

No. 722,300.

PATENTED MAR. 10, 1903.

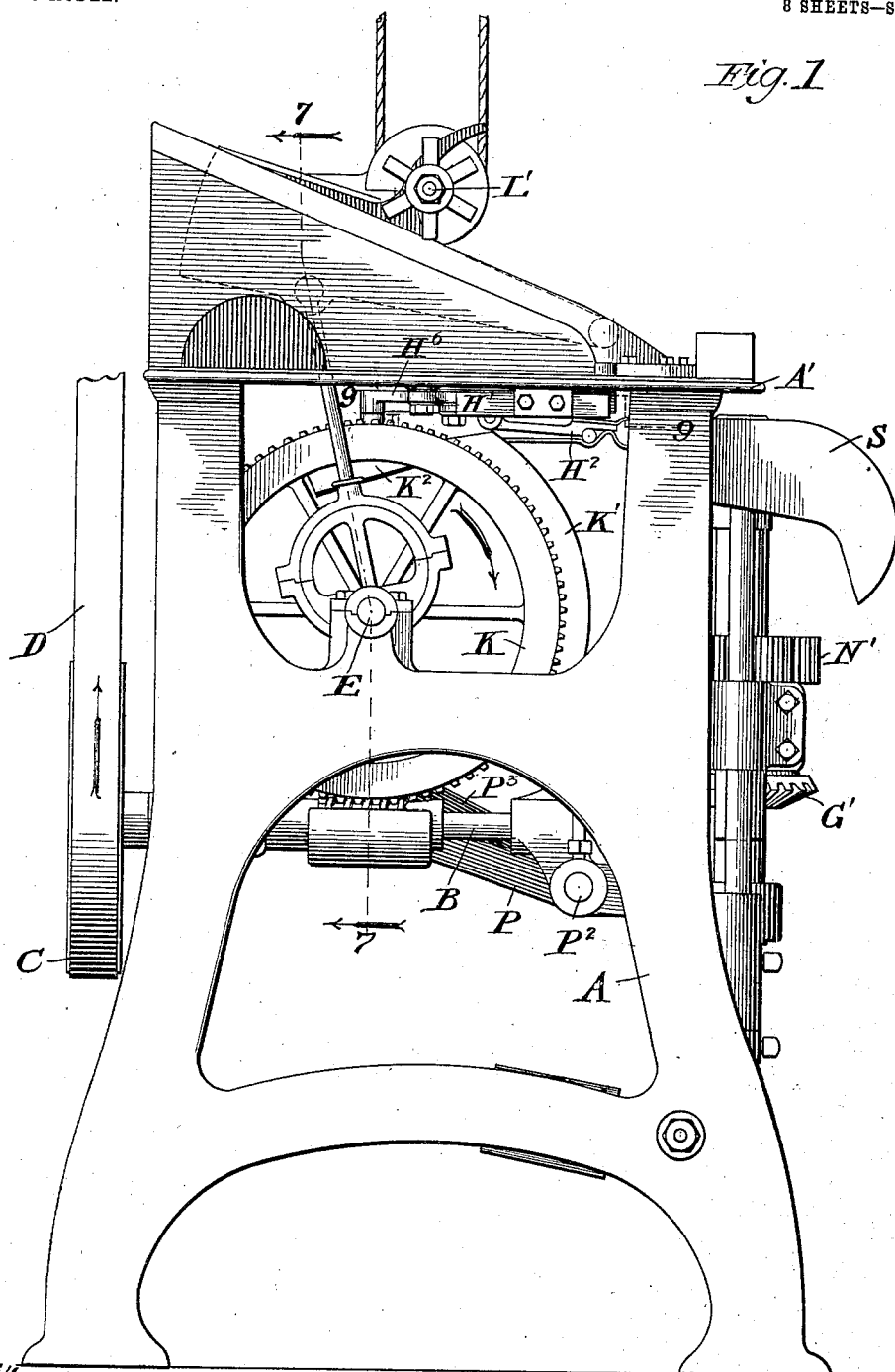
J. H. HASKINS.  
MACHINE FOR FINISHING THE ENDS OF BLANKS.

APPLICATION FILED APR. 25, 1902,

NO MODEL.

8 SHEETS—SHEET 1.

Fig. 1



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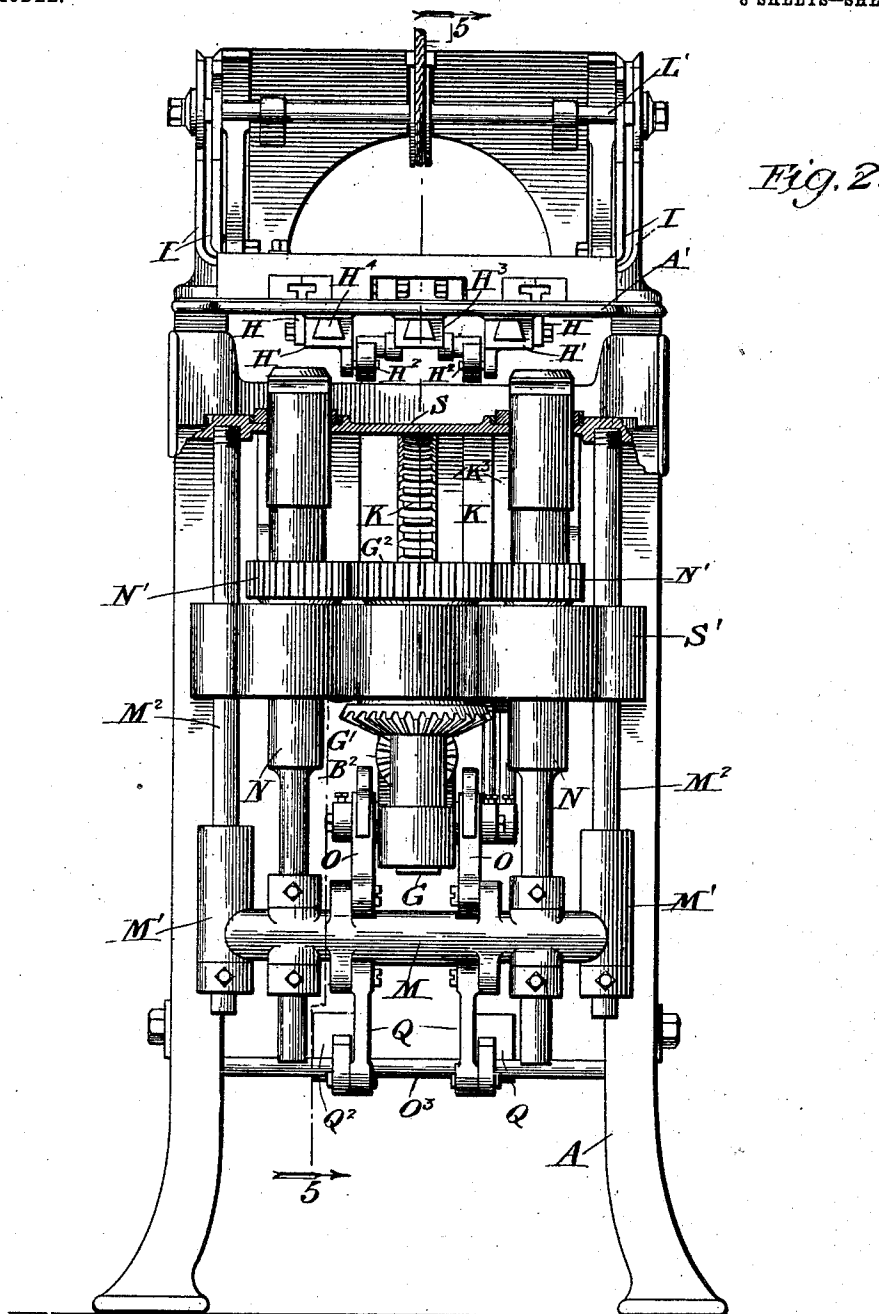
By Lemuel Edelin, Atty.

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NO MODEL.

8 SHEETS—SHEET 2.



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8 SHEETS—SHEET 3.

Fig. 3.

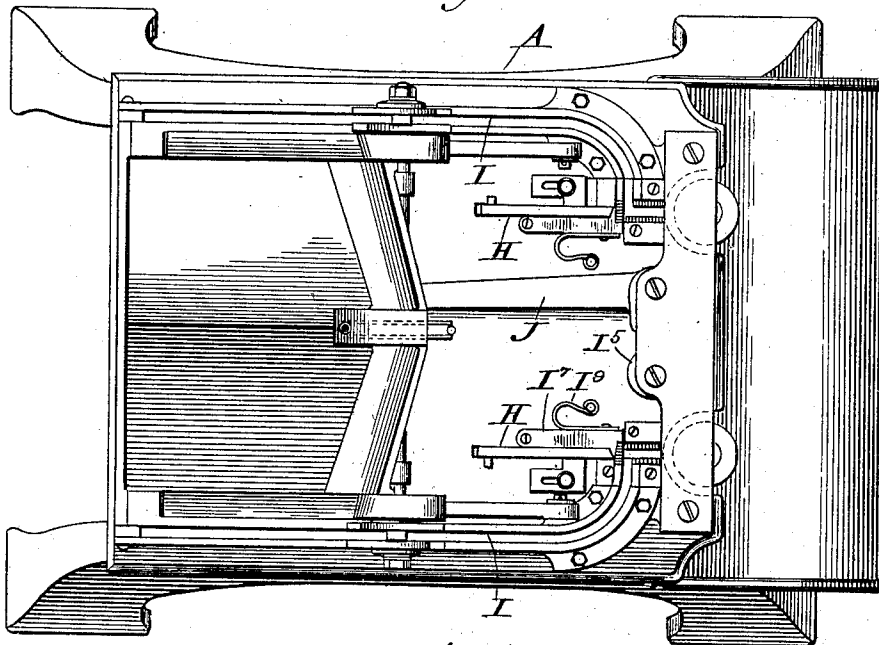
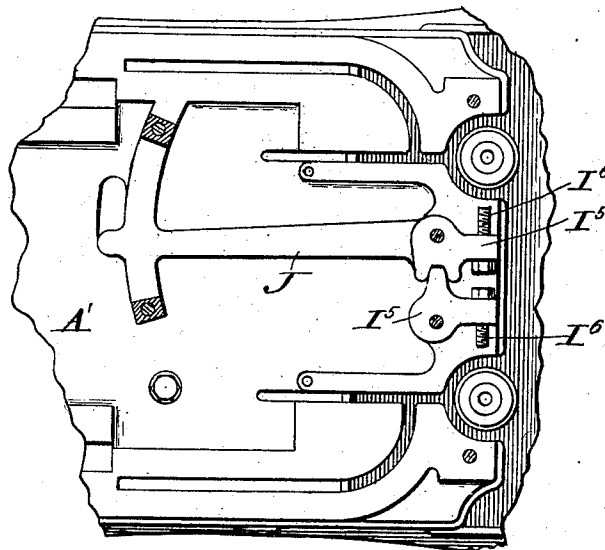


Fig. 4.



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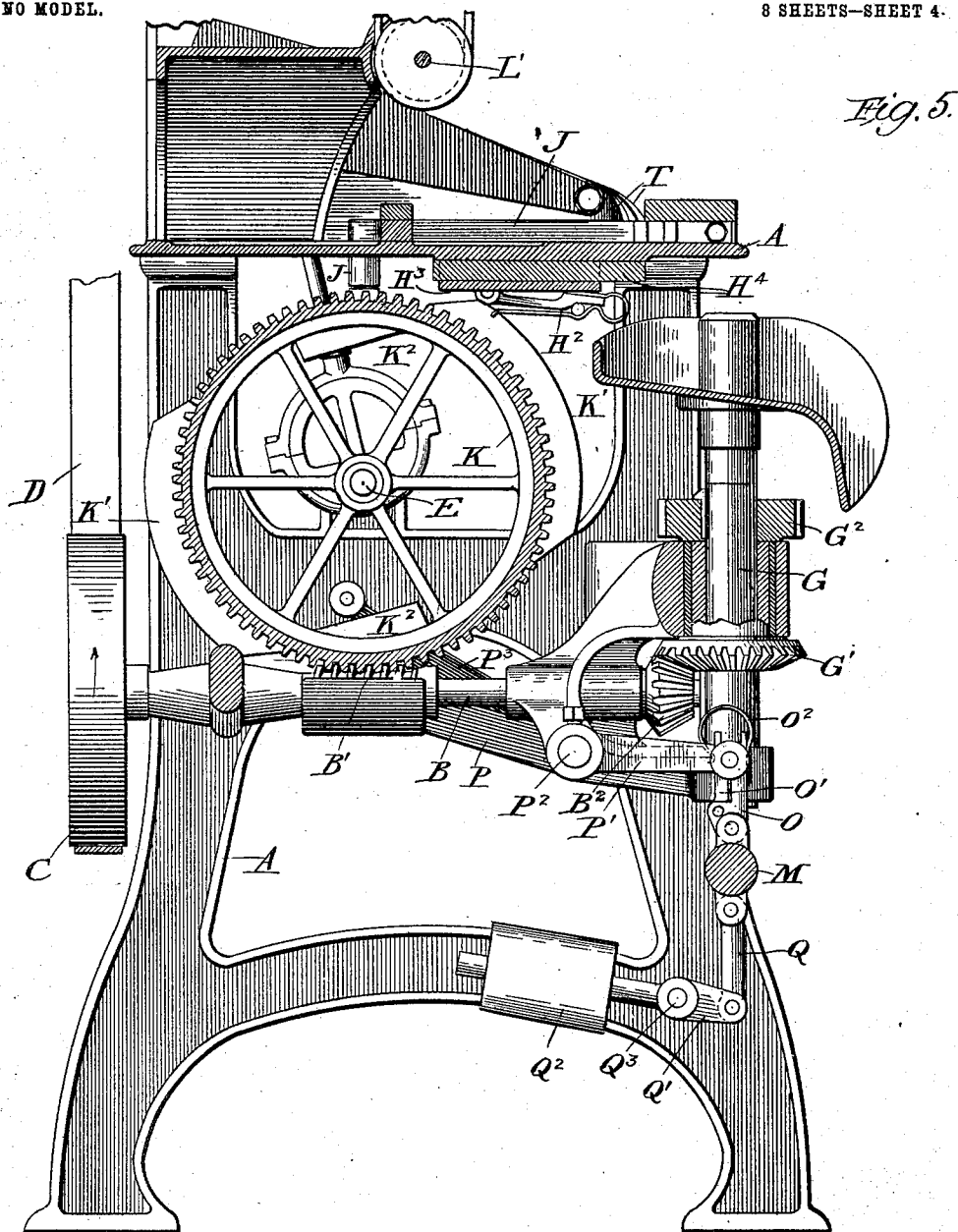
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NO MODEL.

8 SHEETS—SHEET 4.



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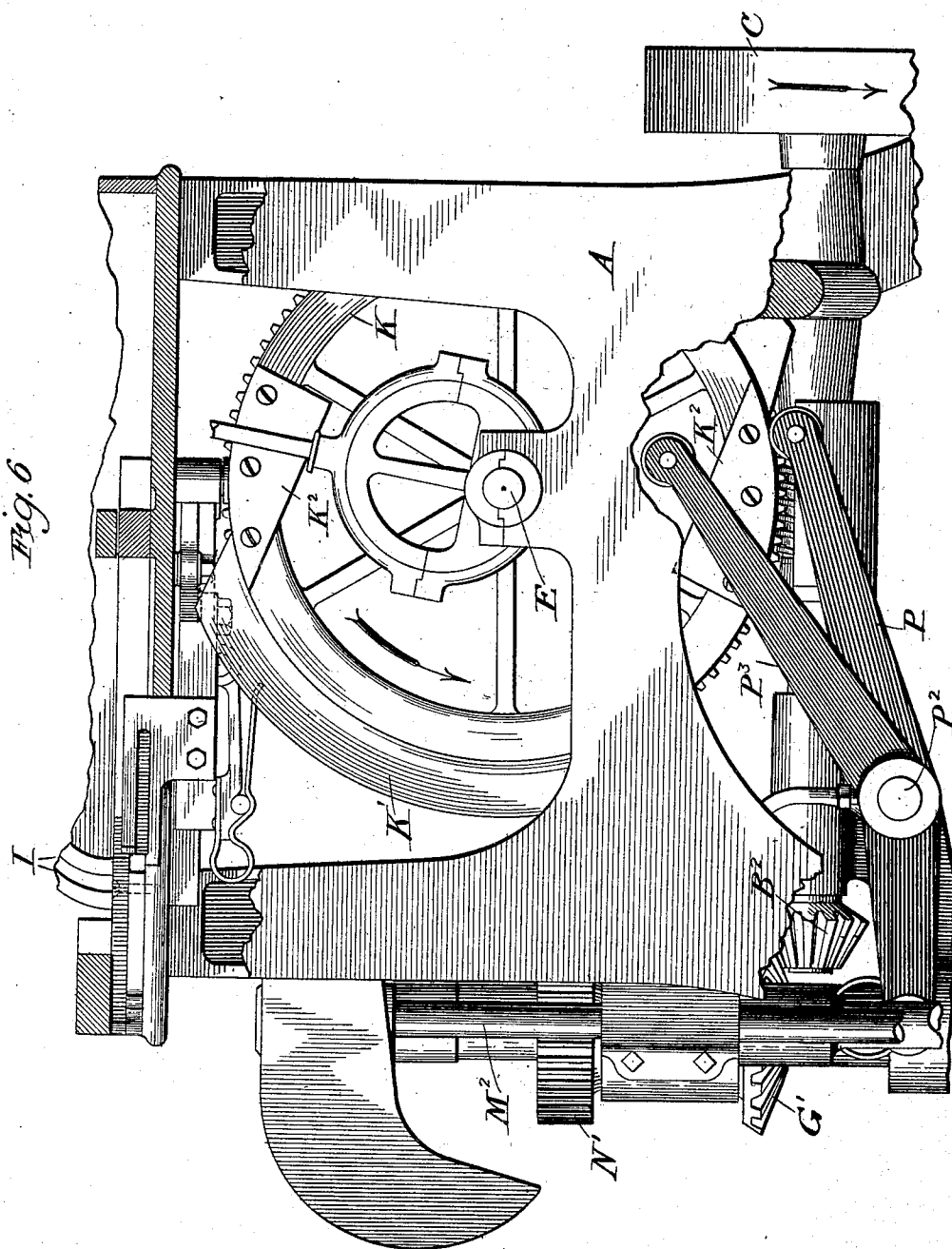
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MACHINE FOR FINISHING THE ENDS OF BLANKS.

APPLICATION FILED APR. 25, 1902.

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8 SHEETS—SHEET 5.



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MACHINE FOR FINISHING THE ENDS OF BLANKS.

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8 SHEETS—SHEET 6.

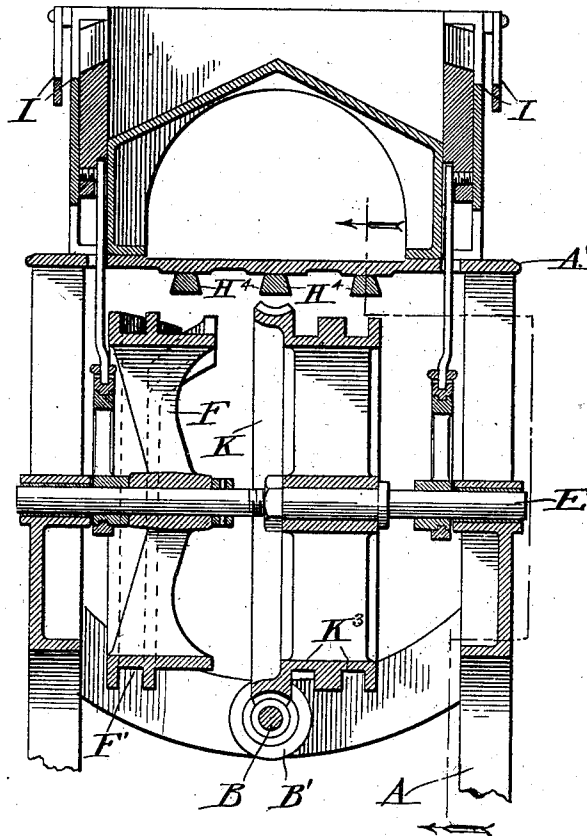


Fig. 7.

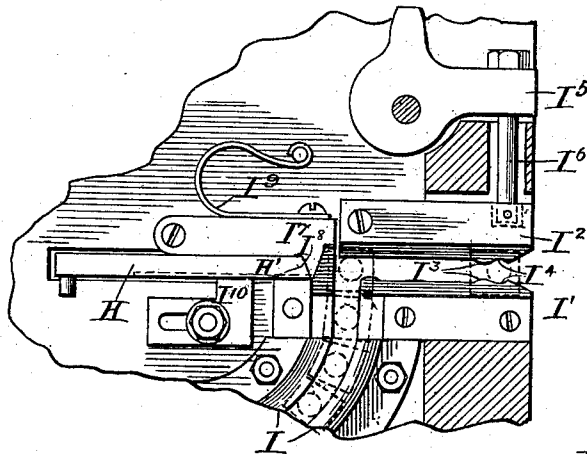


Fig. 8.

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APPLICATION FILED APR. 25, 1902.

NO MODEL.

8 SHEETS—SHEET 7.

Fig. 9.

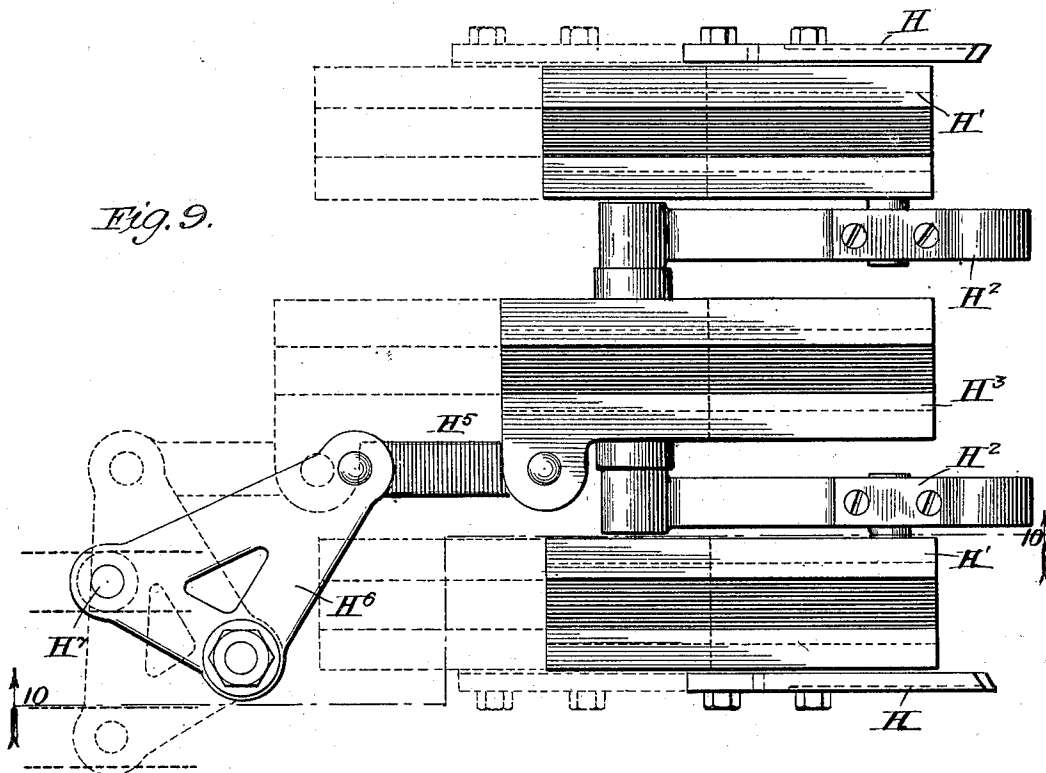
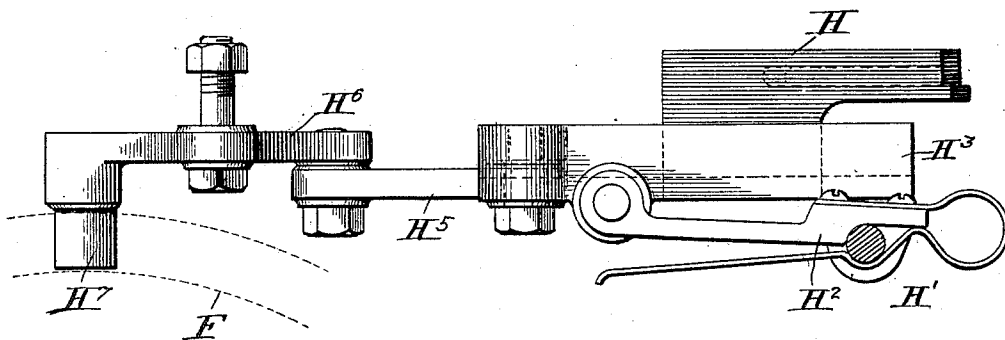


Fig. 10.



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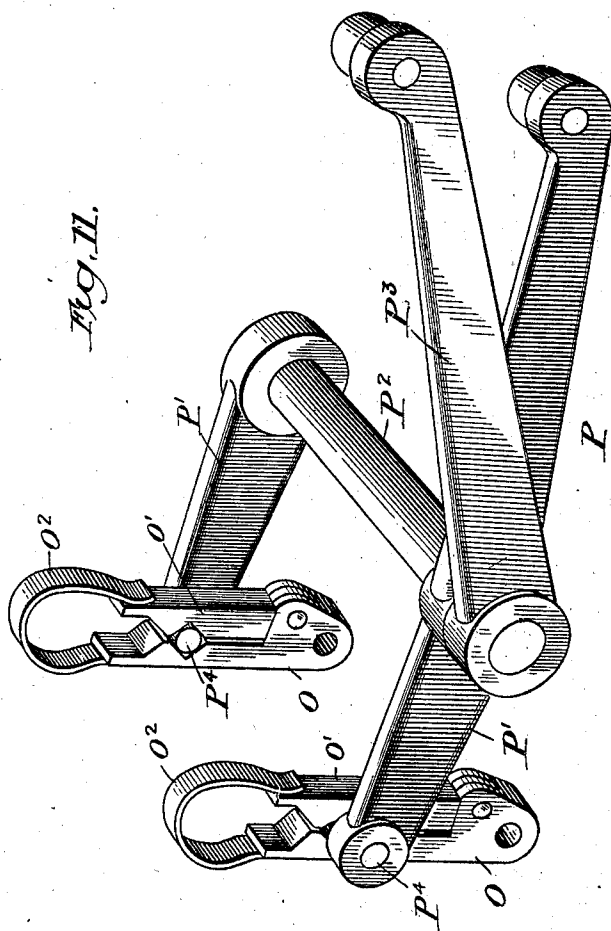
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MACHINE FOR FINISHING THE ENDS OF BLANKS.

APPLICATION FILED APR. 26, 1902.

NO MODEL.

8 SHEETS—SHEET 8.



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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR FINISHING THE ENDS OF BLANKS.

SPECIFICATION forming part of Letters Patent No. 722,300, dated March 10, 1903.

Application filed April 25, 1902. Serial No. 104,733. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES H. HASKINS, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Machines for Finishing the Ends of Blanks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to machines for rounding, pointing, or otherwise finishing the ends of blanks, and, generally considered, relates to that type of machine shown in my prior patents of March 10, 1896, No. 556,054, and April 19, 1898, No. 602,506, wherein the blanks are automatically fed from a hopper into position to be operated upon by the tool-spindles and finally discharged by the succeeding blanks.

The objects of my invention are to provide a machine of this type that will operate continuously in feeding, finishing, and discharging the blanks without reversing the machine, to provide a simple and efficient feed mechanism for the blanks that will insure the proper presentation of one blank at a time to the tool and minimize the tendency of the blanks to clog the feed chute or guide, to provide a positive actuating mechanism for reciprocating the tool-spindles, whereby they are given a regular intermittent motion suitable for working speeds without the interposition of reversing-gearing, and generally to so improve and simplify the mechanism employed in feeding, holding, and discharging the blanks and in operating the tool-spindles as to greatly increase the stability, efficiency, and automatic character of the machine as a whole.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the machine, showing the various parts in their relative arrangement preparatory to feeding blanks to the tool-spindles. Fig. 2 is a front elevation of the machine, showing the spindles and the gear and lever mechanism for operating the same, also the vise or clutch mechanism that holds the blanks when being operated

upon. Fig. 3 is a plan view of the top of the machine, showing the chutes, rear walls of the same in front of the ejectors, and ejectors, the spindles in dotted lines, and the lever that closes and opens the jaws of the vises that hold the blanks. Fig. 4 is an enlarged sectional plan view of the chutes, the spindles, and lever mechanism for holding the blanks when operated upon. Fig. 5 is a longitudinal vertical section of the machine, taken on the line 5 5 of Fig. 2. Fig. 6 is an enlarged detail view of the upper parts of the machine. Fig. 7 is a sectional elevation of the machine on line 7 7 of Fig. 1. Fig. 8 is an enlarged detail plan view, partly in section, of one of the feed-chutes, the movable back wall of the feed-chute, and the ejector. Fig. 9 is an enlarged plan view of the ejectors and the bell-crank for operating the same, taken on lines 9 9 of Fig. 1. Fig. 10 is a sectional view of the ejector, taken on the line 10 10 of Fig. 9; and Fig. 11 is a perspective view of the rock-levers and safety connections for operating the spindles.

It is to be noted that the machine herein-after described illustrates my invention as applied to a double set of feed mechanism and spindles; but it is to be understood that the invention may be applied to a machine having a single spindle and appurtenant feed mechanism or to a machine having a greater number of operating-spindles and coöperating parts.

Referring to the drawings, the operative parts of the machine are mounted upon a framework A, provided with a top A'. A main shaft B, mounted in bearings in the framework A, transmits power to the various operating portions of the machine, which power is derived from a belt D, engaging a pulley C, mounted upon said shaft B. Mounted above the shaft B, and preferably at right angles thereto, is a second shaft E, likewise mounted in the machine-frame, to which rotary motion is imparted by means of a gear K, meshing with a worm B' on the shaft B, so that both shafts B and E, through which all of the moving parts of the machine are actuated, are continuously driven in one direction, as indicated by arrow in Fig. 1. The die-carrying spindles N, which are mounted

in the front portion of the machine, are held in proper alinement by the horizontal portion of the discharge-chute S and a bracket S', projecting from the machine-frame. A rearward projection of this bracket forms a forward bearing for shaft B, and a downwardly-depending gear thereon constitutes the bearing for a rock-shaft P<sup>2</sup>. For imparting a proper rotary motion to the spindles N shaft B is provided with a bevel-pinion B<sup>2</sup>, which meshes with a corresponding pinion G' upon a vertical stub-shaft G, mounted in the bracket S' between the spindles N N. To the upper end of this shaft G is secured a gear G<sup>2</sup>, which meshes with gears N' N' on the spindles N N. The lower end of the spindles N are mounted in a cross-yoke M, which is guided by suitable sleeves M' M' upon vertical guide-rods M<sup>2</sup> M<sup>2</sup>, depending from the machine-frame, so that as the yoke is reciprocated along said guide-bars the spindles are advanced toward or retracted from the blanks, which are fed along the top of the table in a manner to be hereinafter described.

The mechanism for reciprocating the yoke M and the attached spindles N comprises two rock-levers P P<sup>3</sup>, which are rigidly secured to the shaft P<sup>2</sup>, and two levers P', one of which is preferably formed integral with the lever P and the other is keyed to the shaft P<sup>2</sup>, which engage, by means of pins P<sup>4</sup>, secured at their outer ends, with the jaws of a safety connection, in turn connected with the yoke M. Each of these safety connections is formed of a link having pivoted jaws O O', formed near their upper ends with mating recesses, which constitute a bearing for the pins P<sup>4</sup>, and a stout spring O<sup>2</sup>, attached to the longer section, engages the upper end of the other section and forces the two sections together to embrace the pin. These links are pivoted to the yoke M in ears adjacent to the spindles N, as shown in Fig. 2. The rear ends of the levers P P<sup>3</sup> are provided with bowls, which engage, respectively, with peripheral cams K' and K<sup>2</sup>, mounted on the rim of wheel K, the cams K' constituting an outward extension of the periphery and the cams K<sup>2</sup> forming an inward extension thereof, having a sharp incline opposite the direction of rotation of the wheel. The cams K<sup>2</sup> are placed immediately behind the rear of the cams K', so that as the bowl of lever P passes off of incline K' the corresponding bowl on lever P<sup>3</sup> rides upon the incline of cam K<sup>2</sup> when in operation. In order to avoid excessive strain upon the lever P and secure an even pressure of the working dies carried by the spindles N upon the blank, counterbalances Q<sup>2</sup>, mounted upon cross-shaft Q<sup>3</sup>, are connected by crank Q' and links Q to ears on the under side of the yoke M.

The blank-containing hopper and the mechanism for delivering the blanks from said hopper into the feed-chutes are substantially the same as described in my former patents, hereinbefore referred to, and need not be more

particularly described here. In order to provide a practically uninterrupted guide or chute for the blanks as they are fed from the hopper into position to be operated upon by the die-carrying spindles, I provide the feed guides or chutes at or near the delivery end with a deflected section composed of a stationary block I' and an oppositely-facing pivoted block I<sup>2</sup>, both blocks being composed of steel or other hard-surfaced metal to resist wear. These two blocks constitute the clutch or vise for holding the blanks rigidly in position to be operated upon by the die-spindles, and the two members of the clutch are provided with depressions I<sup>4</sup> near their outer ends, which receive the blank after it has been forced over two rounded projections I<sup>3</sup> by the ejector to be described. It is to be noted that the chute or feed-guide is free and uninterrupted throughout its entire length from the hopper to the clamping-jaws of the clutch or vise, and in order to provide for the feeding of but one blank at a time into the deflected section and the corresponding discharge of the finished blank by the ejector H without affecting the continuity of the chute or interposing springs in the path of the blanks I provide the lower inner wall of the chute, which also constitutes the rear wall of the deflected section or vise, with a pivoted lock I<sup>7</sup>, which is held in position to close the rearward opening of the vise by a spring I<sup>9</sup>.

The mechanism for operating the movable jaws of the vises or clutches comprises two pivoted dogs I<sup>5</sup>, having a rocking toothed engagement with each other, each of which dogs is connected with its corresponding clutch-section by a pin I<sup>6</sup>, and one of said dogs has a rearwardly-extending lever J, terminating in a finger which passes through a slot in the top of the frame and engages a cam-slot K<sup>3</sup> in the periphery of the wheel K. By this means it will be seen that as the wheel K revolves the lever J is oscillated, thereby rocking the dogs I<sup>5</sup> upon their bearings and correspondingly moving the pivoted clutch-sections I<sup>2</sup> toward or from the opposing fixed clutch-sections I'.

Coöperating with the deflected sections of the chutes or feed-guides are ejector-fingers H, each of which is formed of an angular bar projecting upwardly through a slot in the table-top and reciprocating in alinement with each deflected section. The forward end of each of these fingers is provided with a bevel or incline H', which engages with a corresponding bevel or incline I<sup>8</sup> on the pivoted block I<sup>2</sup>, so that as the ejector is advanced the pivoted block I<sup>2</sup> is swung laterally to permit said ejector to pass into the rear end of the deflected chute-section, thereby forcing the single blank therein contained along said section until the preceding blank is discharged and the advancing blank is placed in position between the clamping members of the clutch. This forward movement of the ejector likewise closes the inclined portion of the chute

and prevents the passage of another blank into the deflected section until the ejector is withdrawn, and after said ejector has been retracted the pivoted block I' is immediately swung back in place by the spring I<sup>9</sup> to close the rear wall of the terminal or deflected section of the chute.

In order to insure an even steady operation of the ejectors in forcing the blanks successively into position over the die-spindles, I provide a slide H<sup>3</sup>, which fits over and is guided and supported upon a dovetailed rib H<sup>4</sup> on the under side of the top of the frame. This slide is connected by a link H<sup>5</sup> to a bell-crank H<sup>6</sup>, likewise pivoted to the under side of the machine-frame and provided with a bowl H<sup>7</sup>, which works in a cam-slot F' upon the wheel F, mounted upon the cross-shaft E. Pivoted to the slide H<sup>3</sup> are two safety connections or pitmen H<sup>2</sup>, which are substantially the same as those described in my former patents above referred to, which pitmen are respectively connected to two corresponding slides H<sup>1</sup>, working upon dovetailed guides H<sup>4</sup> and to which slides the ejectors H are connected.

The operation of my machine is as follows: The blanks fed from the hopper pass down the inclined chutes or feed-guides I and fill the same, with the foremost blank rigidly clasped between the jaws I' I<sup>2</sup> of the clutches. As the shaft E is rotated in the direction indicated by the arrow in Fig. 1, lever J, engaging the cam-slot in the periphery of wheel F, moves to the right, thereby rocking dogs I<sup>5</sup>, so as to swing the pivoted clutch members I<sup>2</sup> away from the fixed members I', and thereby releasing the end of the foremost blanks. Subsequent thereto the cam-slot in the periphery of wheel K rocks the bell-crank J to advance the slide H<sup>3</sup>, and thereby move the ejectors H in a forward direction, causing the blocks I' to be swung out of alinement with the deflected slot-sections and permitting the ejectors H to engage the blank in each of said sections and force each of said blanks forward, discharging the foremost blanks and driving the succeeding blanks between the clamping-surfaces of the vises or clutches. The continued rotation of wheel F moves lever J toward the left and rocks the dogs I<sup>5</sup> to swing the pivoted vise-sections into clamping position, and the corresponding rotation of wheel K swings the bell-crank lever to retract slide H<sup>3</sup> and its connected slides bearing the ejectors. It is to be particularly noted that if in the forward or rearward movement of these slides any of the blanks should become wedged or clogged in the forward chute-section the safety connection H<sup>2</sup> would immediately free the slide carrying the ejector co-operating with that particular chute-section, so that said ejector would be thrown out of operation until the defective blank could be removed, after which the safety connection could be quickly reestablished. As the wheel K continues to revolve one of the cams K' passes into contact with the bowl on the end

of lever P, with the result that the yoke M, carrying the spindles N, (which spindles are continuously driven from shaft B, as hereinbefore described,) lifts the yoke and the spindles until the dies or finishing-tools in the ends of the spindles come into contact with the ends of the blanks, which are thereby rounded, pointed, or otherwise finished, according to the character of the dies. If at this time the die-spindles should become wedged or meet with any obstruction—as, for instance, a blank of too great length—the safety connection between the rock-levers P' P' and the yoke M would yield, permitting the pins P<sup>4</sup> to pass up between the hinged portions of the safety connections and the spindles would not be advanced. The opposite movement of the lever P' P' would, due to the engagement of the lever P<sup>3</sup> with the cam K<sup>2</sup>, reengage the pins P<sup>4</sup>, with their bearings, in the safety connection, and if the obstruction had been removed continue the normal operation of the spindles. Likewise should either of the spindles become wedged in its forward or working position the yielding connection would operate to release the pins P<sup>4</sup>, which would be correspondingly reengaged upon the return movement. The die-carrying spindles are held in operative relation to the blanks as long as the lever P is held in engagement with cam K'; but as soon as said lever is disengaged from its coöperating cam the yoke M descends, withdrawing the spindles from the work. At this time the lever J is again operated to release the clutches and immediately thereafter the ejectors are advanced to feed another blank to the clutches and the operation continued as before.

In case the spindles meet any resistance in their descent or the pins P<sup>4</sup> are withdrawn from their safety connections the lever P<sup>3</sup> rides up the inclines of the cam K<sup>2</sup>, returning all to their normal position.

The machine embodying my invention, as hereinbefore described, is adapted to operate upon the ends of blanks in the form of bolts for the purpose of rounding the same; but it will be understood that the machine is not limited to this particular use, as obviously it might readily be changed and adapted to point, chamfer, or shoulder the ends of appropriate blanks.

Having thus described my invention, what I claim is—

1. In a machine for finishing the ends of blanks, the combination of a blank-holding clutch, a rotating reciprocating die-carrying spindle, a non-reversing power-shaft for rotating said spindle, mechanism for reciprocating said spindle comprising a rock-lever having a safety connection with said spindle for advancing the latter, a lever for restoring the safety connection between the spindle and the rock-lever, and a wheel driven from the power-shaft and having cams thereon to successively engage said rock-levers.

2. In a machine for finishing the ends of

blanks, the combination of a series of blank-holding clutches, rotating reciprocating die-carrying spindles cooperating with the respective clutches, a non-reversing power-shaft driving said spindles, a yoke supporting said spindles, and means for reciprocating said yoke and said spindles comprising a rock-lever having a safety connection with said yoke, a rotary cam driven from the power-shaft, and a lever operated by said cam for reestablishing the safety connection when the latter parts.

3. In a machine for finishing the ends of blanks, the combination of a series of blank-holding clutches, a corresponding series of rotating reciprocating die-carrying spindles, a non-reversing power-shaft for rotating said spindles, a reciprocating yoke supporting said spindles, and means for reciprocating said yoke comprising a rock-shaft connected with said yoke by safety devices, rock-levers attached to said rock-shaft to rotate the same in alternate directions, and a wheel driven from the power-shaft and provided with peripheral cams to successively engage said rock-levers, whereby the yoke is normally actuated by one lever and the safety connections are reestablished by the other lever.

4. In a machine for finishing the ends of blanks, the combination of a main shaft rotating in one direction, a series of rotating reciprocating die-carrying spindles geared to said shaft, rock-levers yieldably connected with said series of spindles to alternately advance the latter, an additional lever to reestablish the connections between the rock-levers and the spindles, a second shaft mounted adjacent to said main shaft and driven therefrom, a series of blank-holding clutches adjacent to said spindles, feed-guides for delivering blanks to the respective clutches, reciprocating ejectors cooperating with said guides to force the blanks into the respective clutches, and rotary cams on said second shaft adapted to actuate the ejectors, the clutches and the rock-levers, whereby a blank is fed to each clutch, the several clutches closed on the blanks, the spindles are advanced to operate on the blanks, and the yielding connections are reestablished.

5. In a machine for finishing the ends of blanks, a feeding device comprising a slotted feed-guide having a deflected section at the

delivery end thereof, a reciprocating ejector cooperating with said deflected section, a movable abutment interposed between said ejector and said deflected section, said abutment constituting a part of the feed-guide, and engaging means between the ejector and the abutment whereby the latter is displaced when the ejector advances.

6. In a machine for finishing the ends of blanks, a feeding device comprising a slotted feed-guide having a deflected section at the delivery end thereof, a reciprocating ejector cooperating with said deflected section, a pivoted spring-pressed abutment interposed between said ejector and said deflected section, and cooperating inclines on the ejector and the abutment to displace the latter when the ejector is advanced.

7. In a machine for finishing the ends of blanks, a feeding device comprising a slotted feed-guide having a deflected section at the delivery end thereof, a pivoted lever forming one wall of said deflected section and forming with the opposite wall a clutch to hold the blank, a reciprocating ejector cooperating with said deflected section to advance the blanks to the clutch, a movable abutment interposed between said ejector and said deflected section, and means to displace said abutment by the advance of the ejector.

8. In a machine for finishing the ends of blanks, the combination of die-carrying spindles, and means for actuating the same, feed-guides for delivering the blanks, ejectors cooperating with said guides, and means for reciprocating said ejectors comprising a bell-crank lever having safety connections with the respective ejectors, and a rotary cam engaging and operating said bell-crank.

9. In a machine for finishing the ends of blanks, mechanism for actuating the blank-ejectors comprising a rotary cam-wheel on the machine-frame, a bell-crank lever operatively connected therewith, a slide connected to said bell-crank, a second slide to which the ejector is secured, and a safety connection between said slides.

In testimony whereof I affix my signature in presence of two witnesses.

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