(No Model.)

6 Sheets—Sheet 1.

# J. H. MERRILL.

## LASTING MACHINE.

No. 488,442. Patented Dec. 20, 1892.

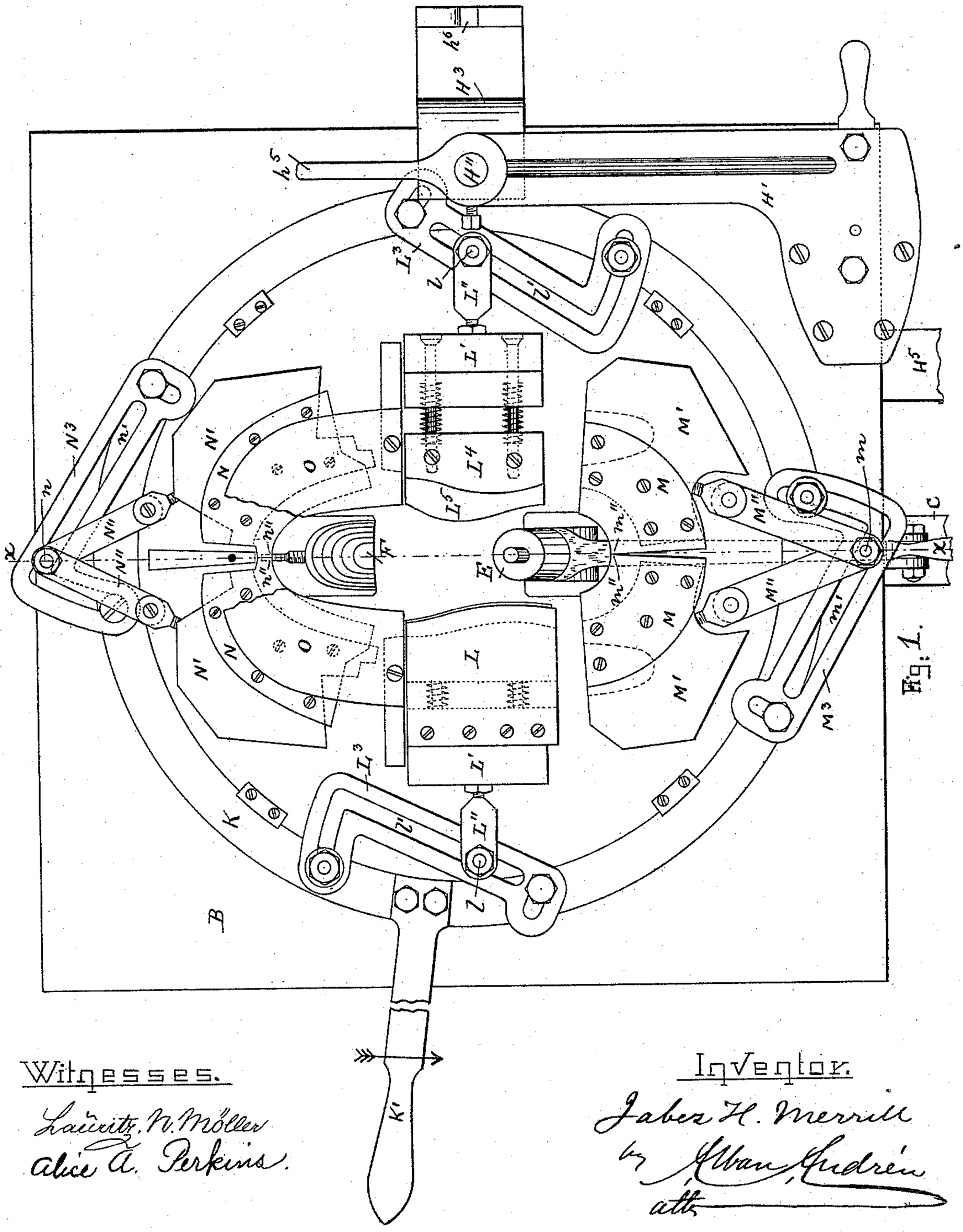

Fig. 1.

Witnesses.

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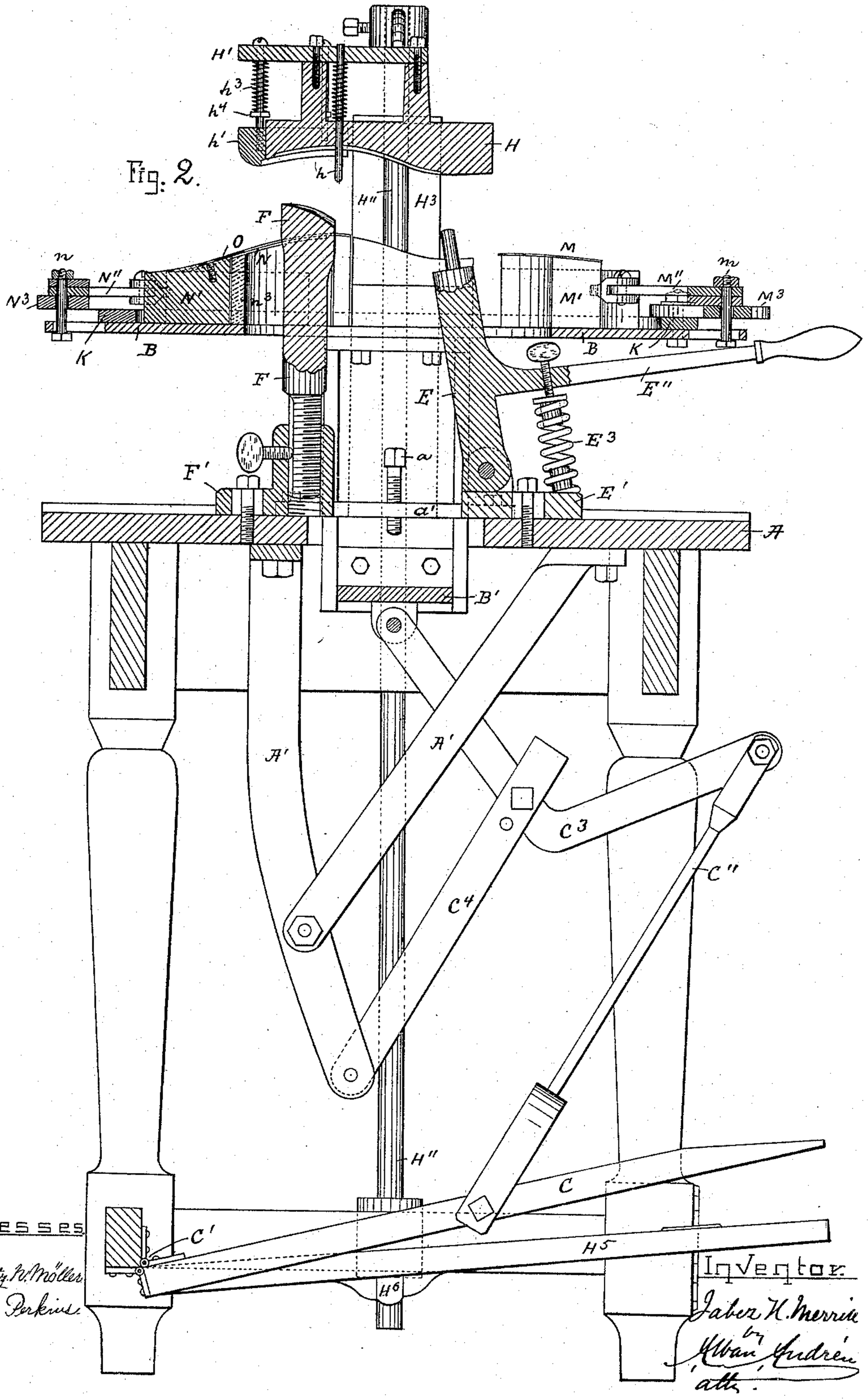
(No Model.) 6 Sheets—Sheet 2.

# J. H. MERRILL.

## LASTING MACHINE.

No. 488,442. Patented Dec. 20, 1892.

Fig. 2.

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(No Model.)

6 Sheets—Sheet 3.

# J. H. MERRILL.

## LASTING MACHINE.

No. 488,442. Patented Dec. 20, 1892.

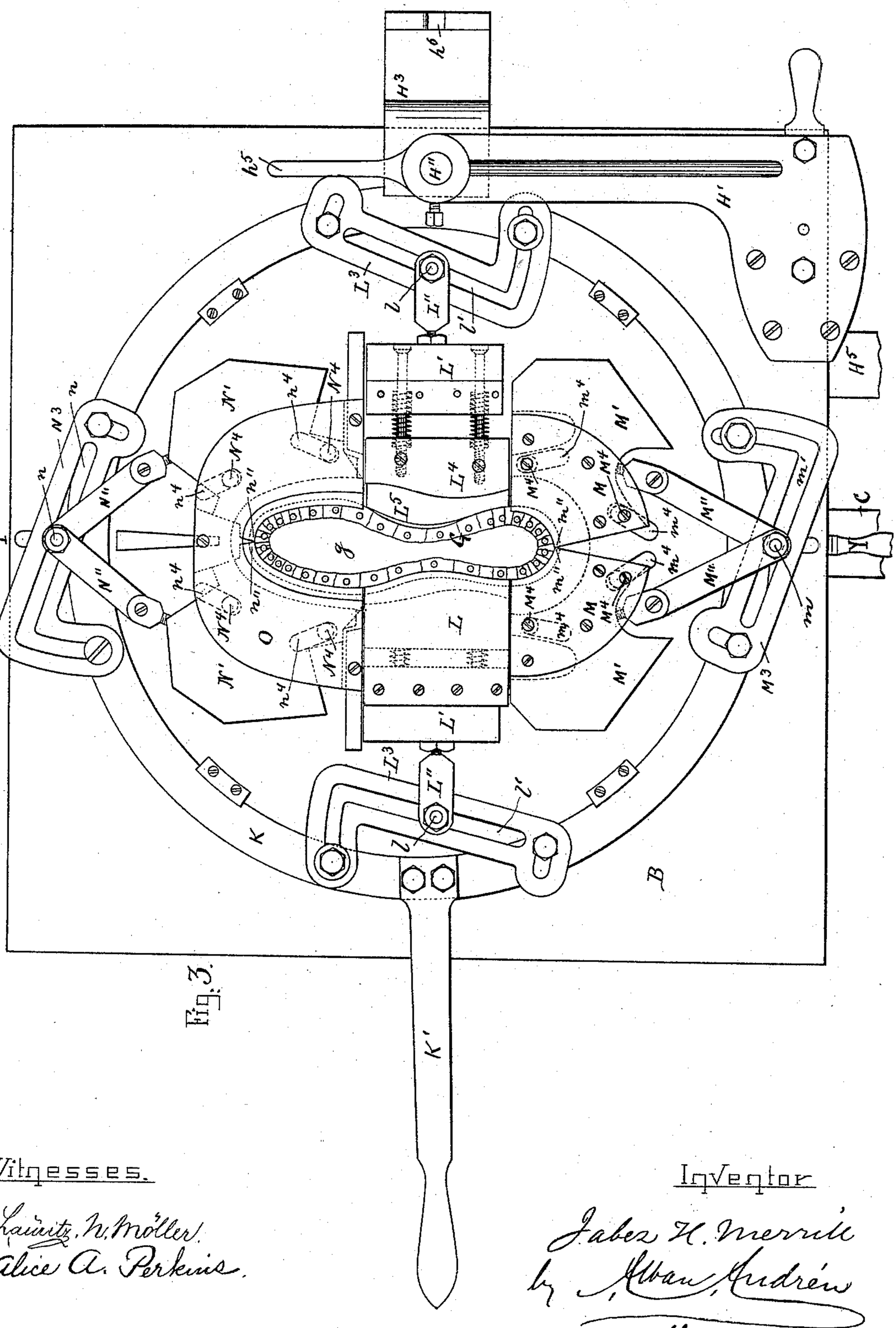


Fig. 3.

Witnesses.

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(No Model.)

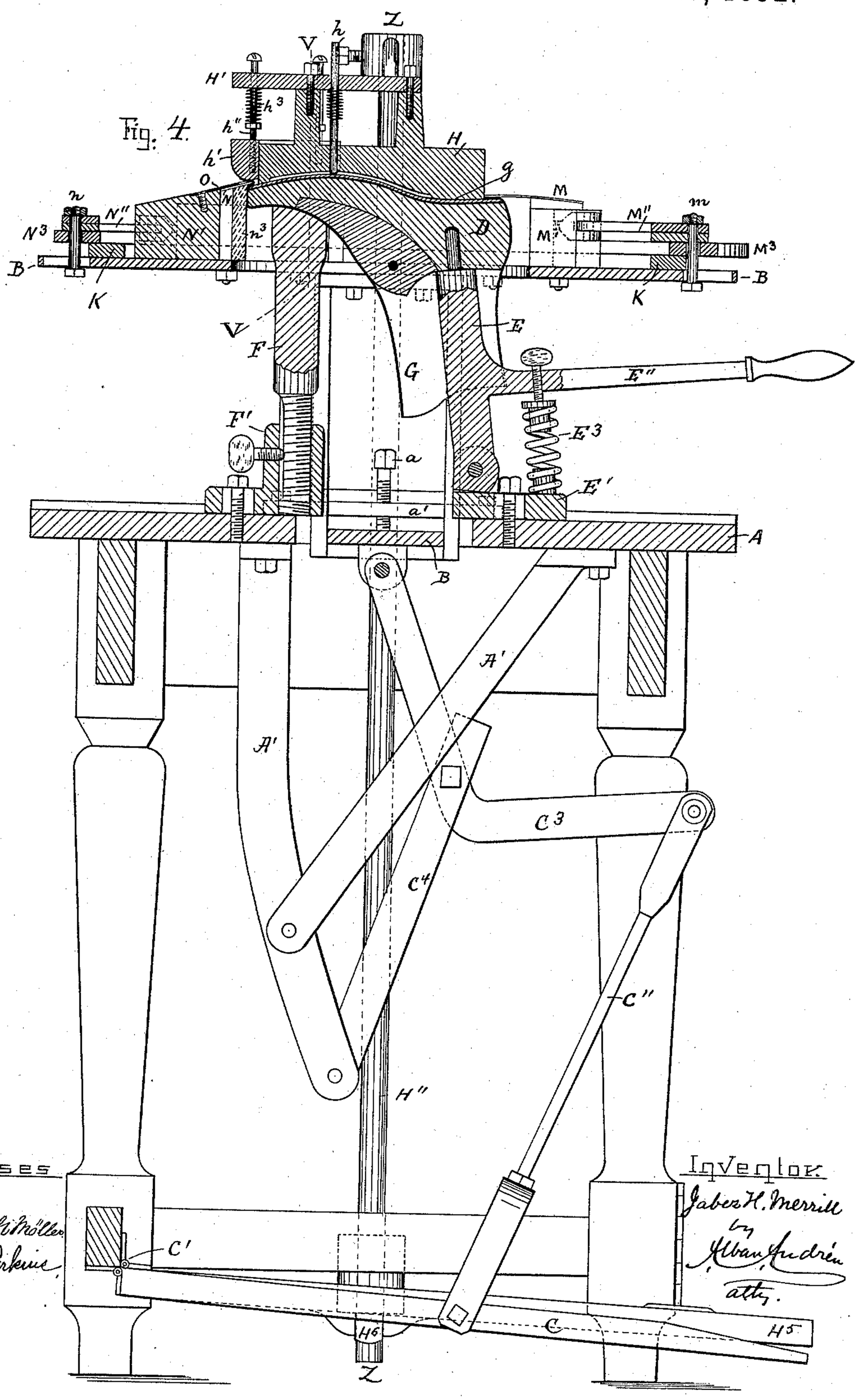
6 Sheets—Sheet 4.

# J. H. MERRILL.

## LASTING MACHINE.

No. 488,442. Patented Dec. 20, 1892.

Fig. 4.




Witnesses

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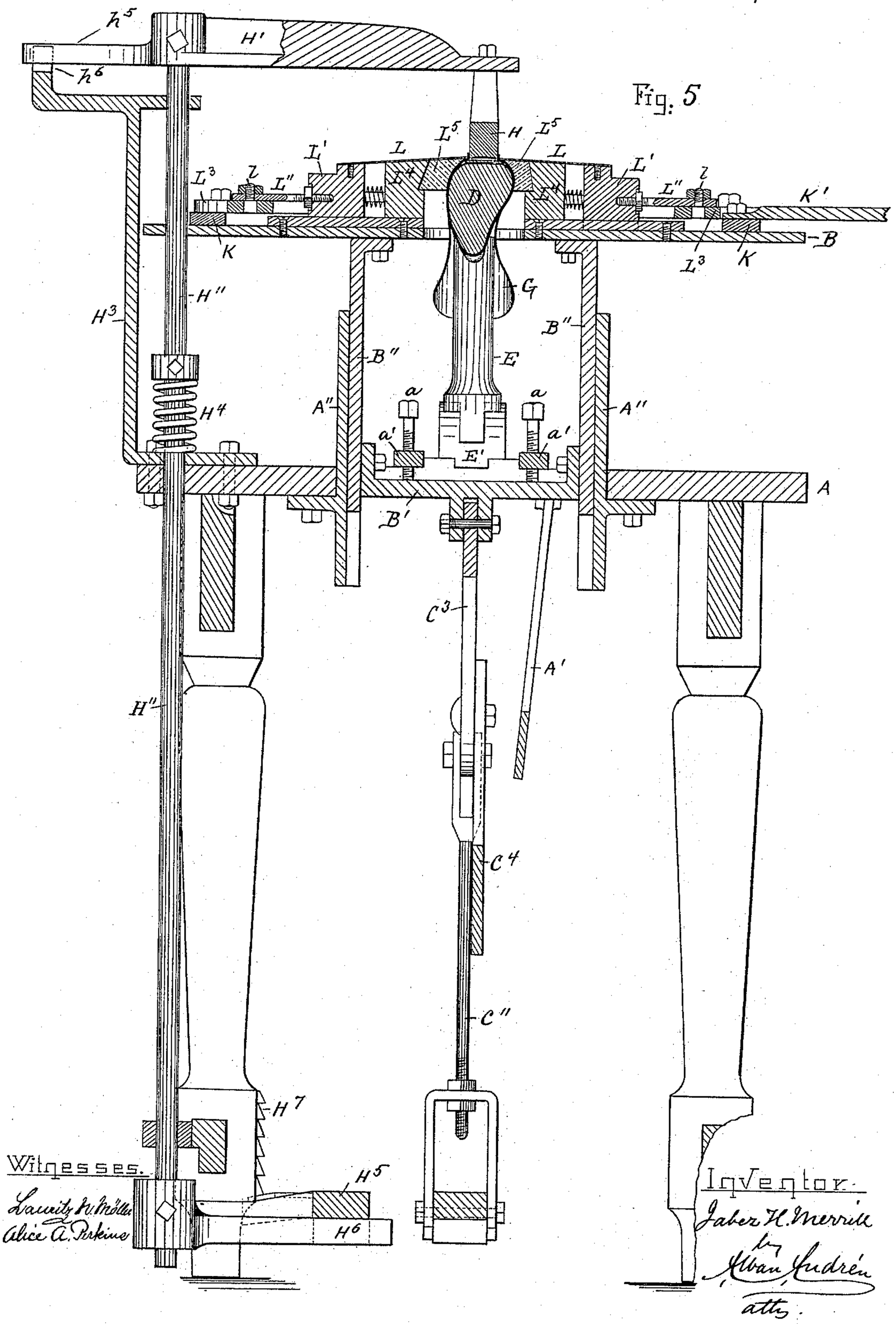
(No Model.) 6 Sheets—Sheet 5.

# J. H. MERRILL.

## LASTING MACHINE.

No. 488,442. Patented Dec. 20, 1892.

Fig. 5




Witnesses.
Lauritz W. Möller
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(No Model.)

6 Sheets—Sheet 6.

# J. H. MERRILL.

## LASTING MACHINE.

No. 488,442. Patented Dec. 20, 1892.

Fig. 6.

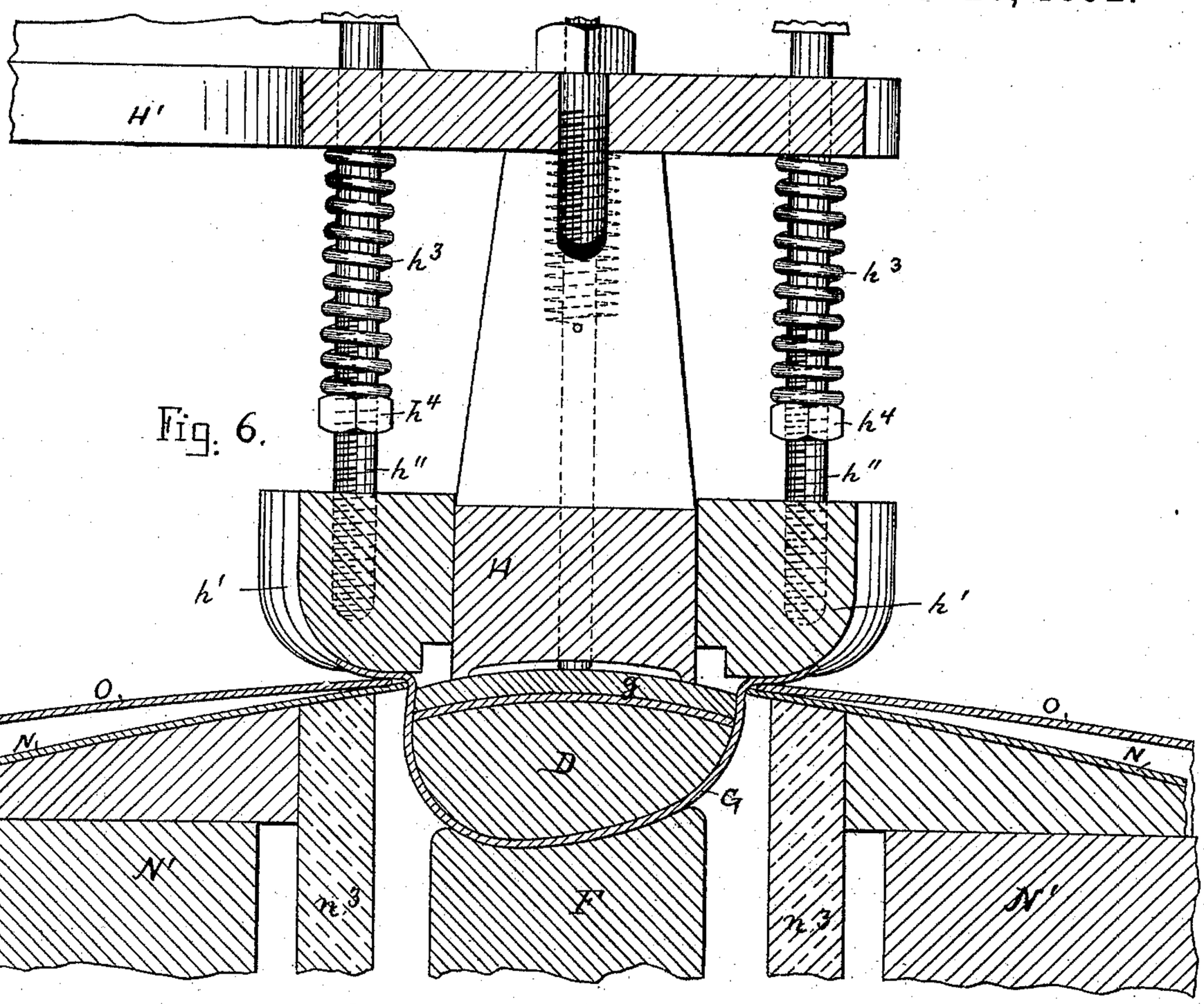
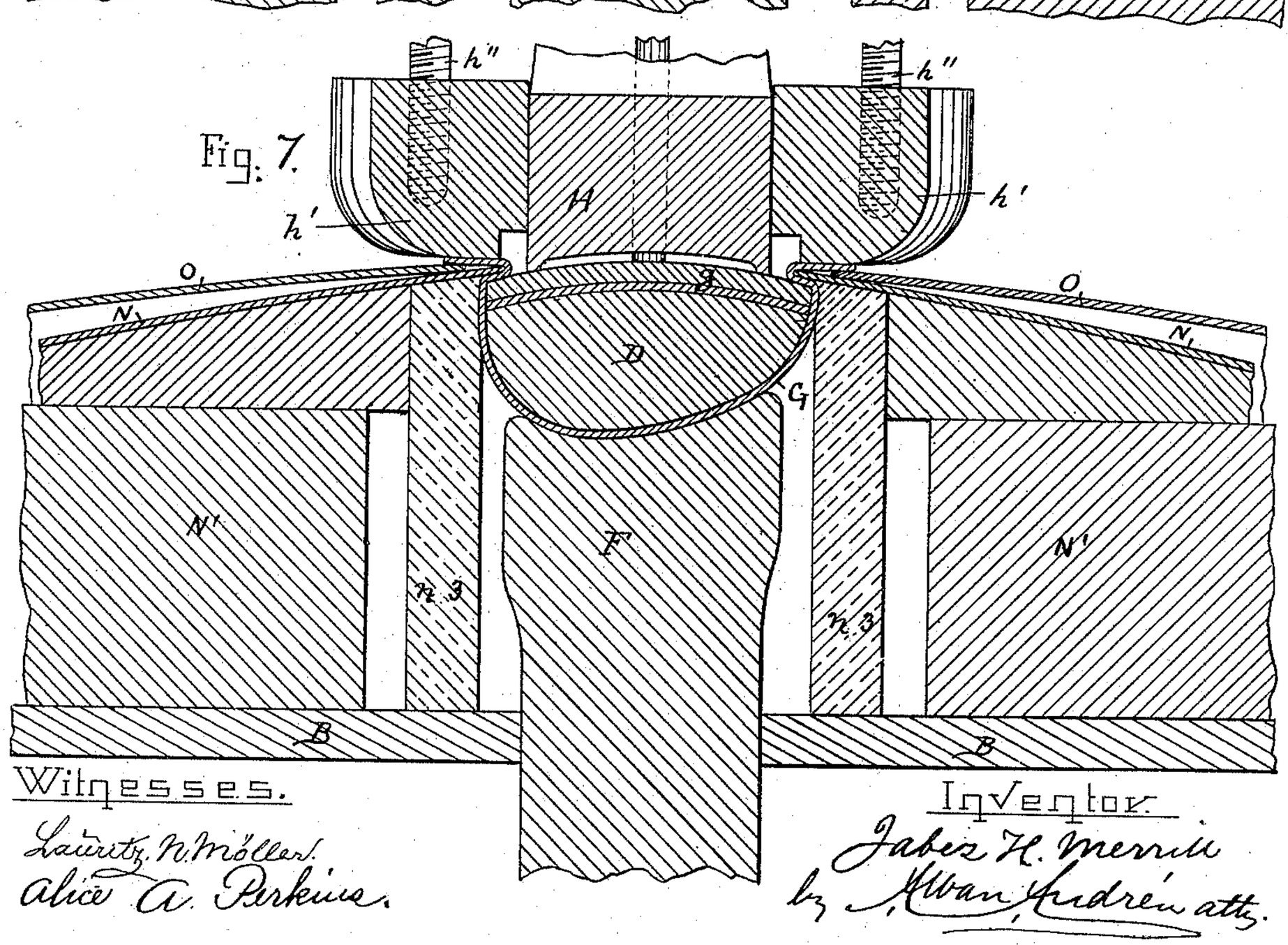



Fig. 7.




Witnesses.

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# UNITED STATES PATENT OFFICE.

JABEZ H. MERRILL, OF SALEM, MASSACHUSETTS.

## LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 488,442, dated December 20, 1892.

Application filed August 10, 1891. Serial No. 402,274. (No model.)

*To all whom it may concern:*

Be it known that I, JABEZ H. MERRILL, a citizen of the United States, and a resident of Salem, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Boot or Shoe Lasting Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in boot or shoe lasting machines and it is carried out as follows; reference being had to the accompanying drawings, wherein—

Figure 1 represents a plan view of the machine showing the folder blades expanded and the machine in position for receiving the last and shoe upper to be lasted thereon; Fig. 2 represents a longitudinal section on the line X—X in Fig. 1, showing the swinging head and spring pressed soleholder swung in position above the last holding device; Fig. 3 represents a plan view of the machine showing the shoe lasted and the folder blades in their inner positions; Fig. 4 represents a vertical section on the line Y—Y in Fig. 3 showing the upper swinging head and sole holder in working position; Fig. 5 represents a vertical section on the line Z—Z shown in Fig. 4; Fig. 6 represents an enlarged section on the line V—V in Fig. 4, showing the folder blades in the act of stretching the upper on the last and folding the edges thereof preparatory to nailing the upper onto the last, and Fig. 7 represents a similar view showing said folder blades in their inner positions.

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

The improved boot or shoe lasting machine is constructed as follows: It consists of a bench or stationary support A and a vertically movable table B that carries the in and out movable folder blades by which the edge of the upper is turned and folded all around the sole portion of the last and its insole as will hereinafter be more fully shown and described.

The table B may be raised and lowered in any suitable manner and by means of any well-known mechanism. In the drawings I have shown for this purpose a treadle lever C pivoted at C′ and having connected to it a link C″ the upper end of which is connected to a lever $C^3$ that is hung on the upper end of an arm $C^4$, the latter being pivoted in its lower end to a bracket A′ secured to the bench or support A, as shown in Fig. 2. The upper end of the lever $C^3$ is shown as being connected to a cross-bar B′ secured to vertical posts B″, B″ depending from and seamed to the table B (Figs. 2, 4 and 5). The posts B″, B″ are adapted to move up and down in guides A″, A″ secured in a suitable manner to the bench or support A, as shown in Fig. 5. It will thus be seen that the depression of the treadle C causes an upward motion to be imparted to the table B and its connections. The weight of the said table B and parts attached to it causes it to be lowered out of the way of the last as soon as the operator relieves his pressure on the treadle C.

The table B. is limited in its upward motion by adjustable stop screws *a*, *a* the lower ends of which come in contact with the cross bar B′ when the table B reaches its highest position as shown in Figs. 4 and 5; the said stop and screws are shown as being screwed through bars *a*′, *a*′ secured in a suitable manner to the bench A or other stationary part of the machine.

D is the last adapted to be secured to a last holder E pivoted in its lower end to a block E′ which is longitudinally adjustable on the bench A′ and secured to the latter by means of a screw or other well known device.

F is the toe support for the last D, which toe support is vertically adjustable preferably in a screw threaded socket F′ which is longitudinally adjustable on the bench A and secured to the latter by means of a screw or other well known device as shown in Fig. 4.

E″ is a handle or lever secured to the last holder E, and $E^3$ is a pressure spring interposed between the handle E″ and block E′ for the purpose of automatically causing the toe portion of the last to rest on the toe support F during the lasting operation. By depressing the handle E″ the last is swung free from the last support as may be desired in placing the last in position before lasting the shoe, and in removing it from the last holder after the shoe has been lasted.

G is the boot or shoe upper and *g* is the inside of the boot or shoe as usual.

Above the last D is located a vertically movable and swinging sole holder block or head H which is adapted to be forced against the insole during the lasting operation for the purpose of temporarily holding the said insole in proper position on the last. Said block H is attached to an arm H′ secured to a vertically adjustable rod H″ that is guided in suitable bearings on a bracket $H^3$ secured to the bench A as shown in the drawings.

The block or head H is normally held in its upper raised position, (shown in Fig. 2,) by the influence of a spring $H^4$ (Fig. 5) and is depressed by means of a treadle lever $H^5$ pivoted to the frame of the machine and resting on an arm or lever $H^6$ mounted in a suitable manner on the lower end of the rod $H^4$. If so desired, the head H may be held and locked in contact with the insole by locking the side of the treadle lever $H^5$ in a ratchet $H^7$ or similar locking device as shown in Fig. 5. When not in use the head H is raised and swung out of operative position as shown in Figs. 1 and 3.

In connection with the block H, I prefer to use a spring pressed pin *h* adapted to come in contact with the insole of the boot or shoe previous to bringing the block H to bear against said insole for the purpose of holding the latter in contact with the last D.

In connection with the head H, I use a yielding spring pressed shaping and holding jaw *h′* adapted to be pressed against a stationary jaw O on the up and down movable table B for the purpose of properly stretching and fitting the toe or vamp portion of the upper to the last during the lasting operation as will hereinafter be more fully shown and described. In practice I prefer to secure to said jaw *h′* a pair of pins *h″*, *h″* passing loosely through perforations in the arm H′ and having heads or projections in their upper ends and springs $h^3$ interposed between the underside of said arm H′ and nuts or collars $h^4$, $h^4$ on the pins *h″*, *h″* as fully shown in detail in Fig. 6.

On the up and down movable table is located a ring K which is properly guided in suitable bearings or equivalent devices, and is adapted to be oscillated by manipulating a handle K′ secured to said ring as fully shown in Figs. 1 and 3. By moving the ring K in the direction of the arrow shown in Fig. 1 a series of folder blades are caused to move inward for the purpose of turning over the edge of the shoe upper on the top of the insole, and by moving said ring K in an opposite direction said folder blades are moved away from the last as will hereinafter be more fully shown and described.

For the purpose of turning over the edge of the upper all around the top of the last, I make use of a pair of shank folder blades L, L, a pair of heel folder blades M, M and a pair of toe folder blades N, N as shown in the drawings. Each of the shank folder blades L is secured to the top of a block L′ that is connected by means of a link L″ and pin *l* to a plate $L^3$ which is adjustably secured in its ends to the ring K as shown in Figs. 1 and 3, the said plates $L^3$ having an inclined slot *l′* adapted to receive the pin *l* and it will be thus seen that by oscillating the ring K a forward and back movement to and from the last is imparted to the blocks L′, L′ and their folder blades L, L. By adjusting the slotted plates $L^3$, $L^3$ on the ring K a corresponding degree of motion will be imparted to the said blocks L′, L′ and their respective folder blades L, L. In practice I prefer to use in combination with each of the shank blocks L′, L′ a spring pressed yielding pressure block $L^4$ having a rubber cushion $L^5$ adapted to be forced against opposite sides of the shank portions of the shoe upper, previous to the turning over of the upper shank portions by the shank folder blades for the purpose of conforming the upper to the last at the shank portions. By adjusting the positions of the inclined plates $L^3$, $L^3$ on the ring K, the throw of the blocks L′, L′ and their folder blades L L can be regulated according to the size of the shoe that is being lasted.

M, M are the heel portion folder blades which are secured to the blocks M′, M′ pivoted to links M″, M″ the outer ends of which are pivoted together by means of a pin *m* that is guided in an inclined slot *m′* on an inclined slotted plate $M^3$, the ends of which are adjustably secured to the ring K in the same manner and for the same purpose as the slotted plates $L^3$, $L^3$ on the shank folders.

It is very essential that the inner meeting edges *m″*, *m″* of the folder blades M, M should be in contact with each other during the forward and back movement of the said folder blades so as to cause the leather at the heel portion of the shoe to be turned over evenly and without wrinkles, and for this purpose I make properly shaped slots $m^4$, $m^4$ in the table B adapted to receive guide pins $M^4$, $M^4$ secured to the respective blocks M′, M′ as shown in Fig. 3. By thus partially sliding and swinging the folder blades M, M to and from the last, the object of holding the meeting edges *m″*, *m″* in contact with each other is attained for the purpose above described.

The toe portion folder blades N, N are constructed, arranged and operated precisely like the heel portion folder blades M, M being for this purpose secured to movable blocks N′, N′ having links N″, N″ pivoted to them and to a pin *n* which is guided in an inclined slot *n′* on the plate $N^3$ which is adjustably secured to the ring K as shown in Figs. 1 and 3.

*n″*, *n″* are the inner meeting edges of the folder plates N, N which are caused to be held in contact with each other during the forward and back motion of said folder blades in the same manner and for the same purpose as heretofore described in relation to the heel folder blades and for this purpose each

of the folder blade blocks N′ has attached to it pins $N^4$, $N^4$ guided in slots $n^4$, $n^4$ in the table B as shown in dotted lines in Fig. 3.

In practice I prefer to provide the inner surface of each toe folder blade block N′ with a rubber lining or cushion $n^3$ as shown in Figs. 6 and 7 for the purpose of stretching and conforming the upper to the last properly at the toe portion without wrinkles.

To the up and down movable table B is secured in a suitable manner directly above the toe portion folder blades N, N a preferably horseshoe shaped jaw O between which and the yielding head jaw $h'$ the forward portion of the edge of the upper is clamped during the upward motion of the table B for the purpose of properly stretching and fitting the toe or vamp portion of the upper relative to the last.

For the purpose of centering and causing the head H to be depressed exactly in its proper position relative to the last D, I prefer to make on the arm H′ a projection $h^5$ which is adapted to enter a groove or notch $h^6$ in the upper end of the bracket $H^3$ as shown in Fig. 5. The said groove and arm projection are also represented in Figs. 1 and 3.

The operation of my improved lasting machine is as follows: The shoe upper, counter and insole are placed on the last D as usual, after which the last is placed in position on the last-holder E with its toe portion resting on the toe support F as shown in Fig. 4. The head H is then swung in position above the last and pressed against the insole by the depression of the treadle $H^5$ as shown in Fig. 4. The table B is then raised by the depression of the treadle C causing the toe portion edge of the upper to be clamped between the lower jaw O and upper spring pressed jaw $h'$ and stretched properly at the toe and vamp portion. During this part of the operation the folder blades L, L, M, M and N, N are expanded in Fig. 1. The operator then takes hold of the handle K′ and moves the ring K in the direction of the arrow shown in Fig. 1 causing the folder blades L, L, M, M and N, N to move toward the last by which the edge of the upper is turned over all around the bottom of the last and its insole; the edge of the upper at the toe and vamp portion being still further made to conform to the last by the clamping of the upper between the jaws $h'$ and O and the inward pressure of the toe folder blades N, N while the toe portion of the upper is thus being held and clamped between said jaws. The head H is then released and swung to one side as shown in Figs. 1 and 3 after which the overlapping edge of the upper is then tacked and secured to the insole. The folder blades L, L, M, M and N, N are then expanded and they and the table B are lowered to their normal position as shown in Fig. 2, and the now lasted shoe with its last removed from the last holder, another last and upper placed thereon and so on.

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

1. In a lasting machine, the combination of a bench provided with a horizontally adjustable block and upright guides, a rocking last holder pivoted at its lower end to the adjustable block and having a laterally projecting hand lever, a toe support mounted on the bench, a spring acting on the rocking last holder to press it toward the toe support, a vertically movable table engaged with the upright guides of the bench, a series of folder blades slidable horizontally on the vertically movable table, means for sliding the folder blades horizontally, and lever mechanism for raising and lowering the blade carrying table independent of the last holder and its supporting bench, substantially as described.

2. In a lasting machine, the combination of a bench having a horizontally adjustable block, a rocking last holder pivoted at its lower end to the adjustable block and provided with a lateral hand lever, a toe support on the bench a vertically movable table having pendent posts engaging the guides of the bench and connected at their lower ends by a cross bar, a series of folder blades slidable horizontally on the vertically movable table, an oscillating ring turning on the table and connected with the folder blades to slide them horizontally, and a lever mechanism connected with the cross bar of the table posts for raising and lowering the table independent of the last holder and its supporting bench, substantially as described.

3. In a lasting machine, the combination of a bench provided with a horizontally adjustable block, means substantially as described for holding the block in any position of adjustment, a rocking last holder pivoted at its lower extremity to the block and adjustable therewith, a vertically movable table engaged with the bench, a series of folder blades slidable horizontally on the table, means for sliding the folder blades horizontally, and lever mechanism for raising and lowering the blade-carrying table independent of the last holder and its supporting bench, substantially as described.

4. In a lasting machine, the combination of a bench having a last holder, a vertically movable table engaged with the bench, a series of laterally movable folder blades carried by the table, means for raising and lowering the blade carrying table independent of the last holder and its supporting bench, and a vertical rod having at its upper end a pressure head to bear against an insole on the last holder and provided with a vertical orifice through which extends a spring pressed pin $h'$ having its lower end projecting below the pressure head to come in contact with the insole prior to such pressure head, substantially as described.

5. In a lasting machine, the combination of a bench having a last holder, a vertically movable table engaged with the bench, a series of laterally movable folder blades carried by the

table, means for raising and lowering the blade carrying table independent of the last holder and its supporting bench, and a vertically movable and axially rotatable rod journaled on the bench and having at its upper end a pressure head adapted to bear against an insole on the last holder and provided with a vertical orifice through which extends a spring pressed pin $h'$ having its lower end projecting below the pressure head to come in contact with the insole prior to such pressure head, substantially as described.

6. In a lasting machine, the combination of a bench having a last holder, a vertically movable table engaged with the bench, and having the pairs of slots $m'$ a series of laterally movable folder blades mounted on blocks M' having guide pins $M^4$ engaging the slots in the table, and a lever mechanism for raising and lowering the blade-carrying-table independent of the last holder and its supporting bench, substantially as described.

7. In a lasting machine, the combination of a bench having an adjustable block and upright guides, a vertically movable table having pendent posts engaging the guides, a rocking last holder pivoted to the adjustable block and having an operating lever arm, a series of laterally movable folder blades carried by the table, an oscillating ring mounted on the table and having a series of plates provided with inclined slots, a series of links engaging the said slots and connected with the folder blades, and a lever mechanism for raising and lowering the table independent of the rocking last holder, substantially as described.

8. In a lasting machine, the combination of a bench having a last holder, a vertically movable table having an attached jaw and engaging the bench, a series of laterally movable folder blades carried by the table, means for raising and lowering the blade-carrying-table independent of the last holder, a vertically movable rod supported by the bench and having at its upper end a pressure head, and a yielding shaping and holding jaw located at one end of the pressure head and against which the toe portion of the upper is pressed by the jaw on the table when the latter ascends, substantially as described.

9. The combination in a lasting machine of the upper jaw $h'$, and lower jaw O, movable toward each other, the jack and laterally movable folder blades N, N, substantially as shown and described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 3d day of August, A. D. 1891.

JABEZ H. MERRILL.

Witnesses:
ALBAN ANDRÉN,
LAURITZ N. MÖLLER.