(No Model.)

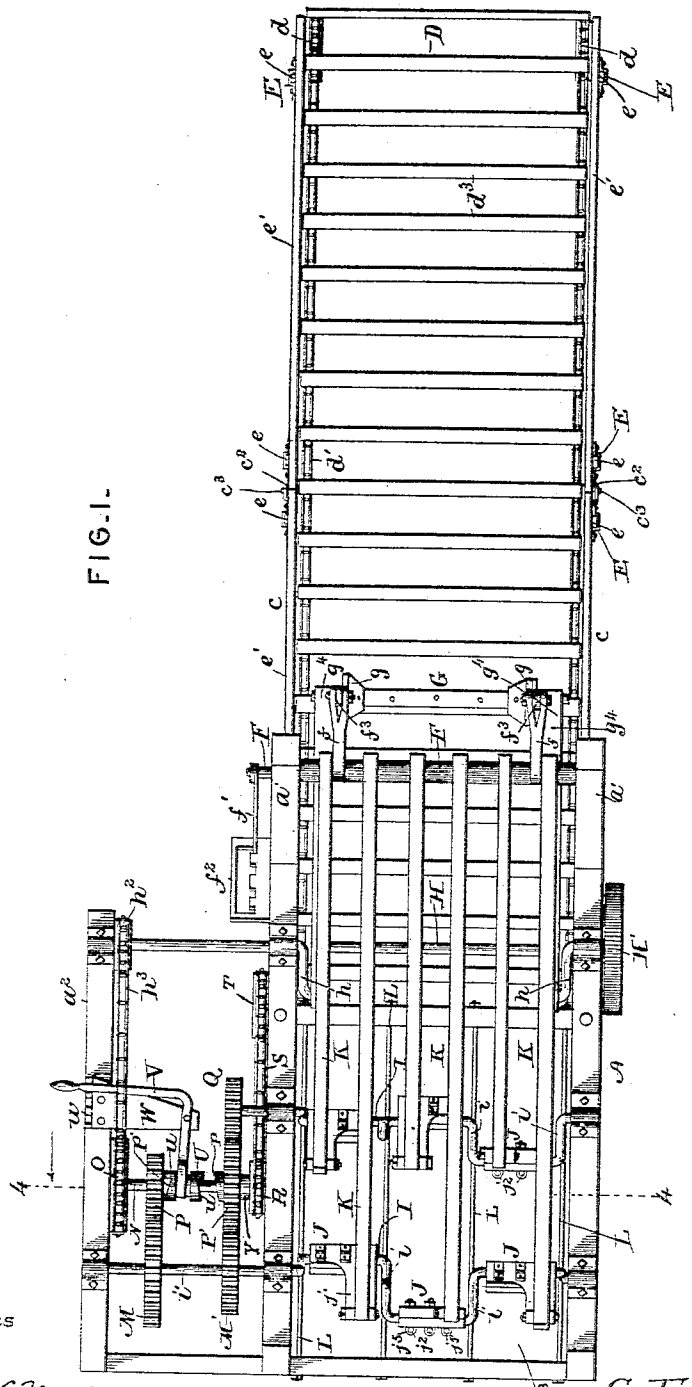
3 Sheets—Sheet 1.

C. F. HAWKINS.

BAND CUTTER AND FEEDER.

No. 489,679. Patented Jan. 10, 1893.

FIG. 1.



Witnesses

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(No Model.)

3 Sheets—Sheet 2.

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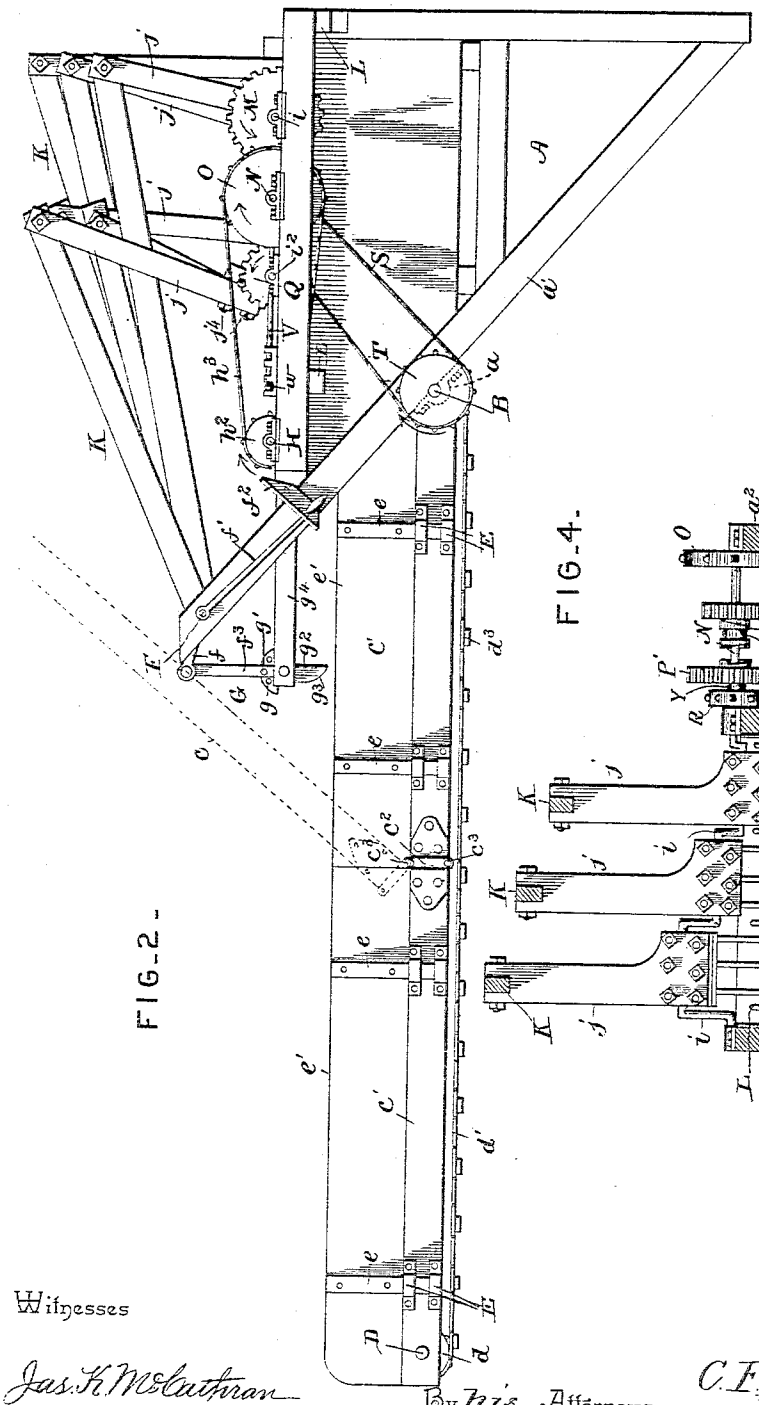

FIG. 2.

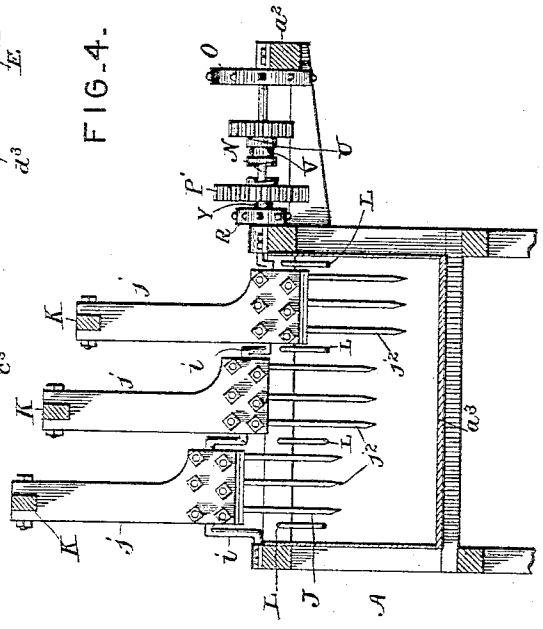

FIG. 4.

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(No Model.) 3 Sheets—Sheet 3.

C. F. HAWKINS.

BAND CUTTER AND FEEDER.

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FIG. 3.

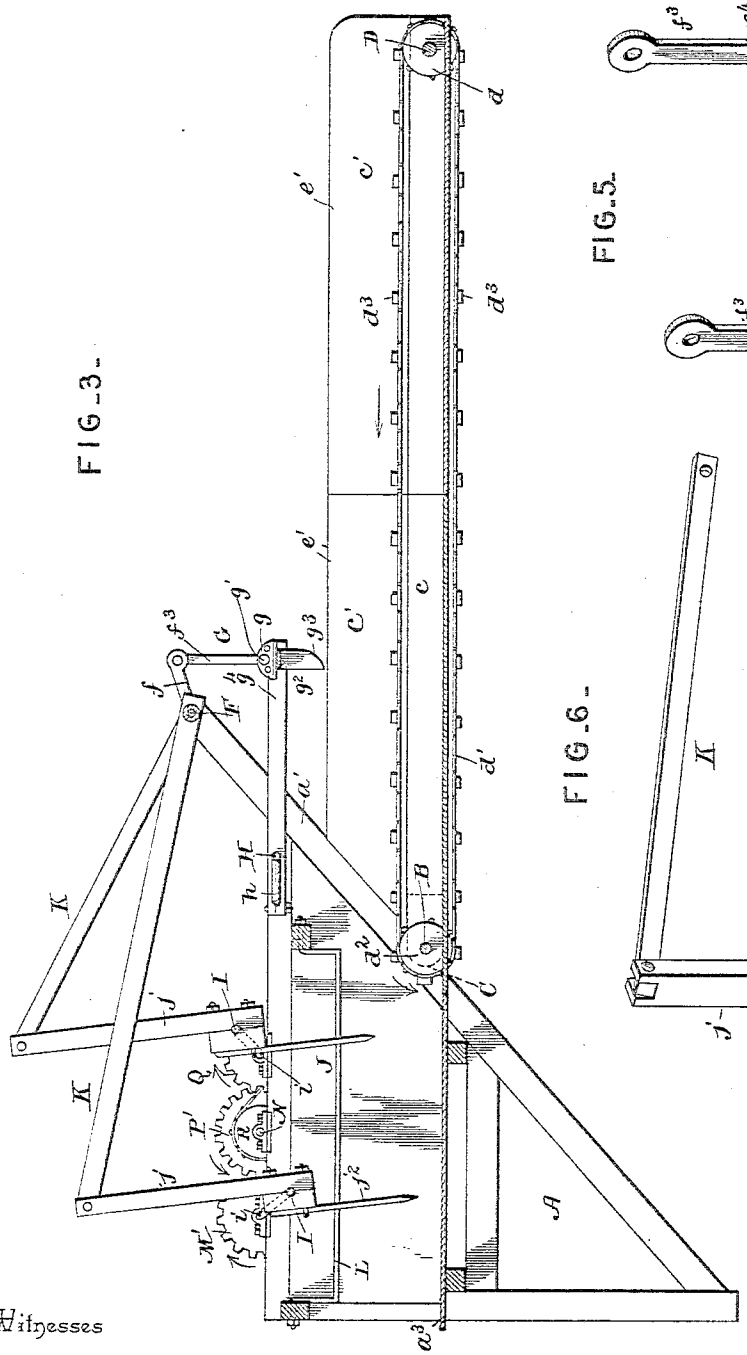


FIG. 5.

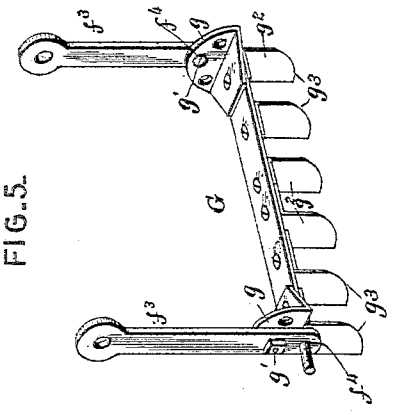
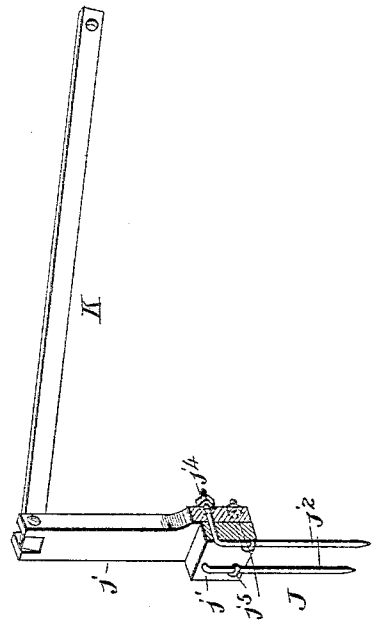


FIG. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES F. HAWKINS, OF ST. JOHN, KANSAS.

BAND-CUTTER AND FEEDER.

SPECIFICATION forming part of Letters Patent No. 489,679, dated January 10, 1893.

Application filed July 28, 1892. Serial No. 441,511. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. HAWKINS, a citizen of the United States, residing at St. John, in the county of Stafford and State of Kansas, have invented a new and useful Band-Cutter and Feeder, of which the following is a specification.

This invention relates to band cutters and feeders for thrashing machines; and it has for its object to provide an improved machine of this character which shall secure the results aimed for in a more effective and thorough manner than by the use of the ordinary machines for cutting the bands and feeding the grain to the cylinder of the thrasher.

To this end the main and primary object of the invention is to provide band cutting and feeding devices which will not only certainly cut the bands of the bundles and spread the grain, but will also at the same time positively and regularly feed the same at the rate of speed desired.

With these and many other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings;—Figure 1 is a top plan view of a band cutter and feeder constructed in accordance with the present invention. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical longitudinal sectional view thereof. Fig. 4 is a vertical transverse sectional view on the line 4—4 of Fig. 1. Fig. 5 is a detail in perspective of the adjustable knife bar. Fig. 6 is a similar view of one of the vibrating forks.

Referring to the accompanying drawings;—A represents the fixed feeder frame adapted to be secured to the cylinder end of a thrasher machine into which the grain is fed. Journaled in suitable bearings *a* at the front or outer sides of said fixed frame is the apron shaft B, which shaft loosely receives the perforated securing arms C secured to one end of the sectional apron frame *c*. The said apron frame *c* comprises the aligning sections *c'*, each having at their meeting ends the perforated hinge and securing plates c^2, which when the sections are extended and the table or frame is in use, are connected fixedly by the securing bolts c^3, one of which may act in the capacity of a hinge or pivot bolt when the other bolt is removed, in order to fold the sections of the apron frame when the same is not in use. Mounted in the extreme outer end of the apron frame is the idle apron shaft D, carrying the opposite sprocket wheels *d*, over which pass the opposite sprocket chains *d'* driven by the sprocket wheels d^2 carried by the apron shaft B at the other end of the frame. The said parallel sprocket chains *d'* are connected by the cross slats d^3 forming an endless apron working over the apron frame to convey or carry the bundles of grain from the extreme outer end of the apron to the inner fixed feeder frame as will be readily apparent. Sockets, E, are secured to opposite sides of the sectional apron frame, and are adapted to receive the projecting arms *e*, secured to the side boards *e'*, adapted to be thus removably secured to the opposite sides of the apron frame so as to hold the grain to its place during its travel over said frame.

The fixed feeder frame A, is provided with the outwardly and upwardly extended bearing arms *a'*, in which are mounted above the inner section of the apron frame *c*, the horizontal adjusting rod or shaft F, to which are fixedly secured the bifurcated arms *f*, adapted to be moved and adjusted with the rod F by means of the adjusting crank or handle *f'*, secured to one end of the rod. The said crank or handle *f'* is adapted to work within the notched bracket f^2 secured to one side of the fixed feeder frame, and providing means for holding the handle in any adjusted position. Pivotally suspended from the outer ends of the rock arms *f*, are the swinging supporting links f^3 provided with the perforations f^4, at the lower ends of the same, the lowermost perforations receiving the rounded ends of the adjustable knife bar G, adjustably mounted on said lower ends of the swinging links by means of the perforated adjusting segment plates *g*. The said segment adjusting plates *g*, are fixedly secured to the upper side of the knife bar G adjacent to the opposite links f^3, and are adapted to receive the adjustment bolts *g'* engaging any one of the series of perforations in said plates and the uppermost perforations at the lower end of

said links so that the knives g^2 secured to the underside of said knife bar can be adjusted to any angle desired so as to place the same in the proper cutting position for bound grain and also to set the same in a retarding position for bunches of loose grain so that the knives will act in the capacity of a spreader to level out the bunches. The said knives g^2 have sharpened rounded cutting edges g^3 which are carried into the grain and across the bands as the same passes thereunder, and the same are swung back and forth or reciprocated by means of the opposite connecting bars g^4. The said connecting bars g^4 are loosely connected at one end to the opposite rounded extended ends of the knife bar outside of the swinging links, and at their other ends are loosely connected to the knife operating crank shaft H. The knife operating crank shaft H is mounted upon the fixed feeder frame A in rear of the bearing arms a', thereof, and is provided with the opposite cranks h, which are connected with the ends of said connecting bars so as to swing the knife carrying frame back and forth as the cranks revolve. To one end of the crank shaft H is secured the band wheel H′ which is driven by a suitable belt from the separator so as to impart motion to the various parts of the feeder, while to the opposite end of said shaft is secured the small chain or sprocket wheel h^2, over which passes the endless sprocket chain h^3, which communicates motion to the other parts of the feeder to be presently described, the sprocket wheel end of said crank shaft being extended across and mounted upon the lateral gearing frame a^2 extended from the top and one side of the fixed feeder frame A.

Journaled in suitable bearings upon the top of the fixed feeder frame A in rear of the forward crank shaft H, are the parallel crank shafts I arranged as close as possible to each other and to the cylinder end of the thrashing machine, and each of said crank shafts are provided with a series of cranks i, which are out of line with each other upon their own respective shafts and alternately disposed with relation to the corresponding crank of the other shaft. The said crank shafts are adapted to be revolved in the same direction and the several cranks of each shaft are adapted to carry the feeding forks J, pivotally mounted thereon. The said forks J are provided with upper bifurcated fork arms j, and the lower removable tine heads j'. The said tine heads j' receive the upper right angularly disposed threaded ends of the depending pointed tines j^2, that are adapted to travel over and in close proximity to the flat floor a^3 within said fixed feeder frame. The upper threaded ends of said tines are adapted to project through the heads j' and the lower ends of the fork arms j, and receive the clamping nuts j^4, engaging the ends, to clamp the tine heads to the fork arms and the forks to the several cranks of said feeding crank shafts, while the tines themselves are held in regular spaced positions by means of the clip bolts j^5, passing thereover and through said tine heads. The specific construction of feeding forks described are thus pivotally connected, approximately at their centers, to the parallel feeding crank shafts, which as they revolve must necessarily carry the fork tines through a circular movement and which comb through the grain and evenly spread and distribute it to the cylinder of the thrasher, while the close arrangement of the several forks to each other and to the cylinder of the thrashing machine prevent the cylinder from jerking clumps of wet grain or wet grown sheaves past the same, before they have been combed out by said forks. The several forks are held in position, and a vibratory motion imparted to the same by means of the swinging fork bars K. The said fork bars K are of different lengths, as is necessitated by the position of the two crank shafts I, and are pivotally mounted at one end upon the rock shaft F while their other free ends are pivotally mounted in the upper bifurcated ends of the fork arms so that as the crank shafts I revolve, the several forks revolve toward and away from each other in a circular vibratory movement in order to insure the even spreading and feeding of the grain to the separator.

In order to prevent the grain passing through the fixed feeder frame A from working up into the cranks of the shafts I, and the tines of the forks and thereby clogging the same, fender bars or strips L are arranged lengthwise of the fixed feeder frame above the table a^3, therein, and are regularly spaced from each other so that the tines of the forks work between the same and are thereby freed from any grain which they may carry upon their upward movement.

The crank shaft I nearest the cylinder end of the thrashing machine is provided with an extended portion i', extending across and journaled upon the lateral extension frame a^2, and carries the cog wheels M and M′, securely mounted upon the same and of different diameters, the wheel M being of larger diameter than the wheel M′. Parallel with the extended shaft portion i' of the innermost crank shaft I, and journaled in suitable bearings upon the extension a^2, is the counter drive shaft N, upon one end of which is securely keyed the sprocket wheel O over which passes the endless sprocket chain h^3 which thereby communicates movement to said counter drive shaft. Loosely mounted upon the drive shaft N are the cog-wheels P, and P′ respectively, the wheel P being smaller than the wheel P′ and meshing with the larger cog wheel M upon the crank shaft extension i', while the other cog wheel P′ meshes with the wheel M′, upon said crank shaft extension, which latter wheels are of the same diameter. The cog-wheel P′ also meshes with an adjacent same sized cog wheel Q, mounted upon one end of the outermost crank shaft I so that both of said crank shafts will

be simultaneously revolved in the same direction and always at the same speed, while said cog-wheel P′ is further provided at one side with a sleeve extension Y carrying at its end the small sprocket wheel R, which in turn drives the endless chain belt S, working over the sprocket wheel T, secured to one end of the apron shaft B so as to communicate motion to the endless apron of the feeder frame.

Mounted to slide upon the counter drive shaft N between the cog wheels P and P′, is the clutch sleeve U provided with opposite clutch faces *u*, adapted to be thrown into engagement with either of the clutch faces *p* or *p′*, upon one side of the cog-wheels P and P′ respectively. The said clutch sleeve U, is mounted upon the counter drive shaft so as revolve therewith and is controlled by means of the bifurcated lever V. The said bifurcated lever V is pivotally mounted upon the bracket W, having a notched flange *w*, at one end in which the said lever is designed to be placed in order to hold the clutch into engagement with either of the cog-wheels noted, or out of engagement with both. Now it will be readily seen that when the clutch is out of engagement with both of said cog wheels the knife carrying frame is alone moved which may be done when it is desired to stop the feeder when choking occurs in the separator. But on the other hand as the clutch sleeve, which is driven by said counter drive shaft, is thrown into engagement with either of the different sized cog wheels P and P′, the speed of the carrier apron and the movement of the several forks are correspondingly increased or lessened according to the diameters of said cog-wheels, it being obvious that when the wheel P is brought into play, the whole gearing is speeded slower through M, and, vice versa, when the clutch is thrown into engagement with P′ only, the wheel M is not in use and the speed of the gearing is therefore increased.

The construction of the several parts of the herein described band cutter and feeder has been detailed, and the advantages and operation thereof mapped out, and it is therefore thought that the many advantages of the same will readily suggest themselves without further description.

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

1. In a feeder for thrashing machines, a folding sectional apron frame, comprising aligning sections, overlapping perforated hinge and securing plates secured to the meeting ends of said sections, securing and pivot bolts clamping the overlapping plates together, either one of said bolts being adapted to be removed to place the hinge or pivot of the frame upon the other bolt, and an endless carrier moving over said frame, substantially as set forth.

2. In a band cutter and feeder, the combination with a fixed feeder frame, of the endless carrier frame pivotally connected to said fixed frame and delivering into the same, a radially adjustable swinging knife carrying frame mounted upon said fixed frame and adapted to be swung over said carrier, and means for swinging said radially adjustable knife frame, longitudinally of the carrier substantially as set forth.

3. The combination with an endless carrier; of an adjustable rod or shaft mounted above said carrier and carrying arms, swinging links suspended from said arms and having lower perforated ends, a radially adjustable knife carrying bar having journaled ends loosely mounted in the lower perforations of said links, perforated adjusting segments connected to said knife bar near each end, adjusting bolts engaging any one of the series of perforations in said segments and the perforations in said links, and means for swinging said links, substantially as set forth.

4. In a band cutter and feeder, the combination with a fixed feeder frame and endless carrier connected therewith, of the stationary adjustable rod or shaft mounted in said fixed frame above the carrier and carrying arms, swinging links loosely suspended from said arms, a radially adjustable knife carrying bar adjustably mounted in the lower ends of said links, a series of cutting knives secured to said knife bar, a double crank shaft mounted upon said fixed frame in rear of and below said rock shaft, and connecting bars or rods loosely connected with the cranks of said shafts and said swinging links, substantially as set forth.

5. In a band cutter and feeder, the combination with the fixed frame having a flat floor, and the endless carrier leading to one end of said floor; of the swinging band cutting knives suspended from the fixed frame above said carriers and adapted to move longitudinally thereof, parallel crank shafts journaled upon the top of said fixed frame near the cylinder end of the thrasher and provided with a series of cranks out of line with each other and alternately arranged with respect to the cranks of the opposite shaft, vibrating forks pivotally clamped at or near their centers on each of the cranks of the said shafts and adapted to vibrate directly over and in close proximity to the flat floor in the fixed frame, a fixed or stationary rod or shaft mounted at one end of the fixed frame, swinging or connecting bars pivotally mounted at one end on said stationary rod or shaft and having their other ends pivotally connected to the upper ends of the forks above the crank shafts, speed gearing connected with said crank shafts and adapted to turn both of the same in one direction and means for changing the rate of speed of said crank shafts, substantially as set forth.

6. The combination with the feeder frame having a floor, of the parallel crank shafts mounted upon said feeder frame over the floor and provided with a multiplicity of cranks, feeding forks pivotally and remov-

ably clamped upon said cranks and having upper bifurcated fork arms, lower removable tine heads, and the tines having upper right angularly disposed threaded ends passing through said heads and the fork arms, nuts engaging the projecting threaded ends of the tines, and removably clamping the heads to the fork arms, a fixed rod or shaft mounted at one end of said frame, and swinging fork bars pivotally mounted at one end upon said fixed rod or shaft and at their other ends in the upper bifurcated ends of said fork arms, substantially as set forth.

7. The combination with the feeder frame and endless carrier; of the apron or carrier shaft having a sprocket wheel at one end, a swinging knife frame, a double crank shaft connected to said knife frame and having an extension at one end carrying a sprocket wheel, a counter drive shaft mounted upon said frame extension and carrying a sprocket wheel at one end, a chain connecting the crank shaft sprocket with the latter sprocket wheel, the parallel fork carrying crank shafts mounted upon said frame and one of which is provided with an extension carrying cog wheels of different diameters, a cog wheel mounted upon one end of the other crank shaft, cog wheels of different diameters loosely mounted upon said counter shaft and provided with inner clutch faces and adapted to mesh with the cog wheels of the crank shafts adjacent thereto, one of said loose cog wheels being connected to a sprocket wheel, an endless chain passing over said latter sprocket wheel and the apron shaft sprocket, and a sliding clutch sleeve mounted to slide upon said counter shaft between said loose cog wheels and to engage either one of the clutch faces thereof, substantially as set forth.

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

CHARLES F. HAWKINS.

Witnesses:
J. R. HAWKINS,
J. F. GUERNSEY.