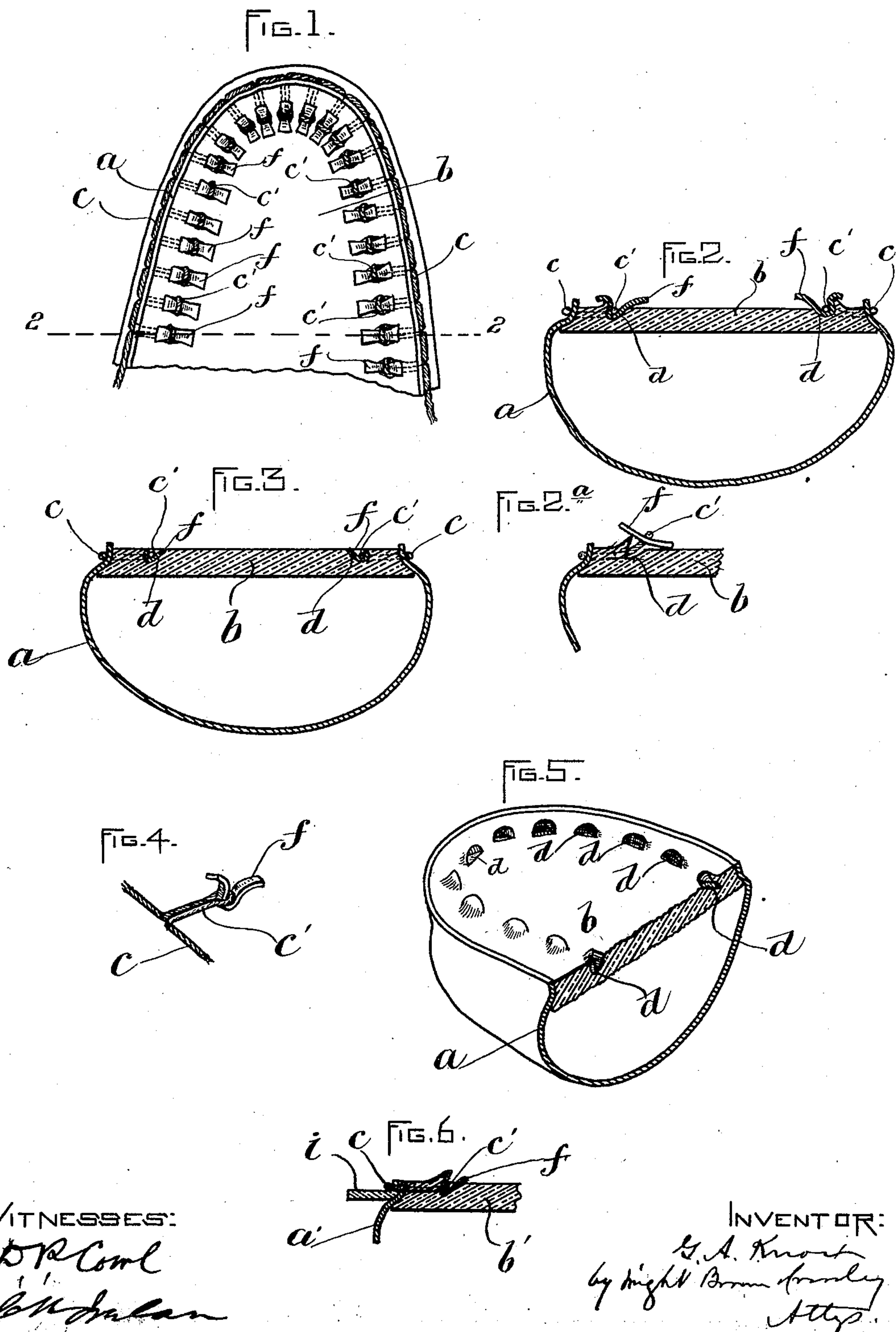


(No Model.)

G. A. KNOX.  
SHOE AND METHOD OF MAKING SAME.

No. 512,976.

Patented Jan. 16, 1894.





# UNITED STATES PATENT OFFICE.

GEORGE A. KNOX, OF LYNN, MASSACHUSETTS.

## SHOE AND METHOD OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 512,976, dated January 16, 1894.

Application filed December 20, 1893. Serial No. 494,213. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE ALFRED KNOX, of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Boots and Shoes and the Method of Making the Same, of which the following is a specification.

This invention relates to turned and welted boots and shoes, in which the upper is united to the sole by means of independent loops drawn from a single thread through the upper and through portions of the sole, and secured at their inner ends by independent locking-devices passing through the bends of the loops, each loop being locked independently of the others, so that the boot or shoe is more flexible than one in which the upper and sole are united by the usual machine-made lock-stitches, the inner ends of the loops of which are interlocked at the inner portion of the between-substance of the sole.

The present invention has for its object to provide certain improvements in boots or shoes of this class and in the art of making the same, said improvements having especial reference to the locking of the loops, and to this end it consists, first, in that improvement in the art of making turned or welted boots and shoes, which consists in forming recessed key-seats in one of the surfaces of the sole, drawing independent loops from a continuous thread through the upper and the between-substance of the sole and through said seats, passing flexible keys through said loops, and taking up the loops to bend the keys down upon said seats.

The invention consists, secondly, in a boot or shoe of the general character specified, comprising an upper, a sole recessed to form key-seats or bearings below its surface, a continuous uniting-thread having loops extending through the upper, the between-substance of the sole and the said seats, and bent locking-pins held against said seats by said loops; all of which I will now proceed to describe and claim.

Of the accompanying drawings, forming part of this specification: Figure 1 represents a plan view, showing a part of a turned shoe, illustrating my improvements, the upper and sole being shown in the "wrong-side-out" po-

sition they occupy before the shoe is turned. Fig. 2 represents a section on line 2—2 of Fig. 1. Fig. 2<sup>a</sup> represents a sectional view, showing the loop and locking key before the loop has been taken up to draw the key down into its recessed seat. Fig. 3 represents a view similar to Fig. 2, showing the locking-keys trimmed off flush with the foot-bearing surface of the sole. Fig. 4 represents a perspective view, showing one of the loops and locking-keys in the relative positions they occupy in the sole. Fig. 5 represents a perspective view of a part of a turned shoe, wrong-side-out, showing the preferred form of the key-seats, the loops and locking-devices being omitted. Fig. 6 represents a sectional view, showing the welt, upper and inner-sole of a welted shoe having my improvements.

The same letters of reference indicate the same parts in all the figures.

Referring to Figs. 1 to 5 inclusive, *b* represents the sole and *a* the upper of a "turned" shoe, said parts being shown wrong-side-out, or in the position they occupy while they are being united.

*c* represents a continuous thread, from which are drawn loops *c'*, passing through the upper and through that portion of the sole known as the "between-substance," which, in a turned shoe sewed in the ordinary way, is the material lying between the edge of the sole and the usual channel formed in the foot-bearing surface of the sole to receive the interlocked portions of the stitches that connect the sole and upper.

The sole is provided with recessed seats *d* for the loop-locking keys hereinafter mentioned, said seats being shaped to impart a bent or angular form to said locking-keys. Said seats are preferably the walls of independently-formed indentations or pockets, such as might be formed by forcing a V-shaped cutting-tool into the sole, the latter being damp or in temper, so that such a tool will penetrate the material and form independent or isolated seats of substantially the form in cross-section shown in Fig. 5. Said tool may constitute a part of a machine organized to draw the loops through the upper and between-substance into said pockets above the seats, and to insert the locking-



keys in the loops, the pockets being formed during the operation of attaching the upper to the sole. I show said pockets, in Fig. 5, as if formed before said operation, merely to illustrate the separation of the key-seats from each other.

In the operation of uniting the upper to the sole, each loop is drawn through the upper, the between-substance and the corresponding key-seat to a point considerably above said seat and above the foot-bearing surface of the sole, as shown in Fig. 2<sup>a</sup>. A locking-key *f*, which is a strip of a suitably flexible yet comparatively incompressible material, preferably leather or raw-hide, is then passed through the projecting portion of the loop, after which the loop is taken up and thus caused to draw the locking-pin closely against its seat and give said pin a bent or angular form, as shown in Fig. 2, the bight of the loop and the operative portion of the locking-pin being thus drawn down somewhat below the foot-bearing surface of the sole, where the loop is firmly supported by the pin.

In practice, I find it desirable to make the locking-pin of more than the length actually required to lock the loop, as I thus obviate any uncertainty as to the proper engagement of the loop and pin, the ends of the loop being therefore left projecting above the surface of the sole. This being the case, I trim or cut away the superfluous parts of the key, leaving the ends of the key substantially flush with the surface of the sole, as shown in Fig. 3. It is obvious, however, that if the key were originally made of such length that its ends would not project materially or objectionably above the sole, the trimming operation would not be required, and in such case any slight projection of the ends of the key might be hammered or pressed down onto the surface of the sole.

It will be seen that the recessed or angular key-seats are important features of my invention, since they enable the keys to be confined by the loops in a bent form below the surface of the sole, so that there is no objectionable projection of the loops and keys above the sole, and no liability of the disengagement of the keys from the loops.

While I find leather and raw-hide suitable materials for the keys, I do not limit myself in this regard, and may use any other suitable material having sufficient flexibility to enable the taking-up tension on the loops to draw the keys down to their seats without an injurious strain on the thread, and sufficient resistance to compression to prevent the keys and loops

from sinking into the holes through which the loops pass.

In Fig. 6, I show the above-described improvements in a welted shoe, *a'* representing the upper, *i* the welt, and *b'* the inner-sole, the outer-sole being omitted. In this case, the inner-sole corresponds to the sole *b* shown in the preceding figures, the chief difference being that the key-seats are formed in the under instead of in the upper or foot-bearing surface.

I claim—

1. That improvement in the art of making turned or welted boots and shoes, which consists in forming recessed key-seats in one of the surfaces of the sole, drawing independent loops from a continuous thread through the upper and the between-substance of the sole and through said seats, passing flexible keys through said loops, and taking up the loops to bend the keys down upon said seats.

2. That improvement in the art of making turned or welted boots and shoes, which consists in forming recessed key-seats in one of the surfaces of the sole, drawing independent loops from a continuous thread through the upper and the between-substance of the sole and through said seats, passing flexible keys through said loops, taking up the loops to bend the keys down upon said seats, and trimming off the ends of the keys flush with the surface of the sole.

3. A boot or shoe of the general character specified, comprising an upper, a sole recessed to form key-seats or bearings below its surface, a continuous uniting-thread having loops extending through the upper, the between-substance of the sole and the said seats, and independent bent locking-pins held against said seats by said loops.

4. A boot or shoe of the general character specified, comprising an upper, a sole recessed to form key-seats or bearings below its surface, a continuous uniting-thread having loops extending through the upper, the between-substance of the sole and the said seats, and independent bent locking-pins held against said seats by said loops, the ends of said pins being substantially flush with the surface of the sole.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 15th day of December, A. D. 1893.

GEORGE A. KNOX.

Witnesses:

C. F. BROWN,  
A. D. HARRISON.