

(No Model.)

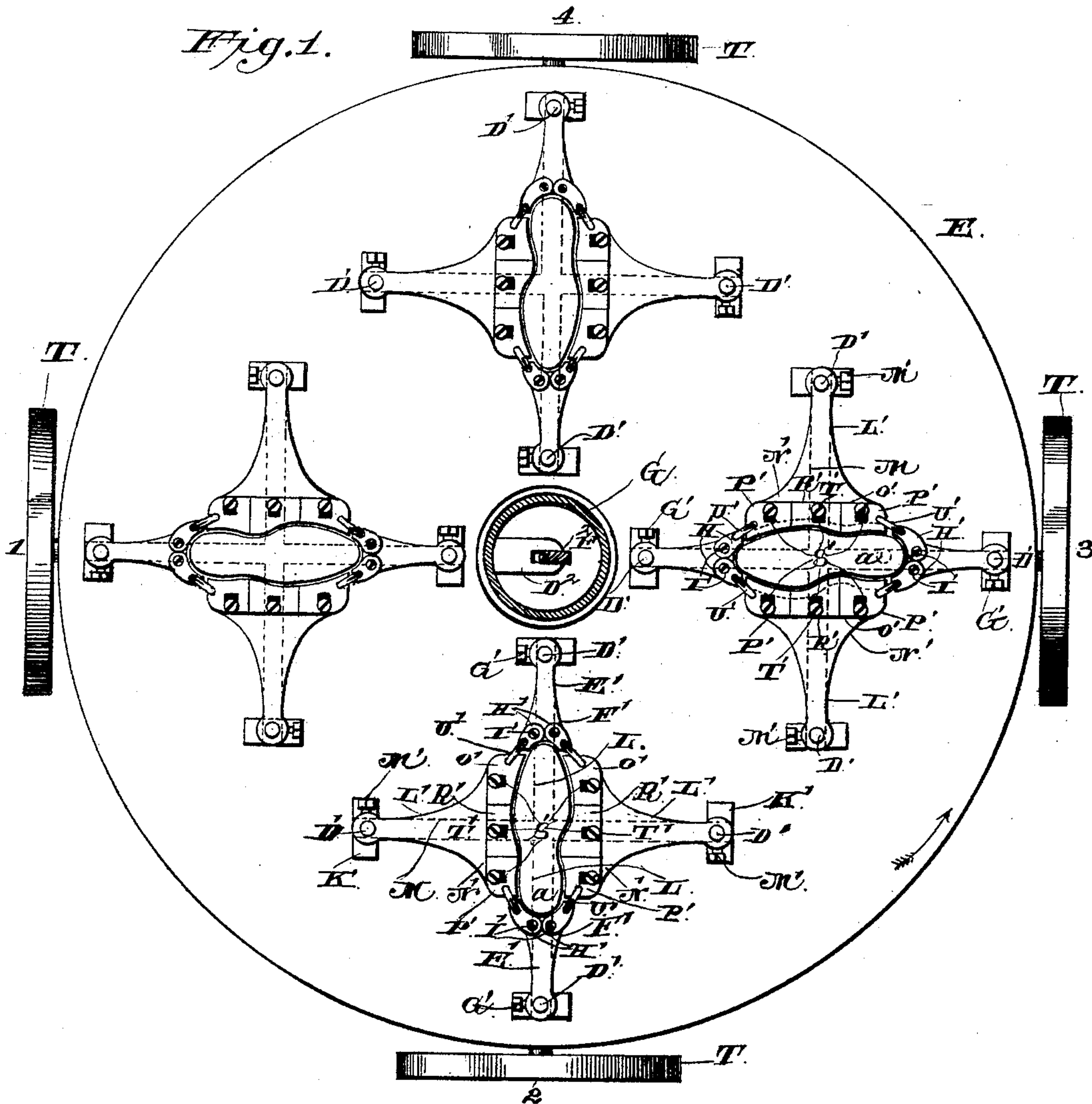
5 Sheets—Sheet 1.

S. B. ELLITHORP.

LASTING MACHINE.

No. 435,888.

Patented Sept. 2, 1890.



Witnesses

Witnesses
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E. Siggers

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Solomon B. Ellithorp

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(No Model.)

5 Sheets—Sheet 2.

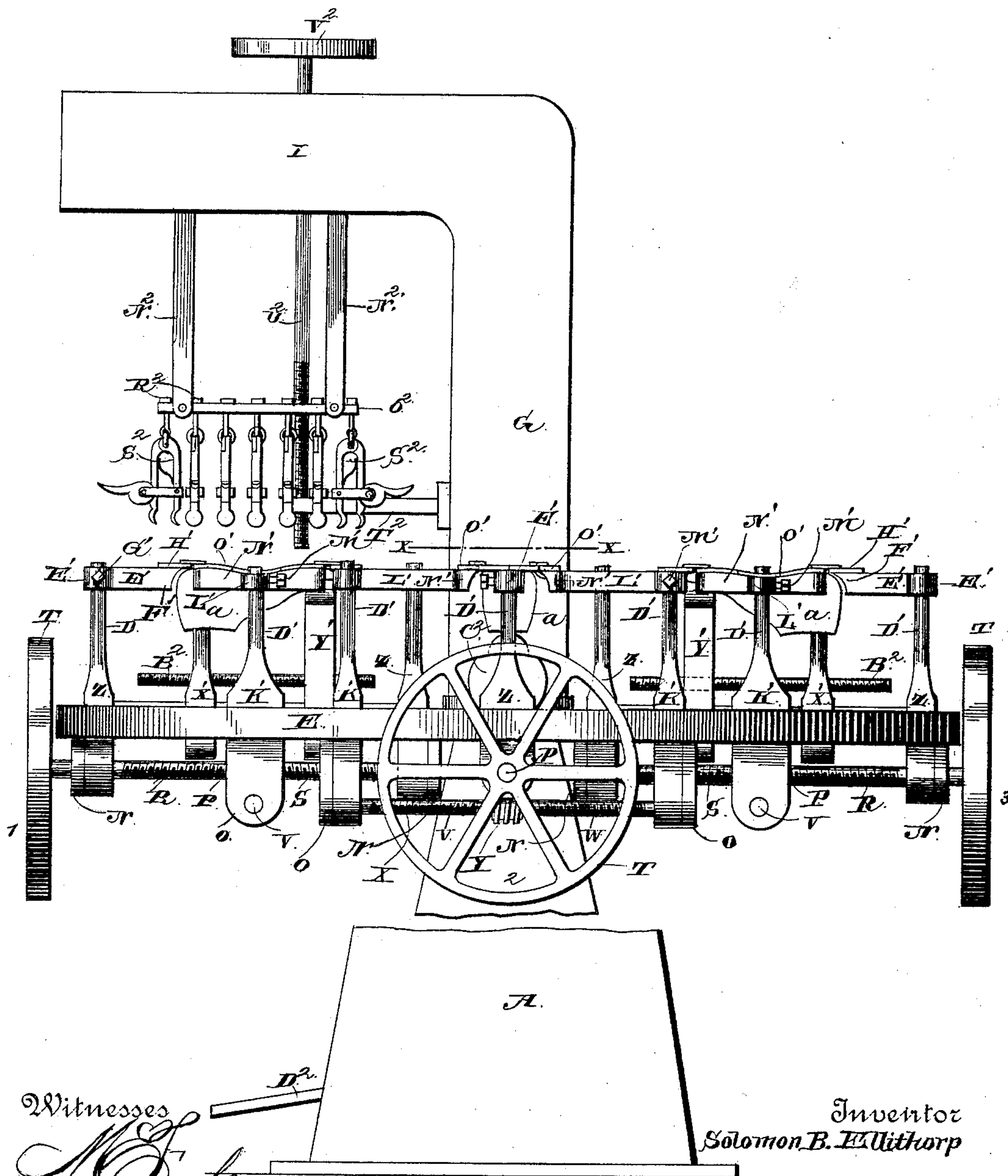
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Fig. 2.



Witnesses

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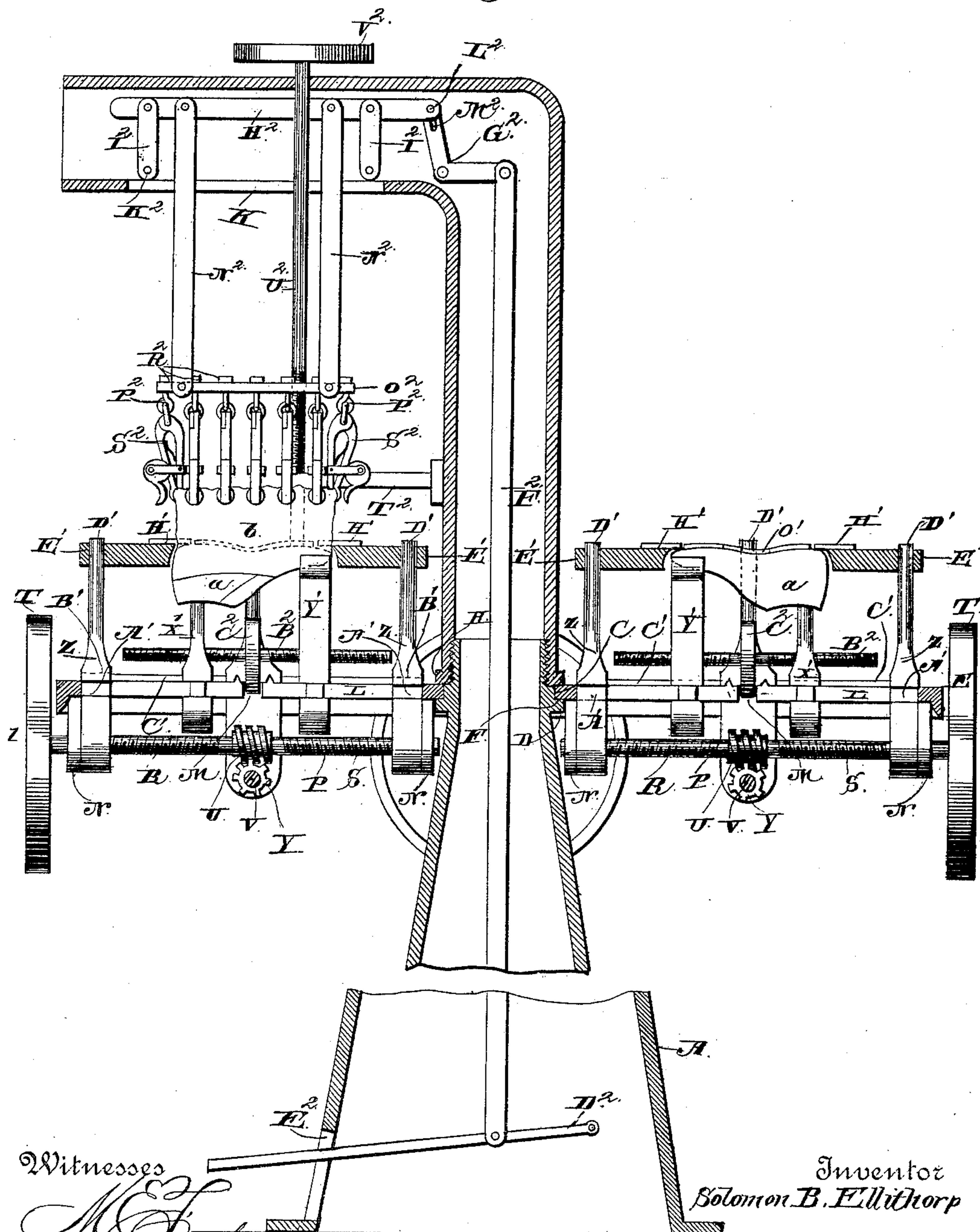
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Fig. 3.



Witnesses

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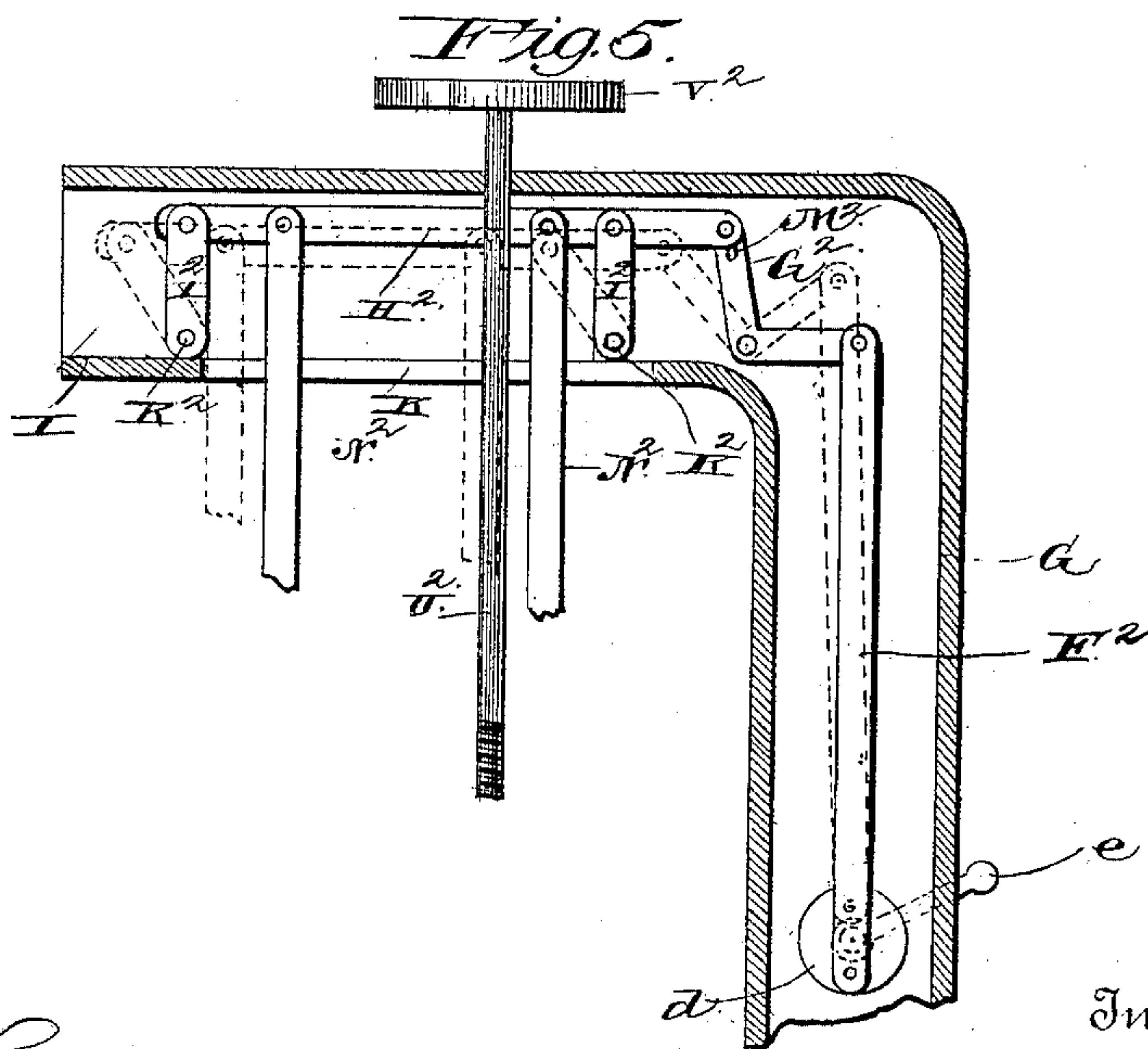
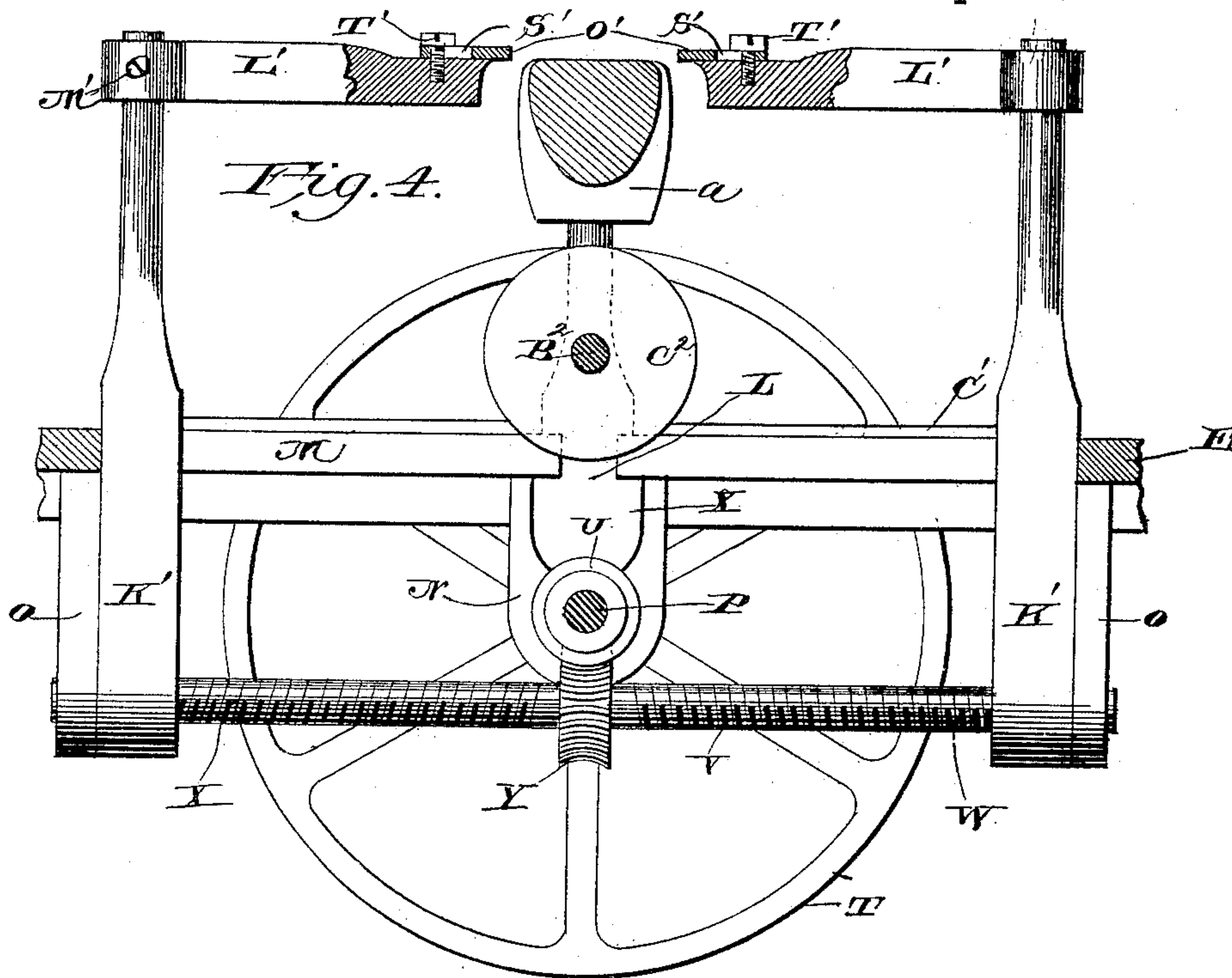
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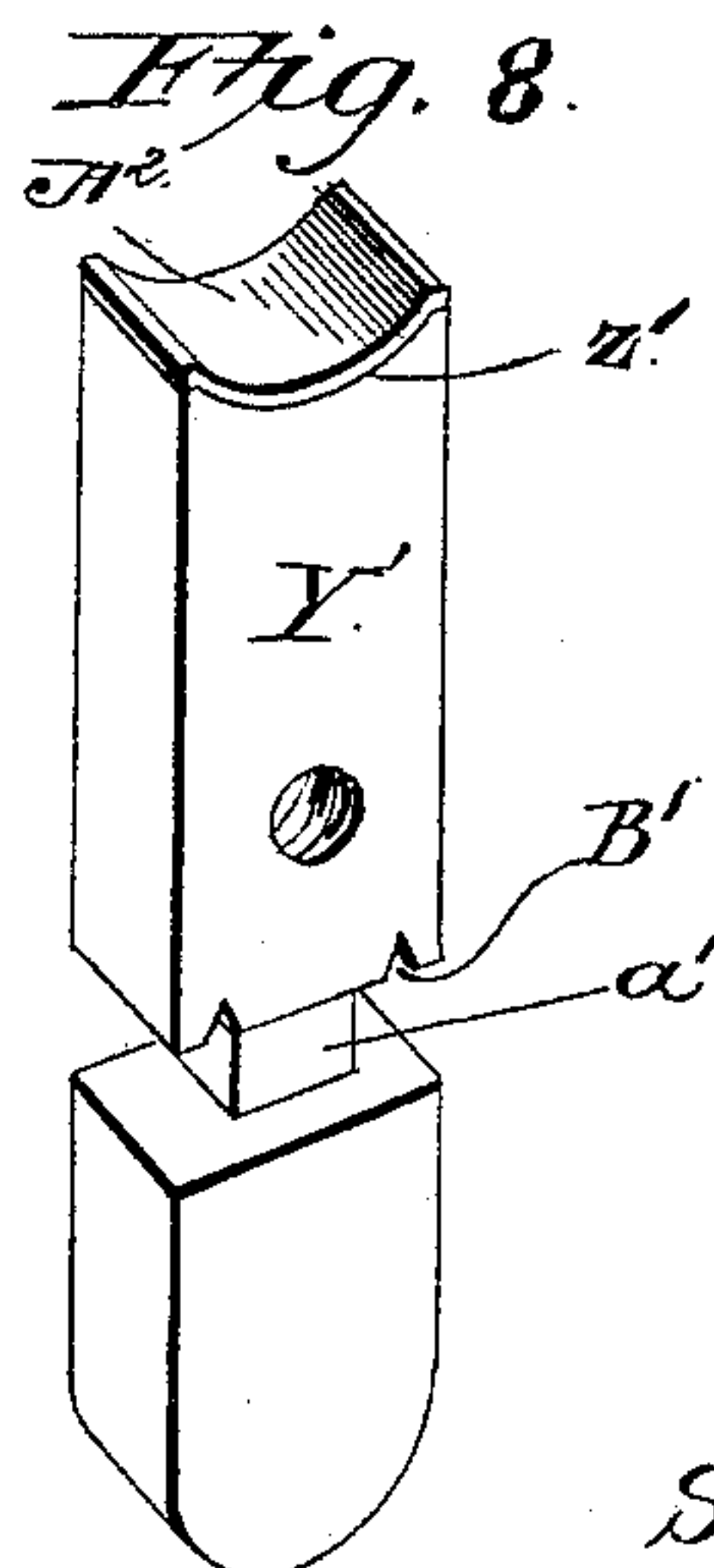
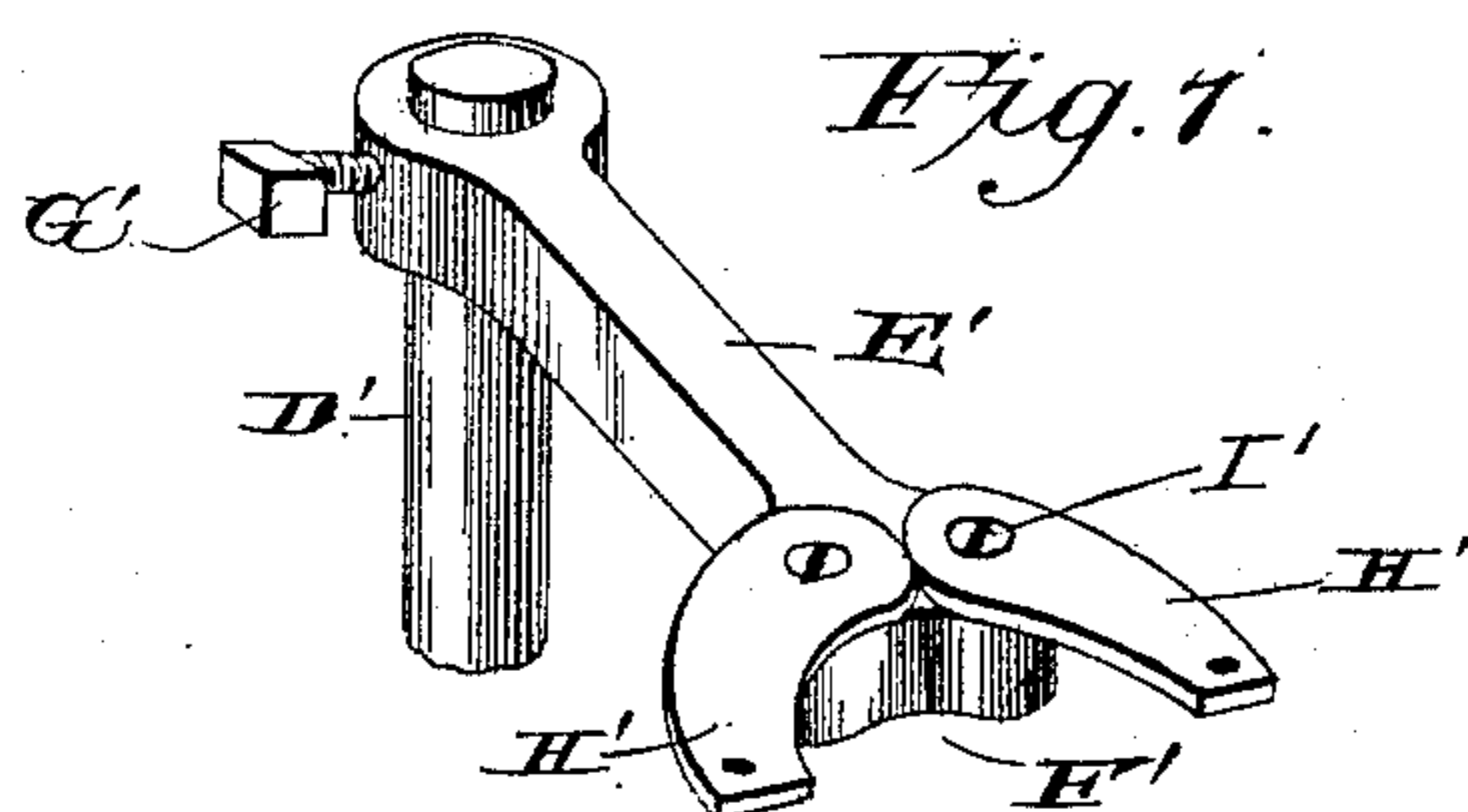
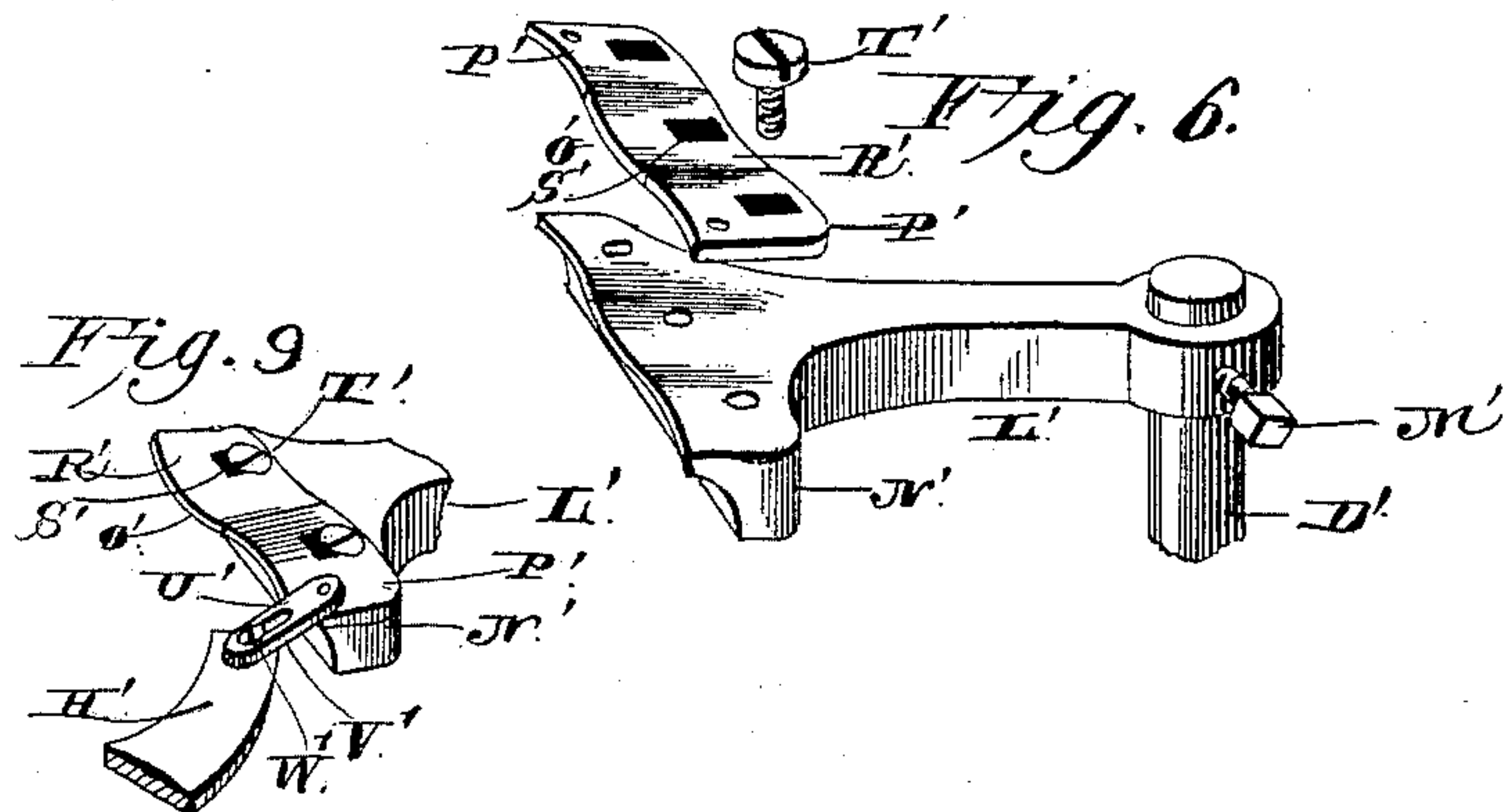
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S. B. ELLITHORP.

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UNITED STATES PATENT OFFICE.

SOLOMON B. ELLITHORP, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO THE ELLITHORP MANUFACTURING COMPANY, OF PROVIDENCE, RHODE ISLAND.

LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 435,888, dated September 2, 1890.

Application filed September 11, 1888. Serial No. 285,128. (No model.)

To all whom it may concern:

Be it known that I, SOLOMON B. ELLITHORP, a citizen of the United States, residing at Washington, District of Columbia, have invented a new and useful Improvement in Lasting-Machines, of which the following is a specification.

My invention relates to an improvement in lasting-machines; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

The object of my invention is to provide a cheap, simple, and compact machine by means of which shoes may be lasted with great rapidity and accuracy.

In the accompanying drawings, Figure is partly a top plan view and partly a sectional view on the line xx of Fig. 2. Fig. 2 is a side elevation of my improved lasting-machine. Fig. 3 is a vertical sectional view of the same. Fig. 4 is a detail vertical sectional view. Fig. 5 is a detail vertical sectional view illustrating a modified form of my invention. Fig. 6 is a detail perspective view of one of the side gatherers and the supporting-arm therefor. Fig. 7 is a similar view of one pair of toe or heel gatherers and their supporting-arm. Fig. 8 is a similar view of one of the last-supports. Fig. 9 is a detail perspective view of one section of one of the side gatherers, one of the toe or heel gatherers, and the adjusting-link connecting the same.

A represents a tapered standard or pedestal, which is provided at its lower end with a base-plate B, that is adapted to be screwed or bolted to the floor. The upper end of the pedestal is screw-threaded, has an annular groove C, and below the said groove is a flange D.

E represents a circular table, which is provided with a central circular opening F, of just sufficient diameter to clear the upper end of the pedestal and enable the table to bear upon and be supported by the flange D, whereby the table is pivoted on the pedestal and is adapted to revolve around the same.

G represents a vertical tubular standard, which has its lower end screwed to the upper

end of the pedestal and provided with a flange H, that bears on the upper side of the table and retains the latter in the groove C. The upper end of the said standard has a horizontal tubular arm I, which projects from one side thereof, and in the lower side of said arm is a slot K of suitable length.

The table E is provided with radial vertical slots L of suitable length, which are arranged at ninety degrees apart. Intersecting the center of each slot L is a slot M, which is arranged at right angles thereto. From the table, at the ends of each slot L, depends a pair of ears or brackets N, and depending from the ends of the slots M are similar brackets or ears O.

P represents the shafts, which are journaled in the ears or brackets N, are provided with right and left hand screws R S, and each of the said shafts has at its outer end a hand-wheel T, and is provided at its center with a worm U.

V represents shafts, which are journaled in the ears or brackets O. Each shaft V has right and left hand screw-threads W X at opposite ends, and is provided at its center with a worm-wheel Y, which engages the worm U of its companion shaft.

Z represents pairs of standards, which work in the slots L, one pair of said standards being in each slot, and have near their lower ends threaded openings, which are engaged by the right and left hand screw-threads of the shaft P. Each standard Z has a reduced neck portion A', which fits in the slot L, and has a pair of inverted-V-shaped transverse grooves B', which engage similarly-shaped guide-flanges C', with which the table is provided, and which are arranged on opposite sides of and parallel with the slots L. The upper ends of the standards Z are reduced to form vertical spindles D'.

E' represents arms, which have openings in their outer ends to receive the spindles D', and have their inner ends enlarged to form heads F'. Set-screws G' engage threaded openings in the outer ends of said arms and are adapted to impinge on the spindles D' in order to clamp the arms E' to the standards at any desired vertical adjustment.

H' represents curved toe and heel gatherers of the shape shown in Fig. 8, or of any other suitable shape, and one pair of said gatherers is pivoted on the head F' of each arm E' by a pair of screws I'.

K' represents standards, which are arranged in the slots M, and are similar in construction to the standard B', and have threaded openings near their lower ends, which are engaged by the right and left hand screw-threads of the shafts V, whereby the said standards may be moved toward or from each other by rotating said shafts V. On the spindles at the upper ends of the standards K' are secured horizontal inwardly-extending arms L', which are similar to the arms E', and are provided with set-screws M', by means of which they may be adjusted vertically on their supporting-standards. The inner ends of the arms L' are widened to form heads N', which correspond in shape with the sides of the last and have their upper sides waved or curved, as shown in Fig. 6. Each head is further provided with vertical threaded openings near its ends and at its center.

O' represents side gathering-plates, which are adapted to fit snugly on the upper sides of the heads N', and are each formed of two end sections P' and a central section R'. The said sections are each provided with an opening S', and set-screws T' pass through the said openings and engage threaded openings in the heads N', and thereby secure the gathering-plates on the said heads and adapt said gathering-plates to be adjusted laterally and longitudinally, and thereby enable them to be contracted or extended to conform to a last of any size, thus rendering the gathering-plates serviceable with lasts of varying sizes. Each section P' has its outer corner pivotally connected to a link U', the latter being provided with a longitudinal slot V'. The said slotted portion of the link bears upon the outer end of the adjacent toe or heel gatherer, and is secured thereto by means of a set-screw W', which extends through the slot and engages a threaded opening in said toe or heel gatherer. By this means the toe and heel gatherers are connected to the side gatherers, so that the entire set of gatherers is adapted to work in unison and to be forced against all sides of the last with equal pressure, when the standards K' and Z are caused to approach a common center by rotating one of the hand-wheels T.

It will be understood from the foregoing that when one of said hand-wheels is rotated it turns the shaft P and causes the standards Z to approach or recede from each other, according to the direction in which the wheel is turned, and that the worm-gear which connects each shaft P to its companion shaft V causes the screw-threads of said shaft V to move the standards K' simultaneously toward or from each other.

In each slot L is fitted a heel-support X' and a toe-support Y' for the last. Said heel

and toe supports are similar in construction to the standards Z and K'. Each heel-support has a spindle at its upper end adapted to fit in a socket in the heel of the last a, and each toe-support has its upper end concaved, as at Z', and covered with a cushion A², of soft leather, felt, or other suitable material.

B² represents two right and left hand threaded shafts, which engage threaded openings in the last-supports and connect the same together in pairs, as shown. At the center of each shaft B² is a hand-wheel C², by means of which the said shaft may be turned in order to adjust the toe and heel supports toward or from each other, according to the length of the last which they are designed to support.

From the foregoing description and by reference to the accompanying drawings it will be understood that the circular revoluble table is provided with four sets of last-supports and gathering-standards, and that each set of said gathering-standards is provided with geared right and left hand threaded shafts and a hand-wheel, whereby they may be operated independently of the others, thus in effect providing the table with four complete and independent mechanisms for supporting the lasts and applying the gatherers thereto.

I will now proceed to describe the mechanism by means of which the upper is stretched on the last.

Near the base of the pedestal is fulcrumed a pedal-lever D², one end of which projects through a vertical opening E² in one side of the pedestal.

F² represents a vertically-movable rod, which extends through the pedestal and through the vertical standard G, and has its lower end pivotally connected to the pedal-lever. A bell-crank lever G² is fulcrumed in the hollow arm I at its junction with the standard G, and one arm of the said bell-crank lever is pivotally connected to the upper end of the rod F².

H² represents a horizontal bar, which is arranged in the hollow arm I, and is supported by a pair of links I². The upper ends of said links are pivoted to said bar, and the lower ends of said links are pivoted on pins or bolts K², that extend transversely across the lower side of the arm I. The inner end of the bar H² is pivoted to the bell-crank lever G² by a bolt or pin L², which engages a slot M² in said bell-crank lever.

N² represents two pairs of link-rods, which have their upper ends pivotally connected on opposite sides of the bar H², and have their lower ends pivoted to opposite sides of a horizontally-disposed templet O² near the ends thereof, as shown. The said templet is provided with radial slots, in which are inserted depending eyebolts P². Adjusting-nuts R² are screwed to the upper ends of said bolts and bear upon the upper side of the templet.

S² represents a series of clutches of suit-

able construction, which are suspended from the bolts P^2 , and are adapted to grip the edges of the shoe-upper b , as shown in Fig. 3. The said clutches form the subject-matter of another pending application for Letters Patent of the United States, (Serial No. 285,127,) filed by me this day, and therefore do not need to be more particularly described in this specification.

10 T^2 represents a horizontal arm, which is secured to the standard G and projects from one side thereof, and is arranged directly below and in line with the center of the horizontal arm I . A shaft U^2 has its upper end 15 guided in an opening in the upper side of the arm I and has its lower end threaded and passed through a threaded opening in the arm T^2 . To the upper end of said shaft is secured a hand-wheel V^2 , by means of which 20 it may be rotated, and thereby caused to move upward or to descend. The function of this screw-shaft is to bear upon the ball of the last, and thereby maintain the same firmly in position on the last-supports, as shown in Fig. 3.

25 The operation of my invention is as follows: When the upper has been placed on the last, the latter is arranged on the last-supports, the operator causes the pedal-lever to be raised and elevate the rod F^2 , and thereby 30 cause the bell-crank lever to move the bar H^2 outward. The links I^2 are thereby caused to turn to an inclined position, and consequently cause the bar H^2 to be lowered, and the link-rods N^2 suspended from the said bar 35 are thereby caused to lower the templet sufficiently to enable the clutches to be engaged or attached to the edges of the upper. The screw-shaft U^2 is then turned down and caused to bear lightly on the ball of the last to prevent the latter from rising from its supports, 40 and the operator then depresses the pedal-lever and causes the rod F^2 to descend and the bell-crank lever G^2 to partly rotate and draw the bar H^2 inward. The links I^2 as 45 they approach a vertical position elevate the bar H^2 , and consequently cause the templet to move upward, with the result that the clutches attached to the upper stretch the latter smoothly and firmly on the last. The operator 50 then before releasing the pedal turns the hand-wheel T and causes the worm-gears and right and left hand threaded shafts to move the standards Z and K' inward toward a common center, and thereby compress the side 55 and toe and heel gathering plates over the bottom of the last and gather the leather of the upper smoothly and firmly thereon and over the insole, which has been previously placed on the last. The pedal is then released to relax the tension on the templet, the clutches are disengaged from the upper, the screw U^2 released from the last, and the table moved to the right to a quarter-revolution and caused to carry the lasted shoe to 60 another operator, who tacks the same. After this the table is again moved through a quar-

ter-revolution to another operative, who takes off the lasted shoe from the machine.

By reference to Fig. 1 the positions of the persons who operate the machine will be readily understood. The person stationed at the point 1 applies the last to the machine. The person stationed at the point 2 lasts the shoe by applying the gatherers and operating the templet, as before described. The person stationed at the point 3 tacks the upper to the insole of the lasted shoe, and the person stationed at the point 4 removes the shoe from the machine. Thus four shoes are continuously operated upon when the machine is 80 running at its full capacity, and hence the machine is adapted to last a great number of shoes in a comparatively short time.

It will be understood that skilled workmen need not be employed in lasting shoes when 85 this machine is used, as the work may be performed very readily by boys or girls.

In Fig. 5 I illustrate a modified form of my invention, in which the pedal-lever is dispensed with and a crank-shaft d is journaled 90 in the standard G and connected to the rod F^2 . This crank-shaft has a crank-handle e , by means of which it may be very readily operated.

Having thus described my invention, I 95 claim—

1. In a lasting-machine, the combination of the tubular standard having a laterally-extending hollow arm provided with a slot in its under side, the revoluble table mounted 100 upon said standard and having independent sets of gathering mechanisms, the templet suspended from a vertically-adjustable bar mounted upon links within the hollow arm extending from the tubular standard, an operating-rod extending vertically through the latter, a bell-crank lever connecting said operating-rod with the vertically-adjustable bar carrying the templet, and a treadle connected with the lower end of the operating-rod, substantially as set forth. 105

2. The combination of the tubular standard having the laterally-extending hollow arm, the vertically-adjustable bar mounted upon links within the latter, the templet suspended from said vertically-adjustable bar, operating mechanism to adjust the latter, the table mounted revolubly upon the standard and having the series of intersecting slots, the standards mounted slidingly in the said slots 115 and carrying independent sets of gathering mechanisms, and operating mechanism, substantially as set forth.

3. The combination of the tubular standard having the laterally-extending hollow arm, the vertically-adjustable bar mounted upon links within the latter, the templet suspended from said bar, the table mounted revolubly upon the standard and carrying the independent sets of gathering mechanisms and the last-supports, a screw-threaded rod extending vertically through the hollow arm extending from 125 130

the standard and through a female threaded perforation in a bracket extending from said standard and having a hand-wheel at its upper end, and mechanism for adjusting the bar carrying the templet, substantially as set forth.

4. The combination of the table having the slots and the V-shaped flanges C' on the sides of the slots, with the standards arranged in the slots and movable therein, said standards having the V-shaped grooves B' engaged by the guide, substantially as described.

5. In a lasting-machine, the combination, with the table having the intersecting slots, of the two pairs of standards guided therein, the crossed right and left hand screws engaging the standards and geared together to move said standards simultaneously toward or from each other, the arms secured to the said standards, the toe, heel, and side gatherers secured to the said arms, and the links connecting said heel and toe gatherers to the side gatherers, whereby said toe, heel, and side gatherers may be simultaneously applied to or released from the last, substantially as set forth.

6. The combination, with the two pairs of standards or supports or mechanism to move the same simultaneously toward or from each other, of the side gatherers secured to the supports and arranged opposite each other,

the pivoted toe and heel gatherers attached to the intermediate support, and the links connecting said toe and heel gatherers to the proximate corner of the side gatherer, substantially as described.

7. The combination, with the movable support or standard, of the adjustable side gatherers, the pivoted toe and heel gatherers, and the slotted links connecting the latter to the side gatherers, substantially as described.

8. The combination, in a lasting-machine, of the pedestal or support having the arm I, the templet suspended from said arm, mechanism to raise and lower the templet, the screw U², the revoluble table journaled centrally to the pedestal or support, and the independent sets of last-supports and gathering mechanisms with which the table is provided, whereby said sets of mechanisms may be successively arranged under the templet by revolving the table, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

SOLOMON B. ELIATHORP.

Witnesses:

J. H. SIGGERS,

CHARLES W. HANDY.