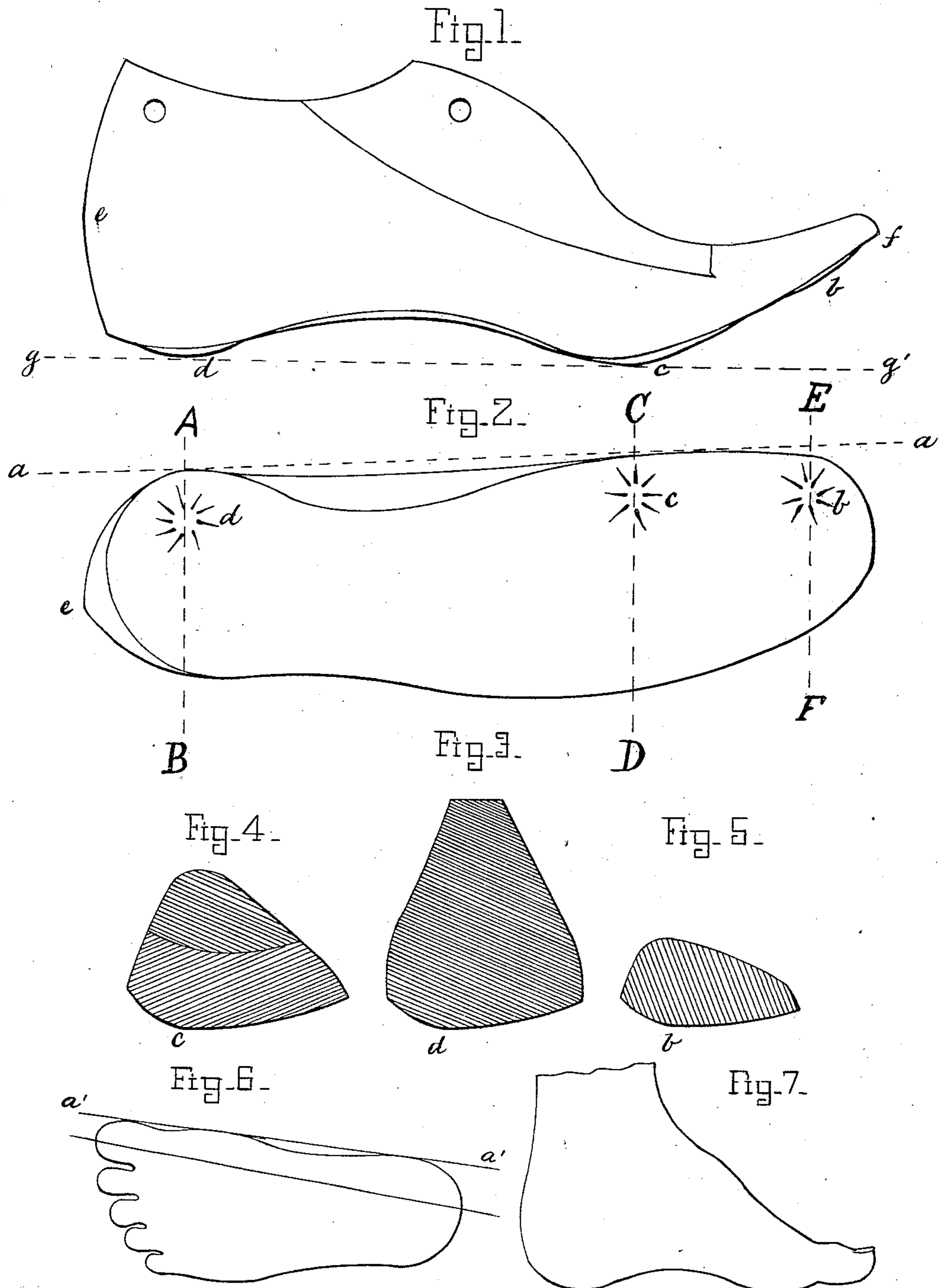


(No Model.)

R. A. MILLER.
BOOT AND SHOE LAST.

No. 245,306.

Patented Aug. 9, 1881.



Witnesses.
Henry Chadbourne.
George E. Ostburg.

Inventor.
Robert A. Miller
by *Alvan Audrein.*
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UNITED STATES PATENT OFFICE.

ROBERT A. MILLER, OF BOSTON, MASSACHUSETTS.

BOOT AND SHOE LAST.

SPECIFICATION forming part of Letters Patent No. 245,306, dated August 9, 1881.

Application filed June 8, 1881. (No model.)

To all whom it may concern:

Be it known that I, ROBERT A. MILLER, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Boot and Shoe Lasts; and I do hereby declare that the same are fully described in the following specification and illustrated in the accompanying drawings.

10 This invention relates to improvements in lasts for boots and shoes, and it is carried out as follows, reference being had to the accompanying drawings, on which—

Figure 1 represents a side elevation of my improved last as seen from the inside. Fig. 2 represents a bottom view thereof. Fig. 3 represents a vertical section on the line A B shown in Fig. 2. Fig. 4 represents a vertical section on the line C D shown in Fig. 2. Fig. 5 represents a vertical section on the line E F shown in Fig. 2. Fig. 6 represents a bottom view of the natural foot, and Fig. 7 represents a side view of the same.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

After a careful study and long-continued practice, the present improved last has been produced by me, especially adapted to the comfort of the foot.

In connection with my improvement, as hereinafter will be more fully described, attention is called to the shape of properly-formed feet, as represented in Figs. 6 and 7, from which it will be seen that an almost straight line exists from the toe to the heel on the inside of the foot, as shown by the line *a' a'* in Fig. 6, and the objection to all boots as now made is that, instead of making them with a straight line from heel to the toe on the inside, a straight line, or nearly so, is made on the outside of the boot, which causes great trouble and annoyance by the foot pressing and bearing against the outside of the boot.

45 My improved last is made with an almost straight line, *a a*, on the inside from heel to toe, as shown in Fig. 2, which line corresponds to the almost straight line *a' a'* shown in Fig. 6.

50 On first examining this my improved last it is natural to get the impression that a boot

or shoe made on it would be very awkward for the wearer, in consequence of the almost straight line *a a* along the inside, and that it would cause the wearer to toe in. That would be the case if the bottom of my last were flat, or like the general style of made boots. The rubbing of the feet to the outside, the bearing of the feet to the outside, and the ending of the step to the outside would naturally cause the wearer to turn the feet inward, not only giving an awkward appearance, but a dangerous step. All these difficulties are done away with by means of three curvatures, *b*, *c*, and *d*, on the inside of the bottom of the last, as shown.

The curvature *b* is designed to come under the front of the large toe in the boot, and its object is to protect and keep off the pressure of the upper leather from the nail; also, as a relief from ingrowing toe-nails; also, to serve as a bed for the big toe, to prevent it from sliding upon the others, and also to act conjointly with the next curvature, *c*, for the large-toe joint. In relation to this curvature *c*, I call attention to the fact that a large majority of persons have large projecting toe-joints, caused by a lack of a bed in the boot for such joint to rest in. Now, by actual measurement, the toe-joint averages three-quarters of an inch thicker than any other joint on the foot, and it is therefore necessary to have a proportionate bed for it in the sole of the boot.

Shoe-makers are often obliged to put a large piece of leather, the shape of the injured joint, on the upper side of the last before they make a boot upon it, so that the upper will not press against it when in the shoe. Many joints become running sores by the continued pressure of the upper against them. Meeting in my business with these actual trials, and making boots for tender joints, I have obviated this great difficulty in my last by means of the curvature *c*, and to maintain the straight line, as well as to keep the foot from bearing to the outside, I find it essential to employ the large curvature *c* under the large-toe joint.

The curvature *c*, in combination with the curvature *d* at the heel, forms a horizontal hollow seat for the foot, and by this combination I give to the instep and heel all the support they require, and at the same time I bring the bearing direct upon the heel, besides keeping the

foot from sliding forward or distorting the bones of the instep by the weight of the body when standing.

The curvature *d*, at the bottom of the heel, 5 is located between the center and inside of the last, as described in my previous patent, No. 102,297, April 26, 1870, to prevent the heel of the wearer from sliding outward in the shoe when walking, and by its use the foot is pro- 10 tected from shifting forward within the shoe.

In addition to the above-mentioned curva- tures *b*, *c*, and *d*, I provide the last with the rear curvature, *e*, or heel-bone protector. To 15 show the purpose of this curvature *e*, I call the attention to the foot as it is placed upon the ground beneath the weight of the body, and from its appearance will be seen the great need of some protection upon the last to form a 20 bed or resting-place for the heel-bone in the counter of the boot or shoe. The heel-bone being the most prominent point on the heel, it being about one inch from the level of the foot upward, it must certainly strike the coun- 25 ter of the shoe, and consequently it will take the weight of the shoe-counter and impair the usefulness of the step in not giving the support to the heel intended, and causing bleeding heels, lameness, and painful suffering by the lack of the proper protection. The curvature

e on my improved last is designed to remedy 30 these troubles by forming a proper bed or resting-place for the heel-bone.

To make my improved last perfect for the wearer of shoes made thereon, and so as to combine, strengthen, and give equal bearing 35 to all parts of the foot, I raise the extreme forward end, *f*, of my last from one and a quarter inch and upward above the horizontal line *g g'*, as shown in Fig. 1. My purpose is to have the 40 foot as high in front as behind when in the shoe with a heel upon it.

Having thus fully described my improved last, what I desire to secure by Letters Patent, and claim, is—

A last constructed with the upwardly-curved 45 toe portion *f*, a substantially straight line along the inside from toe to heel, and having the curves *b*, *c*, and *d* on the inner side of the bottom, and one, *e*, on the rear portion some distance above 50 the sole, and having the deepest part *d* in the horizontal hollow seat between the middle and the inside of the last, substantially as set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

ROBERT A. MILLER.

Witnesses:

ALBAN ANDRÉN,
HENRY CHADBURN.