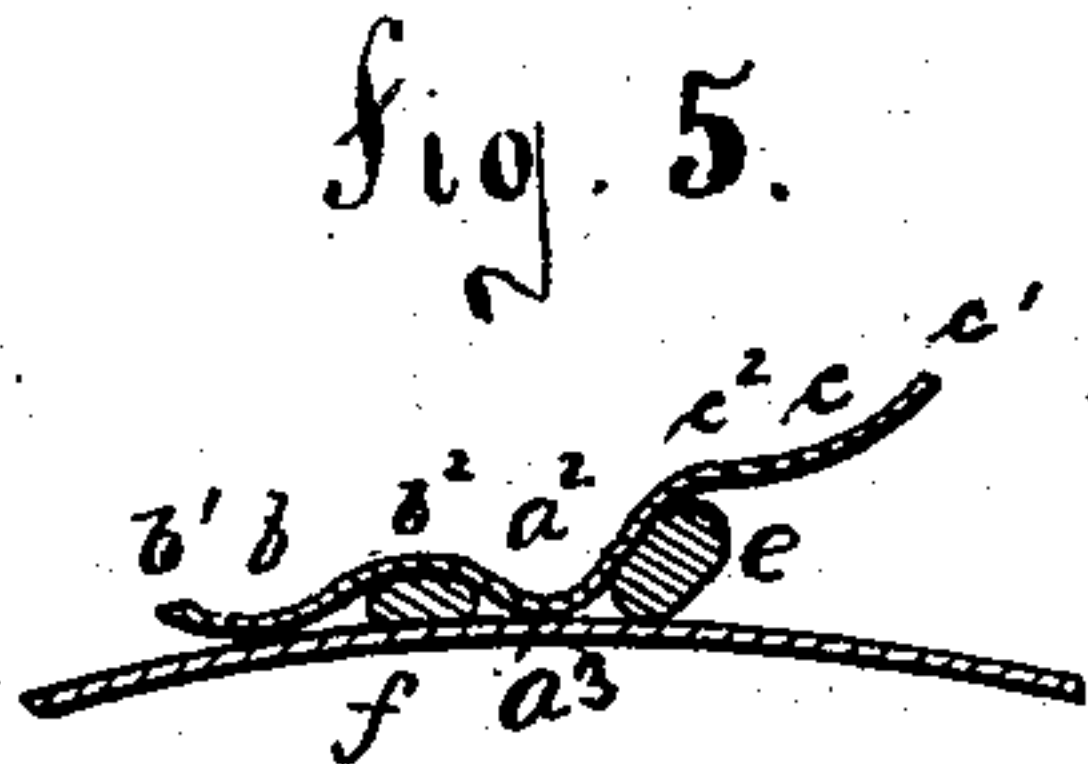
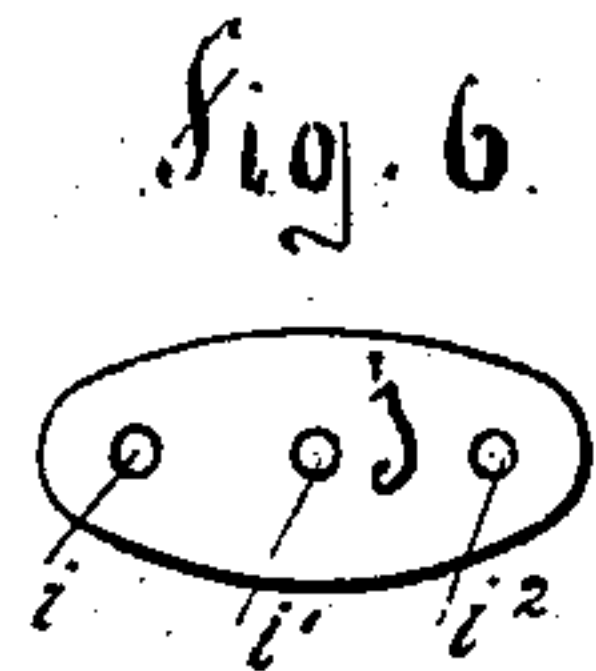
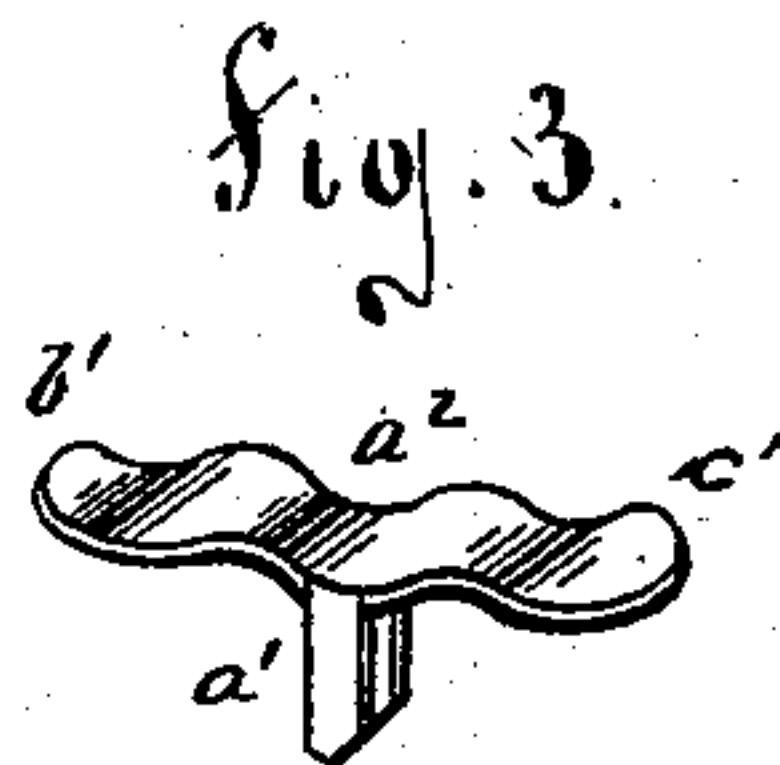
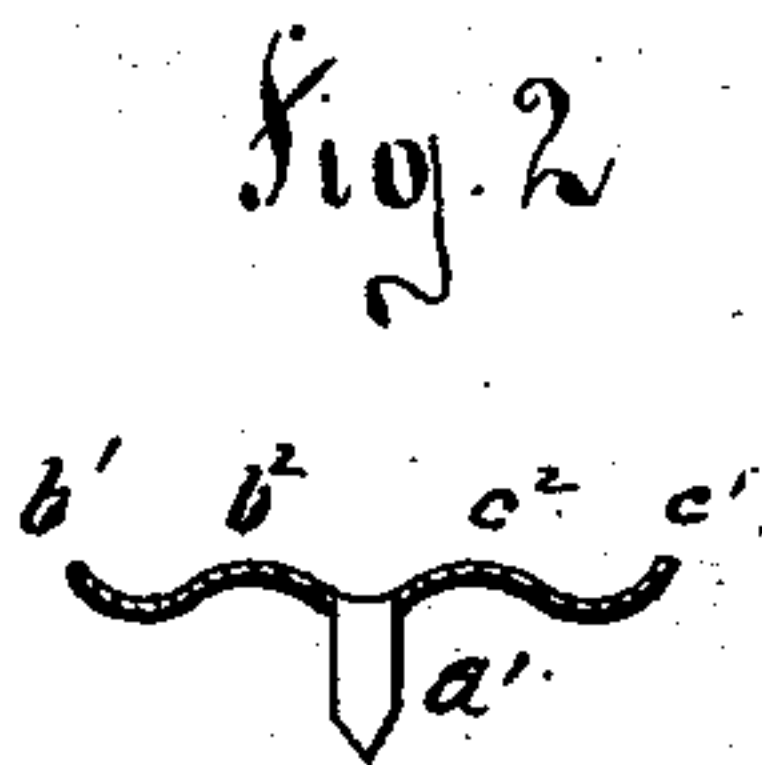
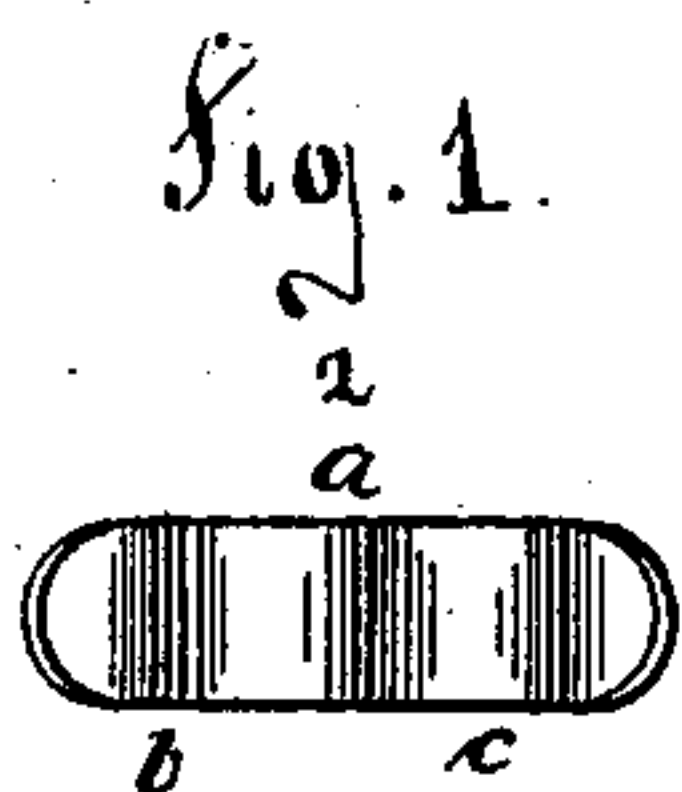
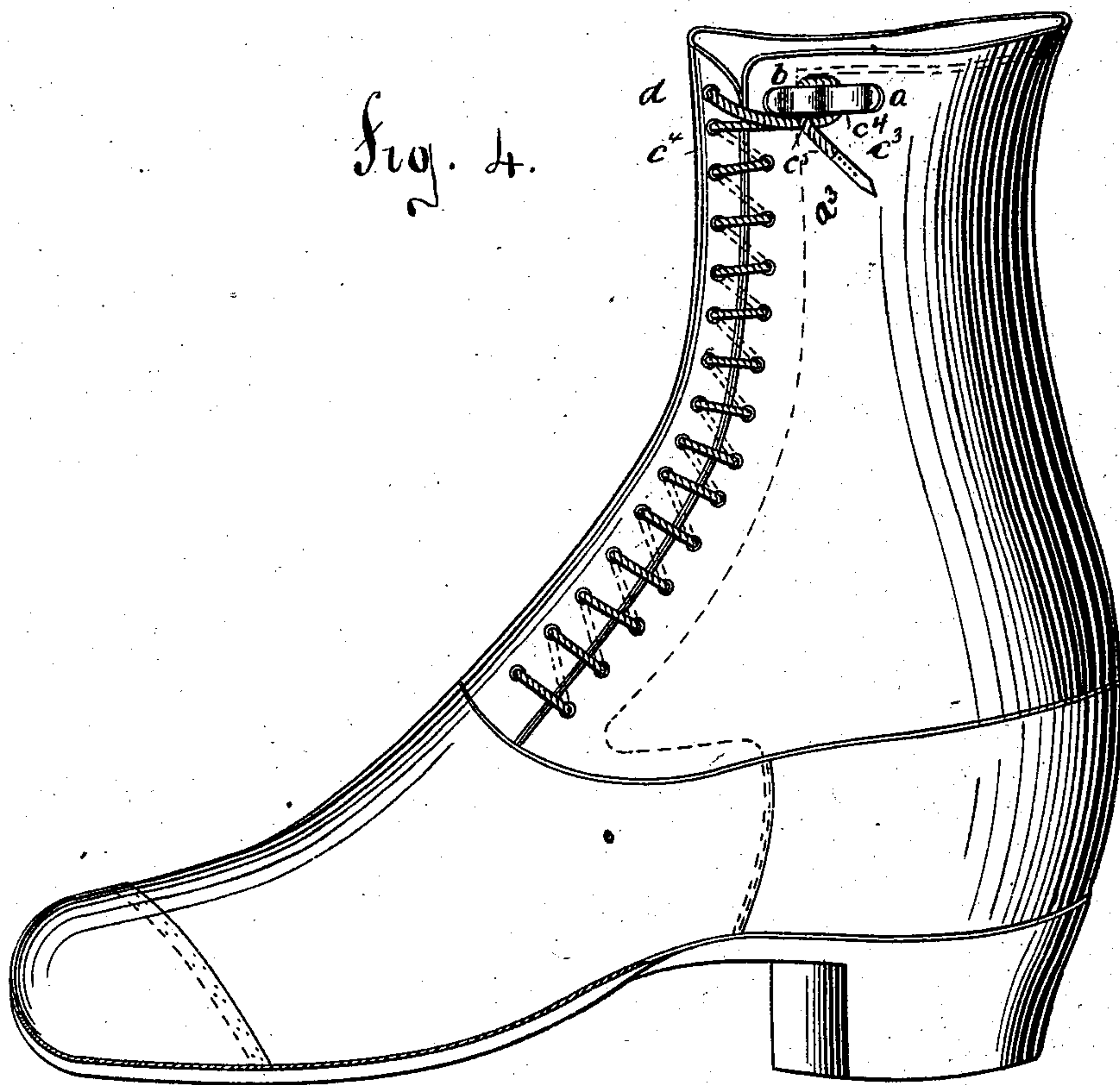


(No Model.)

H. C. HEARD.
LACE FASTENING.

No. 380,113.

Patented Mar. 27, 1888.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HERBERT CYRIL HEARD, OF BUTE VILLA, ROATH, CARDIFF, WALES.

LACE-FASTENING.

SPECIFICATION forming part of Letters Patent No. 380,113, dated March 27, 1888.

Application filed March 14, 1887. Serial No. 230,851. (No model.) Patented in England June 16, 1886, No. 8,026.

To all whom it may concern:

Be it known that I, HERBERT CYRIL HEARD, a subject of the Queen of Great Britain and Ireland, residing at Bute Villa, Roath, Cardiff, Wales, engineer, have invented an Improved Device for Fastening the Ends of Laces, (for which I have received Letters Patent in Great Britain, No. 8,026, dated June 16, 1886,) of which the following is a specification.

10 My invention relates to an improved device for fastening the ends of laces of boots and other articles of wearing-apparel, as well as of laces in general, and has for its especial object the production of a fastening device which
15 shall be at once cheap, compact, and easily operated.

It consists of a single metal plate in which is formed a depression upon each side of the appliance by which the plate is attached to the
20 article to be laced. Each of the said depressions is at a distance from the said appliance sufficient to provide a wedge-shaped space into which the lace can be compressed between the plate and the material. The said depressions
25 are brought into contact with the material by means of the appliance used to attach the plate thereto, and the outer ends or tips of the plate are bent away from the material to facilitate the act of pulling the lace under the plate.

30 The appliance by which the device is attached to the material may be either a rivet to be passed through the plate and material and then riveted up close, or two fangs formed in one piece with the plate, (one on each side
35 thereof and bent down at right angles therewith,) to be passed through the material and clinched on the other side thereof, or a U-shaped strip of thin metal, the ends of which are passed through corresponding perforations
40 in the plate and the material and then clinched upon the latter, or the device may be formed in one piece with a larger plate perforated for the purpose of being sewed to the material.

45 Whichever of the three above-mentioned appliances be adopted, it is necessary, according to my invention, that the riveted end of the rivet or the clenched ends of the fangs or of the strip, as the case may be, should be embedded in the material and flush with the surface thereof.
50

Seeing that according to my invention I use only a single metal plate, between which and the material to be laced the lace to be fastened is pulled and held, the lace itself will not be subjected to so much friction (and consequent
55 wear) as it would be if two plates were used, one of them having a projection formed on its surface corresponding in cross-section to a depression formed in the other; and, further, inasmuch as according to my invention the
60 riveted or clinched ends of the attaching appliance are embedded in the material so as to be flush with the surface of the material, it is clear that the fastening device which is the subject of my invention cannot wear an ad-
65 joining material—*e. g.*, that of a sock, if the invention is applied to a boot—as would one the method of attachment of which to the material involved the projection therefrom of a
70 rivet-head or a washer. The plate then, when centrally attached to the material, will therefore offer to the wearer two arms approximately parallel with said material and held
75 close to it and partially embedded in it at the point of attachment, one of them pointing toward the last lace-hole from which the lace
80 is led to the fastening device, and the other pointing from it. The lace is passed under the latter arm and pulled. This pulling pushes the upper in, and because of the flexibility of
85 the material of the upper throws the fastening device over. The lace is then passed under the first-mentioned arm and pulled. This last pull tends to throw the device back again, and the lace is held in compression between both
90 arms and the opposite portions of the upper. Both pulls may be dispensed with, as the friction of the lace between the arms generally suffices to retain it, inasmuch as in consequence of the wedge shape of the space between an
95 arm and the upper the pressure exerted upon the lace by the arm increases with the strain exerted upon the end of the lace by the act of walking. The slight oscillating motion which the device must receive is provided by the
flexibility of the material of the upper without the permanence of the connection between device and upper being endangered.

The plates are in plan preferably of an oblong or approximately oblong shape, with
100

rounded ends; but other shapes, as oval or round, may be used if the requirements of any particular case render such a variation desirable or advantageous. They may be flat; but I prefer that their ends be turned up to facilitate the passing of the lace under. The plates may also be arched between the raised ends and the fangs for the purpose of making more room for thick laces, or indented near their ends for the double purpose of raising the latter and making more room for thick laces. Their under sides may be serrated. Fangs made in one piece with the plate may be either bent into planes at right angles therewith, for the purpose of being pushed through suitable perforations in the material, or they may be made to lie flat upon either side of the material, being eyeleted or riveted thereto. Rivets or stitching, or any equivalent means for fixing the plate to the material, may also be adopted, according to the special circumstances of the particular case.

The nature and scope of my invention, as well as some of the various ways in which it can be carried into practical effect, are illustrated in the accompanying figures, which are to be taken as part of this specification and read therewith.

The methods of using the invention are described in connection with a boot, although, as I have pointed out, my invention is not confined to fastening the ends of boot-laces.

Figures 1, 2, and 3 are respectively plan, side elevation, and perspective views of a fastening device made according to my invention. Fig. 4 is a perspective view illustrating the application of my invention, constructed according to Figs. 1, 2, and 3, to a laced boot; and Fig. 5 is a sectional longitudinal elevation of the fastening device of Fig. 4, (but drawn to a larger scale,) illustrating the action of the invention upon a lace. Figs. 6 and 7 are a plan and longitudinal section, respectively, of another modification of my invention.

Similar letters of reference indicate corresponding parts.

The fastening device illustrated in Figs. 1, 2, 3, 4, and 5 consists of an oblong plate and its fangs.

The serpentine plate *a* has its ends *b'* *c'* rounded. The central portion, *a'*, has two fangs, *a'*, one on each side of it, and bent down at right angles therewith. These are formed in one piece with it, and are preferably thinner than the plate to facilitate the act of clinching. I form two arches in the plate *b'* *c'*, one on each side of the central portion, *a'*. Next to the arches are ridges or depressions *b* *c*, and between the depressions and the central portion, *a'*, are the wedge-shaped spaces into which the lace end is pulled. The ends or tips *b'* *c'* are bent upward from the upper *a'* to facilitate the act of pulling the lace end under the depressions *b* *c* into the wedge-shaped spaces. The fangs *a'* *a'* may be replaced by a rivet or

any other convenient appliance for attaching the plate to the upper *a'*.

The fastening device above described is used in the following manner: The lace is led from the last hole, *d*, Fig. 4, and pulled first under the depression *b* into the adjoining wedge-shaped space. Its passage under the depression *b* and its being pulled into the wedge-shaped space close up to the central part, *a'*, of the plate, raise the depression *b* off the upper and throw the plate over until the depression *c* touches the upper, the flexibility of the upper allowing each half to be alternately raised and lowered, the fangs *a'* acting as a center of oscillation. The lace is next pulled under the depression *c* and into the adjoining wedge-shaped space, with the result that the plate *a* is thrown over back again until the depression *b* is again in contact with or close to the upper, when the pressure of the arch *b'* is tightened upon that part *f* of the lace between it and the upper, as illustrated in Fig. 5, in which the section *f* is shown to be smaller than the section *e*.

The modification shown in Figs. 6 and 7 consists in forming three indentations, *i* *i'* *i''*, in an oval plate, *j*. The plate is attached to the upper by means of fangs *a'*, in the manner described with reference to Figs. 1 to 5. The center indentation, *i'*, is embedded in the material of the upper in the act of clinching the fangs. In fastening a lace with this modification of my invention the lace is pulled under the indentations *i* *i''*, close up to the respective sides of the central indentation, *i'*.

In conclusion, I wish to point out that, in addition to the lace end being held by being wedged between the arms of the plate and the opposite part of the upper, the act of drawing the tag *c'*, Fig. 4, tight will pull the part of the lace marked *c'* close up to the plate, and will therefore wedge the upper part, *c'*, of the lace tightly against the edge of the arm *b*, which second wedging will have the effect of confirming the hold of the arms of the fastening device upon the lace.

I am aware that it has been proposed to make a lace-fastening consisting of two rigid plates centrally connected and a ridge or ridges projecting from the inner faces of said plates between the center and edges of the same, the distance between the ridge or ridges and the opposing plate being just sufficient for the passage of a single lace at the point of introduction of the same with a greater space within the ridges, and also a shoe-string fastener composed of a tilting spring-button, corrugated spring-washer, and rivet; but I disclaim all intention of claiming either of these devices. I reject the former of them because of its bulk and of the friction upon both sides of the lace caused by its being held between two plates, and the latter because of the projection of the spring-washer from the inner surface of the upper.

I claim—

5 A serpentine plate, with the central part of which are combined two fangs adapted to fasten the plate to the material, and having
10 formed in it two arches adjoining said central part, one on each side of it, and forming, when the plate is attached to the material, wedge-shaped spaces adapted to receive the lace to be fastened, and two depressions next to the arches, substantially as and for the purpose hereinbefore described and illustrated.

In testimony whereof I, the said HERBERT CYRIL HEARD, have hereunto set my hand this 7th day of February, 1887.

HERBERT CYRIL HEARD.

In presence of—

CHAS. C. PERKINS,

127 *Richmond Road, Cardiff.*

FREDK. N. JONES,

134 *Severn Road, Cardiff.*