

J. McCOMBER.  
METHOD OF CONSTRUCTING BOOTS AND SHOES.

4 SHEETS—SHEET 1.

Fig. 1.

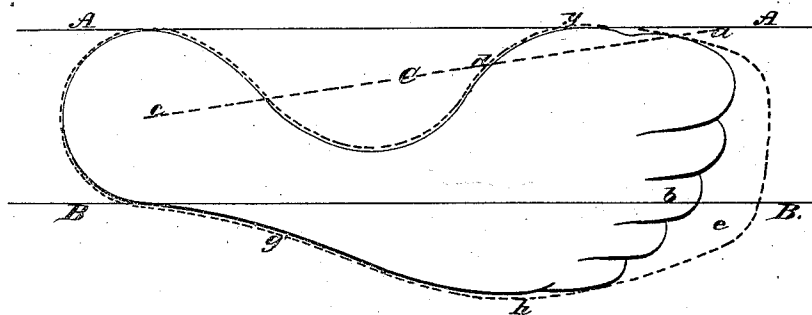


Fig. 2.

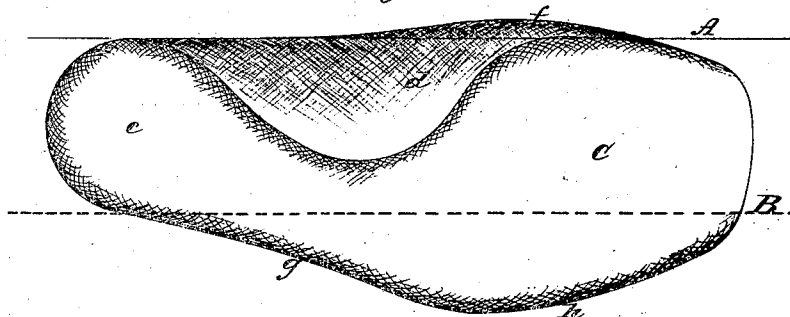
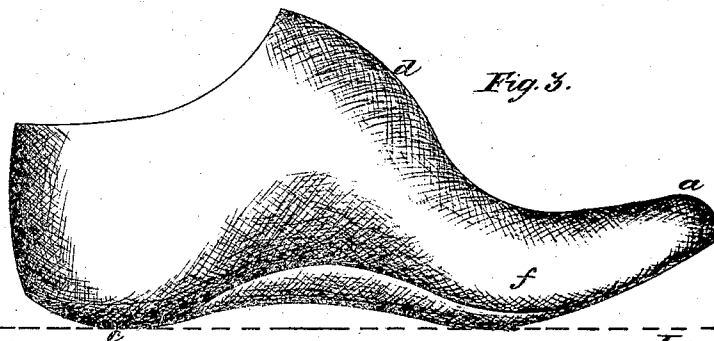


Fig. 3.



Witnesses:

Wm. H. Rawe  
J. S. Peyton

Inventor.

J. McComber  
by his atty  
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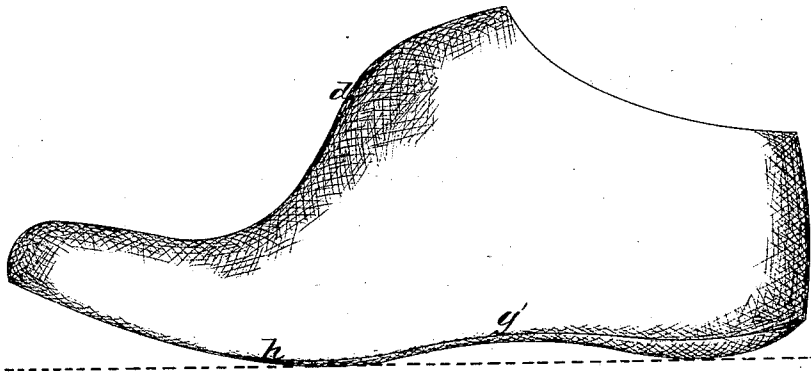
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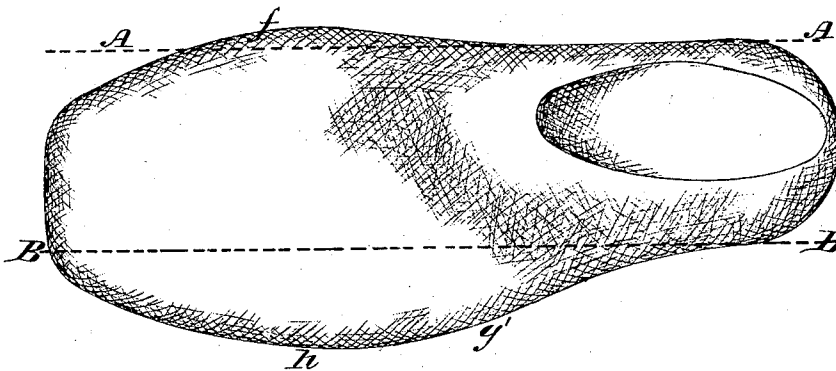
No. 109,438.

Patented Nov. 22, 1870.

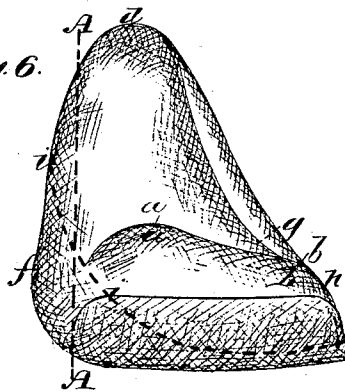
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



Witnesses:

*Wm. H. Rome,*  
*John Taylor*

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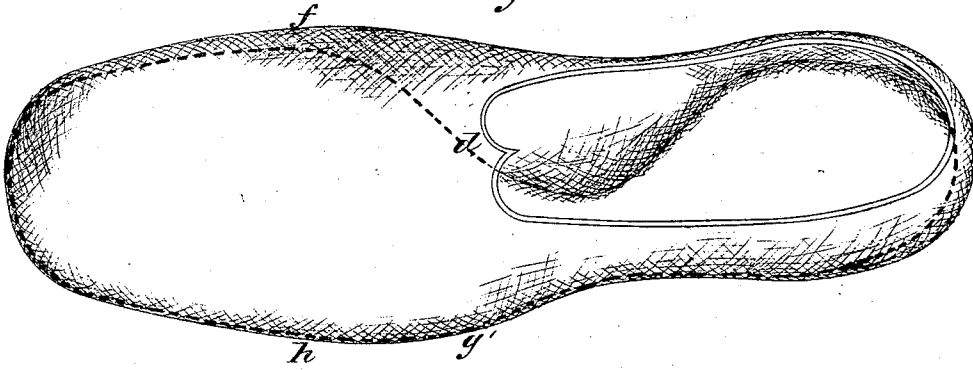
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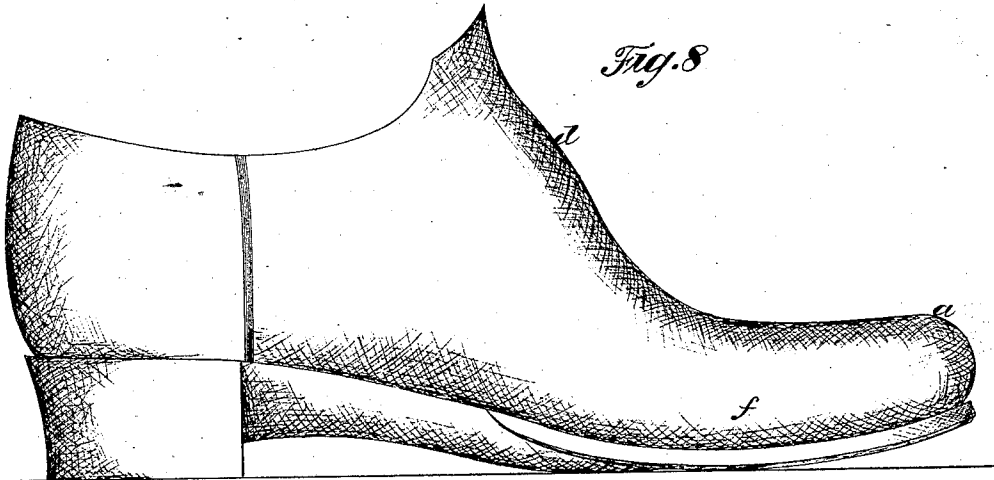
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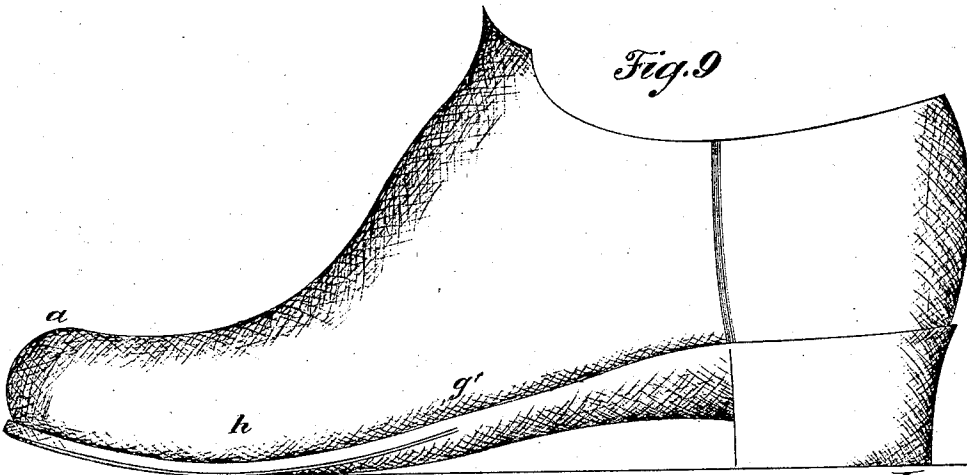
*Fig. 7*



*Fig. 8*



*Fig. 9*



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No. 109,438.

PATENTED NOV. 22, 1870.

J. McCOMBER.

METHOD OF CONSTRUCTING BOOTS AND SHOES.

4 SHEETS—SHEET 4.

Fig. 10

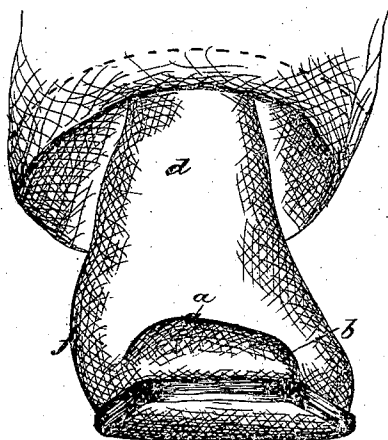
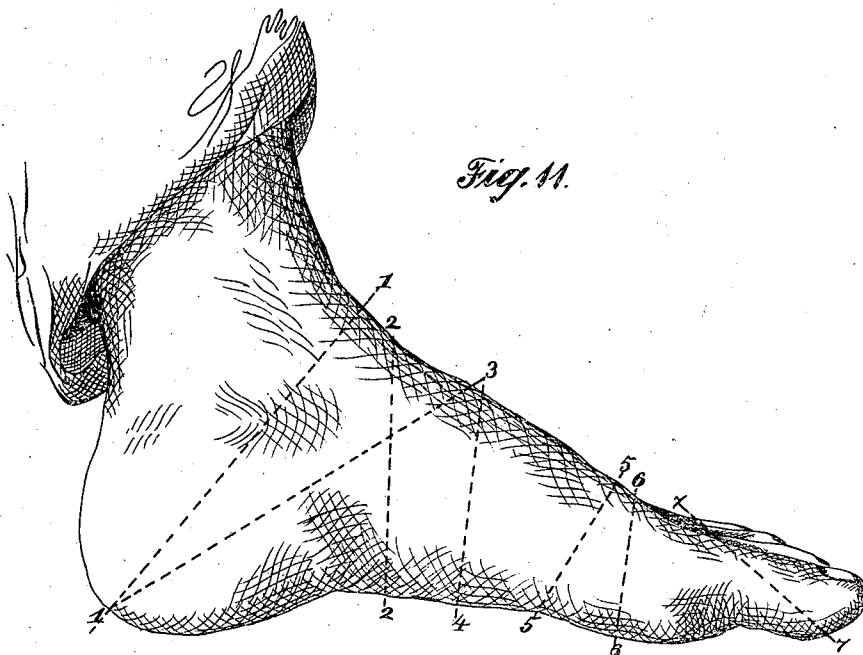


Fig. 11.



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# United States Patent Office.

JOEL McCOMBER, OF ROCKFORD, ILLINOIS.

Letters Patent No. 109,438, dated November 22, 1870.

## IMPROVEMENT IN METHODS OF CONSTRUCTING BOOTS AND SHOES.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, JOEL McCOMBER, of Rockford, in the county of Winnebago and State of Illinois, have invented a new and useful Method of Constructing Boots and Shoes, of which the following is a specification.

The object of my invention is to produce a boot or shoe which will conform to the anatomical structure of the human foot, so that the boot or shoe, if of proper size, will fit the foot snugly, but comfortably, when first put on without going through the present disagreeable process of "breaking in" the shoe to the foot.

My improvement is based on a discovery which is the fruit of a careful investigation of the structure and formation of the human foot, which discovery will be hereinafter fully explained.

In order to carry out my invention, I construct a last with an outside ball and shank projecting laterally more than usual in ordinary lasts. The shank is also lowered to conform more closely to the shape of foot. The instep is located upon a line drawn from the center of the heel to the inside of the great toe, as it is in the properly-formed human foot, and overhangs the sole of the foot. The inner ball of the last also overhangs the sole. The inside shank or hollow of the last is likewise made to conform to the shape of the foot.

My invention will be understood by reference to the accompanying drawing, in which—

Figure 1 represents, in full lines, a diagram or plan of the natural human foot, that is, one undeformed by wearing shoes or boots. The dotted lines in this figure show the outlines of the sole of my improved last.

Figure 2, a view of the under side of a last constructed according to my improvement.

Figure 3, a view of the inner side of my improved last.

Figure 4, a view of the outer side of the same.

Figure 5, a plan, and

Figure 6, a front view of the same.

Figure 7, a plan;

Figure 8, a view from the inner side;

Figure 9, a view from the outer side; and

Figure 10, a front view of my improved boot or shoe.

Figure 11 represents a side view of the human foot.

In the natural human foot a line drawn from the inner side of the heel, and touching the ball of the great toe, will also touch that toe throughout its entire length.

In fig. 1, I have, however, shown the great toe as very slightly drawn in, as it naturally would be when a shoe was worn. This line A, above mentioned, I call, for the sake of distinction, the base-line.

A line, B, drawn from the outer side of the heel parallel with this base-line would pass through the third toe *b*, usually near its center. This line, for the sake of distinction, I call the sole-line.

A line, C, drawn from the center, *c*, of the heel to the inner point, *a*, of the great toe would pass through the instep *d* of the foot. This line I call the instep-line.

In the natural human foot, nearly, if not quite, one-third of the foot lies outside of the sole-line B, and the tendency of the pressure upon the foot is slightly outward. This will be seen by observing the print of the bare foot in walking.

The great defect in the ordinary shoe is that the shoe is formed on some arbitrary notion of symmetry irrespective of the natural formation of the foot, which is distorted into the shape of the boot or shoe. This arbitrary form generally combines an instep near the center of the shoe, an outer line of the sole nearly straight, and a toe pointed or inclined inward from each side. The consequence of this mode of construction is that the great toe is deflected inward, and the foot thus deprived of its support, while the outer side of the foot is drawn inward also. This narrowing of the base of support renders the walk unsteady, and produces corns and bunions.

Most shoes, after being worn, will have become run down on the outer side, by the effort of the foot to widen its base of support.

In fig. 11, I have shown the measures which I take in draughting a last, a description of which will conduce to the better understanding of my invention.

I first measure from the heel to the top of the foot on the line 1 1, known among shoemakers as the "draught-line." I next measure perpendicularly around the upper part of the foot on the line 2 2. I next measure from the heel to the instep on the line 1 3; then around the instep on the line 3 4; then around the smallest part of the foot between the instep and ball at the line 5 5, called the "waist;" then from the ball of the big toe to the ball of the little toe on the line 6 6, and then across the toes on the line 7 7. I thus get the data for constructing a perfect counterpart of the foot. (See also fig. 1.)

I construct the sole *e* of my improved last to conform closely to the shape of the foot, as shown by the dotted line in fig. 1, making it, of course, slightly longer, to leave room for the play of the toes in walking, as is usual.

The sole, it will be observed, is nearly flat across the ball, but is curved in other parts to conform to the foot, as clearly shown in the drawing.

I form the instep *d* full or bulging, so as to overhang the inner side of the sole or the base-line A, fig. 2. The inside ball *f* is enlarged, and overhangs the

inner side of the sole until it reaches the first joint of the great toe, (see figs. 2 and 6,) and is thicker all the way to the end of the great toe than the corresponding portions of the outer side of the last, which are thinned down to correspond with the diminished thickness of the foot on that side.

The outer side *g* of the instep and waist is hollowed out, as shown in fig. 6, so as closely to conform to the shape of the foot.

The outer shank *g'* and ball *h* are lowered nearly to the same plane as the outer line of the ball and heel, and extended laterally as far as the foot does, thus giving a bearing for the foot on the shank of the foot.

The dotted line *i* in fig. 6 shows the outline of the under side of the instep.

The boot or shoe, being a counterpart of the last, needs no description here.

The workman should, however, be careful to work closely to the outlines of the last. I thus produce a

boot or shoe that can be put on and worn comfortably from the start without breaking in the shoe to the foot, or straining or injuring the foot.

I claim as my invention—

1. The construction of a boot or shoe, as set forth, with the sole conformed to the bottom of the foot, the instep and ball overhanging the inner line of the sole and the outer shank and ball, deflected laterally and lowered, all substantially as set forth.

2. The last, constructed as described, with a sole conformed to the foot, an overhanging ball and instep on its inner side, and an outer shank lowered nearly to the plane of the ball and heel on that side, for the purpose set forth.

In testimony whereof, I have hereunto subscribed my name.

JOEL McCOMBER.

Witnesses:

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