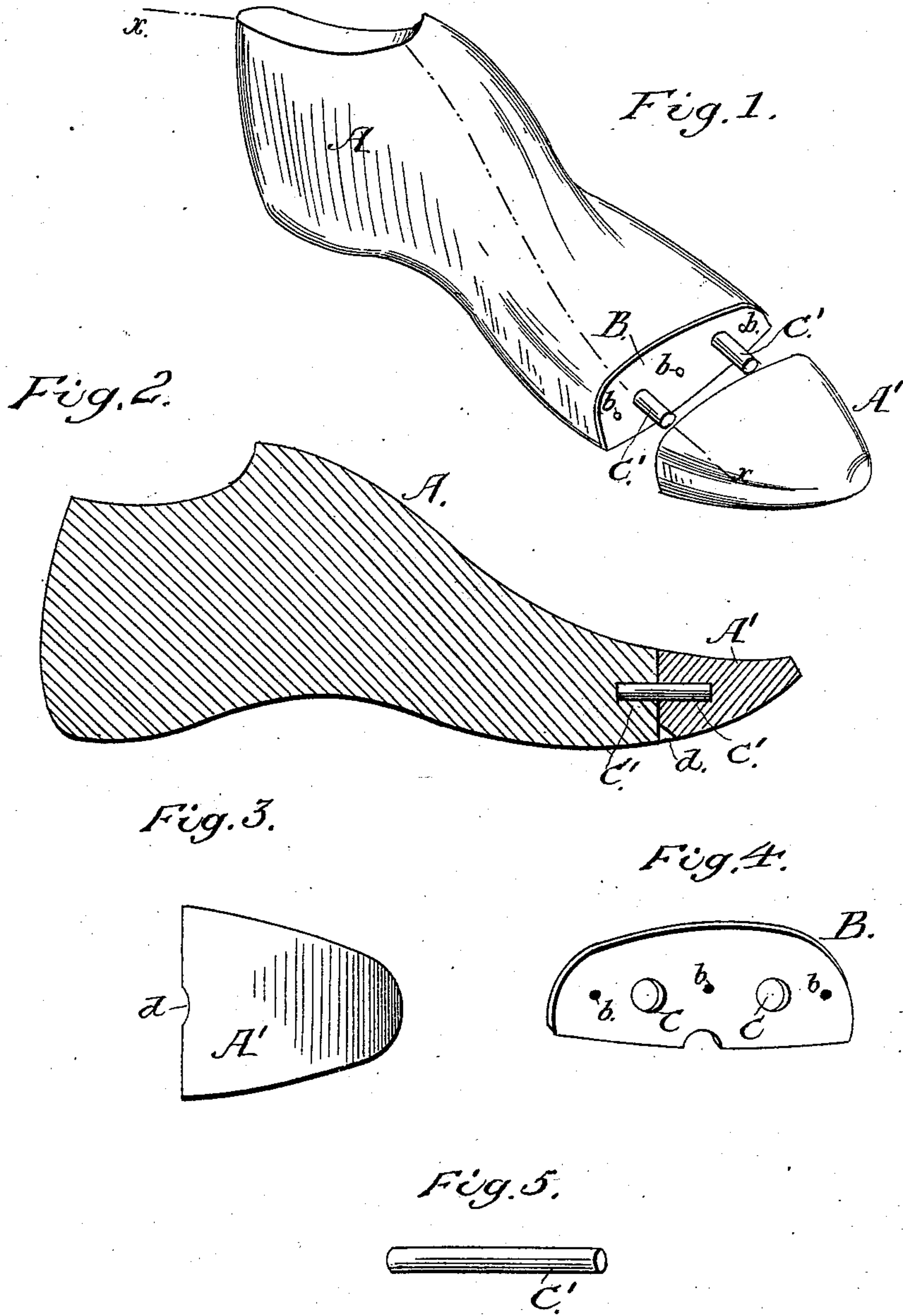


(No Model.)

A. S. ADLER.  
LAST.

No. 549,480.

Patented Nov. 12, 1895.



WITNESSES

*M. B. Fowler.*  
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# UNITED STATES PATENT OFFICE.

ABRAHAM S. ADLER, OF BALTIMORE, MARYLAND.

## LAST.

SPECIFICATION forming part of Letters Patent No. 549,480, dated November 12, 1895.

Application filed March 7, 1895. Serial No. 540,846. (No model.)

*To all whom it may concern:*

Be it known that I, ABRAHAM S. ADLER, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Lasts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Figure 1 represents a perspective view of a last, showing the toe-piece separated therefrom. Fig. 2 is a sectional view on the line  $xx$  of Fig. 1. Fig. 3 is a bottom view of one of the toe-pieces. Figs. 4 and 5 are details to be referred to.

My invention relates to lasts adapted to the manufacture of boots or shoes having removable and changeable toe-pieces, whereby the principal part or body of the last may be used with any one of several forms or styles of toe that may be required.

My invention also relates to a means for ascertaining if a given last has the correct or standard width of bottom and circumferential measurement, said means forming a guide or model to which the cross-sectional form of the last may be shaped or trimmed to bring it to standard shape and size, all of which I shall hereinafter fully describe and claim.

My invention is also an improvement on my former patent, No. 379,039, granted March 6, 1888.

It has long been recognized by makers and users of the ordinary wooden lasts that many lasts which are supposed to be of the recognized standard size often vary to such a degree as to unfit them for the manufacture of shoes of the size denoted by the number or characters usually stamped upon lasts. This condition is especially noticeable in those parts of the last, such as the heel and toe parts, which are left in an unfinished condition after the last is removed from the machine which turns it. Until the employment of the form of measuring-machine disclosed in my former patent, No. 526,849, dated October 2, 1894, there was no absolute accurate way of ascertaining the circumference and diameter of a last at the toe. This was usually guess-

work and was left largely to the discretion of the last-finishers, and as they are not all usually skilled the lasts presumably of the same size cannot all be correct, a fact which is readily proven by cutting a finished pair of lasts at any point transversely.

With the idea of correcting the known defects in the lasts as now manufactured and to provide a means whereby all lasts may be made to standard size, I divide my last at one or more parts, and after shaping one piece to a standard size I shape another piece and fit it thereto, so that when the last is complete it will be true in every particular.

Another feature of improvement of my last over those of the usual solid form, and which tends to reduce the expense of shoe manufacturers considerably, is as follows: The usual insole, in lasting a shoe, is fastened to the last at the toe by one or more tacks, and in course of time wears out the wood at that point and eventually makes the last worthless. With the present styles of "razor" or pointed toes it takes but a very short period to unfit the lasts for use, and consequently the lasts have to be replaced by new solid ones, while with the use of my standard body portion new toe-pieces may be readily made to supply the worn-out pieces at a small expense and without trouble.

Referring now to the accompanying drawings for a more complete explanation of my invention, A represents a last of the ordinary wooden form, divided transversely at its toe portion to form a detachable toe-piece A'. In the manufacture of my last the body portion A is shaped in the rough in the usual manner, but preferably without the usual toe extension. I then take a plate B, of light metal, or it may be paper or other material, if desired, and fasten it to said front of the body of the last by means of pins driven through holes  $b$ , formed in said plate. These plates are accurately made according to the usual and recognized standard width of bottom and circumferential measurement of lasts. They therefore correctly represent the exterior outline of the cross-sectional configuration of a standard last at the toe portion or at any other portion where it may be desired to divide the last transversely, it being



understood that wherever the line of division occurs a plate corresponding with the body portion at that portion will be made and used in the same manner as herein described for the one used at the toe portion. The shape which must be given these plates may be readily ascertained by any suitable method or means, as by the machine shown in said former patent, and the plates may be stamped from a suitable blank or piece in any of the usual or well-known ways. These plates are also formed with holes C, and when the plate is secured to the front of the body by means of pins passed through its holes *b* and into said front the latter is bored with openings corresponding with the holes C, formed in the plate, and pins C' are driven through said holes and into the openings to secure the plate in place. The pins project in front of the plate and furnish means for the attachment of removable and interchangeable toe-pieces, as I shall presently disclose. The plate being now firmly secured to the front of the body, and possessing in outline the exact width of bottom and circumferential measurement of a perfect last at the point where the plate is located, I now shave or trim the last, if inspection shows that its exterior outline does not accurately match the outline of the plate, to the plate, and until the outer line of the plate and outer line of the front of the body are in perfect harmony. I now remove the plate, leaving the pins C' in place and projecting, as before described, and I take a piece or block of wood from which the toe-piece is to be made and finish the edge in the same manner as the body, after boring holes in it to match the pins projecting from the front of the body and giving it the required shape. I then drive this piece upon the pins and close up to the body portion. Having finished one toe-piece, I may then make one or more additional ones in the same way as that described for the first one and give to each of them either the same or a different shape or style; but each style will possess the exact and true width of bottom and circumference and will accurately match the corresponding front end of the perfected body portion.

The pins C' are removable from the body portion, as they are simply driven into holes formed in the same, and they are likewise removable from the toe-piece. The plate is also removable from the pins and has no fixed engagement with any portion of the last or the pins.

In fitting a toe-piece of any shape or style to the body of the last I simply drive the pins into the body, as before mentioned, and then drive the toe-piece onto the pins, the latter fitting the holes in the body and toe-piece

closely enough to hold the toe-piece in position without other means.

In the under face of the toe-piece at the point where it meets the like face of the body I form a groove or notch *d*, (see Fig. 3,) in which a blade or tool may be inserted to effect the separation of toe-piece and body. The last may be divided at other points than the toe, as at the ball, waist, instep, or heel, in the same manner as described for the toe portion, and for the purpose of building up a perfect last from separable sections without departing from the spirit of my invention.

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

1. In a divided last, the body portion thereof, and a means for truing said body and bringing it to standard circumferential size, consisting of a plate removably fitted to the body portion and having its exterior corresponding with the width of bottom and circumference of a last of standard size at the point where the plate is to be used, said body portion being shaped to the outline of the plate, pins removably fitted to the body portion and projecting therefrom, and a toe piece adapted to be removably fitted to the projecting ends of the pins.

2. In a divided last, the body portion, in combination with a plate fitted thereto and having an exterior outline and size representing the outline and the width of bottom and circumferential size of a last of standard size at the point where the plate is used, pins passing through openings in said plate and into corresponding openings in the body portion of the last, and projecting in front of the plate, and a toe piece also shaped to said plate and adapted to be fitted to the projecting ends of said pins, said plate and pins being separable from each other and also from the sections of the last.

3. The process herein described of making lasts, consisting in first forming the body of the last in the rough and without a toe piece; then fitting to the body portion a plate whose outline is in the similitude of the outline of a perfect last at that point; then shaping the exterior outline of the body to the outline of the plate; then removing said plate and fitting it to a toe piece in the same manner as described for the body piece and then joining both pieces together substantially as described.

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

ABRAHAM S. ADLER.

Witnesses:

SAMUEL S. BOGGS,

WILLIAM J. LAKE.