No. 716,511. Patented Dec. 23, 1902.

W. B. ARNOLD.

LAST.

(Application filed June 3, 1902.)

(No Model.)

Fig. 1.

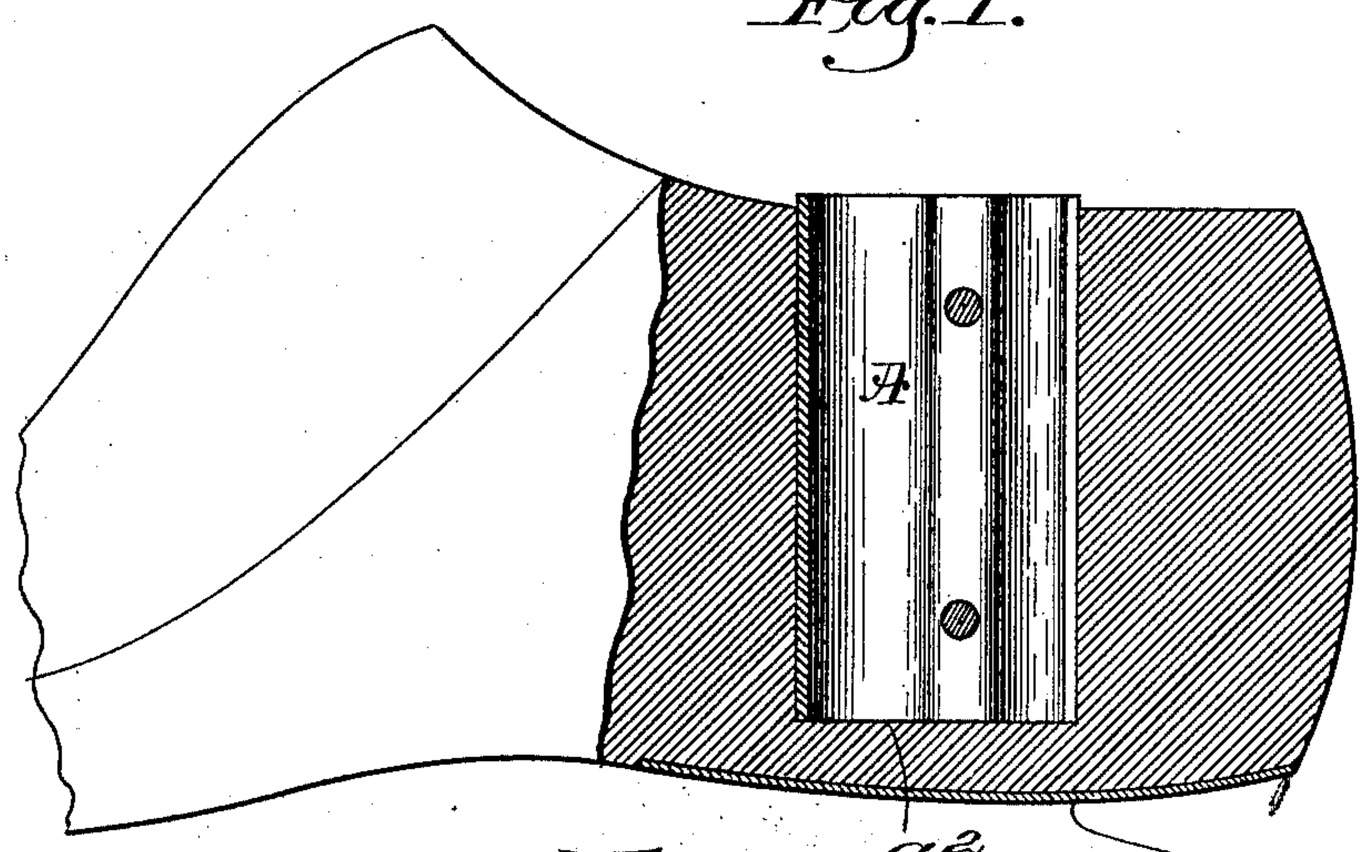


Fig. 2.

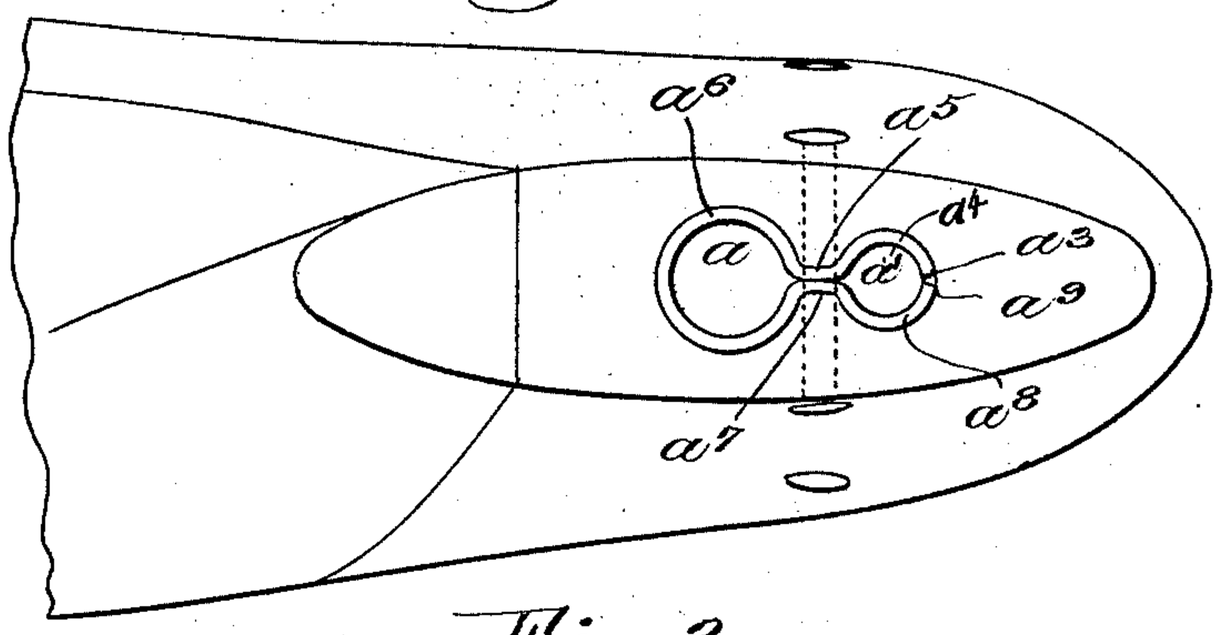
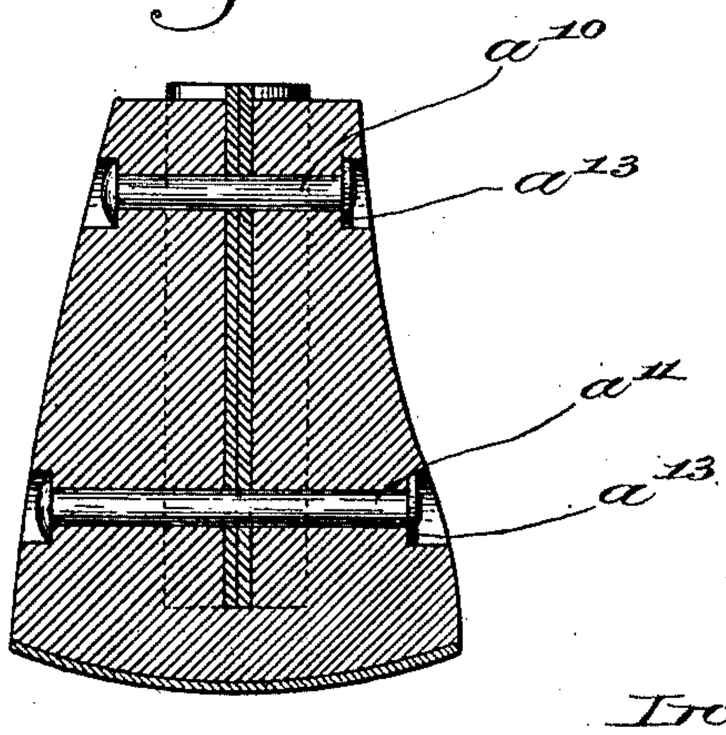


Fig. 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

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LAST.

SPECIFICATION forming part of Letters Patent No. 716,511, dated December 23, 1902.

Application filed June 3, 1902. Serial No. 110,047. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. ARNOLD, a citizen of the United States, residing at North Abington, in the county of Plymouth and State of Massachusetts, have invented an Improvement in Lasts, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention is an improvement in lasts, and relates particularly to the provision of a special heel or heel part.

The heel of the last is the portion which is subjected to the greatest strains, pressures, and abuse, and for this reason more labor and ingenuity have perhaps been bestowed upon this part of the last and with less profit than upon all the remaining portions together.

The last is supported, when in work, upon a spindle which enters a vertical hole in the heel, the result being that all the twisting movements and side pressures, &c., which are necessarily frequent and often severe, bring a great splitting pressure, which is frequently destructive; also, in other stages of shoe manufacture, such as the heeling process, the vertical pressure is such that it crushes the heel, bulging the ordinary tubular thimble, spreading the sides and otherwise ruining the heel, and, finally, the shrinkage of the wood loosens the ordinary thimble, so that it is at a disadvantage for many reasons.

My object is to obviate, so far as possible, all the aforesaid objections, and without further explaining the matter at this point I refer to the accompanying drawings and the following description, in which I have set forth a preferred embodiment of my invention, the latter being more particularly defined in the appended claims.

In the drawings, Figure is a fragmentary view of a last provided with my invention, the embodiment of the latter being shown in central vertical section. Fig. 2 is a top plan view thereof, and Fig. 3 is a vertical transverse section.

It will be understood that my invention is applicable to any form or kind of last, a block-last being herein shown simply for convenience.

As already pointed out, the heel part of lasts has been the object of much invention, the necessity therefor being due to the fact of the severe and complicated strains to which the heel is subjected, as already explained, and thus far the problem has presented almost insurmountable difficulties in view of the limited amount of wood in which the thimble can be secured, the necessary weakening of the wood by the insertion of the thimble, (the size of the latter being necessarily relatively large,) the necessity of having the exterior surface of the last as nearly smooth as possible, and the desirability of a light construction. The anvil heel-last (consisting of a spindle, heel-seat, and connecting-post all cast in one heavy piece) secured the strength desired; but on account of the great weight it not only was objectionable as a last, but because of the weight the shoes were very apt to get injured.

The purpose of my present invention is fourfold—to secure great strength, extreme lightness, also firmness and compactness, and cut the wood as little as possible. I accomplish this by boring the heel part with a connected large hole a and small hole a', approximately of the same shape as have been already provided in connection with other constructions, and in these two connected holes in the last I drive a stamping or metal piece A, which is stamped or rolled out of sheet-steel to the form, approximately, of a figure 8, as shown best in Fig. 2, this combination-thimble having nearly the shape which has been employed in a cast thimble, but differing therefrom in terminating short of the bottom, as indicated at a^2, and extending from one end, a^3, in a semicircle a^4 to a flat neck part a^5 and thence in a circle a^6 around to a second flat neck part a^7, and thence in a semicircle a^8 to the opposite end a^9, these parts being, as already stated, driven or forced into the holes a a', as shown in Fig. 2, so that they are tightly compressed against each other, and the opposite sides of the stamping not only serve to mutually support each other, but the spring or resistance of the metal causes it to maintain a firm permanent contact with the walls of the hole containing it, so that there is no danger or possibility of the wood shrinking away from it after long use. Having forced the thimble into position, as shown in Figs. 1 and 3, I bore two transverse

holes through the heel part, adjacent the top and bottom thereof and passing through the flat neck parts a^5 a^7, as clearly shown in the drawings, and insert two bolts or stays a^{10} a^{11} therein, countersinking the ends in the wood and riveting them over washers a^{13}, which constitute bearing-surfaces for pulling in the sides of the last or holding them against any lateral movement or bulging tendency. I then secure to the bottom of the last a heel-plate a^{14} in usual manner, entirely separate, however, from the part A. As thus constructed, it will be seen that the sides of the last are held rigidly and unyieldingly together, as the bolts or rivets coöperate with the two sides in maintaining the wood which is between the respective ends of the respective bolts and the adjacent sides of the web-like thimble part tightly compressed or unyieldingly held in position.

Whatever spring tendency the sheet-steel member A has for its parts to spread operates not only to hold the thimble against the holes in the heel, but is met by the compression of the bolt-heads, which have been riveted down solidly against the wood, so as to bind the sides of the latter toward each other.

I do not claim that my invention is of a broad character, as I am aware that there have been already many attempts at strengthening and improving the heel part of a last, and so far as I have been able I have made use of elements or parts already at hand, my invention residing mainly in so combining these old elements and uniting them with a new form of thimble made of sheet-steel that the features of strength and lightness are made effective, together with durability, firmness, or solidity of position and smoothness or minimum cutting of the wood.

Many further advantages of my invention will appear to practical shoe manufacturers and others skilled in the art, and therefore,

Without attempting to set forth all the advantages and functions of my invention, and without limiting myself otherwise than as expressed in the claims, what I claim, and desire to secure by Letters Patent, is—

1. A last having its heel part provided with a vertical thimble or spindle holder extending approximately through the last from top to bottom, said holder being shaped from a plate of sheet metal extending from one end in a semicircle to a flat neck part, and thence in a circle around to a second flat neck part, and thence in a semicircle to the opposite end, said two flat neck parts abutting against each other, and two bolts passing through the last from side to side and through said two neck parts and riveted rigidly in place.

2. A last having its heel part provided with a vertical thimble or spindle holder extending approximately through the last from top to bottom, said holder being shaped from a plate of sheet metal extending from one end in a semicircle to a flat neck part, and thence in a circle around to a second flat neck part, and thence in a semicircle to the opposite end, said two flat neck parts abutting against each other, the opposite sides of said holder and adjacent portions of the wood of the last being firmly bolted together, and a bottom plate secured to the bottom of the heel part independently of said holder.

3. A last having its heel part provided with a thimble-hole and with a smaller parallel hole at the rear thereof, said two holes being connected by a narrow neck, in combination with a sheet-metal holder tightly held in said holes by a driving fit, the sheet metal of said holder being rolled or bent to form two opposite semicircular end parts, whose free ends abut at the rear side of the small hole, two narrow necks or flat vertical places being formed adjacent said semicircular parts and coming together in the narrow neck connecting said holes, and the remaining portion of the piece of sheet metal between said necks or flat vertical places being bent in a circle to tightly fit the larger hole.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM B. ARNOLD.

Witnesses:
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