

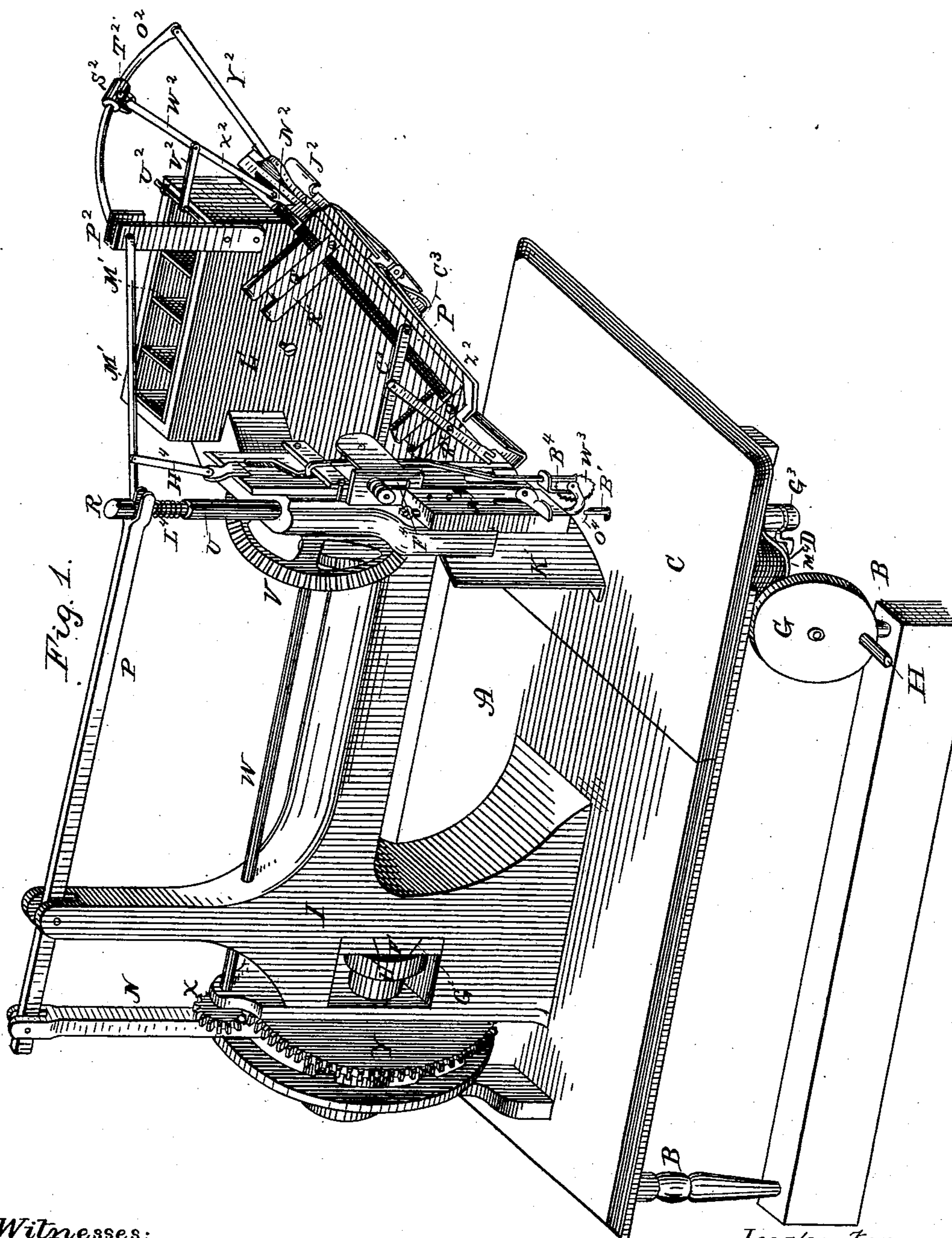
(Model.)

7 Sheets—Sheet 1.

J. H. DODDS.
Brush Machine.

No. 243,528.

Patented June 28, 1881.



Witnesses:

J. W. Garner,
J. R. Little,

Inventor:
James H. Dodds
by A. Snow & Co.
Attorneys.

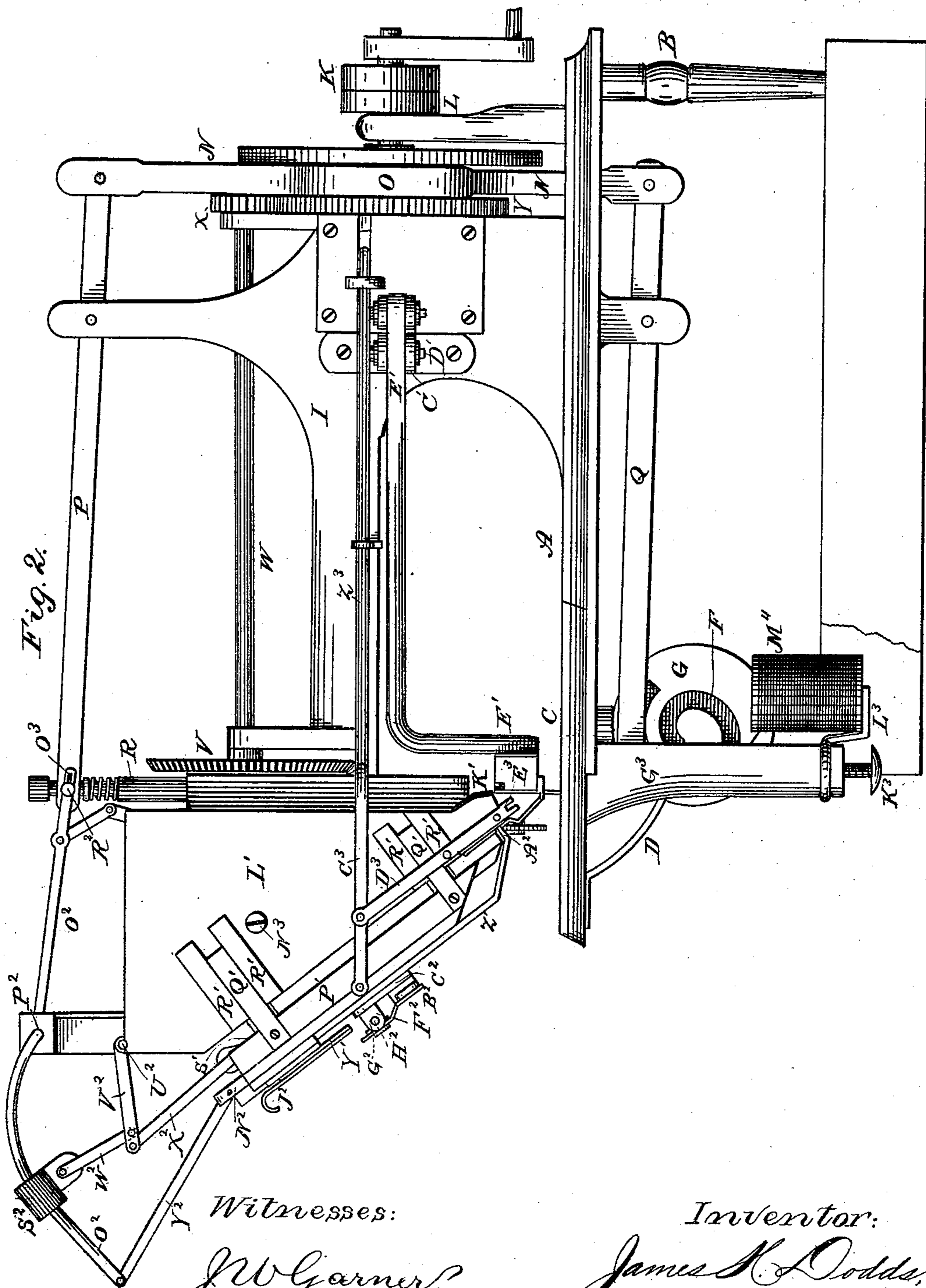
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(Model.)

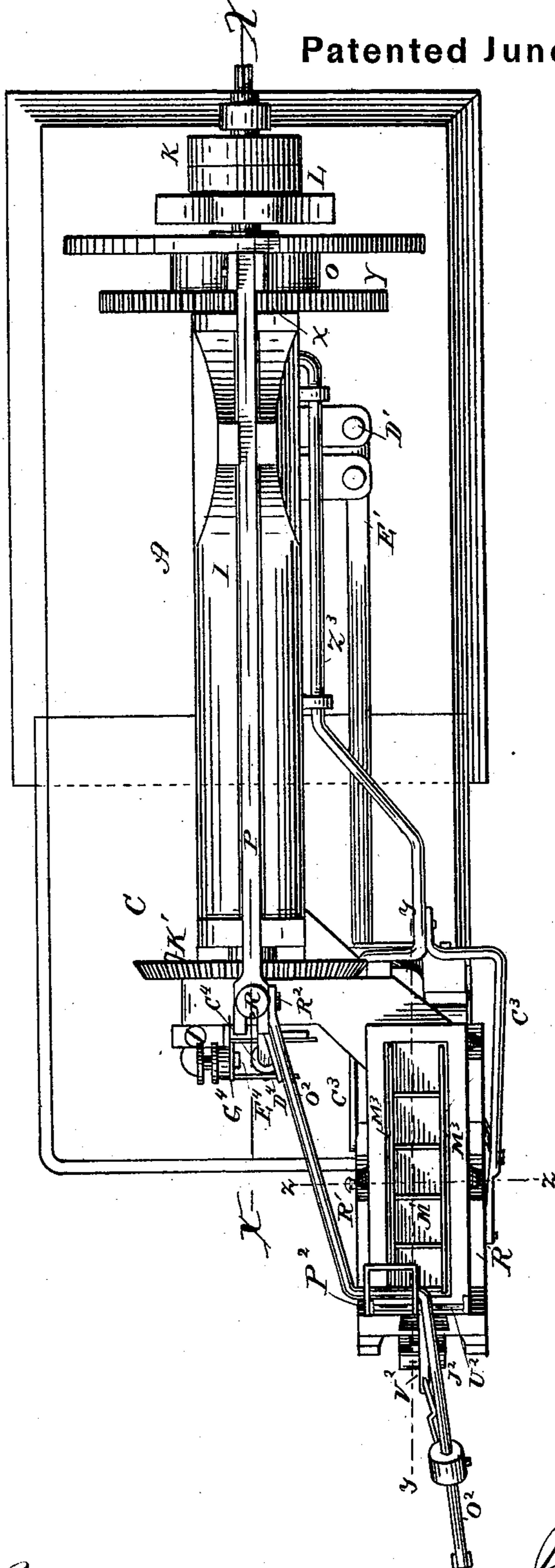
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Fig. 3.



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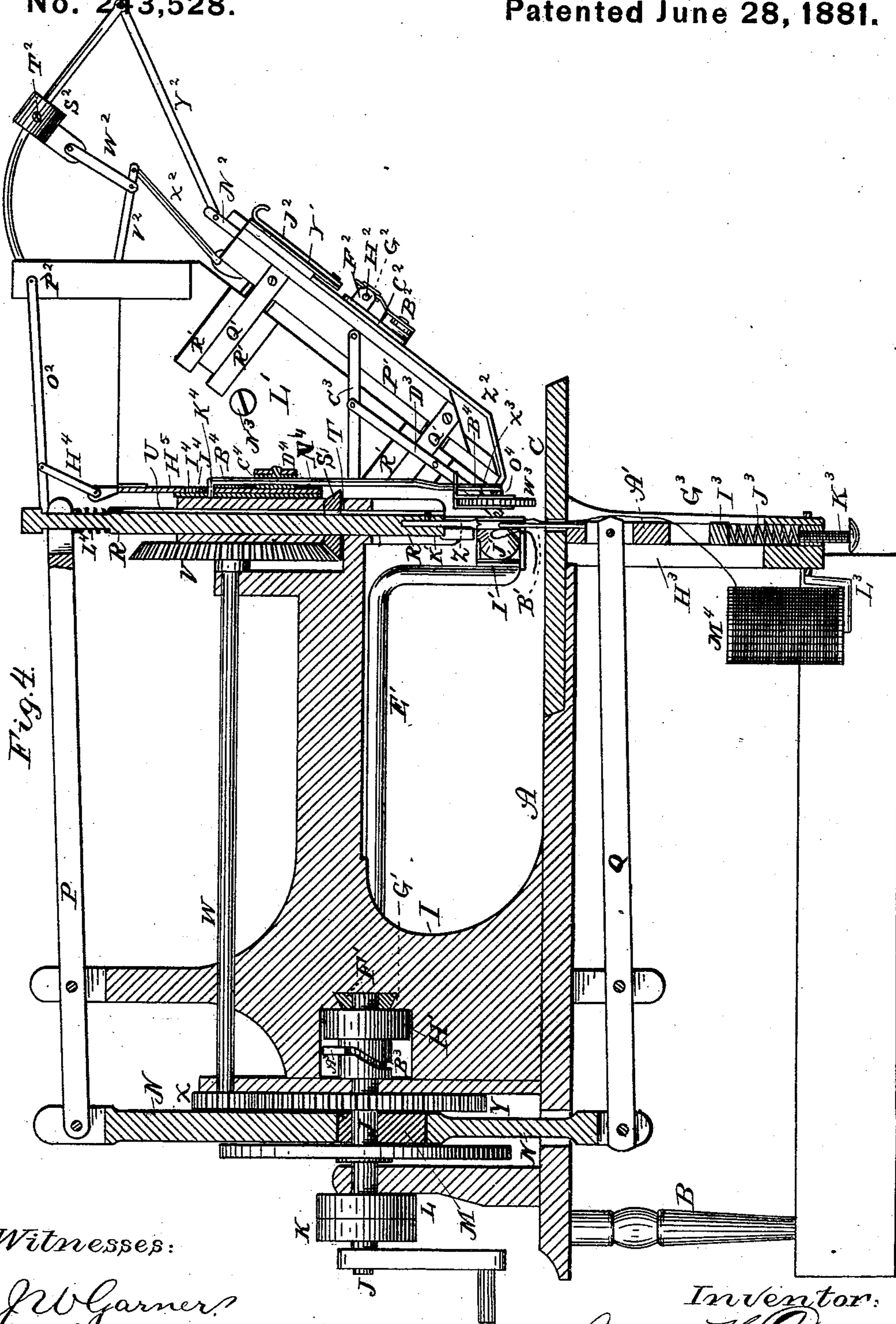
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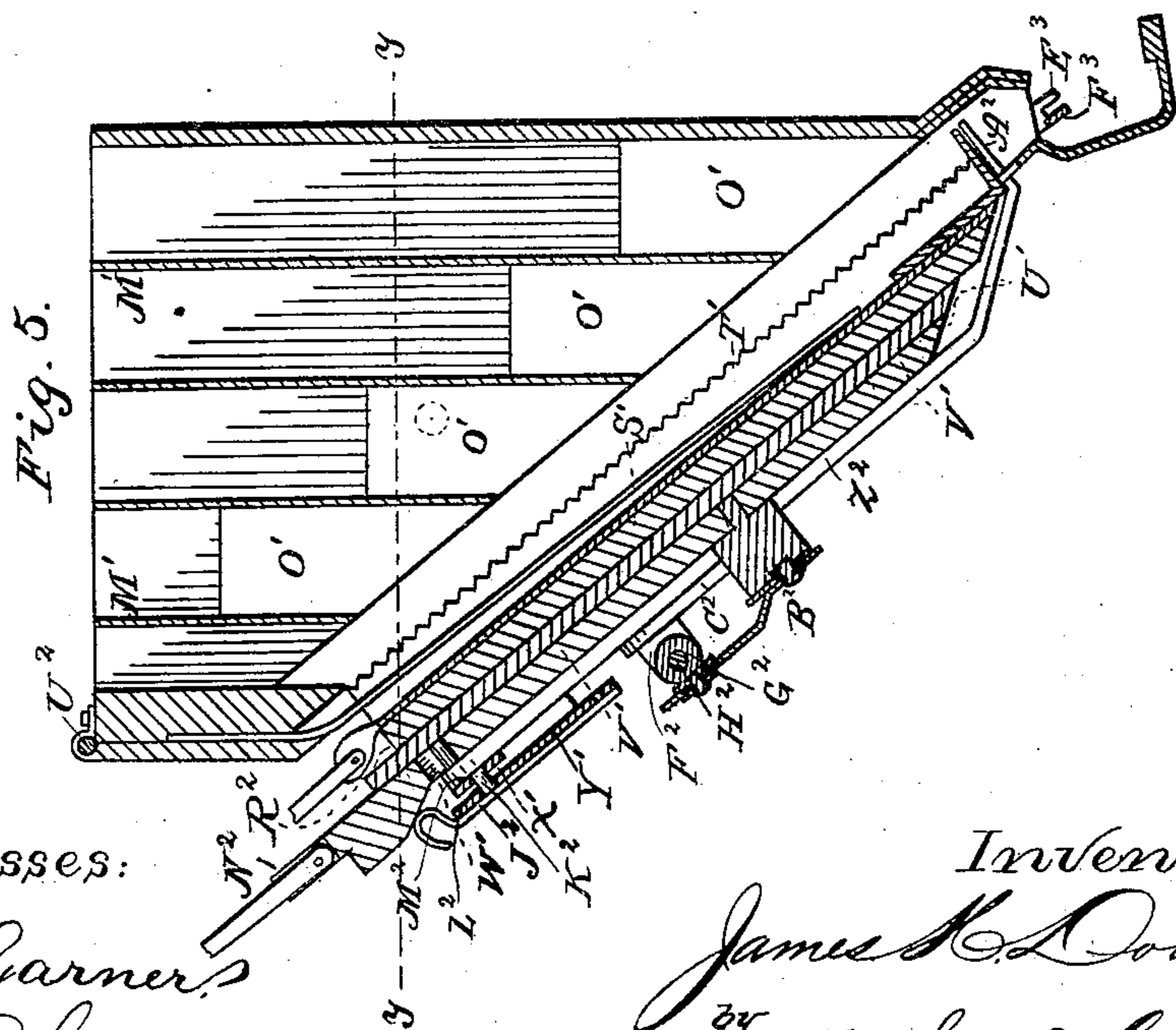
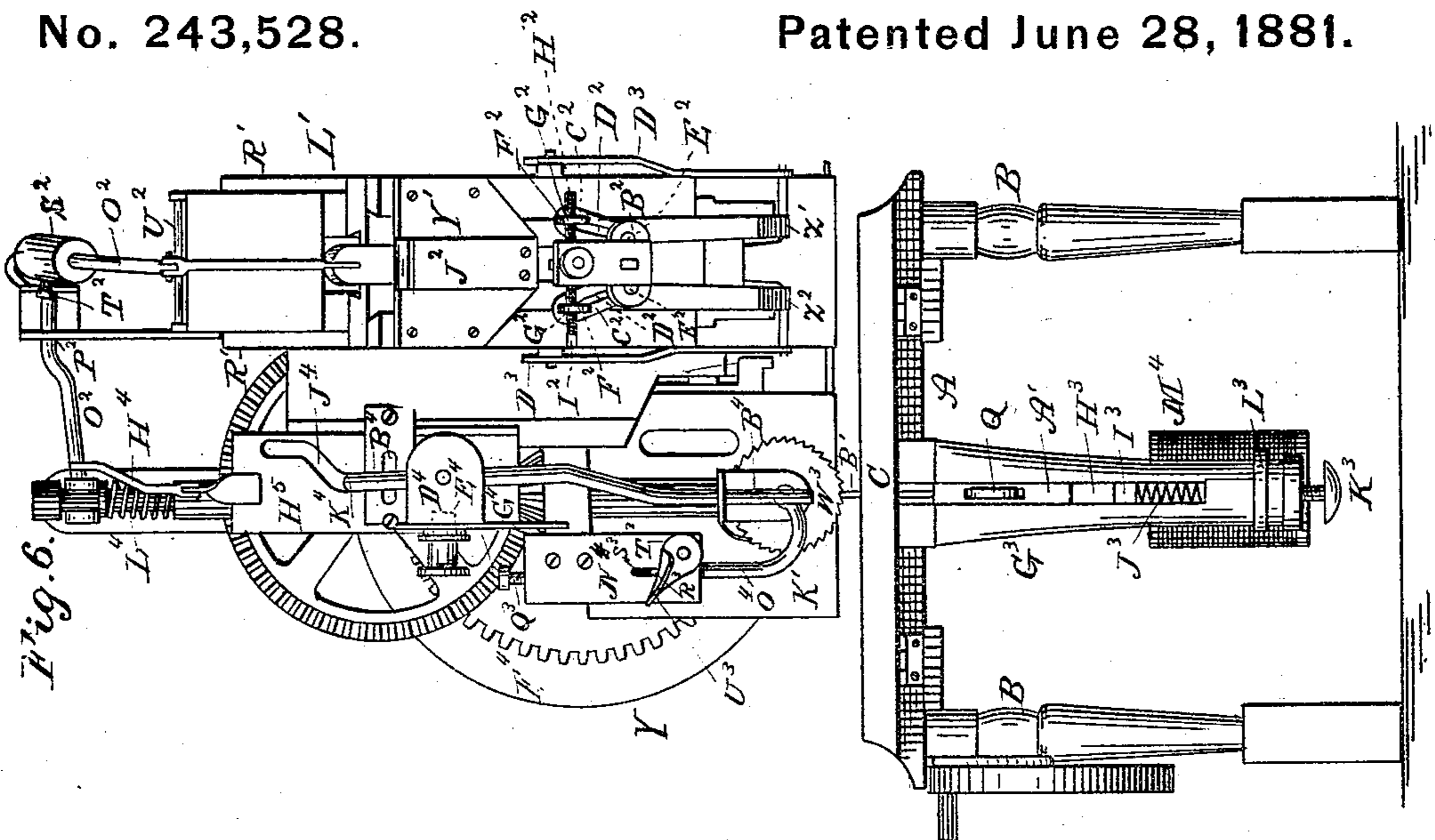
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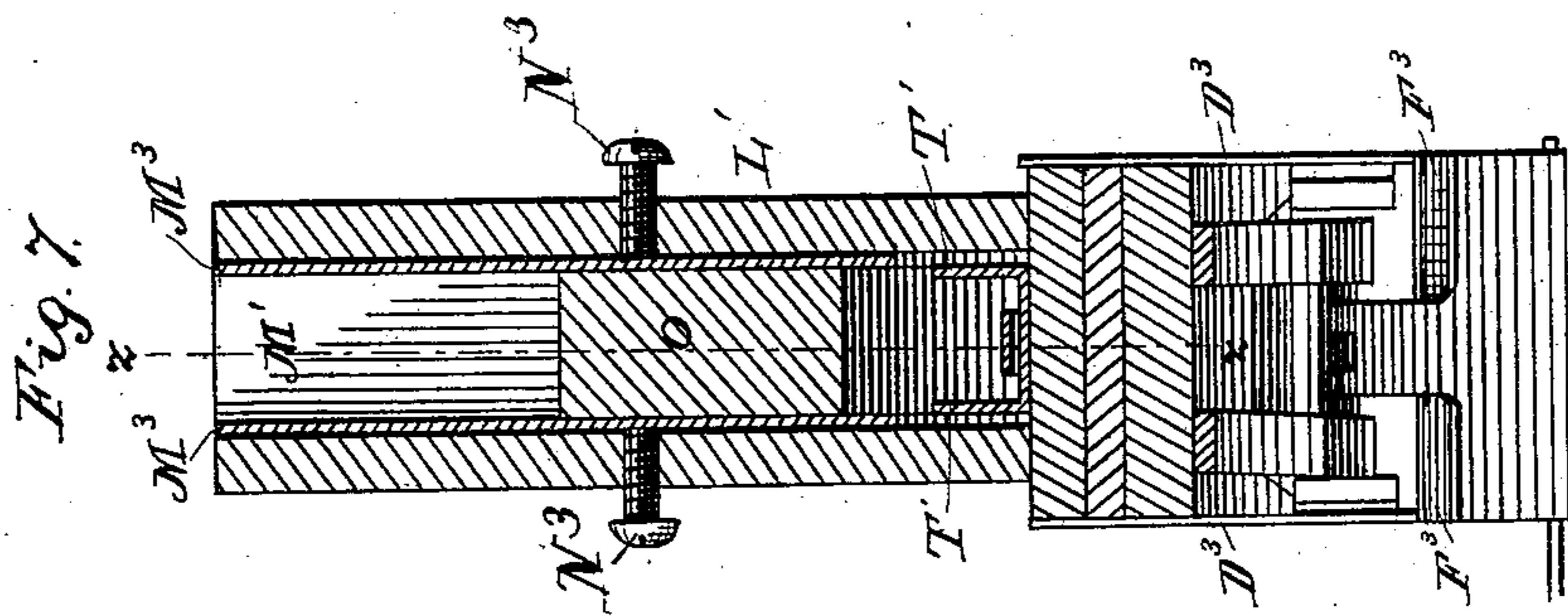
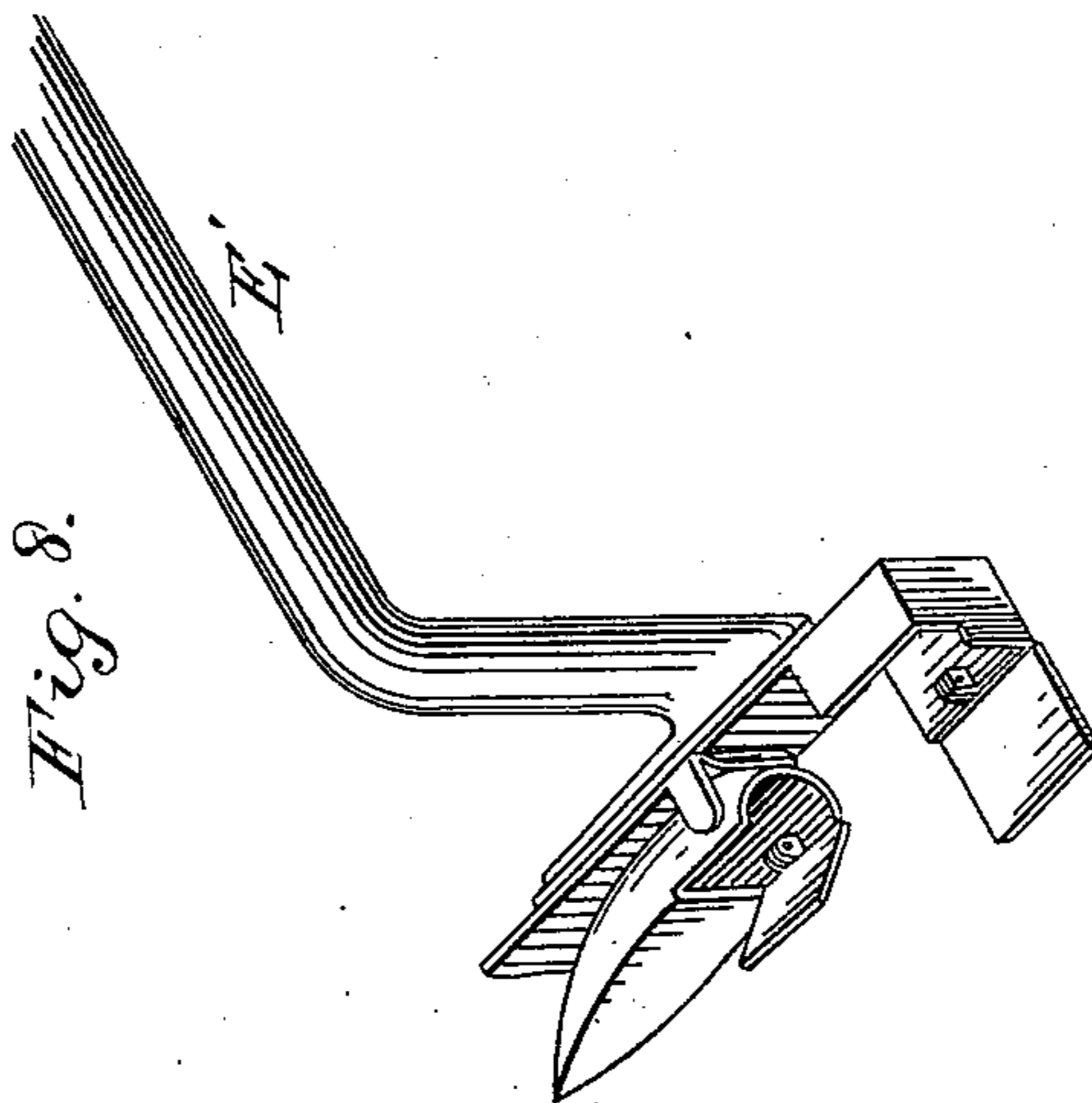
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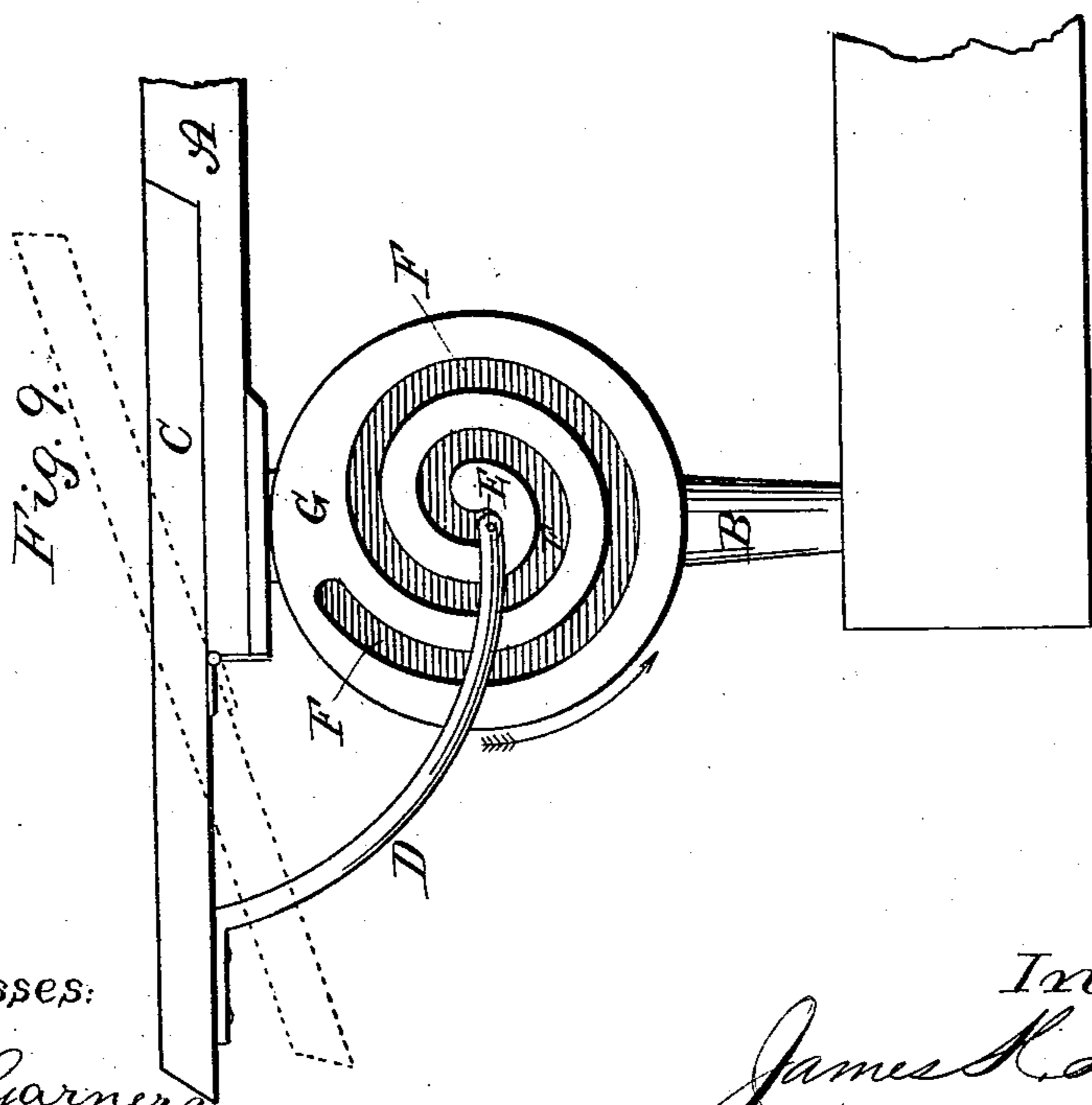
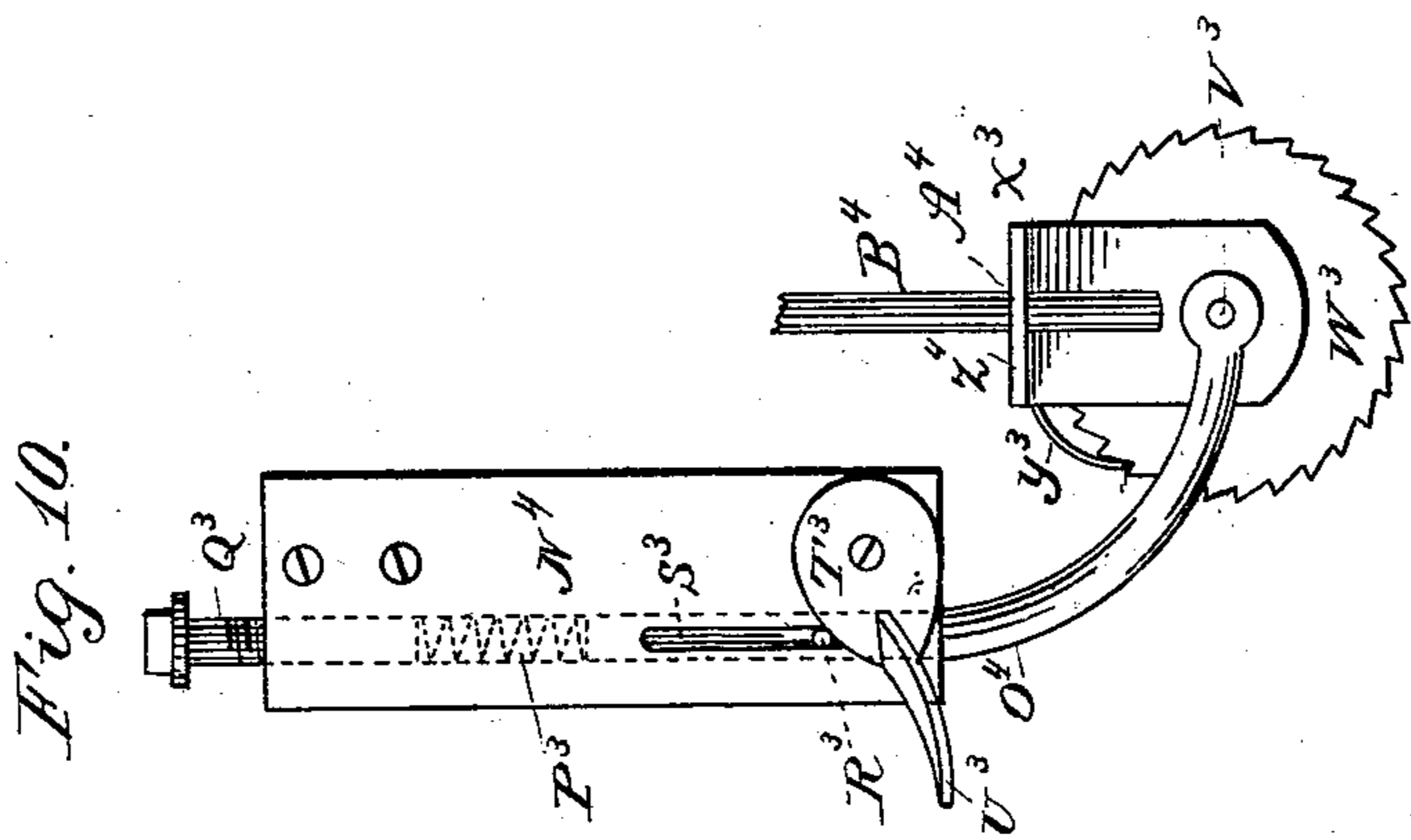
(Model.)

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J. H. DODDS.
Brush Machine.

No. 243,528.

Patented June 28, 1881.



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UNITED STATES PATENT OFFICE.

JAMES H. DODDS, OF PORTSMOUTH, ONTARIO, CANADA.

BRUSH-MACHINE.

SPECIFICATION forming part of Letters Patent No. 243,528, dated June 28, 1881.

Application filed May 5, 1881. (Model.)

To all whom it may concern:

Be it known that I, JAMES H. DODDS, of Portsmouth, in the Province of Ontario and Dominion of Canada, have invented certain new and useful Improvements in Machines for Making Brushes; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to machines for making brushes, or, more properly, for boring the previously-prepared brush-blocks, and dividing, drawing, and tying the bristles; and it consists in certain improvements in the construction of the same, which will be hereinafter more fully described, and in which—

Figure 1. is a perspective view of my improved machine. Fig. 2 is a side view. Fig. 3 is a top view. Fig. 4 is a longitudinal sectional view through the main shaft and levers on the line *xx*, Fig. 3. Fig. 5 is a longitudinal sectional view through the box on the line *yy*, Fig. 3. Fig. 6 is a front view. Fig. 7 is a vertical transverse sectional view through the box on the line *zz*, Fig. 3. Fig. 8 is a detail view of the shuttle and holder. Fig. 9 is a detail view of the tilting table and mechanism for operating the same, and Fig. 10 is a detail view of the ratchet block-feeding mechanism.

Corresponding parts in the several figures are denoted by like letters of reference.

In the drawings hereto annexed, A represents a platform or table, supported upon suitable legs or uprights, B B, and provided at its front end with a hinged or tilting table, C, to support the brush-block.

Pivoted to the under side, near the front end of the tilting table C, is a curved or segmental rod or lever, D, carrying at its extreme end a friction-roller, E, working in an eccentric groove, F, in a wheel or disk, G, journaled to the side of the frame, and provided with a crank or handle, H.

It will be seen that by operating the disk G the tilting table C, with the brush-block supported thereon, may be adjusted to any de-

sired angle at which the perforations are to be made and the bristles to be inserted.

A standard, I, mounted upon the frame A, is provided with suitable bearings for the main shaft J, having pulleys K L for the transmission of power from any suitable source. Shaft J is provided with an eccentric, M, from which motion is communicated through rods N N, connected by a frame, O, encompassing the said eccentric, to levers P Q, located, respectively, above and below the frame, which is provided with suitable fulcrums or bearings for said levers.

To the front end of lever P is journaled a vertical shaft or spindle, R, to which a rotary motion is imparted by means of a pinion, S, fitted upon said spindle, and having a key, T, traveling in a vertical groove, U, therein. Motion is imparted to said pinion by a bevel-wheel, V, fixed upon a shaft, W, suitably mounted, and having a pinion, X, engaging a gear-wheel, Y, upon the main shaft. The shaft or spindle R carries a bit, Z, for boring the brush-block, which is meanwhile supported upon the tilting table.

The lever Q carries at its front end a block, A', in which is secured the needle B', to which a vertical reciprocating motion is thus imparted.

A bracket, C', projecting laterally from the standard I is provided with a vertical pin or pivot, D', for an arm or lever, E', having a pivoted connecting-rod, F', extending through an opening, G', in the side of the standard, so as to be operated by a cam or eccentric, H', fixed upon the main shaft, thus giving a horizontal reciprocating motion to the lever E'. The front end of the latter is curved or bent in a downward direction, and provided with a carrier or holder, I', for the shuttle J'. The shuttle is provided on one side, as shown, with a hinged lid or door for the admission of the bristles, as will be hereinafter described. Brackets K' at the front end of standard I form a way or race for the shuttle.

L' is a box or hopper, secured upon the front end of the standard I, to contain the bristles which are to be made up into brushes. Said box is divided by transverse partitions M' into a series of compartments, N', in which suitable

weights or followers, O' , are to be placed, to force the bristles in a downward direction against the feeder. The construction and arrangement of the latter is as follows: The slanting bottom P' of the hopper L' is provided with arms Q' , adjusted between suitable guide-strips, R' , upon the sides of the box, to which the bottom is thus attached in such a manner as to be capable of being withdrawn a certain distance. The upper side of the bottom is provided with a groove, R^2 , to receive the sliding feeder S' , which has upon its upper side two or more pointed strips or rows of teeth, T' , which serve to push or feed the bristles from the bottoms of the several compartments down toward the bottom of the box or hopper. Upon its under side the bottom P' is provided with a dovetailed groove, U' , in which is fitted a slide, V' , moving vertically. The upper end of said slide is provided with a recess, W' , to receive a second slide, X' , which is held in position by a plate, Y' , secured upon the front or under side of the bottom P' , as shown. Z' Z^2 are what I term the "dividers," consisting of rods pivoted at their upper ends to the slide X' , and provided at their lower ends with inturned teeth A^2 . B^2 is a bracket secured upon the front side of slide V' , and provided with two pivoted arms, C^2 , extending diagonally in opposite directions, and provided with slots D^2 , working over studs E^2 upon the faces of the dividers. The arms C^2 are provided with pivoted lugs F^2 , having threaded openings G^2 , to receive the ends of a double-threaded screw, H^2 , journaled in the bracket B^2 , and having a square seat, I^2 , for a key or wrench, by which it may be turned so as to adjust the slotted arms C^2 , and consequently the throw of the dividers.

J^2 is a spring secured upon the upper side of plate Y' , and rounded or beveled at its upper end, as shown. The spring J^2 is provided with a stud, K^2 , passing through a perforation, L^2 , in plate Y' , and adapted to fit in a recess, M^2 , in the slide X' . The slide V' is provided at its upper end with a shank, N^2 , having a beveled or inclined front side, which, when the said slide is moved in a downward direction, strikes the upper rounded end of the flat spring J^2 , forcing it in an outward direction, and thus releasing the slide X' , which has until then remained stationary. The result of this operation is that, first, the ends of the dividers (which are pivoted to the slide X') are brought toward each other, so as to separate from the bristles forced down by the feeder a suitable quantity to be pushed down into the shuttle; second, the slide V' moves down, carrying with it the slide X' , and consequently the dividers, which push the bristles down into the shuttle, as will be hereinafter described.

The box or hopper L' is provided with double or false sides M^3 , adjustable by means of set-screws N^3 , working in the outer sides, so as to accommodate bristles of any desired length. By means of the double screw H^2 mentioned

above the throw of the ends of the dividers may be regulated for the same purpose.

To operate the feeding mechanism I avail myself of a lever, O^2 , fulcrumed at P^2 to a bracket extending upward from the box or hopper. The rear end of lever O^2 is provided with a slot, O^3 , traveling upon a pin or stud, R^2 , at the front end of lever P , by means of which the said lever O^2 is thus operated. The front part of lever O^2 , or as much of it as is in front of the fulcrum, is curved and provided with a slide, S^2 , adjustable by means of a set-screw, T^2 .

U^2 is a cross-piece, pivoted transversely in suitable bearings upon the upper front end of the hopper, and provided with a forward projecting arm, V^2 , connected with the slide S^2 by means of a pivoted rod, W^2 . The junction of arm V^2 and rod W^2 is connected by a pivoted rod, X^2 , with the upper end of the feeder S' , to which a vertical reciprocating motion is thus imparted, the extent of which is regulated by adjusting the slide S^2 upon the lever O^2 . The T-piece $U^2 V^2$ is employed simply to steady the motion and enable the adjustment to take place. The extreme outer end of lever O^2 is connected by a rod or pitman, Y^2 , with the shank N^2 of slide V' , which latter is thus operated with the result above described—the "throw" of said slide being, of course, longer than that of the feeder.

Z^3 is a rod arranged in suitable slides upon the side of standard I , and provided at its rear end with an arm, A^3 , working in a cam-grooved disk, B^3 , fixed upon the main shaft, by means of which a longitudinal reciprocating motion is thus imparted to the said rod Z^3 . The front end of the latter is forked, as shown, the arms or prongs C^3 being passed by the sides of the box or hopper L' and attached to the sides of the movable bottom P' .

$D^3 D^3$ are arms or levers pivoted to the sides of the box or hopper, and having their upper ends pivoted to arms C^3 , and their lower ends provided with points E^3 , and connected by a cross-piece, F^3 . By this mechanism the movable bottom is, on the upstroke of the feeder, moved in an outward direction, so as to enable the feeder-teeth to pass the bristles, while on the downstroke the bottom is moved back, thus forcing the teeth into the bristles, so as to carry the latter down to the point where they are separated by the dividers, which, the stroke of slide V' being, as above stated, longer than that of the feeder, carry the bunch of bristles down under the cross-piece F^3 . In the meantime the shuttle has been moved back by its operating mechanism, and the pointed ends of the levers D^3 serve to open its lid and that of the carrier, thus enabling the bunch of bristles to be forced by the dividers into the shuttle. When the bottom moves back and the feeder and slide V' up the shuttle moves forward, and its lid and that of the carrier are closed by the pointed levers D^3 . By regulating the throw of the feeder the size of the bunch of bristles

may be increased or reduced, as may be required.

To the under side of the front end of the frame or platform A is secured a tube, G³, for the accommodation of the needle carrier or block A', said tube being provided with a slot, H³, for the end of lever Q. I³ is a slide adjusted under the latter and supported upon a coiled spring, J³, the tension of which may be regulated by a set-screw, K³, at the bottom of the tube. A hook, L³, swiveled upon the lower end of tube G³, or in any other suitable position, carries the reel M⁴, upon which the wire used for sewing or tying the bristles is wound. In threading the machine the wire is first passed between the slide I³ and the end of lever Q, and then upward and through the eye of the needle. It follows that on the down-stroke of lever Q the wire is stretched and clamped between the end of said lever and the slide, thus preventing displacement.

A box or casing, N⁴, secured to the front end of the standard I is provided with a suitable perforation or bearing for the rod or shank O⁴, which is capable of sliding vertically, and is forced in a downward direction by a suitably-arranged coiled spring, P³, the tension of which may be regulated by a set-screw, Q³. The shank O⁴ is provided with a stud, R³, projecting forward through a vertical slot, S³, in the box or case, adjoining which is pivoted a cam, T³, provided with a thumb-piece, U³, by which it may be operated to raise or lift the shank. The latter is curved at its lower end and provided with a stud, V³, upon which is pivoted a ratchet-wheel, W³, and a bracket, X³, having a spring-pawl, Y³, for operating the said ratchet-wheel. The bracket X³ is provided with a forward-projecting plate, Z⁴, having a perforation, A⁴, to receive the lower end of a lever, B⁴, fulcrumed in a tube, C⁴, swiveled in a slide, D⁴, which latter is adjustable by a set-screw, E⁴, in a vertical slot, F⁴, formed in a bracket, G⁴, extending forward from the front end of standard I, as shown.

Connected to the front end of lever P (or to the rear end of lever O²) by means of a pivoted rod, H⁴, is a plate, H⁵, sliding vertically in suitable bearings, I⁴, upon the front end of the standard, and provided with a vertical diagonal slot, J⁴, to receive a stud or friction-roller, K⁴, at the upper end of lever B⁴. It will be seen that when the slotted plate H⁵ is vertically reciprocated it operates lever B⁴, and through it the pivoted bracket X³ and the ratchet-wheel W³, the latter to any desired extent, which may be regulated by properly adjusting the fulcrum of the lever B⁴. The brush block or blank, which is in practice to be placed under the ratchet-wheel, is by the latter fed forward intermittingly between the drill and the needle.

It is proper to state that upon the spindle R, under the end of lever P, is adjusted a spring or cushion, L⁴, to avoid any shock or unnecessary concussion during operation of the machine.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of my invention will be readily understood.

By adjusting the tilting table C the brush-block, which is placed thereupon, may be bored at any desired angle. When the machine is operated it is fed forward automatically by the mechanism described under the drill or auger, which, as the lever P and spindle R move downward, bores a hole of the requisite size. The shuttle, which has in the meantime received a bunch of bristles, now moves forward through the wire loop carried up by the needle, which has at the same time ascended. Next, the needle descends, causing the wire loop to draw the bristles through the opening in the brush-block, which is now fed forward, while the wire is tightened by the clamping mechanism Q I³. Simultaneously the shuttle moves back for the reception of a new bunch of bristles, and the drill again descends for a repetition of the operation, the brush-block having been moved forward exactly the distance required.

My improved machine for making brushes is, as will be seen, nearly automatic in its operation, attendance being only required to replenish the box or hopper with bristles and to feed the brush-blocks. In spite of this it is very simple in its construction, effective in operation, and comparatively inexpensive.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a machine for making brushes, the combination, with the frame or platform A, having hinged or tilting table C, of the curved rod D, having friction-roller E, and the wheel or disk G, having eccentric groove F, substantially as herein described, for the purpose set forth.

2. The combination, with the bristle box or hopper, of the feeder, constructed and arranged, as herein described, to reciprocate in an inclined plane, the lever P, lever O², slide S², and suitable connecting-rods, substantially as herein described, for the purpose set forth.

3. The combination, with the hopper having movable bottom and feed-slide, arranged as herein described, of a slide having pivoted rods or dividers to separate the proper quantity of bristles from the feeder and push them beyond the latter into the shuttle, and suitable operating mechanism, as and for the purpose set forth.

4. The herein-described hopper having sliding bottom and pivoted rods or dividers, in combination with mechanism for carrying their lower ends alternately toward each other and apart, and mechanism for regulating such throw, as and for the purpose set forth.

5. The combination of the slide V' with bracket B², having pivoted slotted arms C², provided with swiveled threaded lugs F², double screw H², secondary slide X', having recess M², and pivoted rods or dividers Z', provided with studs E², plate Y', having perforation L²,

flat spring J², having stud K² and rounded top, and the beveled shank N² at the upper end of slide V', all arranged and operating substantially as herein described, for the purpose
5 shown and specified.

6. The combination of the box or hopper L', having movable bottom P', provided with feed-slide, and slides V' X', carrying the dividers Z' Z² of the lever P, lever O², having curved
10 end and sleeve S², and suitable connecting-rods, all arranged and operating substantially as and for the purpose herein set forth.

7. The combination of the box or hopper L', having movable bottom P', longitudinally-sliding forked rod Z³, and the levers D³ D³, having pointed ends and transverse connecting-piece, with the herein-described shuttle and carrier having hinged lids or covers, and suitable operating mechanism, substantially as
15 and for the purpose set forth.

8. The mechanism for feeding the brush-block, which consists of a shank or presser-foot, O⁴, having ratchet-wheel W³, and pivoted bracket X³, provided with spring-pawl Y³,

lever B⁴, having adjustable fulcrum C⁴, and
25 mechanism for operating said lever, substantially as and for the purpose herein shown and specified.

9. The combination of the vertically-slotted bracket G⁴ with adjustable slide D⁴, having
30 swiveled tube C⁴, lever B⁴, having stud or friction-roller K⁴, and the slotted plate H⁵, connected to lever O² by rod H⁴, substantially as and for the purpose set forth.

10. The combination, with the lever Q, having
35 needle-carrier A', of the slotted tube G³, having adjustable coiled spring J³, and clamping-slide I³, substantially as and for the purpose shown and specified.

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

JAMES H. DODDS.

Witnesses:

DAVID JOHN HAGERTY,
RICHARD MARK GRAHAM,
JOHN MUDIE.