No. 648,211. Patented Apr. 24, 1900.

F. MARGGRAFF.

AUTOMATIC FEED MECHANISM FOR METAL WORKING MACHINES.

(Application filed Feb. 24, 1899.)

(No Model.) 5 Sheets—Sheet 1.

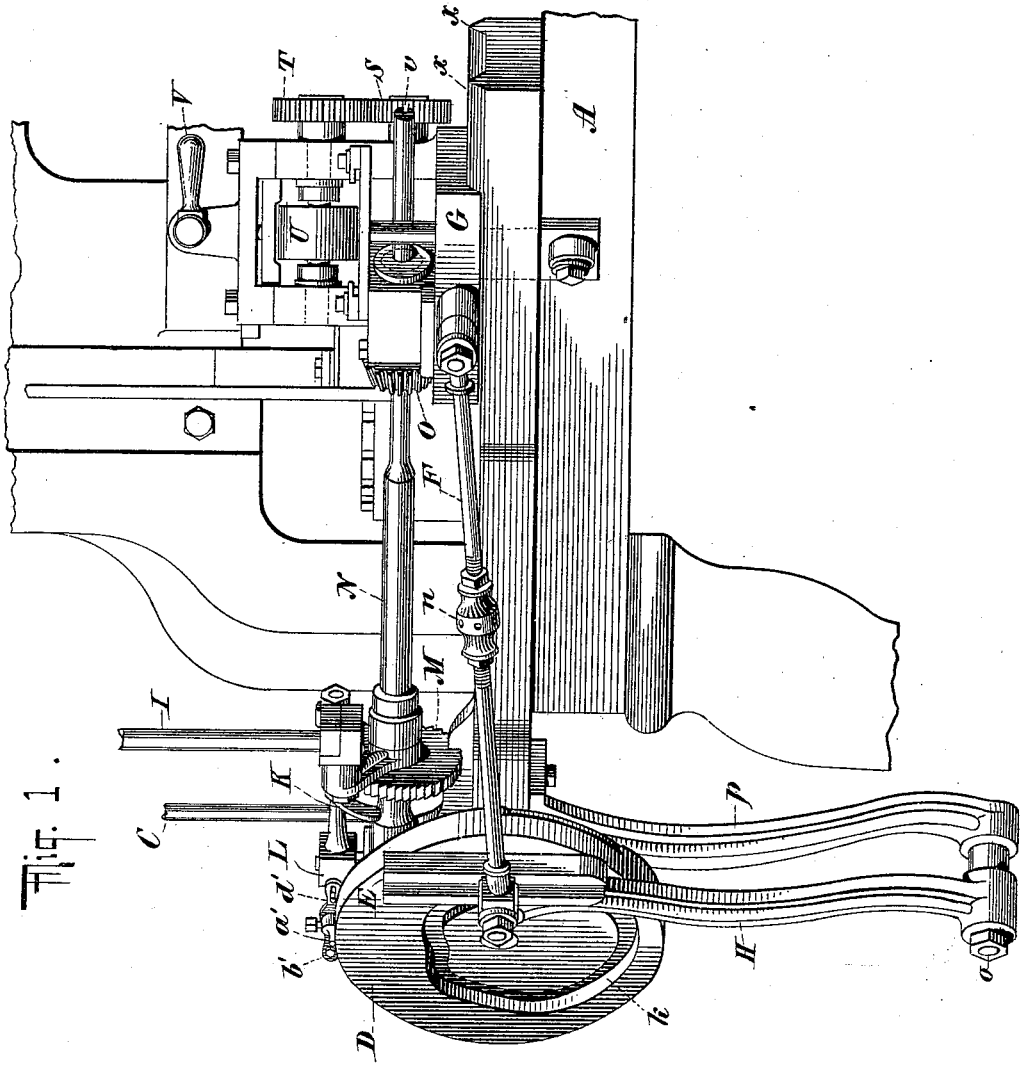

Fig. 1.

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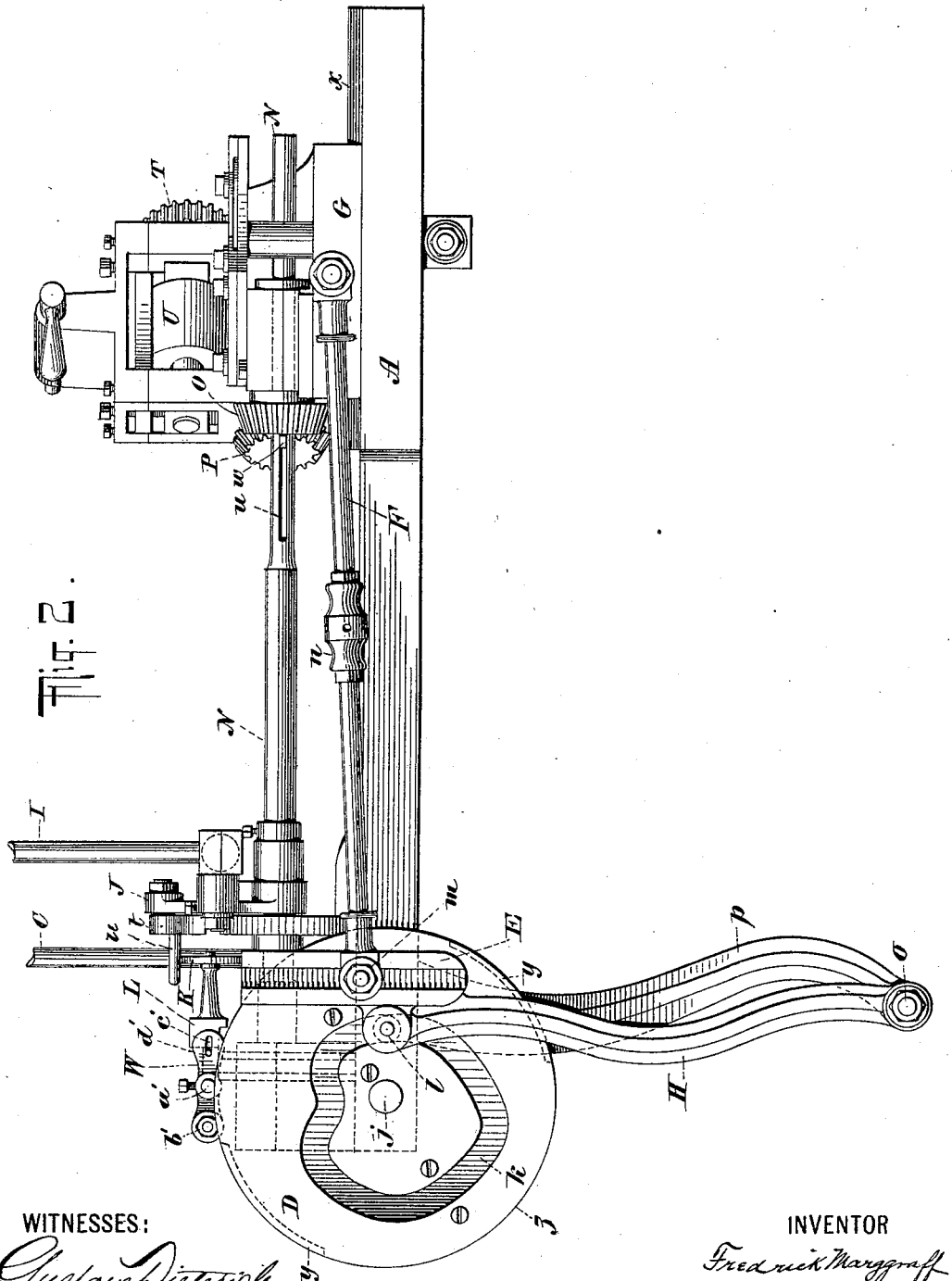

Fig. 2.

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Fig. 3.

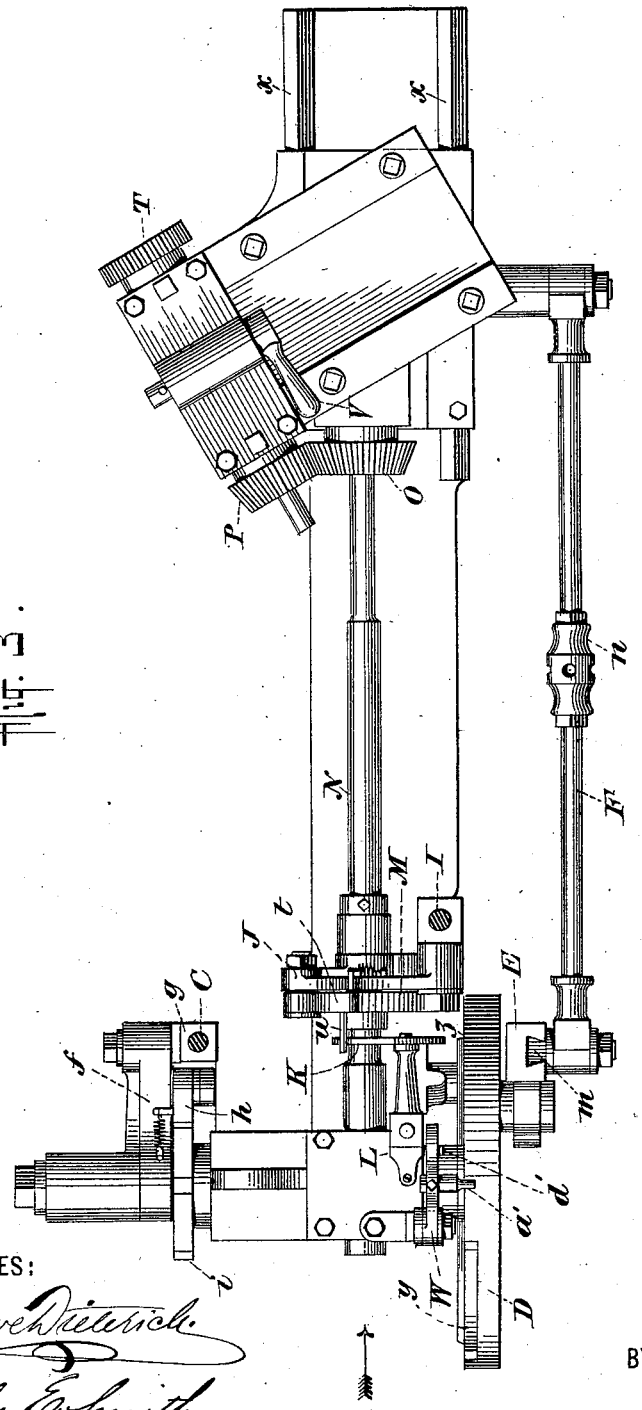

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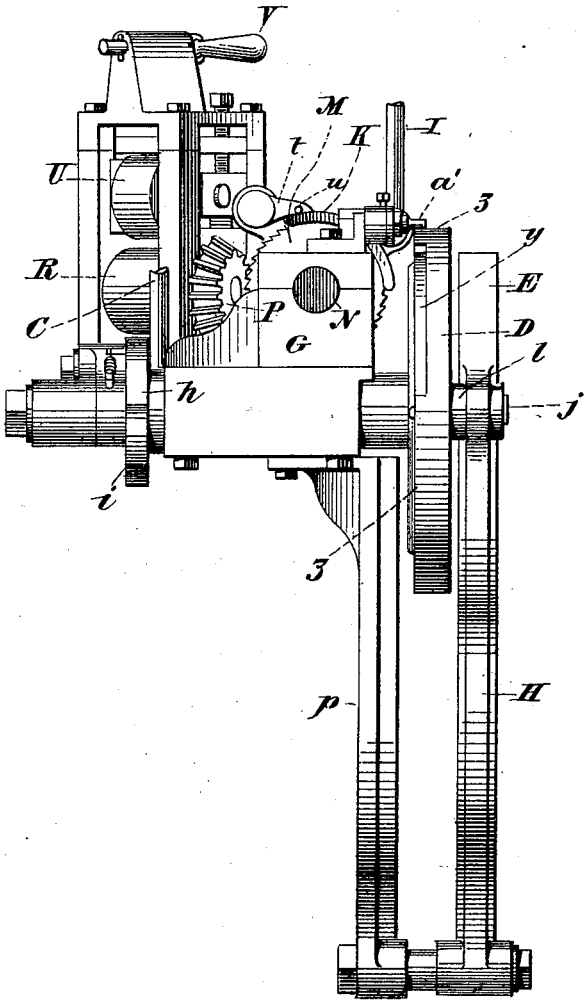
Fig. 4.



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(No Model.) 5 Sheets—Sheet 5.

Fig. 5.

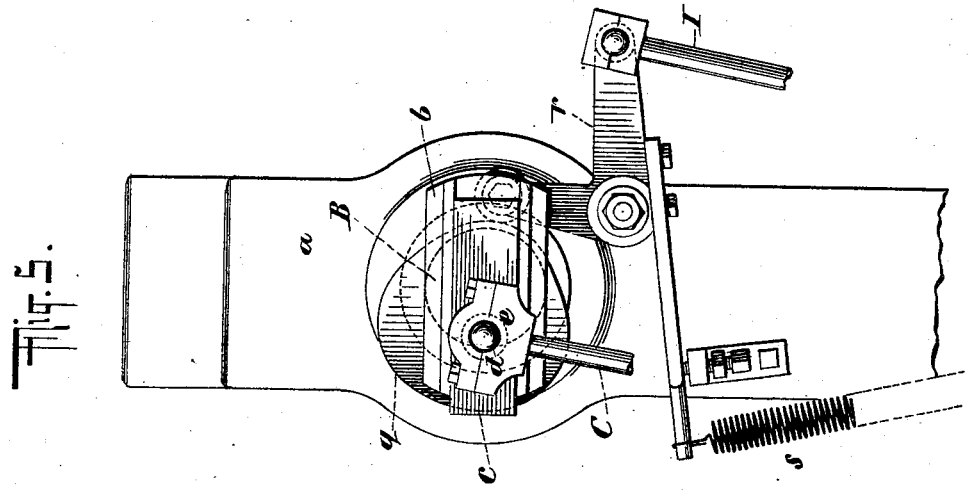

Fig. 5.

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UNITED STATES PATENT OFFICE.

FREDRICK MARGGRAFF, OF WATERBURY, CONNECTICUT, ASSIGNOR OF ONE-HALF TO ALBERT D. FIELD, OF SAME PLACE.

AUTOMATIC FEED MECHANISM FOR METAL-WORKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 648,211, dated April 24, 1900.

Application filed February 24, 1899. Serial No. 706,658. (No model.)

To all whom it may concern:

Be it known that I, FREDRICK MARGGRAFF, a citizen of the United States, and a resident of Waterbury, New Haven county, State of Connecticut, have invented certain new and useful Improvements in Automatic Feed Mechanism for Metal-Working and other Machines, of which the following is a full, clear, and exact description.

My invention relates to automatic feed mechanism for metal-working machines; and one object of said invention is to provide a simple and efficient feed mechanism for automatically and intermittently feeding strips of metal or other suitable material of different widths both laterally and longitudinally to the punch or other device to be operated upon.

A further object of my invention is to provide feed mechanism which may be readily adjusted to change the extent of lateral and longitudinal feed given to the material.

To these ends my invention consists in the novel arrangement and combination of parts hereinafter described and claimed.

In the accompanying drawings, wherein like characters represent corresponding parts in the various views, Figure 1 is a perspective view of one form of feed mechanism embodying my invention and of sufficient number of parts of a metal-working machine to show the application thereof. Fig. 2 is a detail side view of the feed mechanism. Fig. 3 is a plan view of the same. Fig. 4 is an end view of the mechanism looking in the direction of the arrow in Fig. 3. Fig. 5 is an enlarged detail end view of the upper portion of the parts represented in Figs. 1 and 2 of the drawings. Fig. 6 is a front view of the same.

My present invention is in the nature of an improvement upon the feeding device heretofore patented by me in Letters Patent No. 252,786, dated January 24, 1882. The device forming the subject-matter of the present invention is much more simple in construction and is easier to adjust than the said patented device and not so liable to get out of order or out of adjustment.

In the drawings, A represents the framing of any suitable machine—such, for instance, as a metal-punching machine. In the upright standards *a* of this framing is mounted the main driving-shaft B of the machine, which transmits motion to the punch or other tool to operate upon the metal strip or other material to be operated upon. On an end of the main shaft B is carried a slideway *b*, (see Figs. 5 and 6,) in which a slide or block *c* is adjustably carried, and from this block *c* projects one member *d* of a universal joint, the other member *e* of this universal joint being carried by a cam-operating rod C. It will be observed that the member *d* of the universal joint in the present instance constitutes a wrist-pin and that the position thereof, as determined by the adjustment of the block *c* in the slideway *b*, determines the extent of throw given to the rod C. The lower end of the cam-operating rod C is connected to a vibratory pivoted arm *f* by means of a universal joint *g*. This arm *f* carries a pawl *h*, which engages a coöperating ratchet-wheel *i*, that is fixed upon a shaft *j*. This ratchet-wheel *i* preferably has twice as many teeth as there are blanks to be punched in the width of the metal. Thus, for instance, if there are seven blanks to be punched in the width of the metal fourteen teeth will preferably be provided on the ratchet-wheel, so that a complete revolution of the ratchet-wheel will give a reciprocation to the feed-carriage in opposite directions, as will hereinafter appear. The opposite end of this shaft *j* has a cam-wheel D rigidly connected thereto, so that a movement imparted to the ratchet-wheel *i* will be communicated to the cam-wheel. Coöperating with the cam-groove *k* of the cam-wheel D is a projecting pin or roller *l*, carried by a movable slideway E, in which a block carrying a pivot-pin *m* is adjustably secured. One end of a pitman-rod F is connected to this pivot-pin *m*, while the other end of the rod is pivotally connected to a feed-carriage G, which is adapted to slide on the tracks *x* in a direction substantially transverse to the length of the material operated upon. The pitman-rod F is preferably made in two sections, which are united by a right and left hand capstan-screw *n* or other means for adjusting the two sections so as to lengthen or shorten the rod to compensate for any change in throw of the rod by an adjustment of the block

which carries the pivot-pin *m*. In other words, the capstan-screw allows of the proper positioning of the carriage, so as to bring the metal initially in the proper position to be operated upon, whereas the adjustment of the block which carries the pivot *m* determines the extent of each intermittent movement given to the carriage. A link H is pivotally connected to the slideway E at one end, and its opposite end is pivoted, as indicated at *o*, to a fixed depending bracket *p*.

So much of the mechanism as I have described comprises the means for intermittently moving the carriage, and I will now describe the means for feeding the material longitudinally to the punches or other device to operate thereon.

Upon the main shaft of the machine is carried a cam *q*, with which one arm of the bell-crank lever *r* coöperates. An arm of this lever is maintained in constant contact with the cam by means of the spring *s*. The other arm of the lever *r* is pivoted to a feed-roll-operating rod I, which is connected to a pivoted vibratory pawl-carrier J, to which a spring-pressed pawl *t* is pivoted. This pawl *t* carries a pin *u*, which is adapted to bear upon a segmental guard K, that projects from a movable support L, which will be hereinafter more fully described. The pawl *t* coöperates with a ratchet-wheel M, which is fixed upon a shaft N, which is suitably mounted to allow rotation but no longitudinal movement thereof. This shaft N is provided with a spline-groove *v*, (see Fig. 2,) in which a feather *w*, carried by a bevel-pinion O, projects. This pinion O is carried by the feed-carriage G and by reason of the connection just described may be rotated by the shaft N irrespective of the adjustment of the carriage G. The pinion O meshes with the corresponding pinion P, carried by the feed-carriage, and this latter pinion is connected to a feed-roller R, on the shaft of which is carried a gear-wheel S. This gear-wheel S meshes with the corresponding gear-wheel T, fixed upon the shaft of which is an upper feed-roller U, which coöperates with the roller R to feed the strip of metal longitudinally to the punch. The bearings of the upper feed-roller U are preferably adapted to slide vertically in the framing of the feed-carriage, and a handle V is provided to move the upper feed-roller up or down to cause it to coöperate with the lower feed-roller to release or clamp the metal, as the case may be. When the handle has been operated to move the upper feed-roller so as to compress the metal strip between it and the lower feed-roller, the parts are in position to feed the strip when the rolls are automatically rotated, as will be hereinafter described.

On the periphery of the cam-wheel D are depressed portions *y* and elevated portions *z*, and on these portions *y* and *z* a pin *a'* (see Fig. 3) is adapted to bear, as determined by the position of the cam-wheel. The pin *a'* is carried by a carrier W, pivoted to the framing of the machine, as indicated at *b'*. The free end of this pivoted carrier is slotted, as indicated at *c'*, and into this slot projects a pin *d'*, extending from the movable support L, to which the guard K is connected. It will be observed by reference to Fig. 4 of the drawings that when the pin *a'* rests upon the elevated portion *z* of the cam-wheel D the segmental guard K will maintain the pawl *t* elevated above the teeth of the ratchet-wheel M and that an oscillation of said pawl, with its carrier J, will not impart any movement of the ratchet-wheel, whereas when the pin *a'* rests upon a depressed portion *y* of the cam-wheel D the pawl will be allowed to engage the ratchet-wheel M and to feed the rollers R U. It will thus be understood that each of the cam-like portions *z y* on the periphery of the cam-wheel D raises or lowers the guard K, as the case may be, and in this manner determines the time when motion may be transmitted to the feed-rollers.

Having described the construction of one form of device embodying my invention, I will now proceed to describe the operation thereof.

We will suppose for the purpose of illustration that seven blanks are to be cut in the width of the metal to be operated upon. The block carrying the pivot-pin *m* is first adjusted so that each downward movement of the rod C will cause the carriage G to be moved on its tracks to feed the metal strip laterally a slightly-greater distance than the width of the blank to be cut. The capstan-screw *n* is next adjusted so as to bring the edge of the metal strip near the path of the punch for the initial cutting. The slide *c* is then adjusted so as to give the proper throw to the rod C in order that fourteen downward movements transmitted thereto will give a complete revolution to the cam-wheel D. The metal strip is then placed between the feed-rollers R U, and the handle V is operated to cause the rolls to clamp the strip between them. The machine is then set in operation, and the feed mechanism will be automatically and intermittently operated to feed the carriage laterally seven times, during which time the pin *a'* rests upon the elevated portion *z* of the cam-wheel D and no motion will be imparted to the ratchet-wheel K. After the seventh movement of the carriage a depressed portion *y* of the cam-wheel D reaches the pin *a'* and the pawl *t* is allowed to engage its ratchet-wheel K to turn the feed-rollers, so as to feed the material a distance a little greater than the length of a blank, when an elevated portion *z* of the cam is again reached and the pawl *t* is elevated out of engagement with its ratchet-wheel. Further rotation of the cam-wheel D will cause the carriage to be intermittently moved seven times in the opposite direction from that in which it was first moved, when the longitudinal feed will again take place in the

manner above described, and so the feed device will be automatically and intermittently operated at each descent of the punch or at each operation of the main shaft B.

It will be observed that an intermittent reciprocating movement is imparted by the rotating element or cam to the carriage which corresponds to the intermittent reciprocating movement imparted to the rod or connection F and that no mechanism need be employed intermediate of the cam and carriage for effecting a change in the direction of movement of the carriage.

While I have shown and described with considerable detail one form of feed mechanism embodying my invention, I would have it understood that various changes in detail may be made to adapt my feed device to different types of machines or to different ends to be attained without departing from the spirit of my invention.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a feed device, the combination of a feed-carriage, means carried by said carriage for feeding the material in one direction, means for automatically and intermittently operating said feeding means, a pitman-rod connected to the carriage to intermittently reciprocate the same in opposite directions and in a direction at an angle to the line of feed of the first-mentioned feeding means and means for adjusting the throw of said rod.

2. In a feed device, the combination of a feed-carriage, feed-rollers carried by said carriage, means for automatically and intermittently rotating said feed-rollers, a pitman-rod connected to said carriage, a cam for automatically and intermittently reciprocating said rod in opposite directions and means for adjusting the throw of said rod.

3. In a feed device, the combination of a feed-carriage, means carried by said carriage for feeding the material in one direction, means for automatically and intermittently operating said feeding means, means for changing the extent of the intermittent feed of said feeding means, a pitman-rod connected to said carriage to intermittently reciprocate the same in opposite directions and means for adjusting the throw of said rod.

4. In a feed device, the combination of a feed-carriage, feed-rollers carried by said carriage, means for automatically and intermittently rotating said feed-rollers, a cam-wheel, means for intermittently rotating said cam-wheel, an intermediate rod or link between said cam-wheel and carriage and means for adjusting the throw of said rod.

5. In a feed device, the combination of a feed-carriage, feed-rollers carried by said carriage, means for automatically and intermittently rotating said feed-rollers, a cam-wheel, means for intermittently rotating said cam-wheel, an intermediate rod or link between said cam-wheel and carriage, means for adjusting the throw of said rod and means for adjusting the length of said rod.

6. In a feed device, the combination of a feed-carriage, feed-rollers carried by said carriage, means for automatically and intermittently rotating said feed-rollers, a cam-wheel, means for intermittently rotating said cam-wheel, means for varying the extent of intermittent rotation imparted to said cam-wheel, an intermediate rod or link between said cam-wheel and carriage and means for adjusting the throw of said rod.

7. In a feed device, the combination of a feed-carriage, feed-rollers carried by said carriage, means for automatically and intermittently rotating said feed-rollers mechanism for automatically throwing the feed-roller-operating means into and out of operation, a cam-wheel, means for intermittently rotating said cam-wheel, an intermediate rod or link between said cam-wheel and carriage and means for adjusting the throw of said rod.

8. In a feed device, the combination of a feed-carriage, feed-rollers carried by said carriage, means for automatically and intermittently rotating said feed-rollers, mechanism for automatically throwing the feed-roller-operating means into operation when the carriage reaches the end of its travel in either direction and for automatically throwing said operating means out of operation after an intermittent rotation has been imparted to the feed-rollers, a cam-wheel, means for intermittently rotating said cam-wheel, an intermediate rod or link between said cam-wheel and carriage and means for adjusting the throw of said rod.

9. In a feed device, the combination of a feed-carriage, feed-rollers carried by said carriage, means for automatically and intermittently rotating the said feed-rollers, mechanism for automatically throwing the feed-roller-operating means into operation when the carriage reaches the end of its travel in either direction and for automatically throwing said operating means out of operation after an intermittent rotation has been imparted to the feed-rollers, a cam-wheel, means for intermittently rotating said cam-wheel, means for varying the extent of intermittent rotation imparted to said cam-wheel, an intermediate rod or link between said cam-wheel and carriage, means for adjusting the throw of said rod and mechanism for adjusting the length of said rod.

10. In a feed device, the combination of a feed-carriage, means carried by said carriage for feeding the material in one direction, means for automatically and intermittently operating said feeding means, rotating means for imparting a movement to said carriage and connections between said carriage and rotating means for imparting a movement to the carriage which corresponds to the movement imparted to the connections by said rotating means.

11. In a feed device, the combination of a

feed-carriage, means carried by said carriage for feeding the material in one direction, means for automatically and intermittently operating said feeding means, a cam for imparting a movement to said carriage and connections between said carriage and cam for imparting a movement to the carriage which corresponds to the movement imparted to the connections by the cam.

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