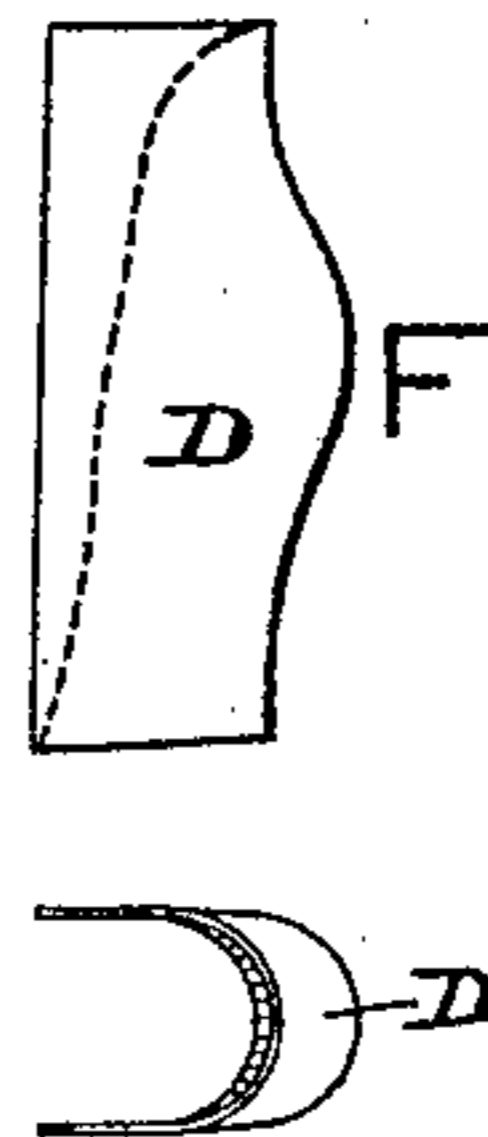
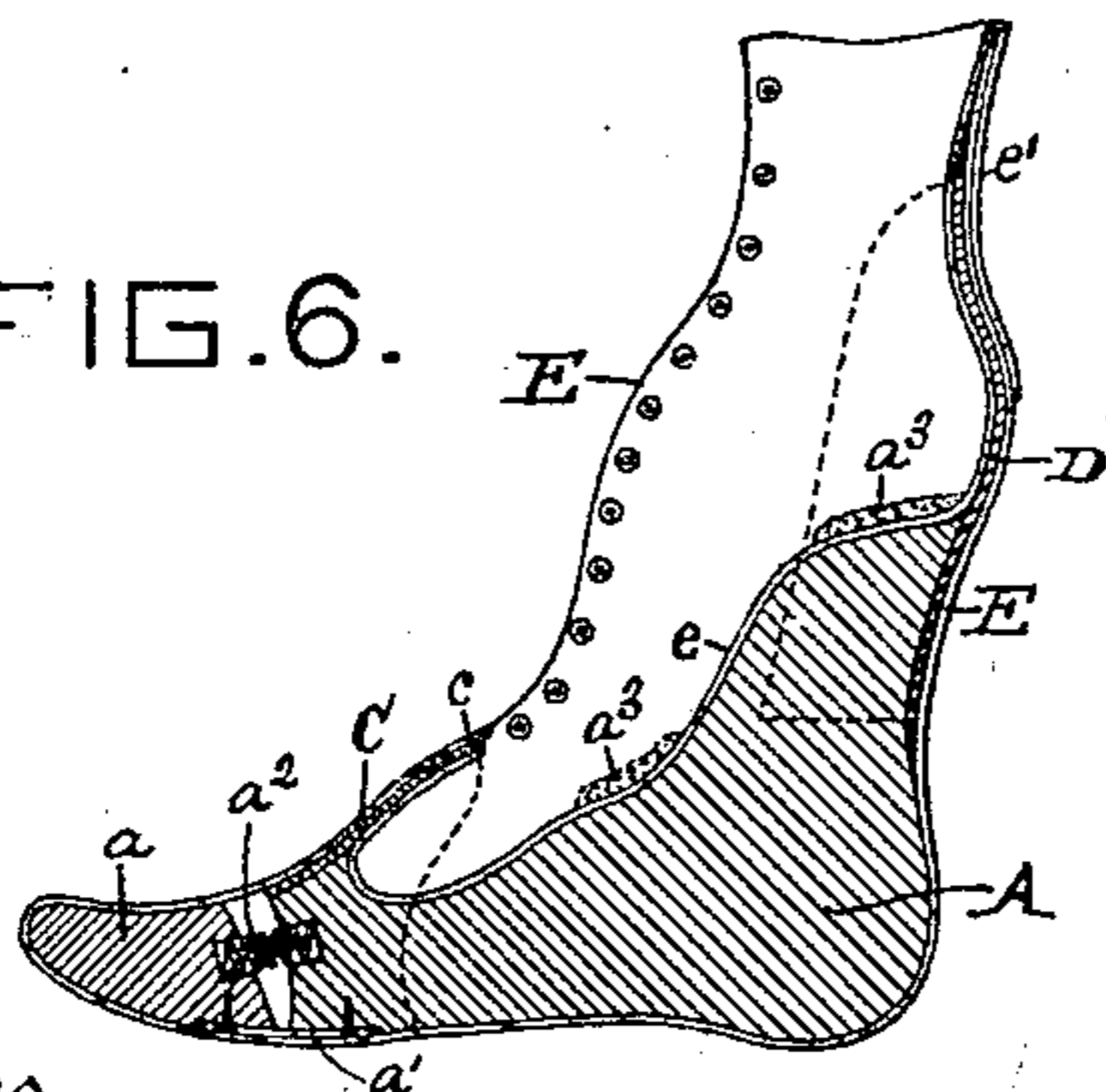


FIG. 6.



Witnesses

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EDWARD L. O'CONNOR, OF CINCINNATI, OHIO.

EXTENSION-FOOT.

SPECIFICATION forming part of Letters Patent No. 428,220, dated May 20, 1890.

Application filed January 6, 1890. Serial No. 336,067. (No model.)

To all whom it may concern:

Be it known that I, EDWARD L. O'CONNOR, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Extension-Feet, of which the following is a specification.

The object of this invention is to provide a light durable extension-foot for persons who have shortened limbs, which conforms in exterior shape to the natural foot and acts like it, and which is so shaped interiorly as to firmly support the foot upon the shortened limb, while allowing its muscles to act as those of the perfect foot when incased in an ordinary shoe.

The device illustrated in my former patent, No. 299,158, dated May 27, 1884, has when applied for use much the same external appearance as my present invention; but it is more expensive to make, and I have found by experience that while it is a graceful substitute for the cork sole or iron frame ordinarily applied for the same purpose it is cumbersome, and in use does not support the lame foot so as to allow its free action and enable the wearer to remain on his feet for a long time without rest.

My present invention overcomes these defects completely by providing an extension-foot which acts like the natural foot and an upper for said foot to receive the foot of the shortened limb and incase it as the natural foot is incased in the ordinary well-fitting shoe.

The invention will be first fully described in connection with the accompanying drawings, after which the novel features will be particularly referred to, and pointed out in the claims.

Referring to the drawings, in which like parts are indicated by similar reference-letters wherever they occur throughout the various views, Figure 1 is a side elevation of my improved extension-foot before the upper is applied, but with the foot of the shortened limb in position. Fig. 2 is a similar view with the upper covering the extension-foot and incasing the foot of the shortened limb. Fig. 3 is a similar view showing the extension-foot inclosed in a low-cut shoe and the upper portion of the extension-foot and upper, shown

in dotted line, covered by the leg of the pantaloons. Fig. 4 illustrates in side and edge elevation the sheet-metal instep of my artificial foot. Fig. 5 is a view in side elevation and top or plan view of the sheet-metal heel-support. Fig. 6 is a central vertical longitudinal section of my extension foot and upper.

The extension-foot A is preferably made of light strong wood, such as is usually employed for artificial limbs, and for additional strength is made of three or more pieces glued or otherwise firmly secured together, the grain of the wood in the adjacent pieces running in different directions, and the joints being parallel to the section shown in Fig. 6, and should be made to conform in size and shape to the opposite or natural foot of the intended wearer. The toe-section *a* of the foot is hinged to the body A by a piece of leather *a'*, preferably rawhide, and secured under the sole. The joint is open at the top, and the opposite surfaces are bored to seat coiled springs *a²*. These should be of sufficient strength to impart a natural movement to the foot when the weight is thrown on the toe, and to return the toe-section to its normal position when the weight is taken off.

The upper portion of the foot A is shaped to the form of the bottom of the lame foot B, so as to firmly support the same when inclined at such an angle as will avoid exposing the deformity, when the foot, incased in the upper, is covered by the pantaloons leg. On the rest for the heel, and across that portion of the foot A upon which the ball of the foot rests, are cushions or pads *a³*; but these are not indispensable.

The instep C for the extension-foot and the support D for the heel are formed of the proper shape from light sheet metal, preferably brass. I find it best to stamp up the blanks for these metal pieces of the form shown in full line in the upper views of Figs. 4 and 5, and afterward to cut away the surplus metal, as shown by dotted line, to fit the wooden foot A. Thus pieces struck up in one set of dies may be made to fit several sizes and different shapes of feet and save the expense of making separate dies for each extension foot and shoe ordered. The piece C is secured around the forward part of the foot A, the forward edge being made to come flush

with the curved forward end, and the instep portion *c* projecting up, forming, with the depression in the foot A, a chamber to receive the toes of the lame foot. The measurement
 5 around the foot A and the instep C should be about the same as around the same part of the natural foot of the wearer. A lining *e* of soft leather covers the inside of the metal pieces C D and the top of foot A. The piece
 10 D is, like the piece C, firmly secured to the foot A by screws or other secure fastenings. After the extension-foot is constructed and the metal instep and heel-support secured in place, as shown in Fig. 1, the foot is placed
 15 in position and the measurements taken for the upper E, the same as for the upper for a shoe for a natural foot. This upper E is drawn around and tacked to the sole of the foot A near its edges, after which a thin
 20 leather sole is pasted over the sole and the underlapped edges of the upper. The body of the upper may be of some light pliable leather—such as kid—with an upper piece *e'* of stronger leather to support the ankle, as
 25 seen in Fig. 2.

It will be seen that when the upper E is tightly laced around the instep of the lame foot the foot is firmly seated and held in the support D, preventing it from slipping down-
 30 ward, and also that the lacing in the upper stiffening-piece *e'* prevents any upward movement, while the ball of the foot and the toes are left comparatively free, as they are in a well-fitting shoe upon a natural foot, so that
 35 the lame foot is as comfortably held and its action as little impeded as it would be in a well-fitting shoe with a high heel.

The extension-foot, as shown in Fig. 2, when a stocking is drawn over it, has all the appearance of the normal foot. The same shoe,
 40 whether low or high cut, may be worn without any appearance of deformity. No special shoe need be made. For my extension-foot any well-made shoe will answer. It is not
 45 even necessary that the shoes be made to order.

The extension-foot shown in Fig. 1 may be used without the covering E; but in such case only a high shoe could be worn, and it would
 50 could be tightly laced across the instep, above

the ankle, to give proper support to the lame foot. In this case the extension-foot after once inserted need not be withdrawn. It would then be practically an upward extension of the shoe instead of a downward extension of the foot, as is the form shown in
 55 Figs. 2, 3, and 5, which may be worn with any ordinary shoe or boot.

The part of the foot and the covering and brass instep and heel pieces may be applied
 60 by mechanics who may be found in any part of the country and at little expense, as no special tools are required; but as the metal parts are best formed in a die-press I intend to make and sell these separately to licensees
 65 or any one desiring to use the invention, in order that my invention may be put upon the market at a moderate cost.

I claim—

1. The foot A, having a spring-jointed toe-
 70 section *a*, in combination with the instep C and heel-support D, substantially as shown and described.

2. The combination of the extension-foot A, having jointed spring-toe section *a*, the metal
 75 instep C, secured to the forward end of said foot, the metal heel-piece secured to and projecting above the heel-rest on top of foot A and covering E for incasing the foot.

3. The sheet-metal blank C, for forming an
 80 artificial instep for an extension-foot, as a new article of manufacture.

4. The sheet-metal heel-support D, adapted to be secured to the artificial extension-foot
 85 A, substantially as shown and described.

5. The combination, substantially as hereinbefore set forth, in an extension-foot, of the foot, the toe-section *a*, the hinge-piece *a'*, uniting the foot and toe section, the springs
 90 *a''*, interposed between the foot and toe section, the metal instep C *c*, secured to the forward end of the foot-section, the metal heel-piece D, secured to the foot and projecting above the heel-rest, and the upper E, secured to the foot A and adapted to tightly incase
 95 the lame foot within the foot-extension.

EDWARD L. O'CONNOR.

Witnesses:

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 FRANK DAVIS.