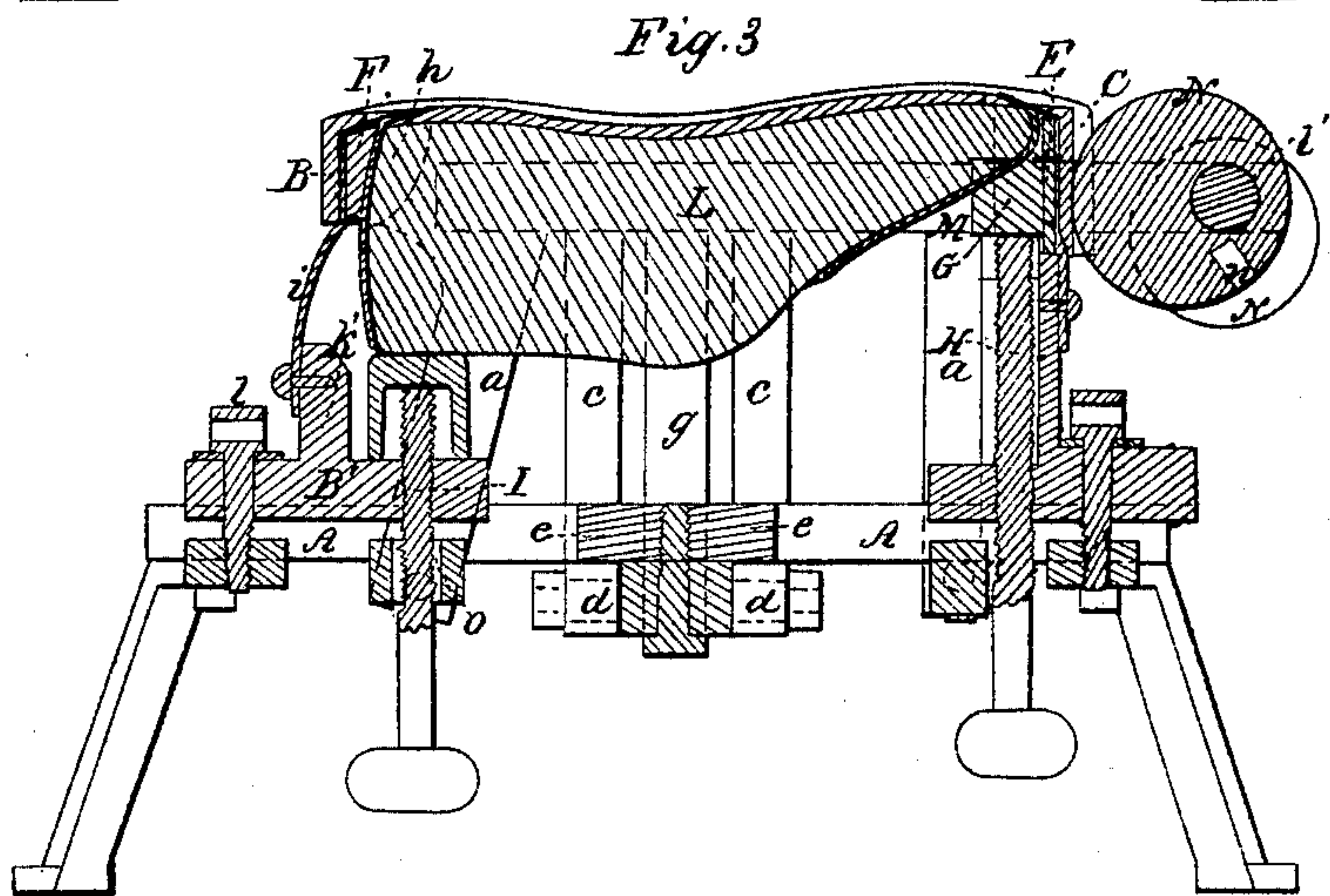
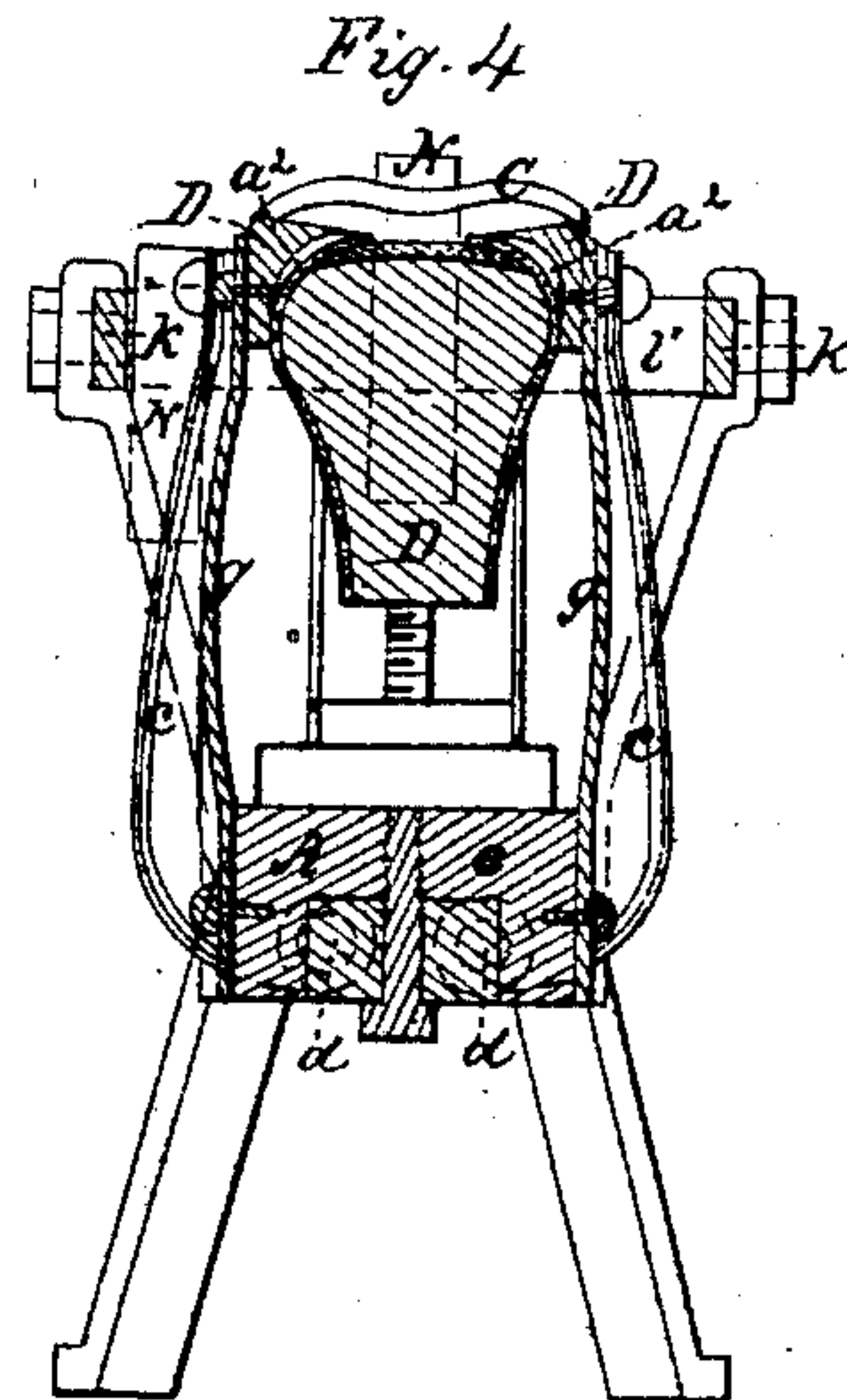
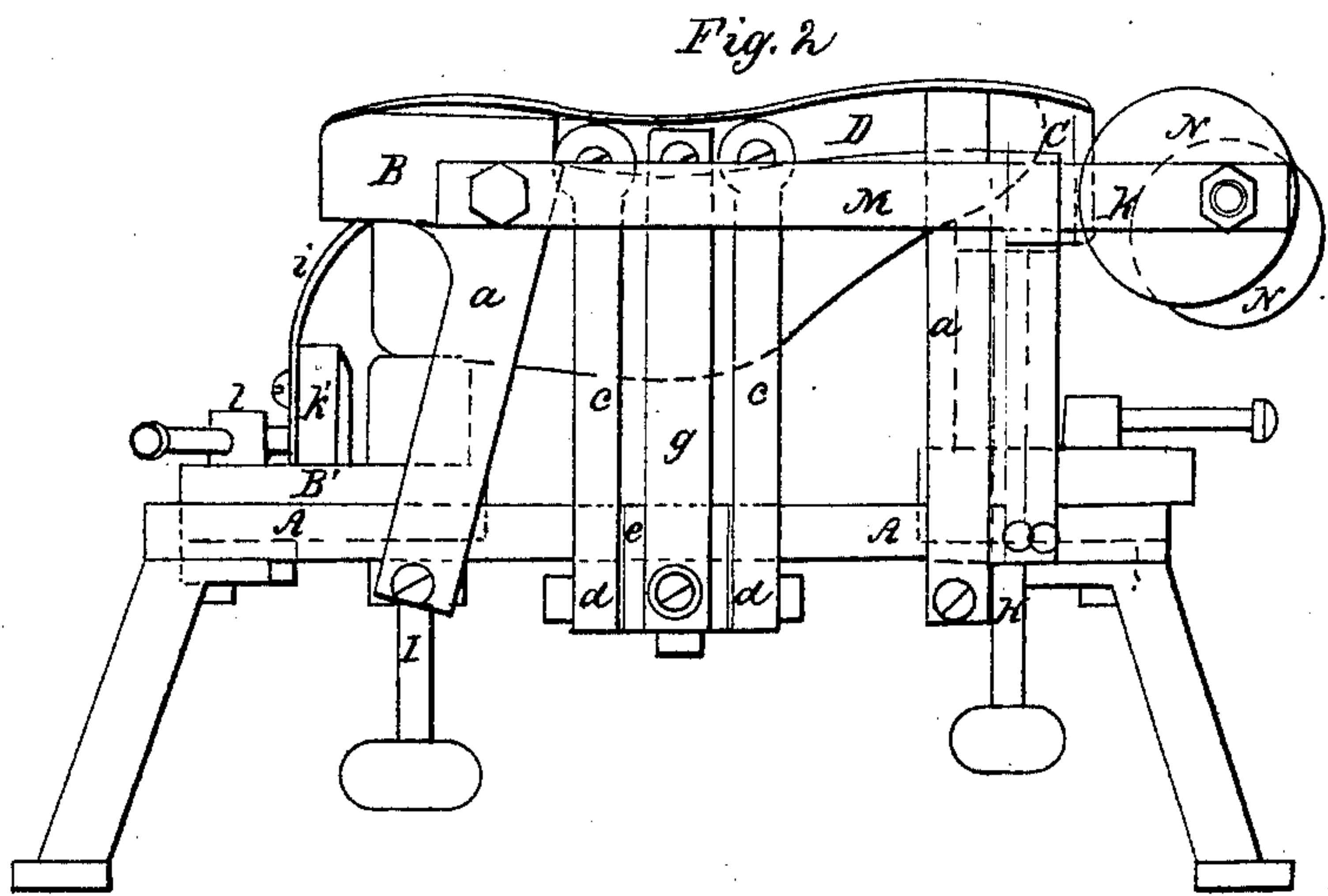
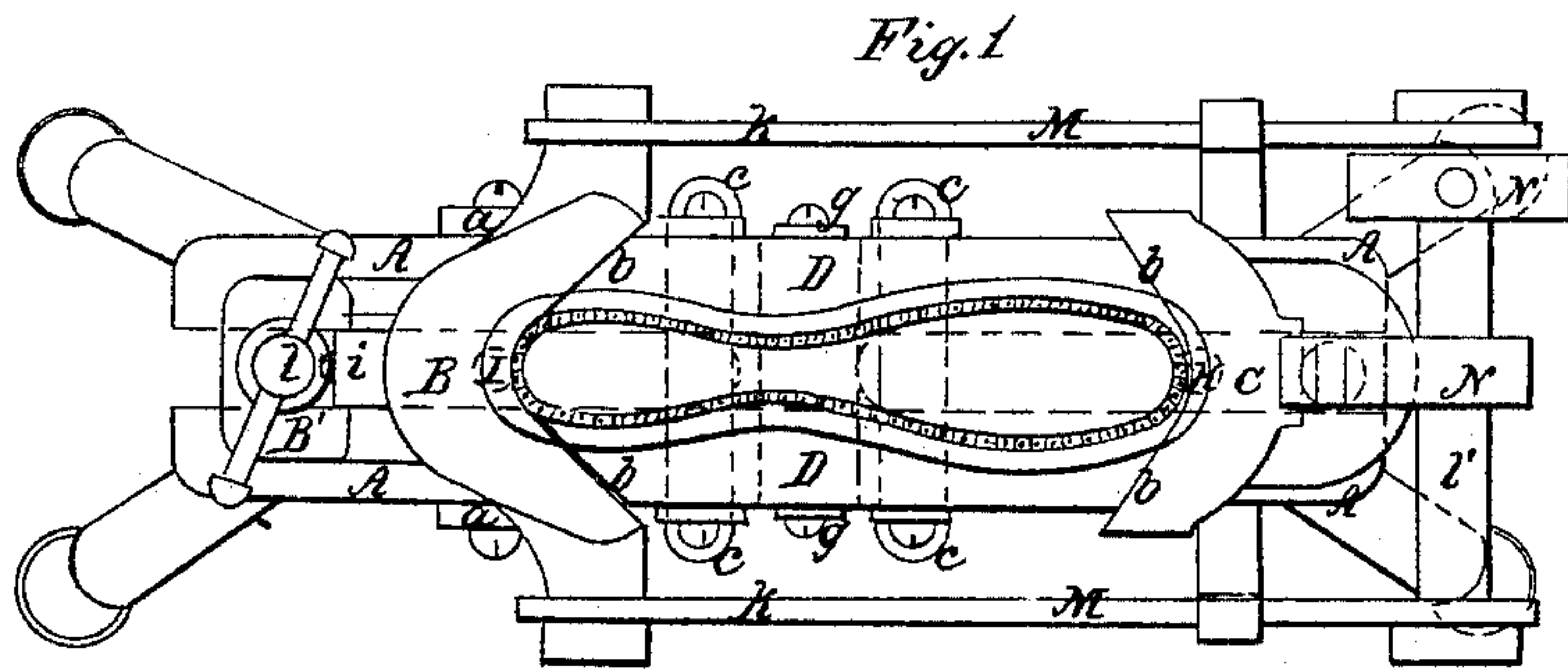


M. R. Ethridge,
Lasting the Uppers of Boots & Shoes,
No 37,907, *Patented Mar. 17, 1863.*



Witnesses.

R. H. Ledy

J. R. Sampson.

Inventor.

Martin A. Ethridge

UNITED STATES PATENT OFFICE.

MARTIN R. ETHRIDGE, OF BETHEL, MAINE.

IMPROVED MACHINE FOR LASTING THE UPPERS OF BOOTS AND SHOES.

Specification forming part of Letters Patent No. 37,907, dated March 17, 1863.

To all whom it may concern:

Be it known that I, MARTIN R. ETHRIDGE, a citizen of the United States of America, and a resident of Bethel, in the county of Oxford and State of Maine, have invented an Improved Machine for Lasting the Uppers of either Boots or Shoes; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view, Fig. 2 a side elevation, Fig. 3 a longitudinal and vertical section, and Fig. 4 a vertical and transverse section, of the said machine.

The novel features of the said mechanism, by which it may be distinguished from others for a like purpose, may be enumerated as follows: First, a peculiar construction of its crimping or "lasting" jaws—viz., with what may be termed "miter-joints"—whereby such jaws, while in the act of being drawn or forced toward and against the upper of a shoe placed on a last arranged between them, they will be caused to strain the said upper and lay it on the sole without puckers or wrinkles at such joints; second, a flexible or spring heel presser, (either stationary or adjustable lengthwise of the last,) combined with the crimping-jaws and a toe rest or support, either stationary or adjustable lengthwise of the last; third, a peculiar mechanism for moving the heel, toe, and side crimping or lasting jaws with reference to a last when arranged between them; fourth, mechanism for supporting the last both at its heel and toe and adjusting such last, or either or both of its ends, vertically with reference to the crimping or lasting jaws; fifth, a toe-seat separate from and arranged within the toe-rest and upon the mechanism for vertically adjusting the toe of the last; sixth, the combination and arrangement of elastic cushions with the crimping-jaws.

In the drawings, A denotes the stand by which the main operative parts of the machine are supported. The heel and toe crimping jaws are exhibited at B and C, each of them being supported by arms *a a*, jointed at their lower ends or parts to the stand in such manner as to enable the said jaws to be moved either toward or away from each other. Between the said jaws are two side crimping or lasting jaws, D D, which are arranged as shown in the drawings. Each of the said

jaws, where in apposition with the next adjacent jaw, is beveled, so as to form therewith a miter-joint, as shown at B in Fig. 1. In consequence thereof, while the heel and toe jaws are being moved toward one another, their bevels acting against those of the side jaws, will cause these latter jaws to simultaneously move toward one another, and all the jaws will be made to so act on the upper or leather held by the last L, placed between the jaws, as to force its edges over upon the insole (when on the sole of the last) in a manner which will effectually prevent the leather from being pinched and wrinkled between or at the said joints. When the joints of the crimping-jaws are at right angles, or about so, to the operative or bearing edges of the side jaws, the leather is liable to be caught and compressed or puckered between each side jaw and the adjacent heel and toe jaws; but with my improved mode of constructing the jaws—viz., with mitered joints, arranged as specified and represented—the leather will be so operated on by the jaws that puckers or wrinkles are seldom or never likely to occur or be produced by and between them.

The four crimping or lasting jaws in this machine are intended not only to perform the function of drawing and straining the leather over the instep and toe parts of the last, but to force and lay it down closely and smoothly upon an insole when placed upon the sole of the last. In order that these jaws may so operate to advantage, it becomes necessary that all of their operative edges or flanges—that is, those which act against the leather—should move in parallelism, or nearly so, with the curved surfaces of the sole on which they are to lay the upper.

In order that the machine or its crimping-jaws may be adaptable to lasts of different sizes, it is provided with mechanism not only for supporting the last at its heel and toe, but for adjusting it vertically, according as the size of a last and the thickness of leather to be stretched on it may require. Each of the side crimping-jaws, D D, is supported by one or more radial arms, *e*, which in their turn are supported on centers *d d*, arranged under the platform *e* of the stand A, as shown in Fig. 4, such arrangement being so as to cause the operative or bearing edges or flanges of the jaws to move in paths parallel, or nearly so,

with the transverse curves of those parts of the sole of the last on which the upper is to be laid. To each side jaw, D, there is a retractive spring, *g*, which is fixed to the stand, and serves to force the jaw, as well as the heel and toe jaws, away from the last during the backward rotation of their operative cam or eccentric, to be hereinafter described.

Between the heel and toe jaws B C there are arranged an adjustable toe abutment or rest, E, and an adjustable and flexible heel-presser, F. The end of the toe of the upper, when on the last, is to abut against the said rest E, while the toe part of the last is supported on a seat or block, G, which is separate from the toe rest and rests in a recess thereof, and on the upper end of an adjusting-screw, H, which screws upward through the lower part of the toe-rest, and serves to adjust the toe of the last vertically with reference to the toe crimping-jaw. There is another adjusting-screw, I, (which extends up into a cylindrical hole, *c*, formed in the heel-block B',) arranged underneath the heel-block, and serves to adjust the latter with reference to the heel-jaw B.

The heel-presser F consists of a curved bearer, *h*, projected from and supported on a spring, *i*, that extends from slider, *k*, arranged on the stand A, and provided with a clamp-screw, *l*. The slider should be capable of being moved either toward or away from the heel of the last L. The purpose of the spring *i* is to enable the last to be either easily removed from between the heel-presser and the toe-rest or to be placed between them, as circumstances may require. This spring also enables the leather of the last to be moved thereon by the heel and toe crimping jaws. When the upper and the last are held by rigid jaws separate from the crimping-jaws, the upper cannot be drawn closely on the last without a liability of being injured; but with the flexible presser F operating in conjunction with the toe abutment or rest E, not only will the last and upper be held in position for the crimping-jaws, but the leather or upper will be free to be drawn or stretched on the last.

The machinery for forcing the heel and toe crimping jaws toward each other consists of a yoke, M, and an eccentric or cam, N. The yoke is made of two parallel bars, *k k*, and a round rod, *l'*, by which such bars are connected at or near one end of each. This yoke is arranged horizontally, and so as to span the two side-crimping jaws and the toe-jaw, and is jointed to the heel-crimping jaw. Two or more cams, N, of different sizes are placed on and so as to be capable of being slid lengthwise and freely revolved on the rod *l'*, such being to enable either of such cams to be arranged so as to operate against the toe-jaw, according as the size of the last L

may require. In the periphery of each cam or eccentric one or more holes, *n*, are made for reception of the end of a lever, by the aid of which the cam or eccentric is to be revolved on the rod *l'*.

In Fig. 4, at *a² a²*, there are exhibited two elastic cushions, they in such figure being colored in red. Each of these cushions is to be made of caoutchouc, or its equivalent, and to be fastened to the inner surface of one of the crimping-jaws D D, there being such a cushion to each of the said jaws and underneath the most projecting part thereof. During the approach of these jaws toward one another, or, in other words, during the process of lasting a shoe, these elastic cushions are borne against the upper and serve to press it into the hollow part of the sides of the last and draw it firmly over the instep of the last prior to the final crimping action of the jaws. These cushions are valuable and important auxiliaries to the jaws.

With the above-described machine the lasting of the upper on a last and an insole can be accomplished with great facility, and at the same time the leather will be duly stretched on the last and laid down upon the insole smoothly and without wrinkles or puckers at the joints of the crimping-jaws. These joints, by their peculiar formation, perform two functions, viz., that of preventing the formation of wrinkles in the leather and that of forcing the side jaws toward one another.

I claim—

1. The construction of the crimping-jaws with mitered joints or ends, arranged together substantially as described.
2. The combination of a flexible or heel spring presser, F, as described, with the crimping-jaws and a toe-rest, substantially as specified.
3. The peculiar combination for operating or moving the crimping-jaws both toward and from the last, the same consisting in the yoke M, the cam or cams N, the springs *g g*, and the miter-joints *b b b b*, the whole being arranged substantially as specified.
4. I do not claim the application of an elevating-screw to the toe part of the last only, but I claim, in combination with the crimping-jaws, mechanism, substantially as described, for holding the last both at its heel and toe and mechanism for adjusting it at either or both ends vertically with reference to the crimping-jaws.
5. The combination and arrangement of the elastic cushions *a² a²* with the crimping-jaws D D.

MARTIN R. ETHRIDGE.

Witnesses:

R. H. EDDY,
J. R. BAMPTON.