

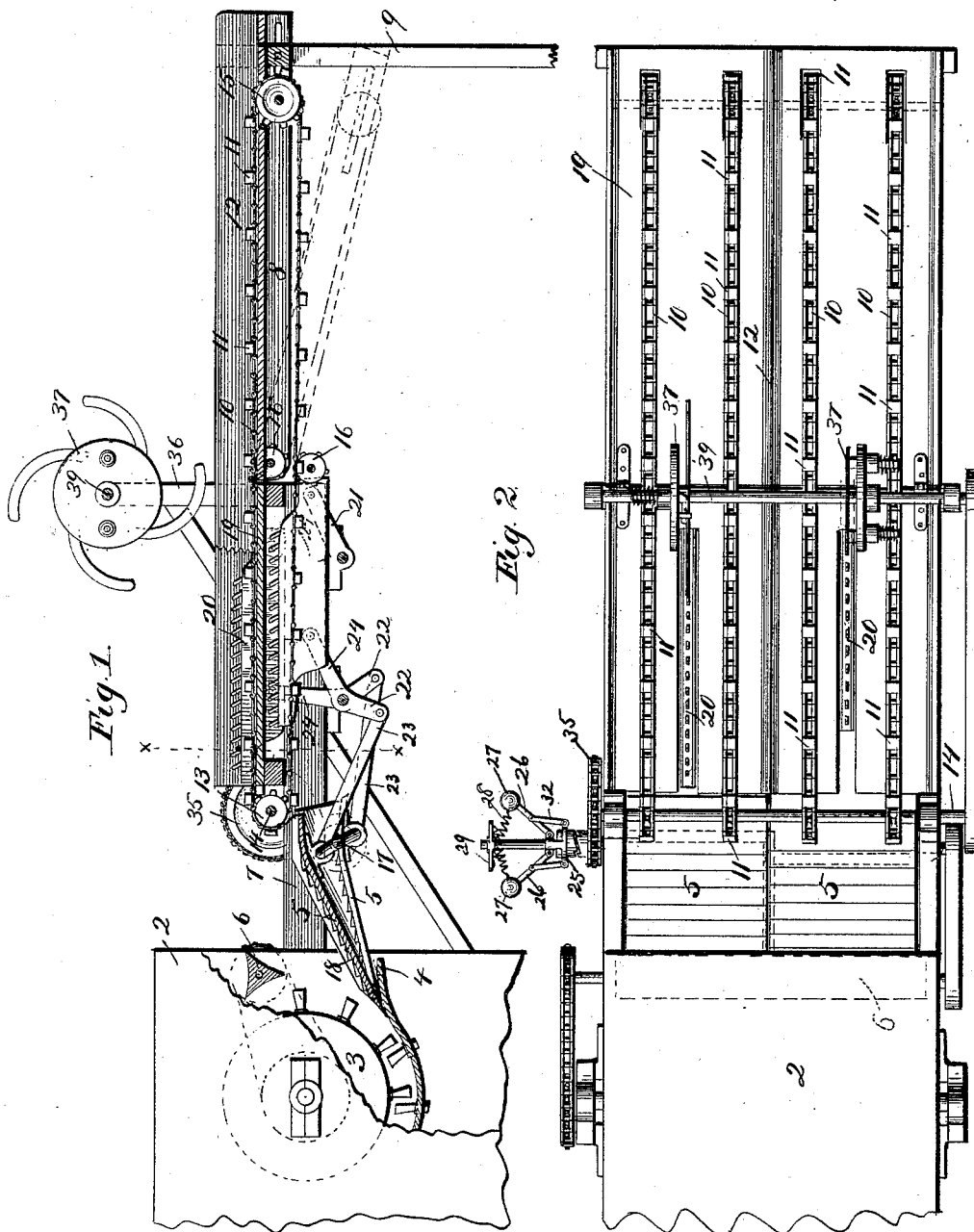
(No Model.)

2 Sheets—Sheet 1.

E. B. KARN.  
BAND CUTTER AND FEEDER.

No. 422,839.

Patented Mar. 4, 1890.



Witnesses.

J. Jensen  
G. Booth

Inventor.

Edwin B. Karn.

By Paul W. Warrick attys.

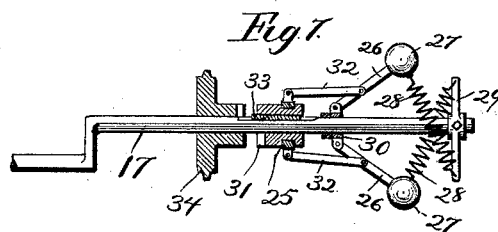
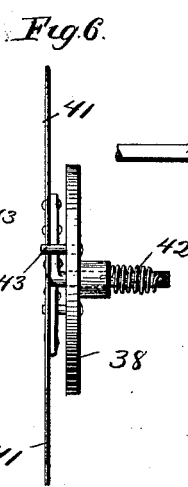
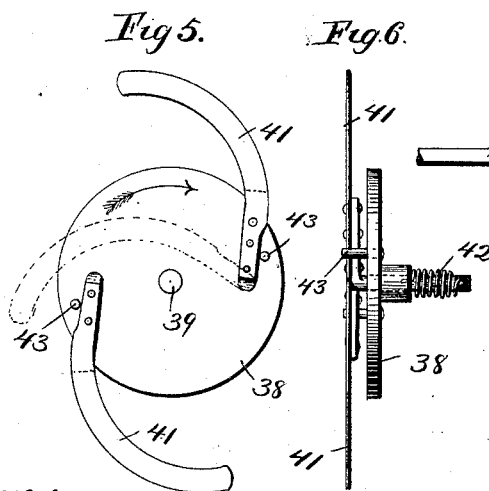
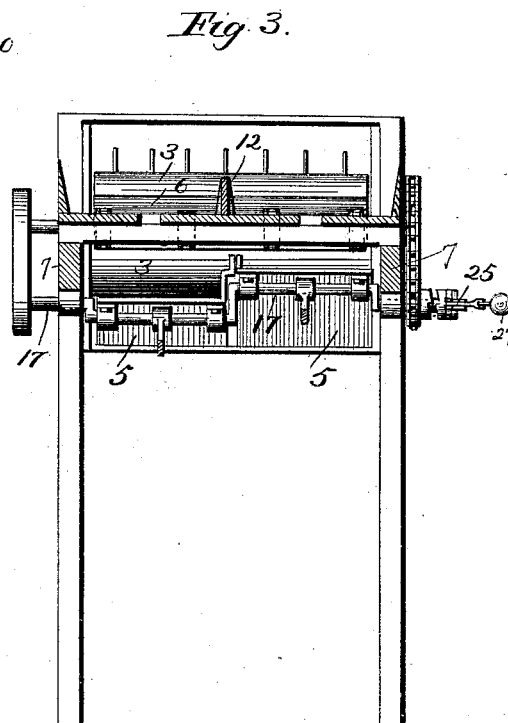
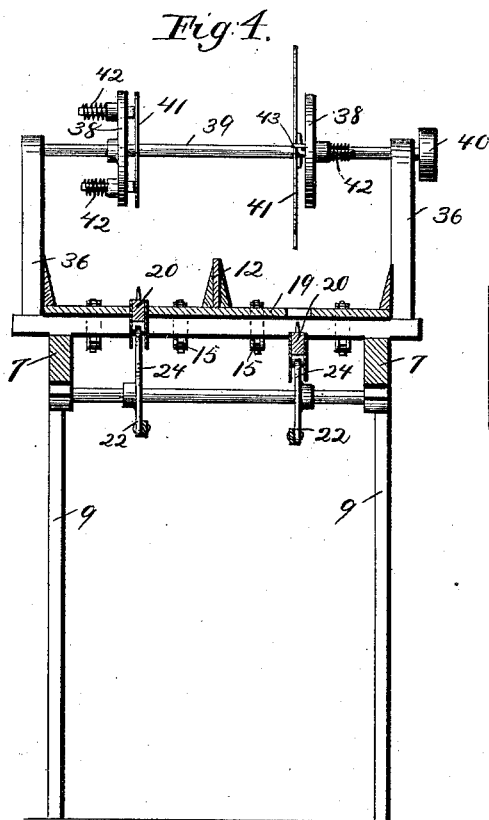
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# UNITED STATES PATENT OFFICE.

EDWIN B. KARN, OF AMHERST, (DAKOTA TERRITORY,) SOUTH DAKOTA.

## BAND-CUTTER AND FEEDER.

SPECIFICATION forming part of Letters Patent No. 422,839, dated March 4, 1890.

Application filed July 1, 1889. Serial No. 316,135. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN B. KARN, of Amherst, Marshall county, Dakota Territory, have invented certain Improvements in Band-Cutters and Feeders, of which the following is a specification.

My invention relates to attachments to thrashing-machines; and its object is to provide improved means for automatically cutting the bands of bundles of grain as delivered to it and loosening and dividing the bundles and delivering them to the thrashing-machine; and it consists, generally, in the construction and combination hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of my improved band-cutter and feeder as attached to a thrasher. Fig. 2 is a plan view of the same. Figs. 3 and 4 are vertical cross-sections of the same on line *xx* of Fig. 1, Fig. 3 being the view looking toward the thrasher, and Fig. 4 the view looking in the opposite direction. Figs. 5 and 6 are respectively side and end elevations of the cutter-head, and Fig. 7 is a detail of the governor.

In the drawings, 2 represents a portion of the thrashing-cylinder case, a part of its wall being broken away to show the cylinder 3.

4 is a projecting shelf or lip, on which is supported the oscillating feed-tables 5.

6 is a beater-roll arranged above said feed-tables and in front of said thrashing-cylinder.

7 is the frame of the band-cutter attachment, which is secured to the thrasher and supported in any suitable manner in a preferably horizontal position. It is also preferably jointed or hinged near its center, whereby its outer portion 8 may be raised or lowered to any desired position, so as to receive the grain at any convenient elevation, its outer end being adjustably supported upon the standard 9. Arranged longitudinally of the said frame and parallel with each other are the four endless chain belts 10, provided with suitable projections or blocks 11, adapted to engage and impel the bundles of grain forward. Arranged centrally and longitudi-

nally of said frame is a partition 12, which divides the frame or platform into two parallel passages for the bundles. Suitable sprocket-wheels 13, arranged upon a common shaft 14 at the forward end of the frame, serve to drive said belts, which are carried over other sprocket-wheels 15, arranged at the outer end of the frame. Suitable idler-sprockets 16 are arranged on suitable shafts centrally and transverse of the frame to carry said belts when the hinged portion of the frame is adjusted out of alignment with the main portion of the frame.

The oscillating feed-tables 5 are supported in an inclined position, their lower or front edge resting upon the shelf 4 and their outer end supported upon the double-crank shaft 17, whereby with the revolution of the shaft an oscillating movement is given to them, the shaft 17 preferably turning in suitable bearings underneath the tables. These tables are provided, preferably, with transverse inclined slats 18, which serve to assist the movement of the grain. Arranged in slots longitudinally of the fixed feed-table 19, supported upon the frame 7, are the toothed feed-bars 20, adapted to engage the straws of the loosened bundles and to divide them longitudinally, carrying the central portions of the bundles more rapidly than the other portions, in the manner hereinafter described. These bars are supported at their outer ends upon the pivoted links 21, and at their inner ends upon the pivoted bell-crank levers 22, which are pivotally connected by the link 23 to the crank-shaft 17. The links 21 and the bell-crank lever 22 are supported underneath said frame in the same horizontal plane and with the pivots connecting them to the bars 20 of equal distances from their supports, the links and the arms 24 of the levers being parallel with each other, so that as motion is imparted to the bars 20 by the oscillation of the levers 22 the bars are maintained in a horizontal position in their vertical and longitudinal movement.

The crank-shaft 17 is driven continuously in the operation by suitable belt or other connection with the thrasher machinery. Arranged upon one end of said crank-shaft I prefer to place the governor 25, having its arms 26 provided with suitable weights 27,

and having opposite spring-connection 28 with the cross-bar 29, the arms 26 being pivoted to a fixed support 30 upon said shaft. The clutch-block 31, having link-connections 5 32 with the arms 26, is adapted to slide upon said shaft, but is held from turning upon the same by the spline 33, so that as the speed of the shaft 17 increases and the arms 26 are thrown outward the block 31 is advanced on 10 the shaft to engage with the loose sprocket-wheel 34. This wheel carries a suitable belt, which passes over the sprocket-wheel 35, rigidly secured to the shaft 14, carrying the sprockets 13. By this means the sprockets 13 15 are not moved so as to carry their belts forward until the machinery has attained a certain predetermined speed which is sufficient for the proper accomplishment of its work. Consequently the bundles of grain are not 20 carried forward and delivered to the thrasher excepting when the machine is going at a sufficiently high speed.

Arranged upon the transverse shaft 39, which turns in suitable bearings in the stand- 25 ards 36 above the fixed feed-table 19, are the band-cutters 37, adapted to rotate in a vertical plane with their knives midway between the belts 10, as driven by suitable belt or other connection with the thrasher machinery. I prefer to arrange one of these cutter- 30 heads above each of the passage-ways formed by the partition 12. While any suitable form of cutter-head may be employed, I prefer to use that shown in the drawings. This consists of a circular disk 38, rigidly secured 35 upon the shaft 39, fitted with a belt-drum 40. Pivotally secured to the disk 38 on opposite sides of one of its faces near the circumference are the sickle-shaped knives 41. The 40 pivots of the knives extend through the disk and are provided with the torsion-springs 42, which tend to throw the knives outward, they being held against the tension of the spring by the loose pin 43, any desired tension of 45 the spring being given by turning the knives on their pivots and inserting the pins to serve as stops. By this means any undue pressure or resistance offered to the knives in their rotation will force them back toward the center of the disk against the tension of the 50 spring, and thus prevent any shock or strain to the machinery. While I have shown and prefer to use two such knives to each disk, a greater or less number may be used, as preferred. This spring attachment to the cut- 55 ting-knives permits of their being adjusted to act upon large or small bundles, as the case may require, by simply adjusting the tension of the spring, the cutter-head when in operation being rotated in the direction indicated 60 by the arrow in Fig. 5.

While I have shown and described my invention provided with two passage-ways for 65 delivering to the thrasher two series of bundles of grain simultaneously, it is obvious that they may be arranged for a greater or less number, as desired, there being an oscil-

lating feed-table, cutter-head, and toothed bar, and a pair of belts 10 for each passage-way or series of bundles. 70

The beater 6 is preferably of triangular fluted form and is driven at any requisite speed, in order to prevent clogging the machinery and to thoroughly distribute the grain before it reaches the cylinder. The 75 toothed bars 20 are preferably driven at a much higher speed than the belts 10, so that they cause the centers of the bundles to be advanced more rapidly than the rest of the bundle as transported by the belts. 80

Operation: The machinery being set in motion and a sufficient speed being attained to cause the belts 10 to be operated, the bundles of grain are delivered to the machine longitudinally of the table 19, and are carried for- 85 ward by the belts 10 underneath the cutter-head, where the bands are struck and severed by the rapidly-revolving knives of the cutter-head. The reciprocating toothed bars 20 thereupon seize the loosened grain in the 90 center of the bundles and carry it rapidly forward, so that the bundle is drawn out longitudinally into two or three times the length of the bundle as it is delivered to the thrasher-cylinder, the oscillating feed-tables 5 receiving 95 the grain from the belts and assisting in delivering it to the thrasher. The motion of the feed-tables is a compound motion, made up of a rotary motion, as imparted by the crank-shaft 17 to their upper or front edge, 100 and the reciprocating motion upon the shelf 4 of their lower edge, the reciprocating motion being toward the cylinder when the table is most inclined and the reverse motion when dropped to a less incline. The toothed 105 bars 20 have their teeth inclined forward, and the motion as imparted by the bell-crank levers is alternately upward and forward and downward and backward. If for any reason the speed of the machinery becomes less than 110 it should be for effective work, the link-belt-carrying mechanism is immediately thrown out of gear and stops, so as to prevent the delivery of grain to the thrasher until the necessary speed is restored and the belts 115 again set in motion.

I claim—

1. The combined cutter and feeder, comprising, in combination, a feed-table having endless belts running longitudinally thereof 120 and adapted to convey bundles of grain upon the same, reciprocating toothed feed-bars arranged between said belts, oscillating inclined feed-tables connecting said band-cutter with the thrasher and adapted to convey the grain 125 from one to the other, and rotating cutter-heads arranged above said table and adapted to sever the bands of the grain-bundles as passed underneath by the endless belts, substantially as and for the purposes set forth. 130

2. The combination, with the feed-table of a band-cutter, of inclined oscillating feed-tables adapted to convey grain from said band-cutter to the thrasher, endless belts arranged

longitudinally of said band-cutter and adapted to convey bundles of grain over the same, rotating cutter-heads arranged above said belts adapted to cut the bands of bundles  
 5 carried underneath upon said belts, reciprocating feed-bars arranged between and parallel with said endless belts and having a more rapid motion than the belts, and an automatic clutch-carrying governor adapted to  
 10 engage with the belt-carrying mechanism and to propel the same when rotated at a predetermined speed and to be disengaged therefrom when rotated at a less speed, adapted to be operated substantially as and  
 15 for the purposes set forth.

3. The band-cutter head comprising, in combination, the rotatable disk 38, the sickle-shaped knives 41, pivotally secured upon said disk, the tension-springs 42, arranged upon  
 20 the pivots of said knives, and the stop-pins 43, substantially as and for the purposes set forth.

4. In a device of the class described, the combination of the fixed feed-table 19, the  
 25 endless belts 10, arranged longitudinally thereof and adapted to be driven by the sprocket-wheels 13, rigidly secured to the common shaft 14, the cutter-head 37, arranged above said table 19 and provided with the  
 30 spring-controlled knives 41, the oscillating feed-table 5, adapted to be operated by the crank-shaft 17, the reciprocating feed-bar 20, arranged between and parallel with said endless belts pivotally connected to the link 21,  
 35 and the bell-crank lever 22, said lever having link-connection with said crank-shaft 17, adapted to be operated substantially as described.

5. In a combined band-cutter and feeder  
 40 having a fixed table with endless belts arranged to run longitudinally thereof, and band-cutters adapted to cut the bands of the bundles of grain carried over it by the endless belts, inclined oscillating feed-tables

adapted to receive the grain from said fixed  
 45 table and convey the same to the thrasher-cylinder, feed-bars arranged between said endless belts and parallel therewith and adapted to be reciprocated at a higher  
 50 speed than the movement of said belts, and mechanism by means of which the belt-carrying machinery is engaged and driven by the operating machinery only when it has  
 55 attained a predetermined speed, and is disengaged whenever such speed falls below said predetermined limit, substantially as and for the purposes set forth.

6. The combination, with a feed-table having endless belts running longitudinally there-  
 60 of and adapted to convey bundles of grain, of reciprocating feed-bars arranged between said belts, and rotating cutter-heads arranged above said feed-table and adapted to sever the bands of the grain-bundles as they are  
 65 passed over said table, substantially as described.

7. In a machine of the class described, the combination, with a suitable feed-table having carrying-belts arranged thereon, of recip-  
 70 rocating toothed feed-bars arranged between said belts and having a more rapid motion than the belts, for the purpose set forth.

8. In a machine of the class described, the combination, with a suitable feed-table hav-  
 75 ing carrying-belts extending longitudinally thereof, of suitable knives arranged to sever the bands on the bundles as the bundles are moved forward by said belts, and reciprocating  
 80 feed-bars having a more rapid motion than said belts, arranged to engage said bundles after the bands have been severed, for the purpose set forth.

In testimony whereof I have hereunto set my hand this 19th day of June, 1889.

EDWIN B. KARN.

In presence of—

A. M. GASKILL,  
 BESSIE BOOTH.