No. 648,949. Patented May 8, 1900.

J. A. HANGER.

FEED CUTTER.

(Application filed Mar. 4, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

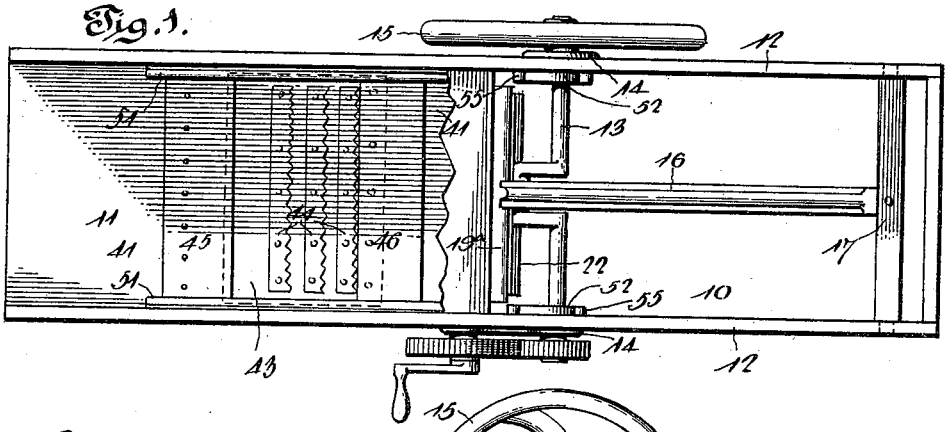


Fig. 2.

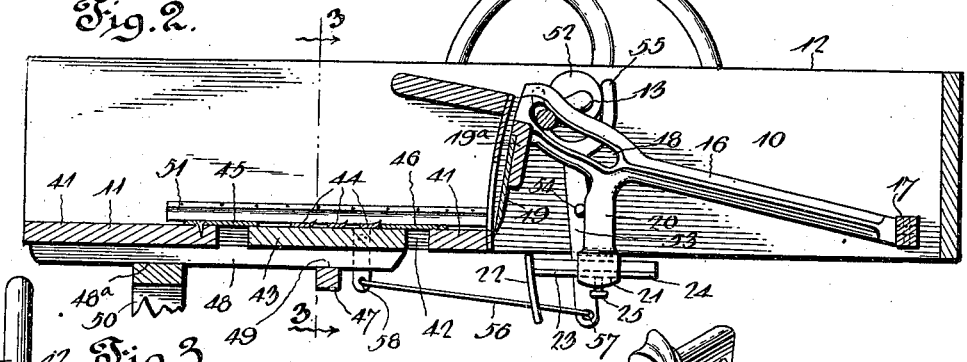


Fig. 3.

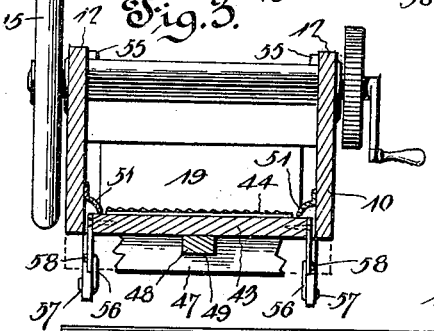
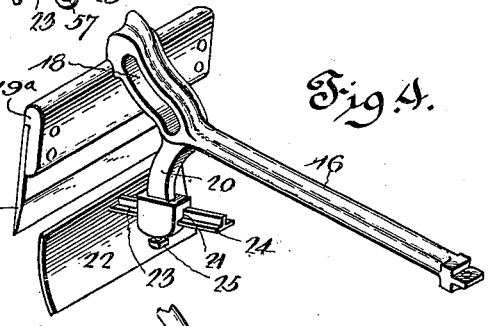


Fig. 4.



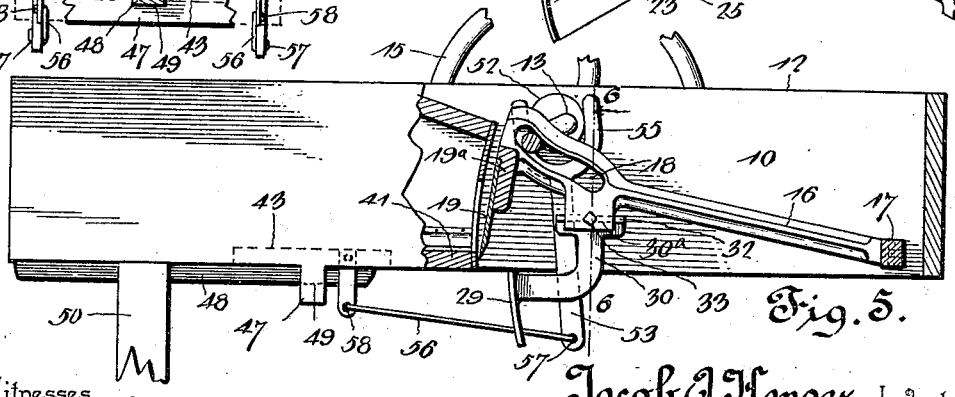


Fig. 5.

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(Application filed Mar. 4, 1899.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 7.

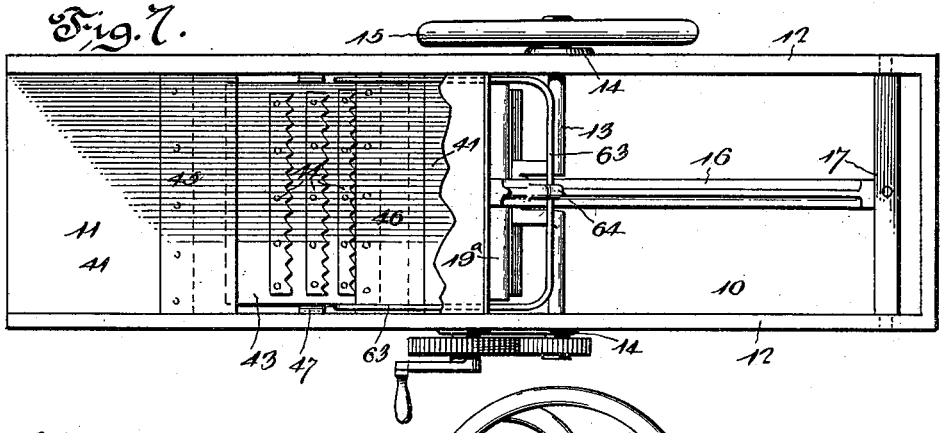


Fig. 8.

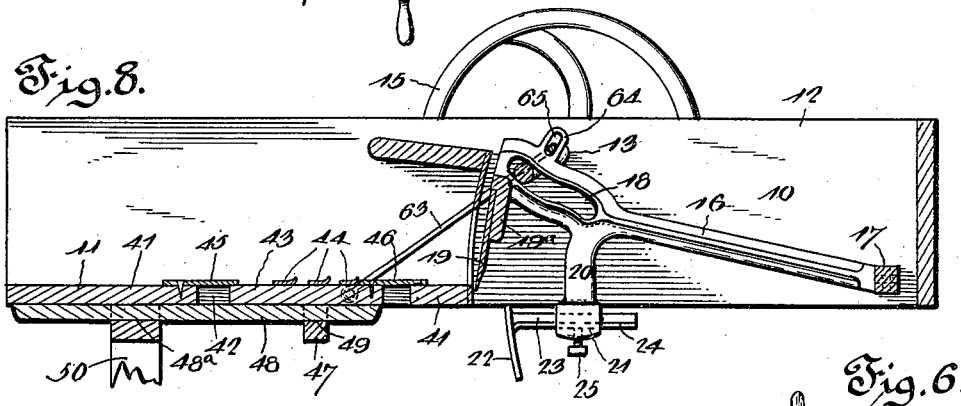


Fig. 6.

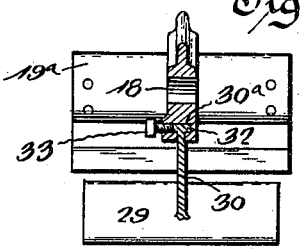


Fig. 9.

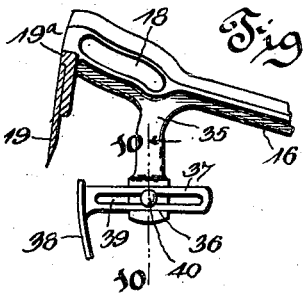


Fig. 10.

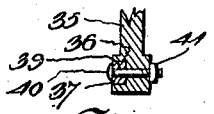
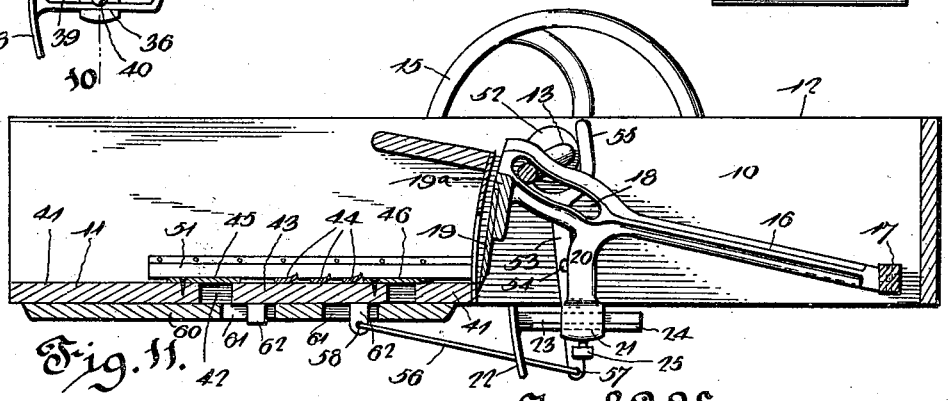


Fig. 11.



Witnesses

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Jacob A. Hanger, Inventor.

By his Attorneys,

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UNITED STATES PATENT OFFICE.

JACOB A. HANGER, OF STAUNTON, VIRGINIA.

FEED-CUTTER.

SPECIFICATION forming part of Letters Patent No. 648,949, dated May 8, 1900.

Application filed March 4, 1899. Serial No. 707,784. (No model.)

To all whom it may concern:

Be it known that I, JACOB A. HANGER, a citizen of the United States, residing at Staunton, in the county of Augusta and State of Virginia, have invented a new and useful Feed-Cutter, of which the following is a specification.

My invention relates to feed-cutters, and one part of the invention is designed more particularly as an improvement on the construction disclosed by United States Letters Patent No. 612,925, issued to George C. Hanger on October 25, 1898.

One object of the present invention is to provide on the swinging knife-arm disclosed by the aforementioned patent a gage for regulating the length of the material which is to be cut by the knife-blade on said arm, said gage being movable with the knife-arm to be presented thereby to a position in line with the feed of the material as the knife-blade is raised, and said gage being moved with the swinging knife-arm out of the path of the material on the descent of the knife-blade in the act of cutting the material into the required lengths, whereby the gage is automatically thrown out of the path of the material which is cut by the knife-blade.

A further object of the invention is to provide a gage which may be adjusted toward or from the plane of the knife-blade for the purpose of varying the length of material to be cut by said knife-blade at each stroke thereof, and, furthermore, to simplify the construction and promote the efficiency of operation.

A further object of the invention is to provide an improved feed mechanism for delivering the material into the path of the knife-blade, and this feed mechanism is operated automatically by the driving means for the knife-bar, to the end that the material may be advanced by the feed mechanism in the intervals between the downstrokes of said knife-bar. Said feed mechanism is connected positively by operative connections with the crank-shaft, and it serves to advance the material in a manner to maintain a full supply in the path of the knife, thus overcoming any liability of the operator having his hands caught in the machine.

With these ends in view the invention 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 the invention, I have illustrated the same in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a plan view of a feed-cutter adapted for the purpose of cutting fodder, hay, &c. Fig. 2 is a longitudinal sectional elevation on the plane indicated by the dotted line 2 2 of Fig. 1. Fig. 3 is a vertical transverse section of one feed-cutter on the line 3 3 of Fig. 2. Fig. 4 is a detail perspective view of the knife-arm with my gage attached thereto. Fig. 5 is a longitudinal sectional elevation of another embodiment of the invention, illustrating another form of the adjustable gage which is carried by the knife-arm. Fig. 6 is a cross-sectional view through the knife-arm and the gage thereon, the plane of the section being indicated by the dotted line 6 6 of Fig. 5. Fig. 7 is a plan view of the machine, showing another form of means for actuating the automatic feeder. Fig. 8 is a longitudinal section on the line 8 8 of Fig. 7. Fig. 9 is a detail view of another construction of the knife-arm, showing another means for adjustably connecting the gage thereto. Fig. 10 is a detail section on the line 10 10 of Fig. 9. Fig. 11 is a longitudinal section of the machine, showing another means for guiding the automatic feeder.

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

The frame 10 of the feed-cutter is provided with a bottom 11 and with the side pieces or rails 12. The bottom 11 terminates within the frame about midway of the side pieces to leave a discharge-opening at one end of the frame, and this opening is spanned by a crank-shaft 13, which is journaled in proper bearings 14, attached to the side rails 12, whereby the crank-shaft lies contiguous to the inner edge of the bottom 11. One end of this crank-shaft carries an ordinary balance-wheel 15, and to the crank of the shaft is operatively connected the swinging knife-arm 16. This knife-arm is fulcrumed, as at 17, in the slotted end of the frame 10, and said knife-arm is furthermore provided with a curved slot 18,

that loosely receives the crank of the shaft 13, whereby the knife-arm is vibrated in a vertical plane on the rotation of the crank-shaft. One end of this knife-arm is contiguous to the feed devices of the machine, to be presently described, and this end of the knife-arm carries the knife-blade 19, which is fastened firmly to a knife-bar 19ª on the free end of the swinging knife-arm.

In the embodiment of one part of the invention, as represented by Figs. 1 to 4, inclusive, I provide the knife-arm with a hanger-arm 20, which is cast as an integral part of said knife-arm, and in this hanger is adjustably secured the gage 22, adapted to regulate the length of the material to be cut by the knife-blade. This hanger-arm depends from the knife-arm at the slotted portion 18 thereof, and at its lower end the hanger-arm has a transverse socket or opening 21. The gage 22 is a single piece of metal, preferably a casting, with a slightly-curved front face, and the length of this gage is coextensive to the width of the feed mechanism of the machine. Said gage is provided at one end with a shank 23, which is fast or integral with the gage and extends in a backward direction therefrom, and this shank is provided with a rib 24 or otherwise formed angular in cross-section, which is fitted in the socket or opening 21 of the hanger-arm to have interlocking engagement therewith and prevent said gage from turning out of position should the binding-screw 25 work loose in its threaded socket of the hanger-arm. The gage 22 at all times occupies a position below the knife-blade 19 and at a proper distance in rear of said knife-blade, and this gage is attached directly to the knife-arm to travel therewith in its swinging movement under the influence of the crank-shaft. By arranging and attaching the gage as described it is caused to be lifted, with the knife-arm, into the plane of feed of the material when the knife-blade is raised preparatory to cutting the material, thus enabling the material to be fed the proper distance beyond the end of the feed mechanism, and thus the gage is presented by the knife-arm in a position for the material to abut against the working face of the gage, the latter being adapted to regulate the length of the material exposed to the action of the knife-blade. On the descent of the swinging arm and the knife-blade the gage moves in a downward direction with the arm and is thus thrown automatically out of the path of the material which is cut or severed by the knife-blade, whereby the material may be discharged without hindrance from the gage through the slotted bottom of the frame 10. The gage may be adjusted manually toward or from the plane of the knife-blade on releasing the binding-screw by hand, moving the shank in the socket of the hanger-arm, and again tightening the screw; but in all adjustments of the gage it remains fast with or attached to the knife-arm, so as to travel therewith and with the knife-blade thereon.

In Figs. 5 and 6 of the drawings I have represented another embodiment of the adjustable gage, which embraces the generic features of the gage represented by Figs. 1 to 4, inclusive—that is to say, the gage is attached to the knife-arm to maintain its relative position to the knife-blade and to travel with the knife-arm in its swinging adjustment; but the detailed construction of the gage is varied somewhat. The gage 29 in this embodiment of the invention is integral with the hanger 30, the parts being preferably cast in a single piece, and the hanger is made separate from the knife-arm. This hanger has a slidable and interlocking connection with the knife-arm by forming a dovetailed groove 30ª in the lower edge of the knife-arm and by providing a dovetailed rib 32 on the upper end of the hanger 30. The rib of said hanger is slidably fitted in the dovetailed groove of the knife-arm for the hanger and gage to be adjustable toward or from the knife-blade, and the hanger is made fast in its adjusted position by the employment of a binding-screw 33, which preferably is supported in a part of the hanger in a position to be tightened against the knife-arm.

It will be noted that in Figs. 1 to 4, inclusive, the shank of the gage has interlocking slidable connection with the hanger and that a like connection is provided between the hanger and knife-arm in Figs. 5 and 6. This is advantageous, because the gage is prevented from turning in a vertical plane out of position should the binding-screw work loose, and the gage is thus adapted to be held in parallel relation to the knife-blade at all times, so that the only displacement possible to the gage is a lateral one toward or from the knife-blade in the event of loosening of the screw.

In the modification represented by Figs. 9 and 10 the hanger-arm 35 is provided in one side or face thereof, at its lower end, with a transverse groove 36, and in this groove is fitted the arm 37 of the gage 38. Said gage-arm has a longitudinal slot 39, and through the slot passes the bolt 40, which also extends through the recessed or grooved part of the hanger-arm, the end of the bolt receiving the clamping-nut 41. The gage-arm is thus adapted to have interlocking engagement with the hanger-arm, and it may be adjusted thereon to change the distance of the gage relatively to the plane of the knife.

My invention further contemplates the employment of means for feeding the material positively along the table and into the path of the reciprocating knife, and in the drawings I have represented different devices for reciprocating the feeder by motion derived from the crank-shaft 13 and for guiding the feeder in its reciprocating plate within the feed-table.

In Figs. 1, 2, 3, and 5 the feed-table of the machine is divided into two sections 41, which are arranged to form an intermediate space or slot 42 for the reception of the feeder. This feeder is represented as consisting of the plate or board 43, lying in the horizontal plane of the sectional table between the side rails of the machine-frame, the width of said feeder-plate 43 being nearly equal to that of the frame. The length of the feeder-plate is less than the slot or space 42 in order that the feeder-plate may have a limited reciprocating movement in said space, and on the upper surface of the feeder-plate it is provided with a number of teeth or rakes 44, said teeth being of any suitable construction, but preferably made from sheet metal. On the upper section of the divided feed-table is secured a plate 45, which is arranged to overlap the end of the reciprocating feeder-plate, and to the lower or opposite edge of the feeder-plate itself is secured a plate 46, which is arranged to overlap the lower section of the feeder-table. The plate 45 occupies a stationary position in the feeder-table, while the plate 46 is arranged to play or move with the feeder-plate over the other section of said feed-table. These two plates prevent the material from passing into the space or slot 42 of the feed-table, and the material is thus kept from lodging in the slot to interfere with or obstruct the free movement of the automatic feeder. The two plates also serve to carry the material across the slot 42, so that the material will be properly advanced by the teeth or rake on the feeder-plate. The space or slot 42 is spanned by a transverse bar 47, which is fixed between the side rails of the machine-frame, and said bar lies below the plane of the feeder-plate in order that the latter may rest on the bar and be supported thereby in proper relation to the sections of the feed-table. The feeder-plate 43 is provided on its lower side with a guide-bar 48, which is firmly secured in place on said feeder-plate, and this guide-bar is slidably fitted in a notch 49 of the transverse bar 47 and in a notch 48^a of the frame 50, that supports the feed-table.

To prevent the material from passing between the side edges of the reciprocating feeder and side rails of the machine-frame, I provide the overhanging fenders 51, which are arranged to close the space between the frame-rails 12 and the side edges of said feeder 43. One means for reciprocating the feeder automatically consists in providing eccentrics on the crank-shaft 13 and in the employment of levers which are operated by the eccentrics and are connected with the feeder-plate 43. The shaft 13 is provided with eccentrics 52, which lie on opposite sides of the crank of said shaft and are arranged adjacent to the bearings 14 on the side rails of the frame, in which bearings the crank-shaft is mounted. The levers 53 are disposed in upright positions within the side rails of the frame and in operative relation to the eccentrics 52. Said levers are fulcrumed, as at 54, to the frame-rails 12, and the upper ends of the levers are provided with forks or yokes 55, which are arranged to loosely embrace the eccentrics 52 on the crank-shaft. The levers are connected with the reciprocating feeder 53 through the medium of pitmen 56, said pitmen having their front ends pivoted, as at 57, to the lower ends of the upper levers 53, while the other ends of the pitmen are pivoted at 58 to the reciprocating feeder 43. The levers and eccentrics are arranged and proportioned to reciprocate the feeder 56 in a direction toward the knife-bar and lengthwise of the feed-table. The forward movement of the feeder 43 takes place on the upward travel of the knife-bar in order that the material may be advanced by the feeder into a position below the blade; but the eccentrics move the levers and pitmen to force the feeder in a rearward direction away from the knife-bar when the latter approaches the limit of its downward stroke.

In Fig. 11 of the drawings the feed-table 60 is provided with a rail or bottom having the longitudinal slots 61 to receive the guide-lugs 62, which are secured on the bottom of the reciprocating feeder, said slots and lugs cooperating to direct the feeder in its reciprocating play.

In lieu of the pitmen and levers represented by Figs. 2 to 5, inclusive, I may employ a bail 63, which has its ends pivoted to said feeder, and this bail is connected operatively with a slotted arm 64 on the knife-bar 16. The arm 64 extends upwardly from the knife-bar, and in it is formed a slot 65 to receive the cross-bar of the connecting-bail 63. In operation the knife is allowed a limited travel in a vertical direction before actuating the bail and the feeder, whereby the knife-bar will be raised half its distance before the feeder is moved forward to advance the material. In like manner the knife-bar travels half its distance on the downstroke before the feeder is returned or moved backward, thus insuring the proper operation of the feeder.

Although I have shown and described my improvements in connection with an automatic feed mechanism, I may use an ordinary feed-table or a corn-chute similar to those now in use. My improved gage devices may be employed in feed-cutters generally, and parts of the improvements may be used without the whole.

Changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What I claim is—

1. A feed-cutter comprising a slotted table, a reciprocating feeder-plate let into said table and lying flush therewith, the teeth fast with the table and inclined therefrom to feed the material in one direction and free to travel in a backward direction without drawing back the material, plates covering the table-slot

unoccupied by the feed-board, a crank-shaft, connections between the crank-shaft and the feeder-plate to reciprocate the latter, and a movable knife, substantially as described.

2. A feed-cutter comprising a slotted table, a reciprocating feeder-plate let into said table and lying flush therewith, teeth fast with the table and inclined upwardly therefrom, plates covering the table-slot unoccupied by the feed-board, a knife-arm having a knife, a crank-shaft provided with the eccentrics and connected with said knife-arm, the levers having the yokes embracing the eccentrics and pivoted to the table-frame to extend below the latter, and the pitmen pivoted to the levers and the feeder-plate, substantially as described.

3. A feed-cutter comprising a slotted table, a guide-rail below said table, a reciprocating feeder-plate let into said table to lie flush therewith and slidably engaging with said guide-rail, the forwardly-inclined teeth secured to the upper side of the feeder-plate, plates attached to the table and the feeder-plate to cover the slots in said table unoccupied by the feeder-plate, a crank-shaft, a knife-arm actuated by said shaft, and connections between the crank-shaft and the feeder-plate, substantially as described.

4. A feed-cutter comprising a slotted table, a reciprocating feeder-plate slidably confined in said table to lie flush therewith and provided with the upwardly and forwardly inclined teeth, a knife-arm arranged in the direction of the length of the table and carrying a knife, a crank-shaft connected with the knife-arm, operative connections from said crank-shaft to the reciprocating feeder-plate, a hanger-arm depending from the knife-arm near its free end, a gage, a shank fast with the gage and fitted adjustably in said depending hanger-arm, and a clamping-screw for holding the shank and gage adjustably on the hanger-arm, substantially as described.

5. A feed-cutter comprising a slotted table, a reciprocating feeder-plate let into said table and provided with the upwardly and forwardly inclined teeth, plates covering the table-slot unoccupied by the feed-plate, a pivoted knife-arm arranged in the direction of the length of the table and having a knife, a hanger-arm fast with and depending from the knife-arm near its free end and provided with a socket, a gage having a shank which has interlocking connection with said socket, a binding-screw supported by the hanger-arm and engaging the gage-shank, a crank-shaft connected with the knife-arm, and operative connections between the crank-shaft and the feeder-plate, 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.

JACOB A. HANGER.

Witnesses:
F. B. KENNEDY,
THOS. D. WOODWARD.