

Dec. 22, 1936.

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2,065,083

STOCK FEEDING MECHANISM

Filed May 7, 1934

5 Sheets-Sheet 1

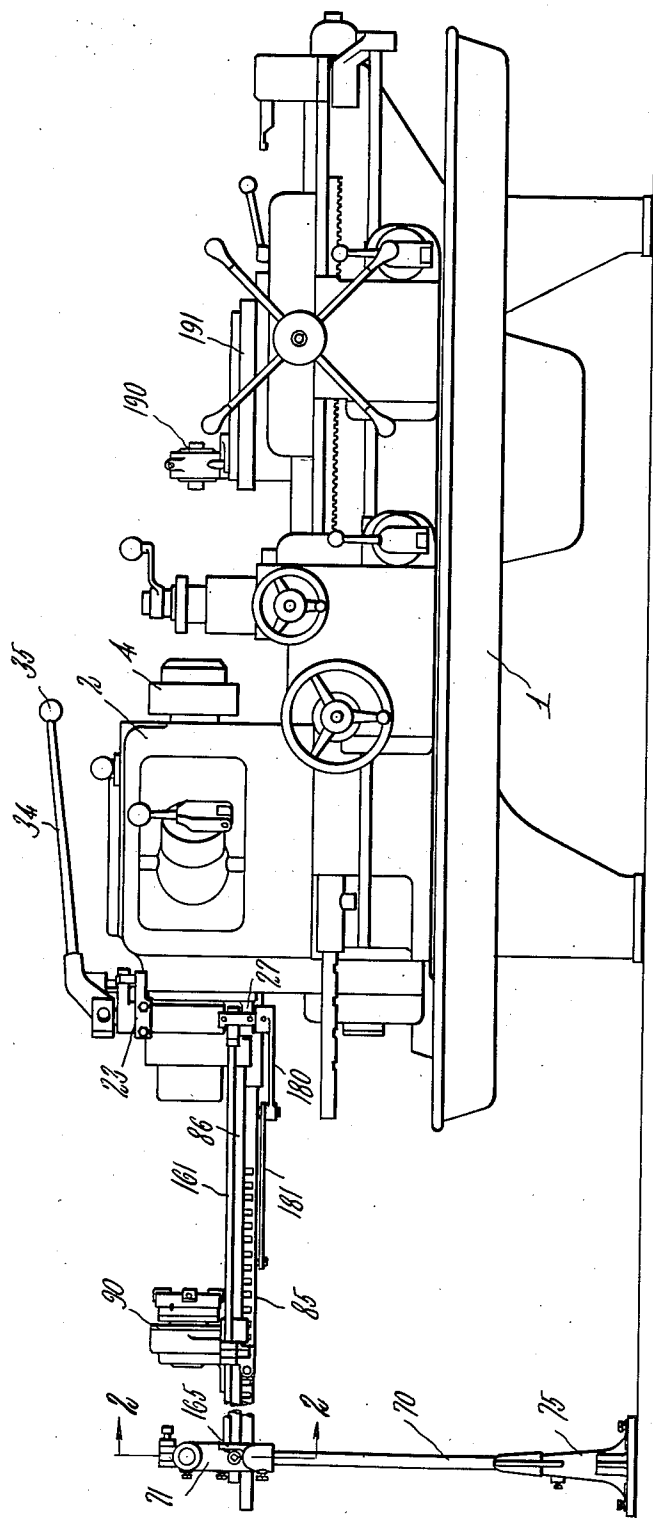
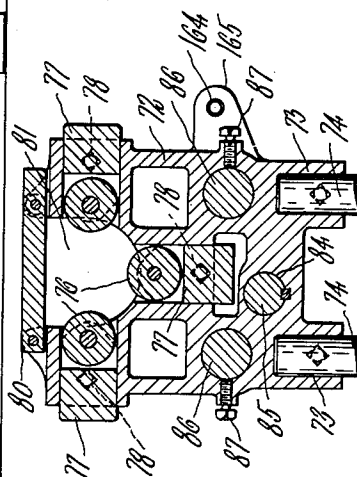


Fig. 1.

Fig. 2.

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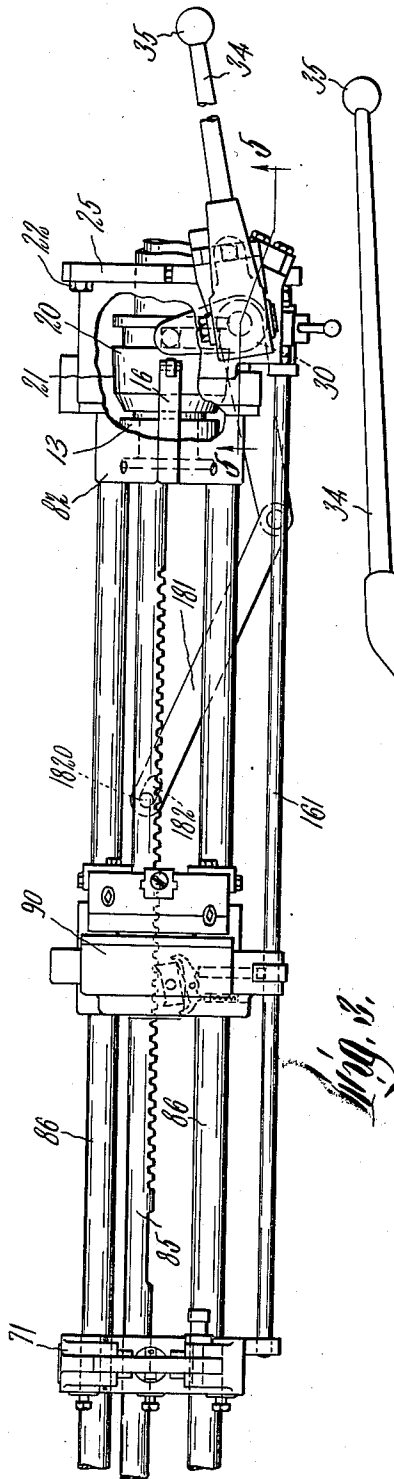
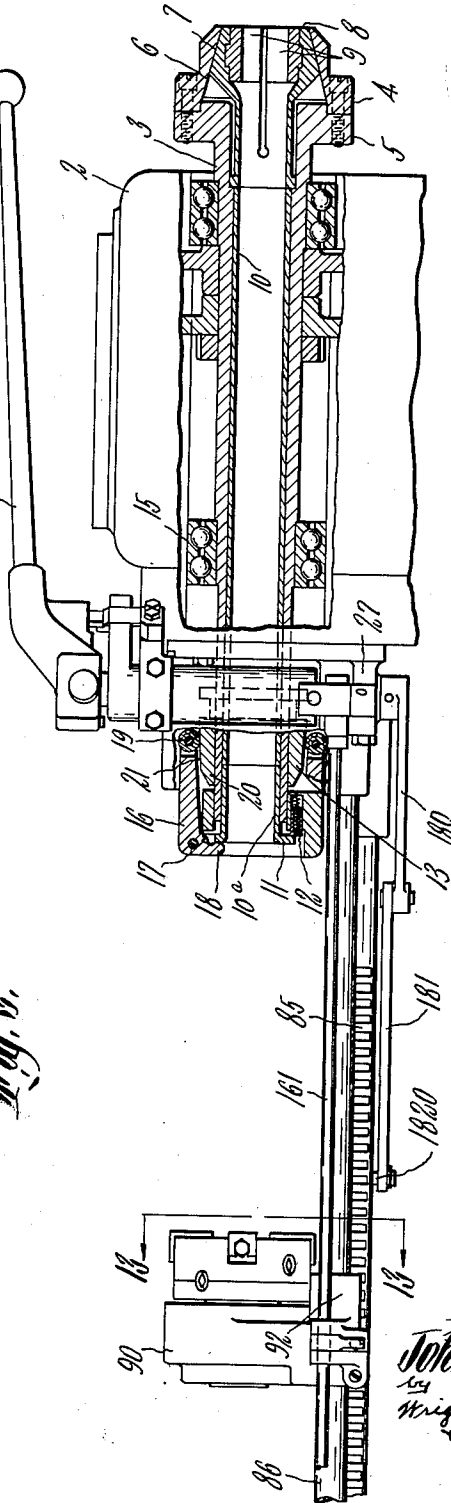
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STOCK FEEDING MECHANISM

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5 Sheets-Sheet 2



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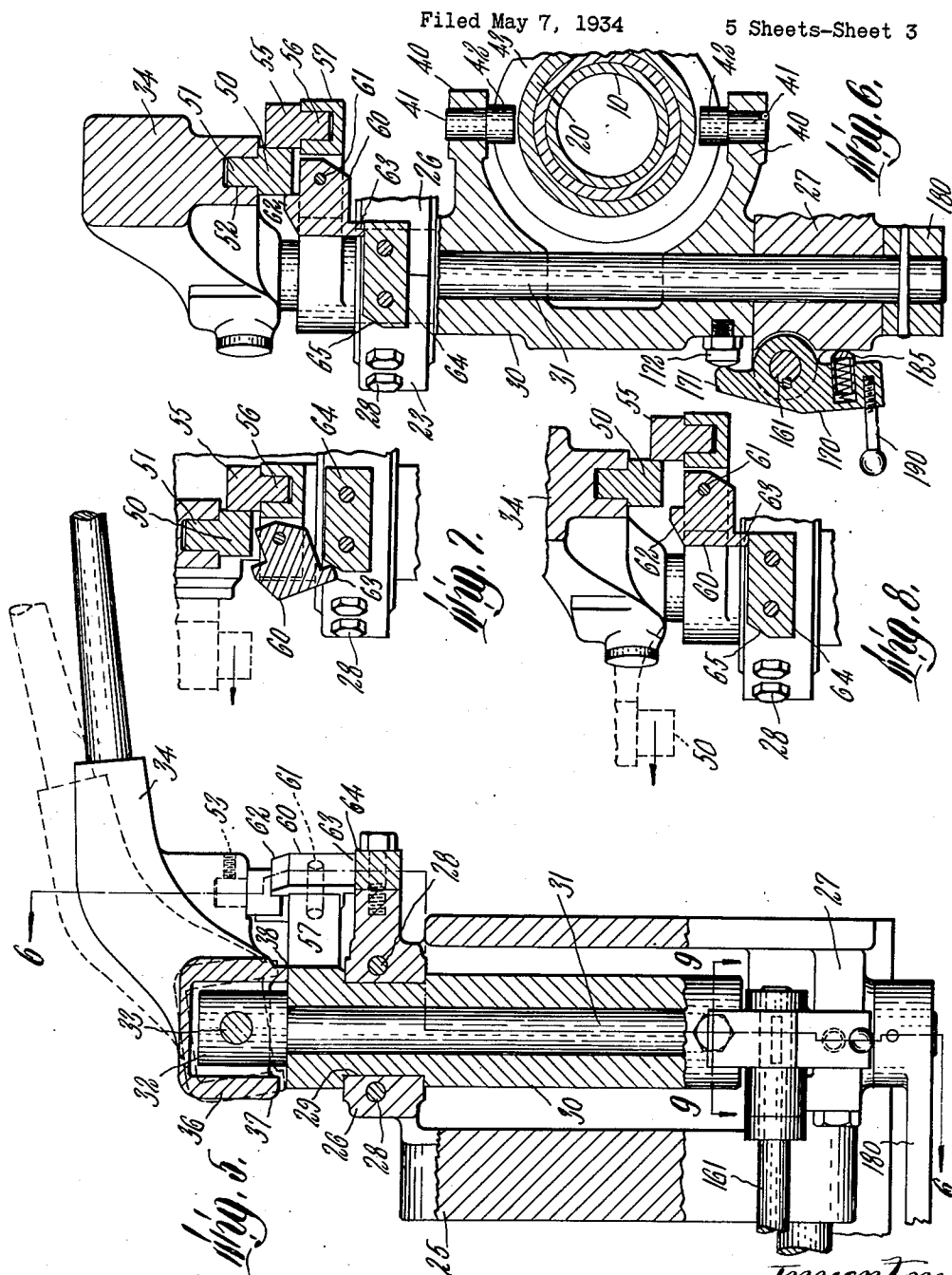
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STOCK FEEDING MECHANISM

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5 Sheets-Sheet 3



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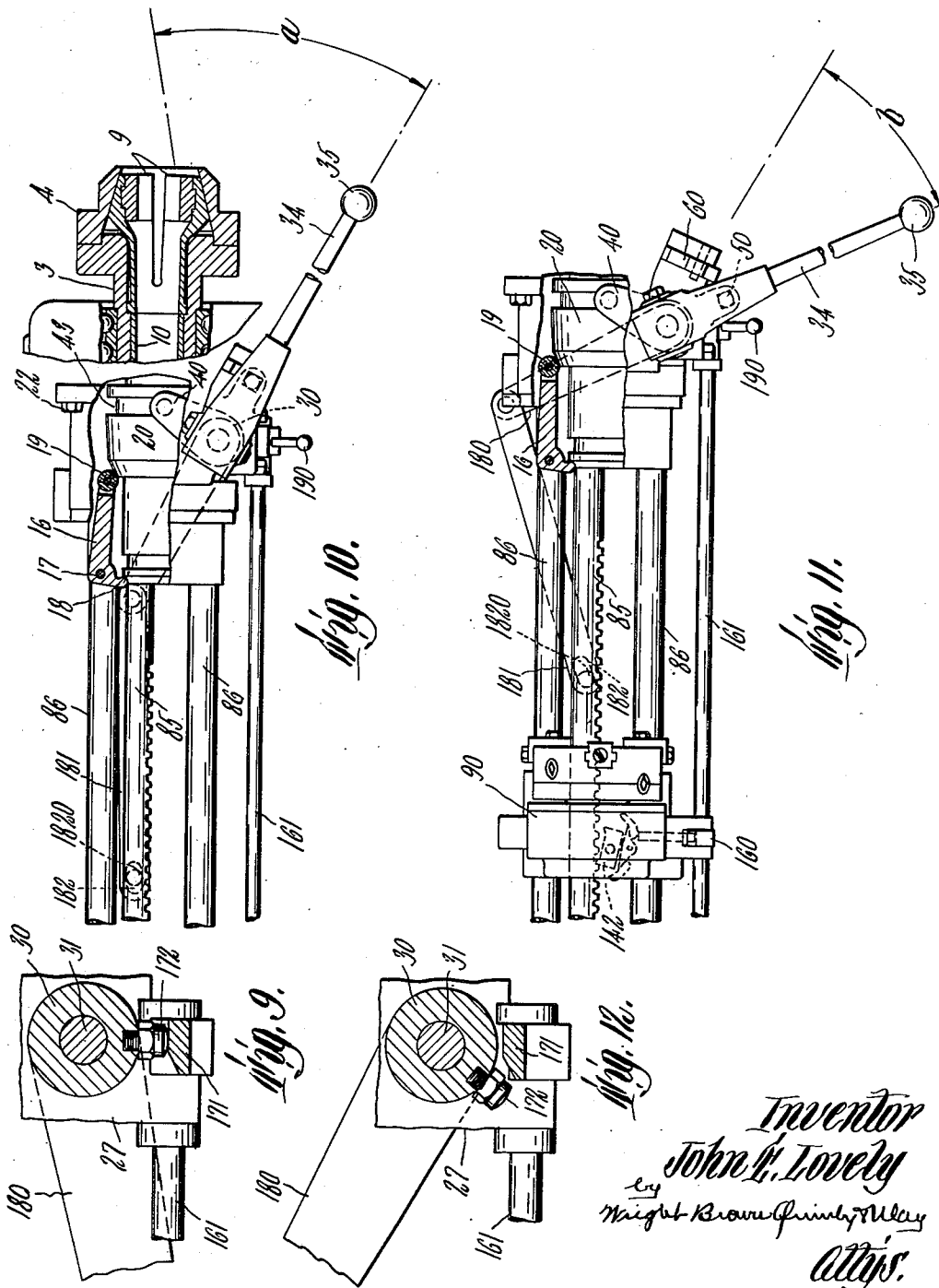
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STOCK FEEDING MECHANISM

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5 Sheets-Sheet 4



Dec. 22, 1936.

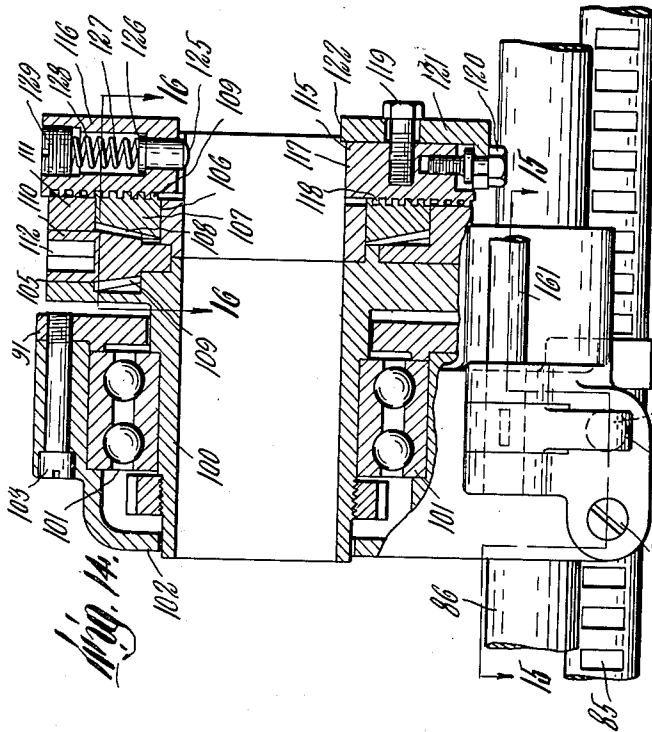
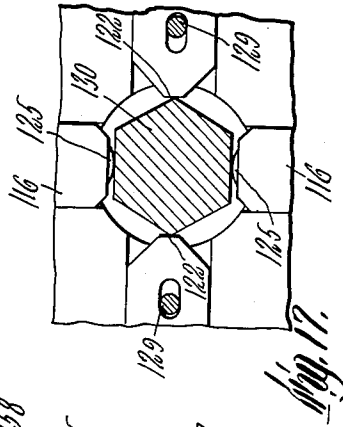
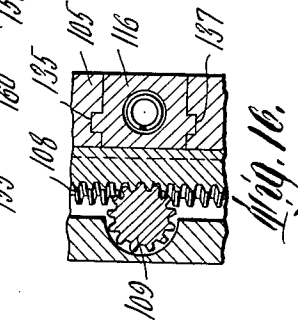
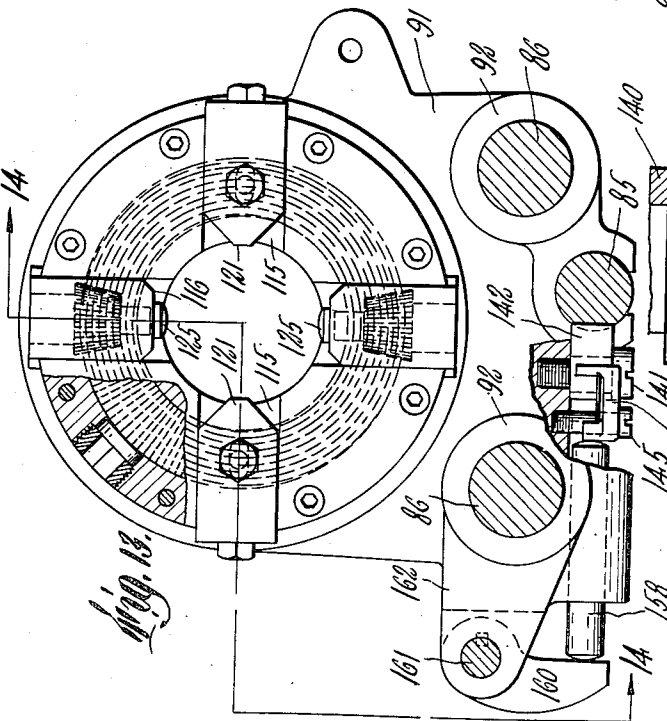
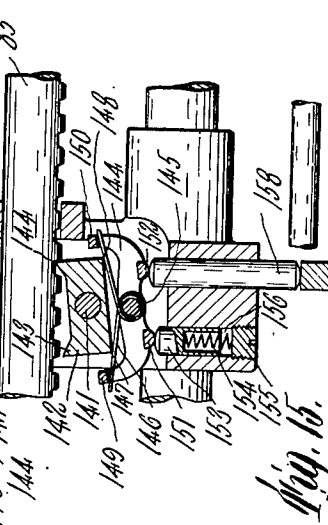
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STOCK FEEDING MECHANISM

Filed May 7, 1934

5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

2,065,083

STOCK FEEDING MECHANISM

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Application May 7, 1934, Serial No. 724,357

30 Claims. (Cl. 29—59)

This invention relates to mechanism for feeding stock, as, for example, bar stock, in a lathe, to the tools for operating on it. One of the objects of this invention is to provide such a mechanism wherein the chuck for gripping the work may be opened and the stock fed therethrough and the chuck again closed by the actuation of a single operating member.

A further object is to provide a feed mechanism by which the amount of feed may be determined as desired.

Still another object is to provide for the return of the stock feeding grip member to its initial position after a feeding motion.

A further object is to provide means whereby the work may be either fed or retracted as desired.

Another object is to provide an improved work feed member adapted to stock of various cross sectional shapes.

Other objects and advantageous features will appear from a more complete description of an embodiment of this invention disclosed in the accompanying drawings in which

Figure 1 is a side elevation of a turret lathe showing the stock feeding mechanism applied thereto.

Figure 2 is a detail cross section of a support for the stock, on line 2—2 of Figure 1.

Figure 3 is a fragmentary top plan partly broken away of the feed mechanism.

Figure 4 is a fragmentary view partly in elevation and partly broken away and in section of the same.

Figure 5 is a detail section on line 5—5 of Figure 3.

Figure 6 is a detail section on line 6—6 of Figure 5.

Figures 7 and 8 are fragmentary views similar to a portion of Figure 6, but showing parts in different positions.

Figure 9 is a detail section on line 9—9 of Figure 5.

Figures 10 and 11 are fragmentary views similar to a portion of Figure 3, but showing the actuating handle lever in chuck-open and stock-feeding positions, respectively.

Figure 12 is a view similar to Figure 9, but showing the parts in the positions of Figure 10.

Figure 13 is a section on line 13—13 of Figure 4.

Figure 14 is a detail section on line 14—14 of Figure 13.

Figures 15 and 16 are detail sections on lines 15—15 and 16—16, respectively, of Figure 14.

Figure 17 is a view similar to a portion of Fig-

ure 13, and showing stock of hexagonal cross section.

Referring first to Figure 1, at 1 is indicated somewhat diagrammatically a turret lathe although it should be understood that this invention is applicable to other types of machines. As shown this lathe is provided with a head-stock 2 through which extends a hollow work spindle 3 having a chuck 4 at its end for gripping the stock to be operated upon.

The mounting of the work spindle 3 in the headstock is shown more in detail in Figure 4. As therein shown the spindle is provided inwardly of the headstock 2 with a spindle nose 5 to which is secured the outer member 6 of the chuck 4, which, as shown, is of the collet type. This member 6 is provided with a conical bore 7 for cooperation with the mating inclined faces of the collet jaws 8, the arrangement being such that on movement of the collet jaws to the right, as seen in Figure 4, these jaws are wedged together into gripping relation with the work, work-gripping shoes being shown at 9 which directly engage the work. The collet tube 10 is extended through the spindle 3, bears at its forward end against the rear end of the collet, and at its rear end on a collar 10a provided with an outwardly turned flange 11 at its rear end which may be engaged by suitable spring pressed plungers 12 seated in a sleeve 13 carried on the rear end of the spindle 3. The spindle 3 may be supported in suitable bearings such as 15 in the headstock and may be rotated by any suitable means not necessary to describe herein since it forms no part of the present invention.

In order to force the collet tube, as viewed in Figure 4, so as to grip the stock extending therethrough, a plurality of grip levers 16 may be employed. Each of these levers 16, as shown in Figure 4, is fulcrumed on the sleeve 13 as at 17 and has an inwardly directed end portion 18 which bears against the outer face of the flange 11. The other arm of each lever 16 may be provided with a cam roller 19 which may ride on the outer face of a cam sleeve 20. This cam sleeve is slidable axially on the work spindle 3 and is provided with a tapered outer face at 21, which, when the sleeve is moved to the left, as viewed in Figure 4, rides inwardly of the cam rollers 19 and forces these cam rollers outwardly, this acting to move the lever portions 18 in a direction to press the collet tube 10 in work-gripping direction. The plungers 12 act to hold the levers 16 with their cam rollers 19 in contact with the cam sleeve 20.

As shown best in Figure 3, this sleeve 20 may be housed within a casing 25 which may be secured as by bolts 22 to the end face of the headstock 2 and this casing 25 may also be employed to support the feed mechanism which will now be described. This member 25, as shown, is provided (see Figure 5) with a pair of vertically spaced bearing portions 26 and 27. The upper of these bearings 26 is a split bearing having a separable member 23 secured to the other member as by bolts 28 and this bearing has a sufficiently large internal opening to receive the reduced diameter portion 29 of a rock sleeve 30. This sleeve 30 is in turn journaled on a rock shaft 31 which extends down through and is journaled in the lower bearing 27. The upper end of the rock shaft 31 is provided with a head 32 to which is pivoted on a transverse pivot 33 a lever 34 having a handle portion 35 at its outer end. This lever 34, as shown, is provided with a socket portion 36 which engages over the head 32 and encloses this head, the lower edges 37 and 38 of the socket acting as stops to limit the extent of pivotal motion of the handle. The portion 38 defines the lower limit of pivotal motion of this handle, this edge then riding on the top of the sleeve 38, and defines the lower path of angular motion of the handle as it is swung horizontally to rock the rock shaft 31. By lifting the handle 35 the portion 37 may be brought down against the top of the sleeve 30 and the handle may be moved in the same horizontal relation to rock the shaft 31, but in a different path. The reasons for this rocking motion will later appear.

The sleeve 30, as shown best in Figure 6, is provided with a pair of spaced arms 40, carrying adjacent to their ends and facing toward each other, pins 41 carrying anti-friction rollers 42. These rollers ride within a groove 43 in the chuck-actuating sleeve 20 previously described, so that as the sleeve 30 is turned from the position shown in Figure 3 to that shown in Figure 10, the sleeve 20 is moved to the right out from between the chuck-actuating arms 16, permitting the chuck to spring open. Conversely when the sleeve 30 is rocked in the opposite direction from the position shown in Figure 10 to that shown in Figure 3, the sleeve 20 is moved in between the arms 16, forcing the roller ends 19 apart and closing the chuck.

Provision is made by which rocking of the handle 35 when in its lower path of motion and through a part only of its entire extent of motion so rocks the sleeve 30 that the chuck is opened or closed, depending on the direction of such rocking. This is accomplished by the following mechanism. The lever 34 is shown as provided at a short distance from the rock shaft 31 with a hardened plug 50 which is shown as provided with a shank 51 which may be inserted in a hole 52 in the lever 34 and there secured as by a set screw 53. Cooperating with this plug 50 is a similar hardened plug 55 having its shank portion 56 similarly secured in an arm 57 which may be integral with or secured to the upper end of the sleeve 30. The plug 50 may bear against the plug 55 when the handle is being moved from its position of Figure 10 to its position of Figure 3, thus to rock the sleeve 30 into its chuck-closed position. On the other side of the plug 50 from the plug 55 the arm 57 carries a latch dog 60 pivoted thereto at 61. This dog 60 has a shoulder 62, which, when the dog is in the position shown in Figures 6 and 8, works with the plug 55 a space of sufficient size to receive the plug 50 so that

the lever 34 and the arm 57 may move in both angular directions as the handle 35 is swung horizontally. The dog 60 is also provided with a foot 63 which may ride along the upper face of a block 64 secured to the bearing 26. This block 64 is of such length that, as the lever 34 is turned in a direction to rock the rock shaft 31 and to turn the sleeves 30 with it, when this sleeve 30 has been turned sufficiently to fully open the chuck, the foot 63 rides off the inclined end 65 of the block 64, whereupon its weight causes it to swing into the position shown in Figure 7 thus to fall away from engagement with the plug 50, whereupon the plug 50 can move away from the plug 55 so that the arm 57 is no longer secured for rocking with the lever 34 in one direction. Thus when the lever is swung from the position shown in Figure 3 to that shown in Figure 10, the chuck is fully opened, but the lever, which is now uncoupled from the sleeve 30, may swing forwardly to a further angular extent but without effect on the chuck mechanism. This further angular motion of the lever 34, rocking the rock shaft 31, is employed to produce the feed of the stock as will now be described.

Referring again to Figure 1, at 70 is shown a stand spaced from the headstock end of the machine and which may have at its top suitable means as at 71 for supporting stock to be fed to the headstock of the lathe. As shown in Figure 2, this portion 71 may be formed as a head 72 having spaced sockets 73 at its lower end in which may be received the upper ends of supporting rods 74, which, at their lower ends may be supported in a suitable base 75. At its upper end the head 72 may be provided with work-supporting rolls 76, each, as shown, carried by blocks 77 adjustable from and toward each other in the head 72 and secured in adjusted positions as by means of clamping screws 78. There may also be provided a pivoted retainer 80 which may be swung down over the stock to hold it within the opening 81 into which the bearing rollers 76 project. The head 72 is also shown as receiving a pair of bars 86 which may be secured therein as by set screws 87 and these bars extend over to the housing member 25 where they may be secured by any suitable means, being shown as seated in sockets in an extension 82 thereon. The head 72 is also provided with a guide opening 84 to slidably receive a rack bar 85 shown as keyed against rotation therein. This rack bar also extends in axial sliding relation into the frame portion 82 and is arranged for motion parallel to the lengths of the guide bars. The bars 86 form guiding members for the slidable reception of stock-gripping or engaging mechanism 90 which has a frame portion 91 (see Figure 13) provided with tubular bearing portions 92 through which the bars 86 slidably pass.

A preferred form of stock-engaging means is shown in detail in Figures 13 and 17. Referring to these figures, at 100 is shown a sleeve through which the stock passes, this sleeve being journaled on ball bearings 101 within a casing 102 secured as by screws 103 to the frame portion 91. The sleeve 100 is shown as provided with an end portion 105 of enlarged diameter having in its outer face an annular recess 106 within which is journaled a ring 107. This ring is provided with beveled gear teeth 108 on its rear face which mesh with corresponding teeth of a pinion 109 on a shaft 110. This shaft 110 extends radially through the outer wall 111 of the portion 105 and has a suitable polygonal socket portion 112 at its

outer end for the reception of a tool by which it may be rotated, thus to rotate the ring 106. This ring 106 on its outer face is provided with spiral ribs 109 which form a scroll for closing and opening the work-engaging jaws 115 and 116 as the ring is turned. The jaws 115 are shown as diametrically opposite to each other and each comprises a block 117 having rack teeth 118 on its back face engaging the ribs of the scroll and having adjustably secured thereto, as by the screws 119 and 120, an angular shaped member 121 which is provided with a work-engaging face 122 at its inner end. Each of the jaws 116 is provided with a spring pressed plug 125 having a head 126 riding in an enlarged socket 127 which houses a spring 128 backed up by a threaded plug 129 which closes the outer end of the socket. Thus two of the four jaws shown are yielding, while the others are rigid but adjustable. This permits the mechanism to be set to properly engage work of various cross sectional shapes satisfactorily. For example, in Figure 17, stock 130 of hexagonal cross section is shown, the fixed jaws engaging with their faces 122 on opposite edges of the stock while the yielding jaws with their plugs 125 engage flat faces of the stock. The jaws should be so adjusted that the stock is gripped sufficiently tightly so that when the collet chuck is open, motion of this gripping means will cause stock to pass through the chuck, while when the chuck is closed on the work, this gripping means may be moved axially of the stock without undue friction thereon. Similarly stock of other cross sectional contours such, for example, as round, square, and many others, may be properly engaged by the jaws, the fixed jaws being adjusted to engage diametrically opposite parts of the stock and the yielding jaws adjusting themselves automatically to the portions of the stock presented thereto-ward.

As shown in Figure 16 each of the jaws may be held in position by forming its main block portion with fins 135 which ride in suitable radial grooves 137 within the portion 105.

Means are provided by which rocking of the handle 35, which results in rocking the rock shaft 31, is effective to move the work-engaging means 90 to feed the work under controlled conditions as will later appear. The rack bar 85 hereinbefore mentioned is slidably guided through the frame member 91 parallel to the direction of motion of the work-engaging means 90, as shown best in Figures 13 and 15, extending through a sleeve portion 140 thereof. Pivoted on the screw 141 secured to this frame portion 91 is a double ended dog 142 having the ratchet tooth extremities 143 and 144, either of which may be brought into operative relation to the teeth of the rack bar 85. In order to determine which one of these ratchet teeth will be in operation, a rocking abutment member 144 has been provided. This abutment member is pivoted as on the screw 145 and has engaged around this pivot screw a torsion spring 146, portions near the ends thereof normally engaging on the corners 147 and 148 of the dog 142. The abutment member 144 is provided with stop portions 149 and 150, which limit the uncoiling motion of opposite end portions of the spring 146. This member 144 is also shown as provided with spaced abutments 151 and 152. The abutment 151 is engaged by a plug 153 spring pressed outwardly thereagainst by the spring 154 seated against a threaded plug 155 which closes the outer end of a bore 156 in which the plug

153 is slidably mounted. The abutment 152 may be engaged by a rod 158 slidably mounted in substantially parallel relation to the plug 153 and the outer end of this rod 158 is engaged by the lower end of an arm 160 (see Figure 13) keyed to a rock shaft 161. This rock shaft is slidably journaled in a portion 162 of the stock-engaging means 90 and is shown as journaled at its outer end, as at 164, in an ear 165 of the work support 71. The other end portion of the rock shaft 161 is journaled in the bearing portion 27 which also carries the rock shaft 31. Keyed to this rock shaft 161 at the bearing 27 is a lever 170, the upper end of which at 171 may bear against an abutment screw 172 adjustably secured in the rock sleeve 30, the arrangement being such that when the rock sleeve 30 is in the angular position wherein the chuck 4 is closed, the abutment screw 172 is in contact with the portion 171, as shown in Figures 6 and 9. This holds the rock shaft 161 in such angular position that the arm 160 has pressed the rod 158 into the position shown in Figures 13 and 15 so that the member 142 is rocked to bring the ratchet extremity 144 into operative engagement with the rack bar 85. Motion of the rack bar 85 to the left, as shown in Figure 15, will then be effective to carry the stock-engaging means 90 to the left with it, while motion of the rack bar 85 to the right will permit motion of the rack bar without moving the stock-engaging means 90. Thus in this position of the parts reciprocatory motion of the rack bar 85 will be effective to cause movement of the stock-engaging means 90 away from the headstock and toward the work support 70.

Motion of the rack bar 85 is produced by rocking of the handle 35 as will now be explained. On the lower end of the rock shaft 31 is pinned an arm 180 to the outer end of which is pivotally connected one end of a link 181. The opposite end of the link 181 is provided with a slot 182 through which passes a headed pivot pin 1820 which is secured to the rack bar 85. Thus as the handle 35 is turned from the position shown in Figure 10 toward the position shown in Figure 11, the rack bar 85 is moved to the right.

The slot 182 in the link 181 prevents the initial rocking motion of the handle 35 throughout the range of arc indicated in Figure 10 by the arrow *a*, from being effective to move the rack bar 85, this initial motion through the arc *a*, as previously described, acting however to open the chuck 4 when the handle is in its lowered position with the abutment 38 of the lever 34 in contact with the top of the rock sleeve 38. This initial angular motion of the handle 35 which opens the chuck, however, is sufficient in amplitude to swing the stop screw 172 of the sleeve 30 out of contact with the end 171 of the lever 170, this end of which is immediately rocked inwardly by the action of the spring pressed plug 185, as shown best, for example, in Figure 12. This rocking of the shaft 161 withdraws the arm 160 from the outer end of the rod 158, whereupon the spring 154 is effective to press the plug 153 against the lug 151 of the member 142 thus to remove the ratchet point 144 from operative relation to the rack bar 85 and to move the point 143 into active relation. In this position of the parts, which is shown in dotted lines in Figure 11, motion to the right of the rack bar 85 by swinging the handle 35 through the arc *b* shown in this figure, is effective to move the work-engaging means 90 toward the headstock of the machine, and since the chuck 4 has al-

ready been opened in the initial angular motion of the handle 35, it is effective to feed the stock forwardly through the chuck.

As the handle 35 is returned toward its initial position of Figure 3, after the lost motion between the pivot 182 and the link 181 is taken up, the rack bar 85 is moved to the left, but in this position of the dog 142, it is ineffective to move the stock-engaging means 90. Thus by a back and forth motion of the handle 35 when in its lower path, the stock is fed intermittently through the chuck to any desired extent and when this feeding has progressed to the desired point, the handle is returned to the angular position of Figure 3, whereupon the chuck 4 closes against the stock in its new axial position. This back and forth feeding motion of the handle 35 moves the stock-engaging means 90 by successive steps toward the headstock of the machine and away from the work support 70. Provision is therefore made by which it may be returned toward the stock support 70 prior to a further feeding motion. This may be effected by raising the handle 35 into its upper path of rocking motion and then oscillating it back and forth in this upper path. Raising of the handle in this manner lifts the plug 55, as shown in Figure 8, above the upper end of the dog 60, so that it can move over the top of its lug 62 so that rocking of the handle back and forth in this upper position is ineffective to rock the rock sleeve 30 and is thus ineffective to open the chuck 4. In this stationary angular position of the rock sleeve 30, however, the abutment 172 remains in the position shown in Figure 6, holding the lever 170 in such angular relation that the rock shaft 161 holds the ratchet point 144 in operative position with relation to the rack bar 85. As the handle is swung forwardly toward the position of Figure 11, therefore, the rack bar is moved to the right without moving the stock-engaging means 90, but on the reverse direction of motion of the handle 35 it moves the rack bar 85 to the left and the stock-engaging means 90 is moved therewith. At this time, however, the chuck 4 is closed so that the stock-engaging means 90 slides back on the stock without producing any feed motion thereof.

The stock stop, as shown at 190 in Figure 1 carried by the turret 191, is commonly employed to limit the forward feed of the stock, and the position of this stop is commonly controlled by the mechanism which determines the position of the turret relative to the headstock 2. By moving the turret saddle toward the headstock while the chuck 4 is open the stock may be pushed rearwardly.

If desired, however, the stock may be retracted relative to the chuck by suitable actuation of the handle 35, and when this is desired, the handle 35 is swung toward the positions of Figures 10 and 11 while in its lower path, so that the chuck is opened at the first part of this motion, thereupon the lever 170 is held in the position shown in Figure 6 by hand, a handle 190 being provided for that purpose. When so held the dog 142 is retained in the position shown in Figure 15, so that as the rack bar 85 is moved to the left by continued motion of the handle 35 toward the position shown in Figure 11, the stock-engaging means 90 is moved away from the headstock. As, however, the chuck 4 has been opened, this motion is effective to retract the stock relative to the headstock.

From the foregoing description of an embodi-

ment of this invention, it should be evident to those skilled in the art that various changes and modifications might be made without departing from the spirit or scope of this invention as defined by the appended claims.

I claim:

1. In combination, a chuck for receiving a length of work, stock-gripping means back of said chuck, and means including connections to said gripping means and chuck and a single operating member actuatable in one manner to move said gripping means toward said chuck while said chuck is open to feed the stock and in another position to retract said gripping means relative to the stock to change the position of its engagement with said stock.

2. In combination, a chuck for receiving a length of work, stock-gripping means back of said chuck by movement of which toward said chuck the stock is fed thereto, and means including connections to said gripping means and chuck and a single operating member actuatable to retract said gripping means along the stock to change the position of its engagement with said stock.

3. In combination, a chuck for receiving a length of work, stock-gripping means back of said chuck by movement of which toward said chuck the stock is fed thereto, and a hand lever and connections to said gripping means and chuck from said hand lever to cause actuation of said hand lever to retract said gripping means along the stock to change the position of its engagement with said stock.

4. A work controlling mechanism comprising a chuck for receiving a length of stock, a stock gripper back of said chuck, means actuatable to move said gripper toward and from said chuck, said mechanism also including means selective to cause motion of said gripper moving means to first open said chuck and then to move said gripper toward said chuck or to move said gripper toward said chuck while said chuck is closed.

5. In combination, a chuck for receiving a length of stock, stock-gripping means back of said chuck, and manually actuatable means including a single actuating member and connections to said gripping means and chuck, operable selectively to move said gripping means toward or away from said chuck while said chuck is closed.

6. In combination, a chuck for receiving a length of stock, stock-gripping means at one side of said chuck, a movable member, uncoupling connections between said member and chuck operative throughout one part only of the movement of said member for opening and closing said chuck, and connections between said member and means operative in another part of such movement while said chuck is uncoupled therefrom for moving said means toward or from said chuck.

7. In combination, stock-gripping means, a movable actuating member for said means, and ratchet means selectively coupling said member and gripping means for simultaneous movement during movement of said member in one or the other direction with freedom of movement of said member in the opposite direction without moving said gripping means.

8. In combination, stock-engaging means, a member, means supporting said member for motion in either selected of a pair of different paths, and connections between said member and means operative to cause movement of said member in

one of said paths to move said means in one direction and to cause movement of said member in the other of said paths to move said means in the opposite direction.

9. In combination, stock-engaging means, a chuck, a member selectively movable in different paths, and operative connections between said member means and chuck causing movement of said member in one of said paths to open or close said chuck and to move said means, and movement of said member in the other of said paths to move said means but inoperative to affect said chuck.
10. In combination, a chuck for receiving a length of stock, stock-engaging means, a member, means supporting said member for motion in either selected of a pair of paths, and connections between said member, chuck and engaging means operative to open said chuck and then to move said means toward said chuck when said member is moved in one of said paths, and to move said member in the other direction while said chuck remains closed when said member is moved in the other of said paths.
11. In combination, a chuck for receiving a length of stock, stock-engaging means, a member, means supporting said member for motion in either selected of a pair of paths, connections between said member, chuck and engaging means operative to open said chuck and then to move said means toward said chuck when said member is moved in one of said paths, and to move said member in the other direction while said chuck remains closed when said member is moved in the other of said paths, and means selectively operative to cause movement of said member in said one path to move said means away from said chuck.
12. In combination, a chuck for receiving a length of stock, stock-engaging means, a handle rockably mounted, connections from said handle actuatable to open said chuck on rocking of said handle through an arc from one angular position and to close said chuck on reverse rocking of said member to said position, a movable member, connections from said handle to said member causing oscillation of said handle through another arc to move said member back and forth, and one way driving means between said member and engaging means causing motion of said member in one direction only to move said stock-engaging means.
13. In combination, a chuck for receiving a length of stock, stock-gripping means, a handle rockably mounted, connections from said handle actuatable to open said chuck on rocking of said handle through an arc from one angular position, a movable member, connections from said handle to said member causing oscillation of said handle through another arc to move said member back and forth, means causing motion of said member in one direction only to move said stock-gripping means, and means for selecting the operative direction of motion of said member.
14. In combination, a chuck for receiving a length of stock, stock-engaging means, a rock shaft, a lever pivoted to said shaft to swing in a plane lengthwise thereof and rockable transverse to said plane to rock said shaft, an arm journaled on said shaft, connections between said arm and chuck for opening and closing said chuck on rocking of said arm, means for retaining said lever and arm in operative connection when said lever is in one angular position about its pivot and throughout only an arc of rocking of said

arm sufficient to open and close said chuck, a movable member, and operative connections between said shaft and member causing said member to be moved when said lever is swung through an arc other than said first-mentioned arc.

15. In combination, a machine having a headstock, a hollow work spindle in said headstock, a chuck on said spindle, a stock support spaced from said headstock, a guide extending between said support and headstock, stock-gripping means movable along said guide toward and from said chuck, a member carried by said support and headstock for motion substantially parallel to the motion of said stock-gripping means, means actuatable selectively to couple said member to said engaging means for either direction of motion of said member and with freedom of said member to move without motion of said gripping means in the opposite direction, and means actuatable to move said member.

16. Stock-engaging means comprising a plurality of stock-engaging jaws, means for moving said jaws simultaneously toward and from each other to conform to work of different transverse dimensions, and stock-engaging elements carried by said jaws, certain only of said elements being yieldingly mounted and the other non-yieldingly mounted whereby said elements may properly engage stock of different cross sectional configurations.

17. In combination, a chuck for holding a length of stock, a stock gripper back of said chuck, means for closing and opening said chuck, and means for moving said gripper toward and from said chuck including mechanism selectively operative or inoperative to actuate said chuck opening and closing means to open said chuck on motion of said gripper moving means in the direction to retract said gripper from said chuck.

18. A work controlling mechanism comprising a chuck for receiving a length of stock, a stock gripper back of said chuck, a member, means supporting said member for motion selectively in either of two paths and for motion from one to the other of said paths, chuck opening and closing means, said chuck opening and closing means and said member having parts cooperating, when said member is moving in one of said paths and failing to cooperate when the member is in the other of said paths, for opening said chuck when said member is moved in a direction to retract said gripper when in said first-mentioned path.

19. In combination, a chuck for receiving a length of stock, stock-gripping means back of said chuck, manually operable means for moving said gripping means toward and from said chuck, means movable toward and from said chuck, means movable to open or close said chuck, said stock gripper moving means having parts selectively cooperating or failing to cooperate with parts of said chuck opening and closing means to cause retracting motion of said stock gripping moving means to first open said chuck and then to retract said gripping means or to be inoperative to open said chuck.

20. In combination, a chuck for receiving a length of stock, a stock gripper back of said chuck, a pivotally mounted handle, connections from said handle to said gripper effective on swinging of said handle about its pivot to move said gripper toward or from said chuck, rockable means for opening and closing said chuck, and selectively cooperating parts on said handle and rockable means to cause swinging of said handle

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to actuate or to fail to actuate said rockable means.

21. In combination, a chuck for receiving a length of stock, a stock gripper back of said chuck, a pivotally mounted handle, connections including lost motion between said handle and gripper to cause swinging of said handle about its pivot after said lost motion is taken up to move said gripper toward or from said chuck, rockable means for opening and closing said chuck, and selectively cooperating parts on said handle and rockable means to cause said swinging of said handle in one direction during the taking up of said lost motion to rock said rockable means.

22. In combination, a chuck for receiving a length of stock, a stock gripper back of said chuck, a handle pivoted for motion in planes transverse to each other, connections from said handle to said gripper to cause swinging of said handle in one of said planes to move said gripper toward or from said chuck, rockable means for opening and closing said chuck, and parts on said handle and rockable means cooperating when said handle is in one angular position in the other of said planes and out of cooperative position in another angular position, whereby rocking of said handle to move said gripper may be operative or inoperative at will to move said rockable means.

23. In combination, a chuck for receiving a length of stock, a stock gripper back of said chuck, a rockable member, a handle pivoted coaxially with said rockable member and mounted to swing transversely of said pivot toward or from said rockable member and into or out of operative engagement therewith for simultaneous rocking motion, operative connections between said rockable member and chuck for causing rocking of said member to open or close said chuck, and connections from said handle to said gripper to cause rocking of said handle about its pivot to move said gripper toward or from said chuck.

24. In combination, a chuck for receiving a length of stock, a stock gripper back of said chuck, a rockable member, a handle pivoted coaxially with said rockable member and mounted to swing transversely of said pivoted member and into or out of operative engagement therewith for simultaneous rocking motions, operative connections between said rockable member and chuck for causing rocking of said member to open or close said chuck, connections from said handle to said gripper to cause rocking of said handle about its pivot to move said gripper toward or from said chuck, said last-mentioned connections including lost motion during which said rockable member is rocked when said handle is in operative relation thereto, and means for operatively disconnecting said handle and rockable member when said handle has turned said means to a predetermined angular extent in one direction.

25. In combination, a chuck for receiving a length of stock, a stock gripper back of said chuck, a member rockable on a substantially vertical axis, operative connections from said member to open or close said chuck on rocking of said member, a handle pivoted coaxially with said rockable member thereabove, said member having spaced elements on its upper end between which a part of said handle may engage, said handle being rockable upwardly out of cooperative relation with one of said elements to opera-

tively disconnect said handle from said member, connections between said handle and gripper to cause horizontal swinging of said handle beyond a preliminary lost motion to move said gripper toward and from said chuck, and means acting after a predetermined extent of rocking of said member to cause one of said elements to release said handle for further swinging independently of said rockable member.

26. In combination, a chuck for receiving a length of stock, a stock gripper back of said chuck, a member rockable on a substantially vertical axis, connections from said member to open or close said chuck on rocking of said member in one or the other direction, a handle pivoted coaxially with said member thereabove, said member having spaced elements on its upper end between which a part of said handle may engage, connections including lost motion between said handle and gripper, means supporting said handle for upward rocking to bring said handle part out from between said elements to operatively disconnect said handle and rockable member, swinging of said handle in its lower position in one direction acting to open said chuck during the taking up of said lost motion, and means for releasing said element to permit further motion of said handle in the same direction after said chuck has been opened to move said gripper.

27. In combination, a chuck for receiving a length of stock, a stock gripper back of said chuck, a member movable substantially parallel to the length of said stock, ratchet connections between said member and gripper to cause motion of said member in either selected direction to move said gripper in the corresponding direction, a member rockable on a substantially vertical axis, connections from said member to open or close said chuck on rocking of said rockable member in one or the other direction, a handle rockable coaxially with said rockable member, and operative connections from said handle to said movable member to cause rocking of said handle to move said movable member, said handle and rockable member having parts selectively cooperating to cause swinging of said handle in one direction to first rock said rockable member to open said chuck or to leave said chuck closed and thereafter to move said movable member toward and from said chuck, operative connections from said rockable member to said ratchet connections to cause said rocking to couple said gripper for movement with said movable member toward said chuck to thereby feed stock thereto, and to cause swinging of said handle when operatively disconnected from said rockable member to cause said ratchet connection to connect said movable member and gripper for motion of said gripper away from said chuck.

28. In combination, a chuck for receiving a length of stock, a stock gripper back of said chuck, a member movable substantially parallel to the length of said stock, ratchet connections between said member and gripper to cause motion of said member in either selected direction to move said gripper in the corresponding direction, a member rockable on a substantially vertical axis, connections from said member to open or close said chuck on rocking of said rockable member in one or the other direction, a handle rockable coaxially with said rockable member, operative connections from said handle to said movable member to cause rocking of said handle to move said movable member, said handle and

rockable member having parts selectively cooperating to cause swinging of said handle in one direction to first rock said rockable member to open said chuck or to leave said chuck closed and thereafter to move said movable member toward and from said chuck, operative connections from said rockable member to said ratchet connections to cause said rocking to couple said gripper for movement with said movable member toward said chuck to thereby feed stock thereto, and to cause swinging of said handle when operatively disconnected from said rockable member to cause said ratchet connection to connect said movable member and gripper for motion of said gripper away from said chuck, and means for adjusting said ratchet connection for causing rocking of said handle to move said gripper away from said chuck when said handle is in its path operatively related to said rockable member and said chuck has been opened.

29. In combination, a chuck for receiving a length of work, a rockable member, connections from said rockable member for opening and closing said chuck by rocking of said member, a lever fulcrumed coaxially with said member, said member having a pair of spaced elements extended therefrom between which a portion of said lever may engage, a fixed member supporting one of said elements during a portion of its motion.

with said member, said element being biased to retract as it rides off said member to thereby operatively disconnect said lever from said member, a stock gripper back of said chuck, and connections from said gripper to said lever operating to move said gripper toward or from said chuck by rocking of said lever while so operatively disconnected from said member.

30. In combination, a chuck for receiving a length of work, a rockable member, connections from said rockable member for opening and closing said chuck by rocking of said member, a lever fulcrumed coaxially with said member, said member having a pair of spaced elements extended therefrom between which a portion of said lever may engage, a fixed member supporting one of said elements during a portion of its motion with said member, said element being biased to retract as it rides off said member to thereby operatively disconnect said lever from said member, a stock gripper back of said chuck, connections from said gripper to said lever operating to move said gripper toward or from said chuck by rocking of said lever while so operatively disconnected from said member, and means for selecting the direction of motion of said gripper produced by rocking of said lever in opposite directions.

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