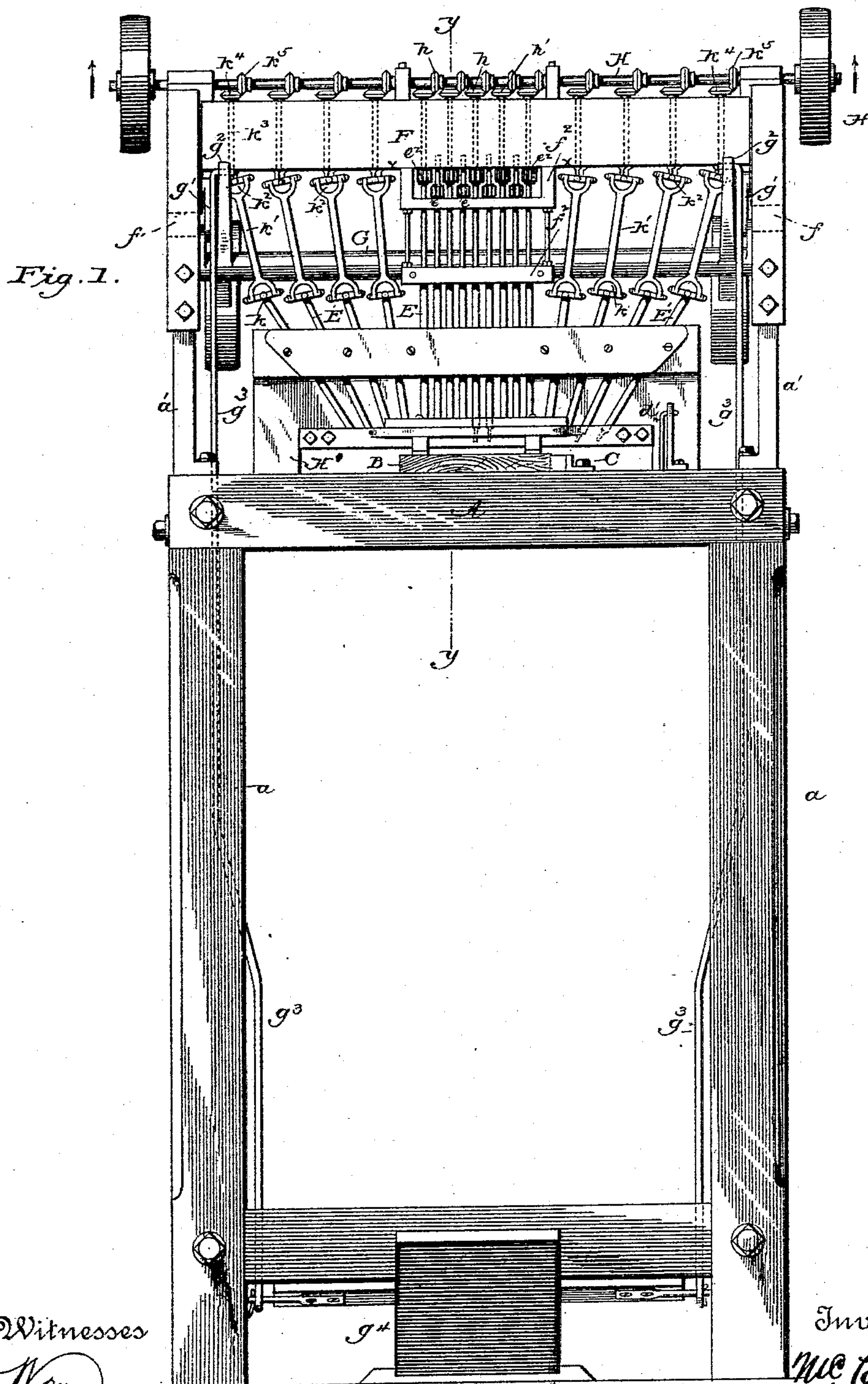


3 Sheets—Sheet 1.

No. 414,471.

Patented Nov. 5, 1889.



Witnesses

W. M. Mortimer
A. R. Kennedy,

By *his* Attorney

Phil. T. Dodge

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Mr. C. Jung.

(No Model.)

3 Sheets—Sheet 2.

McC. YOUNG,
MACHINE FOR BORING BRUSH BODIES.

No. 414,471.

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Fig. 2.

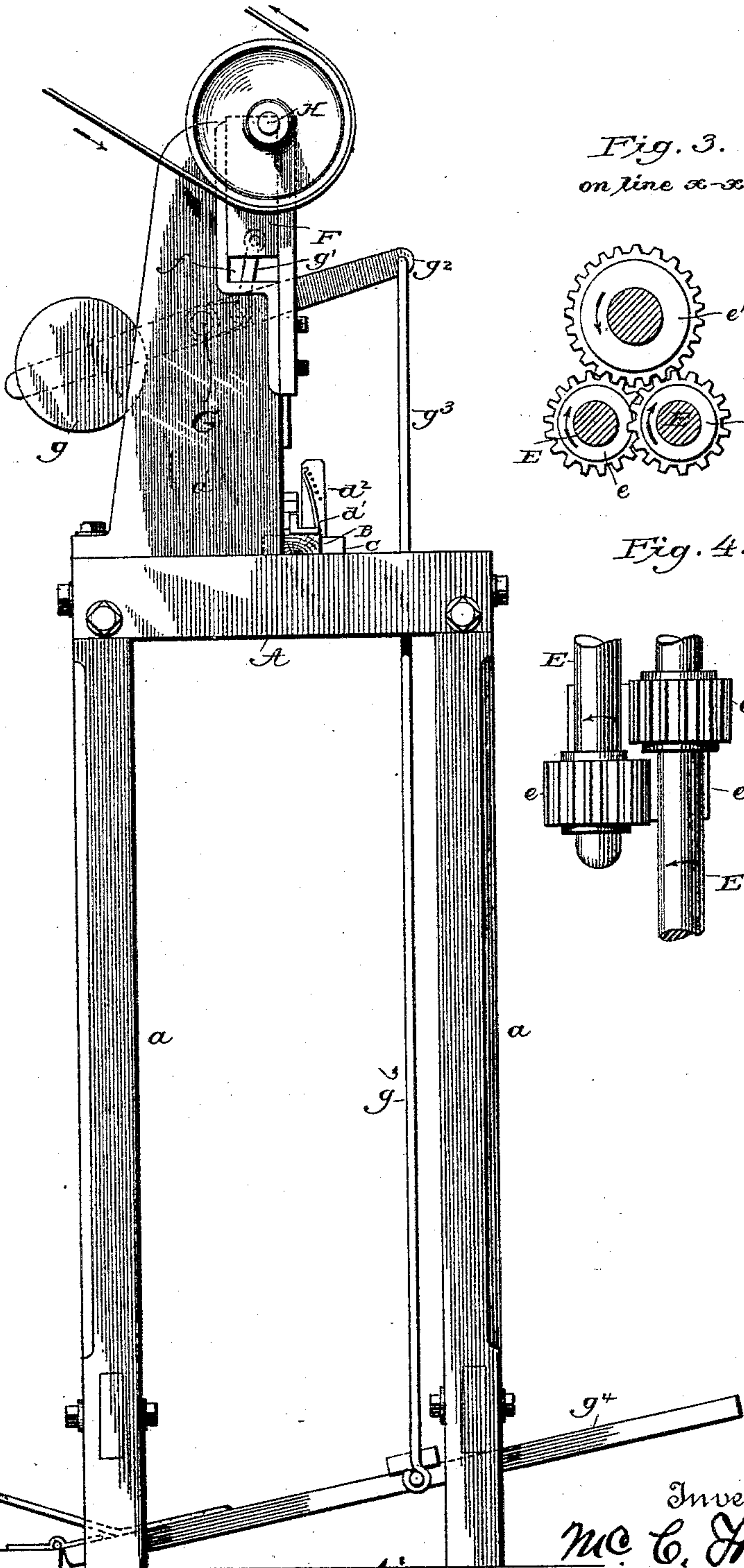


Fig. 3.
on line x-x

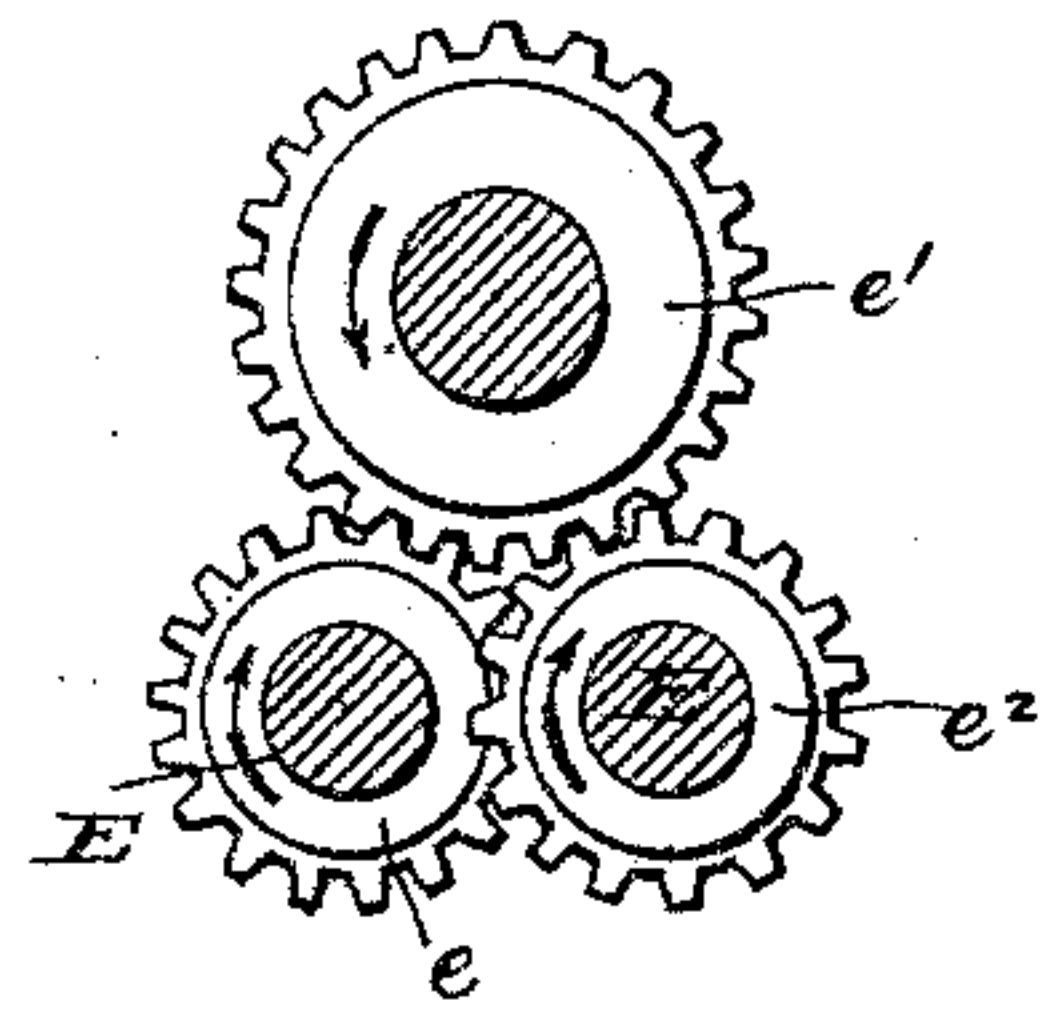
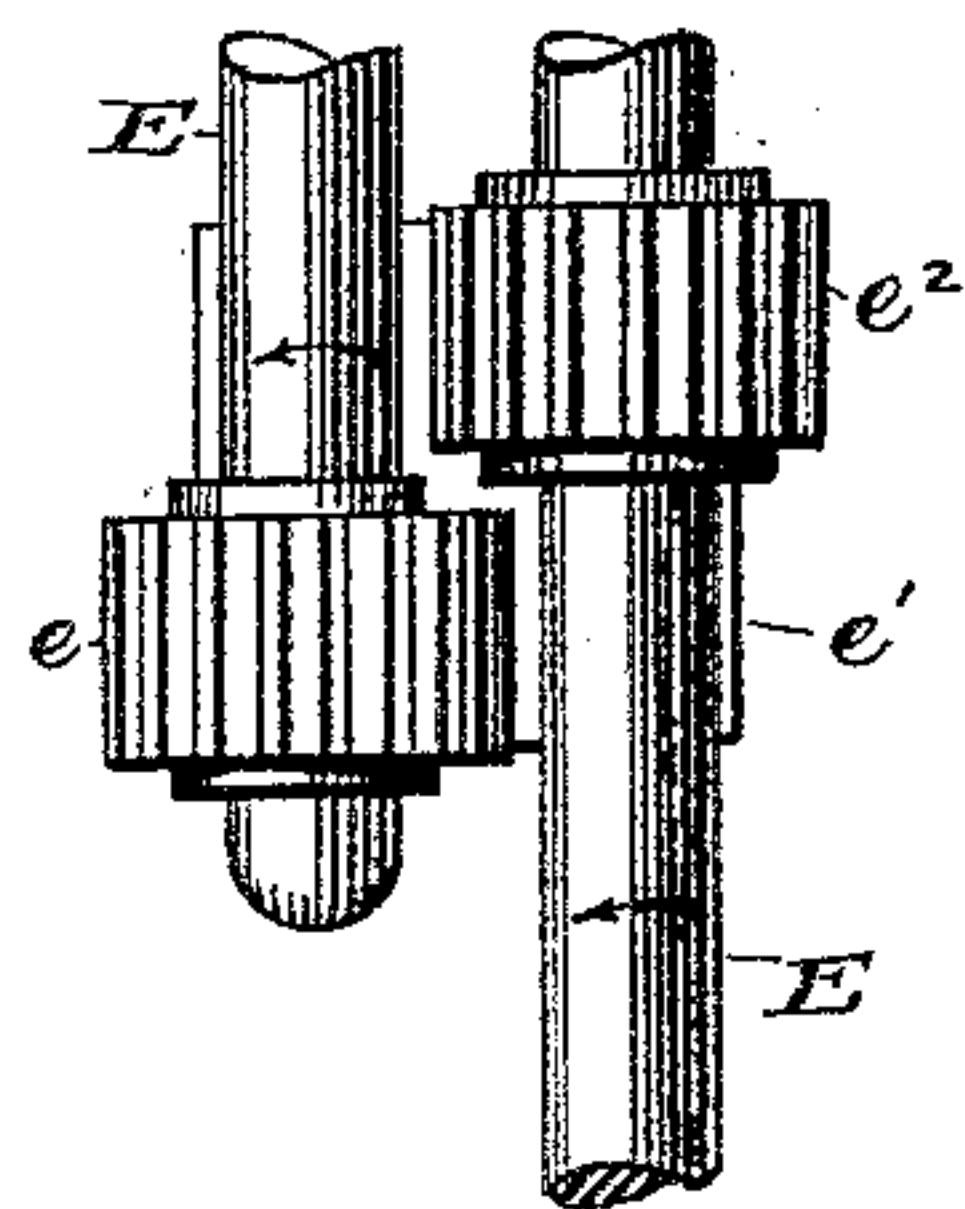


Fig. 4.



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3 Sheets—Sheet 3.

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Fig. 5.
on line y-y

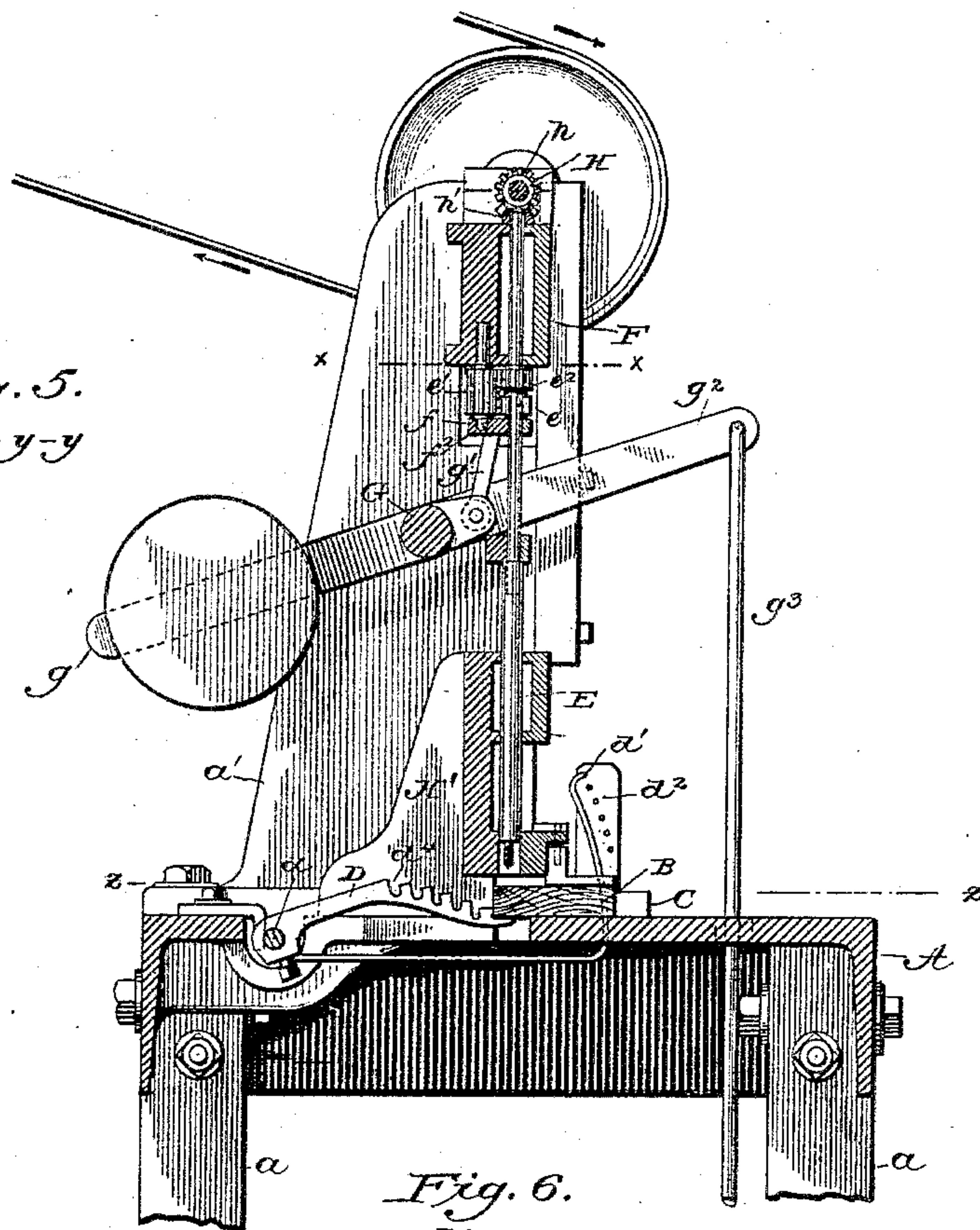
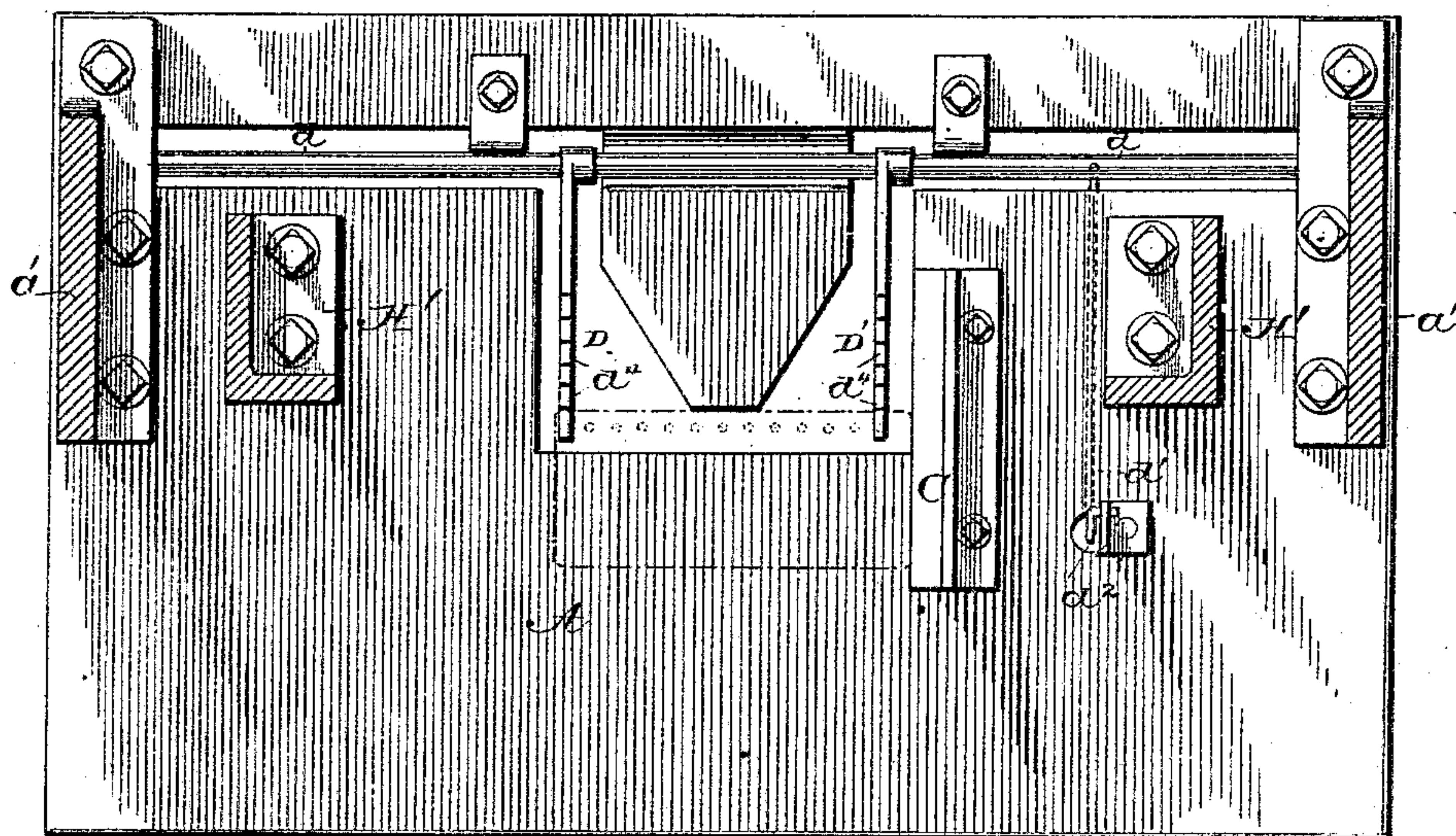


Fig. 6.
on line z-z



Witnesses

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By his Attorney
Phil. T. Dodge

UNITED STATES PATENT OFFICE.

McCLINTOCK YOUNG, OF FREDERICK, MARYLAND.

MACHINE FOR BORING BRUSH-BODIES.

SPECIFICATION forming part of Letters Patent No. 414,471, dated November 5, 1889.

Application filed May 16, 1889. Serial No. 311,048. (No model.)

To all whom it may concern:

Be it known that I, McCLINTOCK YOUNG, of Frederick, in the county of Frederick and State of Maryland, have invented certain Improvements in Machines for Boring Brush-Bodies, of which the following is a specification.

The aim of my invention is to provide a simple and easily-operated machine by which brush-blocks may be bored rapidly and accurately.

My machine comprises as essential features a bed or table to support the block and a vertically-movable frame carrying a series of boring-tools and their driving mechanism, said frame being connected with a foot-lever and counter-weights to admit of the entire series of boring-tools being raised and lowered quickly and easily. It also includes a peculiar arrangement of gearing for driving the boring-tools, at the same time allowing them to be placed close together. It also embraces peculiar means for adjusting and holding the blocks during the boring operation.

In the accompanying drawings, Figure 1 is a front elevation of my improved machine. Fig. 2 is a side elevation of the same. Fig. 3 is a horizontal section on the lines xx of Figs. 1 and 5, showing the end of the gear by which the boring-tools are driven. Fig. 4 is an elevation of the parts represented in the preceding figure. Fig. 5 is a vertical cross-section of the upper part of the machine on the line yy of Fig. 1. Fig. 6 is a plan view of the bed and adjustable gage looking downward from the line zz , Fig. 5.

Referring to the drawings, A represents a rigid horizontal bed-plate supported on legs a of any suitable character and provided at opposite ends with two standards or uprights a' . The bed-plate is intended to give support to the brush-block B, and is provided, as shown, with a fixed gage C, against which to rest one end of the block, and with two notched arms or rests D D', against which to rest the rear edge of the block. These arms D D' lie in a fore-and-aft direction in an opening in the bed and are mounted at their rear ends on a rock-shaft d , mounted in suitable bearings in the bed, and provided with a lever or handle d' , which is extended forward and upward and adapted to engage at its for-

ward ends in holes in a fixed standard d^2 . Each of the arms or rests D D' is provided, as shown, at different points in its length with a series of shoulders or steps d^4 . By operating the handle d' the arms D D' may be raised or lowered, so as to bring their different shoulders successively in position to abut against the brush-block when the latter is placed in position.

In commencing operations the arms are lifted so that the block abuts against the forward shoulders, as shown in Fig. 5. After the first row of holes is bored the arms are dropped until the block again moves rearward against the next shoulders, and so on successively, the block being thus allowed to move back step by step, so as to support the block firmly in the different positions required and to cause the boring of the holes at the proper places. It will be understood that the essential feature in this regard consists in the employment of arms or rests, which are shouldered and made movable, so that the successive shoulders may be brought into action. So long as this feature is retained the details may be modified at will.

The boring of the holes is effected by bits or boring-tools in the lower ends of upright spindles E E'. The spindles E stand closely together in vertical positions and are intended to bore the holes in the body portion of the block, while the spindles E' are inclined somewhat from the vertical and are intended to bore, when necessary, inclined holes at the ends of the blocks. The inclined spindles may be omitted when all of the holes are to be bored vertically.

The entire boring mechanism is adjustable vertically. To this end a cross-head F is mounted at its two ends in vertical slots or guides f in the standards a' , so that it may be raised and lowered at will. A rock-shaft G is mounted horizontally in the standards and provided with weighted levers g , the forward ends of which are connected by links g' to the cross-head. Under this arrangement the weight serves to counterbalance the cross-head and the entire boring mechanism sustained thereby. The rock-shaft G is provided with forwardly-extending arms g^2 , which are in turn connected by rods g^3 with a treadle or foot-lever g^4 near the floor. When the treadle is

depressed by the foot, the entire boring mechanism is depressed; but when it is released the mechanism is lifted by the counter-weight. The vertical spindles E pass through the cross-head and through the guide-bars f^2 bolted thereto, the parts being arranged, as shown in Fig. 5, so that while the spindles are permitted to revolve freely they are compelled to rise and fall with the cross-head.

10 A horizontal driving-shaft H is mounted in suitable bearings on top of the cross-head and is provided with beveled pinions h , which engage corresponding pinions h' on the ends of the alternate vertical spindles E, which thus receive direct and positive motion. These positively-driven spindles communicate motion to the intermediate spindles, as shown in Figs. 3 and 4.

Each of the positively-driven spindles is provided with a pinion e , which engages and turns the longer pinion e' , mounted on an independent shaft or axis. This second pinion, which is made of suitable length for the purpose, engages and drives pinion e^2 on the next spindle E. This arrangement admits of the pinions e and e^2 overlapping each other horizontally, as shown in Fig. 4, and of their being made much larger than would otherwise be possible.

30 The construction is advantageous in that it admits of the boring-spindles being brought closely together and of their being positively operated by pinions of the size best adapted for smooth and easy operation.

35 Every mechanic is familiar with the fact that the use of very small pinions is objectionable. My invention secures all the advantages which would attend the use of small pinions without the consequent disadvantages.

40 The lower ends of all the boring-spindles slide freely through and are accurately guided by a cross head or bar H' , bolted firmly to the bed-plate or to any other suitable portion of the frame. Owing to the inclination of the spindles E', it is impossible to drive them directly from the shaft H. Each of these inclined spindles is therefore connected at its upper end by an ordinary gimbal or other universal joint k to a short shaft k' , which is in turn connected by a gimbal k^2 to a vertical shaft k^3 , mounted in the cross-head and provided with a beveled pinion k^4 , engaging a like pinion k^5 on the driving-shaft.

55 Owing to the jointed connections, the boring-spindles E' are permitted to revolve freely, although standing obliquely to the axis of the driving-shaft H, and they are, moreover, permitted to slide downward through the guide or cross-head H' , as they sink into the brush-block without affecting their operation.

60 The operation of my machine is as follows: The parts stand normally in the position shown in Figs. 1 and 5, the boring mechanism being elevated and the lower ends of the boring-tools retracted within the guide H' , by which they are concealed and protected. The

brush-block is laid upon the bed and slipped into place against the guide C and against the forward shoulders of the arms D D'. The treadle is then depressed and the boring-tools caused to descend and act upon the block, forming instantly and at one operation the complete line or row of holes. As the treadle is relieved from pressure, the boring-tools are automatically lifted. The arms D D' are lowered and the block moved rearward against the second shoulders, the boring operation repeated, and so on continuously.

In practice I have found that the use of a vertically-movable boring mechanism in connection with a supporting-table gives better results than other arrangements. The employment of the treadle to control the boring mechanism is advantageous in that it leaves the operator with both hands free to manipulate the block.

Having thus described my invention, what I claim is—

1. In a boring-machine, and in combination with a bed or support, the rest consisting of the vertically-movable arms, each having a series of steps or shoulders.

2. The bed or support, in combination with the shouldered arms D D', the rock-shaft on which they are mounted, its operating arm or lever, and the plate to lock the lever.

3. In a machine for boring brush-blocks, a frame and a fixed bed or table thereon, in combination with the vertically-movable cross-head mounted on the frame, the counter-weight to lift the head, the treadle and its connections to depress the head, and the series of boring-spindles mounted to rotate freely in the head, but fixed against end motion therein, whereby the rising and falling motion of the head is caused to raise and lower the series of spindles.

4. In a machine for boring brush-blocks, the fixed bed or table, the vertically-movable head provided with the series of spindles, and the shouldered movable arms D D', acting to hold the block in different positions on the table, said elements combined substantially as shown.

5. In a boring-machine, the bed or table and the fixed bar H' above the same, in combination with the vertically-sliding head F and the boring-spindles mounted at their upper ends in said head and sliding at their lower ends through bar H' .

6. In a boring-machine, a vertically-sliding head, a series of upright boring-spindles mounted to rotate in said head, but fixed against end motion therein, a horizontal driving-shaft mounted in bearings on the head, and the series of pinions connecting the horizontal shaft with the vertical spindles, as described and shown.

7. In a boring-machine, two parallel boring-spindles, one of which is provided with a driving-pinion at its end, in combination with overlapping non-connecting pinions applied to the respective spindles and a longer pinion con-

necting the overlapping spindle-pinions, as herein described and shown, whereby one pinion is caused to communicate motion to the other and the two pinions permitted to stand
5 in close proximity.

8. In a boring-machine, the driving-shaft H and the boring-spindles geared directly thereto, in combination with pinions on said spindles, the intermediate spindles with their pinions overlapping those of the first-named
10 spindles, and the intermediate connecting-pinions, as shown, whereby the spindles are all positively driven and their arrangement in close order permitted.

9. In combination with the fixed guide H' 15 and the inclined boring-spindles sliding there-through, the vertically-movable head, the vertical driving-spindles k^3 therein, and the intermediate spindles k' , connected to the others by universal joints. 20

In testimony whereof I hereunto set my hand, this 22d day of April, 1889, in the presence of two attesting witnesses.

McCLINTOCK YOUNG.

Witnesses:

EDWIN C. MARKELL,
MARSHALL FOUT.