F. MÜLLER.

MAGAZINE MECHANISM.

APPLICATION FILED OCT. 23, 1917.

1,273,902.

Patented July 30, 1918.

4 SHEETS—SHEET 1.

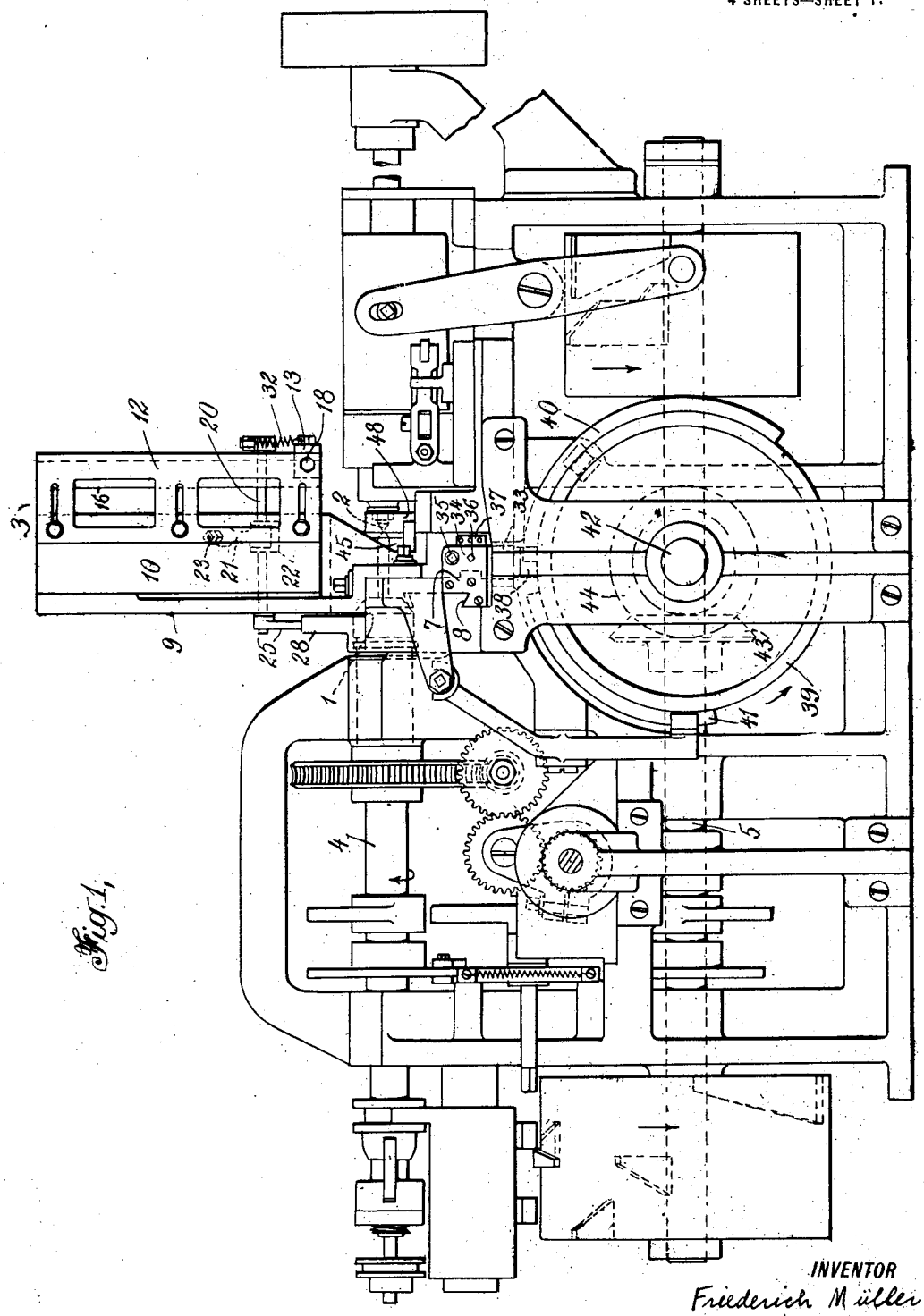

Fig. 1.

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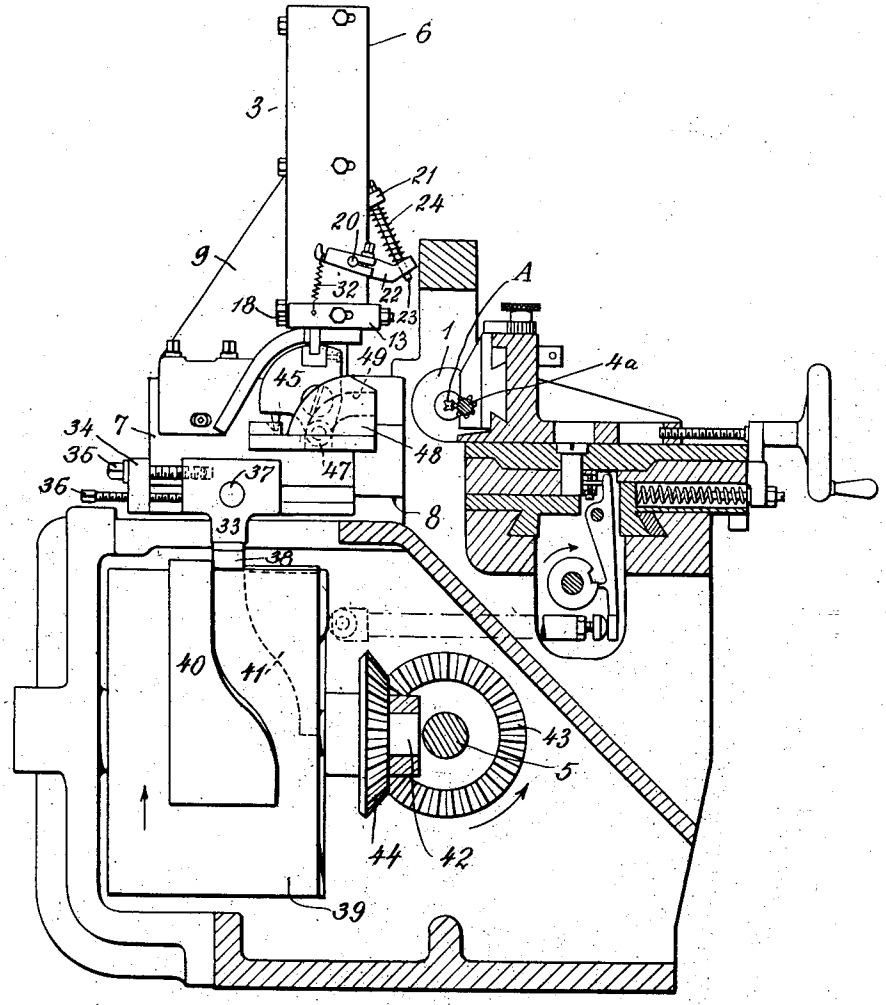
Fig. 2.



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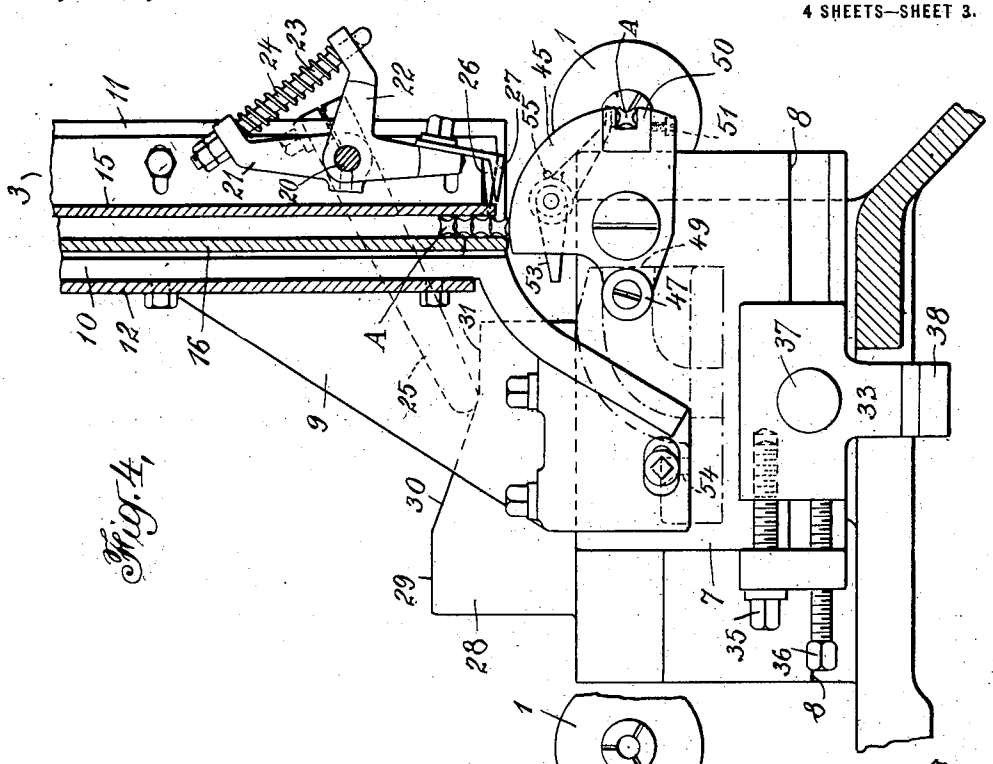

Fig. 4.

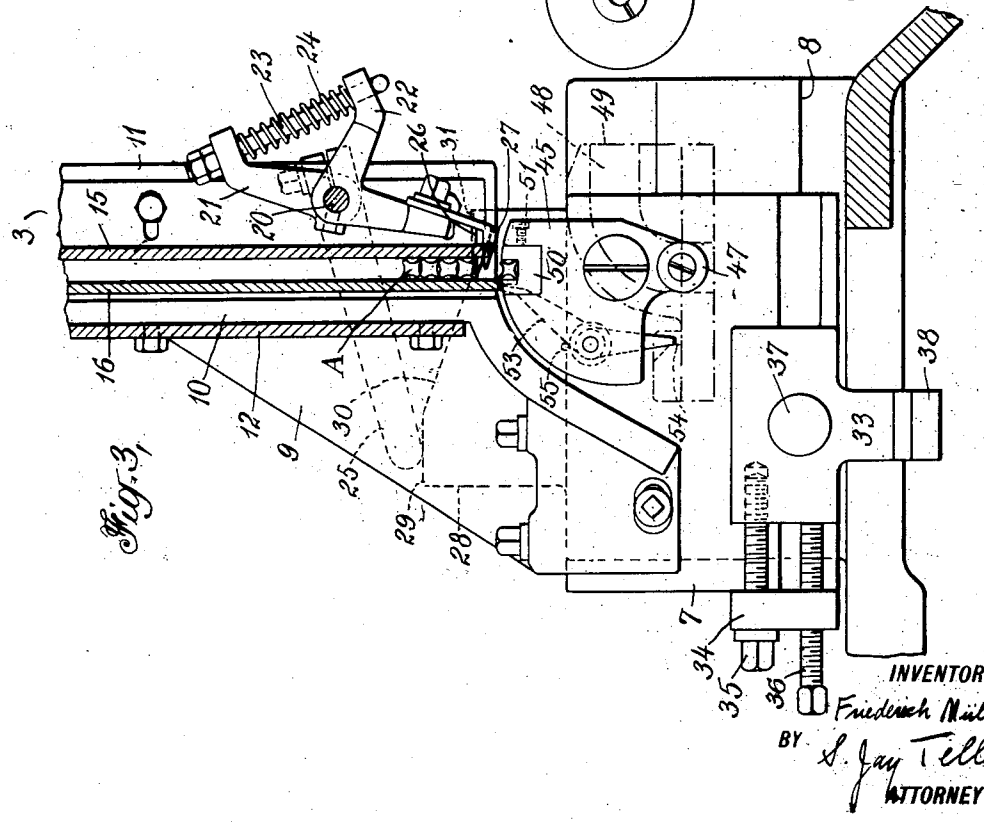

Fig. 3.

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Fig. 5,

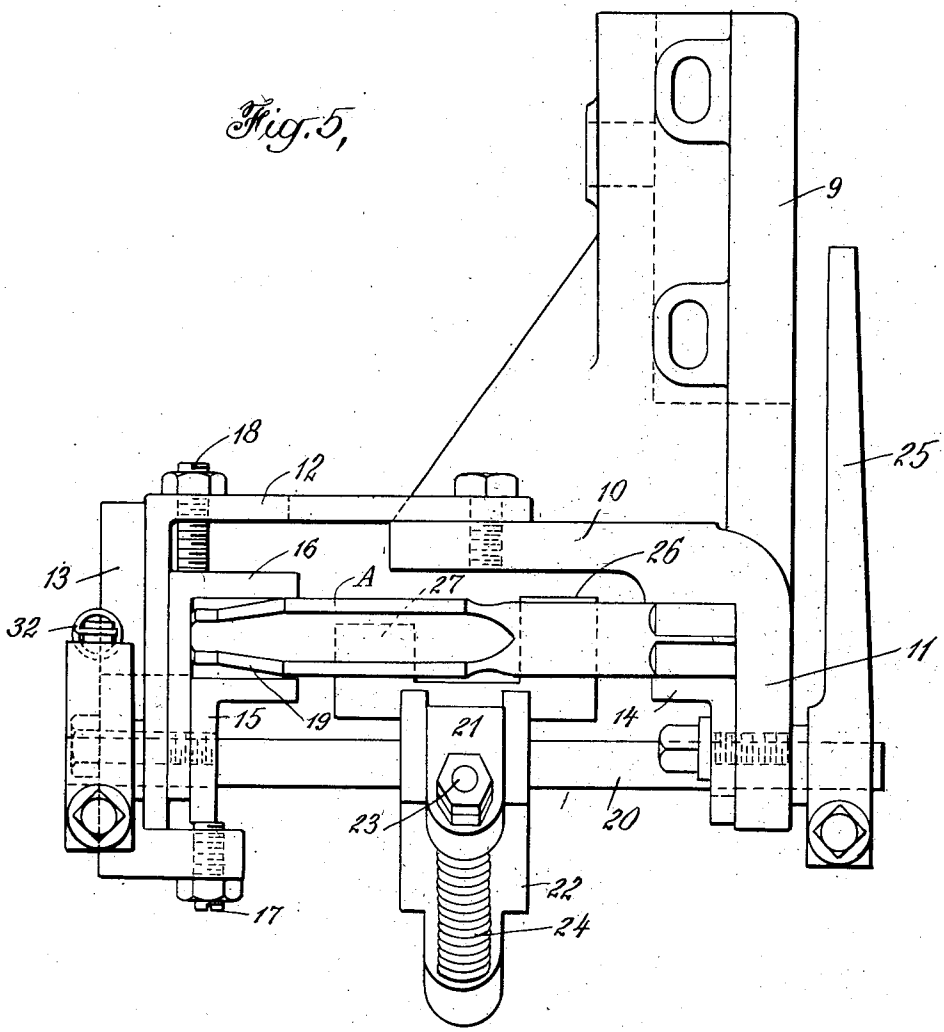
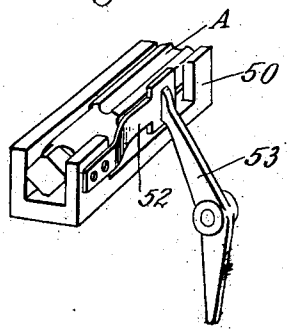


Fig. 6.



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UNITED STATES PATENT OFFICE.

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MAGAZINE MECHANISM.

1,273,902. Specification of Letters Patent. Patented July 30, 1918.

Original application filed February 8, 1911, Serial No. 607,420. Divided and this application filed October 23, 1917. Serial No. 198,056.

To all whom it may concern:

Be it known that I, FRIEDERICH MÜLLER, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Magazine Mechanism, of which the following is a specification.

The invention relates particularly to a magazine mechanism adapted for use in supplying blanks to metal working machines such as milling machines, lathes, grinding machines, etc. The mechanism as herein illustrated and described has features which particularly adapt it for use in connection with or as a part of a machine for milling the thread convolutions on grooved tap blanks, but it will be understood that as concerns other features of the invention the mechanism is adapted to be used in connection with widely differing machines.

The object of the invention is to provide a magazine mechanism having various improved features whereby are attained simplicity of construction, reliability of operation, ease of adjustment and other important advantages which will be apparent from the following specification and claims.

This application constitutes a division of my copending application for tap making machines, filed February 8th, 1911, Serial No. 607,420 and renewed on October 23rd, 1917, as Serial No. 198,185. The construction as herein presented is peculiarly adapted for use in connection with a machine such as that shown in the aforesaid application, but it will be understood, as above stated, that as concerns many of its features the mechanism is equally well adapted for other machines.

Of the drawings which illustrate the preferred embodiment of the invention:

Figure 1 is a rear view of a metal working machine provided with a magazine mechanism embodying the invention.

Fig. 2 is a cross sectional view through the machine showing the magazine mechanism and the operating devices therefor.

Fig. 3 is a fragmentary vertical sectional view through the magazine mechanism.

Fig. 4 is a view similar to Fig. 3 showing the parts in a different position of adjustment.

Fig. 5 is a plan view.

Fig 6 is a view showing certain details.

In Fig. 1 I have illustrated a metal working machine which is adapted for making taps, this machine being the same as that set forth in my aforesaid application of which this present case is a division. It will not be necessary to herein describe the entire machine in detail, and it will be sufficient to point out that the machine comprises a chuck 1 and a tailstock having a center 2, the chuck and the center coöperating to support the tap blank or other part to be machined. The magazine mechanism is represented as a whole by 3 and is constructed and arranged to automatically supply blanks successively to a position in alinement with the said chuck and said center which thereupon engage the blanks.

The machine is provided with a shaft or spindle 4 which serves to intermittently rotate the chuck and thereby the blank at the proper times. For cutting the blank there is provided a rotating milling cutter 4^a. The machine is also provided with a longitudinal shaft 5 which is operated alternately with the spindle 4. This shaft serves to operate several cams for controlling the operation of the machine.

In the embodiment of the invention illustrated the mechanism for supplying blanks to the blank-holder includes a magazine 6 mounted on a slide 7 arranged in a guideway 8 fixed on the frame. The magazine includes an angular upright or standard 9, one portion 10 thereof forming a side section and another portion 11 forming an end section of the magazine. The opposite end section of the magazine comprises an angular plate 12 adjustably secured to the portion 10 of the upright to adapt the magazine to accommodate blanks of different lengths.

Adjustably mounted on the inner face of the end portion 11 is an angular plate 14. The angular plate 12 is provided with two plates 15 and 16 relatively adjustable by means, respectively, of the adjusting screws 17 and 18 threaded through the angular plate 12 and an angle bracket 13 secured to the plate 12. The plates 14, 15 and 16 are made adjustable to provide a channel or runway 19 adapted to accommodate different sized blanks.

As shown in Figs. 3 and 4, the blanks A

occupy a position in the magazine parallel to the longitudinal axis of the spindle 4. To effect a proper delivery of a single blank at a time, a suitable controlling mechanism is provided. The preferred embodiment of this mechanism includes a shaft 20 journaled in the upright 9 near the bottom of the magazine. Fast on said shaft is an arm 21. Arranged in juxtaposition to said arm 21 and loose on said shaft is an angle lever 22. Extending through the ends of the arm 21 and the lever 22 is a T-headed pin 23 which is encircled by a compression spring 24 confined between the said ends. Also fast on said shaft 20 is an arm 25 which rocks the shaft and through the arm 21 and spring 24 rocks the lever 22 which is loose upon the shaft 20. The lower branch of this lever 22 is provided with fingers 26 and 27, which, by reason of the spring 24, are yieldingly thrust between the blanks in the channel when the shaft 20 is rocked in one direction, the finger 26 being projected between the fluted portions and the finger 27 between the shanks of the two lowermost blanks, thereby separating and slightly lifting the blanks within the magazine. By this means the descent of the blanks in the blank channel of the magazine is controlled, so that but one blank can be delivered therefrom at a time.

In order to actuate the arm 25 to perform the function just described, a cam block 28 is fixed on the guideway 8. The cam block 28 is provided with a horizontal face 29, a downwardly sloping face 30, and a second horizontal face 31. It will be understood that the cam block is stationary, while the magazine moves, and that when the lever 25 is resting on the ineffective face 29, the fingers 26 and 27 will project into the blank channel and support the blanks therein. As the magazine moves toward the spindle 4 and carries with it the arm 25, the end of said arm traverses the inclined face of the cam block and turns the shaft 20 either by the weight of the arm or by a spring 32 (see Fig. 1) to actuate the arm 21, which through the T-headed pin 23 rocks the angle lever 22 and withdraws the fingers from the blank channel to the positions shown in Fig. 4. As the magazine is moved away from the spindle 4, the arm 25 again traverses the inclined face of the cam block and thereby effects a rocking of the shaft 20 which in turn moves the arm 21, and this through the spring 24 transfers its movement yieldingly to the angle lever 22 and again yieldingly positions the blank-engaging fingers in the blank channel of the magazine.

The movement of the magazine is accomplished in the following manner: Upon the lower portion of the magazine support 7 a depending block 33 is adjustably secured by a projection 34, adjusting screws 35 and 36, and clamp screw 37, to regulate the extent of movement of the said support. The block 33 is provided with an antifriction roller 38 (see Fig. 2) which occupies a position below the plane of the top plate of the machine. Arranged in juxtaposition to said antifriction roller 38 is a cam drum 39 provided with cams 40 and 41. The cam drum is fast on a transverse shaft 42 suitably journaled in the frame work of the machine and driven from the shaft 5 by bevel gears 43 and 44.

To receive a blank from the magazine and transfer it to the blank-supporting means, a blank carrier is provided and actuated as follows: As shown, the blank carrier comprises a segmental member 45 (see Figs. 3 and 4) pivoted upon the slide 7 immediately beneath the magazine. The segmental member is operated by a depending arm carrying an antifriction roller 47 adapted to travel in a cam groove 48 formed in a block 49 fixed on the machine frame. The segmental member 45 is provided with a transverse groove in which is located a blank carrier member 50 (see Fig. 6) having a recess of a size and shape adapted to hold the blanks A. This member 50 is made detachable, being normally retained by a screw 51 in order that it may be removed and replaced by similar members having recesses suitable for blanks of different sizes.

For the purpose of positioning the blanks in predetermined relation to the blank carrier, thereby enabling the latter to deliver the blanks in predetermined position with relation to the blank support and cutter, the carrier member is recessed at one side, as shown in Fig. 6, and means are provided acting through this recess to engage the blank in such a way as to position it in the carrier member. As shown, a spring detent 52 is fixed on the carrier member, said detent tending normally to remain in a retracted position to permit the blank to enter the carrier, when the latter is in position under the magazine, as shown in Fig. 3. As the carrier moves from its blank-receiving position to the blank-delivering position shown in Fig. 4, means are provided for actuating the detent to position the blank and retain it in the carrier to prevent accidental displacement. As shown, a lever 53 is fulcrumed on the segmental member 45 with one end adjacent to the detent 52 and the other end depending in a position to strike a stationary cam block 54 fixed on the frame in the position indicated in dotted lines in Fig. 3. The lever is normally pressed toward the detent spring 52 by a spring 55 which has sufficient force to overcome the detent spring.

The cam groove 48 is so formed and located that, when the slide 7 is in its retracted

position, the carrier 50 is in position to receive the lowermost blank which is separated from the remaining blanks in the magazine. When the slide 7 is advanced, the segment 45 will first be rotated through an arc of about ninety degrees to bring the blank into the axial plane of the spindle 4 and then advance until the blank is brought into axial alinement with the spindle, as shown in Fig. 4. As soon as the segment starts from the position shown in Fig. 3, the lever 53 is released and the spring 55 moves the detent 52 into contact with the flat portion of the blank to position the blank in the holder and prevent accidental displacement thereof. When the blanks in the magazine are released by the fingers 26 and 27 during the forward motion of the parts, they drop down so that the lowermost blank rests upon the concentric surface of the segment 45 and is retained thereby in position to drop into the carrier member 50, when the segment returns to normal position. When the carrier is in the position shown in Fig. 4 the blank is engaged by the tailstock and by the chuck in the manner already explained. As the carrier is returned to the position shown in Fig. 3 the blank is drawn out, being retained by the said tailstock and chuck.

What I claim is:

1. In a magazine mechanism, the combination of a transversely reciprocable runway for blanks, fingers adapted to be moved into the runway to support the blanks or out of the runway to release a blank, and means dependent on the reciprocation of the runway for operating the fingers.

2. In a magazine mechanism, the combination of a reciprocable runway for blanks, fingers adapted to be moved into the runway to support the blanks or out of the runway to release a blank, a rock shaft supported by the runway and carrying the fingers, a lever on the rock shaft, and means for engaging the lever as the runway is reciprocated, thereby moving the fingers into and out of the runway.

3. In a magazine mechanism, the combination of a runway for blanks, a reciprocable slide, a transferring device pivotally mounted on the slide, and means for relatively moving the transferring device on its pivot as the slide reciprocates whereby the device serves to receive blanks successively from the runway and to transfer them to the position of supply.

4. In a magazine mechanism, the combination of a reciprocable slide, a runway for blanks carried by the slide, a transferring device, and means coöperating with the slide to give the transferring device a movement supplemental to the slide movement, the said device serving to receive blanks successively from the runway and to transfer them to a position of supply.

5. In a magazine mechanism, the combination of a reciprocable slide, a runway for blanks carried by the slide, a pivotally mounted transferring device, and means cooperating with the slide to operate the transferring device, the said device serving to receive blanks successively from the runway and to transfer them to a position of supply.

6. In a magazine mechanism, the combination of a reciprocable slide, a runway for blanks carried by the slide, a transferring device pivotally mounted on the slide, and means for relatively moving the transferring device on its pivot as the slide reciprocates whereby the device serves to receive blanks successively from the runway and to transfer them to a position of supply.

7. In a magazine mechanism, the combination of a reciprocable slide, a runway for blanks carried by the slide, a transferring device pivotally mounted on the slide, a fixed block having a cam groove, and a projection on the transferring device fitting the groove, whereby the device is moved on its pivot as the slide reciprocates thus serving to receive blanks successively from the runway and to transfer them to a position of supply.

8. In a magazine mechanism, the combination of a runway for blanks, and a device for receiving blanks successively from the runway and transferring them to a position of supply, the said device comprising a detachable block having a recess adapted to fit a blank.

9. In a magazine mechanism, the combination of a runway for longitudinally grooved approximately cylindrical blanks, and means for delivering blanks from the runway to a position of supply with the grooves of each blank in predetermined positions.

10. In a magazine mechanism, the combination of a runway for longitudinally grooved blanks, a device for receiving blanks successively from the runway and transferring them to a position of supply, and means carried by the transferring device for holding each blank with its grooves in predetermined relation to the device.

11. In a magazine mechanism, the combination of a runway for longitudinally grooved blanks, a device for receiving blanks successively from the runway and transferring them to a position of supply, and means comprising a spring clip carried by the transferring device for holding each blank with its grooves in predetermined relation to the device.

12. In a magazine mechanism, the combination of a runway for longitudinally grooved blanks, a device for receiving blanks

successively from the runway and transferring them to a position of supply, means carried by the transferring device for holding each blank with its grooves in predetermined relation to the device, the said means comprising a clip and a lever for moving the clip into engagement with a blank, and means for relatively moving the lever to release the clip when the transferring device is in blank receiving position.

In testimony whereof, I hereunto affix my signature.

FRIEDERICH MÜLLER.