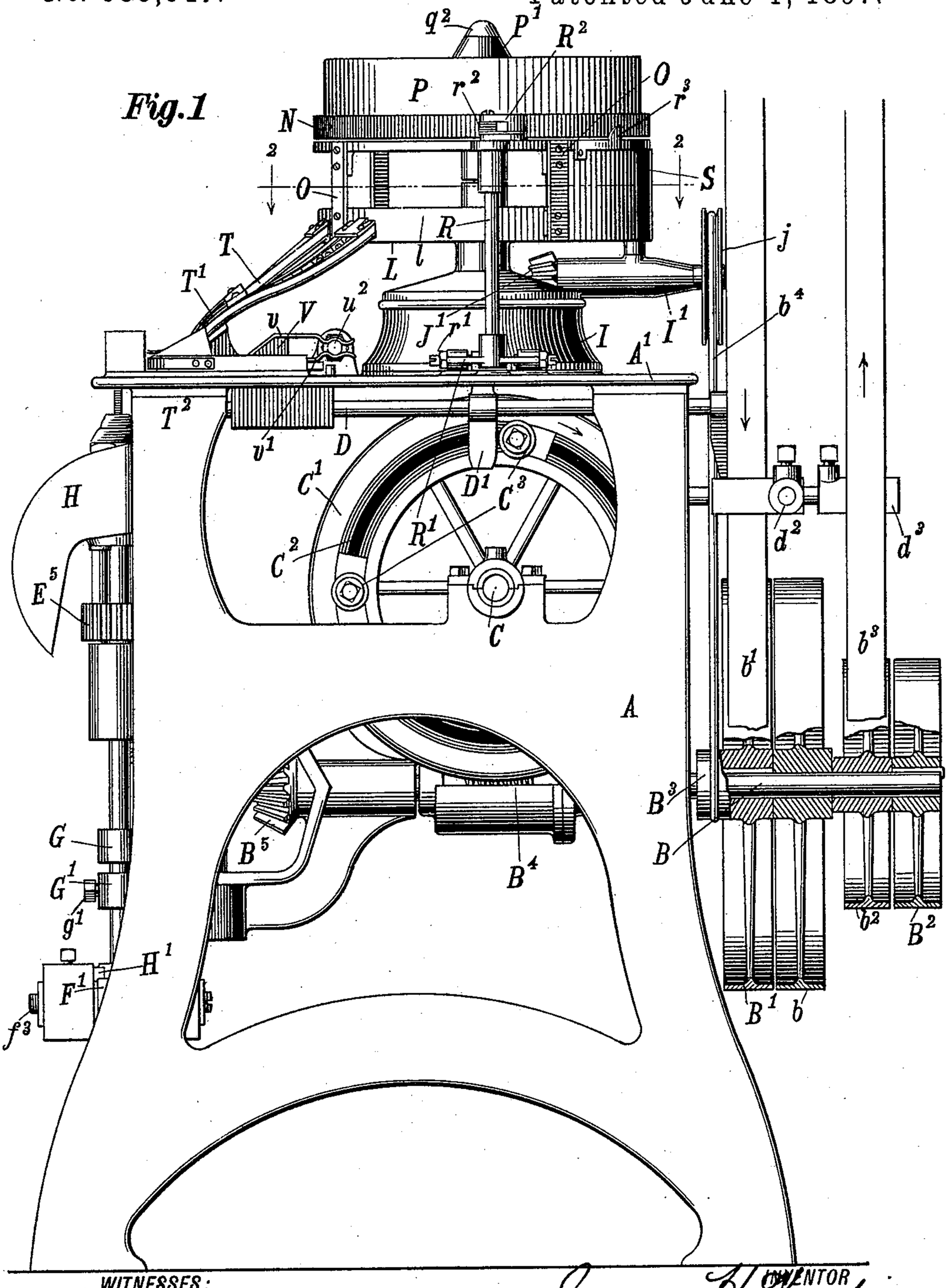
(No Model.) 6 Sheets—Sheet 1.

J. H. HASKINS.

MACHINE FOR THREADING BLANKS.

No. 583,647. Patented June 1, 1897.

Fig. 1



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MACHINE FOR THREADING BLANKS.

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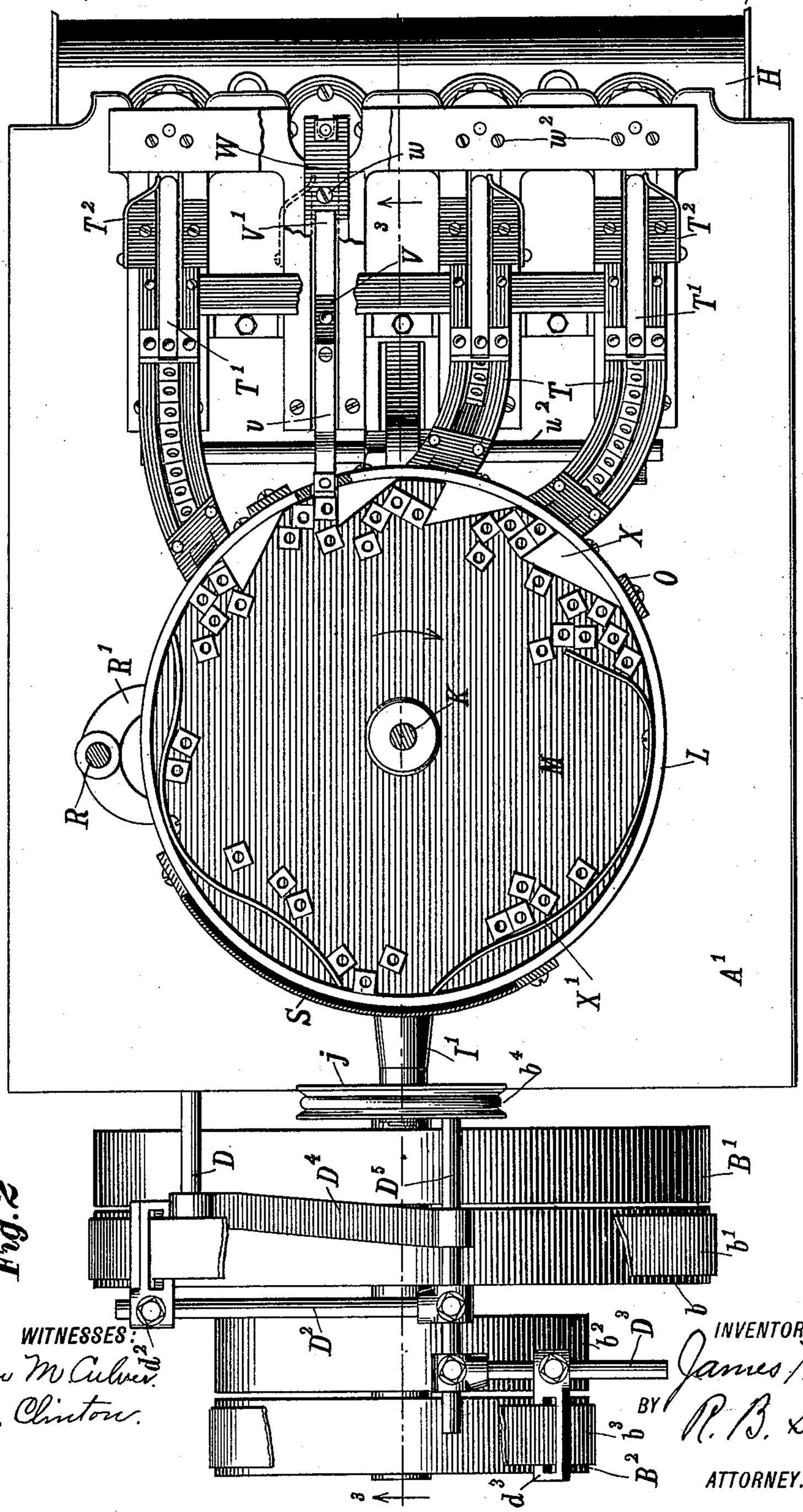

Fig. 2

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MACHINE FOR THREADING BLANKS.

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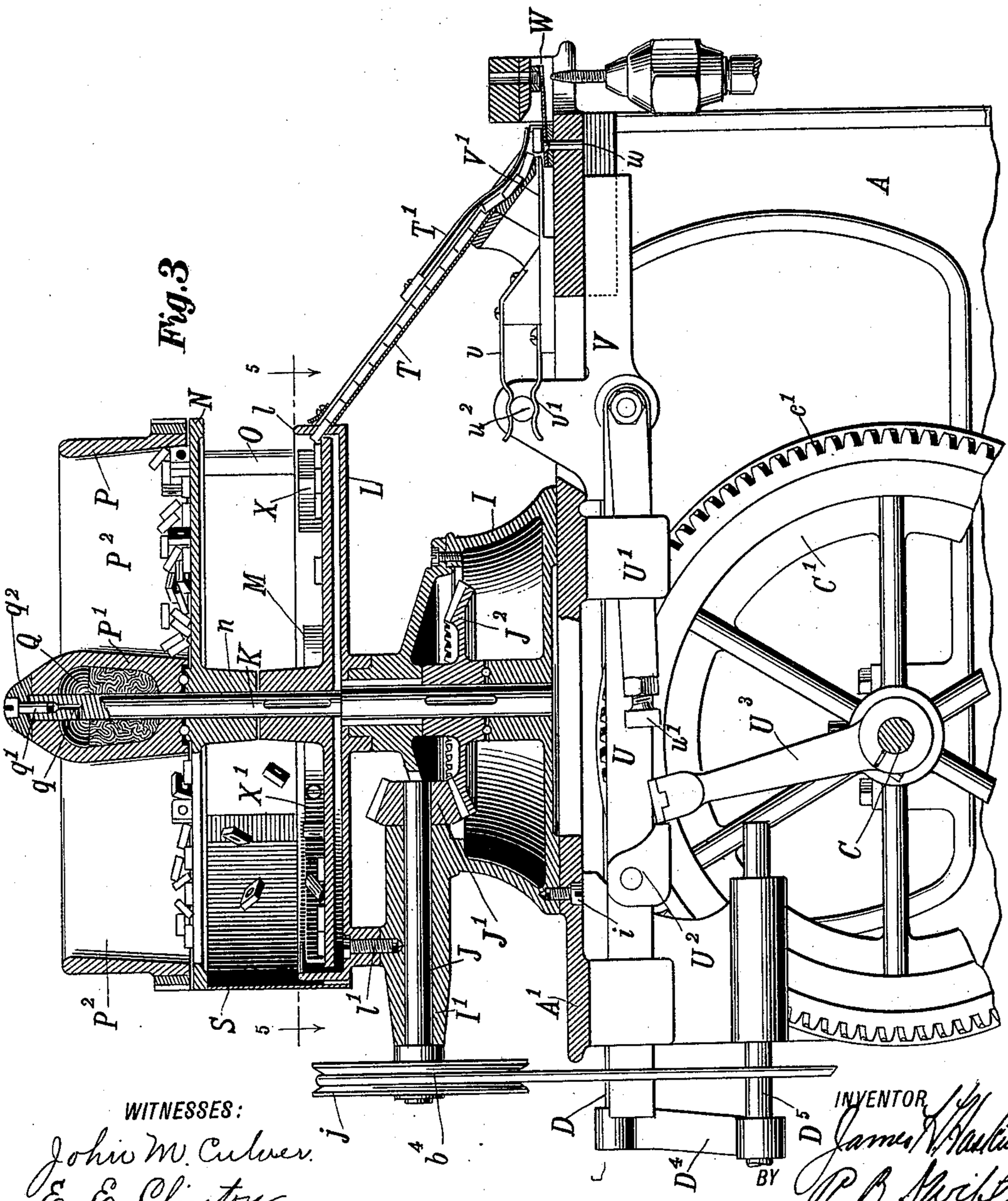
Fig. 3



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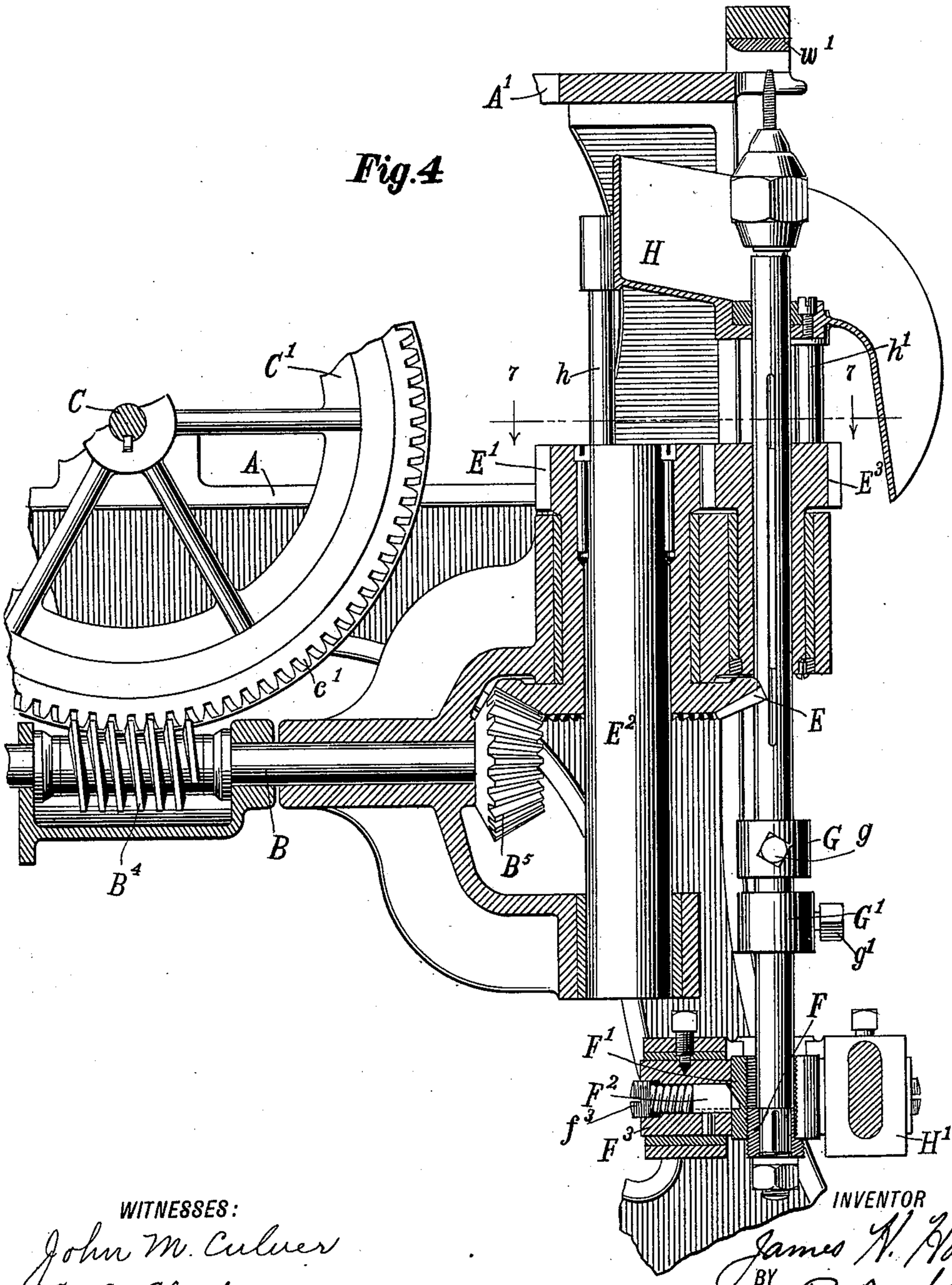
MACHINE FOR THREADING BLANKS.

No. 583,647. Patented June 1, 1897.

Fig. 4



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MACHINE FOR THREADING BLANKS.

No. 583,647. Patented June 1, 1897.

Fig. 5

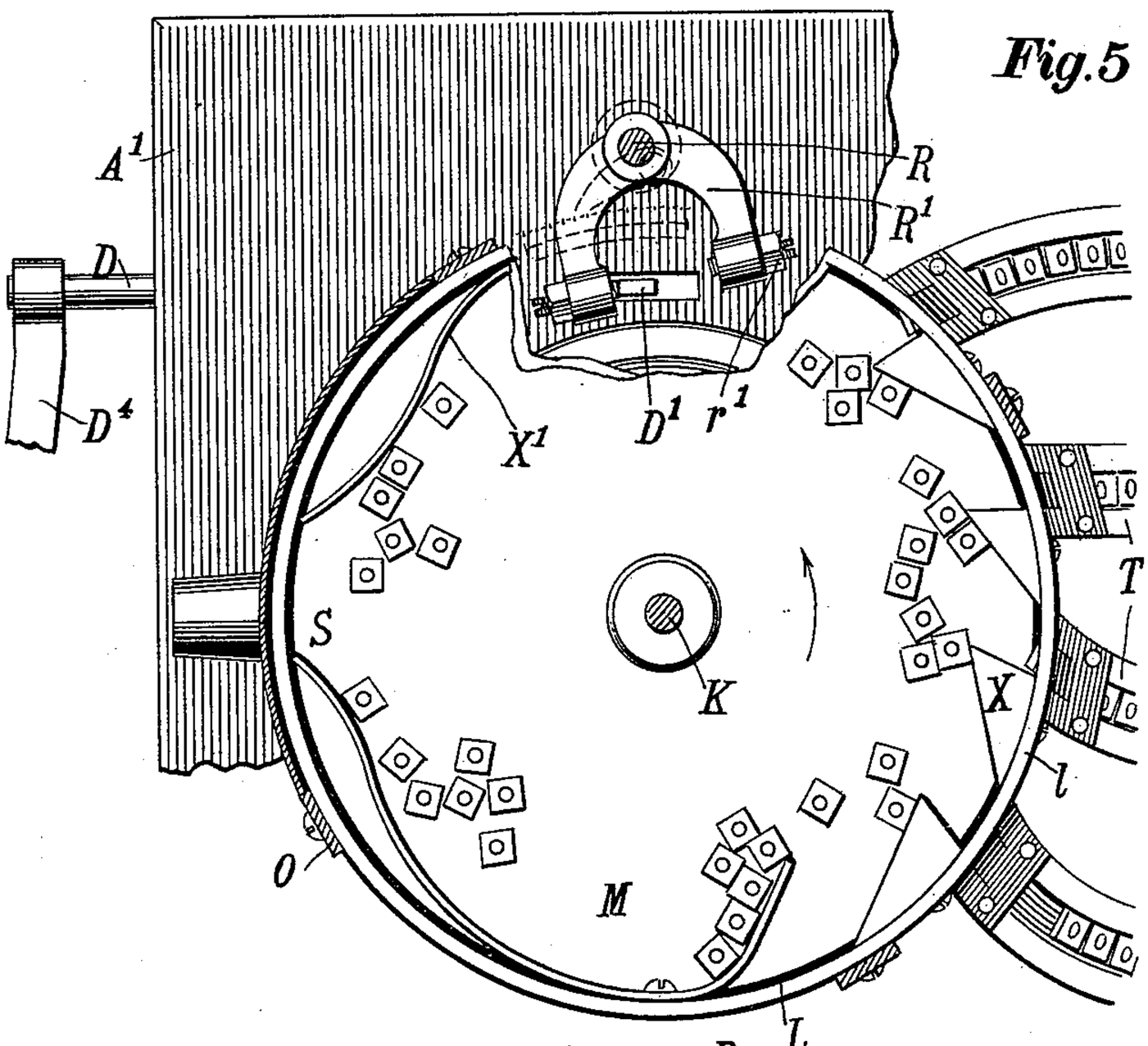
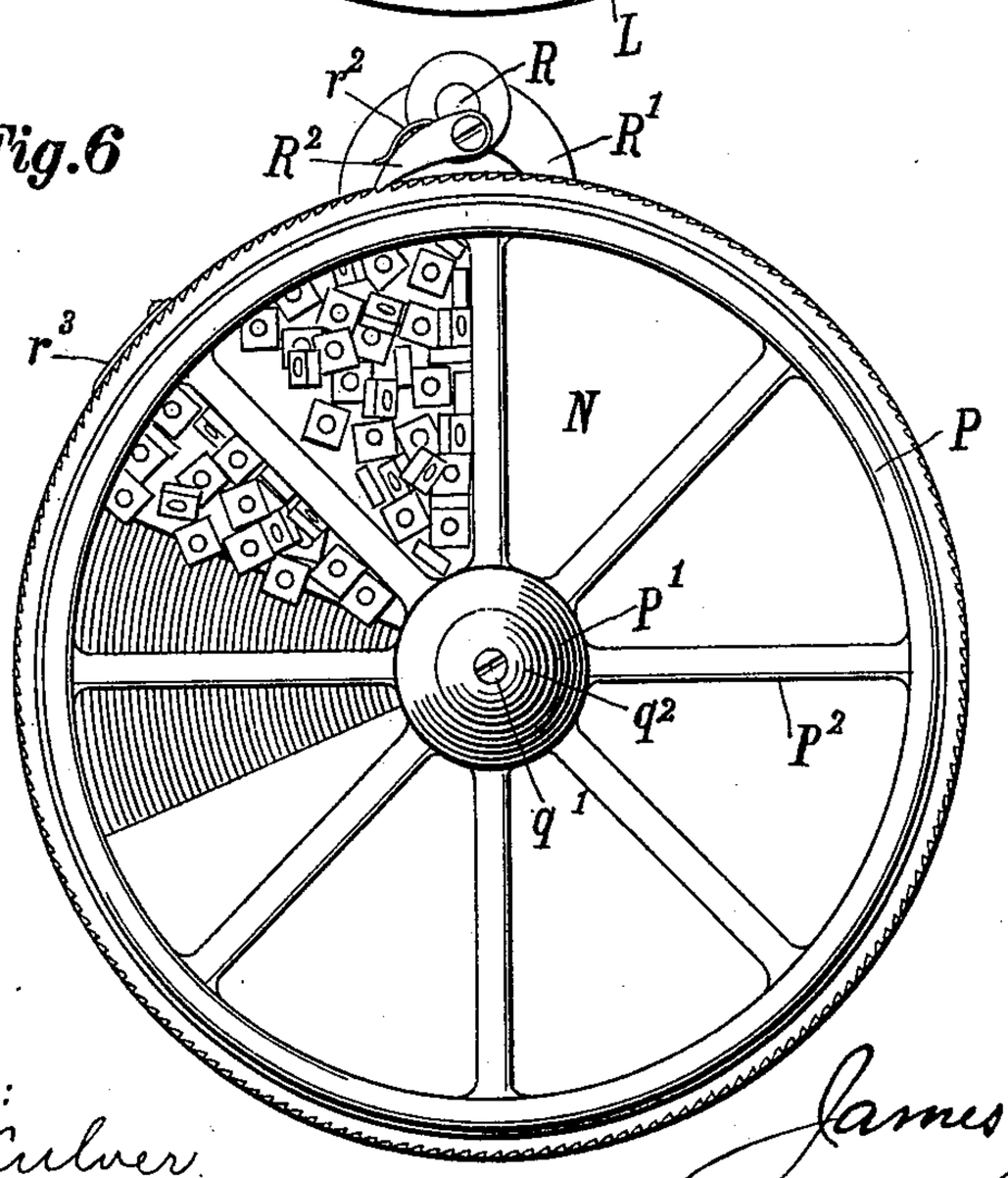


Fig. 6



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(No Model.)

6 Sheets—Sheet 6.

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MACHINE FOR THREADING BLANKS.

No. 583,647. Patented June 1, 1897.

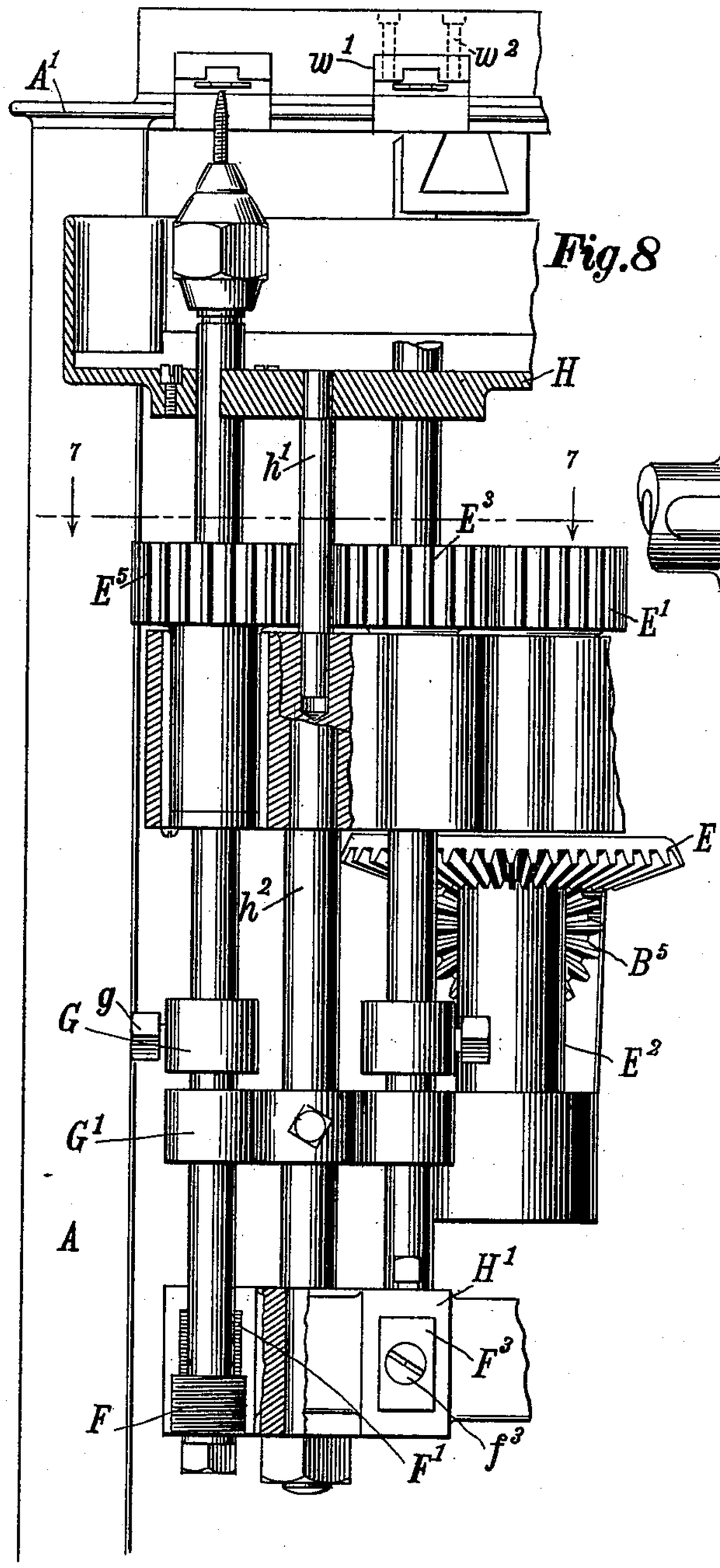

Fig. 8

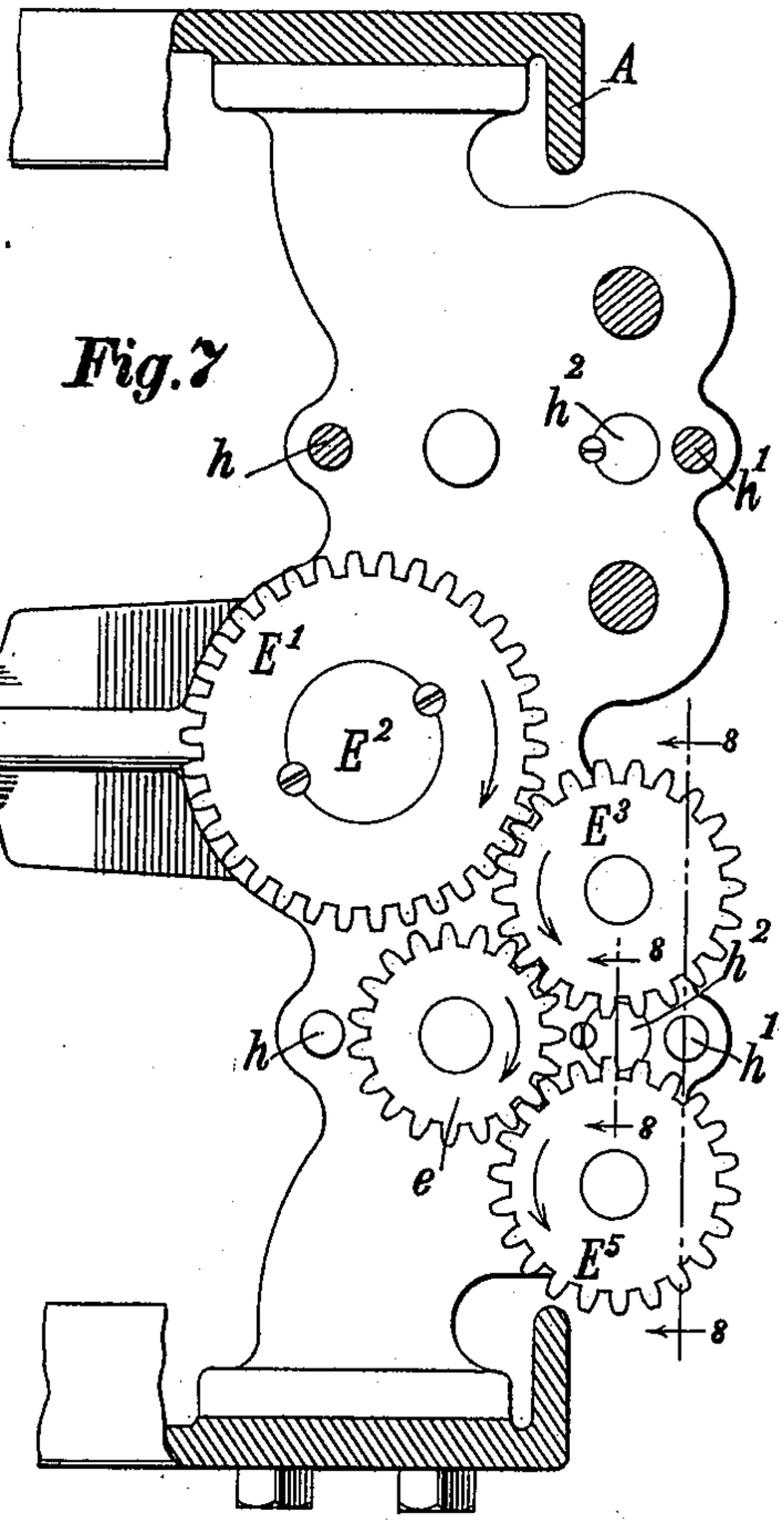

Fig. 7

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UNITED STATES PATENT OFFICE.

JAMES H. HASKINS, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO THE McCORMICK HARVESTING MACHINE COMPANY.

MACHINE FOR THREADING BLANKS.

SPECIFICATION forming part of Letters Patent No. 583,647, dated June 1, 1897.

Application filed June 13, 1896. Serial No. 595,402. (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, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Threading Blanks, of which the following is a specification.

My invention relates to improvements in automatic machines for threading blanks, in which the blanks are automatically fed from a hopper into a position to be acted upon by the thread-cutting tool; and the objects of my improvement are, first, to provide a receptacle into which the nut-blanks can be shoveled in large quantities and which will deliver the blanks, as required, to a rapidly-rotating horizontal plate that has chutes extended from its periphery, down which the blanks travel to the tool that is to act upon them; second, to control the blanks so that they can be kept from becoming compacted and piled upon themselves as they are being presented to the chutes; third, to form the chutes and the feeding devices for the blanks so that they will uniformly be brought into position for being acted upon by the tool, and, fourth, to so construct the various details that a positive, accurate working, automatic device that shall require a minimum amount of attention from the operator is formed. I attain these objects by the mechanisms illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the machine. The fast and loose pulleys, by which the machine is given a forward-and-backward movement and which are positioned on the main shaft of the machine, are partly shown in section. Fig. 2 is a top view of the machine on the line 2 2 of Fig. 1. Fig. 3 is an elevation, partly in section, of the blank-receptacle, the horizontal feed-plate, and the means for giving these parts motion, as well as a section of one of the feed-chutes. Fig. 4 is an elevation in section in about the same vertical plane as Fig. 3, but of parts that are in a horizontal plane below those of Fig. 3. Fig. 5 is a plan view in section on the line 5 5 of Fig. 3, showing the horizontal feed-plate, which is broken away on one side to show the means of actuating the blank-receptacle. Fig. 6 is a top view of the blank-receptacle. Fig. 7 is a plan view on the line 7 7 of Fig. 4; and Fig. 8 is a vertical elevation of one side of the front of the machine, the lower part of it being shown on the inner line 8 8 of Fig. 7 and the upper part on the outer line 8 8 of Fig. 7.

Similar letters refer to similar parts throughout the several views.

The parts of the machine that move are mounted upon a table or framework having the open sides A and top plate A′. The power is transmitted to the different devices by means of a main shaft B, which is extended across the frame of the machine and which has bearings connected to the sides A. Upon one end of the shaft B is placed the fixed pulley B′, which is actuated by the belt b', and beside it is the loose pulley b. Positioned upon the same shaft is the fixed pulley B^2 and the loose pulley b^2. The belt b^3, running in a reverse direction from the belt b' and shifted from the loose to the fixed pulley as the belt b' is shifted from the fixed to the loose pulley, reverses the machine to allow the tool to back out of the blank. Also mounted upon the main shaft B is the fixed pulley B^3, from which a belt b^4 is given motion which is transmitted to the blank-feeding devices.

It will be noticed that the pulleys which give the machine its forward advance and which support the belt while the machine has its reverse movement are larger than the pulleys which give the machine its reverse motion. This is because the thread-cutting tool can retreat after it has performed its work with greater rapidity than it can advance and do work, and this arrangement of these pulleys allows the machine to be more rapid. On the main shaft B is positioned the screw B^4 and also the bevel-pinion B^5. Mounted upon the sides of the framework A of the machine and extending transversely across it at practically right angles to the main shaft B is the cross-shaft C, on which is mounted the wheel C′, having cogs c' on its periphery, that mesh with the spirals of the screw B^4 on the main shaft B. The wheel C′ has on one of its faces a slot C^2, and fastened in this slot and adjustable in it at any desired position are stop-blocks C^3. Beneath the top plate A′ of the machine-frame

is a horizontal bar D, that has bearings in blocks connected with the machine-frame and which has keyed to it a post D′, that extends into the path of the stop-blocks C^3. Connected with the horizontal bar D by an arm D^4 is a parallel bar D^5, on which is mounted an arm D^2, that carries a belt-guide d^2, and an arm D^3, that carries a belt-guide d^3. It will be plain that as motion is transmitted to the main shaft of the machine and to the cross-shaft the horizontal bar carrying the belt-guides will be driven back and forth in its bearings on the frame of the machine when the bearing-blocks strike against it and that by adjusting these bearing-blocks the machine will have a varying time, according to the position of the blocks, in which it will continue its movement in one direction before it reverses that movement and goes in the opposite direction.

Attention is called to the fact that the arms D^2 and D^3, which carry the belt-guides, are not only made adjustable upon the horizontal bar D^5, but the belt-guides are made adjustable upon the arms themselves by means of set-screws, so that pulleys of different diameters may be used, according as the work is such as will allow a more rapid action of the machine. The bevel-pinion B^5 meshes with and gives motion to a bevel-wheel E, that has a long sleeve bearing in the frame A of the machine. Connected with the bevel-wheel E is the spur-wheel E′. This bevel-wheel and spur-wheel can be cast together, as they are shown in the drawings, but they may be separated and attached in any of the ordinary ways of making such connections. The bevel-wheel E and spur-wheel E′ are fixed upon an upright shaft E^2, which has a bearing in the frame of the machine near both extremities and which holds the parts in a fixed relation, so that the bevel-wheel and spur-wheel will not bind and cramp and cause wear from the heavy work that the machine is required to perform. Meshing with the spur-wheel E′ are the spur-pinions E^3, one on each side of the central line of the machine, which pinions actuate the two central tool-carrying spindles. By means of idle-pinions *e* other spur-wheels E^5 are driven. These spur-wheels are also on tool-carrying spindles, which arrangement can be continued so long as the spindles can be arranged about the machine conveniently for the feeding of the blanks and the power can be obtained to actuate the machine.

In the representation shown in the drawings there are four spindles shown which are given motion by the spur-pinion heretofore described. These spindles are reciprocated to and from the blanks, which are held in a fixed position by means of collars F, that are keyed to each of the shafts at their lower end and which are threaded on their periphery. Positioned upon a fixed part of the machine are bearing-blocks F′, that are also threaded, which bearing-blocks partly encircle the threaded collars on the shafts, and the rotation of the shafts thus moves them to and fro from their work.

In Fig. 4 is shown a form of safety device which consists of a spring-pressed bolt F^2, that is beveled on its face that is toward the work and which enters a notch in the bearing-blocks F′. Should the tool in the spindle encounter a displaced blank and the onward motion of the machine continue, the tool would be prevented from injury and the machine from being broken by the bearing-block F′ slipping past the nose of the spring-pressed bolt, and the machine would continue its cycle, the rest of the spindles perform their functions, and an attendant could at any time remedy the difficulties without the machine becoming broken. From Fig. 4 it will be seen that the spring-pressed bolt F^2 is mounted in a block F^3 and that the force of the spring on the bolt can be adjusted in the bearing on the machine-frame by means of the set-screw f^3.

It is to be understood that the safety devices just described work best when they are in pairs on each spindle, one on each side, only one of which, however, has been shown in the drawings. There will be noticed upon the spindle-shafts a collar G, held by set-screws *g*, which is placed there for a stop when the tool is in trouble and prevents the spindle from dropping too far by striking against the fixed part G′ of the frame.

In Fig. 8 of the drawings is shown the means employed to support the spindles from the machine-frame, and at the upper end the means consist of a plate H, that is supported on posts *h* at its rear, that are shrunk into the frame of the machine at their lower ends and support the plate at their upper ends, and at the front by the posts *h*′, which are fastened in the same way. In Fig. 8 the fastening of one of these front posts is shown, the upper part of the frame having been somewhat broken away for that purpose. The plate H also acts as a chute for the blanks after being threaded, and also runs the lubricating fluid from the machine. The lower ends of the spindle-shafts are supported and guided by means of the bearing-block H′, which is attached to the machine-frame by being fastened to the depending posts h^2

In Fig. 8 of the drawings the front post *h*′ is shown, while on the inner line 8 8 the depending post h^2, heavier and stronger and shrunken in the frame, is shown. Upon the bottom of this post the screw-feed and safety device, heretofore described, are positioned. The stop G′ is fastened to this post by the set-screw *g*′ and serves as a support for the spindles when the safety device is in operation.

As thus far explained, this machine resembles in the location of the shafting, in the mechanisms that drive the thread-carrying spindle and the safety devices for this spindle, and in the belt-shifting appliances, the similar parts in the bolt threading and pointing ma-

chine heretofore patented by me, No. 556,054, granted March 10, 1896. The means, however, of feeding the blanks into position to be acted upon by the thread-cutters differs very materially from the means employed in that machine for feeding forward the blanks. In the present construction there is mounted on the top plate A′ of the machine a bell-shaped casting I. It is bolted thereon, as shown, by the set-bolts *i*. Extending from it is a bearing I′ for the shaft J, that carries upon one end the pulley *j*, that is actuated by a belt from the pulley B^3 on the main shaft of the machine. On the inner end of this shaft is the bevel-pinion J′, which meshes with a bevel-wheel J^2, that is keyed to an upright shaft K, that has a bearing in a hub on the bottom plate of the bell-casting I and another bearing as it passes through the apex of this bell-casting. As the bevel-wheel is keyed to the upright shaft K, motion transmitted through the shaft J will rotate it and any parts attached to it. Fastened to the apex of the bell-shaped casting I is a circular plate L, having an upstanding flange *l*. This circular plate has a chair resting upon the extension I′ from the bell-casting I and to which it is fastened by the set-screw *l*′. Mounted on and keyed to the upright shaft K, just above and parallel with the circular plate L and inside the flange *l* of this plate, is a circular disk M. It is into the receptacle formed by the circular disk M with the flange *l* that the blanks are fed in a manner to be hereinafter described, and from which they are presented to the feed-chutes that conduct the blanks to the places where they are to be acted upon by the thread-cutter. The manner in which the blanks are fed forward will be described as soon as the description of the feed-hopper and the devices for presenting the blanks to the circular disk with sufficient rapidity for the uses of the machine have been described.

On the upright shaft K above the circular disk M is placed another circular disk N, having an enlarged hub *n*, which is bored of sufficient size so that the upright shaft K freely turns therein. This circular disk N is supported from the circular plate L by the posts O, that are fastened to the periphery of the circular plate L and to the periphery of the disk N. The disk N is not a full circle, as there is an opening in it, taking out a section of the plate from the center to the circumference, of a width sufficient to allow the blanks to drop through upon the circular disk M. This disk N forms the bottom of the hopper that holds the blanks. The sides of the hopper are formed by the circular rim P, which is connected to a center P′ by radial partitions P^2, which are nearly the width of the flange or rim P, thus forming compartments into which the blanks are shoveled with the exception of that compartment which comes over the opening in the circular disk N. The circular rim P, with its center and partitions, is revolved, by means which will be hereinafter described, on the shaft K as a center.

In the construction shown in the drawings the center P′ is hollowed out about the shaft K, forming a large reservoir Q for the reception of oil, which is turned into the reservoir through the opening *q*. This oil-duct is closed while the machine is in operation by the plug *q*′, which holds a cap q^2 upon the top of the shaft, keeping the parts free from dust and dirt. In order to reduce the friction of the hopper, the center P′ is grooved and a companion groove is made in the enlarged hub *n* of the circular disk N. Into these grooves balls are placed, and a ball-bearing is produced which makes the hopper easier of rotation. The oil from the large reservoir passes down the shaft K, which has been grooved for this purpose, and thus the shaft is oiled throughout its entire length, and it needs but little attention from the operator.

Attention is called to the fact that the bell-casting I is closed at the bottom, and it forms a receptacle into which the oil that passes down the shaft K from the reservoir is caught and from which it can be taken when necessary. The upright shaft K supports the weight of the blanks after they have fallen upon the circular disk M and also carries the weight of the disk as well as the weight of the bevel-wheel. In order to reduce the friction of these parts, the hub of the bevel-wheel J^2 has been grooved and a companion groove made in the hub of the bottom of the bell-casting I. Into these grooves balls are placed, and a ball-bearing is produced which greatly reduces the friction of the parts.

The circular rim P is rotated, carrying with it the radial walls, and therefore the blanks that are in the receptacles formed by the rim and partitions are moved until a receptacle passes over the cut-away portion of the circular disk N, when the blanks drop through onto the circular disk N. This rotating of the blank-receptacles can be brought about in different ways. I have found, however, that the delivery of the blanks onto the circular plate should be governed by the rapidity with which the machine is threading and discharging the blanks. If the blanks are dropped onto the circular plate too fast, the plate will become filled, and, as the object is to produce an automatic machine that will require a minimum amount of attention on the part of the operator, the receptacles for the nut-blanks must be moved forward so as to discharge the blanks with a speed determined by the rapidity with which the machine discharges threaded blanks.

From the explanations heretofore made it is plain that the belts are shifted at the end of the forward advance of the thread-cutting spindle when a set of blanks has been threaded. A movement forward then of the hoppers for each completion of an operation upon a blank would discharge blanks upon the circular plate each time the blanks are threaded.

The operator, with a little practice, can quickly determine just how full the hoppers for the blanks shall be filled in order that when the hoppers are given a forward motion at each time a set of the blanks are threaded the flow of blanks will be sufficient to meet the demands of the machine. A convenient arrangement for moving the hoppers forward in the intervals that depend upon the threading of a set of blanks is formed by extending the post D′ on the horizontal belt-shifting bar D up through a slot in the top plate A′ of the machine.

An upright feed-shaft R is journaled in the top plate A′ of the machine and has a bearing on the circular disk N, which, as heretofore explained, is supported by posts from the circular plate L, that is rigidly attached to the bell-casting I. Extending outwardly from the upright shaft R are arms R′, that end in the path of the extension to the post D′. As this post is moved in one direction the extension will strike one of the arms R′ and throw the shaft in one direction, and as it is carried in the opposite direction it will strike the other arm and move the shaft in the opposite direction. Upon the upper end of this upright shaft R there is pivoted eccentrically to the shaft a feed-pawl R^2, which is held forward against the periphery of the circular rim P by a spring r^2. The circular rim P is notched, as more clearly shown in Fig. 6, into notches of such length as shall give the proper movement necessary for the feeding of the blanks. A lock-spring r^3 prevents any tendency of the hopper to be carried back by the feed-dog. The arms R′ are fitted at the place where they are acted upon by the extension of the post D′ with adjustable threaded bolts r', which can be adjusted in the arms and the throw of the dog on the upright shaft be varied. The blanks when they drop upon the circular disk M are prevented from spilling outside of the disk by a segment of sheet-steel plate S being extended around the periphery of the circular plate L at that part where the blanks drop through from the receptacles onto the circular disk M, as shown more clearly in Fig. 1.

From the circular plate L feed-chutes T extend to the thread-cutting spindles. There are as many of these feed-chutes as there are feed-spindles. In the drawings four feed-chutes are shown, and in the practical operation of the machine I have found that four can be successfully operated. These feed-chutes are fastened to the circular plate L and extend downwardly and outwardly to the thread-cutting spindles. They are of sufficient inclination so that the blanks readily slide down them, and at their delivery ends are fitted with a feed-spring T′, that holds the blanks down upon the bottom of the feed-chute and insures their being delivered in a continuous stream side to side or end to end. A supplemental spring T^2 is positioned at the lower end of the feed-slide, as shown more clearly in Fig. 2, and prevents the blanks from sliding forward faster than they are wanted. In the construction shown in the drawings the lower end of the feed-chute is somewhat curved, and the spring T′ is also curved to correspond with it. The object of this construction is that as the blanks are fed forward they will strike upon the horizontal part of the feed-chute with less angularity than they would were the feed-chutes continued directly on the same pitch to the horizontal part of the feed-slide that leads to the place where the tool acts upon the blank. A horizontal bar U is mounted on bearings beneath the top plate A′ of the machine and has attached to it a pivoted dog U′, that is fitted with an adjustable set-bolt u' and with a pivoted dog U^2. This adjustable bar is connected with a feed-slide V, that reciprocates in ways in the top plate A of the machine.

The feed-slide V is connected to the horizontal bar U by a safety-pitman, which consists of the springs v and v', that are rigidly attached to the feed-slide V and are curved and connected to a wrist-pin u^2 on the horizontal bar U. The feed-slide V has an extended finger V′ of practically the same width as the blank, which enters the feed-slot through an opening at the lower end of the feed-slide behind the foremost blank, and when the horizontal bar is reciprocated it moves the blank forward into position to be acted upon by the thread-cutter. The horizontal bar is moved by an arm U^3, that is rigidly fixed to the cross-shaft C of the machine. As this shaft moves forward the horizontal bar and feed-slide is driven ahead, carrying a blank forward from the feed-slide into position to be acted upon, and as the cross-shaft C returns the horizontal bar is carried back and the feed-slide moves out of the feed-chute and another blank drops ahead of it. The part of the feed-chute in which the feed-slide carries a blank is formed of walls which are hardened to prevent wear, the under walls, upon which the blank rests, being formed of a hardened-steel spring-plate W. This plate is bent up toward the upper wall of the slide, so that the blank will be retarded in its forward movement and held with considerable pressure between the steel plate and the wall above. This steel plate is fastened to the top plate A′ of the machine by a countersunk bolt w. The end of the steel plate W is bifurcated, as shown more clearly in Fig. 2, in which the parts have been broken away and where a blank is shown on the top of this plate. It is bifurcated at this end so that the threaded die can pass through to the blank. In Fig. 8 the upper walls of the feed-chute at its delivery end are shown to be formed of blocks w', which are fastened to the frame of the machine by set-bolts w^2. The feed-slide forwards a blank along the feed-chute, and it is threaded by the spindle. The spindle withdraws, the feed-slide brings along another blank, which pushes out the blank which

has been operated upon, and this operation is continually repeated.

One of the principal features of this machine is the operation of the circular disk M, upon which the nut-blanks are dropped from the hopper-receptacles and which presents these blanks to the feed-chutes T in such a manner that they will enter the feed-chutes and be carried down the chutes to the feed-slide. This is accomplished by the rapid motion given to the circular disk M in the way that has been heretofore explained, which motion carries the blanks upon the disk with great rapidity and throws them, because of the centrifugal force, toward the outside and against the flange of the disk. This movement gives such a motion to the blanks that if they happen to be moving in the right direction and have the right angle for proper presentment to the feed-chutes they will pass into it. Experience shows, however, that the blanks, if the circular plate is to be moved always in one direction, will not enter the feed-chute. They will strike against the sides of the walls forming the feed-chute and there lodge. Other blanks will gather against them, and a congested mass of blanks will form, and none of them will enter the chutes. In order to break up these masses, the circular disk is rapidly rotated in the reverse direction, thus throwing the blanks away from the side from which the feed-chutes depart, and any masses of them that there may have been are broken up. On the next change of direction of movement of the machine the circular disk is rotated in the opposite direction and the blanks are thrown again toward the margin of the disk. In order to assist the breaking up of the masses of blanks, and to keep them separated as much as possible, and to form guiding-ways, so that the blanks will be presented to the feed-chutes at a proper angle, angular blocks X have been fastened to the flange of the stationary plate L. One of the sides of these angular blocks is positioned on a line with the entrance to each of the feed-chutes. The other angle of the blocks is less acute, and when the circular disk is reversed in its rotation these angles tend to throw the feed-blanks more toward the center and to break up any masses that they may have formed in the blanks. As a further assistance to this breaking up of the masses of the blanks and to somewhat prevent the blanks from being carried too far on the reverse motion of the disk strips of plate X′ have been fastened to the walls of the upright flange on the circular plate L and so bent into the path of the blanks on the circular disk M as to change the direction of the blanks as the disk is rotated. The forward movement of the disk will throw the blanks to the outside and they will be guided toward entering the feed-chutes by the angular blocks X. In the construction shown in the drawings the rapid throw of the circular disk M, that feeds the blanks toward the feed-chutes, is so timed as to be on the reverse or rapid motion of the machine. The blanks are thus given a high rate of motion, and there is sufficient centrifugal force to surely throw them to the outside. In the view in Fig. 2 the entrance to one of the feed-chutes is shown stopped by two blanks, which have closed the entrance, and the blanks in the chute are being used. The reversing of the motion of the disk will throw these blanks from the entrance to the chutes. Experience has shown that this clogging of the entrance to a chute will not take place so frequently nor so often that the entire number of blanks in a chute will be used. In the next forward advance of the machine several blanks will probably enter a chute that is somewhat empty, and it will be again filled.

The operation of the machine is as follows: The attendant shovels the receptacles as full of blanks as he has learned from the watching of the machine a short time will be necessary to keep the machine going, which blanks are fed forward by the rotation of the hopper-receptacles until the blanks are dropped through the opening in the plate that forms the bottom of the receptacle onto the rapidly-rotating feed-disk. The rotation of this disk and its reversal presents the blanks to the feed-chutes, down which they slide and from which chutes they are taken blank by blank by the feed-slide and moved forward on top of the spring-pressed plate that holds the blank firmly against the walls of the machine into position to be acted upon by the thread-cutting tool in the spindle. The rotation of the spindle, with its threaded periphery, which turns in companion threads mounted upon the machine-frame, advances the tool until the thread is cut in the blank. At this instant the stop upon the wheel on the cross-shaft strikes the post on the belt-shifter, and the driving-belt is thrown to the loose pulley and the reversing-belt to the fast pulley upon the shaft, and the machine is rapidly reversed, carrying the thread-cutter from the blank, the feed-slide back behind another blank, reversing the feed-disk and moving the dog that advances the blank-receptacle into another notch. At the completion of these operations the stop on the wheel on the cross-shaft again strikes the post on the belt-shifter and the reversing-belt is thrown onto the loose pulley and the other belt onto the fast pulley and the machine starts another cycle. Should a blank pass down the feed-chute and become clogged in the horizontal part of the feed-chute, the feed-slide would strike against it and its safety-device would act and that chute would present no more blanks until the attendant had remedied the difficulty. Should a blank not be properly presented for the action of the thread-cutting spindle, the spindle would strike against the blank and the safety device on the spindle would act and the attendant could remedy the difficulty when he got to it. The machine would thus keep going, and it would require only the at-

tention of the attendant to set the idle-spindle again into action. It will be plain that other methods can be employed for rotating the feed-disk and for moving forward the hopper-receptacles, as well as for getting the blanks into position to be acted upon by the tool. So far as I know, however, I am the first to feed forward blanks from a rapidly-rotating feed-plate by centrifugal force and by a reverse rotation of this plate breaking up the masses that form in the blanks and separating them, so that they will, when thrown forward again, be properly presented to the feed-chute.

I do not desire to claim in this application the feed-slide for feeding forward the blanks, as herein shown and described, as this feature forms a part of an application now pending in the Patent Office, Serial No. 593,450, filed May 28, 1896.

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

1. In a blank-feeding device in combination, a horizontal rotating feed-disk, blank passage-ways extending therefrom to the tool that is to act upon the blanks, and means for rotating the disk in one direction to feed forward the blanks, and in a reverse direction to loosen the blanks.

2. In a blank-feeding device in combination, a rotating feed-disk, chutes extending therefrom to the tool that acts upon the blanks, means for rotating the disk in opposite directions, and guides extending into the pathway of the blanks on the feed-disk to direct them to the feed-chutes.

3. In a blank-feeding device in combination, a feed-disk, passage-ways for the blanks leading from the edge of the disk to the tool, means for oscillating the disk, fixed guides extending into the pathway of the blanks to conduct them to the passage-way to the tool, and fixed obstructions extending into the pathway of the blanks upon the disk.

4. In a blank-feeding device in combination, a hopper, means for feeding the blanks from the hopper to a rotating feed-disk, chutes extending from the disk to the tool that is to act upon the blanks, and means for rotating the disk in opposite directions.

5. In a blank-feeding device in combination, a circular hopper having compartments formed by radial partitions, a fixed plate forming the bottom of the hopper, which plate has an opening, means for rotating the hopper, a feed-disk upon which the blanks are deposited by the hopper, with means for feeding the blanks from the disk to the tool that is to act upon them.

6. In a blank-feeding device in combination, a central spindle, a hopper mounted thereon, a fixed plate forming the bottom of the hopper, with an opening therein, a feed-disk beneath the hopper and oscillated by the central spindle, means for rotating the hopper, and blank passage-ways leading from the feed-disk to the tool, substantially as and for the purpose specified.

7. In combination in a blank-feeding device, a feed-disk, means for oscillating the disk and means for depositing the blanks upon the disk with sufficient rapidity for the uses of the machine, a flange surrounding the disk, feed-chutes extending from the flange to the tools, and guides on the flange extending into the pathway of the blanks, to conduct the blanks to the feed-chutes.

8. In combination in a blank-feeding device, a hopper, a way from the hopper to a feed-disk, and a way from the feed-disk to the tool, means for rotating the feed-disk in opposite directions, and means for moving the hopper governed by the rapidity with which the tool acts upon the blanks, substantially as and for the purpose specified.

9. In combination in a blank-feeding device, a hopper comprising a rim connected by radial partitions with the center, a plate having an opening and forming a bottom for part of these compartments, and gearing connecting the hopper with the mechanisms which actuate the tool.

10. In combination in a blank-feeding device, a vertical spindle, gearing connecting this spindle with a part of the machine that is given motion in opposite directions, a feed-disk mounted on the vertical spindle and oscillated thereby, an upstanding flange surrounding the feed-disk to hold the blanks thereon, a plate with an opening therein above the feed-disk and a hopper above the plate and centered on the spindle, a gearing connecting the hopper with an operative part of the machine, substantially as and for the purpose specified.

11. In combination in a blank-threading machine, a hopper, a feed-disk, positioned in a plane beneath that of the hopper, a downwardly-inclined feed-chute extending from the feed-disk to the tool, a spring so situated as to press upon the blanks at the delivery end of the chute, a feed-plate which forces the blanks past the spring and upon a second spring that holds the blanks in the path of the tool, substantially as and for the purpose specified.

12. In combination in an automatic blank-threading machine, in which the tool is given a motion in one direction to thread the blank, and a reverse motion to withdraw from the blank, a feed-hopper, a feed-disk upon which the blanks are deposited by the hopper, gearing connecting the hopper with a moving part of the machine and gearing connecting the feed-disk with a moving part of the machine, whereby the hopper and the feed-disk are given motions in one direction as the machine advances in that direction, substantially as and for the purpose specified.

13. In combination in a machine for threading blanks, in which the tool is given a motion in one direction to thread the blank, and in a reverse direction to withdraw from the

blank, a hopper, a way from this hopper to a feed-plate and a way from the feed-plate to the tool, means for oscillating the feed-plate, and means for feeding the blanks forward from the hopper to the feed-plate, consisting of a shaft having a spring-pressed pawl that is mounted in bearings on the machine-frame and engages with notches on the hopper, arms fixed upon the shaft in the path of a reciprocating arm that is actuated forwardly and backwardly by the machine as it reverses its motion, substantially as and for the purpose specified.

14. In combination in a machine for threading blanks, in which the tool is given a motion in one direction to the blank, and in a reverse direction away from the blank, a hopper, a feed-disk upon which blanks are deposited by the hopper, ways extending from the feed-disk to the tool and means for rotating the disk in opposite directions, consisting of gearing connecting the disk with the operative parts of the machine that have a reverse motion.

15. In combination in a machine for threading blanks, a blank-holder comprising a fixed resistance to hold the blanks against the onward motion of the tool, a bifurcated spring between which and the fixed resistance the blank is held, and the feed-slide to force the blank into position.

16. In combination in a blank-threading machine, a hopper, means for getting the blanks from the hopper into a passage-way to the tool, which passage-way is formed with a deflected section, a spring pressing upon the blanks in the passage-way where it is deflected and the feed-slide which acts to forward the blanks from the deflected section of the passage-way.

17. In combination in a blank-threading machine, a bar that is reciprocated back and forth for each blank that is threaded, an arm upon this bar, a shaft mounted in bearings upon the machine, arms from the shaft extending into the path of movement of the arm on the reciprocating bar, a pawl on the shaft a hopper, notches on the hopper in the pathway of the pawl, whereby, when the reciprocating bar moves back and forth the shaft will be rotated and the hopper moved a given distance upon the completion of the threading of a blank.

18. In a blank-feeding device, a horizontal feed-plate, a flange projecting above the edge of the plate, blank passage-ways leading from the flange to the tools, and means for moving the plate back and forth.

JAMES H. HASKINS.

Witnesses:
GEORGE C. BLACKMER,
GEORG WEISS.