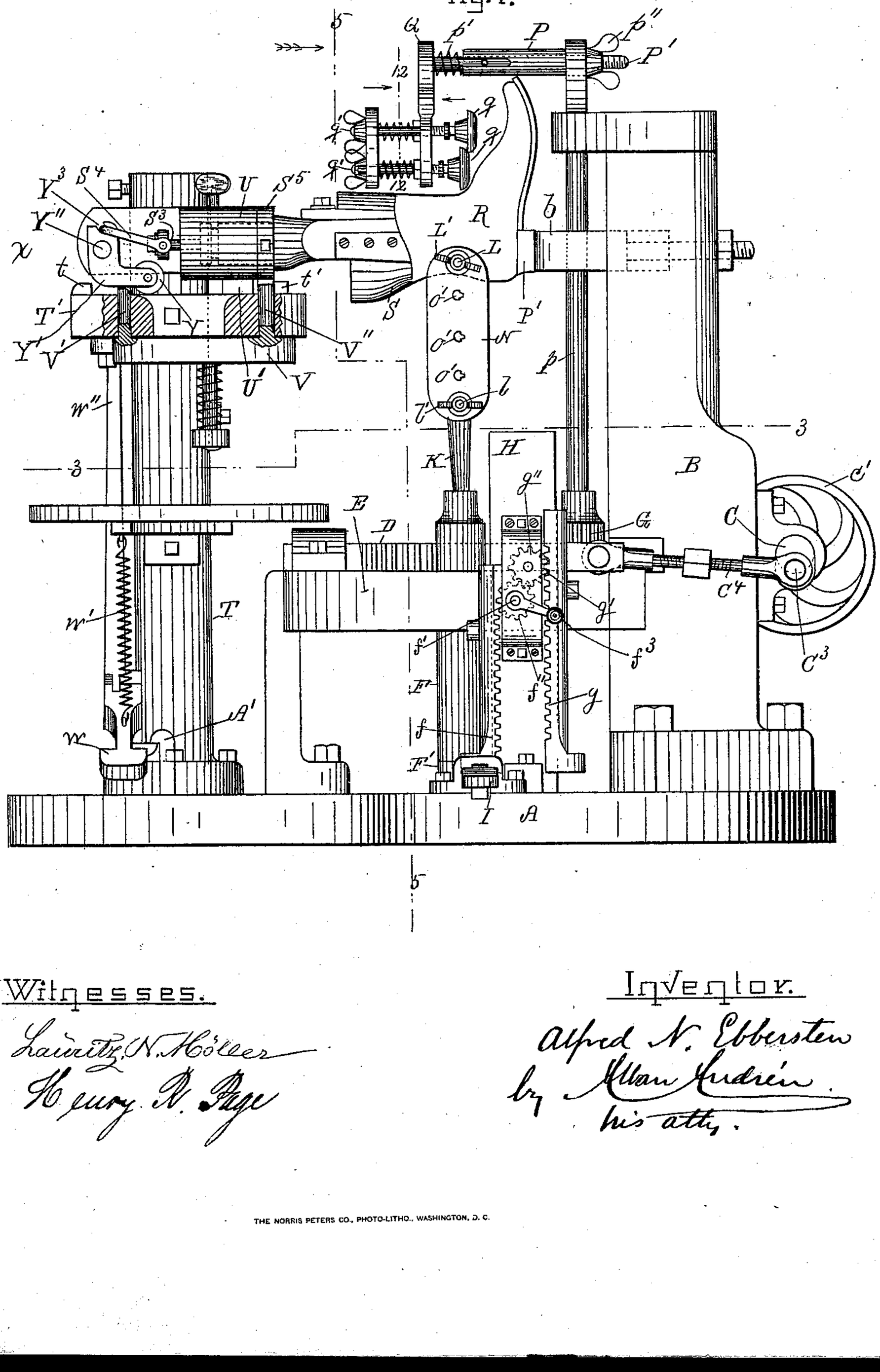
(No Model.) 5 Sheets—Sheet 1.

A. N. EBBERSTEN.

TREEING MACHINE FOR BOOTS OR SHOES.

No. 599,773. Patented Mar. 1, 1898.

Fig. 1.



Witnesses.

Laurits N. Koller

Henry A. Page

Inventor.

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his atty.

(No Model.)

5 Sheets—Sheet 2.

A. N. EBBERSTEN.

TREEING MACHINE FOR BOOTS OR SHOES.

No. 599,773. Patented Mar. 1, 1898.

Fig. 2.

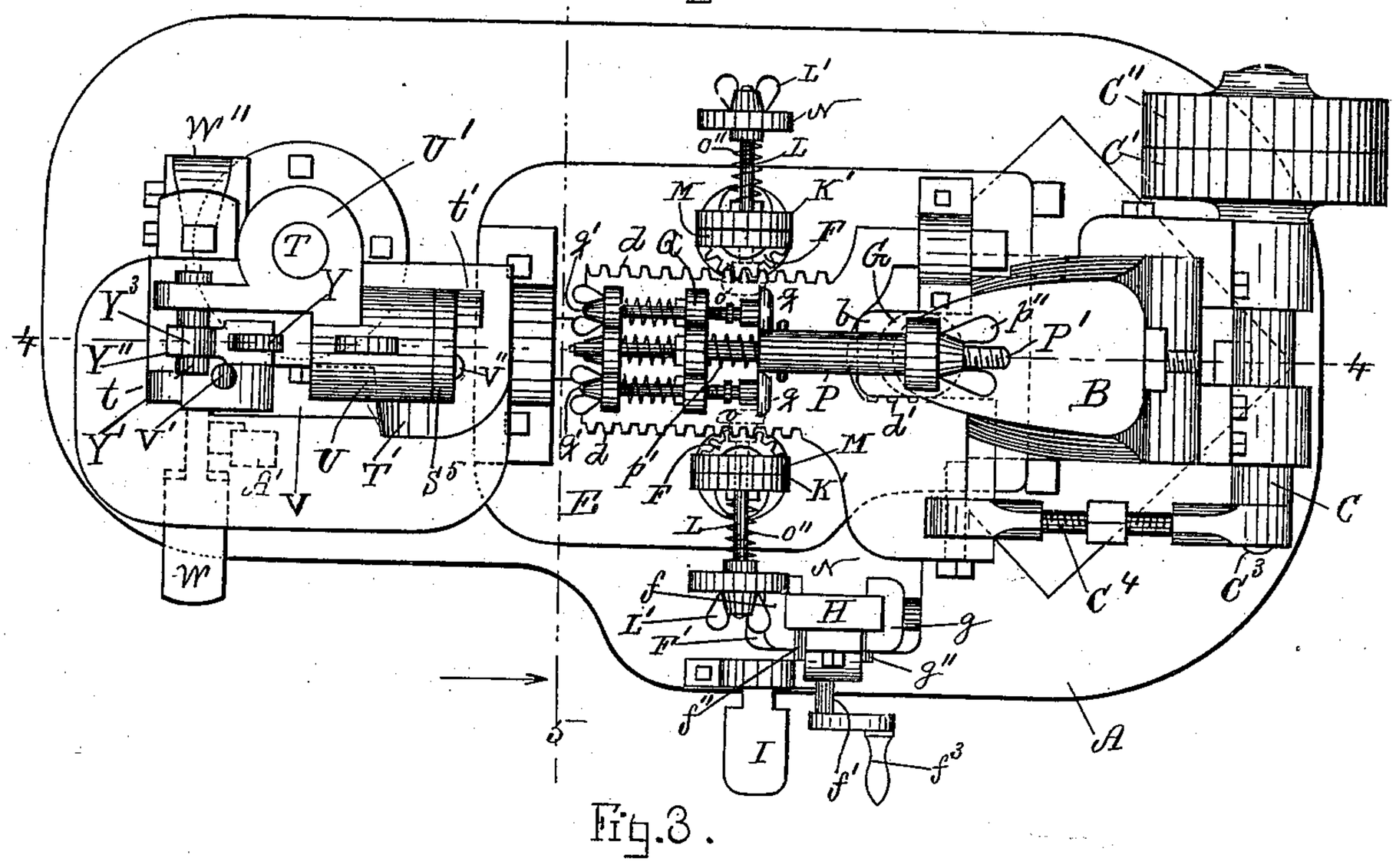
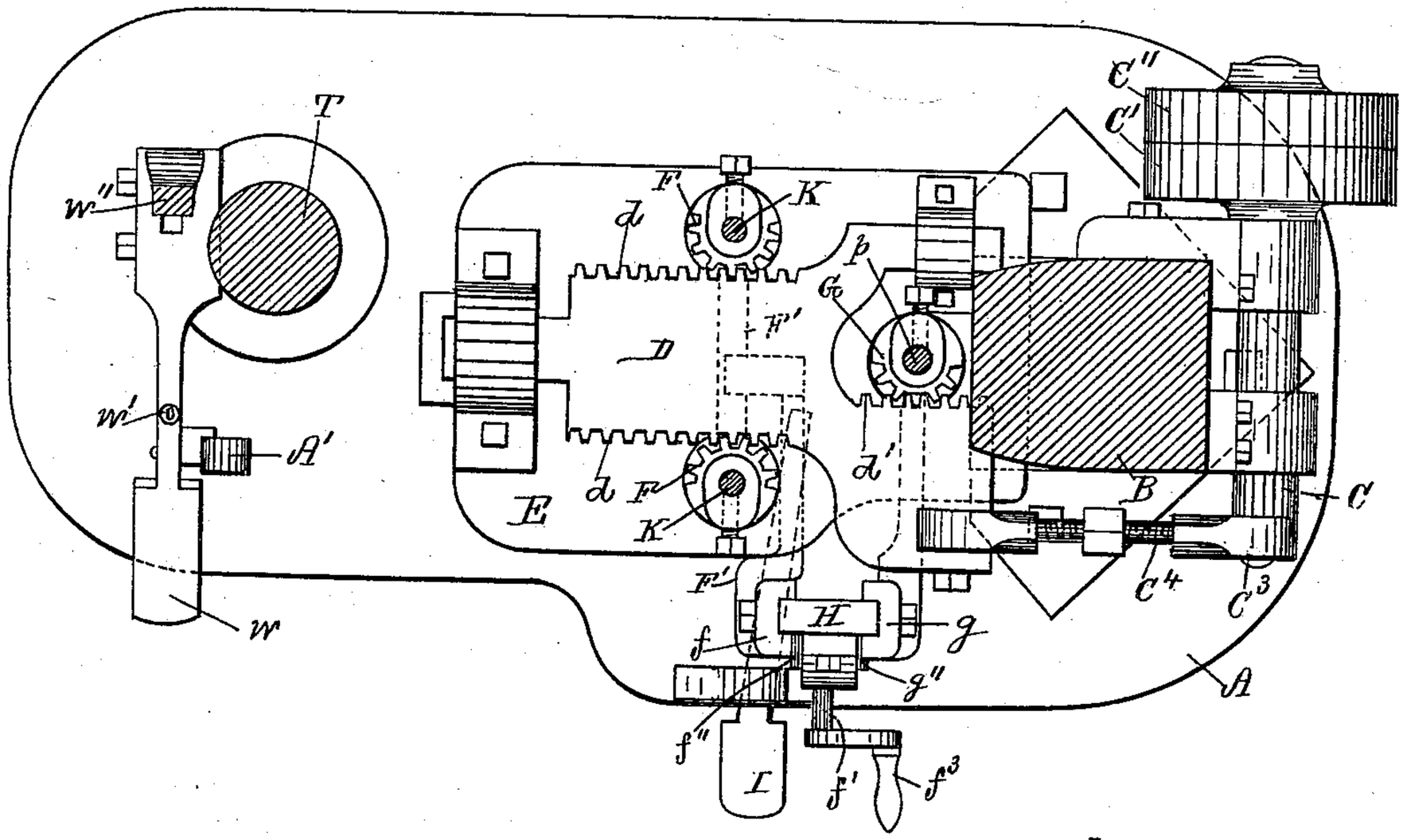


Fig. 3.



Witnesses.

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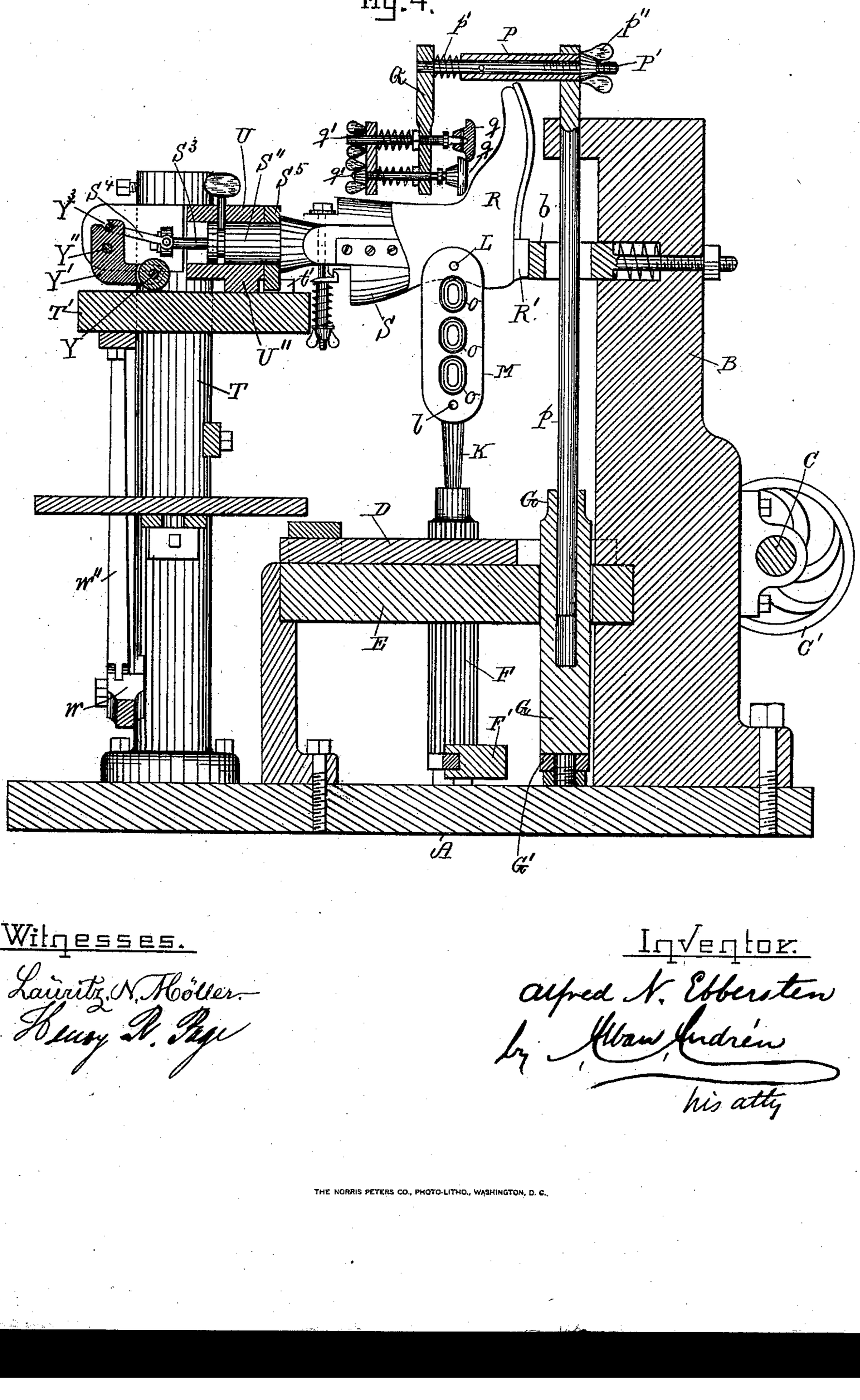
(No Model.) 5 Sheets—Sheet 3.

A. N. EBBERSTEN.

TREEING MACHINE FOR BOOTS OR SHOES.

No. 599,773. Patented Mar. 1, 1898.

Fig. 4.



Witnesses.

Lauritz N. Koller.
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(No Model.) 5 Sheets—Sheet 4.

A. N. EBBERSTEN.

TREEING MACHINE FOR BOOTS OR SHOES.

No. 599,773. Patented Mar. 1, 1898.

Fig. 5.

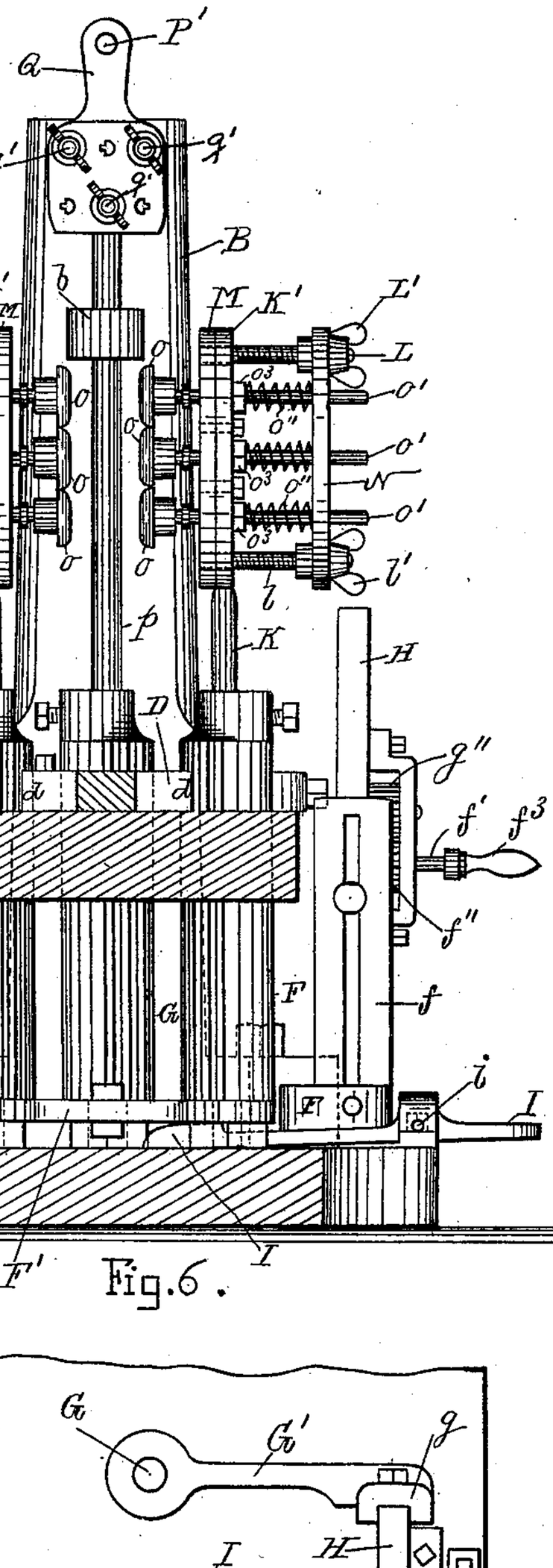

Fig. 6.

Witnesses.

Lauritz N. Möller.

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(No Model.) 5 Sheets—Sheet 5.

A. N. EBBERSTEN.

TREEING MACHINE FOR BOOTS OR SHOES.

No. 599,773. Patented Mar. 1, 1898.

Fig. 7.

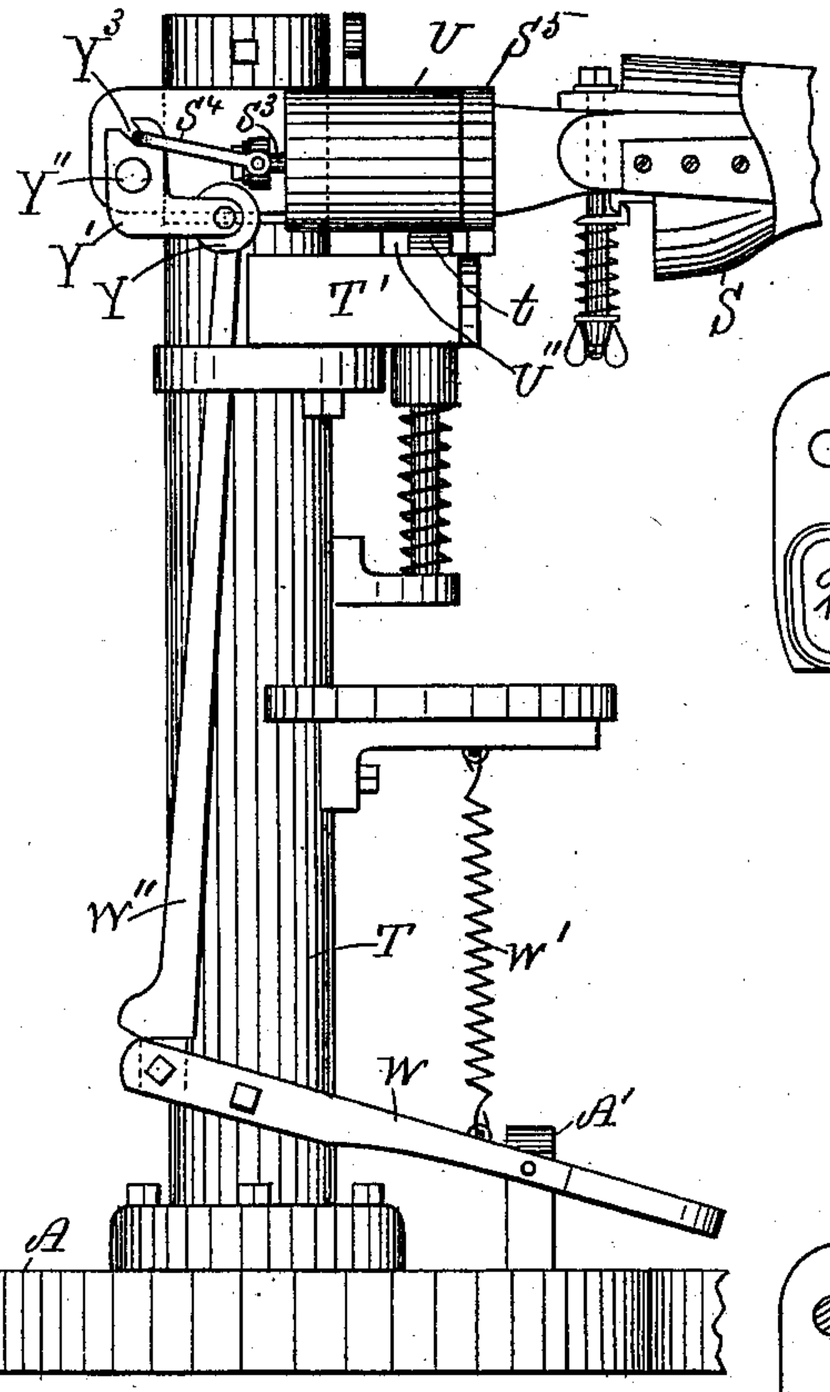


Fig. 10.

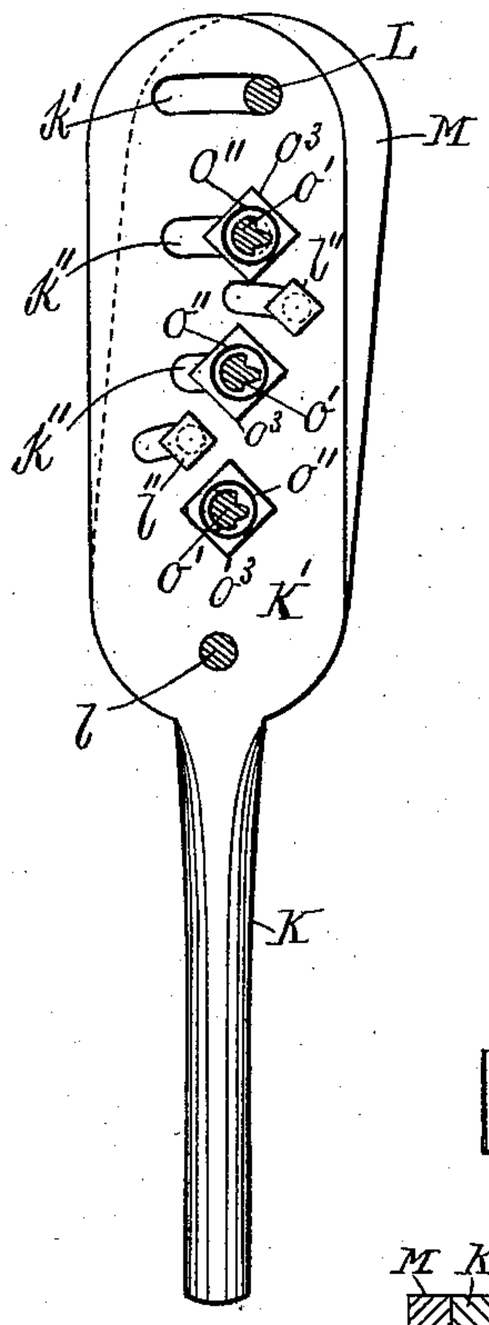


Fig. 11.

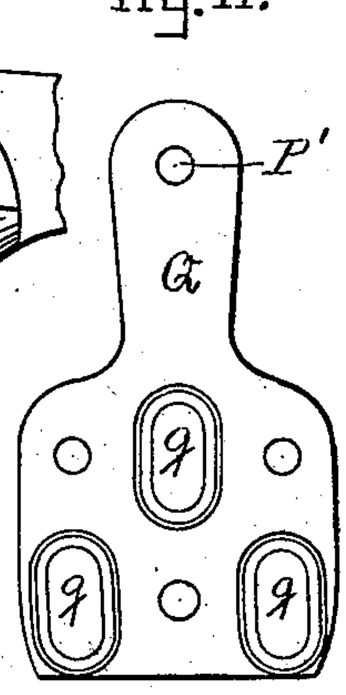


Fig. 12.

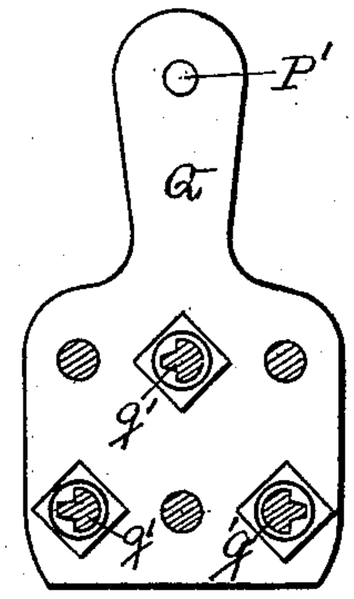


Fig. 8.

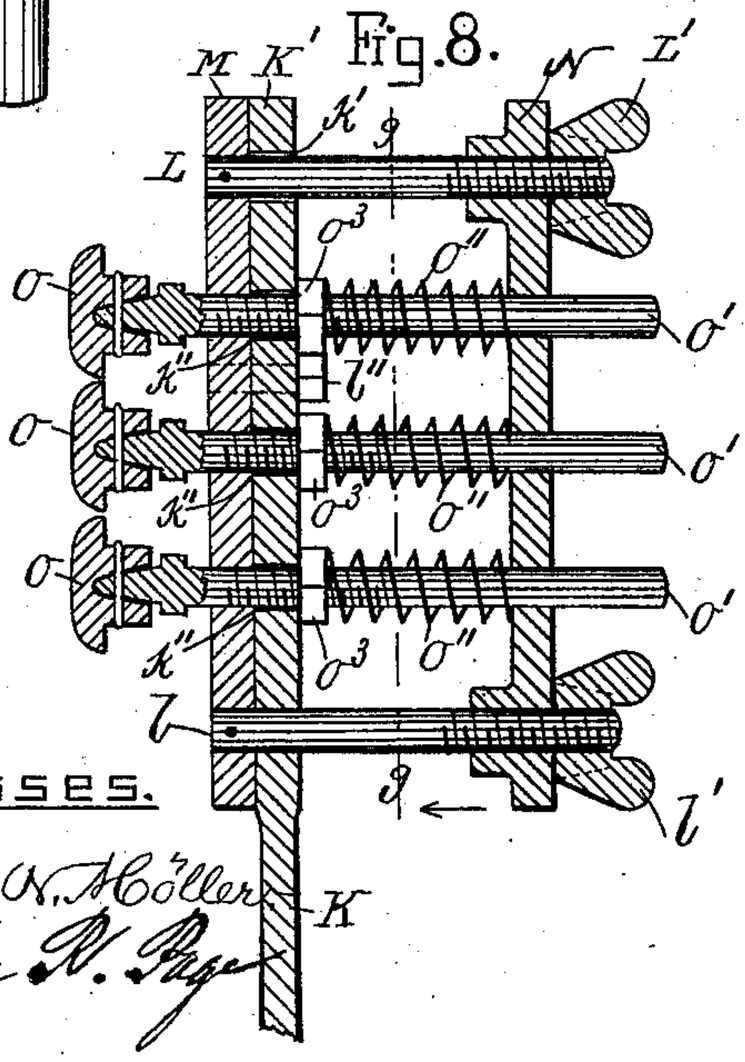
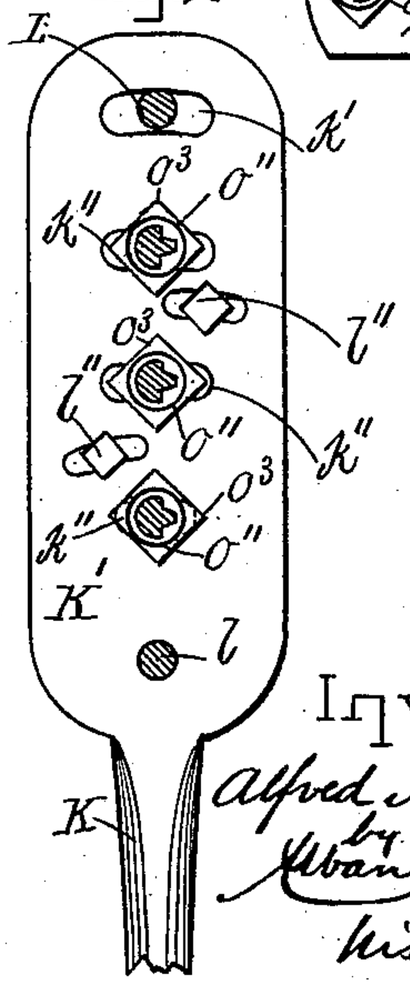


Fig. 9.



Witnesses.
Lauritz N. Möller
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UNITED STATES PATENT OFFICE.

ALFRED N. EBBERSTEN, OF ORANGE, MASSACHUSETTS.

TREEING-MACHINE FOR BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 599,773, dated March 1, 1898.

Application filed May 21, 1897. Serial No. 637,490. (No model.)

To all whom it may concern:

Be it known that I, ALFRED N. EBBERSTEN, a citizen of the United States, and a resident of Orange, in the county of Franklin and State of Massachusetts, have invented new and useful Improvements in Treeing-Machines for Boots or Shoes, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in treeing-machines for boots or shoes, and it is carried out as follows, reference being had to the accompanying drawings, wherein—

Figure 1 represents a side elevation of the improved treeing-machine. Fig. 2 represents a top plan view of the same. Fig. 3 represents a horizontal section on the line 3 3, shown in Fig. 1. Fig. 4 represents a longitudinal section on the line 4 4, shown in Fig. 2. Fig. 5 represents a vertical section on the line 5 5, shown in Fig. 1. Fig. 6 represents a detail plan view of the treadle mechanism for raising the rack on the side or upper treeing tools for engagement with the lifting-gear to cause such treeing-tools, as well as the instep-treeing tools, to be simultaneously raised and lowered. Fig. 7 represents an end view of the machine seen from X in Fig. 1, showing the treadle device for expanding the boot-tree previous to swinging the latter into operative position. Fig. 8 represents a detail vertical section of one of the jacks for the side or upper treeing tools. Fig. 9 represents a cross-section on the line 9 9, shown in Fig. 8. Fig. 10 represents a similar cross-section showing the treeing-tools swung out of perpendicular position. Fig. 11 represents a detail end view of the instep-treeing device; and Fig. 12 represents an enlarged cross-section on the line 12 12, shown in Fig. 1.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

A in the drawings represents the base of the machine, to which is secured the standard B in bearings in which is journaled the rotary driving-shaft C, provided at one end with fast and loose pulleys C′ C″, as shown. A rotary motion is imparted to the said shaft C by means of belt-power applied to the fast pulley C′. The opposite end of the shaft C is provided with a crank or eccentric C^3, to which is pivotally connected an adjustable link C^4, the other end of which is pivoted to a sliding plate D, adapted to move forward and back in guides attached to a support E, suitably secured to the standard B and base A, as shown. It will thus be seen that a reciprocating horizontal motion is imparted to the slide-plate D from the rotary driving-shaft C during the operation of the machine.

The slide-plate D is provided with toothed racks *d*, *d*, and *d′*, as shown. Each rack *d* engages a toothed post F, longitudinally adjustable and journaled in the support E, as shown. The rack *d′* engages a similar toothed post G, also longitudinally adjustable and journaled in the support E.

By means of the reciprocating rack-plate D rocking motions are imparted to the respective toothed posts F, F, and G, for a purpose as will hereinafter be more fully described.

The lower ends of the toothed posts F F are journaled in a yoke or frame F′, to which is attached or made in one piece a toothed rack *f*, suitably guided on a vertical post H, as shown. In a similar manner the lower end of the toothed post G is journaled in a yoke or frame G′, to which is attached or made in one piece a toothed rack *g*, suitably guided on said vertical post, as shown.

In a bearing in the post H is journaled the spindle *g′*, to which is secured the small pinion *g″*, the teeth of which at all times engage the toothed rack *g*. *f′* is a similar spindle journaled in a bearing in the post H and provided with a small pinion *f‴*, the teeth of which at all times intermesh with the teeth of the pinion *g″*, as shown in Fig. 1.

f^3 is a crank secured to the spindle *f′*, by means of which the toothed rack *g* and its connected parts may be raised or lowered, as may be desired, during the operation of the machine.

The rack *f* is normally disengaged from the pinion *f‴*, as shown in Fig. 1. When it is desired to cause the pinion *f‴* to be engaged with the rack *f*, the latter is raised slightly upward by means of a treadle-lever I, pivoted at *i*, and having its inner end arranged below and in contact with the yoke or frame F′ or its connection to the rack *f*, as shown in Figs. 1, 2, 3, 5, and 6. It will thus be seen that the post G and its connections may at

any time be vertically adjusted simply by turning the crank f^3.

If it be desired to simultaneously adjust the posts F and F and their connections, as well as the post G and its connections, it is only necessary to raise the rack f and posts F F, connected thereto, by means of the treadle I sufficiently to cause the pinion f'' to be engaged with the said rack f, after which the said posts F F and G and their connections may be simultaneously raised or lowered by the turning of the crank f^3 and the pinions f'' g''.

To each of the posts F is secured a treeing-tool jack which is constructed as follows: It consists of a spindle K, which is vertically adjustable in said post F and adapted to be secured to the latter after being so adjusted. The upper end of the spindle K terminates as a plate K′, to which is pivoted on a bolt l the treeing-tool-carrying plate M, which latter is secured to the inner end of said bolt l, as shown in Figs. 5, 8, 9, and 10. L is a similar bolt secured to the upper end of plate M. Said bolt L passes loosely through a slot k' in the plate K′ and is provided with a screw-thread in its outer end, which passes loosely through the take-up plate N, which latter may be adjusted in its upper end to and from the plates M K by means of a regulating-nut L′. (Shown in Fig. 8.) The pivot-bolt l is likewise provided with a screw-thread in its outer end, which passes loosely through a perforation in the take-up plate N, which latter may be adjusted in its lower end to and from the plates M K′ by means of a regulating-nut l'. (Shown in said Fig. 8.)

O O O are the treeing-tools, pivotally connected to the inner ends of the tool-carrying spindles O′ O′ O′, which are guided in the plates M N and adapted to yield in a longitudinal direction against the influence of springs O″ O″ O″, surrounding said spindles between the plate N and adjustable nuts O^3 O^3 O^3, screwed on the said spindles O′ O′ O′, and adjustable thereon to vary the positions of the treeing-tools O O O, according to the size of the boot or shoe that is to be treed.

By adjusting the nuts L′ l' the tension of the springs O″ O″ O″ may be regulated, so as to cause the treeing-tools O O O to bear against the boot or shoe with more or less frictional resistance, as may be desired.

The plate M may be adjusted toward the right or left relative to the plate K′, as shown in Fig. 10, by swinging it on the pivot-bolt l and securing it in such position by fastening-bolts going through slots in the plate K′ and secured into the plate M, as shown in Figs. 8, 9, and 10.

The spindles O are made to yield against the influence of the springs O″ during the treeing operation and are guided in the plates M N, so as to be capable of longitudinal adjustment, but prevented from turning round, as fully shown in Figs. 9 and 10.

k'' k'' k'' are slotted perforations in the plate K′, through which the spindles O O O pass loosely, so as to permit the tool-carrying plate M to be adjusted toward the right or left relative to the plate K′ for the purpose of adjusting the position of the treeing-tools O O O relative to the shape or size of the boot or shoe to be treed.

To the post G is secured a vertically-adjustable spindle p, journaled in the upper end of the standard B, as shown in Fig. 4, and to the upper end of such spindle is secured a horizontal sleeve P, containing a longitudinally-sliding spindle P′, which is held from turning around within said sleeve in any suitable manner. To the forward end of said spindle is secured the treeing-tool carrier Q, and between the latter and the sleeve P is interposed a yielding spring p', the tension of which is regulated by means of an adjusting-nut p'', screwed on the rear end of the spindle P′, as shown in Fig. 4. The carrier Q is provided with a series of pivoted and longitudinally-yielding treeing-tools q q q, arranged for operation in a manner similar to the side-treeing tools O O O. The treeing-tools q q q, however, are not provided with a side-adjusting device such as described on the tools O O O, as this is not necessary on the tools q q q, which are adapted to tree the boot or shoe on the instep and fore part thereof. The treeing-tools O O O are adapted to tree the remaining portion, sides, and upper portions of the boot or shoe during the treeing operation.

S in Figs. 1 and 4 represents an expansive boot-tree of any well-known construction, to which the boot or shoe R is secured. R′ is the heel of said boot or shoe, which is held against the yielding heel-rest b, which is spring-pressed and guided in a suitable manner in the standard b, as shown in said Figs. 1 and 4.

T represents the standard, which serves as a support for the boot-tree. Said standard is secured in a suitable manner to the base A, as shown.

To the standard or post T is secured a plate or table T′, provided at its upper side with two stationary stop projections t and t', which serve to limit the swinging motion of the boot-tree to and from its operative position, as will hereinafter be more fully described.

S″ is the shank, and S^3 is the expander-rod on the boot-tree, as usual. The expander-rod has at its end a pivoted bail or hook S^4, as is common in devices of this kind.

The boot-tree shank S″ is received or journaled in a sleeve U, having a side projection or hub U′, pivoted on the upper end of the standard T, as shown, so as to permit the boot-tree to be swung in a horizontal plane about a fourth of a revolution to and from operative position.

U″ is a projection on the under side of the sleeve U, which is adapted to be brought in contact with the stop projection t on the table T′ when the boot-tree is swung out of operative position, as shown in Fig. 7.

On the shank S″ of the boot-tree is secured a ring S⁵, the lower end of which is brought against the stop t' when the boot-tree is swung into operative position, as represented in Figs. 1, 2, and 4.

V is a vertically-yielding spring-pressed locking-plate provided with upwardly-projecting stops V′ and V″, going through perforations in the table T′ and adapted, in connection with the respective stationary stop projections t and t', to serve as locking devices to hold the boot-tree in inoperative and operative positions.

The boot-tree may be freely adjusted from operative to inoperative, or vice versa, simply by depressing the yielding locking-plate V.

In connection with the swinging boot-tree I use a treadle device for expanding said tree, and it is constructed as follows: To the standard T is pivoted a treadle-lever W, which is depressed against the influence of a spring W′, attached to such treadle-lever and a projection or bracket on the post T, as shown in Fig. 7. When said treadle-lever is depressed, it is caused to be interlocked with a hook A′, secured to the base A, as shown in Figs. 1, 2, 3, and 7. To the rear end of the pivoted treadle-lever W is pivoted a link W″, the upper end of which is adapted to bear against a roller Y, journaled in a knee-lever Y′, which is pivoted at Y″ to the hub U′ and provided at its upper end with a notch Y³, adapted to receive the bail or hook S⁴ of the boot-tree-expanding device, as shown in Figs. 1, 4, and 7. After the boot-tree has been thus expanded it will be held in such expanded position during the swinging of said boot-tree into operative position by the engagement of the roller Y with the upper side of the table or support T′, as shown in Figs. 1 and 4.

The operation of the machine is as follows: Before starting the machine the boot-tree is placed out of operative position, as shown in Fig. 7, and the boot is then placed on the tree, after which the treadle W is depressed and locked for the purpose of expanding the boot-tree. The lock-plate V is then depressed for the purpose of liberating the boot-tree, which is then swung into operative position, as shown in Figs. 1 and 4, and locked in such position by the locking device hereinbefore mentioned. The shaft C is then set in a rotary motion, causing a reciprocating motion to be imparted to the rack-plate D, by which an oscillating motion is imparted to each of the toothed posts F, F, and G, their respective jacks, and treeing-tools, which latter are thereby caused to be held in yielding rubbing contact with the boot or shoe held on the boot-tree. By turning the crank f^3 the post G and treeing-tools q q q may be raised or lowered, so as to bring the said treeing-tools in contact with the forward part of the boot or shoe from the upper portion of the instep to the toe portion. By depressing the treadle I the posts F F are raised sufficiently to cause their rack f to engage with the pinion f', and if now the crank f^3 is turned the toothed posts F F and their jacks and treeing-tools O O O may be raised and lowered simultaneously with the post G and its treeing-tools, so as to cause the treeing-tools O O O to be brought in contact with the opposite sides of the boot or shoe, thus causing the latter to be properly and automatically treed. After the boot or shoe has been treed the boot-tree is released and swung out of operative position, the boot or shoe removed and replaced by another one to be treed, and so on during the operation of the machine.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

1. In a treeing-machine for boots and shoes in combination a rotary driving-shaft, a reciprocating toothed rack actuated by said shaft and intermediate connecting mechanism, a boot-tree, toothed posts intermeshing with said rack and means for vertically adjusting said posts, jacks secured to the latter and yielding treeing-tools connected to said jacks substantially as and for the purpose set forth.

2. In a treeing-machine in combination a boot or shoe holding tree, a pair of oscillating and vertically-adjustable treeing-jacks, yielding, pivoted treeing-tools arranged on spring-pressed spindles in said jacks, means for regulating the tension on said spring-pressed treeing-tools and means for adjusting the positions of said treeing-tools relative to their jacks substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 17th day of April, A. D. 1897.

ALFRED N. EBBERSTEN.

Witnesses:
ALBAN ANDRÉN,
LAURITZ N. MÖLLER.