No. 614,113. Patented Nov. 15, 1898.

M. D. LEAR.

FEED MECHANISM FOR CLOTHES PIN LATHES.

(Application filed Feb. 9, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1

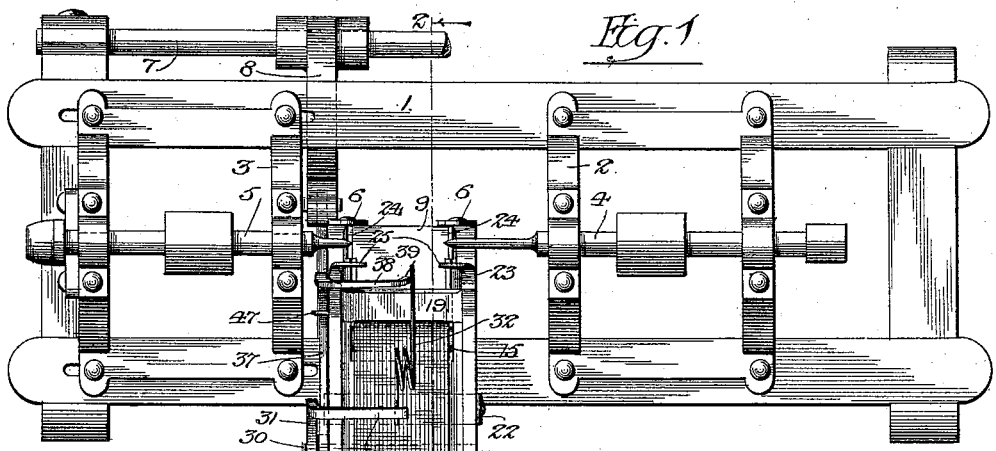
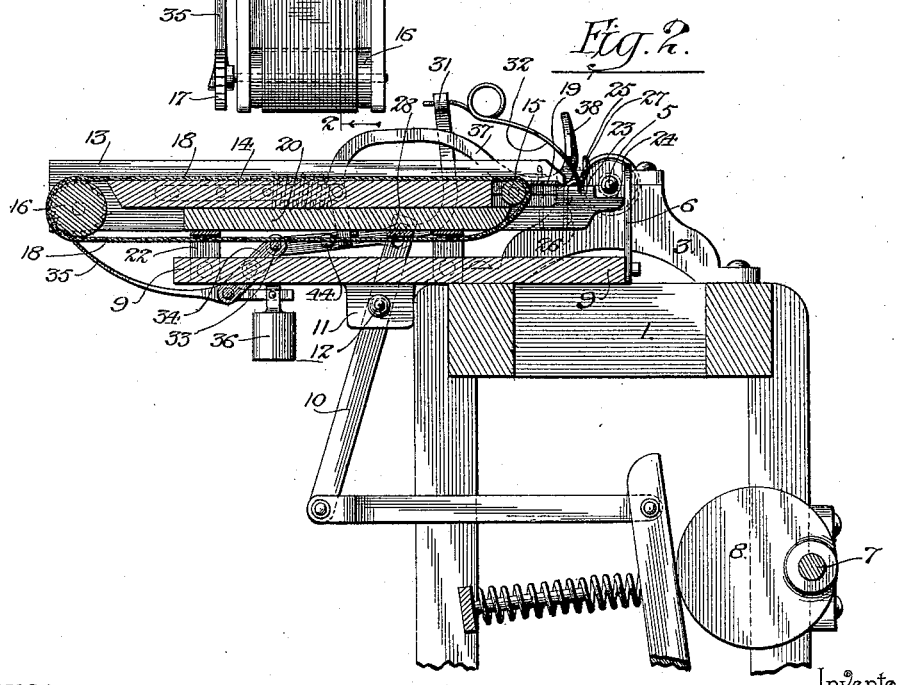


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

Fig. 3.

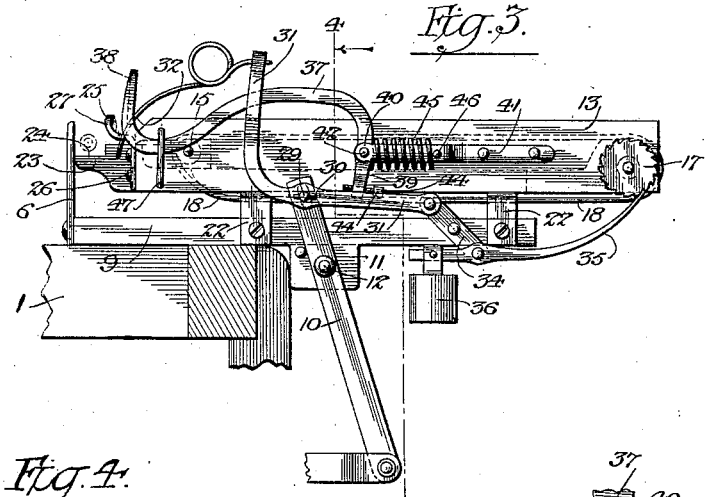


Fig. 4.

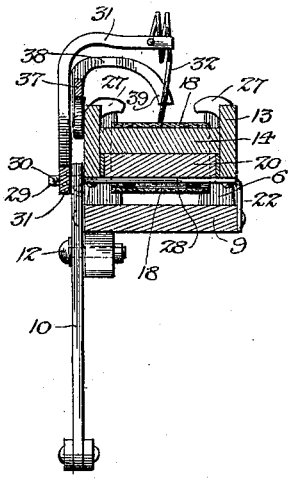


Fig. 6.

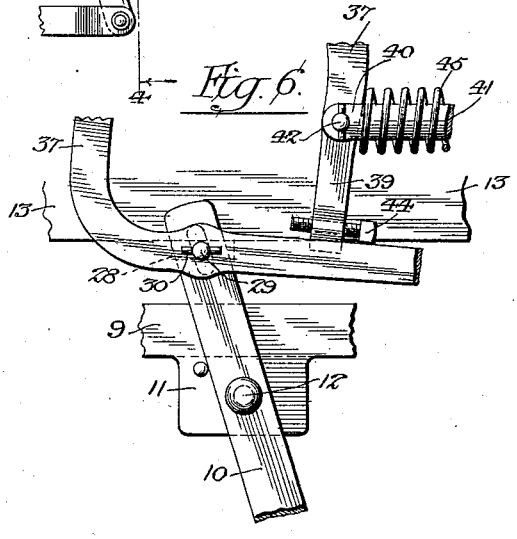
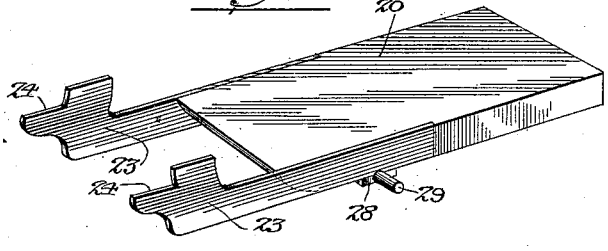


Fig. 5.



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MASON D. LEAR, OF KUSHEQUA, PENNSYLVANIA.

FEED MECHANISM FOR CLOTHES-PIN LATHES.

SPECIFICATION forming part of Letters Patent No. 614,113, dated November 15, 1898.

Application filed February 9, 1898. Serial No. 669,667. (No model.)

To all whom it may concern:

Be it known that I, MASON D. LEAR, a citizen of the United States, residing at Kushequa, in the county of McKean and State of Pennsylvania, have invented a new and useful Feed Mechanism for Clothes-Pin Lathes, of which the following is a specification.

This invention is a novel feed mechanism for use in lathes of the class disclosed by United States Letters Patent to J. B. Smith, No. 85,338, dated December 29, 1868, or in the lathe disclosed by my own prior patent, No. 490,206, dated January 17, 1893, wherein are disclosed lathes especially designed for automatically turning clothes-pins.

As shown by the Letters Patent to which reference has been made, it is old in the art to provide a feed mechanism consisting of a traveling apron supported by rollers one of which is provided with a ratchet adapted to be rotated at intervals by the action of a feed-pawl that is operated by a cam on one of the lathe-shafts; but extended experience and use of such prior feed mechanism has demonstrated that the work or blanks are not infrequently dropped through the space between the feed mechanism and the lathe-spindles, entailing improper feed of the work and consequent loss of the blanks. This is due primarily to the high speed at which the feed mechanism is run—about one hundred and twenty to one hundred and twenty-five movements per minute—and such rapidity of operation requires skilled and experienced operators to feed and attend to the machine. In the operation of such prior feed mechanism the backward or retrograde movement thereof tends to often disarrange the blanks or work, and consequently the motion of the feed mechanism causes in a great many cases the blanks to be improperly presented to the lathe-spindles, thereby permitting the blanks to drop through the machine.

I have devised an improved feed mechanism which overcomes the defects herein referred to and operates with precision and efficiency, so that the capacity of the machine is materially increased by running the same at a higher rate of speed, as I have found by practical experience that instead of feeding one hundred and twenty-five blanks per minute to the spindles, as is the case with the old-style feed mechanism, the machine may be run at a speed to receive and properly turn one hundred and fifty clothes-pin blanks per minute.

A further object of the invention is to overcome another of the objections to such prior feed devices, viewed from a practical standpoint—viz., the weight of the feed mechanism and its high rate of speed causes the parts to get out of working condition, necessitating stoppage of the machine for repairs to the feed mechanism. In my improvement I arrange and connect the parts for positive automatic operation, so that blanks or work are moved to a reciprocating feeder and forced or pressed down upon the same with a positive motion. The movement of the blanks or work is arrested at a predetermined point, and the feeder reciprocates positively to present the work between the lathe-spindles.

The invention further consists in the novel combination of elements and in the construction and arrangement of parts which will be hereinafter fully described and claimed.

To enable others to understand my invention, I have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a plan view of my improved feed mechanism applied to a lathe, a part only of which is shown. Fig. 2 is a longitudinal sectional elevation on the plane indicated by the dotted line 2 2 of Fig. 1. Fig. 3 is a side elevation of the parts shown by Figs. 1 and 2. Fig. 4 is a vertical transverse sectional elevation on the plane indicated by the dotted line 4 4 of Fig. 3. Fig. 5 is a detail perspective view of the reciprocating feeder detached from the mechanism. Fig. 6 is an enlarged detail view of the main operating-lever and the automatic depressing-bar, illustrating the means by which the movement or stroke of the depressing-bar may be varied.

Like numerals of reference denote like and corresponding parts in each of the several figures of the drawings.

In Figs. 1 to 3, inclusive, of the drawings I have illustrated so much of an automatic clothes-pin lathe as is necessary to an understanding of my invention. It will be understood, however, that no novelty for the clothes-

pin lathe proper is herein claimed, because the improvement resides in the novel form and construction of a positively and automatically actuated feed mechanism.

1 designates a portion of the lathe-bed.

2 is the head-stock, and 3 is the tail-stock. In said head and tail stocks are mounted the lathe-spindles 4 5, the spindle in the head-stock 2 being arranged for rotation and reciprocation endwise with respect to the spindle in the tail-stock, as clearly disclosed by either of the patents to which reference has been made. In rear of the lathe-spindles are the stops 6, which arrest the movement of the blanks when carried by the feed mechanism to and between the lathe-spindles. As is usual in the art, the lathe is equipped with the cam-shaft 7, and on said shaft is mounted a cam 8 for operating the feed mechanism automatically.

My improved feed mechanism is situated at one side of the lathe-bed and in alinement with the space between the lathe-spindles, and to properly support the feed mechanism in relation to the spindles I provide the platform or bed 9, which has one end securely attached to the lathe-bed in any suitable or preferred way. This platform or feed mechanism bed is provided at a point intermediate of its length with a bearing-block 11, in which is mounted a fulcrum shaft or bolt 12 for the main operating-lever, which is arranged in a vertical position alongside of the bed or platform 9, the lower end of said main operating-lever being operatively connected with the driving-cam 8, either through an intermediate connection between the heel of said lever and the cam or by direct engagement of the lever with the cam.

Above the platform or bed 9 and parallel therewith is the frame 13, which sustains certain parts of the feed mechanism, and I prefer to employ the rests or supports 22, which are fixed to the bed or platform 9 and to the feed-frame 13, to sustain the latter in fixed parallel relation to the platform 9. On the end of the feed-frame adjacent to the lathe is journaled an idle supporting-roller 15, while on the distal end of the feed-frame is journaled a driving-roller 16, one trunnion or the shaft of which driving-roller is extended beyond one side bar or rail of the feed-frame 13 to receive a ratchet 17, adapted to be engaged by a feed-pawl, which actuates the ratchet to intermittently rotate the driving-roll 16, as disclosed by the prior patents, to which reference has been made. Around the idle and driving rollers 15 16 passes the endless traveling apron 18, adapted to be driven by the intermittent rotation of the roller 16, and within the limits of the apron 18 is arranged a feed-table 14, the sides of which are suitably attached to the side rails of the feed-frame 13. This feed-table is in close relation to the upper strand or length of the traveling apron, and it prevents sagging of the apron under the weight or load of the work thereon. The idle-roller 15 and the delivery end of the traveling feed-apron terminate a short distance in the rear of the delivery end of the feed-frame 13, and to this end of the frame 13 is rigidly secured a delivery-plate 19, which lies in the horizontal plane of the upper strand or length of the feed-apron 18, said delivery-plate being arranged to receive the work-blanks from the apron and deliver the same to the reciprocating feeder 20. This reciprocating feeder is arranged longitudinally in a horizontal position within the feeder-frame 13, below the feed-table 14, and between the upper and lower strands of the endless traveling feed-apron 18. On the inner opposing sides or faces of the rails or bars of the feeder-frame 13 may be provided the longitudinal ways or guides, in which may be snugly fitted the edges of the reciprocating feeder 20, or in lieu of providing guideways for the feeder I may fit the same snugly between the sides of the frame 13 and the feed-table 14 and the rests or supports 22, either of which expedients for guiding the feeder in its rectilinear reciprocating movements may be adopted. The feeder 20 is thus mounted and guided on the feeder-frame for reciprocation in a true direct line with relation to the lathe-spindles, and as the feeder proper lies within the limits of the frame 13 I provide the protruding carriers 23, which are rigidly attached to the feeder 20, at the sides thereof, so as to play between the sides of the frame 13 and the edges of the traveling apron 18. These carriers are shown as angular plates having their shanks secured to the side edges of the feeder 20, while the heads of said angular plates extend upwardly from the shanks, said heads of the carriers being notched to provide the seats 24, in which are adapted to be placed the work-blanks which are to be presented to the lathe-spindles. The carriers of the feeder normally lie below the fixed delivery-plate 19 on the feed-frame 13, and when the feeder is moved in one direction the carriers are adapted to be retracted below the delivery-plate to such an extent as to have the seats 24 thereof coincident with the rear edge of said delivery-plate, while the reverse movement of the feeder causes the carriers to be projected a suitable distance beyond the delivery-plate and between the lathe-spindles for the purpose of presenting the work-blank between the spindles in proper position for the lathe-spindles to engage with said blank.

To the ends of the side rails or bars of the fixed feeder-frame 13 are secured the fixed stops 25, which lie in the path of the work-blanks and overhang the carriers forming parts of the feeder. The shanks 26 of the stops are suitably secured to the ends of the frame 13, while the heads 27 of the stops are bent outwardly and laterally with respect to the feeder-frame 13, so that said heads are projected inwardly into the path of the work on the apron and the delivery-plate and also cause the heads 27 to overhang the carriers

23, whereby the stops are arranged to occupy suitable positions in rear of the delivery-plate and in line with the work-blanks to arrest the progress of said work-blanks at a point where the blanks are to be forced positively, in a manner presently described, from the delivery-plate to the seats of the carriers 23.

The reciprocating feeder 20 is operatively connected with the main operating-lever 10 by the employment of a connecting-bar 28, which is attached rigidly in a suitable way to the feeder 20, and one end of this connecting-bar is reduced and rounded to produce a pintle 29, said pintle extending outwardly beyond the feeder-frame and the table or bed 9 for a sufficient distance to pass through alined openings in the operating-lever 10 and a detaining-arm 31, presently referred to. This pintle is provided at its free protruding end with a transverse pin 30, which prevents accidental separation of the lever 10 and the retaining-arm 31, and the connecting-bar 28 thus serves to directly connect the feeder to the operating-lever for the purpose of giving to the feeder a positive reciprocating movement from the lever 10.

In the rapid operation of the feed mechanism it is desirable to prevent the work-blanks from passing too rapidly and indiscriminately to the delivery-plate and carriers of the feed mechanism, and to attain the object that I have in view for positively and rapidly supplying the work-blanks to a reciprocating feeder by which the work-blanks are presented to the lathe-spindles I provide a detaining-arm 31, which operates in synchronism with the movements of the feeder. This detaining-bar is irregularly bent to have one end thereof overhang the traveling apron at a point near the delivery end thereof, while the other part or length of said detaining-arm extends downwardly alongside of the frame 13, the upper end of the lever 10, and thence extends forwardly to an operating-lever 34 for the pawl 35, that engages with the ratchet 17 of the driving-roller 16 for the feed-apron. At the point where the detaining-arm 31 laps or crosses the main operating-lever 10 said arm 31 is provided with a transverse opening through which passes the pintle 29 of the bar 28, and said pintle thus serves to operatively connect the short arm of the lever 10 with the feeder 20 and the detaining-arm 31. The overhanging upper end of the detaining-arm 31 carries a yieldable or spring finger 32, one end of which is suitably attached to the extremity of the arm 31. This yieldable finger 32 is arranged to project rearwardly beyond the delivery end of the traveling feed-apron 18 and adjacent to the delivery-plate 19, and said yieldable finger is thus arranged to intercept the work-blanks supplied by the feed-apron and to momentarily detain the same in the operation of feeding the blanks from the apron 18 across the delivery-plate and thence to the carriers of the reciprocating feeder. The detaining-arm 31 is operated by its connection with the lever 10 to give to the yieldable finger 32 a limited oscillating movement sufficient to lift said yieldable finger intermittently out of the path of the work-blanks which are carried by the apron to the delivery-plate, thus permitting the work-blanks at proper intervals to be carried by the apron and the delivery-plate and preventing the work-blanks from being disarranged in presenting them to the reciprocating feeder below the delivery-plate.

The feed-pawl 35 is pivotally attached to one end of the short lever 34, and said feed-pawl has its working end arranged to engage with the ratchet 17, while to the other end of said feed-pawl is connected a drop-weight 36, or a spring may be combined with said weight to normally hold the working end of the pawl in engagement with the ratchet 17. The short lever 34 is fulcrumed at a point intermediate of its length to the side of the platform or bed 9, and to the other end of this short lever 34 is pivotally connected, as at 33, the forward extremity of the horizontal length of the detaining-bar 31. It will thus be seen that the detaining-bar serves a twofold purpose in operating the yieldable finger 32 and as a link connection between the main operating-lever 10 and the short lever 34, which actuates the feed-pawl for giving the intermittent traveling motion to the feed-apron 18.

One of the important features of my improvement consists in the employment of an automatic device for depressing the work-blanks from the delivery-plate upon the seats of the carriers 23 on the feeder 20, whereby the work-blanks are positively moved from the delivery-plate to the seats on the feeder. In the preferred embodiment of this part of my invention I employ an automatic depressing-bar 37, which is irregularly bent, substantially as shown by the drawings, to have one extremity thereof overhang the feeder-work carriers, while its other extremity is adapted to be operated upon by the main operating-lever 10. As shown, the depressing-bar has the overhanging bar 38, which extends inwardly toward the central line of the feed-apron and delivery-plate; but this arm lies in rear of said delivery-plate, so that in its vertical movements or vibrations it is brought into contact with the work-blank at proper intervals of time to depress the blank into the seats of the carriers 23. The main link of the irregularly-bent depressing-bar 37 lies alongside of the feeder-frame 13, and at its forward portion said depressing-bar has a depending heel 39, the extremity of which lies in the path of the short arm of the main operating-lever 10. The heel 39 is fitted in a forked or bifurcated end 40 of an offstanding bracket 41, which is rigidly attached to one side of the feeder-frame 13, and said heel of the depressing-bar is pivoted, as at 42, in said forked end of the fixed bracket. The length of the feeder-bar between its pivoted heel and the overhanging arm 38 is slidably

confined in place against lateral deflection by means of a fixed keeper 47, which is rigidly attached to the feeder-frame 13 and which serves to hold the depressing-bar in proper relation thereto. The pivoted heel 39 of the depressing-bar is normally pressed toward and held in the path of the main operating-lever 10 by means of a coiled pressure-spring 45, which loosely encircles the offstanding arm or end of the bracket 41, and one end of this pressure-spring is fitted against the pivoted heel 39 of said depressing-bar, while the other end of the spring bears against a stop-pin 46, secured to the bracket 41. To vary the stroke or movement of the depressing-bar 37 under the action of the main operating-lever 10, I provide an adjustable stop 44, preferably in the form of a screw, which is mounted in the free end of the pivoted heel 39, forming a part of the depressing-bar, and by properly adjusting this screw 44 in relation to the operating-lever 10 the movement or stroke of the depressing-bar 37 may be varied as desired. The pressure of the spring 45 against the heel of the depressing-bar 37 tends to normally hold said depressing-bar in a position where its overhanging arm 38 is above and out of the horizontal plane of the feed of the work-blanks from the delivery-plate to the seats of the feeder; but the movement of the lever 10 against the heel 39 overcomes the pressure of this spring and positively actuates the bar 37 to depress the arm 38 upon the work-blank and force the latter into the seats 24 of the feeder 20.

The operation may be described as follows: With the parts in their normal positions, as shown by the drawings, the cam 8 on the camshaft 7 acts against the heel of the operating-lever 10 to force the latter in the direction indicated by the arrow in Fig. 3. On the initial movement of said operating-lever the bar 28 retracts the feeder 20 to move the carriers 23 in a position beneath the delivery-plate 19 and bring the seats 24 coincident with the rear edge of said plate 19. At the same time the detaining-bar 31 is moved forwardly to cause its yieldable finger 32 to engage with one of the work-blanks on the plate 19 and the lever 10 strikes the pivoted heel of the depressing-bar to overcome the resistance of the spring, and thereby move the depressing-bar so as to lower its overhanging arm 38, which movement of the depressing-bar forces a blank from the delivery-plate into the seats of the carrier. On the reverse movement of the lever 10 under the influence of the cam 8 the feeder 20 is reciprocated endwise to move the carriers 23 and the work-blank thereon to a position between the lathe-spindles 4 5, the carriers passing below the horizontal plane of the spindle and the work being presented between said spindles, so that on the proper reciprocation of the live lathe-spindle the work will be engaged by and between the spindles 4 5. Simultaneously with the described reverse movement of the operating-lever the detaining bar or arm 31 is moved sufficiently to elevate its yieldable finger to provide for the passage of the work-blank from the apron to the delivery-plate, and this movement of the detaining-arm shifts the short lever 34 to the position where the feed-pawl 35 engages with the ratchet of the roller 16, thereby imparting rotation to said roller to move the feed-apron a sufficient distance to present another work-blank to the detaining-finger. The cam now actuates the lever to impel it in the first-named direction, the feeder is retracted, the detaining-arm is depressed, the depressing-arm is forced into engagement with the work-blank, and the feed-pawl retracted to take fresh hold on the ratchet of the apron-driving roller.

The operation is continuous and automatic to rapidly feed the work-blanks to the delivery-plate, obviate the undue feed and disarrangement of the work-blanks to said plate, depress the work-blanks into the seats of the feeder, and to present the work-blanks in proper relation to the lathe-spindles.

I am aware that changes in the form and proportion of parts and in the details of construction may be made by a skilled mechanic without departing from the spirit or sacrificing the advantages of my invention, and I therefore reserve the right to make such modifications as clearly fall within the scope of the invention.

Having thus described the invention, what I claim is—

1. In a feed mechanism for lathes, the combination with a conveyer situated adjacent to the lathe-spindles, of a rectilinearly-reciprocating feeder arranged operatively between said conveyer and the lathe-spindles to transfer the work-blanks from said conveyer and present the same properly to said spindles, work-rests movable with the feeder and arranged to receive and carry the work-blanks, a reciprocating depressor device movable in a plane across the delivery end of said conveyer for seating the work-blanks upon the work-rests of said reciprocating feeder, and a detainer mechanism in operative relation to the conveyer for positively checking the passage of work-blanks from the conveyer to the feeder during the period of movement of the depressor device, substantially as described.

2. In a feed mechanism for lathes, the combination with a conveyer, of a reciprocating feeder having the work-rests and arranged for operation between said conveyer and lathe-spindles, a reciprocating depressor device arranged in the plane of the feeder work-rests when the feeder is at rest and movable across the delivery end of said conveyer toward the work-rests, a detainer-finger arranged to engage with the work on such conveyer during the period of the downward movement of said depressor device, and a common driving connection for the depressor device and the detaining-finger arranged to lift the depressor

device and the detaining-finger simultaneously with the advance of the work-blanks by the conveyer, substantially as described.

3. In a feed mechanism for lathes, the combination with a conveyer, and a reciprocating feeder arranged to transfer work-blanks from said conveyer to and between the lathe-spindles, of a depressing device for seating work-blanks upon the feeder, a detaining device movable vertically in relation to the conveyer, and a driving mechanism arranged to actuate the feeder in a horizontal plane and to vibrate the depressor device and the detaining device alternately and in a vertical direction with relation to the conveyer and the feeder, respectively, substantially as described.

4. In a feed mechanism for lathes, the combination with a conveyer, of a feeder guided to reciprocate in the horizontal plane of said conveyer, a delivery-plate between the feeder and the discharge end of said conveyer, a detaining-finger arranged to traverse said plate and restrain work-blanks from passing thereover to the feeder during the period of movement of the depressor device, and the depressing device movable past the delivery-plate toward or from the feeder, substantially as described.

5. In a feed mechanism for lathes, the combination with a conveyer, of a rectilinearly-reciprocating feeder supported to travel in the horizontal plane of the conveyer and arranged to be projected from the delivery end of the conveyer to and between the lathe-spindles, the work-plates carried by the feeder at its exposed end and provided with seats for the reception of work-blanks, and a depressor device movable in a vertical plane across the delivery end of said conveyer and toward or from the work-carriers on said feeder, substantially as described.

6. In a feed mechanism for lathes, the combination of a conveyer, a reciprocating feeder movable in the horizontal plane of the conveyer, a depressor device arranged to operate across the delivery end of the conveyer, a detaining-finger between the depressor device and said delivery end of the conveyer, a single driving-lever, and operative connections from said driving-lever to the conveyer, the feeder, depressor device and the detaining-finger to operate the several mechanisms in unison, substantially as described.

7. In a feed mechanism for lathes, the combination with a traveling conveyer-apron, of a reciprocating feeder, a depressing device, a driving device for said feeder and the depressing device, a detaining-arm connected with said driving device, and a feeding mechanism for the conveyer-apron operatively connected with said detaining device, substantially as described.

8. In a feed mechanism for lathes, the combination with a suitable framework, and an endless conveyer, of a feeder slidably supported by the frame for reciprocating play in the horizontal plane of the conveyer and having, at its end which protrudes beyond the delivery end of the conveyer, the exposed carrier-plates provided with seats, a fixed delivery-plate at the delivery end of the conveyer and in a horizontal plane above the seats of said feeder carrier-plates, a depressing device traveling across the rear edge of the delivery-plate toward or from the feeder, and a detaining device in operative relation to the delivery-plate, substantially as described.

9. In a feed mechanism for lathes, the combination with a conveyer, of a rectilinearly-reciprocating feeder, a driving-lever connected to said feeder and actuating the conveyer through an intermittent feed mechanism, a detaining-lever having a finger that traverses the conveyer and said lever connected to the driving-lever directly, and a depressing-lever with an arm arranged to move across the delivery end of the conveyer and having a spring-pressed heel in the path of the driving-lever, substantially as described.

10. In a feed mechanism for lathes, the combination with a conveyer-apron, of a reciprocating feeder, a pivoted depressing-bar having an arm which overhangs the work-receiving end of said feeder, a spring to normally hold the depressing-arm in its raised position, and a driving-lever connected with the feeder and arranged to actuate the depressing-arm, substantially as described.

11. In a feed mechanism for lathes, the combination with a conveyer-apron, of a reciprocating feeder provided with the carriers, a driving-lever connected with said feeder, a depressing-bar having an overhanging arm in operative relation to the feeder and with its heel in the path of the driving-lever, and a spring to normally maintain the depressing-arm in its raised position, substantially as described.

12. In a feed mechanism for lathes, the combination with a conveyer-apron, of a reciprocating feeder having the carriers, a fixed bracket, a depressing-arm provided with an overhanging end in operative relation to the carriers of said feeder and having its heel pivoted in said bracket, a driving-lever connected with the feeder, an adjustable stop carried by the heel of the depressing-arm and lying in the path of said operating-lever, and a spring to normally hold the depressing-arm in its raised position, substantially as described.

13. In a feed mechanism for lathes, the combination with a conveyer-apron, of a reciprocating feeder, a driving-lever therefor, a detaining-arm connected with said driving-lever at a point intermediate of its length and having one end thereof overhanging the conveyer-apron, a yieldable finger carried by said overhanging end of the detaining-arm, a short lever connected with the heel of the detaining-arm, and a feed mechanism for the conveyer-apron having the pawl thereof at-

tached to said short lever, substantially as described.

14. In a feed mechanism for lathes, the combination with a suitable frame and a traveling conveyer-apron mounted therein, of a delivery-plate fixed in said frame in the path of the conveyer-apron, a feeder supported in the frame below the delivery-plate and arranged for rectilinear reciprocating movement toward and from the lathe-spindles, the carriers movable with said reciprocating feeder, a driving-lever connected to said feeder to reciprocate the same, a detaining-arm connected to the driving-lever and having its overhanging end provided with a yieldable finger, a pivoted depressing-arm with one end overlapping the carriers and its other end in the path of the driving-lever, and a feed-pawl operatively connected with the heel of the detaining-arm and engaging with the ratchet-feed mechanism for the conveyer-apron, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

MASON D. LEAR.

Witnesses:
A. E. FOSTER,
M. A. SYLVANDER.