(Model.)

3 Sheets—Sheet 1.

P. MOËNOZ.

BRISTLE BUNCHING TOOL.

No. 324,403. Patented Aug. 18, 1885.

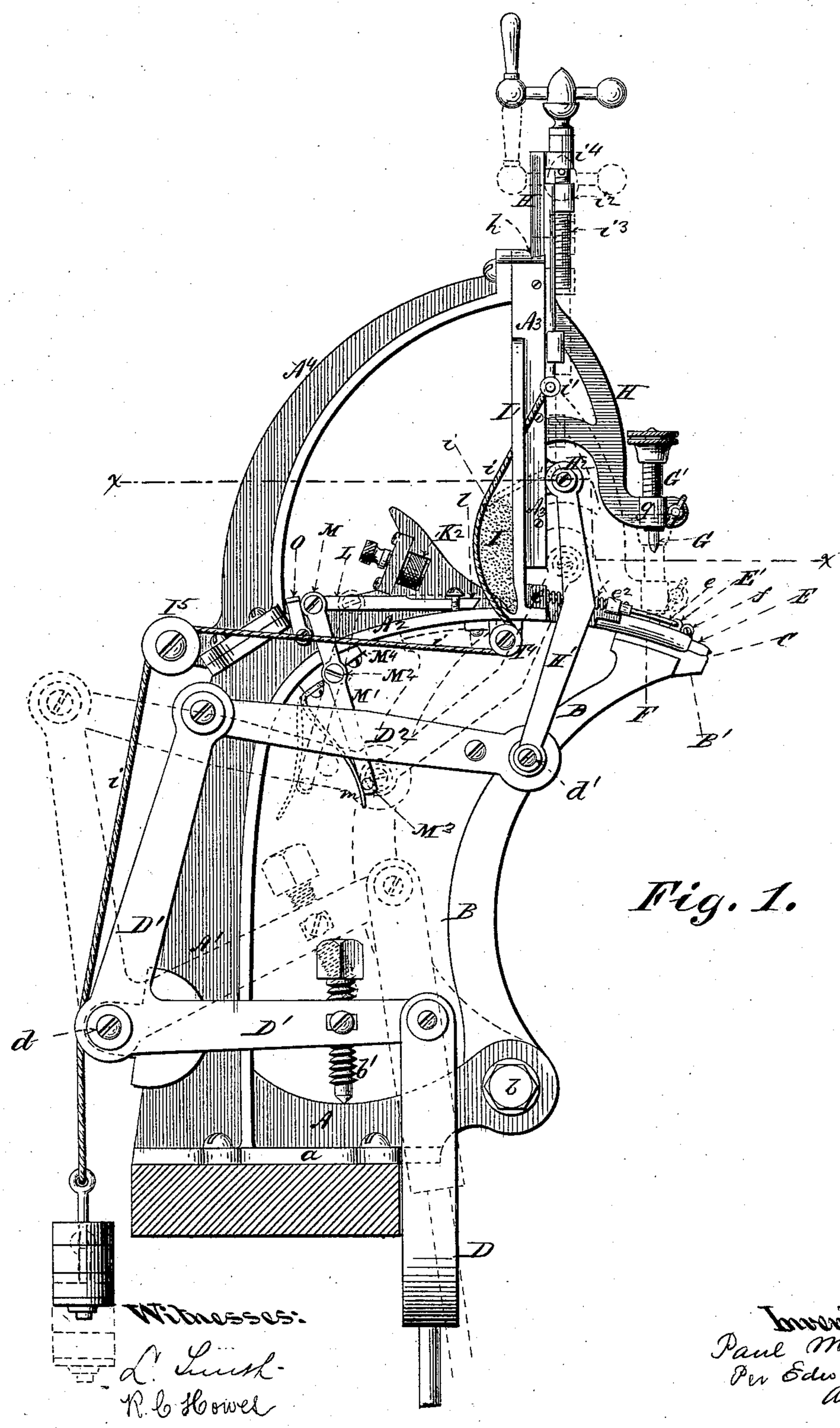

Fig. 1.

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Fig. 3.

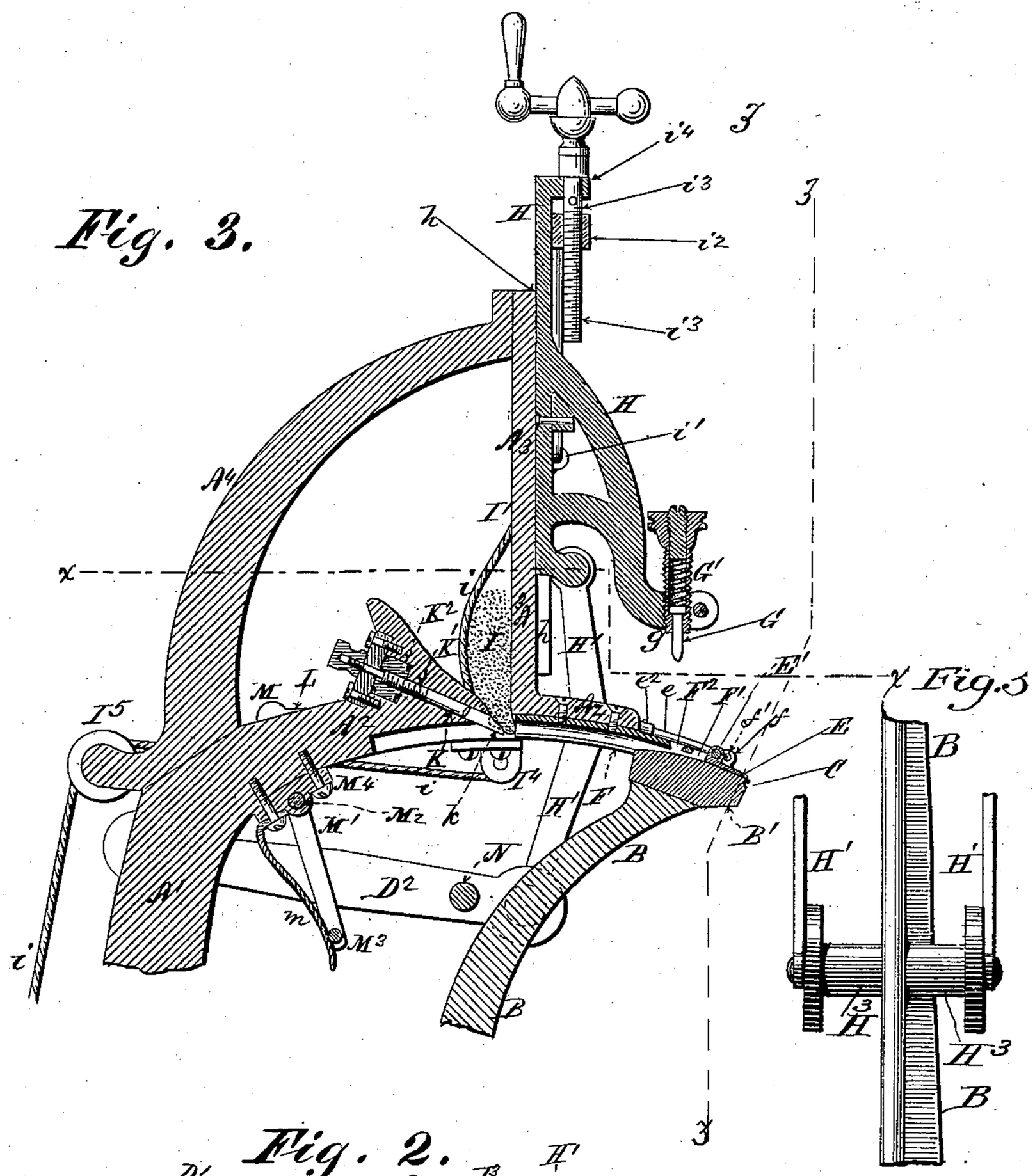
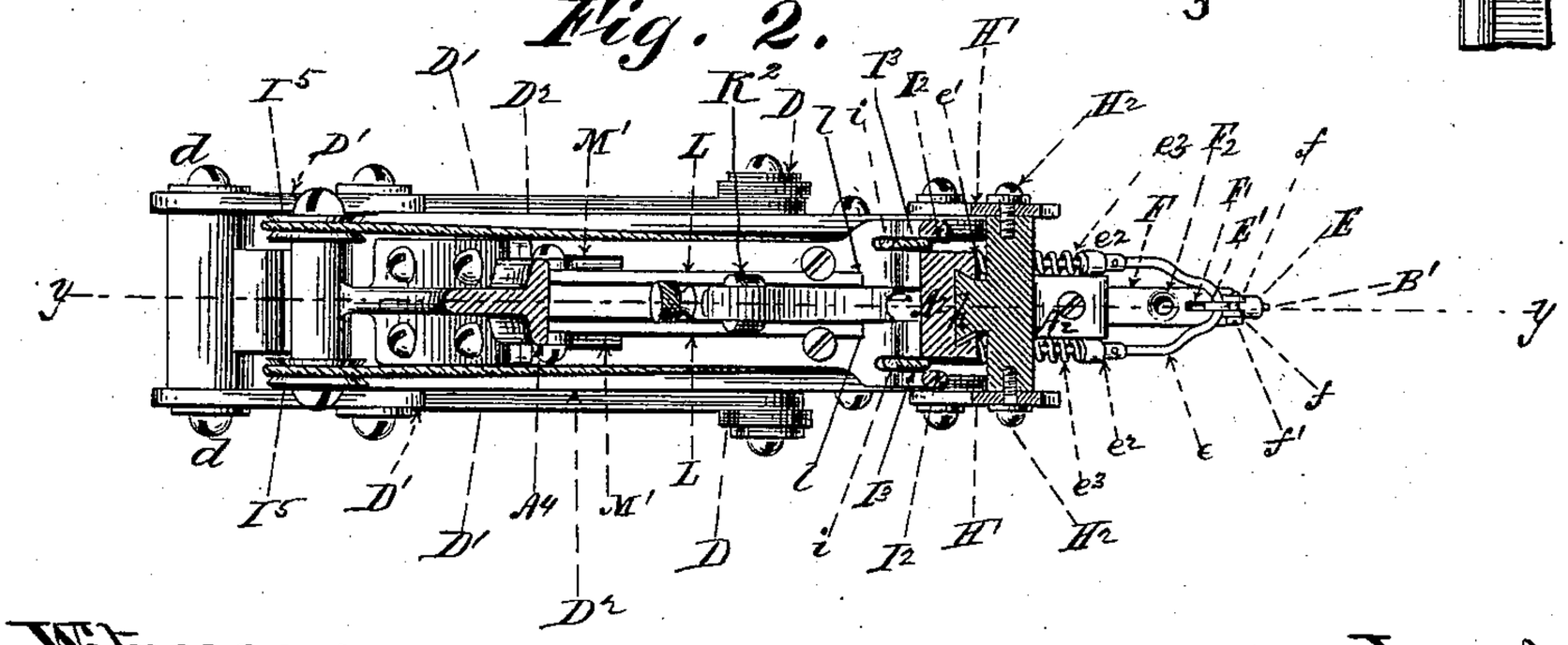


Fig. 5

Fig. 2.



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(Model.) 3 Sheets—Sheet 3.

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BRISTLE BUNCHING TOOL.

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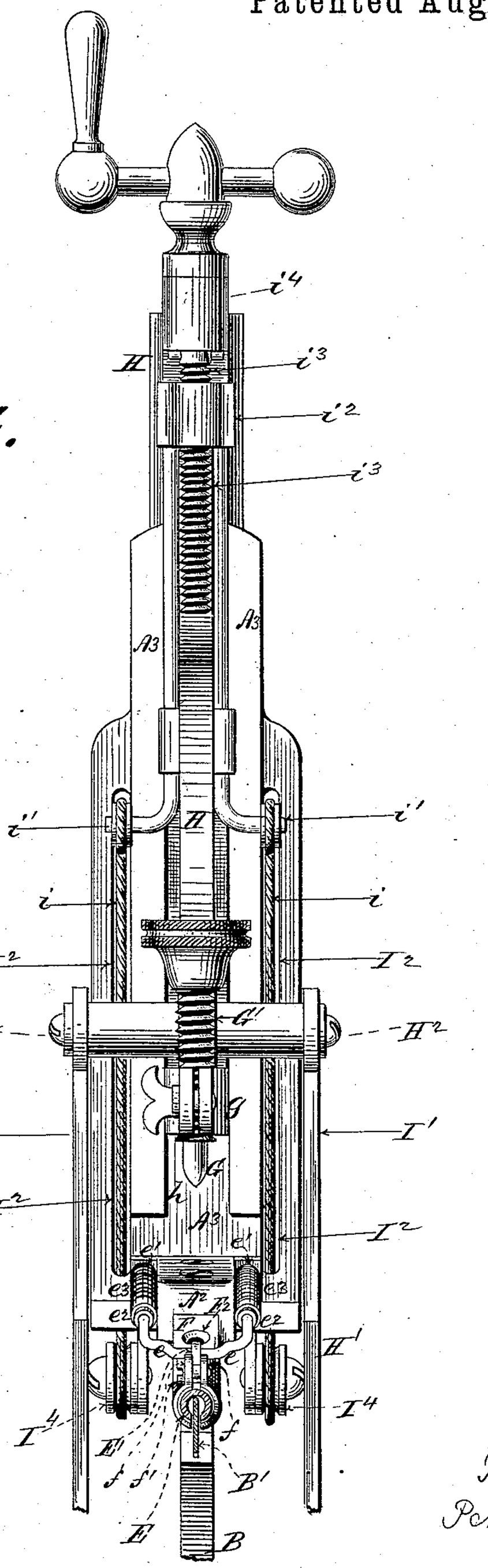
Fig. 4.



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UNITED STATES PATENT OFFICE.

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BRISTLE-BUNCHING TOOL.

SPECIFICATION forming part of Letters Patent No. 324,403, dated August 18, 1885.

Application filed August 25, 1884. (Model.)

To all whom it may concern:

Be it known that I, PAUL MOËNOZ, of Passaic, New Jersey, have invented certain Improvements in Bristle-Bunching Tools, of which the following is a specification.

This invention relates to bristle-bunching tools of the type in which a reciprocating notched pusher is employed to separate from a mass of bristles contained in a suitable magazine the quantity of bristles required for a single tuft, and to form the tuft by bending the bunch of bristles double and then pushing the bight of this tuft into and through a split nozzle, by which the bight is presented in convenient position for entrance into one of the holes in the brush-back.

My apparatus is intended to be fastened to a suitable bench, and to be operated by a treadle to form and present the tufts successively. The brush-back held in the hands of the operator is moved up to the nozzle in appropriate position successively to receive the bights of the tufts in the holes in the brush-back. The nozzle yields backwardly as the brush-back is pressed against it, and the continued protrusion of the bight of the tuft from the end of the split nozzle is insured by a movable stop, which, after the tuft has been formed, holds the tuft stationary while its bight is being made to enter into a hole in the brush-back, after which the stop retires, thus releasing the tuft, the bight of which is held in the hole in the brush-back with sufficient friction to cause the tuft to be pulled out of the tube in which it is formed when the brush-back is moved backward.

The accompanying drawings of a bristle-bunching tool containing my improvements are as follows: Figure 1 is a side elevation exhibiting in transverse vertical section a portion of the bench to which the apparatus is fastened. Fig. 2 is a horizontal section taken through the line X X on Fig. 1. Fig. 3 is a vertical section through the line Y Y on Fig. 2. Fig. 4 is a transverse vertical section taken through the line Z Z on Fig. 3. Fig. 5 is a front elevation of the doubling-lever B, showing the horizontal lugs H^3 H^3, to which are pivoted the lower ends of the links H′ H′.

The mechanism illustrated in the drawings is mounted upon a substantial frame having its base *a* perforated to admit screws for fastening the frame to the operator's bench. The frame is composed of the rib A, extending longitudinally across the base *a*, the upright A′, the lateral arm A^2, the standard A^3, and the curved brace A^4, bolted to the upper end of the upright A′ and to the upper end of the standard A^3. The front end of the rib A is perforated to receive the horizontal pin *b*, which serves as the axis of the oscillating doubling-lever B, to the upper end of which is affixed the doubling-plate B′, provided upon its front edge with the notch C. The radial distance of the rear end or heel of the doubling-plate B′ from its axis of oscillation is less than the radial distance of the forward end from its axis of oscillation.

Power to oscillate the doubling-lever is transmitted from an ordinary counterbalanced treadle by means of the pitman D, the bell-crank lever D′, and the link D^2.

The upper end of the pitman D may be bifurcated, and its two legs, extending upward astride the flanged base of the frame, may be pivotally connected, respectively, with two bell-crank levers respectively upon opposite sides of the frame, and having a common axis upon the pin *d*, inserted horizontally through the upright A′. In this case two links will be employed to pivotally connect the upright arms of the bell-crank levers, respectively, with the doubling-lever B, the latter connection being by means of the pin *d′*.

The range of forward motion of the doubling-lever is fixed by means of the check-bolt *b′*, adjustably inserted transversely through the lower arm of one bell-crank lever, or through a horizontal cross-bar connecting the two bell-crank levers, if two are employed. The intended adjustment is such that the impact upon the rib A of the lower end of the check-bolt *b′* will stop the forward swing of the doubling-lever when the forward edge of the doubling-plate B′ has reached the front end of the split tube or nozzle E, or, if desired, has reached a point slightly forward of the front end of the split nozzle, or has reached such a point that the bight of a tuft of bristles which has been engaged by the notch C and has been pushed through the split tube E protrudes slightly from the front end of the split tube,

and is thus presented in convenient position for entrance into one of the holes in the brush-back.

The forward end of the split tube E is the equivalent of the ordinary split nozzle used in bristle bunching and doubling apparatus. As heretofore employed the split nozzle has been rigidly affixed to the arm which supported it. In the present case the split tube E has the capacity of yielding longitudinally when the brush-back is pressed against its front end.

The tube E is loosely contained in the split tubular arm F, projecting forward from the lower end of the standard A^3, and forming a continuation of the lateral arm A^2 of the frame. The lateral arm A^2, the tubular arm F, and the split tube E are curved in an arc of a circle of which the axis of the doubling-lever is the center.

The longitudinal slot in the concave side of the tube E and a similar slot in the tubular arm F and a corresponding groove in the under side of the lateral arm A^2 are in the same vertical plane, and define the path of the oscillating doubling-plate B'.

The front portion of the tubular arm F is provided upon its upper side with the slot F', through which there projects upward the ear E', attached to the rear end of the tube E. The ear E' is transversely perforated to receive the bight of the staple *e*, the two legs of which are loosely seated in the holes at *e'*, formed in the lower part of the standard A^3. Each leg is provided with a fixed collar, e^2, and an expanding spiral spring, e^3, abutting at one end against the face of the standard A^3 and at the other against the collar e^2.

The tubular arm F is provided at its front end with the ears *f f*, which are transversely perforated to receive the pin or screw *f'*, against which the ear E' is forced by the thrust of the expanding springs e^3 e^3.

Immediately in the rear of the slot F' the tubular arm F is provided with the hole F^2 to admit the tuft-stop G, which is dropped into the hole F^2 during the latter part of the backward excursion of the doubling-plate B', where it serves as a stop by wedging apart and crowding the two legs of the loop of bristles against the sides of the tubular arm F in the rear of the yielding tube E, thus holding the tuft stationary by friction during the time that the brush-back is being pressed against the forward end of the yielding tube E in the act of effecting the deposit of the bight of the tuft into one of the holes in the brush-back. By the time the tuft has been received in the hole in the brush-back to the proper depth the tuft-stop G is moved upward, and the tuft is thereby released, so that when the brush-back is moved away from the tube E the tuft is drawn out of the tubular arm F by reason of the frictional hold of the sides of the hole upon the legs of the bight inserted therein.

The stop G is an upwardly-yielding pin contained in the screw G', inserted in a vertical hole tapped through the arm *g*, projecting forward from the reciprocating carriage H, seated in a dovetailed groove, *h*, formed in the front face of the standard A^3.

The necessary up and down movement is imparted to the carriage H by means of the links H' H', hung at their upper ends upon the horizontal pivots H^2 H^2, and thus connected to the carriage H, and pivotally connected at their lower ends by the pins *d'* with horizontal lugs H^3 H^3, projecting, respectively, from the opposite sides of the doubling-lever B. When the doubling-lever swings forward, the carriage H slides upward, thus removing the stop G from the path of the doubling-plate B'.

The bunches of bristles to form the doubled tufts are at each forward excursion of the doubling-plate successively separated from a mass of bristles, I, arranged transversely across the rear face, I', of the standard A^3, and held against the rear face thereof by the weighted flexible cords *i i*.

The upper ends of the cords *i i* are respectively attached to the hooks *i' i'*, which are affixed to and project downward from the nut i^2, through which passes the vertical adjusting-screw i^3, the shank of which is loosely contained in a hole formed in the lug i^4, projecting forward from the upper end of the carriage H. The cords *i i* are led from the hooks *i' i'*, respectively, through the vertical slots I^2 I^2 in the standard A^3, then downward through the slots I^3 I^3 and under the guide-pulleys I^4 I^4, then backward and over the guide-pulleys I^5 I^5, and thence downward to the weight or weights hung upon the lower ends of the cords *i i*.

At each backward swing of the doubling-lever, when the downward movement of the carriage H lowers the hooks *i' i'*, the cords *i i* are kept taut by the weight hung upon them and crowd the mass of bristles downward, so that the lower portion of the mass is made to intersect the path of the doubling-plate B'.

By each forward movement of the doubling-plate a bunch of bristles is caught in the middle by the notch C and pushed away from the mass and bent double, and carried through the split tubular arm F and the split tube E, as has been explained.

During the backward movement of the doubling-lever the heel of the doubling-plate passes under the mass of bristles, which, as the doubling-plate moves backward, are wedged upward, but which spring downward in front of the notched end of the doubling-plate after the latter has completed its backward movement.

By appropriately turning the adjusting-screw i^3 as the mass of bristles I gradually diminishes in size, the hooks *i' i'* can be adjustably lowered relatively to the carriage H, as may be required, in order to have the upper portions of the cords *i i* exert the desired downwardly-crowding effect upon the mass of bristles I at every stroke of the doubling-lever.

The mass of bristles I at the bottom bears upon the forwardly and downwardly inclined end *k* of the gage-bar K, which, by means of its screw-thread K′ and the nut K^2, is adjustable toward and from the corner formed by the junction of the rear face of the standard A^3 with the lateral arm A^2. The path of the doubling-plate B′ is immediately alongside the gage-bar K, the inclined end of which holds up the middle portion of the mass of bristles I, thus correcting any tendency of the bristles to spring downward, and leaving in the path of the doubling-plate B′ only the quantity required for a single bunch.

As an additional expedient for crowding downward into the path of the doubling-plate the quantity of bristles required for a bunch, the sliding bars L L are employed.

The forward ends, *l l*, of the bars L L are downwardly and backwardly inclined, and their rear ends, respectively, are pivotally secured to the bifurcated upper end, M, of the rocking frame M′, which rocks upon the horizontal axis afforded by the pin M^2, inserted transversely through the box M^4, bolted to the upright A′.

The lower end, M^3, of the rocking frame M′ is pushed forward by the forward thrust of the spring *m*, except at the close of the backward excursion of the doubling-lever B, when a cross-bar, N, connecting the two links D^2 D^2, or a lug projecting backward from the doubling-lever, or the rear edge of the doubling-lever itself, may strike against and rock backward the lower end, M^3, of the rocking frame, thus rocking the upper end, M, in the opposite direction, and forcing forward the inclined ends *l l* of the bars L L against the bristles in the lower portion of the mass of bristles I, and resultantly crowding them downward into the path of the doubling-plate.

When for any reason it is desired to stop the feeding of bristles downward into the path of the doubling-plate, the pivoted stop-lever O is rocked forward, thus forcing the bars L L under the mass of bristles I, and holding them up, notwithstanding continued oscillation of the doubling-lever and continued reciprocation of the vertically-sliding carriage H.

The machine may thus be continuously worked merely for the purposes of adjustment or lubrication without removing the mass of bristles from it.

Several of the individual devices described herein may be usefully employed in other forms of bristle bunching and doubling implements heretofore used. The doubling-plate or reciprocating notched pusher may be moved back and forth in a right line, instead of in the arc of a circle, and be combined with a yielding tube or nozzle, which is straight instead of curved.

I claim as my invention—

1. In apparatus for bunching and doubling bristles, a suitably-supported stationary tubular arm and a longitudinally-yielding tube or nozzle, in which the end of the said tubular arm is loosely inserted, in combination with a reciprocating notched pusher for pushing the bight of the loop or tuft of bristles through the said stationary tubular arm, and through the said yielding tube or nozzle, substantially as shown and described.

2. The combination, substantially as herein described, of a reciprocating notched pusher, a stationary tubular arm, and a longitudinally-yielding tube or nozzle, in which the end of the said stationary tubular arm is loosely inserted, and a reciprocating tuft-stop for holding the tuft stationary in the said tubular arm while the brush-back is being pressed against the end of the said yielding tube or nozzle, for the purpose of effecting the deposit of the bight of the tuft in one of the holes in the brush-back and then releasing the tuft, as and for the purpose set forth.

3. The combination, substantially as herein described, of the reciprocating notched pusher, the tubular arm through which said pusher works, a magazine for supporting and feeding a mass of bristles transversely toward the path of the reciprocating pusher in the rear of the tubular arm, and an adjustable gage for gaging the quantity of bristles allowed to drop or be crowded into and across the path of the notched pusher.

4. The oscillating doubling-lever B, in combination with the rocking frame M and the sliding bars L L, having their forward ends backwardly and downwardly inclined, as and for the purpose set forth.

5. The sliding bars L L, in combination with the stop-lever O, adapted to hold the said bars stationary, as and for the purpose set forth.

6. The weighted cords *i i*, adapted to partially encircle the mass of bristles I, in combination with the reciprocating hooks *i′ i′*, to which the upper ends of the said cords are attached, respectively, as and for the purpose set forth.

7. The combination of the weighted cords *i i*, the reciprocating hooks *i′ i′*, and the adjusting-screw i^3, as and for the purpose set forth.

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