

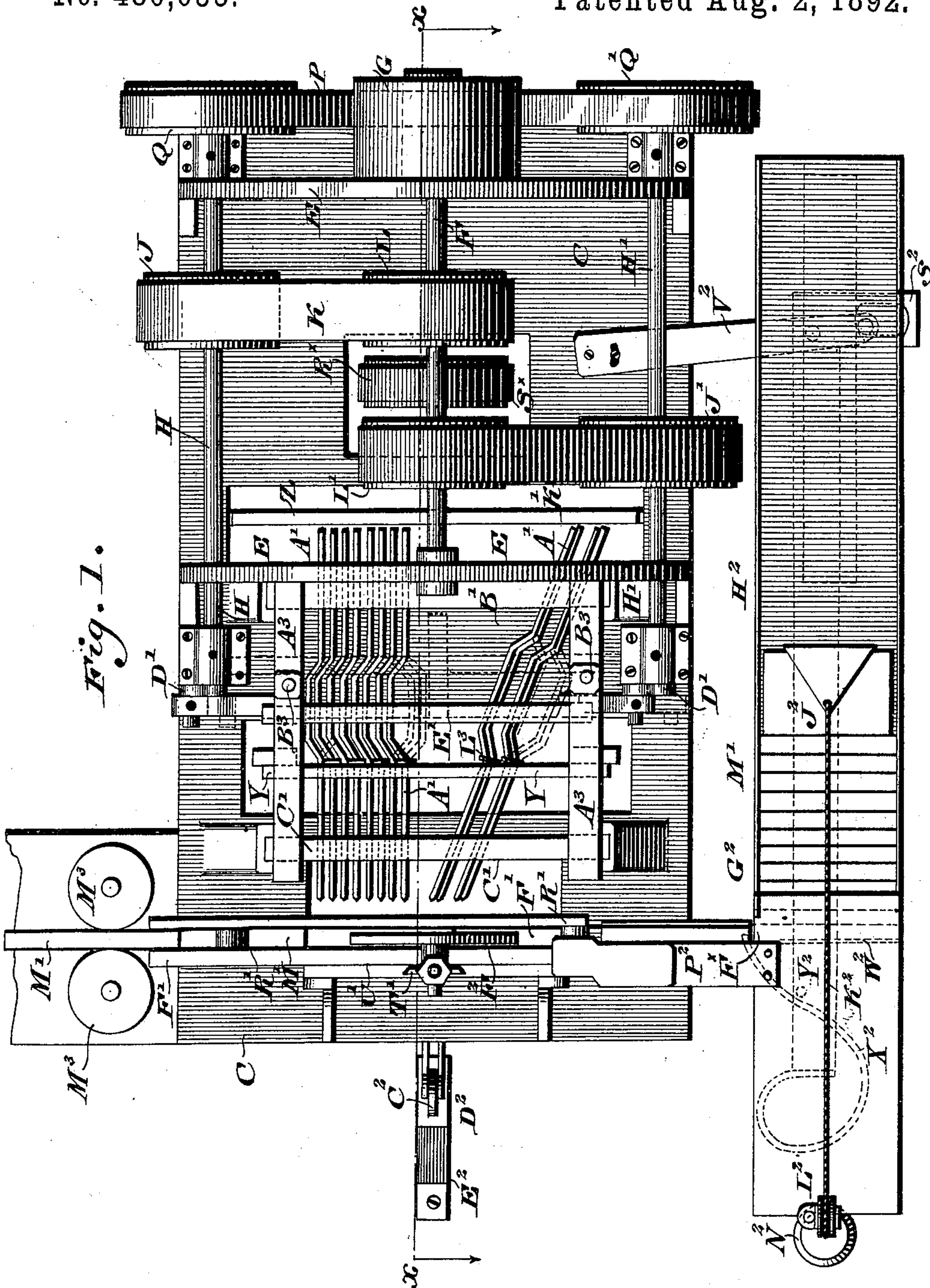
(No Model.)

4 Sheets—Sheet 1.

V. P. WILLCOX.  
BRUSH BLOCK BORING MACHINE.

No. 480,053.

Patented Aug. 2, 1892.



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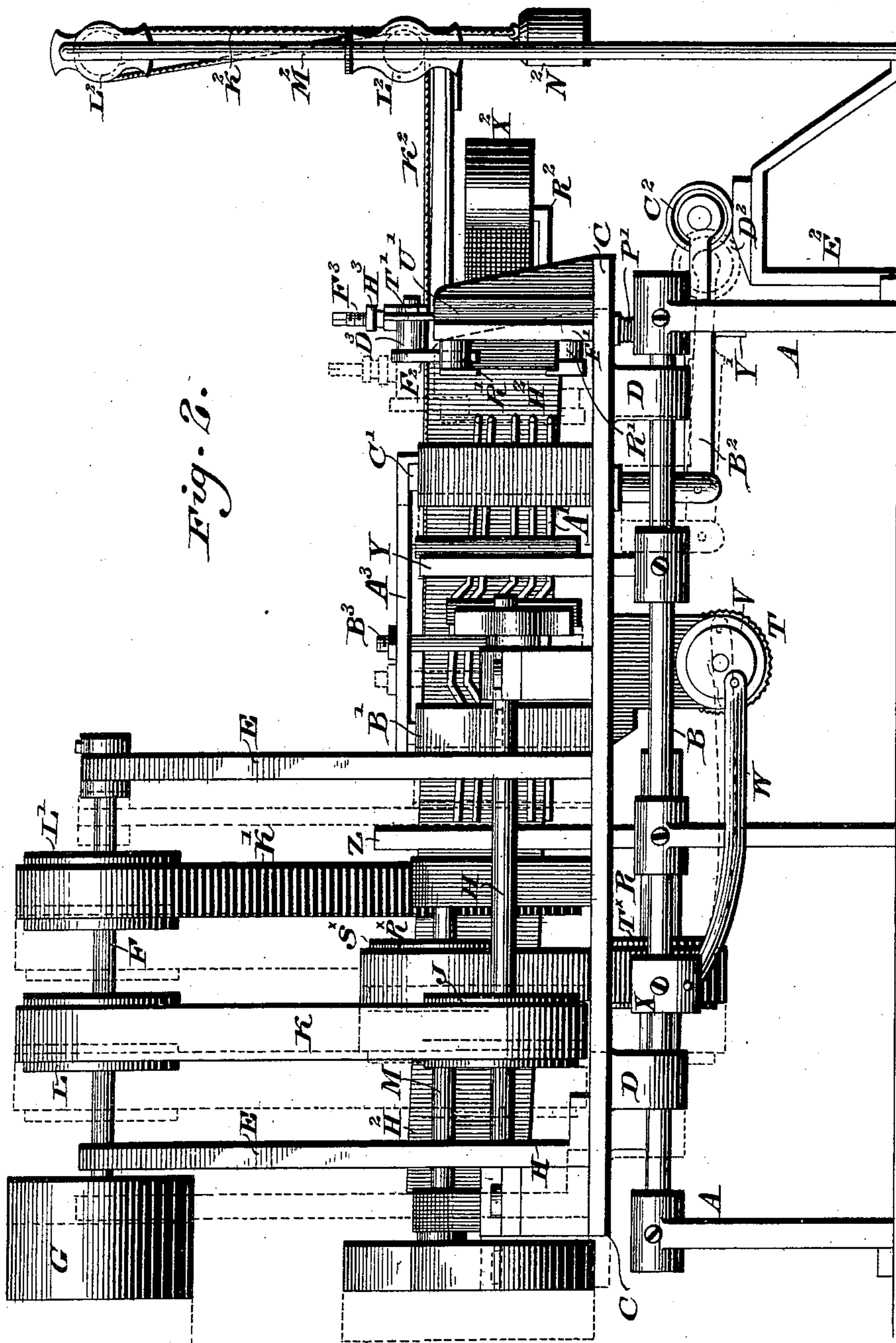
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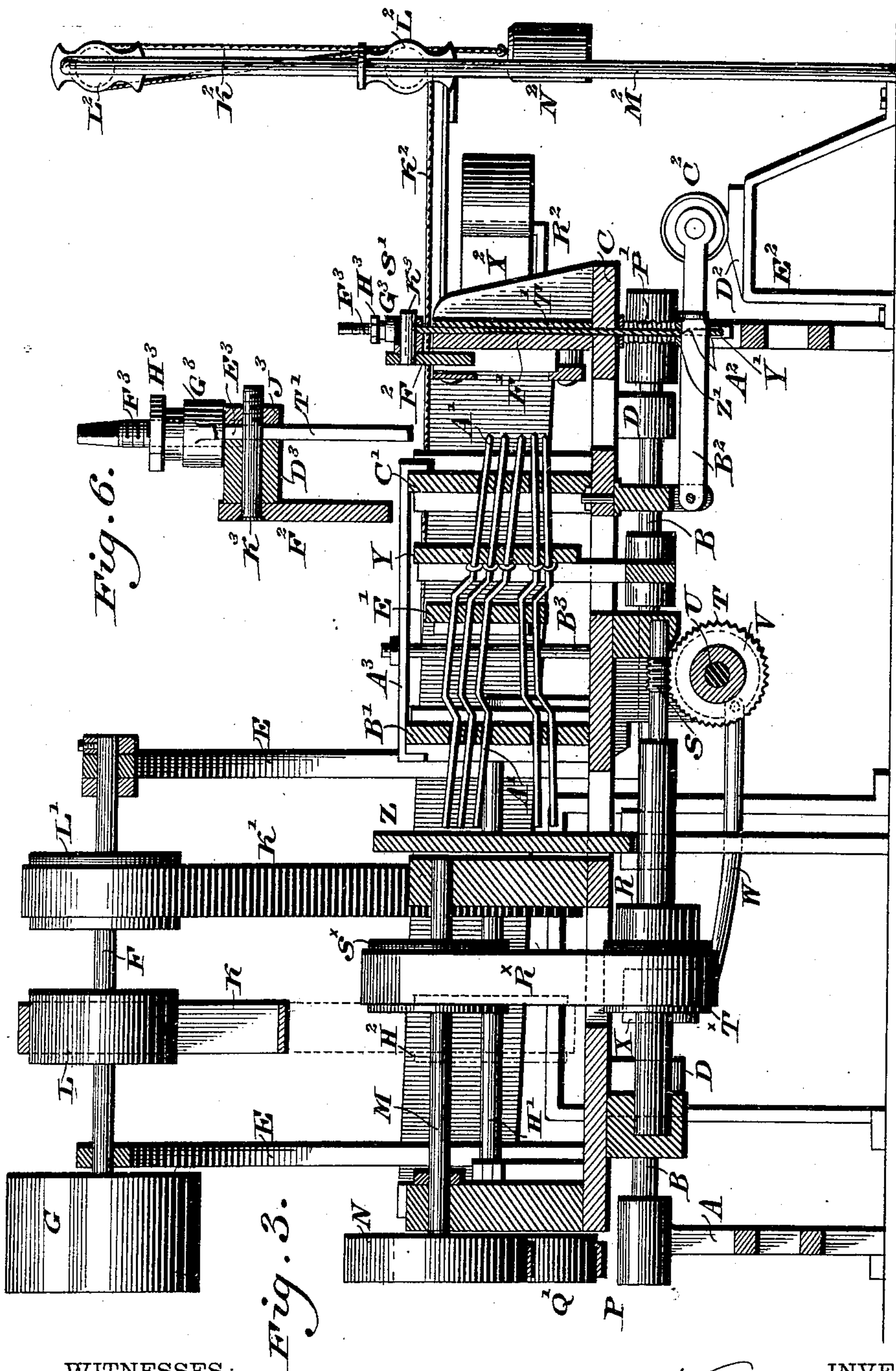
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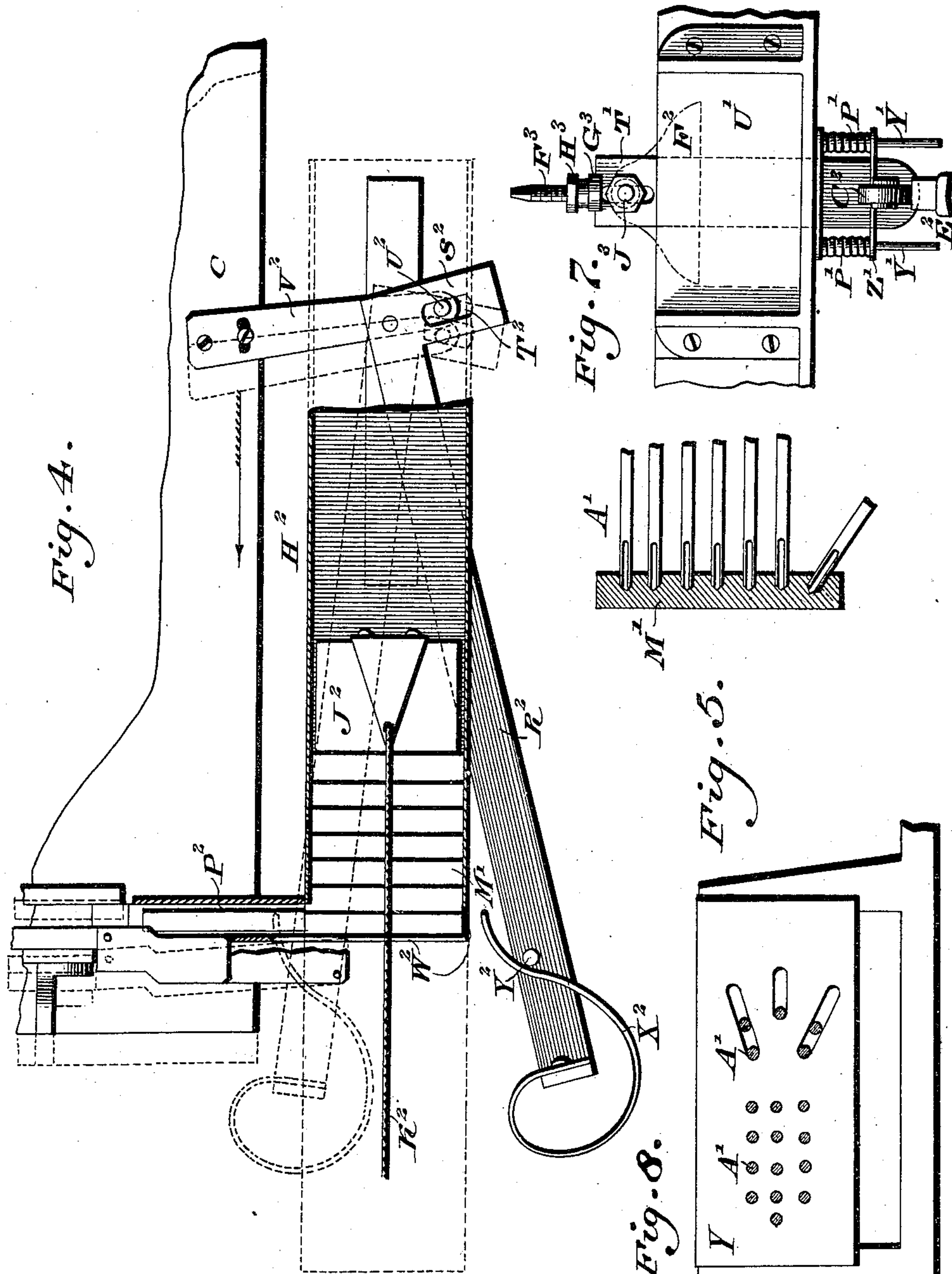
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Patented Aug. 2, 1892.



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# UNITED STATES PATENT OFFICE.

VESTUS P. WILLCOX, OF TRENTON, NEW JERSEY.

## BRUSH-BLOCK-BORING MACHINE.

SPECIFICATION forming part of Letters Patent No. 480,053, dated August 2, 1892.

Application filed April 22, 1891. Serial No. 389,923. (No model.)

*To all whom it may concern:*

Be it known that I, VESTUS P. WILLCOX, a citizen of the United States, residing at Trenton, in the county of Mercer, State of New Jersey, have invented a new and useful Improvement in Brush-Block-Boring Machines, which improvement is fully set forth in the following specification and accompanying drawings.

10 My invention relates to improvements in brush-block-boring machines; and it consists of a machine provided with a stationary tool-holder and a reciprocating block-holder, substantially as described.

15 It further consists of a novel clamping device for holding the brush-block while the same is being bored.

It further consists of an automatic feeding device for the blocks, as hereinafter described.

20 It further consists of mechanism, substantially as described, for rotating the boring-tools.

It further consists of mechanism, substantially as described, for reciprocating the movable frame carrying the block-holder.

25 It finally consists of the combination of parts, as hereinafter set forth.

Figure 1 represents a plan view of the machine embodying my invention. Fig. 2 represents a side view of the same machine. Fig. 3 represents a longitudinal section on line  $x$ , Fig. 1. Fig. 4 represents a plan view of the feeding device with adjacent portion of the frame of the machine, showing different positions of the operating-lever. Fig. 5 represents a view, partly sectional and on an enlarged scale, showing portions of the boring-tools in operation on the brush-block. Fig. 6 represents a partial sectional and partial side view of a detail portion of the machine. Fig. 7 represents a front view in elevation of the clamping device. Fig. 8 represents a vertical section through the boring bits or tools.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates the stationary frame of the machine, in the ends of which are secured the ends of the side bars B, forming ways or guides for the movable frame C, which is provided with bosses D, mounted on the said side bars and adapted to move endwise thereon. In uprights E on the

said movable frame is journaled the driving-shaft F of the device, having an operating-pulley G thereon. On opposite sides of the frame C and suitably journaled in supports thereon are the shafts H H', carrying the pulleys J J', respectively, which are connected by belts K K' with the pulleys L L' on the shaft F, so as to receive motion therefrom, for a purpose hereinafter explained.

M designates a rotary shaft, which is parallel with the shafts F H H' and mounted on suitable standards on the frame C. The said shaft receives rotary motion by means of the pulley N thereon, which is rotated by contact with a belt P on the pulleys Q Q' of the shafts H H', respectively, and communicates motion to a parallel shaft R, journaled in bearings on the under side of the said frame C by means of a belt R<sup>x</sup> on the pulleys S<sup>x</sup> and T<sup>x</sup> of the said shafts M and R, respectively. The said shaft R is provided with a worm S, which meshes with a worm-wheel T on a countershaft U, journaled in lugs on the under side of the said frame C and having wheels V thereon. To each of the said wheels V one end of an arm or pitman W is connected, the other end being pivoted to a boss X, which is secured to one of the side bars B, whereby as the shaft U, which rotates in bearings secured to the frame C, is operated, the said frame is moved backward and forward or reciprocated. The wheels V form means for connecting the pitmen W eccentrically to the shaft U.

Y and Z designate plates, which are secured to the side bars B, so as to be stationary thereon, and extend above the frame C transversely thereof. The boring tools or bits A', which have a straight central portion bent or out of line with the remaining portions thereof, are held in openings in the plate Y and have one of the ends adjacent to the plate Z, so as to be prevented thereby from longitudinal displacement. Secured to the frame C are the transverse plates B' and C', having openings in the walls of which the said bits A' are supported, the said plates moving freely on the said bits during the reciprocating movements of the said frame.

On crank-arms D' on the shafts H H' is secured a plate E', extending transversely of the frame C and having openings in which are fitted the straight central portions of the



boring-tools, so as to be adapted to rotate the same, the plate E' being also movable on the said portions of said tools during the reciprocating movements of the frame C.

- 5 Secured to the upper side of one end of the frame C is a holder or support F' for the brush-blocks M', having open ends to receive and discharge the blocks and an open face for freely presenting the same to the bits.
- 10 The rollers R', journaled in the said holder, serve to keep the blocks in place during their passage through the holder, and a clamp S' serves to bind the block firmly in place during the drilling or boring of the holes therein.
- 15 The clamp S' is formed of a bar T', vertically movable in a support U', which is secured to the frame C, and is provided with depending rods Y', on which moves a rising and falling cross bar or piece Z', also movable on the bar T'.
- 20 In the lower end of the bar T' is an opening A<sup>2</sup>, through which passes a lever B<sup>2</sup>, pivotally secured at one end to the under side of the frame C and at the other end provided with a roller C<sup>2</sup>, which rides on an inclined top D<sup>2</sup> of a stationary standard E<sup>2</sup>. The coil-springs P' on the rods Y' bear against the cross-piece Z', so as to force the latter against the lever B<sup>2</sup>, and as the said lever is lowered when the roller C<sup>2</sup> rides down the inclined top D<sup>2</sup> the bar T' descends, carrying with it a pivoted arm F<sup>2</sup>, which bears against a brush-block. The riding of the roller C<sup>2</sup> upward on the inclined top raises the lever B<sup>2</sup>, and thereby the bar T' and the arm F<sup>2</sup>.
- 35 G<sup>2</sup> designates a feeding device for automatically supplying the holder F' with brush-blocks, said feeding device consisting of a trough H<sup>2</sup>, suitable supported and adapted to hold a number of blocks M', fitted therein, as shown in Fig. 1, the said blocks being kept in place at the discharge end of the trough by means of a sliding weight J<sup>2</sup>, which bears against the blocks and is operated by means of a cord K<sup>2</sup>, passed around the pulleys L<sup>2</sup> on an upright M<sup>2</sup>, said cord having a weight N<sup>2</sup> attached to its outer end. The side of the trough H<sup>2</sup> adjacent to the holder F' is provided with an opening F<sup>x</sup> of sufficient size to permit the discharge from the trough of a single block at one time. Between the trough H<sup>2</sup> and the holder F' is a guide P<sup>2</sup>, through which the blocks M' are passed from the trough to the holder. Said guide consists, preferably, of a piece of metal bent so as to form a passage-way, and is secured to said trough so as to be in line with the holder when the block is to be fed thereto.

- Pivoted to the under side of the trough is a lever R<sup>2</sup>, having an angular limb S<sup>2</sup>, which is provided with a slot T<sup>2</sup>, in which a pin U<sup>2</sup>, secured to an arm V<sup>2</sup> of the frame C, works, the said pin contacting with the walls of said slot, and thereby operating the lever R<sup>2</sup>. The said lever has at its front end a spring-finger X<sup>2</sup>, the outer end of which works in a transverse slot W<sup>2</sup>, formed in the discharge or front end of the trough H<sup>2</sup>, so as to push the front

or end block in the trough across the same and out of the side opening to the conveyer P<sup>2</sup>, which latter is also provided with a slot for the said finger X<sup>2</sup> to work therein, and thereby further advance the block. A stop Y<sup>2</sup> on the lever R<sup>2</sup> limits the movement of the spring-finger in one direction.

The operation of the machine is as follows: The parts being in position, as shown in Fig. 1, the rotation of the driving-shaft operates by means of the shafts H H' and their connected pulleys and belts the shaft M and pulleys thereon, so as to rotate the connected shaft R, and thereby the worm-wheel T and shaft U, and thus move the frame C toward the boring ends of the bits, owing to the pitman connection of the wheels V on said shaft U with the side bars B of the stationary frame A. At the same time the rotation of the shafts H H', with their crank-arms D', so moves the plate E' that the bits A' are rotated in their bearings, whereby when the holder F' is sufficiently advanced the block M' presented to the bits receives the ends of the latter. During this movement of the frame C the lever B<sup>2</sup> has been lowered, owing to its roller C<sup>2</sup> descending the inclined top D<sup>2</sup> and the coil-springs P', bearing against the cross-piece Z', which latter bears against the said lever B<sup>2</sup>. The lowering of the lever B<sup>2</sup> draws down or lowers the bar T' and the arms F<sup>2</sup>, the latter clamping the block M' firmly in place during the boring the holes in said block. This movement of the frame C also operates the attached arm V<sup>2</sup>, with its pin or stud U<sup>2</sup>, so that the lever R<sup>2</sup> is moved outward or to the position shown in full lines, Fig. 4. The continued operation of the driving-shaft causes a reverse motion of the frame C, whereby when a sufficient boring of the block has been accomplished the holder F' recedes from the tools. During the reverse movement the lever B<sup>2</sup> is raised, owing to its roller riding upward on the inclined top D<sup>2</sup>, and the clamping-arm F<sup>2</sup> is released from the block. At the same time the return movement of the arm V<sup>2</sup> operates the lever R<sup>2</sup>, causing its finger X<sup>2</sup> to engage the end block in the trough H<sup>2</sup> and carry it through the side opening in the trough into the guide P<sup>2</sup>, so that it is advanced to the holder to be in its turn engaged by the clamping-arm and operated on by the bits. It will be seen that the contact of the ends of the blocks in the holder permits their conveyance through the latter by the action of the finger X<sup>2</sup> on the block leaving the trough.

Each of the plates B', E', Y, and C' is adapted to be detachably secured to side supports, so that they may be readily removed from the device in case of a breaking or injury to any of the tools, and thereby permit the substitution of another tool. To give firmness or rigidity to the plates B' and C', and thereby prevent the ends of the tools from lateral and vertical motion during the boring, the straps A<sup>3</sup> are employed, said straps



bearing on said plates being bound to the frame C by the brace-rods B<sup>3</sup>.

To adjust the pivotal connection of the arm F<sup>2</sup> with the bar T', the said arm is attached to a block D<sup>3</sup>, having on one end a stud, which is fitted in a slot E<sup>3</sup> in said bar T', so as to have a vertical adjustment therein by means of a screw F<sup>3</sup>, working in a boss G<sup>3</sup> on the upper end of the bar, a jam-nut H<sup>3</sup> holding the said screw in place, and a jam-nut J<sup>3</sup> on the pivot K<sup>3</sup> holds the block D<sup>3</sup> in place.

The shanks of the boring-bits are provided with a disk L<sup>3</sup> at or near the bend thereof, so as to prevent their longitudinal movement in the direction of the block-holders, the plate Z preventing their movement in the opposite direction.

M<sup>3</sup> designates horizontal guide-rollers mounted on a suitable attachment of the frame C and adapted to guide the blocks M' from the holder F' after the boring operation to a planer, thus avoiding the dropping of the said blocks to the ground or floor and their subsequent picking up and arrangement in order to suitably present them for planing.

It will be noticed that a part of the boring-bits are arranged at an angle to the others to provide angular holes in the brush-block.

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

1. A machine for the purpose set forth having a stationary frame, a reciprocating frame movable on said stationary frame, plates secured to the stationary frame for supporting and also preventing the endwise movement of the boring-tools, mechanism, substantially as described, for rotating said boring-tools, a brush-block holder on said reciprocating frame, and an automatic feeding device operated by the movement of the reciprocating frame for conveying the brush-blocks to the said holder, said parts being combined substantially as described.

2. A stationary frame, a reciprocating frame having a holder thereon, a sliding bar with a pivoted clamping-arm, a lever pivoted to the reciprocating frame and connected with said sliding bar, and means, substantially as described, for moving said lever, so as to operate said sliding bar, said parts being combined substantially as described.

3. A reciprocating frame with a holder thereon, a sliding bar having a pivoted arm adapted to clamp a block in said holder, a

lever pivoted to said reciprocating frame and adapted to operate said sliding bar, and means, substantially as described, for raising and lowering said lever, said parts being combined substantially as described.

4. A reciprocating frame with a holder thereon, a sliding bar having a pivoted arm adapted to clamp a block in said holder, a lever pivoted to said reciprocating frame and connected with said sliding bar, so as to be adapted to operate the same in opposite directions, a frame with inclined top, a roller connected with the outer end of the lever and riding on said inclined top, and springs bearing against said lever, said parts being combined substantially as described.

5. A reciprocating frame with a brush-block holder thereon, a supply-trough with a discharge-opening in its side at one end thereof, a lever engaged and oscillated by an arm attached to the reciprocating frame, a spring-finger attached to said lever and adapted to engage the end block in said trough, and means, substantially as described, for keeping the blocks which are in the trough at the discharge end thereof, said parts being combined substantially as described.

6. A reciprocating frame with a brush-block holder thereon, a supply-trough for said brush-blocks having a discharge-opening at one side, a lever having an angular limb engaged by an arm attached to the reciprocating frame, a finger connected with the said lever and adapted to move across the front end of the supply-trough, and a guide located between said trough and holder, said parts being combined substantially as described.

7. A machine for the purpose named having a stationary frame with side bars, a movable plate having bosses mounted on said bars, a driving-shaft mounted on said movable frame and connected with said driving-shaft by intermediate mechanism carried by said movable frame, a counter-shaft having a worm-wheel thereon and journaled in lugs on the under side of the movable frame, wheels on said rotary shaft, and pitmen connected with said wheels and pivoted to bosses on said side bars, said parts being combined substantially as described.

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