May 11, 1926. 1,584,264

R. L. WILCOX

THREADING MACHINE

Filed August 9, 1924 5 Sheets-Sheet 1

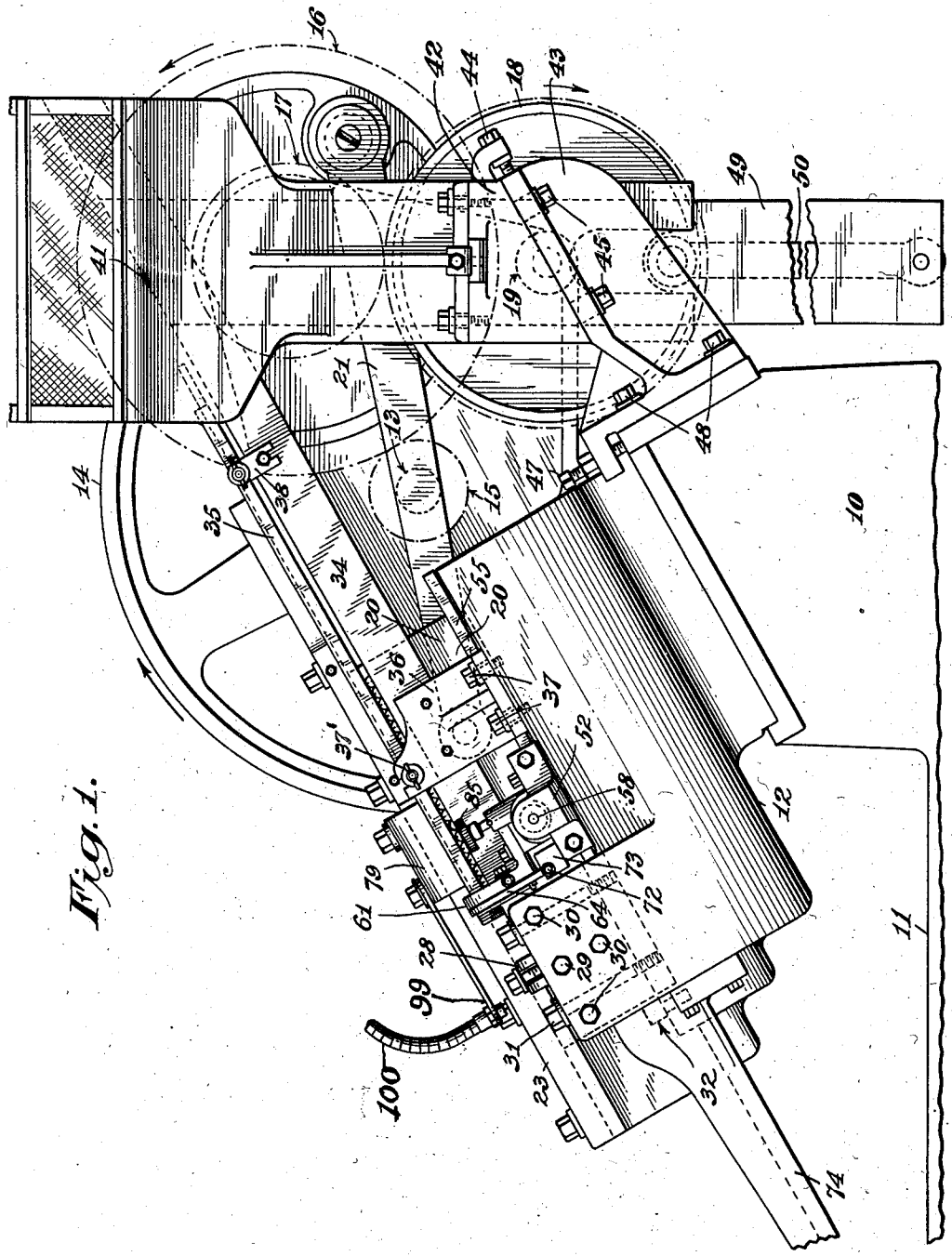


Fig. 1.

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THREADING MACHINE

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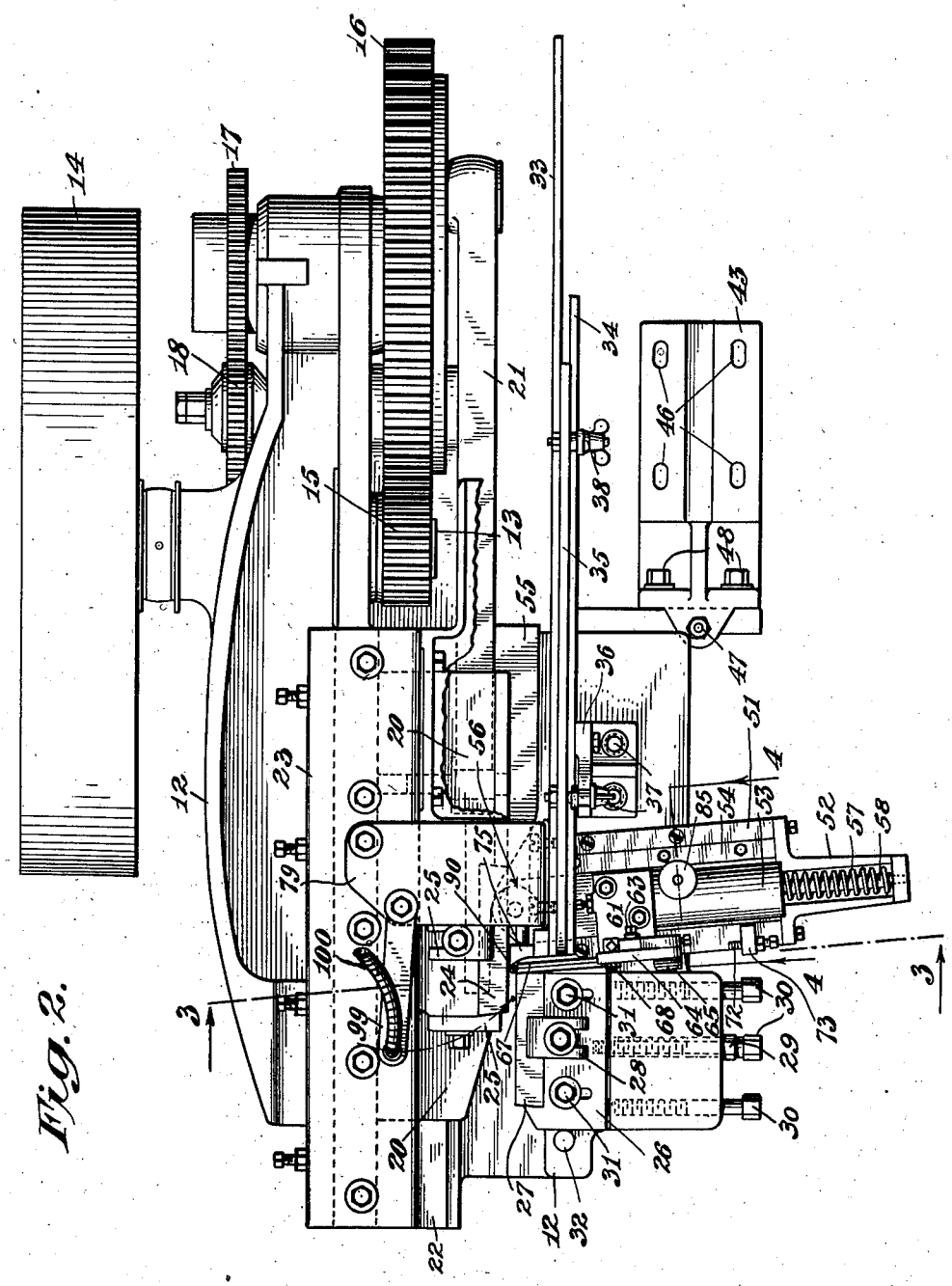


Fig. 2.

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THREADING MACHINE

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Fig. 3.

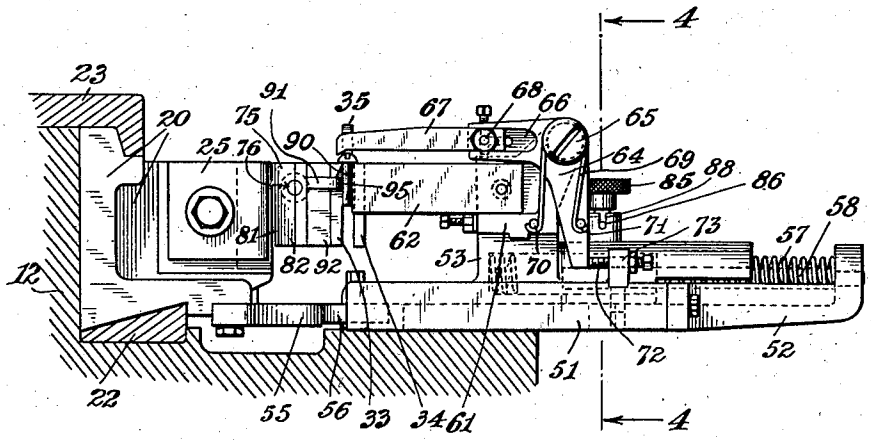
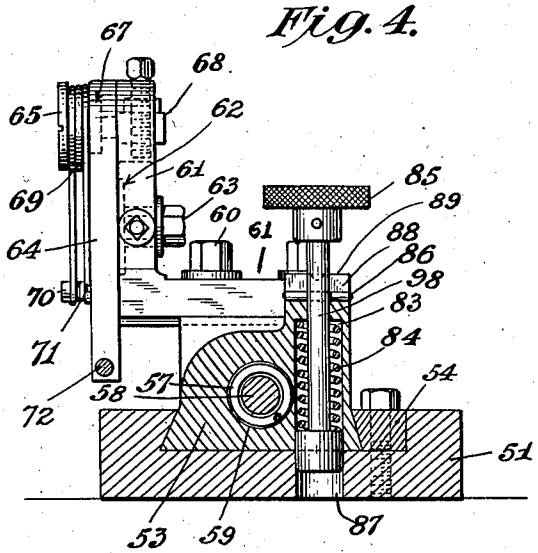


Fig. 4.



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THREADING MACHINE

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Fig. 5.

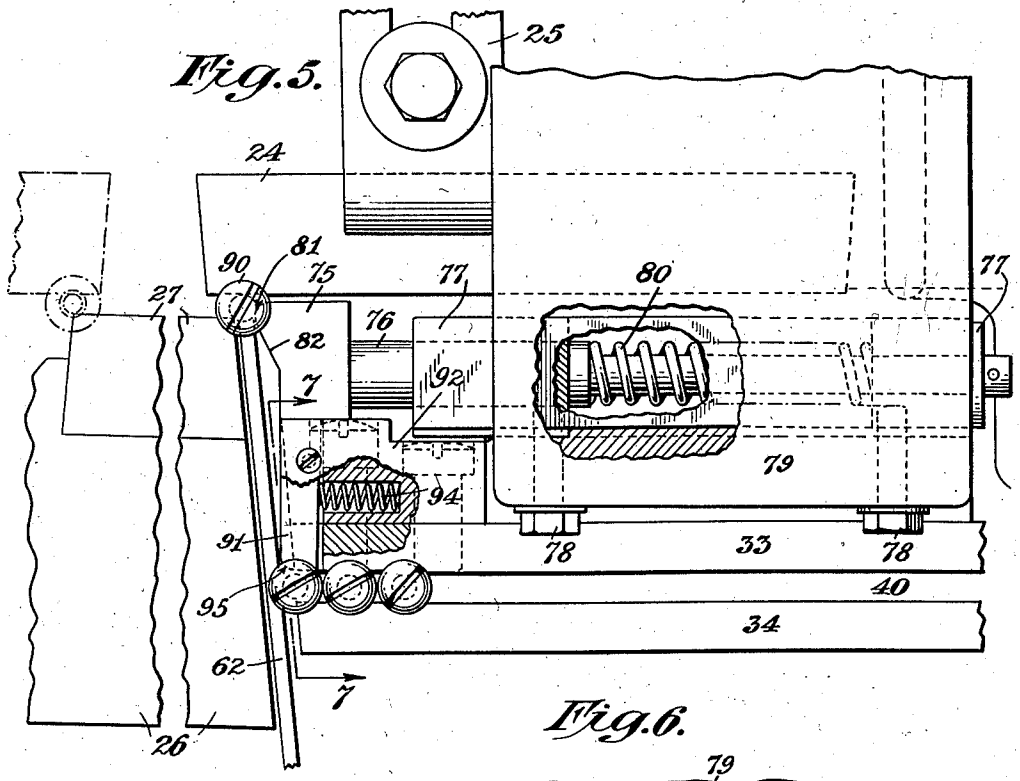


Fig. 6.

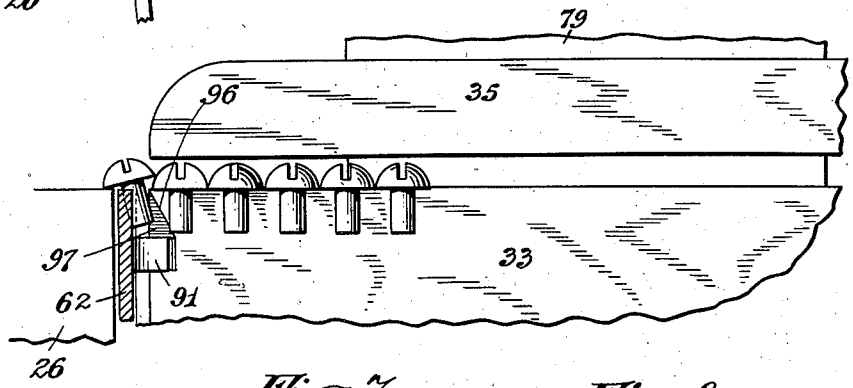


Fig. 7.

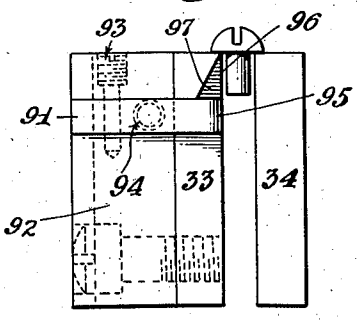
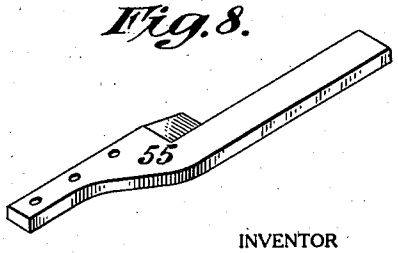


Fig. 8.



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THREADING MACHINE

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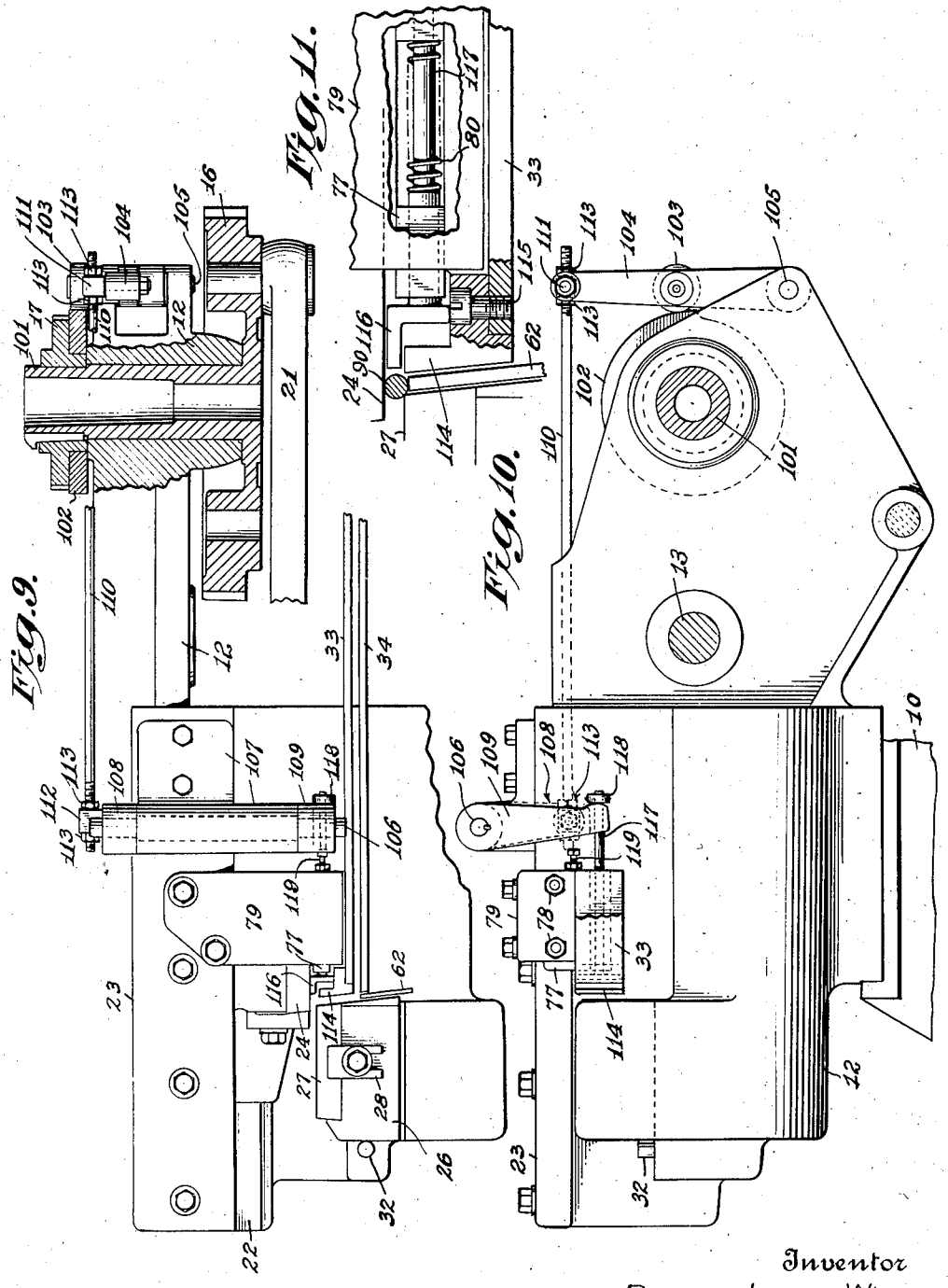


Fig. 9.

Fig. 11.

Fig. 10.

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By Attorney George E. Hall

Patented May 11, 1926. 1,584,264

UNITED STATES PATENT OFFICE.

RICHARD LESTER WILCOX, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE WATERBURY FARREL FOUNDRY AND MACHINE COMPANY, OF WATERBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT.

THREADING MACHINE.

Application filed August 9, 1924. Serial No. 731,152.

This invention relates to a new and improved threading machine of the rolled thread type.

It is the object of this invention, among other things, to provide a machine of this character wherein the blank will travel downwardly in an inclined plane from the time it leaves the hopper mechanism to its discharge from the threading dies completely threaded, thereby producing many desirable results, among which might be recited, the entire elimination of knock out mechanism, and a flushing of the dies by the lubricant which facilitates the thread rolling operation and cleans the dies of chips, etc., as well as to provide for an easy and convenient adjustment of the parts to conform to this movement of the blank, and for blanks of various sizes, and to make the machine entirely automatic in its action.

These and other desirable results are obtained by a machine of simple design, wherein threading dies of standard size may be readily installed and which can be operated at the highest efficiency with the minimum labor and attention.

To these, and other ends, my invention consists in the threading machine, having certain details of construction and combinations of parts as will be hereinafter described and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals of reference designate like parts in the several figures;

Figure 1 is a side elevation of the upper portion of my improved threading machine;

Figure 2 is a plan view thereof with the hopper mechanism removed.

Figure 3 is a transverse sectional view, taken generally upon line 3—3 of Figure 2;

Figure 4 is an enlarged detail view of some of the parts, taken generally upon line 4—4 of Figure 3;

Figure 5 is an enlarged plan view of the lower end of the chute mechanism and adjacent parts;

Figure 6 is a detail side elevation of the lower end of the chute and some of the adjacent parts;

Figure 7 is an end elevation of the lower end of the chute mechanism, looking in the direction of the arrows 7—7 of Figure 5;

Figure 8 is a perspective, detail view of the slide cam;

Figure 9 is a fragmentary plan view illustrating the means for in part positively operating the pusher mechanism;

Figure 10 is a side elevation thereof; and

Figure 11 is an enlarged detail view of the pusher slide and some of the adjacent parts.

In the preferred form of the threading machine shown in the drawings; 10 designates the pedestal or base, the lower portion of which is not shown but may be of any desired construction, having an apron 11 projecting from one face thereof, and secured upon the top thereof in any convenient manner is the body member 12, which is arranged so as to lie in an inclined plane substantially as shown in Figure 1, this angle being about 30°. Journaled in this body member is a shaft 13 having a driving wheel 14 upon one end and a pinion 15 on the other end, the teeth of which mesh into those of a spur gear 16 mounted upon a shaft having a pinion 17 thereon, the teeth of which mesh into those of a gear 18 upon a shaft 19. Slidably mounted within the body member 12 is the gate 20 that is connected with the spur gear by the pitman 21 whereby a reciprocatory movement is imparted to the gate. A gib 22 and a cap 23, both of which are associated with the body 12 provide convenient means for holding the gate in operative relation with the body member 12. Secured within the inner face of the gate 20 is the movable die 24, held therein by the clamps 25 or similar means. Adjustably secured upon the body member 12 by the screws 31 is the die block 26, to which the stationary die 27 is secured by the clamp 28. This die block is adjusted toward and away from the gate by the screw 29 threaded therein and the stop screws 30 which are threaded in the body member 12, the inner ends of which impinge against the die block, as shown in Figure 2.

As an additional support for the die block 26 and to minimize the strain upon

the bolts and screws holding the same, a stud 32, or the like, may be fixed in the body 12 against the lower edge of the die block, as shown particularly in Figure 2.

Both the movable die 24 and the stationary die 27 are provided with the usual grooves in the working faces thereof and by means of which the thread is rolled in the blank.

The chute mechanism, arranged in the same angle as the body member 12, comprises in part the fixed side plate 33, an adjustable side plate 34 and a cap or cover 35. The adjustable plate 34, is secured to a movable bracket 36 that is adjustably held upon the body member 12 by the screws 37, so as to be moved toward and away from the fixed side plate 33. This section varies the width of the open space 40 between the chute plates and accommodates blanks of various diameters.

Preferably, the cap or cover 35 is adjustably secured to the side chute plate 34 at one end by the clip 38 and at the lower end to the bracket 36 by the screws 37' having a thumb nut thereon. Movement of this cap toward and away from the top of the plates 33 and 34 accommodates the heads of blanks of various sizes.

Blanks are delivered to the chute from a hopper 41 adjustable in a substantially horizontal plane toward and away from the chute mechanism to conform to the chute in its different positions, upon a bracket 42 that is adjustably mounted upon a bracket 43 in a path substantially parallel with the angle of inclination of the body member 12 by means of the screw 44 and locked in these several positions by the bolts 45 that pass through slots 46 therein. This bracket 43 is mounted upon the pedestal or base 10 and adjusted by means of the screw 47 in a path at a right angle to the angle of inclination to the body member 12 and there locked in any of its several positions by the bolts 48 in a well known manner. By thus mounting the hopper, it may be moved as a unit to any desired position without varying its angular relation to the body 12 or to the chute mechanism.

The blanks are discharged from the hopper in a well known manner by a vertically movable plate 49 actuated by a pitman 50 connected therewith and to the gear 18. The hopper, the method of operating the same, or discharging the blanks therefrom, constitutes no part of this present invention.

Fixed to the body member 12 is a slide bracket 51 to the outer end of which is secured a spring arm 52 and within which is mounted a slide 53 that is held therein by the gib 54. Motion is imparted to this slide 53 away from the gate 20 by a cam 55 secured to the underside of the gate and movable therewith, and a cam roll 56 fixed to the inner end of the slide and held in contact with the cam by the spring 57 which encircles a spring pin 58 in the spring arm 52 and lies within the bore 59 of the slide 53. As the gate moves to the left the parts are as shown in Figure 2, at which time a blank is between the faces of the threading dies, the slide 53 is moving away from the gate against the tension of the spring 57 which is thereby compressed. Upon the return stroke of the gate, the slide 53 is moved inwardly toward the gate by the expansion of the spring 57, the roll 56 thus maintaining its contact with the cam 55.

Adjustably secured to the slide 53 by the bolt 60 is the finger bracket 61, carrying the pusher plate 62 that is held in any of its adjusted positions by the screw 63. A rock lever 64 pivotally connected to this bracket by the screw 65, has a recess 66 therein containing the finger 67 adjustably secured by the bolt 68 or like means. A spring 69 encircles the screw 65 and one of its free ends engages a pin 70 in the finger bracket 61 and the other end a pin 71 in the rock lever 64 and by reason thereof exerts its tension so as to rock the lever 64 and hold the outer end of the finger 67 in its down position, as shown in Figure 3, but will yield and allow the same end of the finger to pass over the head of a blank during the outward movement of the slide. When the slide 53 nears its outermost position the rock lever 64 engages a stop screw 72 in the poppet 73 fixed in the slide bracket 51 and is rocked thereby and the finger 67 moved to its up position. The blanks are delivered from the hopper onto the chute mechanism and travel therethrough by gravity in a well known manner in an inclined path to the lower end of the chute. The timed relation between the reciprocating gate and the slide 53 is such that the pusher plate 62 engages the lowermost blank in the column of blanks in the chute, substantially as shown in the drawing in Figure 3, wherein the blank is designated 90 and pushes the same in an angular path relatively thereto along the upper face of the die block 26 until it engages the face of the movable die 24 as shown in Figure 5. This action of the pusher finger in advancing the blank from the chute to the threading dies is derived from the spring 57 as above described so that if by chance, the blank should catch or for any other reason be impeded in its travel, the pusher plate will come to a stop instead of continuing to advance as if driven by positive means, thus eliminating one very serious cause of difficulty in this type of mechanism. The upper face of the die block 26 and the upper end of the fixed die 27 are arranged at a slight downward angle transversely to that of the chute so that the blanks will continue to travel down-

wardly during their transverse movement. The blank, after its transfer to the dies is picked up thereby and rolled therebetween by the action of the movable die until it has passed the end of the fixed die as shown by the broken lines in Figure 5, at which time it is released and drops by gravity onto the guide tray 74 from which it drops into the apron 11. Thus the blank, from the time it leaves the hopper, travels in the same inclined plane until it is discharged onto the guide tray 74 and receiving during its travel a transverse movement, from the chute to the die mechanism, which is also an inclined plane. The blank is readily picked up between the dies after being delivered thereto by the transfer mechanism, but this engagement is assured by the means which comprises a pusher 75 having a shank 76 thereon that is supported in blocks 77 connected by screws 78 or the like, to the plate 79 separably secured to the cap 23. The spring 80 surrounding this shank 76 between the blocks 77 exerts its tension so as to move the pusher 75 toward the fixed die 27. When the pusher plate 62 is withdrawn the nose 81 of the pusher 75 projects into the open space between the stationary and movable dies. As the blank is advanced toward the dies from the chute, it first engages the angular face 82 of the head 75 and presses the same inwardly against the tension of the spring 80 until the parts are in the position substantially as shown by full lines in Figure 5, at which time the nose 81 is in contact with the shank of the blank and applying a slight pressure thereto sufficient to insure its entrance between the dies.

Other types and forms of pusher mechanism may be substituted as may seem desirable. The slide 53 and associated parts are held stationary in its outermost position for the purpose of adjustment of the parts etc. by a plunger 98 movable within the chamber 83 and pressed downwardly by the spring 84. A knurled thumb button 85 is fixed on the upper end of this plunger and projecting therefrom at a right angle to its length is a pin 86. In Figure 4 this plunger is shown in its down position and projecting into an opening 87 in the slide bracket 51 and the pin 86 is in a notch 88 in the slide. When the parts are in the position thus described, the slide is held in its outermost position against movement. By lifting the plunger upwardly against the tension of the spring 84, and the pin 86 out of the notch 88 and then rotating the same slightly so that the pin rests upon the top of the lug 89, substantially as shown in Figure 1, the plunger 98 is withdrawn into the chamber 83 and above the opening 87, and the slide 53 is operable, as before, by the cam 55 and the spring 57.

As the dies move in an inclined plane, the lubricant applied thereto readily washes and cleans the dies, due to the fact that it travels through the grooves therein. In the old type machines, wherein the dies travel in a substantially horizontal plane, the stream of lubricant was unable to flush and clean the dies. Thus the chips frequently remained in the grooves and marred the thread produced thereby and frequently damaged and so injured the dies as to require recutting, reshaping and regrinding. One convenient means for conveying lubricant to the dies is shown in the drawing, that is, a plate 99 pivotally secured at one end, and a flexible tube 100 connected therewith near the other end. The plate 99 may be moved to any position about its pivot mounting and the lubricant discharged onto the dies through the tube 100.

With the angle of inclination of the chute, dies, etc., as shown herein, the lowermost blank in the column, if it has a countersunk head or the like, engages the upper corner of the upper face of the die block 26 opposite the chute and is there suspended by the head at three points, two of which points are the lower inside upper corners of the chute plates 33 and 34, and the third point the upper corner edge of the die block 26. Sometimes with this form of blank, the shank instead of lying parallel with the slot or open space 40 in the chute and also with the slot leading therefrom alongside the upper face of the die block 26, has a tendency to cant, by reason of the weight of the blanks in the chute resting against it. This results in the lower end thereof being inclined toward the threading dies. When so arranged, the shank of the next blank in the column of blanks in the chute is crowded by gravity, assisted by the weight of the other blanks in the column, into a position where it is under the shank of the lowermost blank, which it will be remembered, is inclined a little toward the dies. The pusher plate 62, now instead of engaging the shank of the lowermost blank, frequently contacts with the next succeeding blank and as the shanks of the two lowermost blanks are interlocked and the pusher plate is unable to perform its function, remains stationary. The stream of blanks to the threading dies is then cut off. This situation does not occur except with blanks having a countersunk head and a relatively long shank. To prevent such possible interlocking of the two lowermost blanks and to insure a positive feed of a stream of blanks to the dies, I have inserted a latch 91 in the block 92, having a rounded outer end 95 and secured to the chute plate 33 at its lower end. This latch is hinged upon a pin 93 below the top of the block (see Figure 7) and engaging the rear face thereof is a spring 94 which exerts its tension so as to

move the inner end of the latch toward the die block 26, the position shown in Figure 5. The limit of the outward position of the outer end of this latch is determined by the contact of the heel thereof with the bottom of the recess on the block 92 in which it is mounted. When in this out position, as shown in Figure 5, there is an open space between the outer end of the latch and the upper face of the die block 26. This latch being in the path of the blank engages the shank of the lowermost blank and prevents it from canting out of alignment with the next succeeding blank, as above described. Hence there is no possibility of an interlocking of the blanks or a stoppage of the feed of the stream of blanks to the threading dies. The spring 94 yields as the pusher plate 62 advances the blank from the chute to the dies, the rounded end 95 facilitating this movement.

If the shanks of the blanks are so short that the weight of the head outweighs that of the shank, the lowermost blank in the column of blanks in the chute has a tendency to occupy a position substantially as shown in Figure 6, at which time the head of the next succeeding blank crowds under the head of the lowermost blank in the column. In this position the shank of the lowermost blank projects back into the slot 40 and by reason thereof is locked against movement by the pusher plate 62 and hence is not fed to the threading dies. To obviate this difficulty and insure a proper alignment of the lowermost blank relatively to the chute slot and the pusher plate, the inner lowermost corner of the chute plate 33 is formed with an undercut notch 96 wherein the wall 97 thereof is at an angle to both the inside faces of the chute plate 33 and the end thereof and terminates in a point at the intersection of the inner and lower edges of the top face of said chute plate 33, substantially as shown in Figures 6 and 7. When the lowermost blank in the chute is in the position substantially as shown in Figure 6, it is engaged by the pusher plate 62 and its alignment is rectified by reason of the engagement of the end of the shank with the angular wall 97 and after passing the end of the chute plate 33 is readily advanced to the threading dies.

It is desirable with some classes of work to positively withdraw the pusher that projects the blank between the dies, instead of maintaining it under a forward pressure, as with the pusher 75. To this end I have provided a mechanism, which consists of a pusher slide 116 which is substituted for the pusher slide 75, the shank 117 thereof being supported in the blocks 77 and projects rearwardly therefrom with a collar 118 fixed thereon.

Rotatable in the journal block 107, connected with the cap 23 is a shaft 106 having on one end an arm 109, which at its lower end straddles the shank 117 and contacts with the inner face of the collar 118 substantially as shown in Figure 10. A rocking movement is imparted to this shaft 106 from a cam 102, shown herein as mounted upon the hub 101 of the pinion 17 and against which rides a cam roll 103 carried by the lever 104 pivotally connected to the frame by the stud 105. A rod 110 projecting through a swivel block 111 on the lever 104 at one end and a swivel block 112 connected with the arm 109 at the opposite end is secured in its adjusted positions by the nuts 113. Thus means are provided for connecting the lever 104 with the arm 108, whereby the shaft 106 is oscillated in timed relation with the other parts. By this mechanism the pusher 116 is withdrawn against the tension of the spring 80 so that the forward end thereof is in rear of the inclined face of the block 114, secured to the fixed plate 33 by the screw 115 until the blank 90 is in substantially the position shown in Figure 11. An adjustable stop screw 119 provides means for limiting the movement of the pusher toward the stationary die 27. At the instant the blank is brought up against the movable die 24 the pusher slide 116 moves forward and applies sufficient pressure to the blank to insure its engagement between the dies. The pusher slide 116 is then withdrawn and retains a position with its front end in rear of the angular face of the guide block 114 substantially as shown in Figure 11, until the next blank is presented in front thereof.

Aside from the possible modifications and alterations in the detail construction of my invention as herein referred to, others will readily suggest themselves to those versed in the art, and therefore, I do not limit myself to the exact construction herein shown and described.

What I claim is:—

1. In a threading machine; a pair of dies; and means for guiding blanks to the dies, arranged so that the blanks will travel continuously in substantially the same plane at an angle to the horizontal through both the guiding means and dies.

2. In a threading machine; a pair of dies; means for guiding blanks to the dies in a path wherein one portion thereof is at an angle to the other portion thereof, and arranged so that the blanks will travel continuously in substantially the same plane at an angle to the horizontal through both the guiding means and dies.

3. In a threading machine; a pair of dies; means for guiding blanks to the dies in a path wherein one portion thereof is at an angle other than a right angle to the other portion thereof, arranged so that the blanks

will travel continuously in substantially the same plane at an angle to the horizontal through both the guiding means and dies.

4. In a threading machine; a pair of dies; means for guiding blanks to the dies in a path wherein one portion thereof is at an angle other than a right angle to the other portion thereof, arranged so that the blanks will travel continuously in substantially the same plane at an angle to the horizontal through both the guiding means and dies, the angular portion of the guiding means inclining downwardly toward said dies

5. In a threading machine; a pair of dies, one of which is movable in a plane at an angle to the horizontal; a chute mechanism adjacent thereto and occupying a plane at an angle to the horizontal and in substantially the same plane as the dies; and means for transferring blanks from the chute mechanism to the dies at an angle to the chute mechanism and inclining downwardly therefrom to the dies.

6. In a threading machine; a pair of dies; a hopper mechanism; and means for guiding blanks from the hopper mechanism to the dies, all arranged so that blanks will travel by gravity in substantially the same plane and at an angle to the horizontal from the hopper to and between said dies and until discharged therefrom.

7. In a threading machine; a pair of dies; a hopper mechanism; and means for guiding blanks from the hopper mechanism to the dies, all arranged so that the blanks will travel by gravity in substantially the same plane and at an angle to the horizontal from the hopper mechanism to and between said dies and until discharged therefrom, the blank guiding means being so arranged that the blanks will travel in an angular path.

8. In a threading machine; a pair of dies; a hopper mechanism; means for guiding blanks from the hopper mechanism to the dies, all arranged so that blanks will travel by gravity in substantially the same plane and at an angle to the horizontal from the hopper to and between said dies and until discharged therefrom; and means for mounting said hopper mechanism, whereby it may be moved in said plane toward and away from the chute mechanism.

9. In a threading machine; a pair of dies; a hopper mechanism; means for guiding blanks from the hopper mechanism to the dies, all arranged so that blanks will travel by gravity in substantially the same plane and at an angle to the horizontal from the hopper to and between said dies and until discharged therefrom; and means for mounting said hopper mechanism, whereby it may be moved in said plane substantially parallel with the chute mechanism.

10. In a threading machine; a pair of dies; a hopper mechanism; means for guiding blanks from the hopper mechanism to the dies, all arranged so that blanks will travel by gravity in substantially the same plane and at an angle to the horizontal from the hopper to and between said dies and until discharged therefrom; and means for moving said hopper mechanism vertically and occupying the same angular plane to the horizontal.

11. In a threading machine; a pair of dies; means for guiding blanks to the dies in a path wherein one portion thereof is at an angle other than a right angle to the other portion thereof, arranged so that the blanks will travel continuously in substantially the same plane at an angle to the horizontal through both the guiding means and dies, the angular portion of said path being substantially parallel with one end of one of said dies.

12. In a threading machine; a pair of dies; a member for holding one of the dies in a stationary position; and a chute mechanism, said chute mechanism and dies being in substantially the same plane at an angle to the horizontal, the lower end of the chute terminating adjacent to said member so that the blanks after being discharged from the chute travel along one face of said member and stationary die.

13. In a threading machine; a pair of dies; a hopper mechanism; means for guiding blanks from the hopper mechanism to the dies, all arranged so that blanks will travel by gravity in substantially the same plane and at an angle to the horizontal from the hopper to and between said dies and until discharged therefrom; and yielding means applying pressure to the blank to insure its engagement between the dies.

14. In a threading machine; a pair of dies; a member for holding one of the dies in a stationary position; a chute mechanism, said chute mechanism and dies being in substantially the same plane at an angle to the horizontal, the lower end of the chute terminating adjacent to said member so that the blanks after being discharged from the chute travel along one face of said member and stationary die; and yielding means applying pressure to the blank to insure its engagement between the dies.

15. In a threading machine; a pair of dies, one of which is movable; a chute mechanism terminating at a point distant from the movable die; and transfer means for moving a blank from the chute mechanism to said dies and comprising in part a pusher actuated by yielding means while it is in engagement with the blank.

16. In a threading machine; a pair of dies, one of which is movable; a chute mechanism terminating at a point distant from the movable die; transfer means for moving a blank from the chute mechanism to said

dies and comprising in part a pusher actuated by yielding means while it is in engagement with the blank; and positively actuated means for moving said pusher in the opposite direction.

17. In a threading machine; a pair of dies, one of which is movable; a chute mechanism terminating at a point distant from the movable die; transfer means for moving a blank from the chute mechanism to said dies and comprising in part a pusher actuated by yielding means while it is in engagement with the blank; and positively actuated means for moving said pusher in the opposite direction, comprising in part cam means that travels with said movable die.

18. In a threading machine; a pair of dies, one of which moves in a reciprocatory path; a cam connected therewith; a chute mechanism, terminating at a point distant from the movable die; transfer mechanism for moving the blank from the chute mechanism to said dies, comprising in part a pusher; yielding means for actuating said pusher during its movement toward said movable die; and means actuated by said cam for moving the same in the opposite direction.

19. In a threading machine; a pair of dies, one of which is movable; a chute mechanism terminating at a point distant from the movable die; transfer means for moving a blank from the chute mechanism to said dies and comprising in part a pusher actuated by yielding means while it is in engagement with the blank; and yielding means for applying pressure to the blank to insure its engagement between the dies that is moved in one direction by the blank while being transferred from the chute to the dies.

20. In a threading machine; a pair of dies, one of which is movable; a chute mechanism terminating at a point distant from the movable die; transfer means for moving a blank from the chute mechanism to said dies and comprising in part a slide; cam means for moving said slide in a path toward and away from said dies; yielding means for moving said slide in the opposite direction; and a pusher connected with said slide which during its movement passes in front of said chute mechanism.

21. In a threading machine; a pair of dies, one of which is movable; a chute mechanism terminating at a point distant from the movable die; transfer means for moving a blank from the chute mechanism to said dies and comprising in part a pusher actuated by yielding means while it is in engagement with the blank; and a finger substantially parallel with said plate and projecting over the head of the blank.

22. In a threading machine; a pair of dies. one of which is movable; a chute mechanism terminating at a point distant from the movable die; transfer means for moving a blank from the chute mechanism to said dies and comprising in part a pusher actuated by yielding means while it is in engagement with the blank; and a finger substantially parallel with said plate and projecting over the head of the blank, said finger being yieldingly mounted so as to pass over the head of a blank while said pusher is being moved in one direction.

23. In a threading machine; a pair of dies, one of which is movable; a chute mechanism terminating at a point distant from the movable die; transfer means for moving a blank from the chute mechanism to said dies and comprising in part a pusher actuated by yielding means while it is in engagement with the blank; a finger substantially parallel with said plate and projecting over the head of the blank; and means for mounting said finger whereby its position relatively to the plate may be varied.

24. In a threading machine; a pair of dies, one of which is movable; a chute mechanism terminating at a point distant from the movable die; transfer means for moving a blank from the chute mechanism to said dies and comprising in part a pusher actuated by yielding means while it is in engagement with the blank; a finger substantially parallel with said plate and projecting over the head of the blank; and means for moving said finger relatively to the pusher the same as in one of its relative positions.

25. In a threading machine; a pair of dies, one of which is movable; a chute mechanism terminating at a point distant from the movable die; transfer means for moving a blank from the chute mechanism to said dies and comprising in part a pusher actuated by yielding means while it is in engagement with the blank; a finger substantially parallel with said plate and projecting over the head of the blank; and adjustable means for moving said finger relatively to the pusher when the same is in one of its relative positions.

26. In a threading machine; a pair of dies, one of which is movable; a chute mechanism terminating at a point distant from the movable die; transfer means for moving a blank from the chute mechanism to said dies and comprising in part a slide; cam means for moving said slide in a path toward and away from said dies; yielding means for moving said slide in the opposite direction; a pusher connected with said slide which during its movement passes in front of said chute mechanism; and means for holding said slide against movement in one of its positions.

27. In a threading machine, a pair of dies, one of which is movable; a chute mechanism terminating at a point distant from the movable die; transfer means for moving a

blank from the chute mechanism to said dies and comprising in part a slide; cam means for moving said slide in a path toward and away from said dies; yielding means for moving said slide in the opposite direction; a pusher connected with said slide which during its movement passes in front of said chute mechanism; and means for holding said slide against movement in one of its positions, comprising a plunger movably mounted in said slide and projected into an opening in a fixed part when said plunger is in register therewith.

28. In a threading machine; a pair of dies; a hopper mechanism; means for guiding blanks from the hopper mechanism to the dies, all arranged so that blanks will travel by gravity in substantially the same plane and at an angle to the horizontal from the hopper to and between said dies and until discharged therefrom; and yielding means applying pressure to the blank to insure its engagement between the dies, comprising a pusher, having a nose thereon in a plane between the faces of the dies, and a spring for moving the same in one direction.

29. In a threading machine; a pair of dies; a hopper mechanism; means for guiding blanks from the hopper mechanism to the dies, all arranged so that blanks will travel by gravity in substantially the same plane and at an angle to the horizontal from the hopper to and between said dies and until discharged therefrom; and yielding means applying pressure to the blank to insure its engagement between the dies, comprising a pusher, having a nose thereon in a plane between the faces of the dies and an inclined face adjacent thereto terminating at said nose, and a spring for moving the same in one direction.

30. In a device of the character described; delivery mechanism wherein blanks travel in two paths, one being at substantially a right angle to the other; and means for insuring the relative alignment of the blanks while passing the angle of said path, comprising in part a latch which projects into one of said paths and is moved to its retracted position by the blank while moving thereby.

31. In a device of the character described; delivery mechanism wherein blanks travel in two paths, one being at substantially a right angle to the other; means for insuring the relative alignment of the blanks while passing the angle of said path, comprising in part a latch which projects into one of said paths and is moved to its retracted positions by the blank while moving thereby; and means for applying pressure to the blank during a portion of its movement through said path.

32. In a device of the character described; delivery mechanism wherein blanks travel in two paths, one being at substantially a right angle to the other; means for insuring the relative alignment of the blanks while passing the angle of said path, comprising in part a latch having a rounded head which projects into one of said paths and is moved to its retracted position by the blank while moving thereby.

33. In a device of the character described; delivery mechanism wherein blanks travel in two paths, one being at substantially a right angle to the other; means for insuring the relative alignment of the blanks while passing the angle of said path, comprising in part a latch which projects into one of said paths and is moved to its retracted position by the blank while moving thereby; and yielding means for moving said latch from its retracted position.

34. In a device of the character described; delivery mechanism, comprising in part a plate having a notch formed in the corner thereof formed by two of its faces.

35. In a device of the character described; delivery mechanism, comprising in part a plate having an undercut notch formed in the corner thereof formed by two of its faces.

36. In a device of the character described; delivery mechanism comprising in part a plate having a notch formed in the corner thereof formed by two of its faces, the face of the notch being at an angle to both of the adjacent faces of the plate.

37. In a device of the character described; delivery mechanism comprising in part a plate having a notch in one corner thereof formed by two of its faces; a latch movably connected thereto at one end below the notch; and a spring which exerts its tension against the latch so as to move the same into a position where it projects beyond the end of said plate.

38. In a threading machine; a pair of dies; a hopper mechanism; means for guiding blanks from the hopper mechanism to the dies, all arranged so that the blanks will travel by gravity in substantially the same plane and at an angle to the horizontal from the hopper to and between said dies and until discharged therefrom; yielding means applying pressure to the blank to insure its engagement between the dies, comprising a pusher, having a nose thereon in a plane between the faces of the dies; a spring for moving the same in one direction; and positive means for moving the same in the opposite direction.

39. In a threading machine; a pair of dies; a hopper mechanism; means for guiding blanks from the hopper mechanism to the dies, all arranged so that blanks will travel by gravity in substantially the same plane and at an angle to the horizontal from the hopper to and between said dies and until discharged therefrom; yielding means ap-

plying pressure to the blank to insure its engagement between the dies, comprising a pusher, having a nose thereon in a plane between the faces of the dies and held out of the path of travel of the blank to the dies until the blank has engaged one of the dies; and a spring moving the same in one direction.

40. In a threading machine; a pair of dies; a hopper mechanism; means for guiding blanks from the hopper mechanism to the dies, all arranged so that blanks will travel by gravity in substantially the same plane and at an angle to the horizontal from the hopper to and between said dies and until discharged therefrom; yielding means applying pressure to the blank to insure its engagement between the dies, comprising a pusher, having a nose thereon in a plane between the faces of the dies; a spring for moving the same in one direction; and positive means for moving the same in the opposite direction, comprising a rock member having operative engagement with said yielding means and actuated in timed relation with the movement of said blank.

In testimony whereof, I have hereunto affixed my signature.

RICHARD LESTER WILCOX.