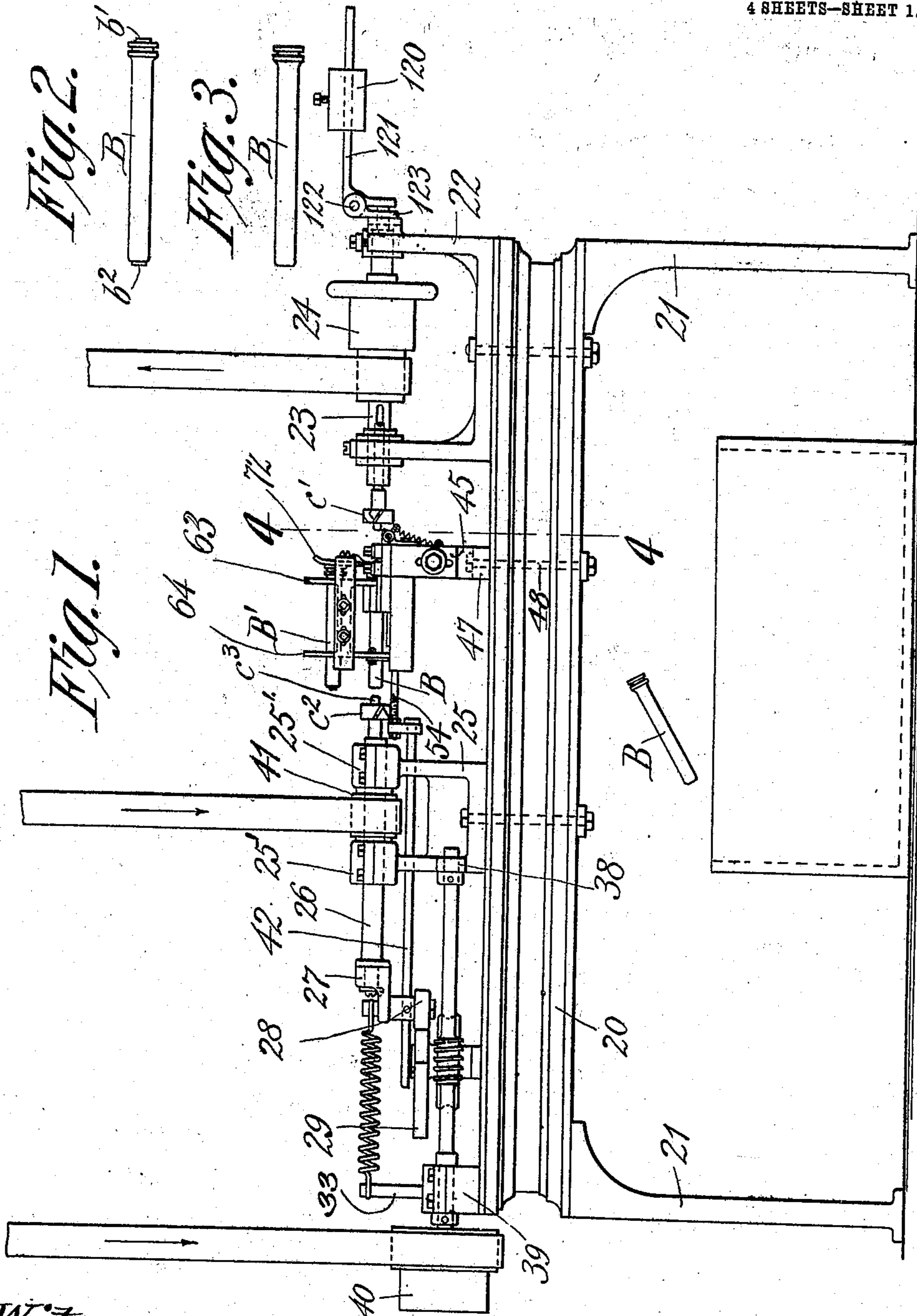


D. S. COURTNEY.
WOODWORKING MACHINE.
APPLICATION FILED APR. 25, 1908.

924,536.

Patented June 8, 1909.

4 SHEETS—SHEET 1.



Witnesses:
A. L. Sprague
R. M. Mowry

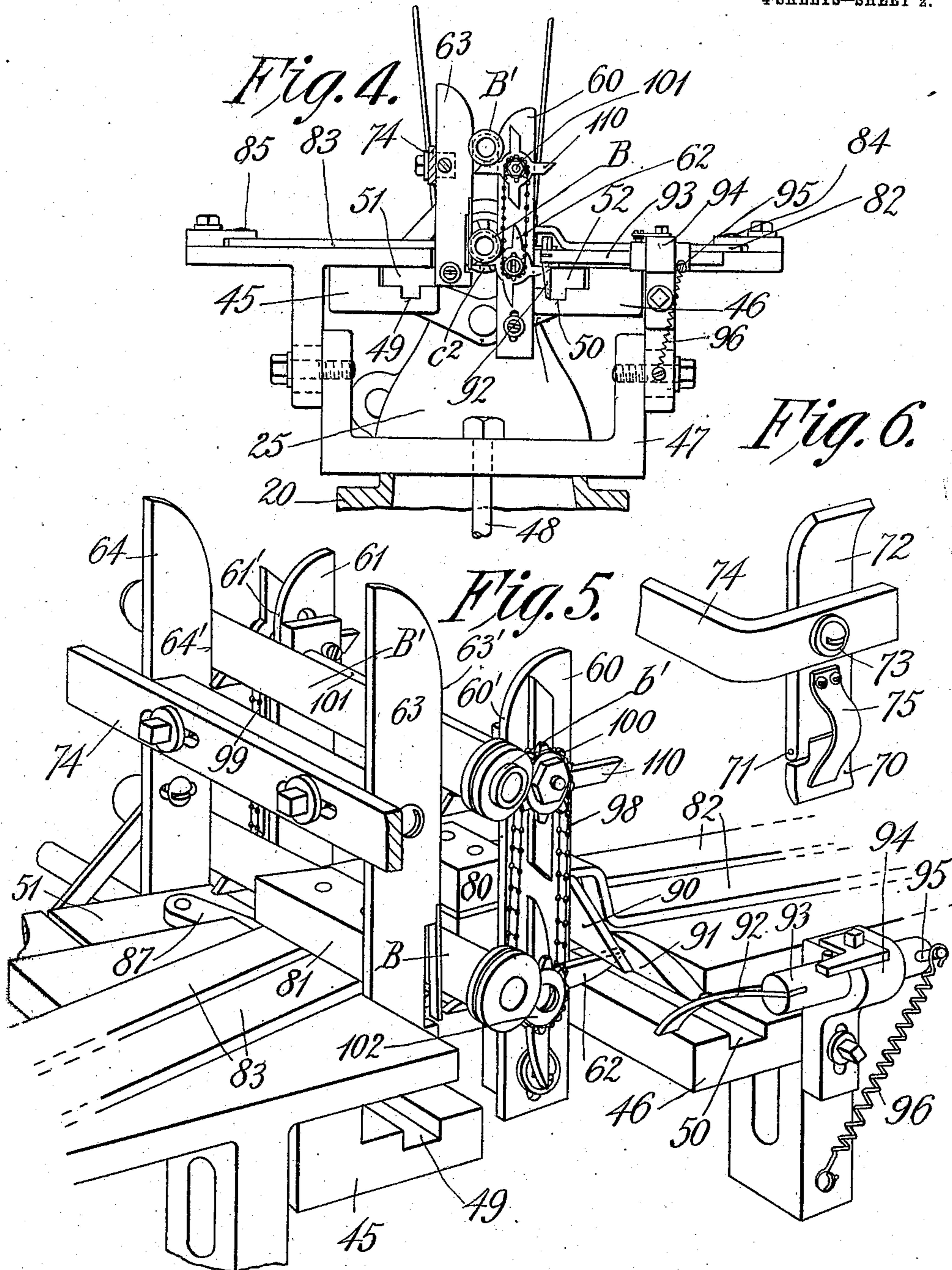
Inventor;
Dana S. Courtney.
by *[Signature]*
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4 SHEETS—SHEET 2.



Witnesses:
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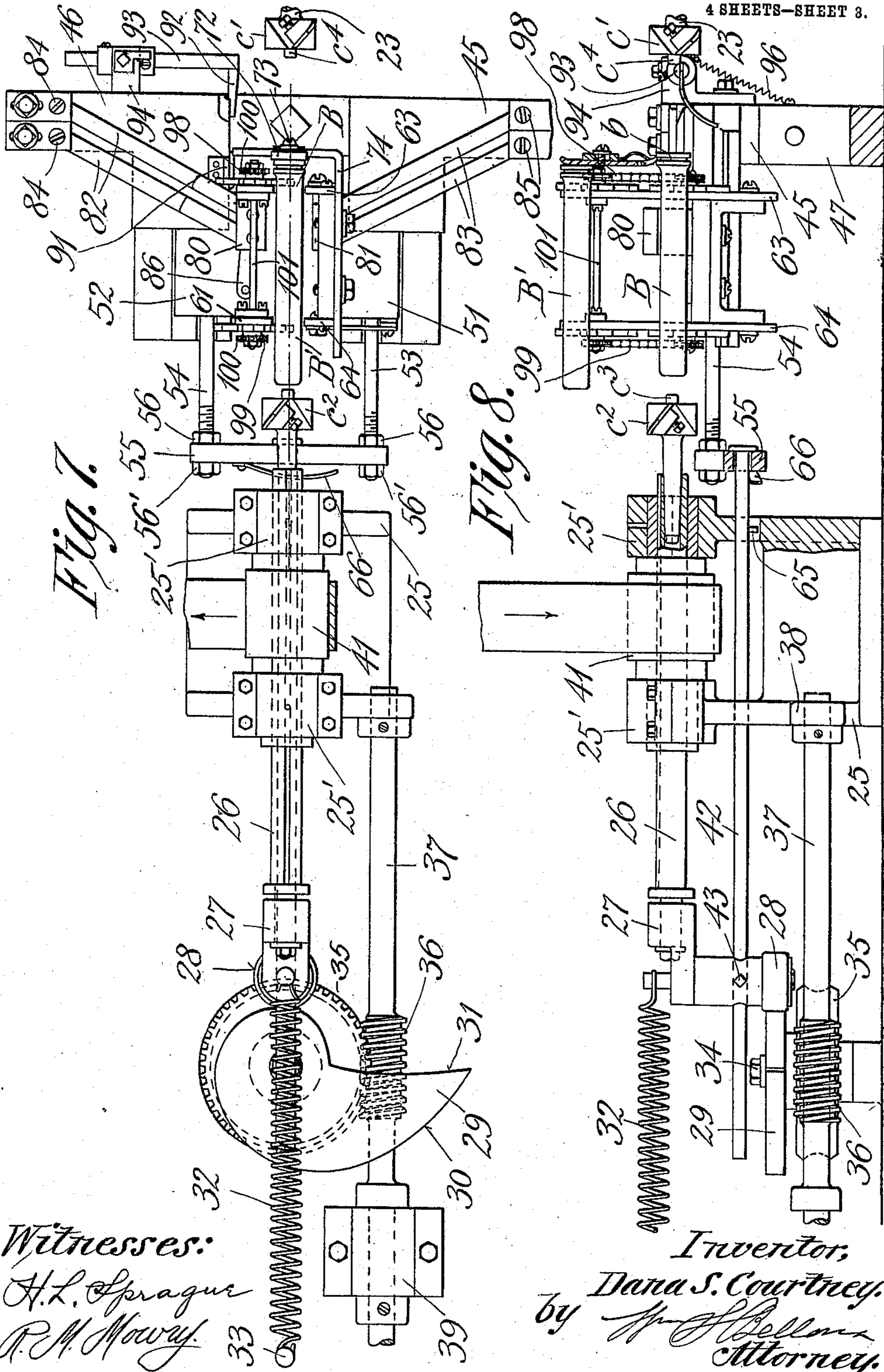
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Patented June 8, 1909.

4 SHEETS—SHEET 3.



Witnesses:
H. L. Sprague
R. M. Noway.

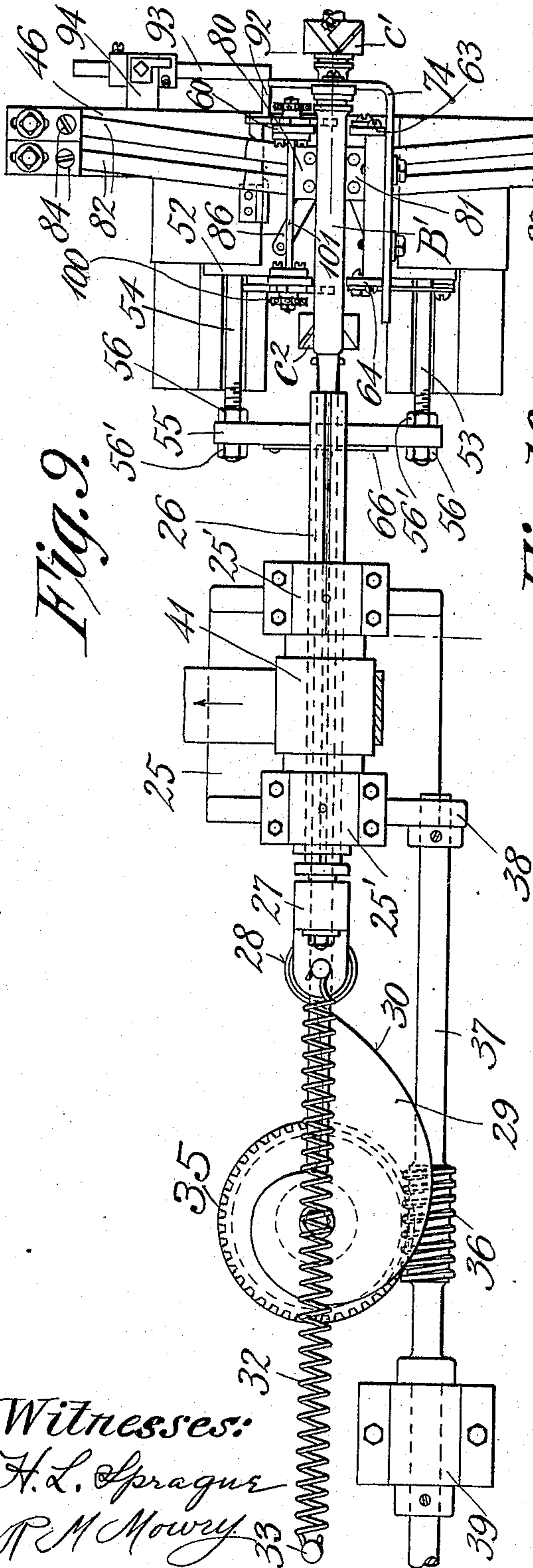
Inventor,
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Attorney.

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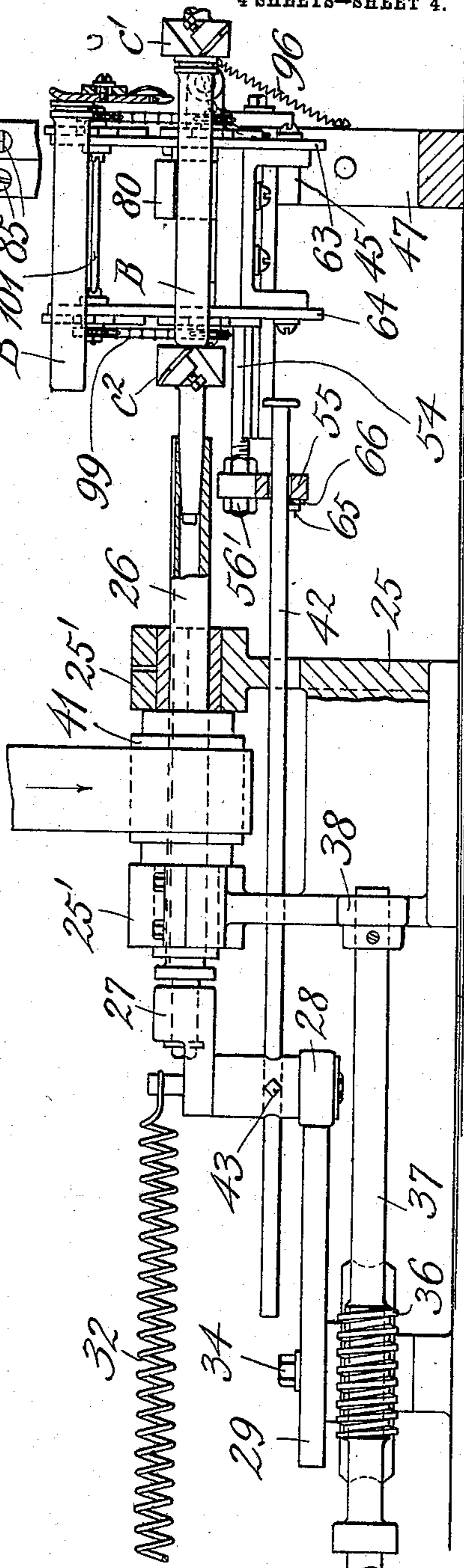
4 SHEETS—SHEET 4.

Fig. 9.



Witnesses:
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Fig. 10.



Inventor,
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UNITED STATES PATENT OFFICE.

DANA S. COURTNEY, OF CHICOPEE, MASSACHUSETTS.

WOODWORKING-MACHINE.

No. 924,536.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed April 25, 1908. Serial No. 429,171.

To all whom it may concern:

Be it known that I, DANA S. COURTNEY, a citizen of the United States of America, and resident of Chicopee, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Woodworking-Machines, of which the following is a full, clear, and exact description.

This invention relates to wood working machinery, and more especially to that class thereof which are employed for finishing or trimming the end-nibs of bobbins or spools, after they have been turned in a lathe or similar machine; and it has for one of its objects the provision of a machine for trimming both ends in a single operation.

The invention has, furthermore, for its object the provision of a machine of this character which is adapted to perform its function on one bobbin while the operator is enabled to put another bobbin into position to be operated upon as soon as the first one has been finished, the machine incorporating a mechanism whereby the finished bobbin is automatically discharged and a fresh blank permitted to drop into place and into alinement with suitable cutting devices whereby the ends of the blanks are trimmed.

The invention has, furthermore, for its object the provision of improved means for clamping each bobbin in place automatically, and which are adapted to release the same upon the return movement of the carriage upon which the clamping mechanism is supported.

Further objects of the invention will be found in the general organization and construction of the component elements as will be hereinafter described, and the means for the attainment of which will be particularly specified in the claims.

Briefly stated, the present machine comprises a pair of rotatable cutters, one of which is preferably movable relatively to the other, and between which the work to be operated upon will be disposed in such a manner that, as the movable cutter advances, it will first engage one end of the work which is supported on a slide or carriage, then move both, the carriage and also the work, toward and into engagement with the stationary cutter, and finally operate on the end which had been first engaged thereby.

The carriage is, in the present instance, reciprocatory, and upon its return movement the finished blank will be discharged from

the carriage automatically, and a new blank will be permitted to fall into place on the carriage and in position to be operated upon by the cutters.

The invention is clearly illustrated in the accompanying drawings in which similar characters denote similar parts, and in which,—

Figure 1 illustrates a side view of a machine embodying my improvements; Fig. 2 shows one of the blanks or bobbins as it appears before it enters the machine, and in its unfinished or untrimmed condition. Fig. 3 shows the same bobbin after it has been finished and left the machine; Fig. 4 is a transverse section on line 4—4, Fig. 1. Figs. 5 and 6, collectively, are perspective views of the feeding-in device and the supporting means for the blanks employed during and prior to the operation of the cutters. Fig. 7 is a top view of the work-supporting carriage and its driving mechanism, the parts being shown in normal or retracted position. Fig. 8 is a side view thereof some of the parts being shown in section; Figs. 9 and 10 are top view and side view, respectively, of the machine, and corresponding to Figs. 7 and 8, the different parts, however, being shown in their most advanced position.

Referring to the drawings, 20 denotes the bed supported on standards or legs 21 and having at the right hand thereof what may be termed a "head stock" 22 rotatably supporting a cutter spindle 23 which is provided with a cone pulley 24 and is adapted to receive at its forward end a cutter c' whereby the base-end of the blank or bobbin, shown at b' in Fig. 2, is to be trimmed off. Also supported on the bed 20 is a tail stock 25 rotatably supporting a spindle 26, the forward end of which is provided with a cutter c^2 and the rear end of which loosely carries a depending swivel bracket 27 which is provided with a roller 28 to be engaged by a cam 29. This cam, which is clearly shown as in Figs. 7 and 9, has an active working face 30 and a quick return portion 31, which latter will permit the spindle 26 to be rapidly retracted, as for instance by a spring 32 attached to the bracket 27 and also held on a fixed stud 33 secured to the bed 20.

The cam 29 is mounted upon a vertical spindle or post 34 and its hub carries a worm gear 35 in engagement with a worm 36 secured to, or constituting a part of, a

shaft 37 which is journaled in bearings 38 and 39 of the tail stock 25 and bed 20 respectively, and which carries a cone pulley 40, to which power may be imparted from
5 any convenient source.

The cutter spindle 26 is provided with a belt pulley 41 which is driven at a high rate of speed, the organization, however, being such that the spindle 26 may move longitudinally through the pulley 41, endwise
10 movement of which is prevented by bearings 25' on the tail stock 25.

In order to maintain the roller 28 in proper position relative to the cam 29, I
15 provide a rod 42 which may be rigidly secured to the bracket 27 by a set screw 43 and which, furthermore, is supported in the tail stock 25 as clearly shown in Fig. 8.

Interposed between the cutters c^1 , c^2 , and
20 supported on the bed 20, are a pair of frame sections 45, 46, (see Figs. 4 and 5) supported on a knee 47 which in turn may be secured to the bed 20 by a bolt 48. The upper faces of these frame sections 45 and 46 are provided with grooves, 49, 50, to receive and
25 slidably support a pair of carriage sections 51, 52, (see Fig. 4) which are provided at their rear ends with rods 53, 54 (see Fig. 7), both of which are rigidly united by a yoke
30 55 held in place by nuts 56, 56', so that in this manner both carriage sections 51 and 52 will be caused to move simultaneously.

The means for supporting the blanks or bobbins comprise in the present instance a
35 feed mechanism consisting substantially of wing wheels, the arms of which are so disposed as to adapt them to receive between them the blanks as they are consecutively permitted to fall into place thereon, and as
40 controlled by a blank-receiving or primary feed wheel, which in the present instance is superposed to the secondary blank holding wheel, both wheels, however, being united for co-rotation and so organized that when
45 the lower supporting wheel is rotated to discharge or liberate the finished bobbin from the machine, the upper wheel will be correspondingly rotated to permit a new bobbin to drop into place on the next suc-
50 ceeding wing of the lower supporting wheel, this organization being clearly shown in Figs. 4 and 5.

Supported on the slide 52 are a pair of uprights 60 and 61, rotatably supporting
55 (near their lower ends) a pair of wing wheels 62, the arms of which are adapted to project beyond the edges 60', 60' of the uprights 60 and 61. These edges in connection with edges 63' and 64' of uprights 63 and 64,
60 respectively (secured to the carriage section 51), form a trough for guiding the consecutive blanks or bobbins onto the wings or blades of the wing wheels 62 and into axial alinement with the cutters c^1 and c^2 . The
65 carriage is, in the present instance, mounted

for reciprocation as controlled by the movement of the rod 42 above mentioned, (see Fig. 8) the latter being provided with a pin 65 which constitutes an actuator for the carriage by coming into contact with a stiff
70 spring 66 secured to the side of the yoke 55, so that the rod 42 (during the initial movement thereof, and also of the cutter spindle 26), will not actuate the carriage until said pin 65 engages said spring 66, at which time
75 the cutter c^2 , or more particularly speaking the center portion c^3 thereof, will have engaged the rear end of the tubular bobbin or blank B without, however, performing any cutting action thereon, such action not oc-
80 ccurring until after the bobbin has been endwise forced to the action of the cutter c^1 , and confined by gripping jaws hereinafter referred to. At this time also it will be observed that the bobbin b is resting upon the
85 inner wings of the wheels 62 in an entirely free or loose condition, and, furthermore that as the rotation of the cam 30 continues, the bobbin will be pushed forward independently of the carriage, which will then
90 also be caused to advance by virtue of the movement of the rod 42 and the pin 65 thereof until the lower end of the bobbin B will be seated over a central projection c^4 of the cutter c^1 , against which it will be
95 forced, and which will then serve to trim the projection b' of the bobbin at that end, clearly shown in Fig. 2. As soon as this projection has been trimmed off, the cutter c^2 will be advanced still further, while the
100 advance movement of the bobbin B is arrested, this continued movement of the cutter c^2 being permissible by virtue of the spring 66 yielding sufficiently to permit the small advance movement of the cutter
105 spindle 26 required to trim off the projection b^2 of the bobbin B.

Means are provided for disengaging the cutter c^2 from the rear end of the bobbin B, these means consisting preferably of a
110 tongue 70 (see Fig. 6) pivoted at 71 to a vertical guide blade 72 which in turn is secured by a screw 73 to a strap 74, the latter being represented as being broken off in Fig. 5 in order to disclose the mechanism in
115 the rear thereof; it being understood, however, that the end of the bar 74 shown in Fig. 6 constitutes in reality a continuation of the bar 74 in Fig. 5.

The guide blade 72 serves to locate the
120 bobbins endwise in the trough so that the ends of the successively entering bobbins will be properly located on the carriage and the clamping action and the work performed by the cutters will be uniform.
125

Inasmuch as it is evident from the above description, that the guide blade 72 is stationary, as far as the advance movement of the bobbin is concerned, it follows that when the bobbin is pushed forward by the cutter
130

c^2 the "head" of the bobbin will be forced past the tongue 70 which will then immediately resume its position back of the head, such action being facilitated by a spring 75 and so that when the spindle 26 of the cutter head c^2 is retracted by the spring 32, the bobbin will be prevented from following it and the cutter c^2 will, therefore, be withdrawn therefrom.

Means are provided for preventing rotation of the bobbin B during the operation of the cutters, these means consisting preferably of a pair of jaws 80, 81, (see Fig. 7) connected by parallel links 82, 83, with studs 84, 85, respectively, secured on the frame sections 45, 46, the gripping faces of the jaws thus moving in parallelism and toward each other, while the free ends of said links or jaws 80, 81, carried thereby, are connected by links 86, 87, (see Figs. 7 and 5) with the slide sections 52, 51, respectively. Hence it will be seen that when the slide or carriage is advanced toward the right, the jaws 80, 81, will approach each other and finally grip the bobbin between them; while, on the other hand, the return movement of the carriage will result in withdrawing the jaws therefrom, the initial portion of said return movement naturally resulting in withdrawing the bobbin from the cutter c' .

During the forward movement of the slide or carriage, the wing wheels 62 are held against rotation to prevent the bobbin from leaving the wings which support it, these means consisting of a ledge 90 (see Fig. 5) secured to the frame of the machine, and on the underside of which that wing of the wheel 62 which is opposite to the supporting wing thereof, rests, and the bobbin is centered on the projections of the cutters before the resisting wing of the wheel shall have passed out from under the ledge 90. This ledge is furthermore extended by a cam 91, the under side of which is flush with the underside of the ledge 90, and which is also engaged by the resisting wing of the wheel 62. When now the carriage is advanced toward the cutter c' , (thus shifting the resisting wing of the wheel 62 along and finally clear of the undersides of the ledge 90 and cam 91), said wing will finally encounter a tripping mechanism whereby the resisting wing of the wheel 62 will be engaged to turn said wheel sufficiently to bring said wing to a position slightly above the top surface of the cam 91 and also the upper face of the ledge 90, and then return to normal or retracted position by riding over these surfaces, this movement being very rapid on account of the action of the spring 32 and the cut-away portion of the cam 29, the momentum of said wheel being sufficient to bring the next wing thereof into engagement with the underside of the ledge 90 and the cam 91, and its opposite wing into the trough

between the uprights 60, 61, and 63, 64, ready to receive another bobbin.

The tripping mechanism above referred to consists preferably of a blade 92 held in a spindle 93 which is journaled in a bracket 94 on the frame and has a pin 95 actuated upon by a spring 96, the other end of which is secured to the frame so that the tendency of the spring 96 is to throw the blade 92 upward while at the same time said spring will time the tripping mechanism so as to be uniform to prevent breakage of the wheel wings 62, which latter will naturally move said blade to some extent and until said wheel has passed out from under the cam by-pass 91, whereupon the spring 96 will rotate the wheel 62 sufficiently to bring the end of the wing slightly above the active face of said by-pass.

Means are provided to facilitate the insertion of individual blanks or bobbins into the machine so that unskilled labor may be employed and the machine will be rendered automatic not only to discharge the finished article but also to admit an unfinished blank in the place of the latter. In order to accomplish this object, I provide another set of wing wheels 110 to constitute a feeding mechanism, said wheels being disposed above the work-supporting wheels and connected for co-rotation, as for instance by chains 98, 99 (see Fig. 7) in engagement with sprocket wheels 100 secured upon the upper wheel shaft 101, and sprocket wheels 102 of the lower wing wheels 62, said shaft 101 being journaled in the uprights 60, 61, respectively, as is clearly shown in Fig. 7.

Means are provided for guarding against breakage of the cutters when the carriage and the bobbins carried thereby are moved up toward the cutter, these means being preferably of a yielding nature so that the cutter spindle 23 may have endwise movement, it being understood, however, that said spindle will be held in its normal or engaging position thereby. In Fig. 1 I have shown these means as consisting of a weight 120 supported on an angle lever 121 which is fulcrumed at 122 on a bracket 123 carried on the head stop 22, the organization being such that the short arm of the lever 121 will rest against the end of the spindle 23 so that when the latter should be pushed toward the right by a superabundance of force exerted by the movement of the carriage, said weight will permit the spindle 23 to yield to such pressure momentarily and until the cutters have performed their functions.

The operation of my improved machine is as follows: The several parts being in the position shown in Figs. 7 and 8, it will be seen that when the cam 29 is rotated by means of the worm 36, the spindle 26 and the cutter c^2 (rotated at a high speed from

any suitable source) will be advanced until the projection c^3 of the cutter c^2 will engage the rear end of the bobbin B, which at this time rests upon the inwardly projecting rings of the wing wheels 62. At the same time the rod 42 carried by the depending arm 27 of the cutter spindle 26 will slide through the aperture in the yoke 55 until the pin 65 brings up against the outer face of the spring 66 whereupon both, the bobbin B and the carriage, will be advanced simultaneously toward the cutter c' . This advance movement will result in swinging the jaws 80, 81, toward each other to grip the bobbin B and prevent the same from rotation with the cutter c^2 subsequent to its engagement therewith. As the carriage is now further advanced toward the cutter c' , the head end of the bobbin B will be brought into engagement with the latter on which it will be centered by virtue of the projection c^4 , and the superfluous stock b' of the bobbin B will thus be removed by said cutter. After this function has been performed and the end face of the bobbin B is in engagement with the collar portion of the cutter c' , a further advance movement of the spindle 26 will result in forcing the cutter c^2 against the rear bobbin-end and thus remove the surplus stock b^2 thereof, while at the same time the rod 42 may have this additional movement without moving the carriage by virtue of the spring 66 yielding to the pressure of the pin 65 of the rod.

During the advance movement of the carriage, the resisting wing of the supporting wheel 62 will slide on the underside of the ledge 90 and cam by-pass 91, and then come into contact with the primary wheel-actuator 92 which is placed under tension of the spring 96 by the time that said wing has passed from under the end of the by-pass 91 so that during the final advance movement of the carriage the resisting wing of the wheel 62 will be slightly turned by the return of the blade 92 to its normal position, this turning movement being just sufficient to cause the end of the wing 62 to come into position above the toe of the by-pass 91. By this time the active face 30 of the cam 29 has reached its highest point of movement relatively to the roller 28, and the spring 32 can now become active and quickly return the carriage and the parts appurtenant thereto, to normal position. That wing of the wheel 62 which had heretofore acted as a resisting medium for preventing the rotation of the wheel and also its companion 110, will now become effective in rotating the wheels 62 and 110 partially, thereby removing the supporting wing of the wheel 62 from under the finished bobbin B, and also permitting a new blank B' to drop onto the next wing of the wheel 62, which projects into the trough between the uprights 60, 61,

and 63, 64, the gravitative descent of the latter blank B' serving also to rotate the wheel 62 until its opposite wing has brought up against the underside of the cam-stops 90 and 91, as will be clearly understood.

I claim:—

1. The combination, with a cutter, a reciprocatory carriage, and a gravitative bobbin-feed on said carriage, of means for gripping a bobbin during and by the advance movement of the carriage, means for releasing the bobbin during the return movement of the carriage, and means controlled by the movement of the carriage for actuating the bobbin feed.

2. The combination, with a cutter, a reciprocatory carriage, a bobbin-feed mechanism comprising a pair of rotatable carriers and means for connecting said carriers for simultaneous rotation, of means for actuating one of said carriers to release the finished bobbin from one carrier during the return movement of the carriage and to bring the next bobbin from the other carrier into position on the first carrier to be acted upon by the cutter.

3. The combination, with a cutter, a reciprocatory carriage, a bobbin-feeding mechanism comprising a pair of superposed carrier wheels, and means for connecting said wheels for simultaneous rotation, of means for actuating one of said wheels to release the finished bobbin during the return movement of the carriage and to bring the next blank into position to be acted upon by the cutter.

4. The combination, with a cutter, a reciprocatory carriage, a pair of wing wheels for supporting a pair of bobbins, and means for rotatively connecting said wheels, of means for holding said wheels against rotation during initial advancing movement of the carriage, means for partially rotating said wheels during the final advance movement of the carriage, and means for completing the feed movements of said wheels during the return of said carriage.

5. The combination, with a cutter, a reciprocatory carriage, a pair of superposed coöperative wing wheels for supporting a pair of bobbins, and means for rotatively connecting said wheels, of means for preventing rotation of said wheels during the initial movement of the carriage, a movable cam blade for partially rotating one of said wheels during the final advance movement of the carriage, and a stationary cam for completing the feed movement of said wheels during the return movement of said carriage.

6. The combination, with a cutter, a reciprocatory carriage, a pair of wing wheels for supporting a pair of bobbins, means for rotatively connecting said wheels, and a stationary cam for holding said wheels against

rotation during the initial advance movement of the carriage and having a face for rotating one of said wheels during the return movement thereof, of means for imparting an advance rotation to one of said wheels during the final advance movement of the carriage and to bring its operative wing into proper position with said cam face to be engaged thereby during the return movement of the carriage.

7. The combination, with a head cutter, a tail cutter, and a bobbin holder disposed between said cutters and comprising a pair of jaws, of means for moving one of said cutters toward the other and for moving the bobbin holder toward the head cutter and means operated by said movement to bring said jaws into engagement with the bobbin.

8. The combination, with a cutter, a reciprocatory carriage, and a bobbin-feeding mechanism comprising a pair of wing wheels and mounted on said carriage, of means for advancing said carriage toward the cutter, means for partially rotating said wing wheels near the end of the carriage movement, and means for completing the rotative movement of the wing wheels during the return movement of the carriage.

9. The combination, with a cutter, a reciprocatory carriage, and a bobbin-feeding mechanism comprising a pair of wing wheels and mounted on said carriage, of a cam for advancing said carriage toward the cutter, means for partially rotating said wing wheels near the end of the carriage movement, a spring for retracting said carriage, and means for completing the rotative movement of the wing wheels during the return movement of the carriage.

10. The combination, with a cutter, a reciprocatory carriage, and a bobbin-feeding mechanism comprising a pair of wing wheels mounted on said carriage, of means for advancing said carriage toward the cutter, yielding means for partially rotating said wheels near the end of the carriage movement, means for rapidly retracting said carriage, and means for completing the rotative movements of the wing wheels to bring a new bobbin into position relatively to the cutter during the return movement of the carriage.

11. The combination, with a cutter, a reciprocatory carriage and a bobbin-feeding mechanism comprising a pair of wing wheels mounted on said carriage, of means for advancing said carriage with the blank toward the cutter, a spring actuated blade for partially rotating said wheels near the end of the carriage movement, and means for completing the rotative movement of the wing wheels to bring a new bobbin into position relatively to the cutter during the return movement of the carriage.

12. The combination, with a cutter, a re-

ciprocatory carriage and a bobbin-feeding mechanism comprising a pair of wing wheels and mounted on said carriage, of positive means for advancing said carriage with the blank toward the cutter, a device for partially rotating said wing wheels near the end of the carriage movement in its advancing direction, a cam plate for completing the rotative movement of the wing wheel during the return movement of the carriage, and means for rapidly returning the carriage to its retracted position.

13. The combination, with a stationary and a movable cutter, a reciprocatory carriage interposed and movable between said cutters, means for moving the movable cutter prior to and during the movement of said carriage toward the stationary cutter, and means for varying the zone of movement of said carriage relatively to the movement of the movable cutter.

14. The combination, with a movable cutter spindle, a stationary second spindle, and a bobbin support interposed between said cutter spindles and controlled by the movement of the first cutter spindle, of means for first moving said first spindle toward the second spindle, and for then moving said support with said spindle, and means for positioning said moving-means for varying the zone of movement of the blank support with the blank relatively to the second spindle.

15. The combination, with a tail cutter, a head cutter, and a movable bobbin support interposed between said cutters, of a cam for moving the tail cutter toward the head cutter, yielding means for moving the bobbin support with the blank toward the head cutter, said yielding means being also actuated by said cam, and means for varying the zone of movement of the support relatively to the movement of the tail cutter.

16. The combination, with a pair of alined cutters, and a bobbin-supporting carriage interposed between said cutters and longitudinally movable relatively thereto, of a bobbin-feed mechanism supported on said carriage, means for guiding successive bobbins into position to be operated upon by said cutters, and means for confining the position of the bobbin longitudinally on said carriage.

17. The combination, with a pair of alined cutters, and a bobbin-supporting carriage interposed between said cutters and longitudinally movable relatively thereto, of a bobbin-feed mechanism supported on said carriage, means for guiding successive bobbins into position to be operated upon by said cutters, and a guide blade supported on the carriage and for confining the position of the blank longitudinally on said carriage.

18. In a machine for jointing the ends of bobbins, in combination, opposed axially

alined spindles, one thereof essentially being rotative and carrying a cutter, means for receiving bobbins and feeding them successively, vertically, into axial alinement with said spindles, means for advancing one of said spindles to endwise engage the downwardly fed bobbin and move it into engagement with the cutter carried by the other spindle, opposed jaws for gripping the spindle advanced to the jointing action of the spindle-carried cutter, and means for actuating said jaws for closing the same upon the bobbin substantially simultaneously with the advancement of the bobbin by the one spindle to the action of the cutter carried by the other spindle.

19. In a machine for jointing the ends of bobbins, in combination, opposed axially alined spindles, one having bobbin jointing cutters at the ends thereof, and one of said spindles being movably mounted to approach and recede from the other, together with means for imparting its movement thereto, means for feeding bobbins, one at a time, to the line of said spindles, a pair of opposed spindle-gripping jaws located between the spindles, opposed toggle bars on the approached ends of which the said jaws are carried, the same being pivotally held at their outer ends, normally angular to each other, arranged to be operated by the advancement of one spindle toward the other, to assume inwardly approached movements, whereby they become approximately alined to have their jaws grip the bobbin about simultaneously with the forcing of the latter,

by the one spindle to endwise engagement with the other, for subjecting it to the end jointing action.

20. In a machine of the character described, the combination with a frame having a normally stationary head stock and rotary cutter spindle mounted therein, a tail stock slidable on the frame toward and away from the head cutter, having a spindle axially alined with the head cutter, and means for imparting the movements to the tail stock and its spindle, a carriage slidably mounted on the frame between the approached ends of the said spindles having devices for intermittently downwardly feeding bobbins to the line of said spindles, normally angularly arranged bars pivotally connected at outer ends thereof to the frame having engagements near the inner ends thereof with said carriage and being provided at their inner ends with opposed bobbin gripping jaws, and means for forwardly sliding said carriage in conjunction with the forward movement of the tail stock to cause said bars to assume approximately alined positions transversely of the line of movement of the carriage for causing the jaws to grip the bobbins about simultaneously with the final forward movement of the carriage.

Signed by me at Springfield, Mass., in presence of two subscribing witnesses.

DANA S. COURTNEY.

Witnesses:

WM. S. BELLOWES,
G. R. DRISCOLL.