

(No Model.)

3 Sheets—Sheet 1.

C. D. HUGHES.
BRUSH MAKING MACHINE.

No. 429,921.

Patented June 10, 1890.

Fig. 1

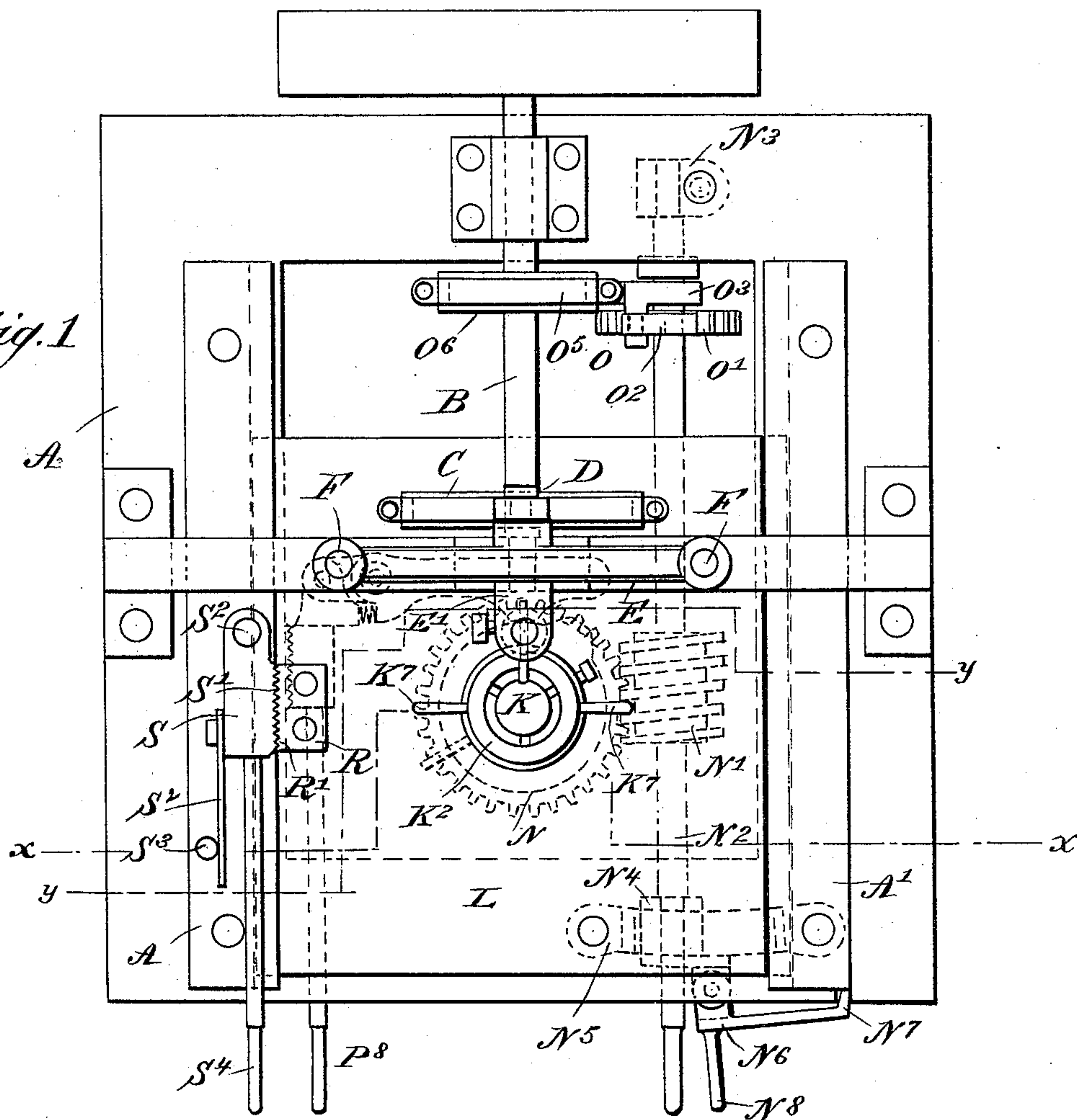
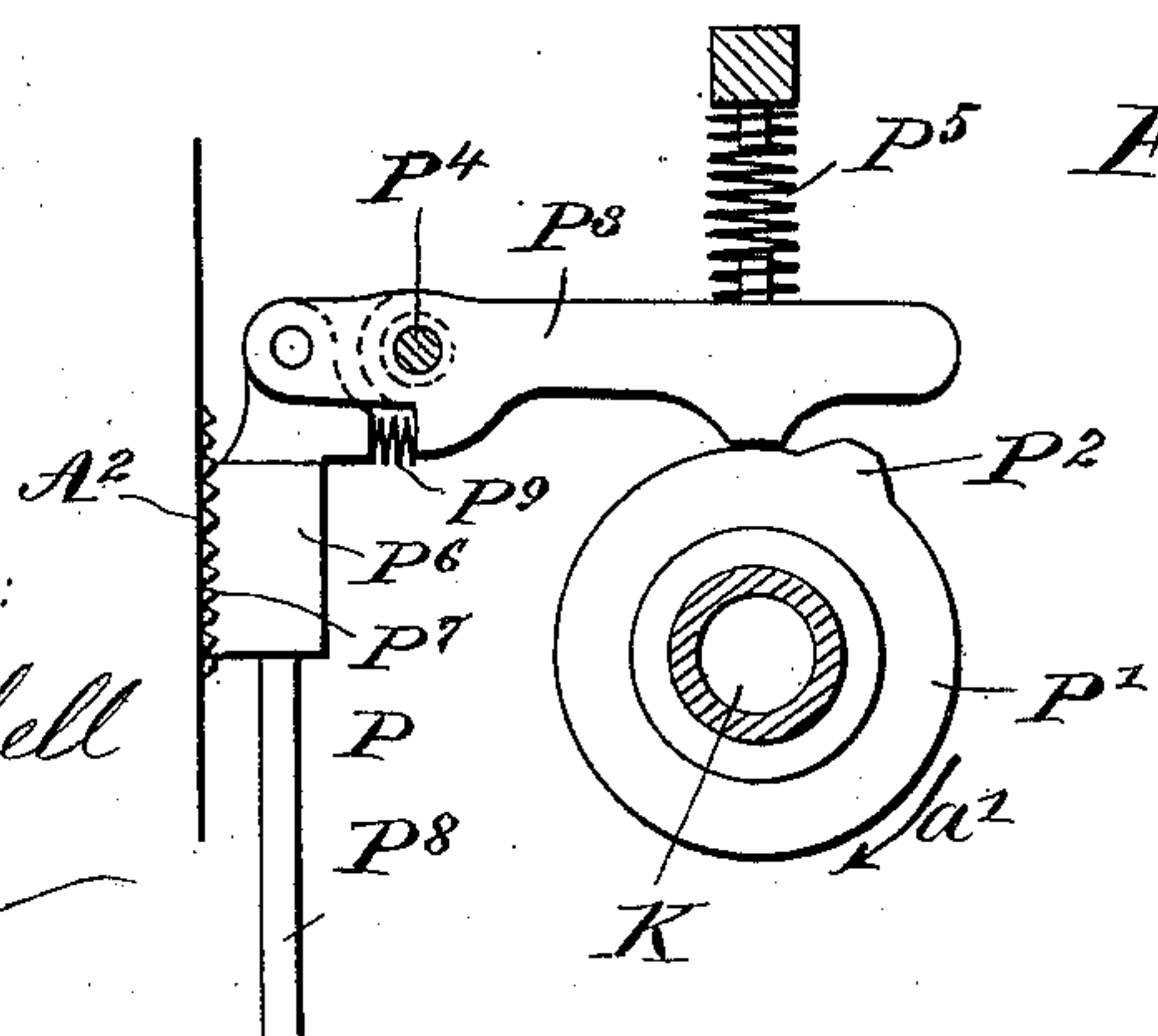


Fig. 3.



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C. D. Hughes

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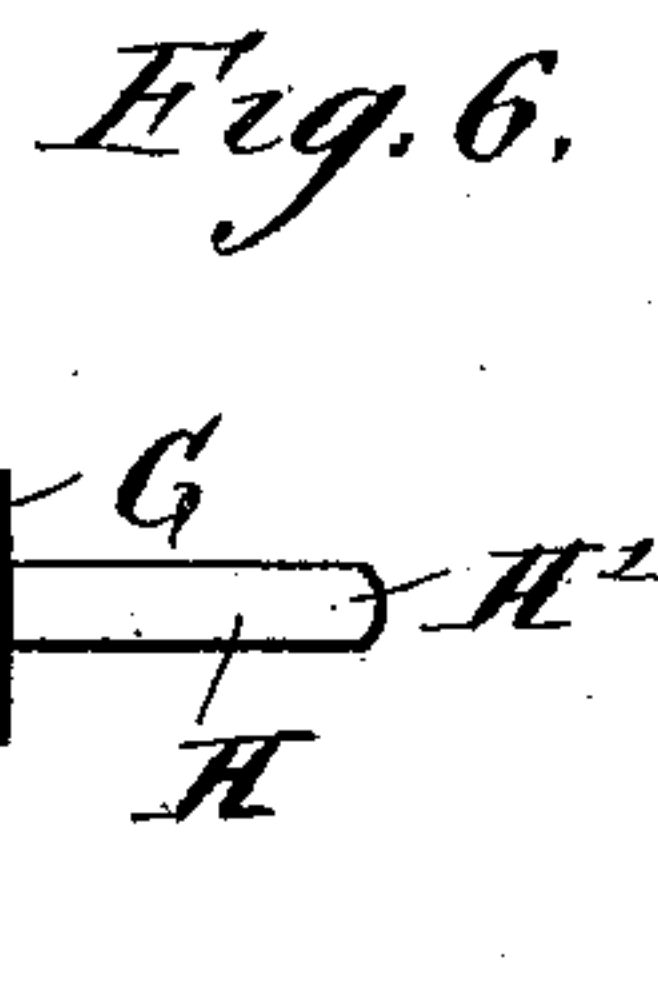
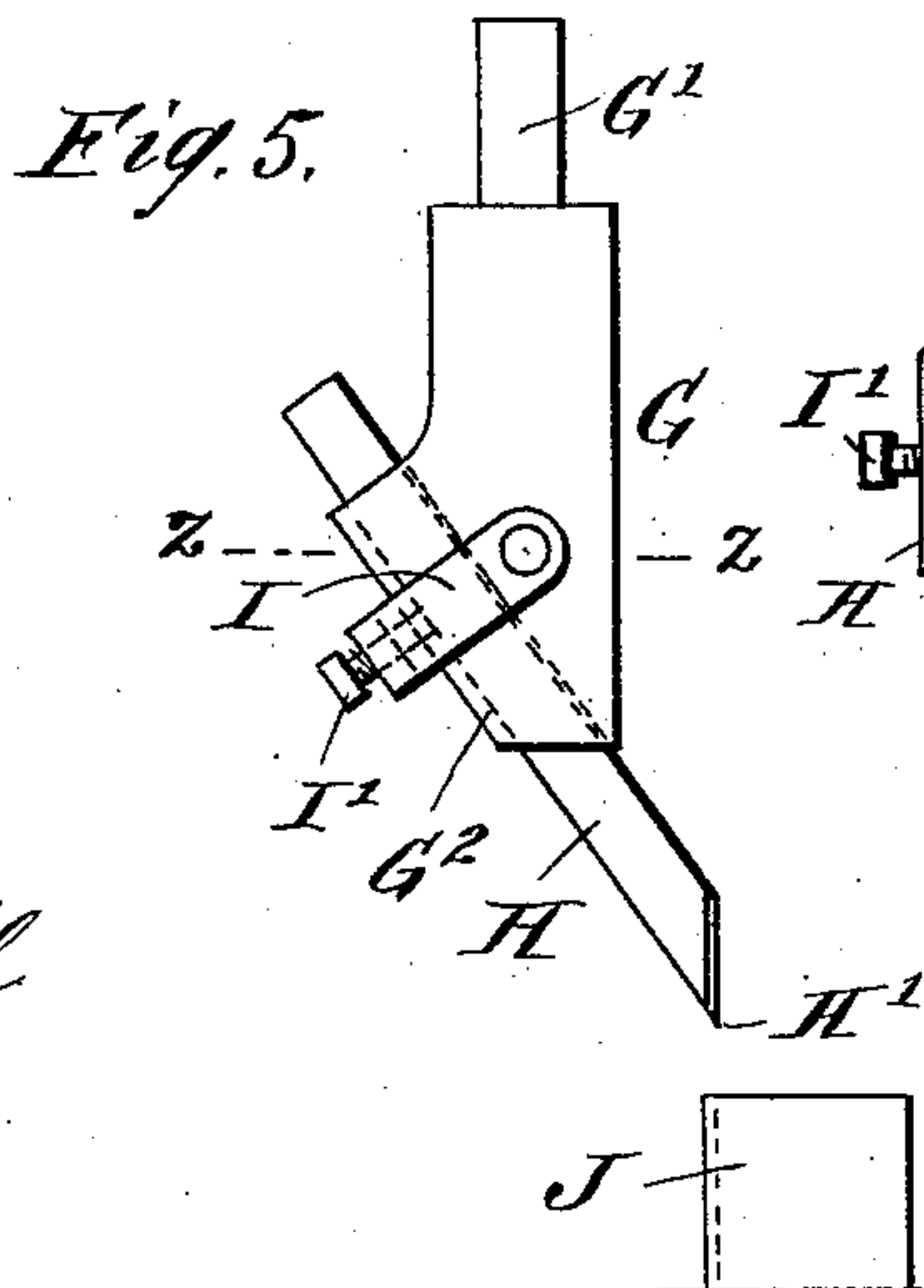
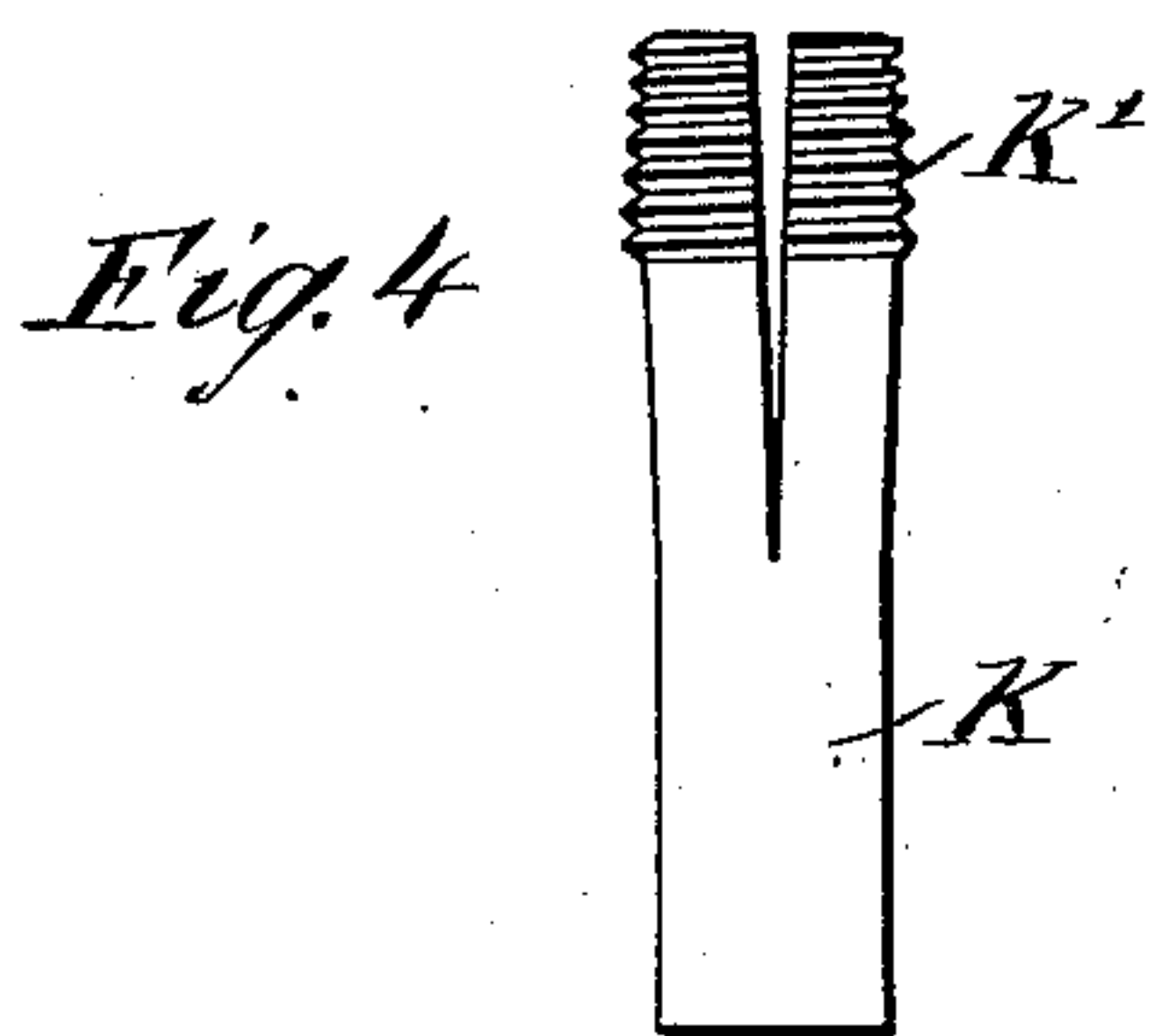
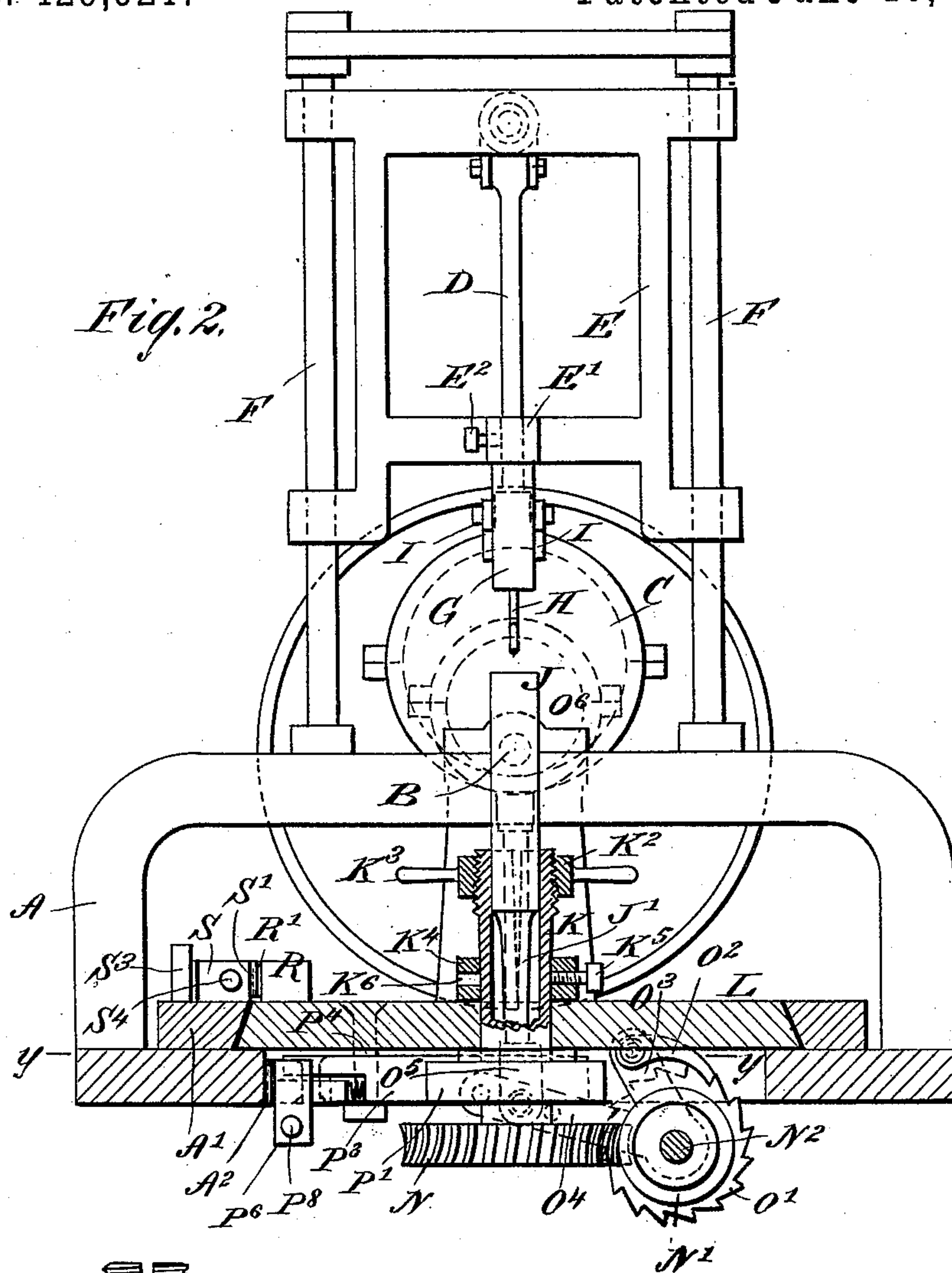
Munn & Co.

ATTORNEYS

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Fig. 7.

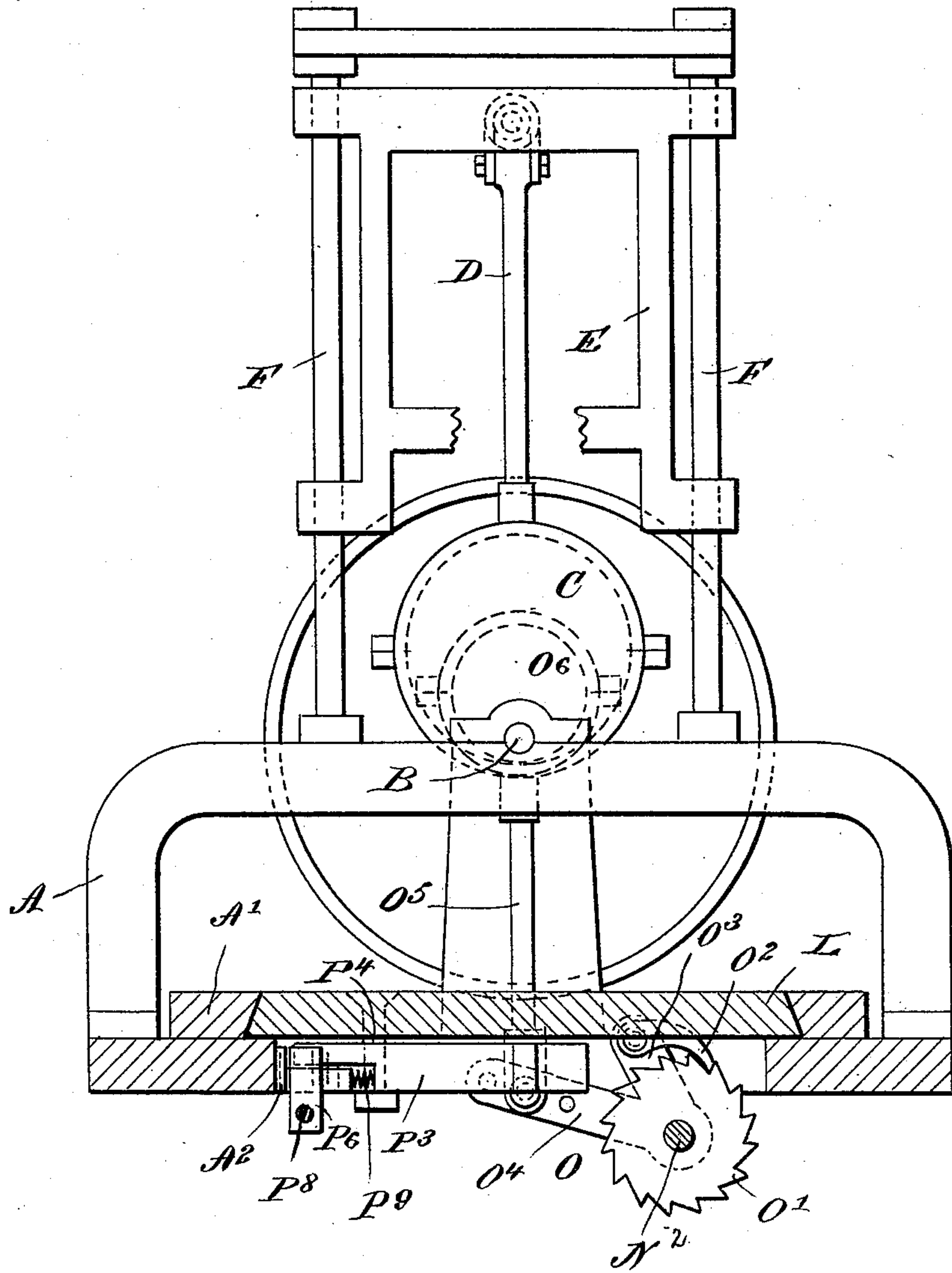
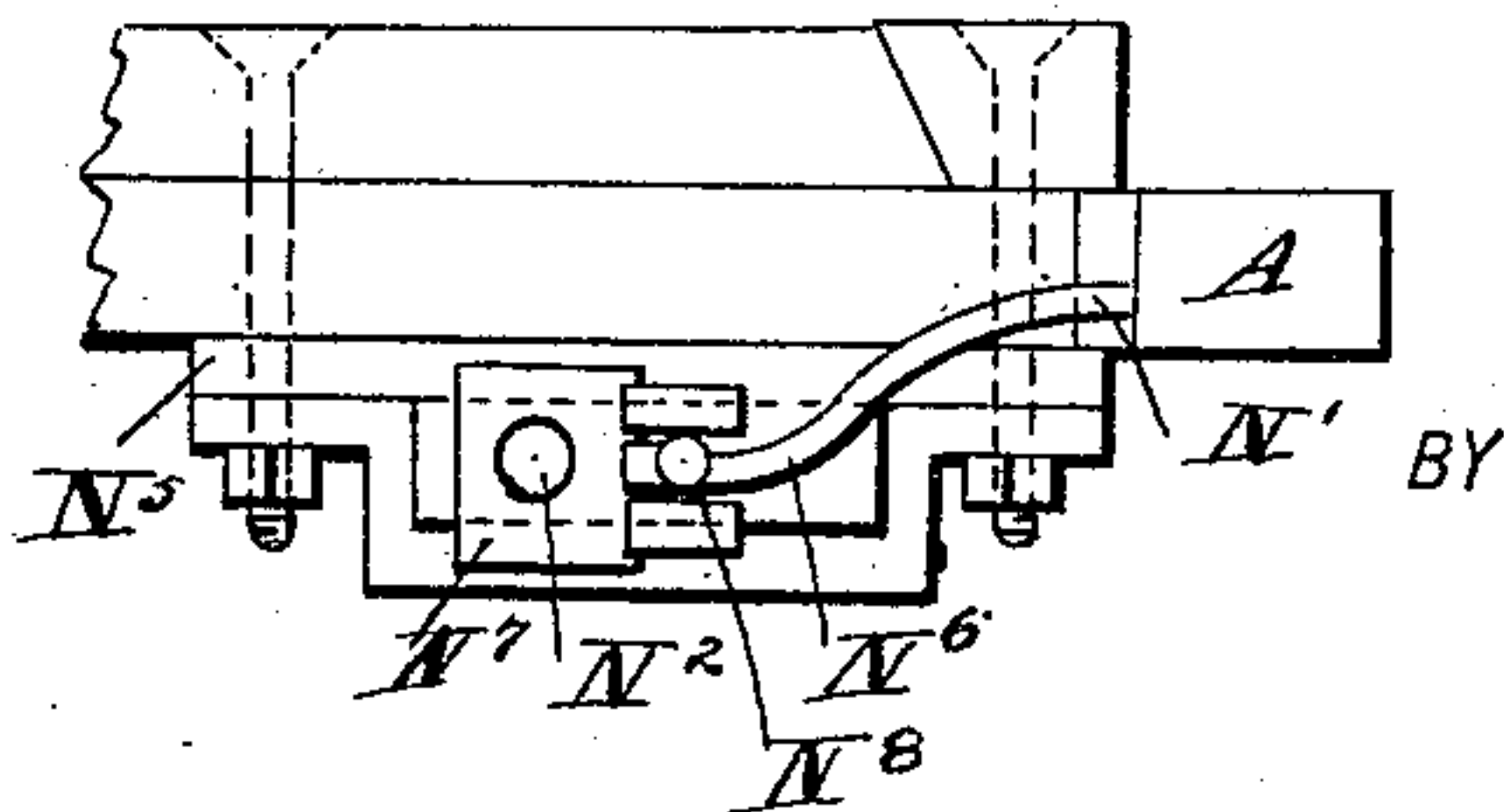


Fig. 8.



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UNITED STATES PATENT OFFICE.

CHARLES D. HUGHES, OF BROOKLYN, NEW YORK, ASSIGNOR TO ARTHUR S. FRENCH, OF SAME PLACE.

BRUSH-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 429,921, dated June 10, 1890.

Application filed November 20, 1889. Serial No. 330,986. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. HUGHES, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Brush-Making Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved machine which is simple and durable in construction, very effective in operation, and serves for making a complete brush from a single block of wood, the bristles of the brush being cut out of the solid block and integral with the same, on which brush is also formed a handle.

The invention consists of a reciprocating tool-holder and a block-holder held beneath the said tool-holder and mounted to turn in conjunction with the stroke of the reciprocating tool-holder.

The invention also consists of certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improvement. Fig. 2 is a sectional front view of the same on the line *xx* of Fig. 1. Fig. 3 is a sectional plan view of part of the improvement on the line *yy* of Fig. 2. Fig. 4 is a side elevation of the block-holder. Fig. 5 is a side elevation of the tool-holder. Fig. 6 is a sectional plan view of the same on the line *zz* of Fig. 5. Fig. 7 is a section on line *yy*, Fig. 1; and Fig. 8 is detail view showing the sliding bearing and latch for locking the same in position.

The improved brush-making machine is mounted on a suitably-constructed frame A, on which is mounted to turn in suitable bearings the main driving-shaft B, carrying near one end an eccentric C, pivotally-connected by its eccentric-rod D with a cross-head E, mounted to slide vertically in suitable guideways F, erected on the main frame A.

On the cross-head E is formed an apertured lug E', adapted to receive the shank G' of a

tool-holder H, supporting the tool H for cutting the bristles. The shank G' of the tool-holder G is secured in place in the lug E' by a set-screw E², which when slackened permits of turning the tool-holder G, with its shank G', in the lug E' until the tool H is in proper position for cutting on the block J, held in a suitable block-holder K, located below the reciprocating tool-holder G. The tool-holder G is provided with an inclined recess G², in which fits the tool H, and the latter is held in place by a U-shaped clamp I, pivoted on the tool-holder G, and carrying a set-screw I', screwing against the front side of the tool H, as is plainly shown in Figs. 5 and 6. The tool H is held in an inclined position, so that its cutting-end stands vertically in relation to the upright block of wood J, as is plainly shown in Fig. 5. The cutting-edge of the tool H is rounded off at H', (see Fig. 6,) so that the shaving cut off of the edge of the block J is rounded off at its inside.

The block-holder K is preferably made in the shape of a hollow tube, (see Fig. 4,) in which the round block of wood J is set, and the upper end of the said tube is split and provided with a conical threaded head K', on which screws the nut K², provided with suitable handles K³ for conveniently turning the said nut K² to press the split ends of the tube together, so as to clamp the block of wood in place on the said tube. The tube K passes loosely through a feed-table L, mounted to slide transversely in suitable guideways A', formed on the bed of the frame A.

In order to hold the block-holder K in place and permit the same to turn in the table L, a collar K⁴ is secured on the tube by a set-screw K⁵, said collar resting on top of the table L. The collar K⁴ is also provided with a series of apertures K⁶, adapted to receive rods or pins K⁷ for conveniently turning the block-holder K by hand whenever desired.

At the lower end of the tube of the block-holder K is secured a worm-wheel N, which meshes into a worm N', secured on a shaft N², mounted to turn at one end of a bearing N³, pivoted to the under side of the bed-plate of the frame A in such a manner as to swing

horizontally. The other end of the shaft N^2 is mounted to turn in a journal-box N^4 , mounted to slide in a slotted guide N^5 , secured on the under side of the bed-plate of the frame A. (See Fig. 1.)

On the journal-box N^4 is pivoted a latch N^6 , provided with the bent lug N^7 , adapted to engage a recess in the bed-plate, so as to lock the journal-box N^4 into one end of the guide N^5 . A handle N^8 is formed on the latch N^6 , which disengages the lug N^7 from the notch in the bed-plate, so as to permit of sliding the shaft N^2 outward, in order to disengage the worm N' from the worm-wheel N whenever it is desired to turn the block-holder K by hand or for other purposes.

The shaft N^2 receives an intermittent rotary motion by means of a device O, connected with the main driving-shaft B. The device O is provided with a ratchet-wheel O' , secured on the shaft N^2 and engaged by a pawl O^2 , pivoted on an arm O^3 , loosely fulcrumed on the shaft N^2 . A second arm O^4 projects from the arm O^3 and is connected with the eccentric-rod O^5 of an eccentric O^6 , secured on the main shaft B. The eccentrics O^6 and C stand in line with each other, so that when the eccentric C imparts a downstroke to the cross-head E the other eccentric O^6 acts on the arms O^4 and O^3 in such a manner that the last-named arm O^3 drags the pawl O^2 over the back of the teeth of the ratchet-wheel O' , so that the shaft N^2 remains at a standstill during the downward stroke of the cross-head E and the tool-holder H, carried by the said cross-head.

When the eccentric C imparts an upstroke to the cross-head E, then the eccentric O^6 , by acting on the arms O^4 and O^3 , causes the latter to move the ratchet-wheel O' by the pawl O^2 so that the shaft N^2 turns, and by the worm N' and the worm-wheel N turns the block-holder K, supporting the block of wood J. Thus at the downstroke of the tool H the block J is at a standstill, while at the upstroke of the tool H the block J is turned to present a new place for the tool edge to act on when on its next following downstroke. It will be seen that the tool H cuts downward on the vertical block J, so as to cut a strip which remains connected at its lower end to the block of wood, and forms one of the bristles of the brush. The block is then turned to permit the tool H to make another cut to form a second bristle, and so on until the tool has cut around the block once, after which the block-holder K must be shifted rearward, so as to permit the tool H to cut a second circular row of bristles from the block. In order to accomplish this, the table L, carrying the block-holder K, is mounted to slide, and is automatically fed rearward by a device P, presently to be described, and illustrated in Figs. 2 and 3.

On the tube of the brush-holder K is secured a wheel P' , provided on its periphery with a tooth or projection P^2 , adapted to engage at every revolution of the said wheel P'

the lug formed on the lever P^3 , pivoted at P^4 to the underside of the feed-table L, to swing horizontally. A spring P^5 is pressed on the said lever P^3 , so as to hold its lug in contact with the periphery of the wheel P' and the tooth P^2 . The end of the lever P^3 is pivotally connected with a block P^6 , provided on one side with teeth P^7 , meshing into rack-teeth A^2 , formed on the bed-plate of the frame A, as is plainly shown in Fig. 3. A handle P^8 is secured on the block P^6 and extends to the front of the machine, to be taken hold of by the operator whenever desired. A spring P^9 is placed between the pivoted block P^6 and the lever P^3 , so as to make the said block yielding to permit the teeth P^7 to slide over the teeth A^2 after the tooth P^2 of the wheel P' has passed over the lug on the lever P^3 .

It will be seen that when the several parts are in the position shown in Fig. 3 and the wheel P' turns in the direction of the arrow a' its tooth P^2 can finally engage the projection on the lever P^3 , move the same rearward against the tension of the spring P^5 , the block P^6 being the fulcrum, so that the table L is slid rearward by being pivotally connected at P^4 with the said lever P^3 . Now when this has been accomplished the operator takes hold of the handle P^8 , moving the same to the right, so as to disengage the teeth P^7 from the teeth A^2 , whereby the spring P^5 will press the lever P^3 forward, the pivot P^4 , held on the table L, being the fulcrum, so that the toothed block P^6 is drawn rearward, and when the operator now releases his hold on the lever P^8 the block P^6 again engages with its teeth P^7 the teeth A^2 on the bed-plate of the frame A. The table L is then again locked in place until the tooth P^2 again acts on the projection of the lever P^3 in the manner above described. In order to additionally lock the table L in place, a toothed block R is secured to the top of the said table and engages with its very fine teeth R' correspondingly-shaped teeth S' , formed on one side of a block S, pivoted at S^2 to the top of one of the guideways A' on the bed-plate of the frame. A spring S^3 is secured to the block S and rests with its free end against the pin S^3 , projecting from the said guideway A' . A handle S^4 is secured to the said block S and projects from the front of the machine, to be taken hold of by the operator to disengage the block S from the fixed block R whenever desired.

The operation is as follows: A cylindrical block of wood J is provided with a handle end J' , which is inserted in the tube of the block-holder K, after which the block is secured in place in the said tube by adjusting the nut K^2 , as previously described, so that part of the block projects upward from the top of the holder K. The cutting-edge H' of the tool H then stands in line with the periphery of the block, so as to cut a strip out of the latter when moving downward, as previously described. When the tool is on its upstroke, the block-holder K is turned a short

distance, as previously described, so that the tool H on its downward stroke again cuts a strip of shaving on the block. The tool in the holder G passes downward a suitable distance on the block J without cutting off the strip it has been cutting, and the said strip remains attached on the lower part of the block, so that when the entire upper part of the block has been cut in strips the brush is completed by the bristles being integral parts with the lower part of the block and its handle J'.

It will be seen that when the tool has made the first cuts around the block J then the tooth P² of the wheel P' on the block-holder K engages the lever P³, as above described, so as to shift the table L rearward a distance corresponding to a new cut to be made in the block by the tool H. The strips cut by the tool H are turned slightly in a spiral shape, and the thickness of the strips decreases from the outside to the center of the brush, on account of the decrease in diameter of the block as operated on by the tool H and the regular feed imparted to the holder K from the shaft N².

The brush as formed by the machine being a new article of manufacture forms the subject-matter of an additional application.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a brush-making machine, the combination, with a main driving-shaft, of a tool-holder receiving a reciprocating motion from the said main shaft, a block-holder held beneath the said tool-holder and receiving an intermittent rotary motion from the said main shaft, and an intermediate mechanism for connecting the said main shaft with the said reciprocating tool-holder, and an intermediate mechanism for connecting the said main shaft with the said block-holder, substantially as shown and described.

2. In a brush-making machine, the combination, with a block-holder mounted to turn, of a table in which the said block-holder turns, a feeding device P, operated from the said block-holder and serving to impart a sliding motion to the table, and a locking mechanism for holding the said table in place after being moved by the said feeding mechanism, substantially as shown and described.

3. In a brush-making machine, the combination, with a fixed rack, of a toothed block adapted to engage the said rack, a lever pivotally connected with the said toothed block, a feed-table on which the said lever is fulcrumed, and a wheel mounted to turn and provided with a tooth for operating on the said lever, substantially as shown and described.

4. In a brush-making machine, the combination, with a fixed rack, of a toothed block adapted to engage the said rack, a lever pivotally connected with the said toothed block, a feed-table on which the said lever is ful-

crumed, a wheel mounted to turn and provided with a tooth for operating on the said lever, and a block-holder mounted to turn in the said table and carrying the said wheel, substantially as shown and described.

5. In a brush-making machine, the combination, with a fixed rack, of a toothed block adapted to engage the said rack, a lever pivotally connected with the said toothed block, a feed-table on which the said lever is fulcrumed, a spring acting said lever, a wheel mounted to turn and provided with a tooth for operating on the said lever, and a block-holder mounted to turn in the said table and carrying the said wheel, substantially as shown and described.

6. In a brush-making machine, the combination, with a feed-table and a toothed block secured thereon, of a pivoted block provided with teeth adapted to engage the said toothed block, a spring acting on the said pivoted block, and a handle secured on the said pivoted block for moving the same, substantially as shown and described.

7. In a brush-making machine, the combination, with a block-holder and a worm-wheel on the lower end of the same, of a pivoted shaft, a worm on the shaft meshing with the worm-wheel, a sliding bearing in which one end of the shaft works, and means for locking said bearing in place, substantially as described.

8. In a brush-making machine, the combination, with a frame, a sliding table, a block-holder mounted in the table, and a worm-wheel on the end of the block-holder below the table, of a pivoted shaft, a worm on the shaft meshing with the worm-wheel, a sliding bearing in which one end of the shaft works, a latch pivoted to the sliding bearing and adapted to engage the frame to lock the said bearing in place, substantially as herein shown and described.

9. In a brush-making machine, the combination, with the frame, a sliding table, and a block-holder mounted therein, of the toothed wheel P' P² on the brush-holder, the spring-pressed lever P³, pivoted to the under side of the table, the block P⁶, to which the lever P³ is pivoted, provided with teeth engaging teeth on the frame, and the spring P⁹ between the block and lever P³, substantially as herein shown and described.

10. In a brush-making machine, the combination, with the main driving-shaft B and shaft N², of the ratchet-wheel O', secured on the shaft N², the arm O³, pivoted on the shaft N², the pawl O², pivoted to the arm O³ and engaging the ratchet-wheel O', the arm O⁴, projecting from the arm O³, the eccentric O⁶, secured on the shaft B, and the rod O⁵, connected to the arm O⁴ and eccentric O⁶, substantially as herein shown and described.

CHARLES D. HUGHES.

Witnesses:

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C. SEDGWICK.