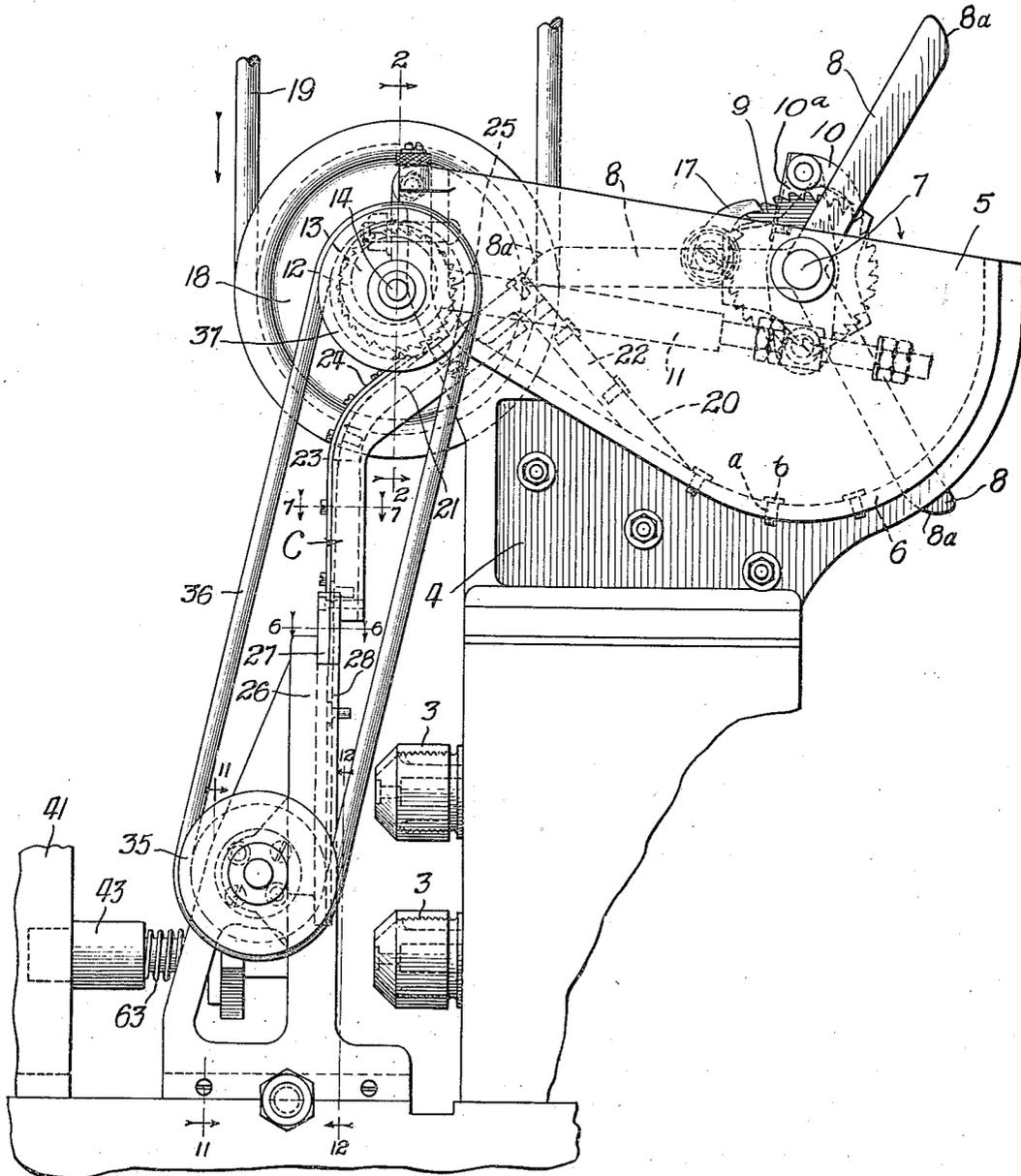


O. ANDERSON.  
MULTIPLE SPINDLE TURRET MACHINE.  
APPLICATION FILED DEC. 21, 1916.

1,297,983.

Patented Mar. 25, 1919.  
4 SHEETS—SHEET 1.

*Fig. 1.*



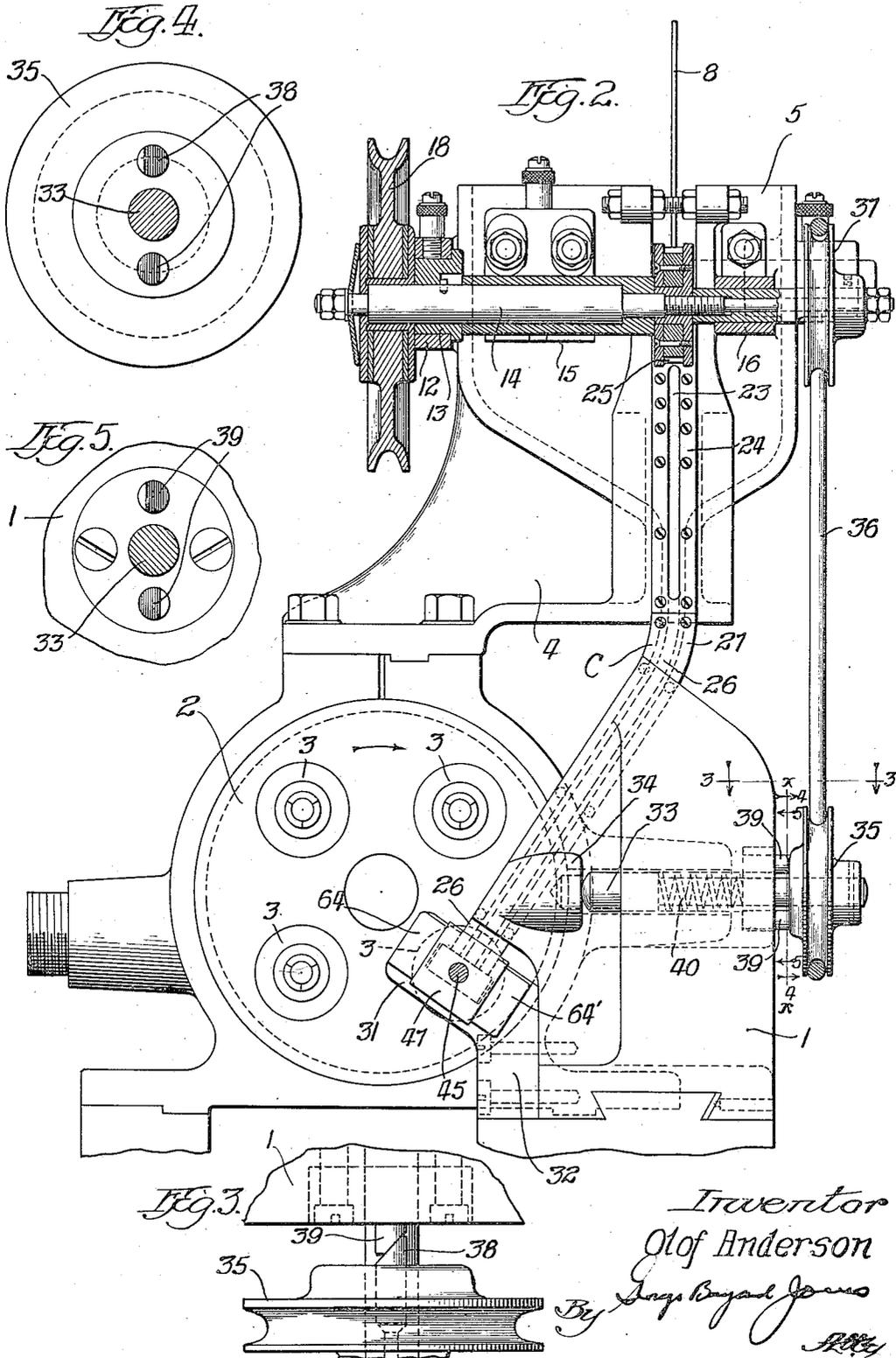
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*Olof Anderson*  
*By George Bayard Jones*  
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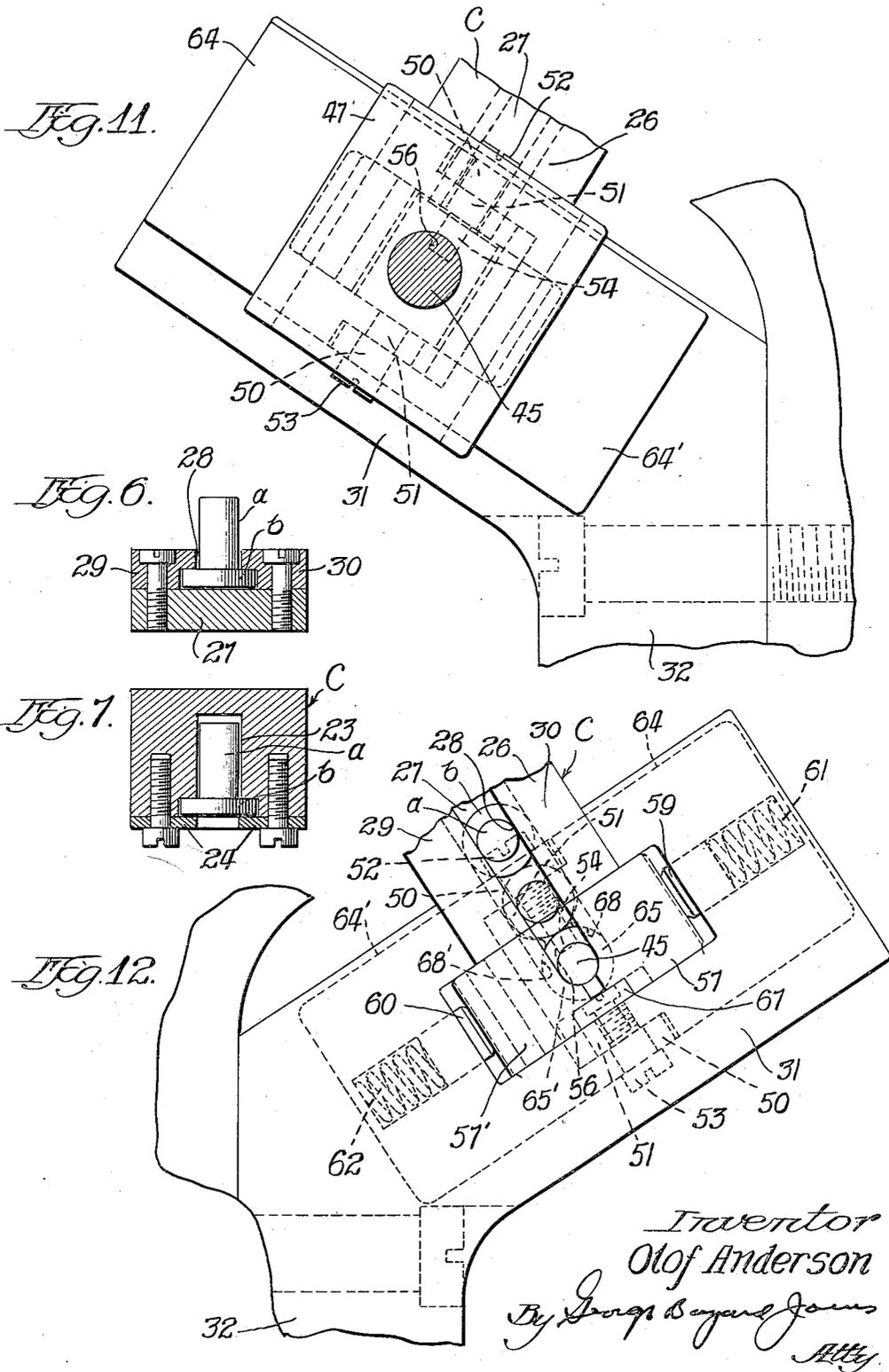
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# UNITED STATES PATENT OFFICE.

OLOF ANDERSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

## MULTIPLE-SPINDLE TURRET-MACHINE.

1,297,983.

Specification of Letters Patent.

Patented Mar. 25, 1919.

Application filed December 21, 1916. Serial No. 138,178.

*To all whom it may concern:*

Be it known that I, OLOF ANDERSON, 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 Multiple-Spindle Turret-Machines, of which the following is a full, clear, concise, and exact description.

This invention relates to multiple spindle turret machines, the object being to provide an improved attachment for transferring blanks or similar parts from a supply chute into the spindle chucks carried on the intermittently revolving turret of the machine.

In the accompanying drawings the construction, arrangement and operation of one form of the invention is clearly illustrated:

Figure 1 is a side elevational view of a turret machine with the attachment applied thereto;

Fig. 2 is a front elevational view partly in section on plane 2—2, Fig. 1;

Fig. 3 is an enlarged view from plane 3—3, Fig. 2;

Fig. 4 is a view from plane  $x-x$ , Fig. 2, in the direction of the arrows 4—4;

Fig. 5 is a view from plane  $x-x$  in the direction of the arrows 5—5;

Fig. 6 is an enlarged sectional view on plane 6—6, Fig. 1;

Fig. 7 is an enlarged sectional view on plane 7—7, Fig. 1;

Fig. 8 is an enlarged side elevational view of the attachment with the lower end of the blank supply chute in vertical section;

Fig. 9 is a sectional view on plane 9—9, Fig. 8;

Fig. 10 is a similar sectional view showing the attachment in a different operative position;

Fig. 11 is an enlarged view on planes 11—11, Figs. 1 and 9;

Fig. 12 is an enlarged view on planes 12—12, Figs. 1 and 9;

Fig. 13 is a plan view of a jaw member engaging washer;

Fig. 14 is a front view of the washer, and

Fig. 15 is a horizontal sectional view through the lower end of the chute showing the location of a wedge for cooperating with the jaws of the transfer attachment.

The machine to which the invention is shown applied comprises a supporting base structure 1 in which a turret 2 is revolved by mechanism which is not shown, the tur-

ret supporting the chucks 3 for receiving blanks to be operated on by suitable tools in a manner well understood in the art. Mounted on the supporting base 1 is a bracket frame 4 which carries a hopper 5 for the blanks to be treated, the blanks here shown being screw blanks comprising a tubular body  $a$  and a circular head  $b$ . The hopper is of two parts separated by a gap 6 of a width substantially equal to the diameter of the blank bodies, the blanks being thrown promiscuously into the hopper, some of them seating themselves in the gap or slot, as shown in Fig. 1. Journaled on the halves of the hopper is the transverse shaft 7 which carries a number of blades 8 which, during rotation of the shaft, pass through the slot to propel the blanks. The shaft has intermittent movement, a ratchet wheel 9 being secured thereto and engaged by a drive pawl 10 pivoted to the upper end of the rocker arm 10<sup>a</sup> which is connected at its lower end to the rod 11 extending from the eccentric strap 12 encircling the eccentric disk 13 on the main driving shaft 14 which is journaled in bearing frames 15 and 16 secured to the front ends of the hopper sections. The rocker arm 10<sup>a</sup> is pivoted on the shaft 7 intermediate its ends, the rocking of said arm by the rod 11 and its associated driving mechanism acting to turn the ratchet wheel 9 in the direction indicated by the arrow in Fig. 1. A detent pawl 17 is secured to the hopper and engages the ratchet wheel 9 to prevent reverse movement thereof. A drive pulley 18 is secured at one end of the shaft 14 and is rotated by belt 19 from a suitable source.

Toward the front end of the hopper is the incline 20 leading to the upper end 21 of the chute structure C, the end 21 being inclined downwardly so as to be at substantially right angles with the incline 20. The incline 20 has a slot 22 for receiving the bodies of the blanks and the chute has a slot 23 registering with the slot 22, the juncture of the slots being so located that after a blade 8 has shifted a blank through the slot 22 its curved end 8<sup>a</sup> will tilt the blank and shift it into the slot 23 of the chute, the blanks then sliding down the inclined end 21 to engage with their heads underneath the guide plate 24 secured to the front of the chute body. Directly above the chute end 21 and adjacent the upper end of the guide

plate 24 is a toothed disk 25 which is carried on the shaft 14. If the blanks are properly seated in the slot of the chute end 21 they will pass underneath the toothed wheel 5 and below the guide plate 24, but if for any reason a blank is not properly located it will be engaged by the toothed wheel and either straightened out in the slot or entirely removed therefrom. The blanks eventually reach the lower section 26 of the chute with their heads abutting against the front wall 10 27 of this chute section and their bodies projecting rearwardly through the slot 28 between the confining plates 29 and 30 (Fig. 6).

The chute section 26 leads to a block 31 fixed in front of the turret 2 in the path of the chucks, as clearly shown in Fig. 2, the block 31 forming part of a bracket 32 secured 20 to the base structure 1. 33 represents a hammer shaft journaled in the frame base 1 for striking a lug 34 on the chute structure to agitate this structure to prevent sticking of the blanks and to cause continuous feed 25 thereof from the hopper to the block 31. Secured to the outer end of the shaft 33 is a pulley 35 connected by belt 36 to the pulley 37 on the main drive shaft 14. On its inner side the pulley 35 has bevel pins 38 which 30 cooperate with bevel pins 39 extending from the frame 1 so that as the pulley 35 rotates it will be shifted in and out with the shaft 33, such outward movement being resisted by a coil spring 40, the operation causing the 35 lug 34 to be continuously struck by the shaft 33. The structure thus far described is old and well known in the art, my invention concerning particularly improved mechanism for transferring the blanks from the 40 lower end of the chute structure to the chucks carried by the turret.

The construction of the improved transfer mechanism is clearly shown in Figs. 8 to 15. It is supported and carried by a 45 head 41 which is reciprocated toward and away from the turret by the usual mechanism which it is not necessary to show here. Secured to the head 41, as by means of a set screw 42, is a block or holder 43 having the 50 bore 44 for a shaft 45, the shaft extending co-axially with reference to one of the positions of the chucks during their intermittent travel with the turret, this being plainly shown in Figs. 1, 2, 9 and 10. Slid- 55 able on the shaft is a hub 46 having the square head 47 with the upper and lower forwardly extending beads or ridges 48 and 49. The hub is received between the outer ends of L-shaped jaw members J and J' 60 which at their sides have respectively the lugs 50 and 51 pivoted together by screws 52 and 53, the lower end 54 of one of the screws having a pin end extending through the slot 55 in the hub 46 and into the longi- 65 tudinal slot 56 cut in the shaft 45, such

engagement limiting the longitudinal movement of the jaw members J and J' with reference to the shaft 45. The horizontal members 57 and 57' of the jaws extend into the 70 guide passageway 58 in the block 31 supported from the machine base 1 and plungers 59 and 60 are pressed by springs 61 and 62 into the opening and against the sides of the jaw members 57 and 57' and tend to hold them together. Encircling the 75 shaft 45 between the block 43 and the head 47 is a spring 63 which tends at all times to force the head 47 against the vertical members 64 and 64' of the jaws. When the head 41 is shifted toward the turret, the jaw 80 members 57 and 57' will be shifted through the opening 58, the sides *c* and *d* of this opening diverging slightly, as clearly shown in Figs. 9 and 10. The sides *e* and *f* of jaw 85 members 57 and 57' at their inner ends are correspondingly tapered and the inner faces *g* and *h* of the jaw members 64 and 64' are in planes which are at less than a right angle with the axis of shaft 45. With this ar- 90 rangement, when the head 41 is shifted forwardly and the jaw members 64 and 64' reach the block 31, the force of spring 63 acting against the head 47 will cause pressure of the heads or ridges 48 and 49 95 against the jaw members, which will then be rotated around their pivotal connections until their surfaces *g* and *h* flatly engage with the block 31, this causing spreading apart of the jaw members 57 and 57', as 100 clearly shown in Fig. 10, the tapered sides of the opening and of the jaw members permitting such spreading. Before the jaw members 64 and 64' reach the block 31 the spring 63 will cooperate with the springs 61 and 62 to hold the jaw members 57 and 57' 105 together. However, as soon as the block 31 is reached the members 64 and 64' will be fulcrumed against the block at their outer corners so that the pressure of the spring 63 acting on the jaws through the beads 48 and 110 49 will open the jaws against the force of the springs 61 and 62.

At their front ends the jaw members 57 and 57' have the opposed semi-circular 115 grooves 65 and 65' which in the "out" position of the head 41 are directly in line with the lower end of the chute structure so that the blank heads can enter between the opposed slots with their bodies extending out- 120 wardly between the jaw ends (Fig. 9). In order to permit the blanks to enter more readily between the jaw ends, the jaws are kept spread apart a trifle when in their "out" position. This is accomplished by 125 means of wedge lugs 66 and 66' on the inner faces of the jaw members 57 and 57', which wedge lugs cooperate with the wedge plate 67 secured at the bottom of the opening 58. Just before the head 41 reaches its outer- 130 most position after an "in" movement there-

of, the wedge lugs will cooperate with the wedge plate to effect a slight separation of the jaw members against the pressure on the plungers 59 and 60, and ample clearance is thus provided for ready entrance of the lowermost blank into the slots 65 and 65'.

The jaw members 57 and 57' have also the opposed substantially semi-circular pockets 68 and 68' for receiving the shaft 45, the shaft end forming a backing for the blank head when it is received between the jaws. When the head 41 is now shifted inwardly the jaws travel through opening 58 and securely hold the blank until its body *a* has been inserted part-way in one of the chucks 3 (Fig. 9), and then, as soon as the jaw members 64 and 64' engage with the block 31 the jaws will start to move bodily and continued movement of the shaft will cause them to spread apart to release the blank while the shaft continues and pushes the blank entirely into the chuck. To prevent injury or breakage in case a blank is not properly guided into the chuck or in case chips should come between the shaft end and the blank, means are provided for permitting yielding of the shaft. The means shown is in the form of a compression spring 69 behind the shaft in the bore 44. To limit such yielding movement of the shaft a set screw 70 extends into a slot 71 in the shaft.

The slot 56 in shaft 45 into which extends one of the pivot screws of the jaws is of sufficient length to permit yielding movement of the shaft in the holder 43 and also to permit the necessary relative movement of the shaft relative to the jaws and the hub 46. After a blank has been entirely inserted in a chuck and the head 41 starts to move outwardly the shaft alone will be carried with it until the inner end of the slot 56 engages with the screw end 54 and then the jaws will be carried with the shaft back to their normal position, the springs 61 and 62 re-closing the jaws except for the slight opening thereof due to the engagement of the wedge lugs 66 and 66' with the wedge plate 67. During the inward movement of the transfer mechanism and the greater part of its outward movement, the blank which was directly above the one transferred will rest at the bottom of the chute with its head against the top of the shaft, and when the transfer mechanism is fully returned to its outer position, this head will drop down in front of the shaft end into the pockets 65 and 65' ready to be transferred to a chuck when the head 41 is again shifted inwardly. After the transfer mechanism comes to its extreme outer position it remains at rest a sufficient length of time to allow a blank to become properly seated between the jaws.

What is claimed is:

1. In a machine of the class described, the combination with a revoluble turret, of a

plurality of chucks associated therewith, a stationary chute arranged to receive blanks, and a plurality of jaws cooperating with said chute to automatically grip and advance said blanks from said chute to said chucks.

2. In a machine of the class described, the combination of a chuck supporting turret, chute mechanism for feeding blanks, a supporting head shiftable toward and away from said turret in line with one of the chuck positions thereon, a shaft extending from said head, jaws pivoted on said shaft, a passageway at the lower end of the chute structure for the passage of said shaft and jaws, said jaws having pockets normally in alinement with said chute structure to receive blanks therefrom, means normally holding said jaws closed to clamp a blank, and means controlled during the end of the forward movement of said head for moving said shaft and jaws for effecting opening thereof to release the blank.

3. In a machine of the class described, the combination with a receiving chuck, a chute for the feeding of blanks, said chute having a passageway in front of said chuck, a supporting frame shiftable toward and away from said chuck, a shaft extending from said frame, L-shaped jaw members pivoted at their corners to said shaft, the horizontal members of said jaw members being alongside the shaft end and projecting therewith into said passageway, opposed pockets in said jaw members normally in alinement with the chute to receive a blank therefrom, means tending to close the jaws on a received blank and to hold it closed during the forward shift thereof to carry the blank through to the chuck, and means cooperating with the vertical members of the jaws to open them after delivery of the blank to the chuck.

4. In a machine of the class described, the combination with a chuck and a chute for delivering blanks, of transfer mechanism for transferring blanks from the chute to the chuck, said transfer mechanism comprising a holder shiftable toward and away from the chuck coincident with the axis thereof, L-shaped jaw members pivoted at their corners to said holder, the front ends of the jaw members having opposed pockets normally in line with the chute to receive a blank therefrom, means for closing said jaws during the greater part of the movement thereof with the holder toward the chuck during which movement a blank is delivered to the chuck, and means operative during the latter part of the forward movement of the jaws for causing opening thereof to release the blank.

5. In a machine of the class described, the combination with a chute for blanks having a transverse passageway at its lower

end, and chucks adapted to be shifted into alinement with said passageway, of transfer mechanism for transferring blanks from the chute to the chucks, said transfer mechanism comprising a holder shiftable toward and away from the chuck, jaw members pivoted at their outer ends to said holder and projecting through said passageway, said jaw members at their inner ends having opposed pockets normally in alinement with said chute for receiving a blank therefrom, means tending to hold said jaw members together to clamp the blank during inward shift of said holder whereby a blank is delivered to a chuck, extensions at the outer ends of said jaw members, and means cooperating with said extension to swing the jaw members apart at the end of a forward movement of said holder whereby to release the delivered blank.

6. In a machine of the class described, the combination with a chute for blanks having a transverse passageway at its lower end, and chucks adapted to be shifted into alinement with said passageway, of transfer mechanism for transferring blanks from the chute to the chucks, said transfer mechanism comprising a holder shiftable toward and away from the chuck, jaw members pivoted at their outer ends to said holder and projecting through said passageway, said jaw members at their inner ends having opposed pockets normally in alinement with said chute for receiving a blank therefrom, means tending to hold said jaw members together to clamp the blank during inward shift of said holder whereby a blank is delivered to a chuck, extensions at the outer ends of said jaw members, and abutments engaging with the ends of said extensions after inward shift of the jaw members through said passageway for causing a swinging of the jaw members to release the delivered blank.

7. In a machine of the class described, the combination with a blank receiving member, a chute, a frame part having a passageway in which said chute terminates, of transfer mechanism for transferring blanks from said chute to said receiving member, said receiving mechanism comprising a holder projecting into said passageway, jaw members pivoted at their outer ends to said holder and extending along the ends thereof and into said passageway, said jaw members having opposed pockets for receiving a blank from the chute, means for shifting said holder and jaw members inwardly through said passageway to insert the blank part-way in said receiving member, means operable after such part-way insertion to open the jaw members and for causing continued movement of the holder to fully insert the released blank in said receiving member.

8. In transfer mechanism of the class described, the combination with a chute frame having a chute duct and a transverse passageway through the lower end thereof communicating with said duct, of a shaft projecting into said passageway, jaw members mounted on said shaft and projecting into said passageway, said jaw members having opposed pockets in front of the shaft end for receiving blanks from said chute duct, means for closing said jaws to clamp a received blank, means for bodily shifting said shaft and jaws through said passageway to carry a received blank therefrom, means for preventing the bodily movement of said jaw members and for effecting opening thereof to release the blank and for continuing the movement of the shaft to shift the released blank from the jaw members.

9. In a machine of the class described, the combination with a chuck, of a frame mounted stationarily in front of the chuck and having a passageway in alinement therewith, a chute terminating at said passageway for delivering blanks to be fed to the chuck, a supporting head movable toward and away from said frame, a shaft extending from said head in axial alinement with said passageway and chuck and projecting into said passageway, jaw members pivoted at their outer ends on the shaft and extending into said passageway, the inner ends of said jaw members having opposed pockets for receiving a blank from the chute, yielding means acting on said jaw members and tending to hold them closed to clamp a received blank, said jaw members being carried with said shaft to partially insert the clamped blank in the chuck, said jaw members having lateral extensions, yielding pressure means interposed between said extensions and said head, said extensions having fulcrum points at their outer ends for engaging with said frame during the latter part of the feeding movement of said head and jaws to cause said jaws to swing on their pivots to be opened to release the partially fed in blank, and means for permitting continued movement of the shaft relative to the jaw members to fully insert the released blank in said chuck.

10. In a machine of the class described, the combination with a chuck, of a frame stationarily mounted in front of said chuck and having a passageway in alinement therewith, a chute terminating at said passageway for delivering blanks thereto, a supporting head adapted to be shifted toward and away from said frame, a holder secured in said head, a shaft supported in said holder and projecting into said passageway in line with the chuck axis, jaw members pivoted at their outer ends to said shaft and projecting into said passageway alongside of said shaft, the inner ends of said jaw

members having opposed pockets for receiving a blank from the chute, lateral extensions at the outer ends of said jaw members, a plate having ridges at its outer ends for engaging against said extensions, a spring interposed between said plate and holder for exerting pressure against said plate, said pressure tending normally to swing the jaw members on their pivots to hold the inner ends thereof in clamping engagement with the blank, said jaw members being shifted in said shaft through said passageway to partially insert the clamped blank in said chuck, fulcrum projections at the outer ends of said extensions for engaging with said stationary frame after outward movement of said jaw members through said passageway, such engagement preventing further bodily movement of the jaw members and effecting rotation of the jaw members about their pivots and opening thereof to release the delivered blank, and means whereby after such releasing movement of the jaw members said shaft will continue its movement and will fully insert the released blank into the chuck.

11. In combination, a revoluble turret, chucks carried thereby, a chute terminating adjacent to the path of rotation of said chucks and adapted to contain the blanks to be operated on, and jaws for gripping said blanks and advancing them directly to said chucks.

12. In combination, a revoluble turret, chucks carried thereby, a chute adapted to contain the blanks to be operated on, and reciprocating feeding jaws adapted, when fully retracted, to receive a blank from said chute and to be thereafter moved forward to position said blank in one of said chucks and means for releasing said blank from said jaws during such forward movement.

13. In a machine of the class described, the combination of a multiple chuck turret, chute mechanism for conveying blanks to a position adjacent thereto, a movable head, a shaft extending from said head, pivotally mounted jaws adapted to receive blanks from the chute structure, one of said jaws being disposed on each side of said shaft, a passageway at the lower end of said chute structure for the passage of said shaft and jaws, means normally holding said jaws closed to clamp a blank, and means controlled during the

end of the forward movement of said head for moving said shaft and jaws for effecting an opening of the latter to release the blank.

14. In a machine of the class described, the combination of a multiple chuck turret, chute mechanism for conveying blanks to a position adjacent thereto, a movable head, a shaft extending from said head, pivotally mounted jaws carried by said head and adapted to receive blanks from the chute structure, a passageway at the lower end of said chute structure for the passage of said jaws, means normally holding said jaws closed to clamp a blank and means operable adjacent the forward limit of travel of said head for moving said jaws apart to effect the release of the blank.

15. In a machine of the class described, the combination of a multiple chuck turret, chute mechanism for conveying blanks to a position adjacent thereto, a movable head, a shaft extending from said head, pivotally mounted jaws carried by said head and adapted to receive blanks from the chute structure, a passageway at the lower end of said chute structure for the passage of said jaws, means normally holding said jaws closed to clamp a blank, means operable adjacent the forward limit of travel of said head for moving said jaws apart to effect the release of the blank, and means operable after such release for pushing the blank forwardly into position in one of the chucks of said turret.

16. In combination a revoluble turret, chucks carried thereby, a chute terminating adjacent the path of rotation of said chucks and adapted to contain headed blanks to be operated upon, and jaws for gripping the heads of said blanks and advancing said blanks directly to said chucks.

17. In combination, a revoluble turret, chucks carried thereby, a chute terminating adjacent the path of rotation of said chucks and adapted to contain blanks to be operated upon, jaws for gripping said blanks at one end thereof, means for thereafter advancing said jaws so as to position the other end of said blanks in said chucks, and means for thereafter positively actuating said jaws to release said blanks.

In witness whereof I hereunto subscribe my name this 13th day of Dec., A. D. 1916.

OLOF ANDERSON.