No. 708,140. Patented Sept. 2, 1902.

J. H. HASKINS.

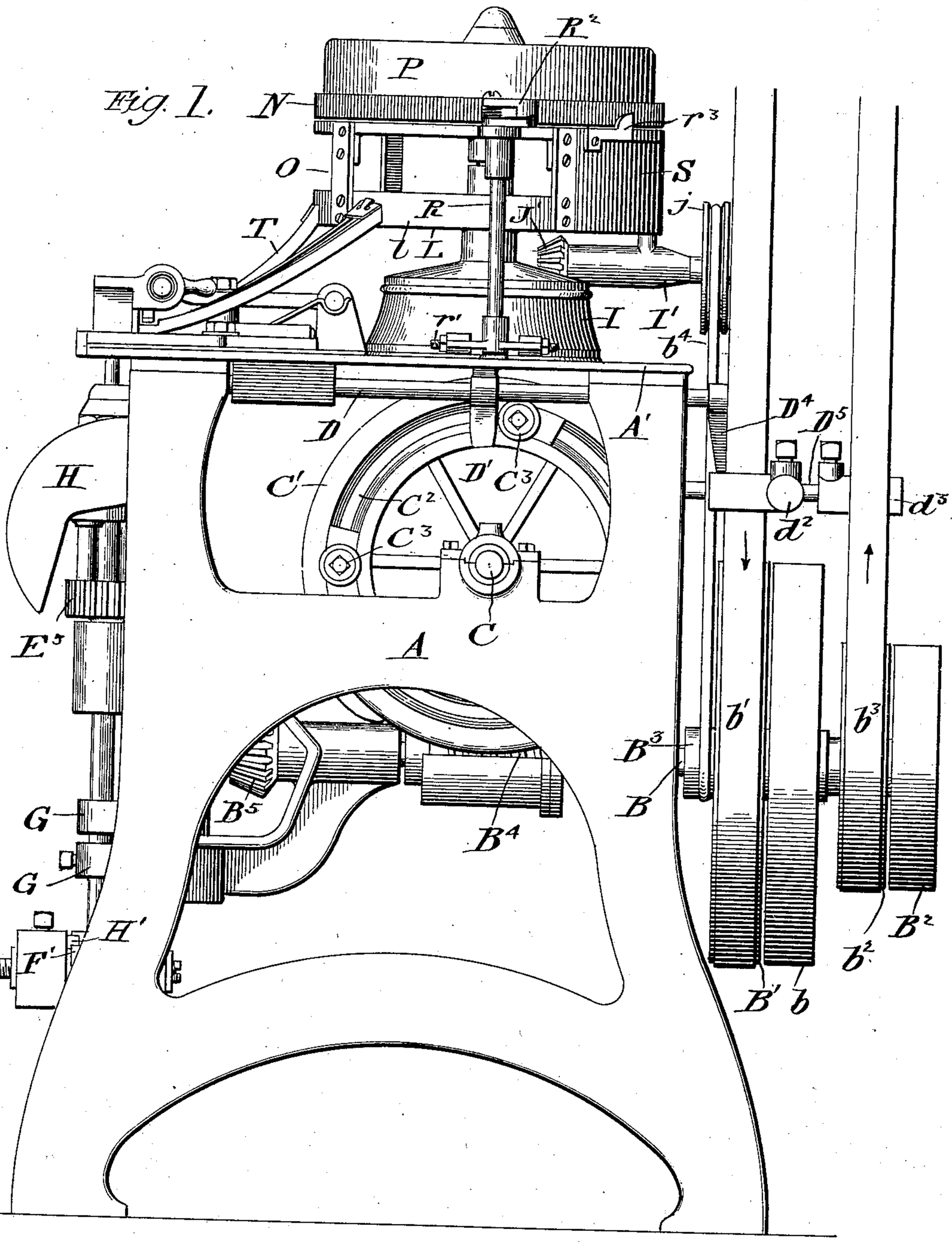
FEED MECHANISM FOR BLANK THREADING MACHINES.

(Application filed Feb. 19, 1902.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



Witnesses;
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Edw. Barrett.

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(No Model.) 4 Sheets—Sheet 2.

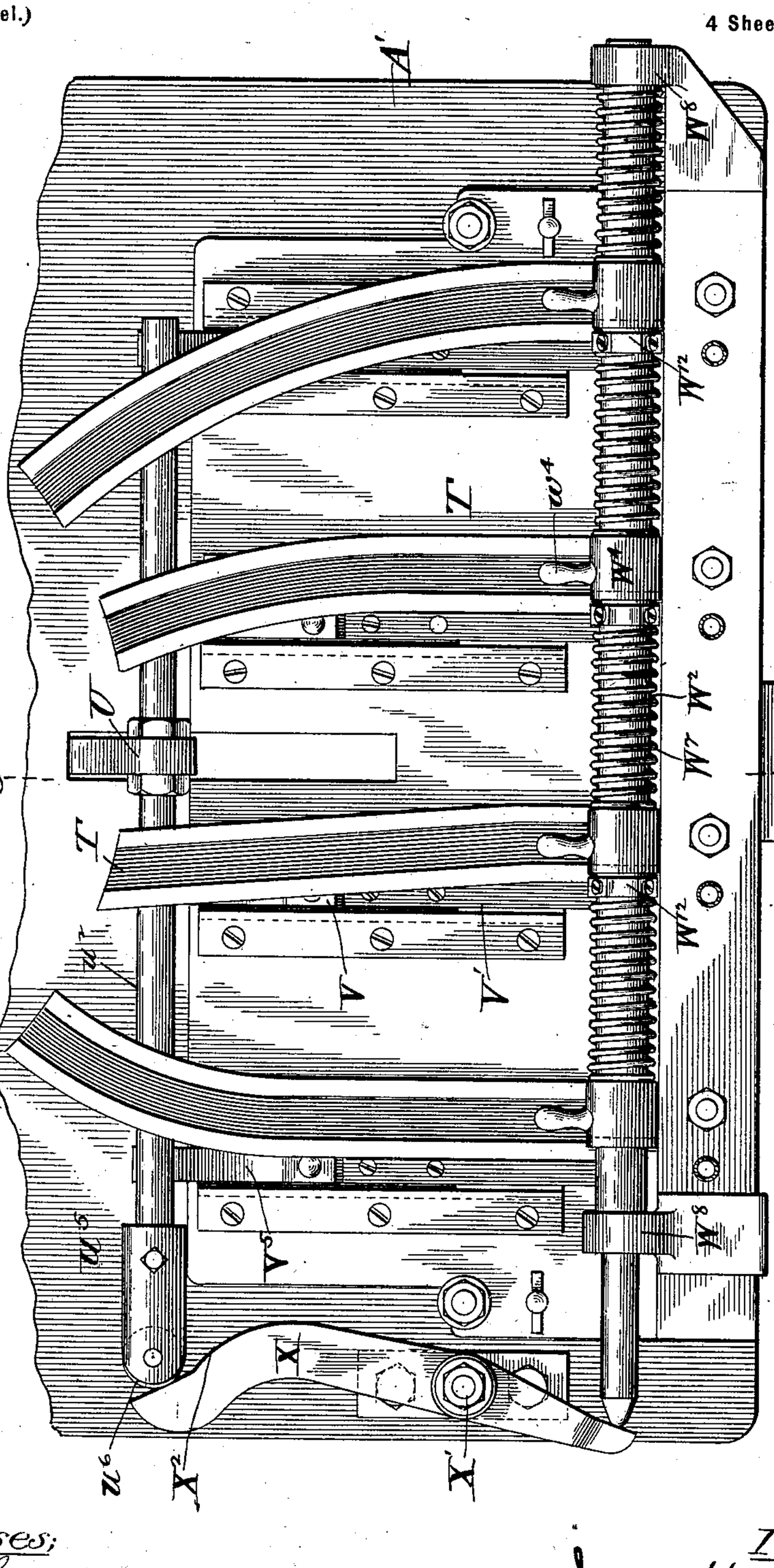

Fig. 2.

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FEED MECHANISM FOR BLANK THREADING MACHINES.

(No Model.) (Application filed Feb. 19, 1902.) 4 Sheets—Sheet 3.

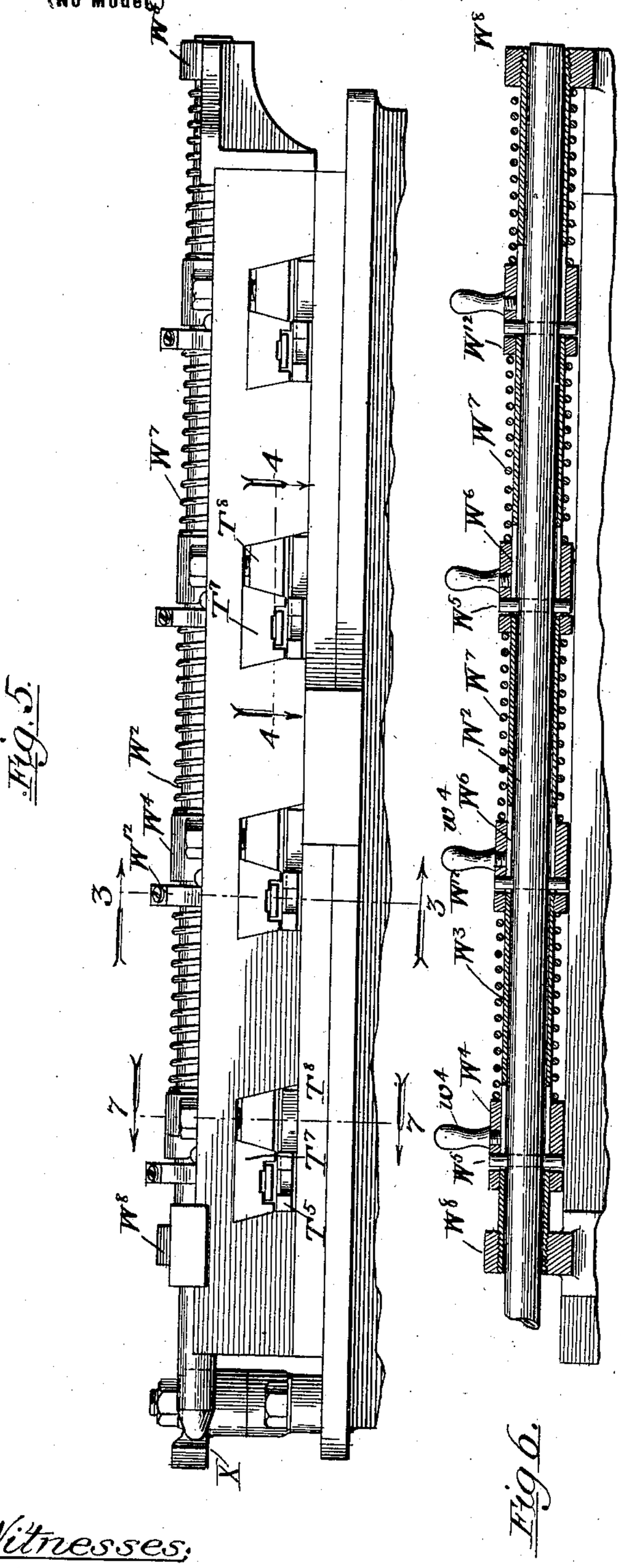

Fig. 5.

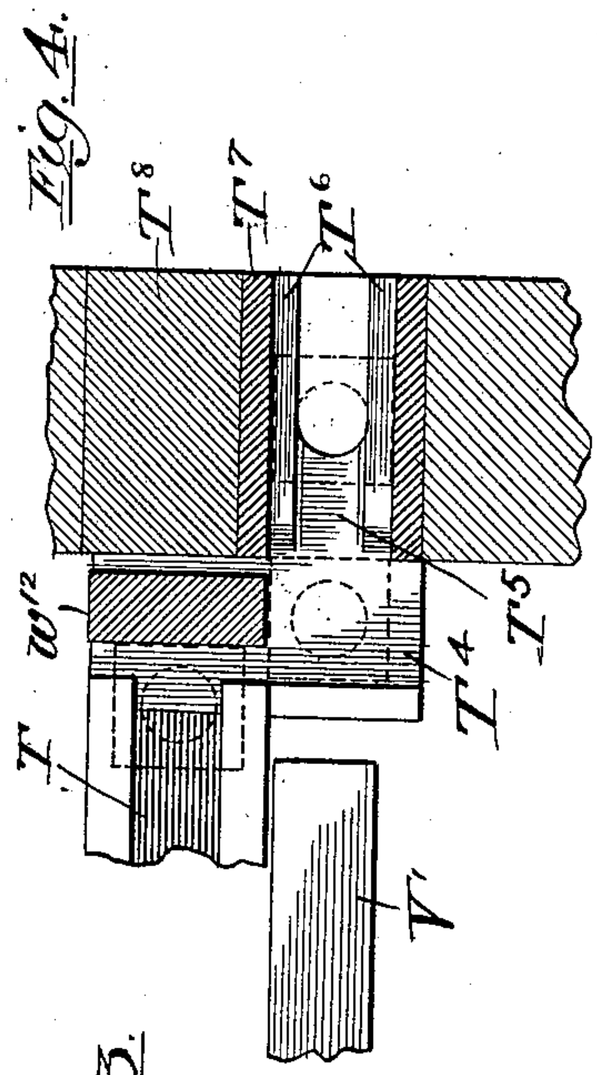

Fig. 4.

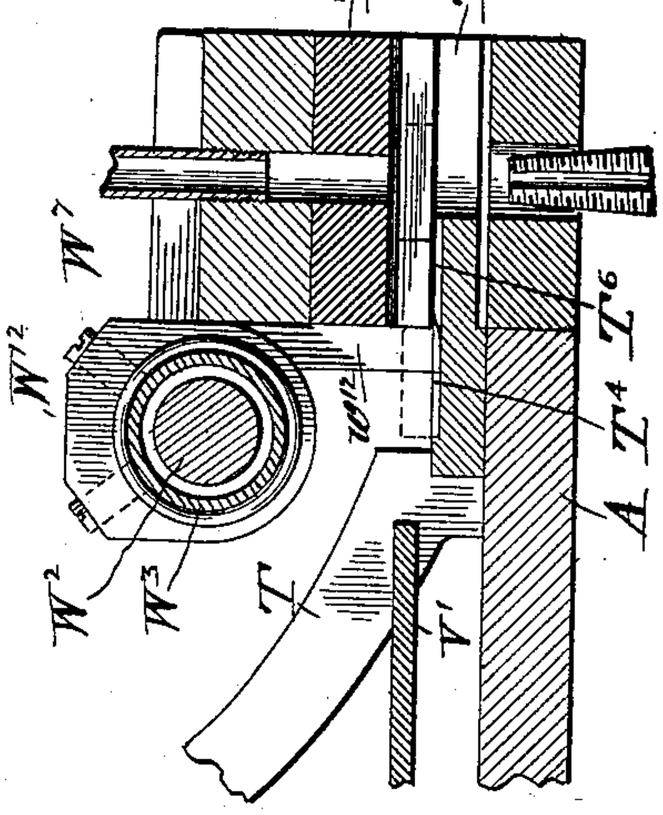

Fig. 3.

Fig. 6.

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FEED MECHANISM FOR BLANK THREADING MACHINES.

(No Model.) (Application filed Feb. 19, 1902.)

4 Sheets—Sheet 4.

Fig. 9.

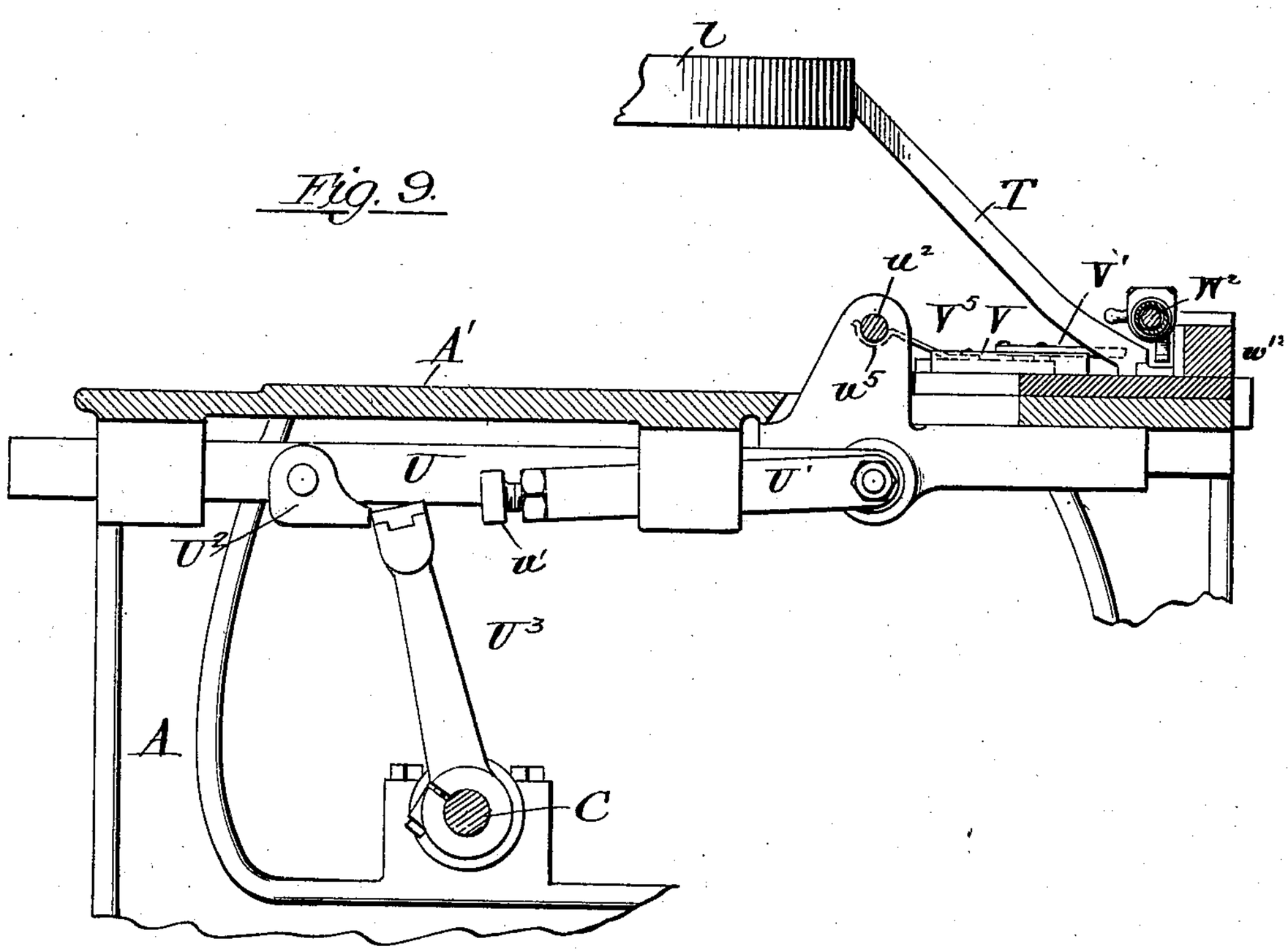


Fig. 8.

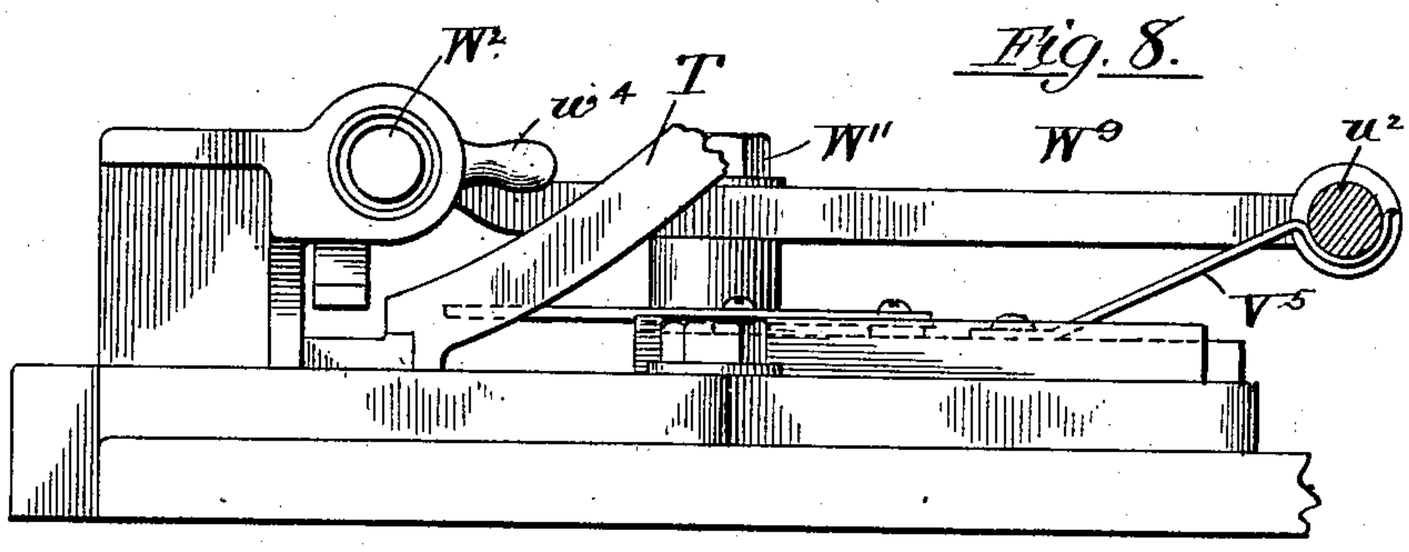
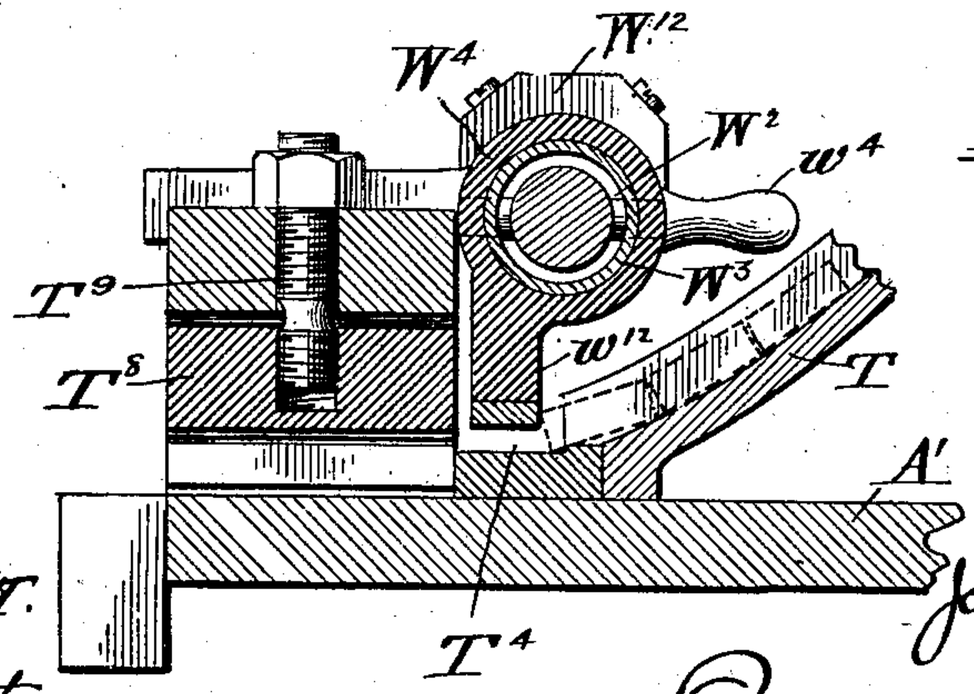


Fig. 7



Witnesses,
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Inventor
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UNITED STATES PATENT OFFICE.

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FEED MECHANISM FOR BLANK-THREADING MACHINES.

SPECIFICATION forming part of Letters Patent No. 708,140, dated September 2, 1902.

Application filed February 19, 1902. Serial No. 94,813. (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 Feed Mechanism for Blank-Threading Machines; 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 improvements in automatic machines for threading blanks, in which the blanks are automatically fed from a hopper by way of a chute or series of chutes into position to be acted upon by the thread-cutting tools; and the object of my invention is to provide an improved form of feeding device for the blanks as they are delivered from the chute or chutes that will insure the delivery of but a single blank at a time to the plunger which presents the blank to the thread-cutting tool, that will automatically close the chute after a single blank has been delivered, that will avoid the necessity of providing spring-clips to hold each blank prior to its being operated upon by the plunger, and that will effect a positive, accurate, and uniform feed of the blanks, and thereby minimize the tendency of the blanks to "clog" in the chute and in a corresponding degree reduce the amount of attention required from the operator.

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

Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a top plan view of the front portion of the machine, showing my improved feed mechanism. Fig. 3 is a sectional side elevation of the feed mechanism, taken on line 3 3 of Fig. 5. Fig. 4 is a sectional plan view on line 4 4 of Fig. 5, showing the feeding-chute, the feeder-bar, and the plunger just prior to driving a blank into position for threading. Fig. 5 is a front elevation of the upper part of the machine. Fig. 6 is a fragmentary longitudinal section through the feeder-bar. Fig. 7 is a section on line 7 7 of Fig. 5 looking in the direction of the arrows. Fig. 8 is a fragmentary side elevation showing the feed mechanism and its connection with the actuator-bar. Fig. 9 is a fragmentary sectional elevation of the machine, showing the feed mechanism, the actuator-bar, and the means for actuating the latter.

My improved feeding device is particularly adapted for use in connection with blank-threading machines of the type heretofore patented by me, No. 583,647, granted January 1, 1897, and, as illustrated in the accompanying drawings, the machine to which my present invention is applied is practically identical in structure and mode of operation with the aforesaid patented machine as concerns the mechanisms for actuating the thread-cutting tools and for controlling the blanks in the hopper to prevent them from becoming compact and piled upon themselves as they are being presented to the chutes. It is to be understood, however, that my improved feeding device is not limited in its practical application to this particular machine or to any other specific type of machine, but is capable of successful application to all machines wherein blanks of regular form are fed from chutes into position to be operated upon by tools or finishing mechanism. In so far as the mechanism covered by the patent is concerned, reference may be had to the specification of said patent for the specific details of construction and mode of operation thereof; but as much of the said mechanism as is directly effective in the operation of my improved feeding mechanism may be briefly described as follows:

The moving parts of the machine are mounted upon a table or framework having the open sides A and top plate A'. A main power-shaft B extends across the frame of the machine and is journaled in bearings mounted in the sides A. Mounted upon the shaft B are two sets of pulleys B' b and B^2 b^2, the latter set being of smaller diameter than the former. Pulleys B' B^2 are fast to shaft B, and pulleys b b^2 are loose on said shaft. Coöperating with the respective sets of pulleys are belts b' and b^3, which belts run in opposite directions. The belt b' on pulley B' drives the shaft B in a forward direction with respect to the tool operating on the blank, and the belt b^3 when engaging the pul-

ley B^2 reverses the motion of shaft B and correspondingly causes the tool to back out of the blank.

Mounted on the shaft B is a worm B^4 and a bevel-pinion B^5, the former engaging suitable cogs in the periphery of a wheel C', mounted on a transverse shaft C, and the latter driving a series of spindles carrying the thread-cutting taps, as clearly described in the patent aforesaid. The wheel C' has in one of its faces a slot C^2, in which are adjustably mounted two stop-blocks C^3. A sliding bar D, mounted in bearings on the under side of the top plate A', is provided with a cross-post D', that extends in the path of the stop-blocks C^3. Connected with the bar D by an arm D^4 is a parallel bar D^5, upon which are mounted the belt-shifters d^2 and d^3. As the wheel C' is actuated from the main shaft B, the bar D will be reciprocated back and forth by the stop-blocks C^3 engaging the post D', thereby shifting the belts b' and b^3 from the fast to the loose pulleys, and vice versa, with the result that the machine is automatically advanced and reversed with a period of operation determined by the position of the stop-blocks C^3, and as the pulley B^2 of the reversing-belt is smaller than pulley B' of the direct-driving belt the machine will be operated more rapidly in the reverse direction, and consequently the taps will be advanced slowly in the threading operation and will be more rapidly operated to back the taps out of the blanks.

Mounted upon the top plate A' is a bell-shaped casting I, which supports the blank-receiving hopper P and the devices coöperating therewith, whereby the blanks, which are dumped into the hopper in large quantities, are regularly and uniformly delivered to the various feed-chutes T.

As thus far explained this machine is like that described in my Patent No. 556,054; but the means for controlling the blanks in the chutes and for feeding said blanks into position to be acted upon by the thread-cutters differ widely from the feeding means employed in the said patented device. In the present construction a series of feed-chutes corresponding in number to the thread-cutting spindles are connected with the circular plate L, within which the blank feeding and agitating devices are contained. Each of these chutes T is extended downwardly and outwardly from the circular plate to the thread-cutting spindles. At the bottom of the inclined portion each chute is provided with a deflected section T^4, which is preferably formed by a continuation of the chute at right angles to its former direction. Beyond this deflected section that portion T^5 of each chute which is directly over the thread-cutting tools is formed at right angles to and in communication with said deflected section, so that each blank passing down the feed-chute to the taps during the final feeding operations is moved laterally and then forwardly to a position over the taps. The deflected sections of the chutes, which are disposed in a horizontal plane along the forward edge of the top plate A', are preferably of steel or other hard metal and are formed integrally with the end sections T^5 of the respective chutes, which in turn are secured in a support on the top plate A'. The end of each section T^5 is bifurcated to permit the passage of the tap and is also provided with two guides or ways T^6, raised slightly above the level of the section T^4. Above the chute-section T^5 is a wearing-block T^7, which has in its lower face a channel to receive and center the blank. This block T^7, which is wedge-shaped in section, is held in position by a key-piece T^8, which is held adjustably in the support by bolt T^9.

Mounted in brackets W^8, projecting from the support on top plate A', is a feed-bar which consists of a reciprocating rod W^2, fitting freely in a tubular sleeve W^3. Substantially opposite the mouths or outlets of the main chutes T there is slidably mounted on the sleeve W^3 a series of collars W^4, each provided with a depending finger w^{12} and a handle w^4. Beneath each collar W^4 the sleeve W^3 is slotted at diametrically opposite points to permit the passage of pins W^5, passing through the rod W^2 and normally engaging suitable slots in the edges of the collars. Between the collars W^4 and rings W^{12}, secured to sleeve W^3, are springs W^7, surrounding the sleeve and normally holding the respective collars W^4 in engagement with their coöperating pins W^5. It will be apparent that as the rod W^2 is moved to the right the collars W^4 will be moved along sleeve W^3 against the tension of the springs W^7, and upon the reverse movement of the rod each spring will force its particular collar into engagement with its pin W^5, and hence the rod and the collars will travel together during the entire reciprocation of the former. Each collar, however, is capable of being moved along and rotated on the sleeve W^3 independently of the rod W^2, as will be hereinafter described. The fingers w^{12} normally occupy positions in the deflected sections of the several chutes directly in front of and closing the openings of the main chutes T into the said deflected sections. One end of the rod W^2 projects beyond the supporting-bracket W^8 and is engaged by the end of a rock-lever X, pivoted to the top plate A' by a suitable pin X', and the other end of said rock-lever is provided with a cam-section X^2, which coöperates with a bowl u^6, mounted in a collar u^5, which is adjustably secured to the end of an actuator-bar u^2.

A series of feed slides or plungers V, each having an extended finger V', are mounted in guideways in the top plate A'. The fingers V', which are practically the same width as the blanks, reciprocate across the section T^4 of the respective chutes to force the blanks therein contained into the end sections T^5 of

the chutes and over the tap corresponding to the particular chute. Each of these plungers V is connected to the horizontal actuator-bar u^2 by a safety-pitman V^5, which consists of a spring rigidly secured to the plunger and having a curved end embracing the under side of bar u^2. The actuator-bar u^2 is rigidly attached at its middle portion to an arm u^5 of a slide U, mounted in brackets on the under side of the top plate A', which arm u^5 projects through and reciprocates in a slot in said plate A'. Motion is imparted to the slide U by an arm U^3, that is rigidly fixed to the cross-shaft C, which arm alternately engages a pin u', adjustably mounted in the end of a pivoted dog U', secured to slide U, and a second dog U^2, likewise pivoted to slide U. As the machine is moved in a forward direction the arm U^3 engages the dog U' and advances the slide U, thereby advancing the actuator-bar u^2 and the various plungers V. The forward movement of the plunger-bar causes the bowl u^6 at its end to ride up on the cam X^2 on the rock-lever X, thereby causing the said lever to turn on its pivot and force the rod W^2 of the feed-bar to the right. The reverse movement of the cross-shaft C causes the end of arm U^3 to engage the dog U^2 and retract the slide U and actuator-bar u^2, and consequently withdraw the plungers V from engagement with the deflected sections T^5 of the feed-chutes. At the same time the bowl u^6 moves off of the cam-section X^2 of rock-lever X, and the springs W^7, surrounding the rod W^2, drive this rod, with its appurtenant parts, to the left, and thereby return the rock-lever X to the position shown in Fig. 2.

The operation of my improved feed mechanism in connection with this particular machine is as follows: The hopper P is supplied with blanks to be threaded, and these blanks are regularly delivered into the feed-chutes. The blanks readily pass down the inclined portions of the main chutes until the foremost blank in each chute reaches the deflected section T^4 of the chute, where it encounters the finger w^{12} of the feed-bar, which finger occupies said section T^4 and effectively closes the mouth of the chute. Assuming that the machine is now operating with the driving-belt b' on fast pulley B', the tap-spindles are actuated through the bevel-pinion B^5 and the shaft C through the wheel C' and the screw B^4, and as shaft C rotates in the forward direction arm U^3, secured thereon, engages the dog U' on slide U, moving said slide, together with the attached actuator-bar u^2, in a forward direction, thereby driving the fingers V' of the plungers V across the deflected sections T^4 of the several chutes. If a blank happened to occupy any of these deflected chute-sections, it would be engaged by the corresponding plunger and forced into position in the forward chute-section over the tap, and the latter in its continued advance would pass through and properly thread the blank. The forward movement of the actuator-bar u^2 rocks the lever X on its pivot, and the outer end of said lever forces the rod W^2 of the feed-bar to the right. The pins W^5 in said rod engaging the grooves in the collars W^4 force said collars along the sleeve W^3 against the tension of springs W^7. As the rod W^2 moves to the right the fingers w^{12} on the respective collars W^4 are carried along the deflected chute-sections T^4 until the mouths of the main chutes, opening into the several deflected sections, are uncovered, and a single blank passes from each main chute into the corresponding deflected section. As the machine reaches the end of its forward operation the appropriate stop-block C^3 strikes post D' on rod D and shifts belt b' from fast pulley B' to loose pulley b and moves reversing-belt b^3 from loose pulley b^2 to fast pulley B^2, which immediately causes a reversal of all of the moving parts of the machine which effect the feeding and threading of the blanks. The reversal of shaft C causes arm U^3 to engage dog U^2 and move slide U to the rear, thereby retracting the actuator-bar u^2 and the connected plungers V until the fingers V' of said plungers are withdrawn from the various deflected chute-sections T^4. The springs W^7 now come into operation and force the collars W^4 and the rod W^2 to the left, whereby the blanks that have been passed from the main chutes into the deflected chute-sections are each engaged by the finger w^{12} coöperating with that particular section and forced along said section until they reach a position directly in front of the end chute-sections T^5 and in the path of the plunger-fingers V'. In this movement of the feed-bar the several fingers pass in front of and effectually close the mouths of the various chutes T, so that no other blank can pass into the deflected chute portions. The belts are again automatically shifted, and the machine is driven in its forward operation, as before described. The plungers V are advanced to force the blanks in the respective sections T^4 into the end sections T^5 and over the tap-spindles, which are then advanced into the blanks to properly thread the same. All blanks which occupy the end sections T^5 over the taps are forced out of the machine by the admission of the succeeding blanks. After the blanks have been threaded the machine is again automatically reversed and the operation repeated indefinitely.

It is to be particularly noted that but a single blank is allowed to pass into a deflected chute-section at a time, and the finger w^{12}, which advances this blank into position to be operated upon by the plunger, simultaneously closes the main chute to absolutely prevent the escape of the blanks from the main chute until the first blank has been fed to the taps and the finger w^{12} has been fully retracted. By this means the clogging of the blanks in the chute is entirely obviated and the necessity of providing holding springs or detents for the lower blank in the chute is avoided.

It is also to be noted that should any chute fail to deliver a blank or should a blank become wedged between the finger w^{12} and the sides of the chute the difficulty may be quickly released by moving the finger coöperating with the particular blank or chute along the sleeve W^3 by the handle W^4, provided for that purpose, when the blank may be properly adjusted in the chute; also, when necessary any finger may be completely disengaged from its chute by moving the collar W^4 to the right and rotating it about the sleeve W^3, thereby turning the finger up out of the line of the chute. Again, should a blank become lodged in the chute in front of the finger w^{12} there is no possibility of breaking the finger or feed-bar or of interrupting the operation of the other fingers, as the spring W^7 will yield as the other springs force their respective collars and the rod W^2 forward, and the one finger alone will be thrown out of operation.

It will be seen that my improved device is simple in construction, involving little wear on the moving parts, and most efficient in operation, effecting an accurate, uniform, and positive feed of the blanks from the chutes one at a time in such manner and under such conditions as to practically preclude the possibility of a stoppage of the feed due to clogging of the blanks or a failure to deliver a blank to each of the taps if there are any blanks at all in the several main chutes.

Having thus described my invention, what I claim is—

1. In combination in a blank-threading machine, a feed-chute for the blanks, a feed-bar moving across said chute, a finger on said bar adapted to simultaneously engage and deflect the foremost blank in the chute and arrest the movement of the blanks in the chute, a plunger for forcing the deflected blank to the tap and operating at right angles to the feed-bar, and means to successively advance the feed-bar and the plunger.

2. In combination in a blank-threading machine, a feed-chute for the blanks, which chute is formed with a deflected section, a feed-bar reciprocating across said chute, a finger on said bar adapted to simultaneously advance a blank along said deflected chute-section and arrest the movement of the blanks in the main chute, a plunger operating across the deflected section to force the blank from the deflected section and over the tap, and means to successively advance the feed-bar and the plunger.

3. In combination in a blank-threading machine, a feed-chute for the blanks, which chute is provided with a deflected section at its lower end, a feed-bar having a finger reciprocating across said chute adapted to simultaneously advance a blank along the deflected section of said chute and arrest the movement of the blanks in the main chute, a plunger operating across said chute-section to force the blank from the deflected section and over the tap, an actuator-bar connected to said plunger and said feed-bar, whereby the feed-bar and the plunger are alternately operated to advance the blank.

4. In combination in a blank-threading machine, a feed-chute for the blanks, which chute is provided with a deflected section at its lower end, a feed-bar having a finger reciprocating across the chute and adapted to simultaneously advance a blank along the deflected section of said chute and arrest the movement of the blanks in the main chute, a plunger operating across said chute-section to force the blank from the deflected section and over the tap, an actuator-bar operatively connected to said plunger, and a rock-lever pivoted between said actuator-bar and said feed-bar, whereby the latter is operated by said actuator-bar, all so arranged that when the plunger is advanced to force a blank over the tap, the feed-bar is retracted to uncover the chute and upon the reverse movement of the plunger the feed-bar is advanced to close the chute and advance the next blank.

5. In combination in a blank-threading machine, a hopper containing the blanks, a series of feed-chutes delivering the blanks from the hopper to the taps, each chute having a deflected section at its lower end, a feed-bar reciprocating across said chutes, a series of spring-pressed fingers mounted upon said feed-bar and normally closing the respective chutes, reciprocating plungers for the respective chute-sections, and an actuator-bar connected with the several plungers and with the feed-bar, whereby the blanks are advanced along the deflected sections of the chute by the feed-bar fingers and subsequently forced over the taps by the plungers.

6. In combination in a blank-threading machine, a hopper containing the blanks, a series of chutes delivering the blanks from the hopper to the taps, each chute having a deflected section at its lower end, a plunger reciprocating across each of said deflected chute-sections to force the blank therefrom and over the corresponding tap, an actuator-bar, yielding safety connections between the actuator-bar and the respective plungers, whereby the latter are reciprocated, a feed-bar having a series of fingers reciprocating along said deflected chute-sections to advance the foremost blank in each chute and arrest the movement of the blanks in the main chutes, and means connected with said actuator-bar to retract the feed-bar and cause the fingers thereon to uncover the respective chutes for the delivery of another blank into each of the deflected chute-sections.

7. A blank-feeding mechanism comprising a chute having a deflected section, a plunger reciprocating across said deflected section, a feed-bar mounted above and transversely of said chute, said bar comprising a stationary sleeve, a reciprocating rod mounted in said sleeve, a collar on said sleeve and connected with said rod, a finger on said collar operat-

ing in said deflected chute-section and normally closing the main chute, and means for advancing and retracting said plunger and said feed-bar alternately, whereby a single blank is fed from the chute, advanced by the finger along said deflected chute-section, and forced over the tap by the plunger.

8. A blank-feeding mechanism comprising a series of chutes, each having a deflected section at its end, a plunger reciprocating across each of said deflected sections, a feed-bar mounted above and transversely of said chutes, said feed-bar comprising a stationary sleeve, a reciprocating rod mounted in said sleeve, a series of collars loosely mounted on said sleeve and detachably connected to said rod, springs surrounding said sleeves and operating to hold said collars and said rod in engagement, and fingers on the collars operating in the deflected sections of the chutes, and means for advancing and retracting said plungers and said feed-bar alternately, whereby a single blank is fed from each chute, advanced by the coöperating finger-bar along the deflected chute-sections and forced over the tap by the corresponding plunger.

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

JAMES H. HASKINS.

Witnesses:

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S. W. BOUTON.