(No Model.)

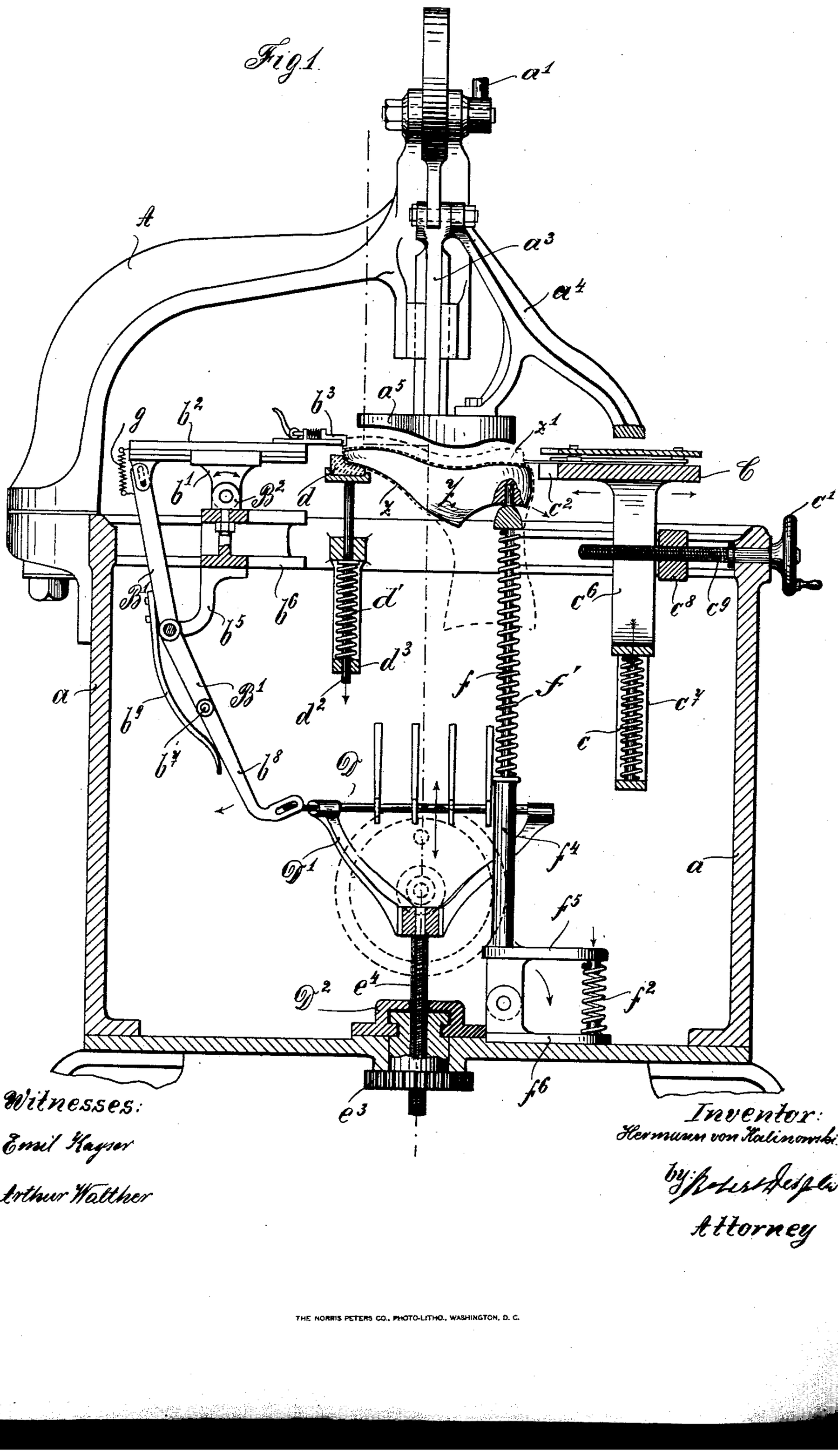
6 Sheets—Sheet 1.

H. VON KALINOWSKI.

LASTING MACHINE.

No. 593,356. Patented Nov. 9, 1897.

Fig. 1.



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Inventor:

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by Roberts Sheffield

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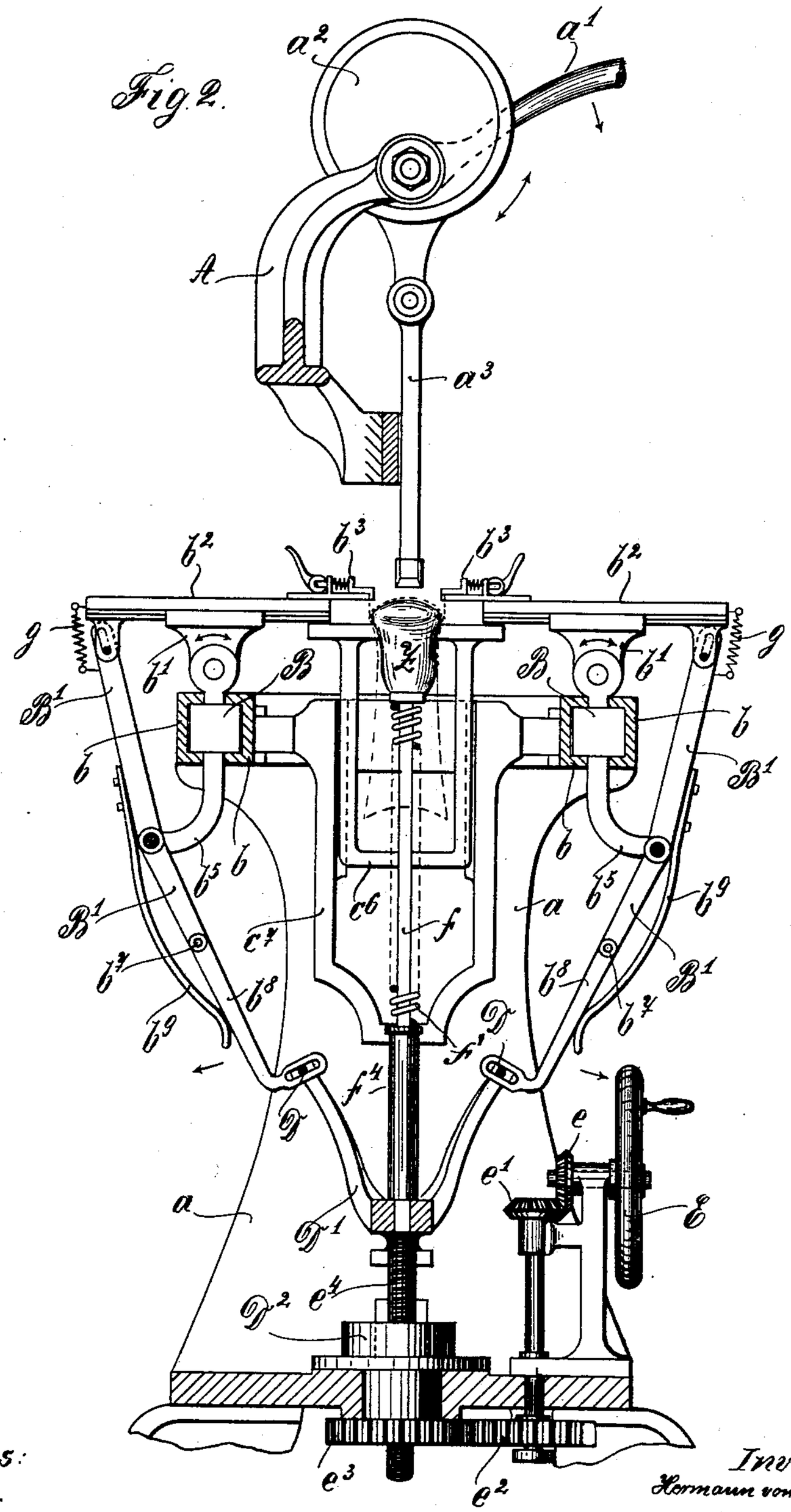
(No Model.) 6 Sheets—Sheet 2.

H. VON KALINOWSKI.

LASTING MACHINE.

No. 593,356. Patented Nov. 9, 1897.

Fig. 2.



Witnesses:

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(No Model.) 6 Sheets—Sheet 3.

H. VON KALINOWSKI.

LASTING MACHINE.

No. 593,356. Patented Nov. 9, 1897.

Fig 3

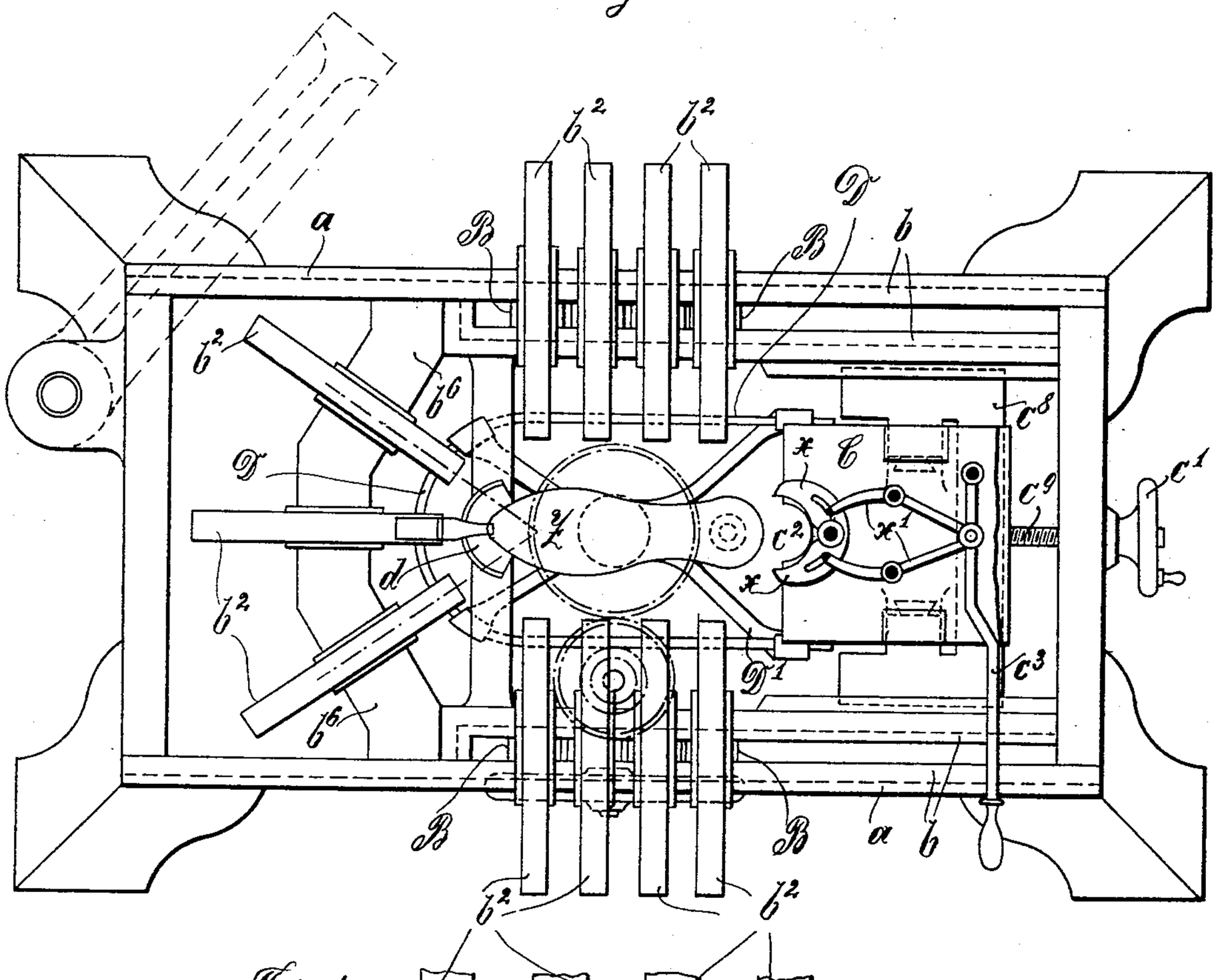
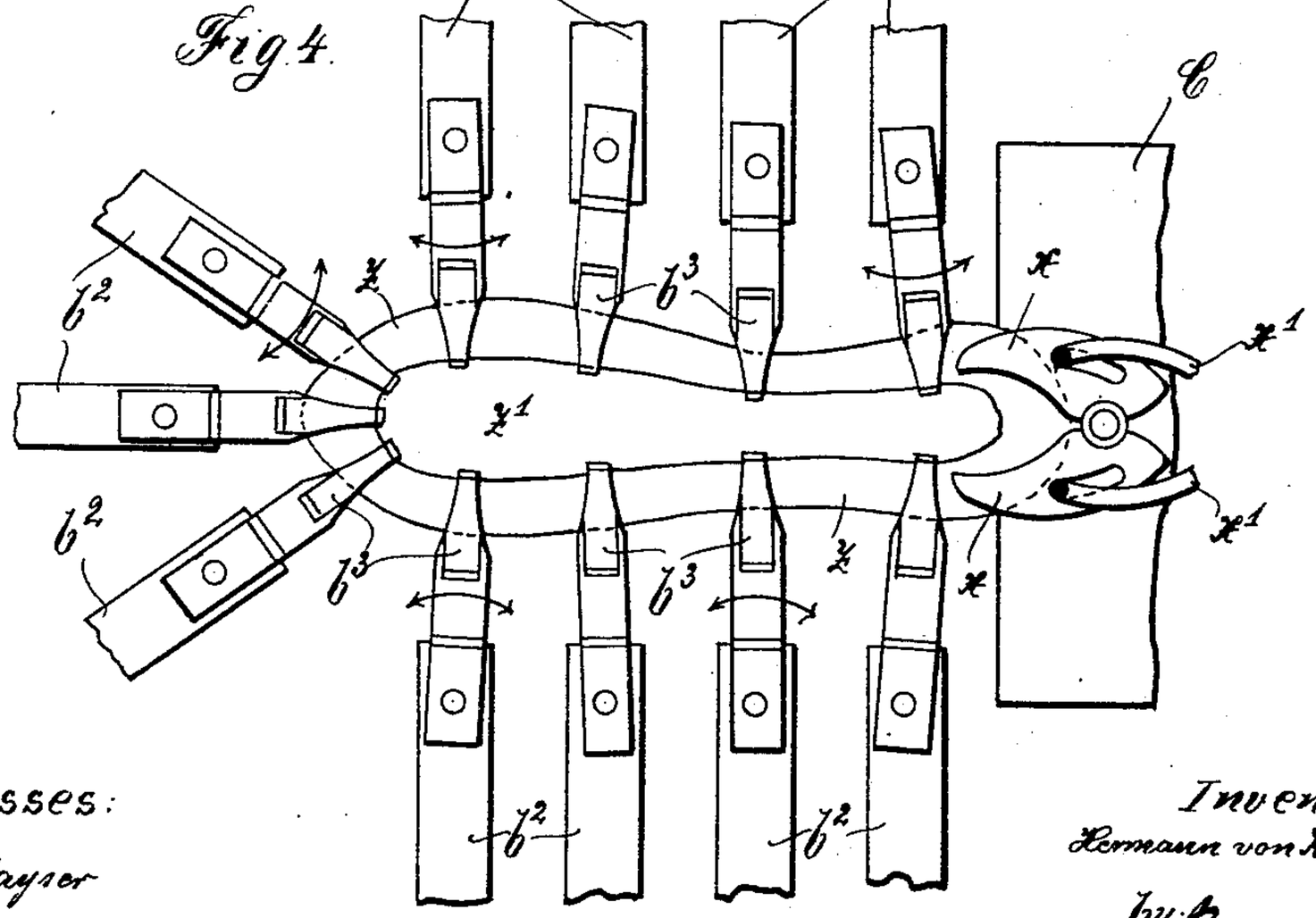


Fig 4.



Witnesses:

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(No Model.) 6 Sheets—Sheet 4.

H. VON KALINOWSKI.

LASTING MACHINE.

No. 593,356. Patented Nov. 9, 1897.

Fig. 5.

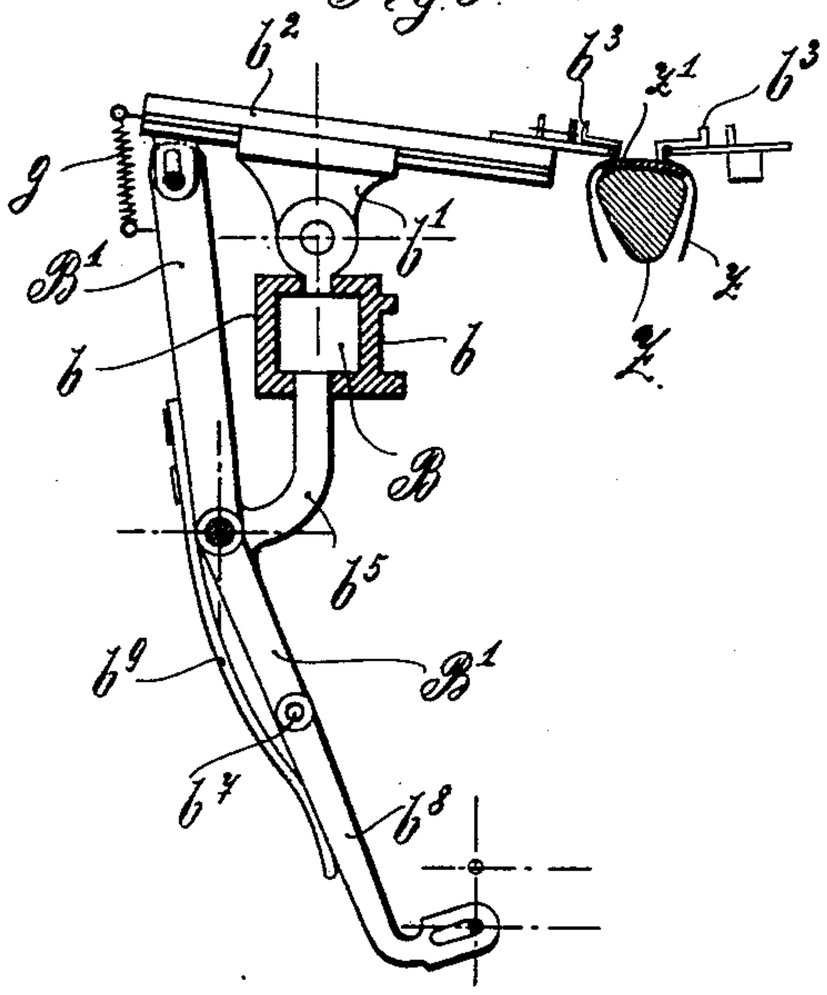


Fig. 6.

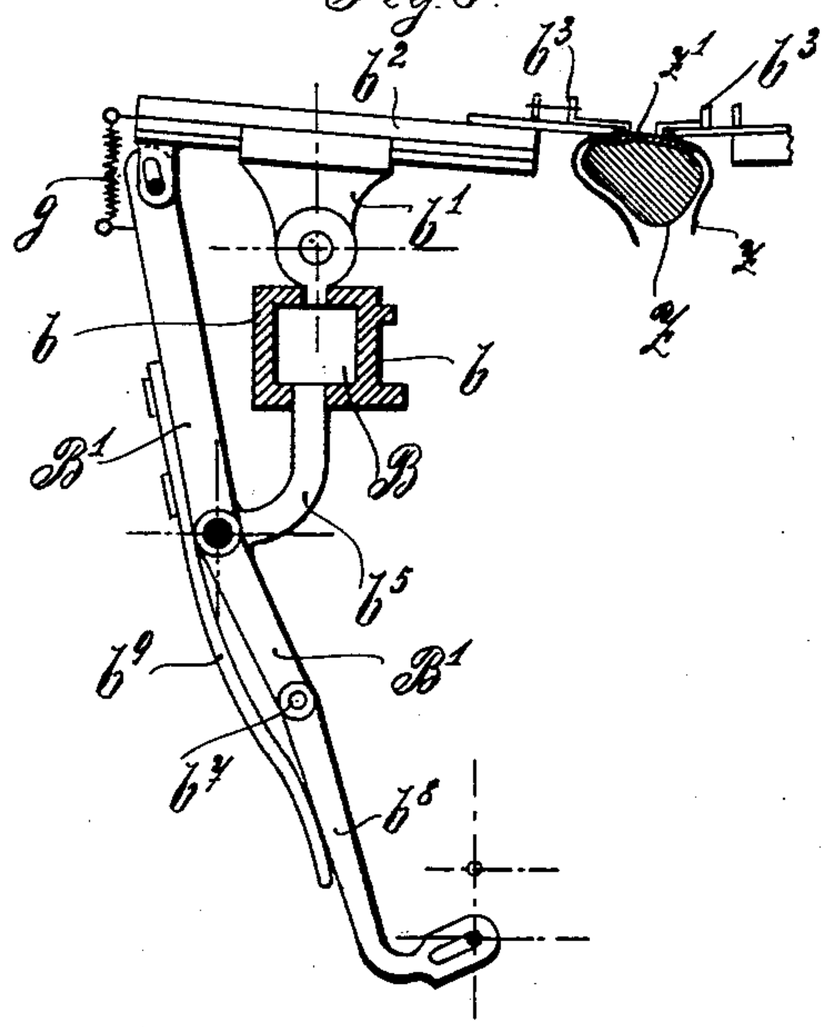


Fig. 7.

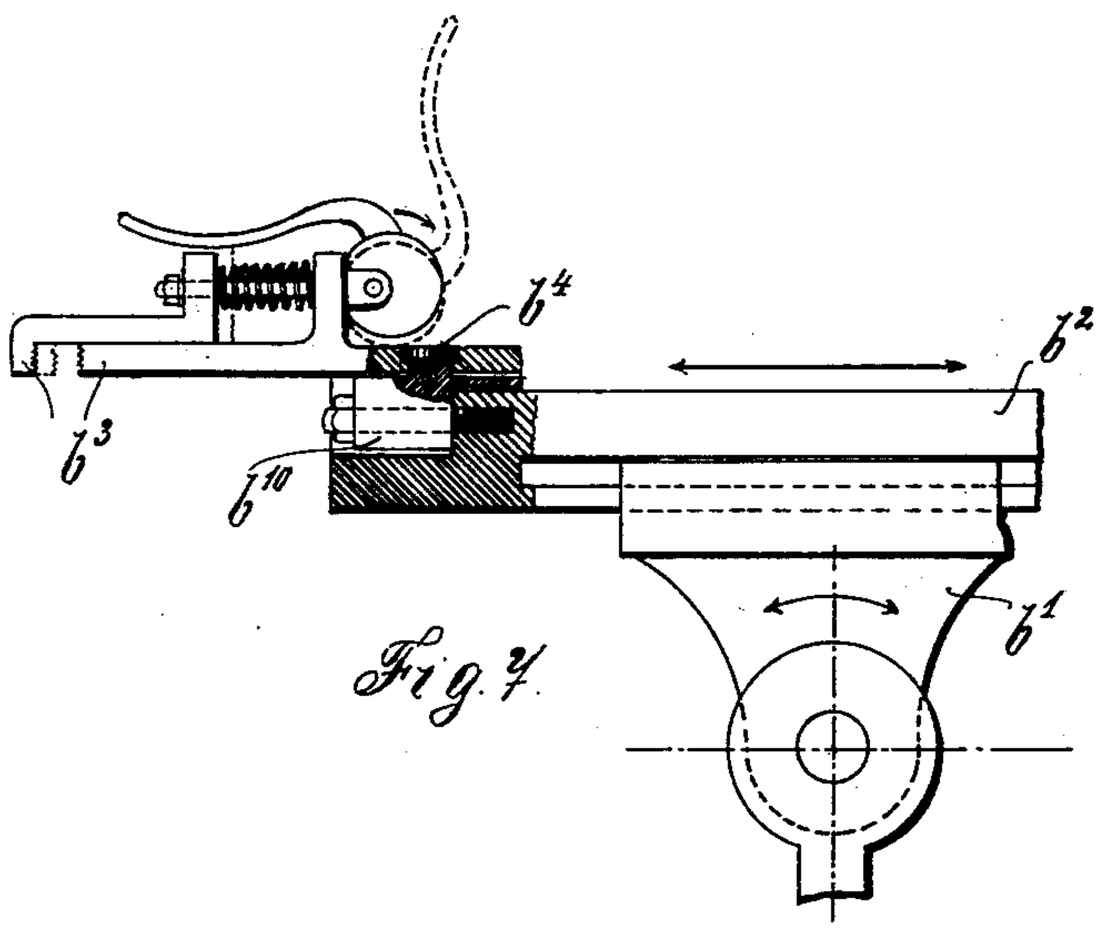
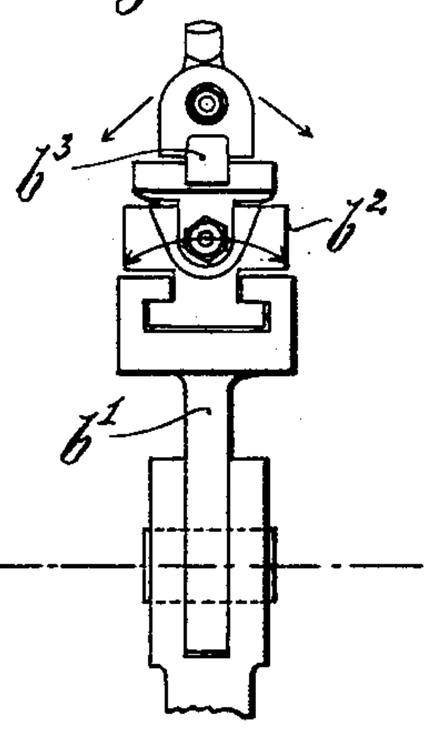


Fig. 8.



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(No Model.)

6 Sheets—Sheet 5.

H. VON KALINOWSKI.

LASTING MACHINE.

No. 593,356. Patented Nov. 9, 1897.

Fig. 12

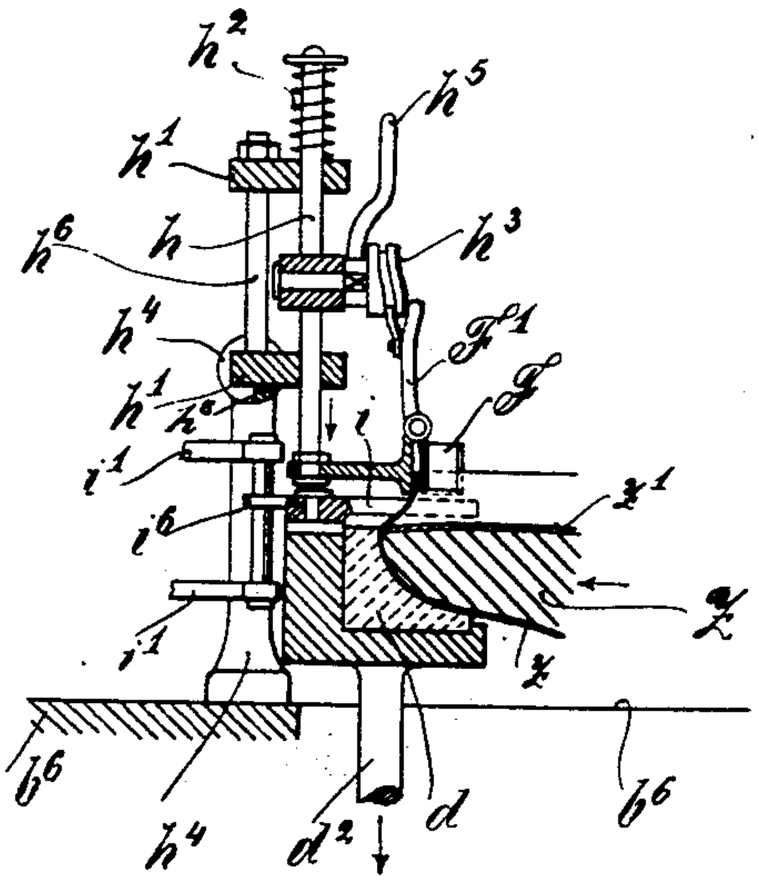
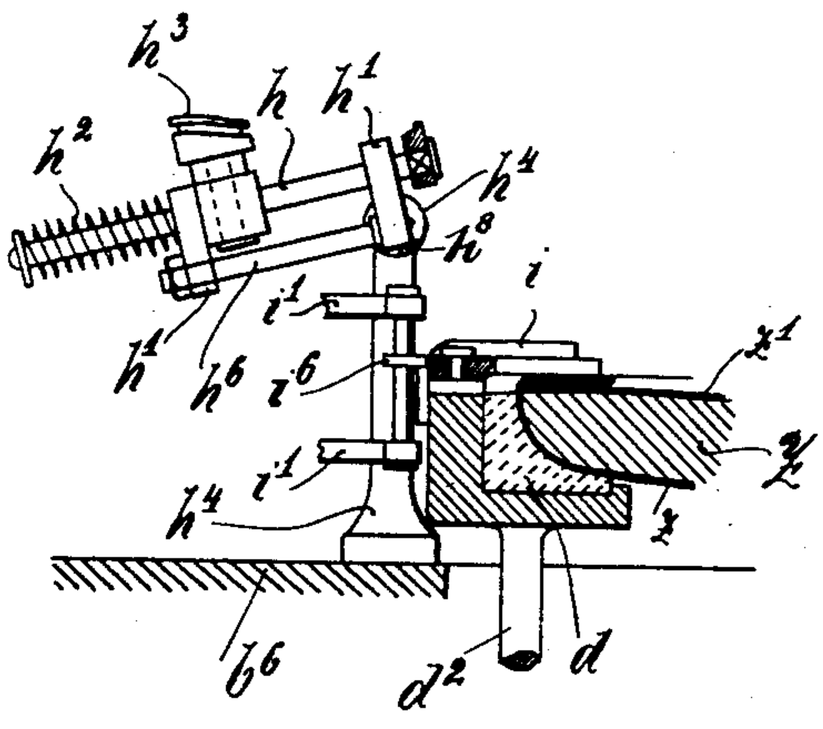


Fig. 13



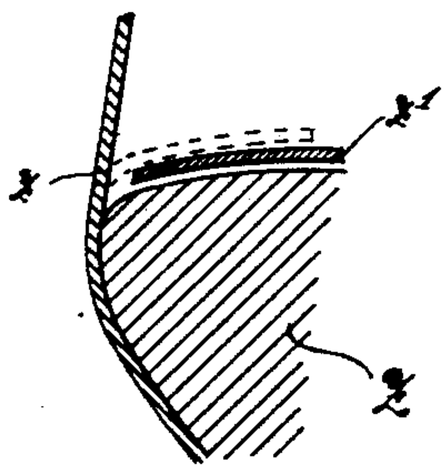


Fig. 9.

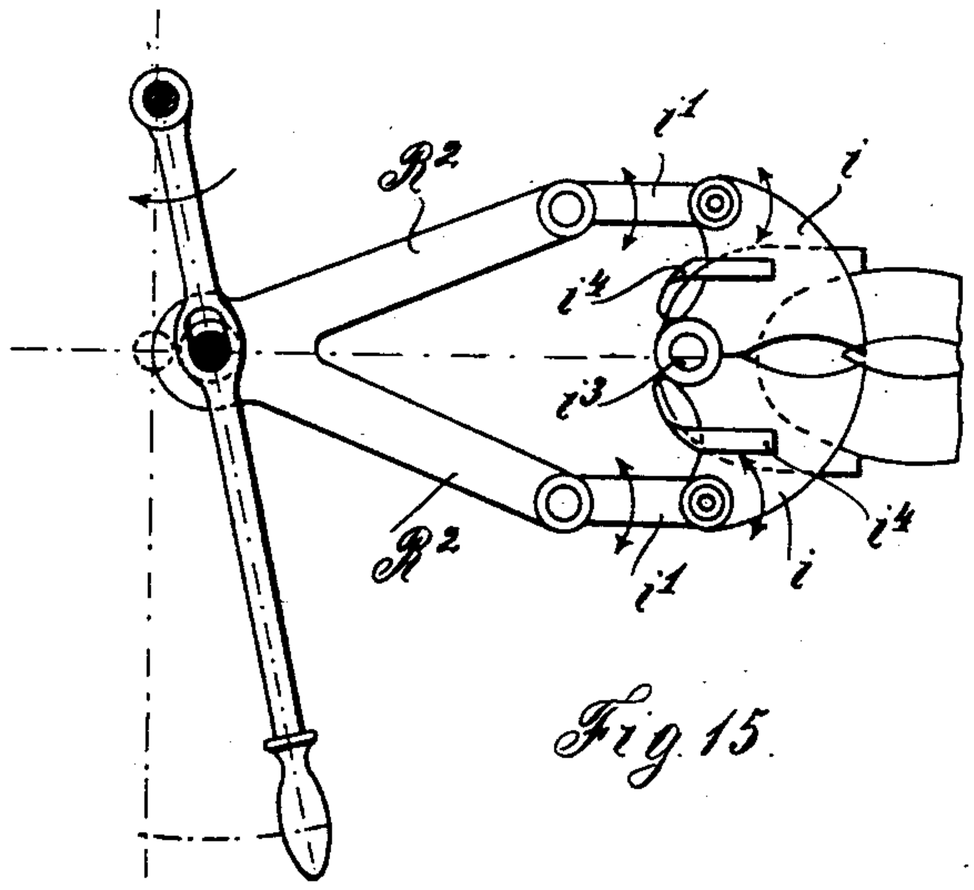


Fig. 15.

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(No Model.) 6 Sheets—Sheet 6.

H. VON KALINOWSKI.

LASTING MACHINE.

No. 593,356. Patented Nov. 9, 1897.

Fig 10

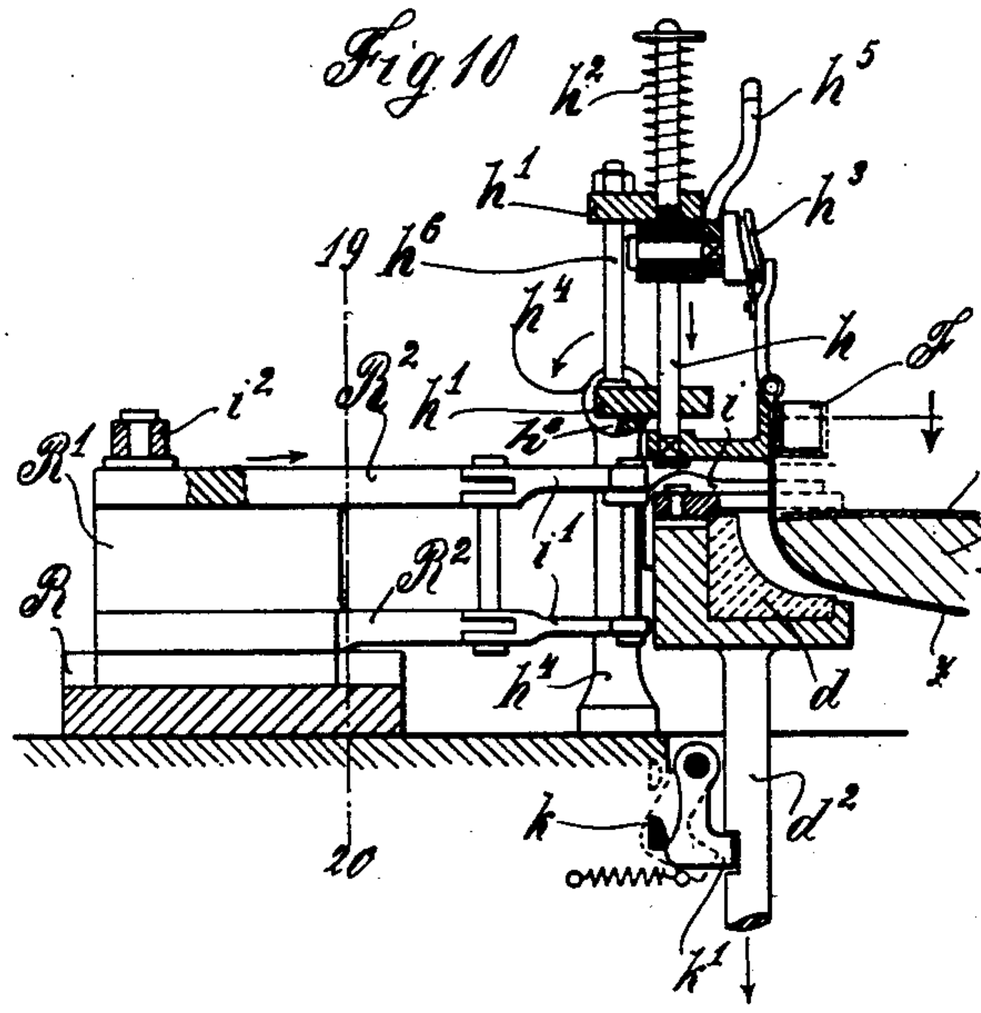


Fig 11

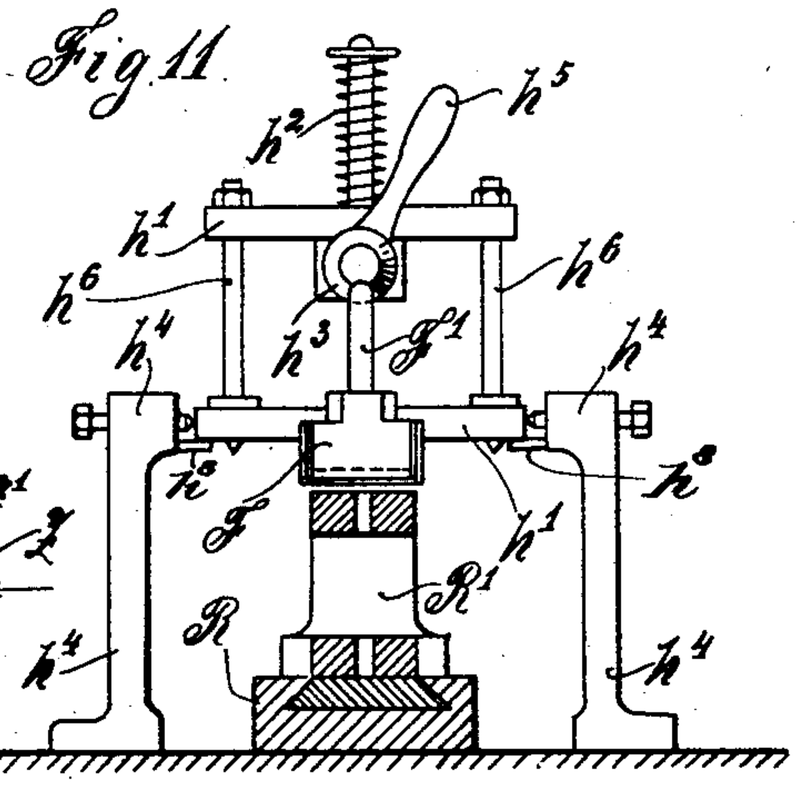


Fig 14

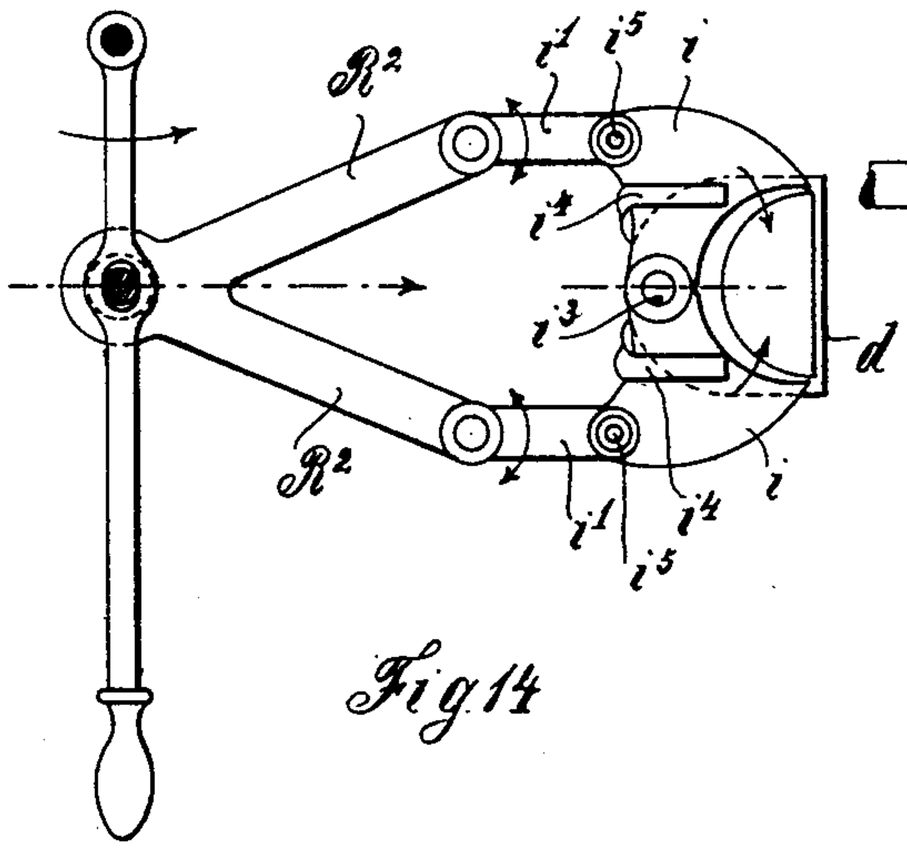


Fig 16.

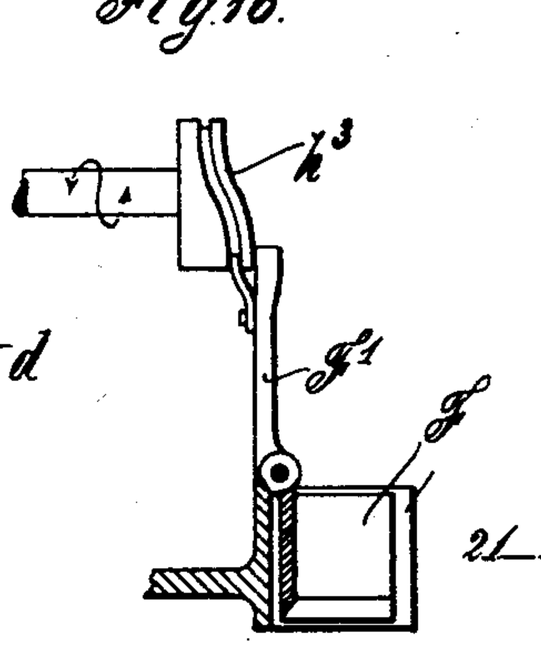


Fig 17

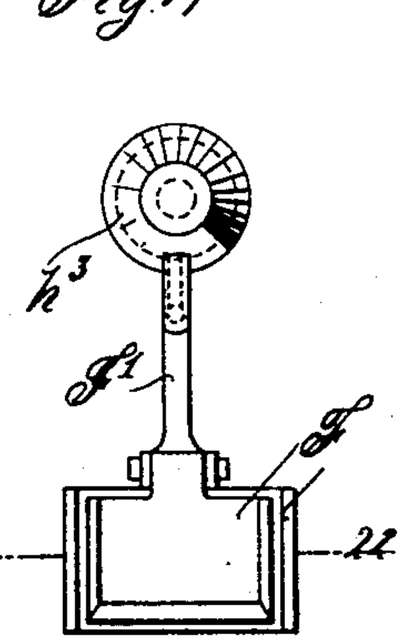
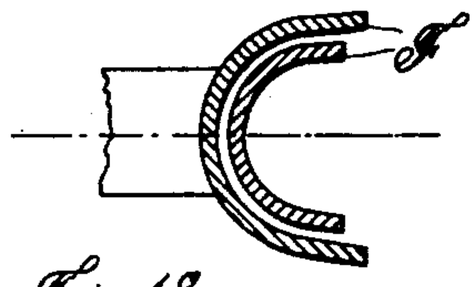


Fig 18.



Witnesses:

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Arthur Walthoer

Inventor:
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by: Peter Dieffes
Attorney.

UNITED STATES PATENT OFFICE.

HERMANN VON KALINOWSKI, OF BERLIN, GERMANY.

LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 593,356, dated November 9, 1897.

Application filed June 5, 1896. Serial No. 594,430. (No model.)

To all whom it may concern:

Be it known that I, HERMANN VON KALINOWSKI, a subject of the King of Prussia, German Emperor, and a resident of Berlin, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Lasting-Machines, of which the following is an exact specification.

The lasting-machines that have become known to me up to now cannot well answer their purpose if the leather employed for the upper is uncommonly thick or strong. This is generally the case with boots intended for military people, and in lasting the uppers for such boots the projecting rims of said uppers are drawn upon and over the lasts by aid of special pincers that are to be operated by hand. The pincers of the lasting-machines do not possess a sufficient movableness to be able to adjust themselves to the different shapes of the various portions of a last, and they are therefore unable to effect a uniform stretching of the leather at every part of the same. This applies also if a last for a boot for the right foot is exchanged for a last for the left foot. The pincers are generally unable to answer automatically to such an exchange, but must by hand be especially adjusted.

The purpose of my invention is to make a lasting-machine able to bend and stretch thick or strong leather as easily and securely as thin or light leather, and I attain that purpose by increasing the movableness of the pincers so much as to permit of their automatic adjustment to any shape of any portion of a last. According to this purpose the supports of the pincers are combined with a sort of universal joint in such a manner that they become partly independent of the mechanisms for moving them. I prefer to connect the several parts of said joints by springs the strength of which corresponds or may be adjusted so as to correspond to the limit of ductility or strength of the respective kind of leather. The movement of the pincers is then stopped and is transferred solely to said springs as soon as the limit of ductility or strength of the leather has been nearly reached. The leather is thus fully prevented from being injured or torn in spite of the compulsory operation of the pincers. Each of the latter is perfectly independent of all the others, and each will thus adjust itself to the last, even if the shape of the same is a somewhat abnormal one.

In order to make my invention more clear, I refer to the accompanying drawings, in which similar letters denote similar parts throughout the different figures, and in which—

Figure 1, Sheet 1, is a side view of my improved lasting-machine, the frame and some parts of the mechanism being in section. Fig. 2, Sheet 2, is a front view of the machine, the frame, as well as some parts of the mechanism, being again in section. Fig. 3, Sheet 3, is a plan, the movable arm A, Figs. 1 and 2, and the parts carried by it being left away. Fig. 4, Sheet 3, is a diagrammatical view of the pincers in their various relative positions with regard to the rim of the upper and the insole. Fig. 5, Sheet 4, is a side view of one set of mechanisms as employed for operating one of the pincers. Fig. 6, Sheet 4, is a similar view, the part b^8 being in another position. Fig. 7, Sheet 4, is an enlarged side view of one of the pincers, together with a portion of the slide carrying the pincers. Fig. 8, Sheet 4, is a front view of the mechanisms shown in Fig. 7 or showing the latter regarded from the left. Fig. 9, Sheet 5, is a portion of a vertical cross-section through the last, the upper and the insole drawn on an enlarged scale. Fig. 10, Sheet 6, is a vertical longitudinal section through a device intended to replace, if desired, the three or more pincers situated opposite to the toe portion of the last. Fig. 11, Sheet 6, is a front view of the parts shown in Fig. 10, the lower portion, however, of said figure being a section in line 19 20 of Fig. 10. Fig. 12, Sheet 5, is a view similar to Fig. 10, the left-hand portion of the latter being, however, left away and the parts of the other portion being in another position. Fig. 13, Sheet 5, is a view similar to Fig. 12, the upper portion being, however, turned to the left or rearward, respectively. Fig. 14, Sheet 6, shows on a greatly-enlarged scale a pair of tongues employed with the device represented in Figs. 10 to 13. Fig. 15, Sheet 5, is a similar view, the parts being in another position. Fig. 16, Sheet 6, shows some parts of Figs. 10 and 12 drawn on an enlarged scale. Fig. 17, Sheet 6, is a front view of the same parts; and Fig. 18, Sheet 6, is a horizontal section taken on line 21 22 of Fig. 17.

The upper part of the frame a is formed into or provided with two parallel pairs of guide-pieces b b, Figs. 1 to 3, that contain or embrace a number of slides B. The frame a carries, further, an upwardly-extending curved arm A, that may be oscillated around a vertical axis. (Compare the position of the arm A shown in dotted lines in Fig. 3.) Said arm extends above the middle of the frame a and is at its upper end provided with a pivot serving as a bearing for a handle a' and an eccentric a^2, Fig. 2. The parts a' a^2 are firmly connected with each other. A vertical rod a^3, guided by a suitable projection of the arm A, is connected with the strap of said eccentric and holds at its lower end an exchangeable press-plate a^5, that is shaped to correspond to the sole portion of the last. The plate a^5, as well as the rod a^3, (or, more precisely, the bolt connecting said rod to the strap of the eccentric a^2,) holds a downwardly-extending arm a^4, Fig. 1, that terminates in a small plate. This plate serves to press upon or to press down a table C, that is provided with a U-shaped slide c^6, arranged below said table. Said slide is vertically guided by a similarly-shaped frame c^7, which in its turn is guided in horizontal direction by ledges secured to the inner ones of the guide-pieces b b aforementioned. The upper ends of the two legs forming the combined guide-frame and slide c^7 are connected by an arm c^8, Fig. 1, extending across the slide c^6. Said arm is provided with a female thread and receives a threaded spindle c^9, that is held and secured against axial displacement by a suitable part of the frame a. The table C may thus be displaced in a horizontal plane parallel to the guide-pieces b b, and may further be vertically displaced by the arm a^4, or, more precisely, by the handle a' and the eccentric a^2. A spring c, held by the frame c^7, tends constantly to bring the table c back into its original position.

The last Z after being furnished with the upper z and with the insole z', Fig. 1, is placed with its toe portion upon a suitably-shaped support d and with its heel portion upon the top of a vertical rod f. The support d is held by a vertical rod d^2, that is guided by an angular frame-piece d^3. Both rods f and d^2 are elastically supported by springs d' f'. The rod f is held and guided by a piece of tube f^4, that is secured to the upper part of a hinge f^5 f^6. A spring f^2, arranged between the horizontally-projecting parts of said hinge, tends constantly to move the rod f in the direction to the rod d^2, and the toe portion of the last is thus always securely held against its support d irrespective of the size or length of the last.

The table C, which may be moved against the heel portion of the last by the spindle c^9, (the latter being furnished with a hand-wheel c',) has a recess c^2, shaped according to said heel portion. The last may thus be fixed in position between the support d and the table C.

The slides B aforementioned carry hinge-like bearings b', Fig. 2, the upper parts of which are formed into guides for slides b^2, Figs. 2 to 8. Said slides b^2 carry the pincers b^3. I call special attention to the fact that the pincers may be of any desired or suitable construction. My improved lasting-machine is not dependent on pincers of the construction shown. Each pair of pincers b^3 is secured to its slide b^2 by the mediation of a joint b^{10}, Fig. 7, allowing of the pincers being turned in a vertical plane standing rectangular to the plane of motion of the guide b'. The pincers may further be moved in a horizontal plane around a screw b^4, Fig. 7, taking into said joint-piece b^{10}. The pincers are thus enabled to assume every possible position, and they may thus be adjusted, or, more precisely, automatically adjust themselves, to any configuration of any part of a last, as has already been mentioned in the preamble.

Each of the slides B holds, further, a downwardly-extending arm b^5, Figs. 2, 5, and 6, that serves as a bearing for double-armed lever B'. The upper end of said lever is connected with the outer end of the slide b^2. Said connection is effected by a pin secured to a downwardly-extending projection of the slide and by a slot provided within the said lever and taking over said pin. A spring g, fixed at one end to the lever B' and at the other end to the slide b^2, tends constantly to draw the pin aforementioned into the lowermost part of the slot of said lever. If, therefore, the lever B' is turned by any suitable means in such a direction that the slide b^2, with its pincers, moves in the direction to the last, (after the projecting rim of the upper has been properly clamped into or by the pincers,) said projecting rim is drawn over the adjacent portion of the last and is placed in its whole extent upon the adjacent portion of the insole lying upon the last. In consequence of the reacting force of the leather or of the rim of the upper, respectively, the pincers are drawn down upon the insole, and the spring g is thus expanded or strained in a corresponding degree. The degree of the stretching of the rim of the upper is, as a matter of course, dependent not only on the extent of the movement of the lever B' or of the slide b^2, respectively, but on the strength of the spring g too, because said spring contributes to the tension of the leather as soon as the pincers are drawn down upon the insole by said leather. The projecting rim of the upper turns, so to say, around a horizontal axis extending parallel to the upper lateral edges of the last, and the edge proper of said projecting rim, when approaching the insole, moves in a sort of curve. The full contact between the projecting rim of the upper and the adjacent portion of the insole is afforded mainly by the dead-play given to the slide b^2 with regard to the lever B'.

The lower ends of the levers B' are angularly bent. Each of the said ends is provided

with an inclined slot that serves for the reception of a horizontal rod D, Figs. 1 to 3. In the form of construction of the machine as shown said rod D is shaped similarly to a horseshoe, in consequence of the position of the slides b^2 relative to each other, and is held by a bracket D′, fixed to the upper end of a threaded spindle e^4. The lower end of said spindle carries a cog-wheel e^3, the nave of which reaches through the base-plate of the frame and is hindered from any axial displacement by means of the bipartite cap D^2. If, therefore, the wheel e^3 is rotated in one or the other direction, the spindle d^4 will be raised or lowered, and the levers B′ will thus be oscillated to one or the other direction, so as to move the pincers b^3 against or from the last. The rotation of the combined nut and cog-wheel e^3 is effected from the hand-wheel E, Fig. 2, by the mediation of the wheels e, e', and e^2, as will be clear from said figure without any further explanation.

Besides the eight or more pincers that are supported by the slides B, Figs. 2 and 3, and that serve for drawing the projecting rim of the upper over the side portion of the last, there are three or more similar pincers situated upon a cross-beam b^6 of the frame, opposite to the toe portion of the last. Said three or more pincers are also attached to slides b^2, and these latter are guided and operated in exactly the same manner as has been described with regard to the slides shown in Fig. 2. The slides B, however, are replaced by a sort of hinges B^2, Fig. 1, that are attached to said cross-beam b^6. Said hinges may turn around vertical bolts, so that the slides b^2, with their pincers b^3, may be adjusted or may adjust themselves according to the special configuration of the toe portion of the last.

To lay the projecting rim of the upper over the heel portion of the last, I make use of a known device, which I describe in this specification only for the sake of completeness. Said device consists of two clutches x, Figs. 3 and 4, that are fulcrumed by means of a common bolt to the table C and are connected by links or rods x' to a lever c^3, Fig. 3, that is likewise fulcrumed to said table. The clutches x are situated near to the recess c^2 of the table C and may be brought over said recess, as well as over the heel portion of the last, after said table has been moved against the last by the means aforedescribed. The table C is first moved against the last, and the clutches x are then moved by the lever c^3 against and upon the projecting rim of the upper, so as to press said rim upon the heel portion of the last, as is clearly represented in Fig. 4.

Concerning the levers B′ and the slides b^2, with their pincers b^3, attention must be called to the fact that (provided no last be placed in the machine or upon the supports d and the rod f, respectively) the extent of movement of the parts b', b^2, and b^3 will be the same, on account of all the levers being operated from one and the same part—*i. e.*, the horseshoe-shaped horizontal rod D. This equal extent of movement of the several pincers is of no use for the practical application of the machine in that the various portions of the last which the projecting rim of the upper is to be drawn over are of very different size—that is to say, the various portions of the last possess or form curves of different radii and different lengths, and the projecting rim of the upper, although having its edge lying originally in a horizontal plane, will take unequally over the various portions of the last, as may, for instance, be seen from Fig. 4.

In order to enable the several pincers to make ways of different lengths or to move one independent of the other, I let the lower arm of each of the levers B′ consist of two parts, the lower part b^8, Figs. 1, 2, 5, and 6, being connected to the upper part by means of a hinge b^7. The lower part b^8 is subjected to the constant action of a flat spring b^9, that is secured to the upper arm of the lever B′. The strength of each of said springs b^9 is such that the projecting rim of the upper may be properly and sufficiently drawn over the last or over the insole, respectively, but cannot be torn if the bracket D′ or the rod D moves still more downward. In this case the part b^8 of the lower arm of the lever B′ is moved separately in a direction opposite to the direction of action of the spring b^9. It is thus clear that each of the pincers will cease moving as soon as the proper straining of the projecting rim of the upper has been reached and will not in any way hinder the other pincers from moving farther until the proper straining of the portions of the leather operated by said respective pincers has been effected.

The three or more pincers for drawing the projecting rim of the upper over the toe portion of the last may well be replaced by the device represented in Figs. 10 to 18, Sheets 5 and 6. (See the short description of the figures.) In said device I make use of a special sort of pincers—that is to say, of but one pincers—which is provided with a pair of curved clamps having a configuration corresponding to that of the toe portion of the last. The respective portion of the projecting rim of the upper is thus spanned as a whole, which does completely away with the arising of folds at said portion. It is, moreover, desirable to span or strain said portion of the projecting rim of the upper perfectly independent of the other portions, and this independent operation may well be attained by the device in question. The latter is constructed as follows: The pincers F, Figs. 10 to 12 and 16 to 18, consist of a stationary clamp that is fixed to the lower end of a vertical rod h, Figs. 10, 12, and 13, and of a movable clamp that is coupled to a cam h^3 by the mediation of an arm F′, Figs. 16 and 17. The middle portion of said rod h is formed into a bearing for the axle of

the cam h^3, and this latter may be turned for one hundred and eighty degrees by means of a lever or handle h^5, Figs. 10 to 12, fixed to said axle. The rod h is held by horizontal plates h', Figs. 10 to 12, and is supported from the upper of said plates by means of a spring h^2. If, therefore, the rim z, Fig. 9, of the upper is clamped in between the clamps of the pincers F, Fig. 10, and if then the last Z, lying within the upper, is pressed against and upon the support d, Figs. 1, 10, and 12, by means of the table C, Fig. 1, and if, further, said last is depressed by the plate a^5, Fig. 1, then the pincers F, together with the rod h, may yield in a downward direction and the position of the parts shown in Fig. 10 will become that shown in Fig. 12. The upper is thus spanned or stretched over the toe portion of the last and is now to be drawn over the adjacent portion of the insole z'. To effect this, I make use of two plates i, Figs. 14 and 15, that are arranged like the blades of a pair of scissors and are fulcrumed to a common bolt i^3. The latter is secured to the support d for the toe portion of the last, and the plates i are thus held by said support. To operate the said plates, I have arranged upon the frame portion b^6 a guide-piece R, Figs. 10 and 11, holding a slide R'. This slide is provided with two pairs of diverging arms R^2, to which are hinged two pairs of links i'. The two links on each side are connected at their free ends by bolts i^5, and the plates i aforementioned are coupled to said bolts by ears i^6, Figs. 12 and 13, in such a manner that the support d, with the plates i, may be depressed without causing a similar depression of the links i'. The plates i may therefore be moved against the projecting rim of the upper or may draw the latter upon the insole, respectively, at every position of the last, as will become perfectly clear by comparing Fig. 10 with Figs. 12 and 13.

The two plates h' aforementioned are formed into a quadrangular frame by means of rods h^6, and said frame is pivotally connected to supports h^4, fixed to a suitable part of the main frame of the machine. The frame $h'\ h^6\ h'\ h^6$ is hindered from turning in the direction to the last by suitably-arranged pins, but may be turned by hand in opposite direction after the projecting rim of the upper has been drawn over the adjacent rim of the insole z' by the plates i. (Compare Fig. 13.) The latter are then in the position shown in Fig. 15, and said projecting rim may now be secured to the insole by tacks, pegs, or any other suitable means.

To hinder the support d from being moved downward by the last Z being pressed against said support, I prefer to provide a hook k', Fig. 10, that can be caused to enter a suitable recess of the rod d^2 by a lever or equivalent part k. If this part is moved from the position shown in dotted lines in Fig. 10 into that shown in full lines, the hook k' takes into the recess of the rod d^2 and causes the latter to remain stationary during the time of stretching the leather by the movement of the last Z in the direction to the slide R'.

Having thus fully described the nature of my invention, what I desire to secure by Letters Patent of the United States is—

1. In a lasting-machine having its pincers secured to slides adapted to be displaced, as well as to swing, in the direction to the last, the combination with said slides, of an equally great number of levers connected each with lost motion to one of said slides; springs tending to keep each lever in gear with its respective slide, and means for operating said levers all at a time, for the purpose as described.

2. In a lasting-machine having its pincers secured to slides adapted to be displaced, as well as to swing, in the direction to the last, the combination with said slides, of an equally great number of levers connected each to one of said slides; means for operating said levers all at a time, and springs adapted to coöperate with the levers in transmitting the driving power to the slides, for the purpose as described.

3. In a lasting-machine having its pincers secured to slides adapted to be displaced, as well as to swing, in the direction to the last, the combination with said slides, of an equally great number of double-armed levers connected each to one of said slides; one arm of each lever consisting of two parts hinged together; a spring adapted to transmit the movements of one part to the other part of the lever, and means for operating said levers all at a time, for the purpose as described.

4. In a lasting-machine having its pincers secured to slides adapted to be displaced, as well as to swing, in the direction to the last, the combination with said slides, of an equally great number of levers connected each with dead-play to one of said slides, and having each one arm composed of two parts hinged together; springs secured each to one of said parts, and adapted to transmit the movements of the latter to the other parts of said levers; other springs tending to keep each lever in gear with its respective slide, and means for operating the said levers all at a time, for the purpose as described.

5. In a lasting-machine having its side pincers secured to slides adapted to be displaced, as well as to swing, in the direction to the last, the combination with said slides, of an equally great number of levers connected each to one of said slides, and means for operating said levers all at a time; a special toe-pincers consisting of two vertical jaws arranged one in front of the other, and being each curved according to the configuration of the toe part of the last; the jaw situated nearest to the last being hinged to the other jaw, and both jaws being yieldable in a vertical direction; means for pressing the hinged jaw against the other one, for the purpose as described.

6. In a lasting-machine having its side pincers secured to slides adapted to be displaced, as well as to swing, in the direction to the last, the combination with said slides, of an equally great number of levers connected each to one of said slides, and means for operating said levers all at a time; a special toe-pincers consisting of two vertical jaws arranged one in front of the other, and being each curved according to the configuration of the toe part of the last; the jaw situated nearest to the last being hinged to the other jaw, and the latter being secured to an automatically-displaceable vertical rod; a spring tending to draw said rod upward; a cam held by the said rod, and a lever secured to the hinged jaw, and gearing with said eccentric, for the purpose as described.

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

HERMANN VON KALINOWSKI.

Witnesses:
W. HAUPT,
HENRY HARPER.