No. 647,733. Patented Apr. 17, 1900.

J. H. WARD.

AUTOMATIC BAND CUTTER AND FEEDER.

(Application filed July 22, 1899.)

(No Model.) 4 Sheets—Sheet 1.

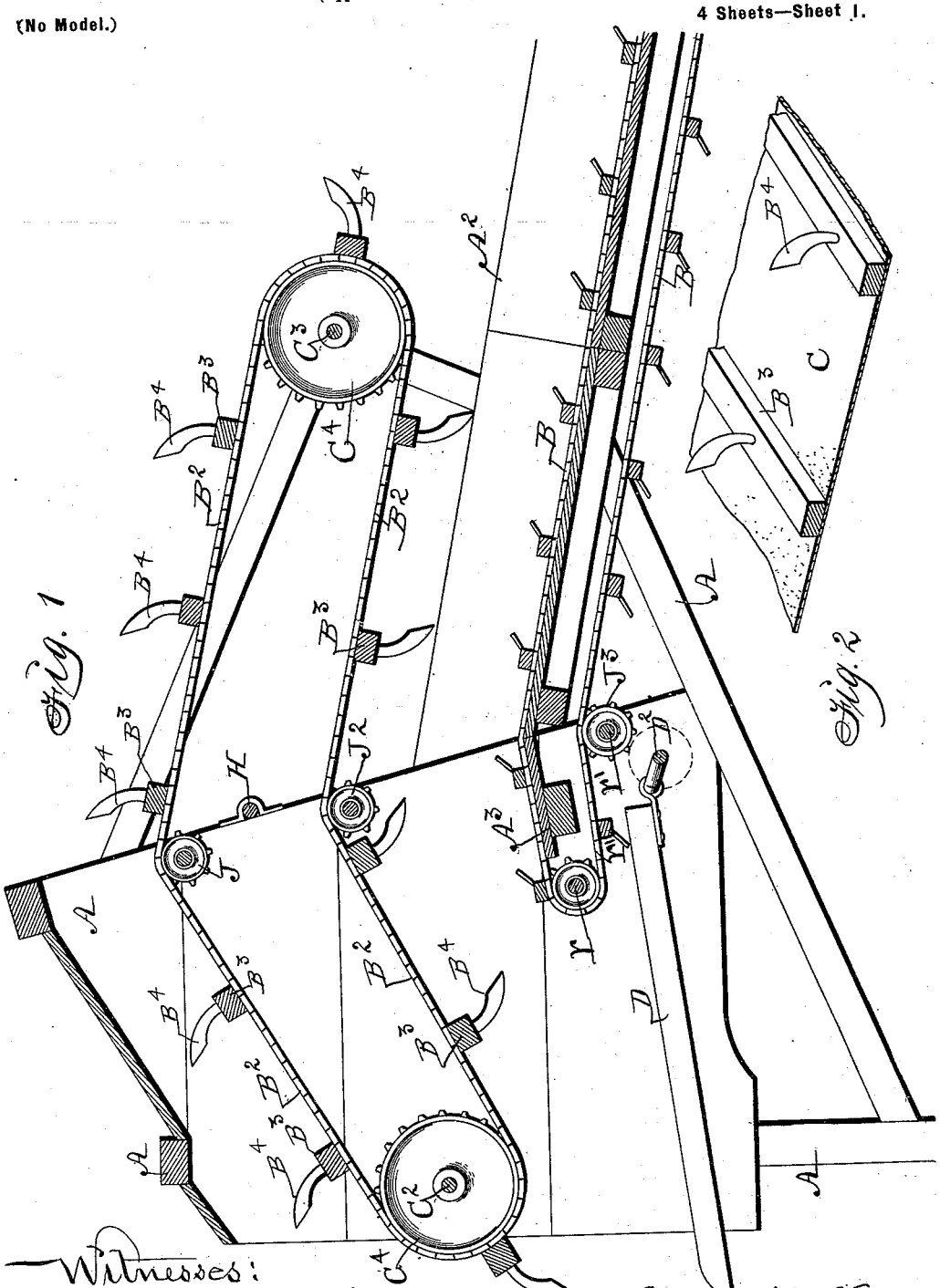

Fig. 1

Fig. 2

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Fig. 3

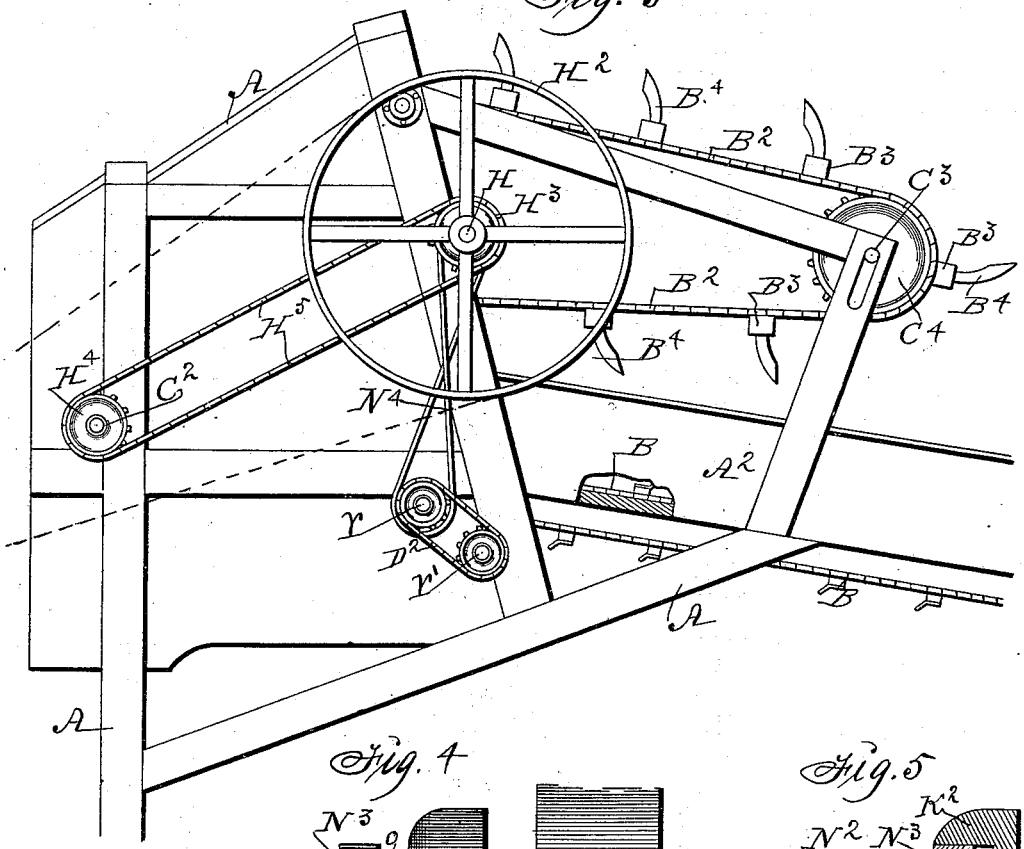

Fig. 4

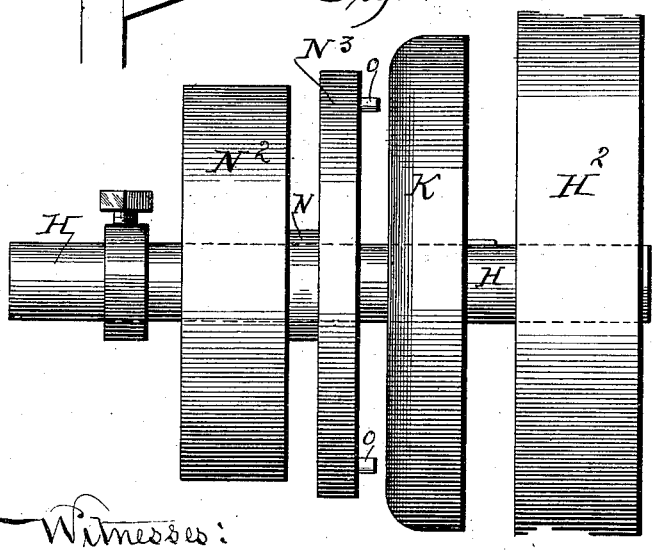

Fig. 5

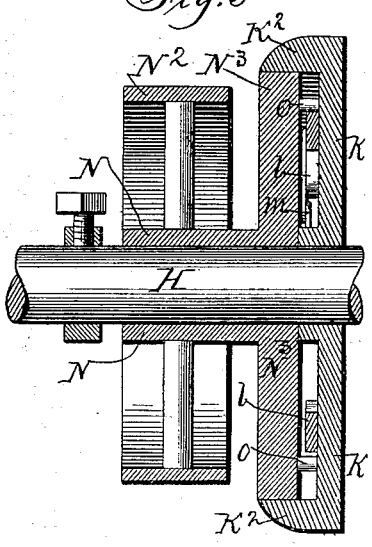

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Fig. 6

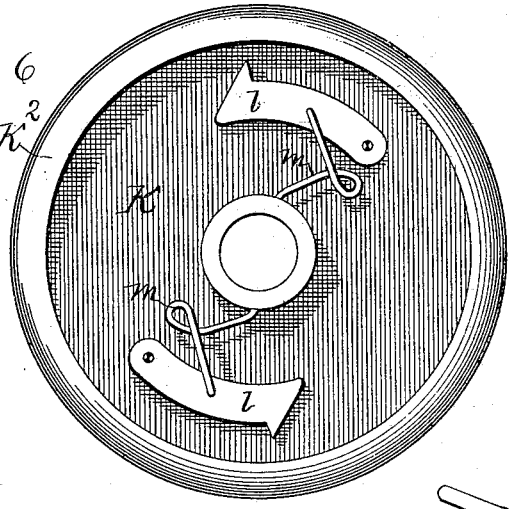
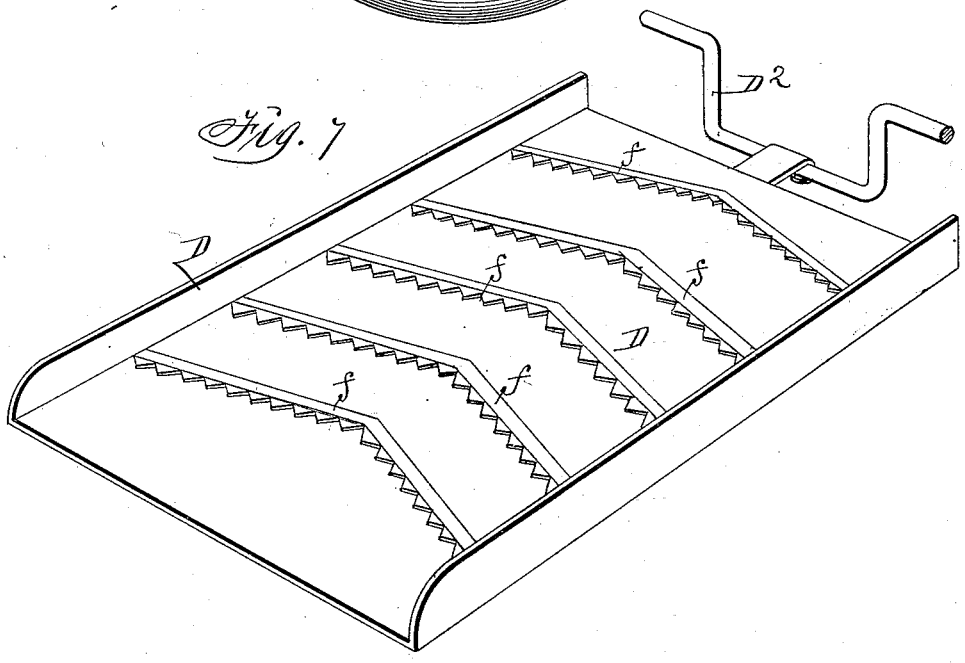


Fig. 7



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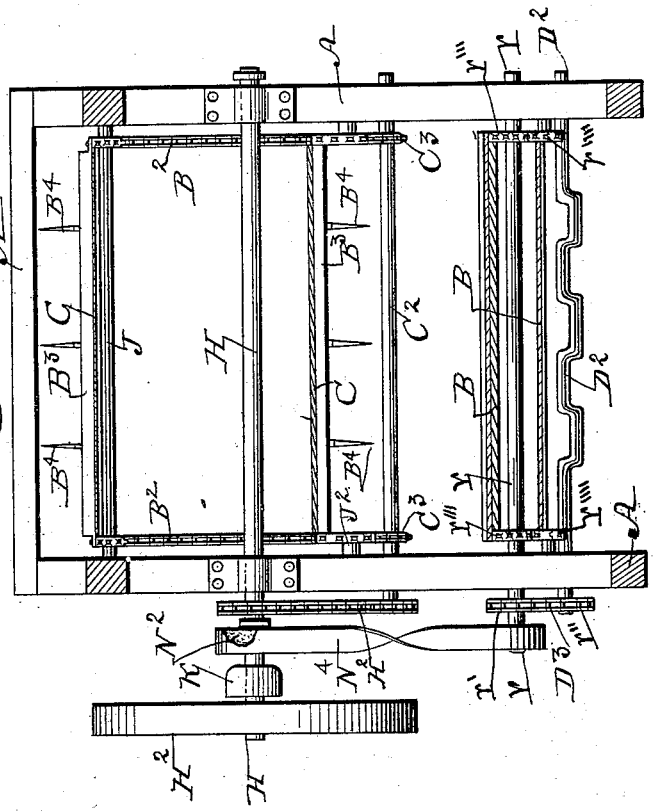
(No Model.) 4 Sheets—Sheet 4

Fig. 8



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UNITED STATES PATENT OFFICE.

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AUTOMATIC BAND-CUTTER AND FEEDER.

SPECIFICATION forming part of Letters Patent No. 647,733, dated April 17, 1900.

Application filed July 22, 1899. Serial No. 724,769. (No model.)

To all whom it may concern:

Be it known that I, JESSE H. WARD, a citizen of the United States, residing at Newton, in the county of Jasper and State of Iowa, have invented a new and useful Automatic Band-Cutter and Feeder, of which the following is a specification.

My object is to provide an improved automatic band-cutter and feeder for grain threshing and separating machines; and my invention consists in the arrangement and combination of an endless sheaf-carrier, an endless cutter-carrier, vibrating grain-carriers, and speed-governing mechanism, and a frame adapted to be connected with a thresher to coöperate the band-cutting mechanism with the cylinder of the machine, as hereinafter set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 is an enlarged longitudinal sectional view showing the relative positions of the sheaf-carrier, the cutter-carrier, and the vibratory grain-carrier. Fig. 2 is a detail view showing a piece of the endless canvas fixed to the cross-bars that connect the endless chains of the cutter-carrier. Fig. 3 is an outside side view showing how motion is simultaneously communicated to the two endless carriers and the vibrating carriers by means of a belt extended from a pulley on the end of the shaft of a thresher-cylinder. Fig. 4 is an enlarged view of the speed-governing mechanism on a rotatable shaft, and Fig. 5 is a sectional view of the same mechanism. Fig. 6 is an inside face view of the wheel, that has a variable speed relative to the driving-shaft, as required to slow and stop the motion of the sheaf-carrier. Fig. 7 is a perspective view of one of the vibratory grain-carriers connected with the crank of a rotatable shaft. Fig. 8 is a transverse view through the central portion of the machine, showing the relative positions of the shaft upon which the speed-governing mechanism is mounted, shafts that operate the cutter-carrier, the shaft at the inner end of the sheaf-carrier, and the crank-shaft to which the shakers are connected, as shown in Fig. 7.

The letter A designates the frame upon which the operative mechanisms are mounted.

A^2 is an extension of the frame A for supporting the endless sheaf-carrier B. The inner end of the solid bottom A^3, upon which the carrier B moves, is inclined downward to project over the ends of the vibratory grain-carriers, as shown in Fig. 1.

B^2 is the cutter-carrier in an arched position over the inner end portion of the sheaf-carrier B. It is composed of parallel endless chains connected by means of cross-bars B^3, in which are fixed cutters B^4. An endless canvas C is fixed on the inside of the cross-bars B^3 to prevent straw from getting into the endless cutter-carrier.

Rotatable shafts C^2 and C^3, mounted in the end portions of the frame A, have fixed mating sprocket-wheels C at their ends, upon which the chains of the carrier B^2 are supported and operated.

Reciprocating and mating grain-carriers D are connected with the cranks of a shaft D^2, located below the downwardly-inclined inner end of the sheaf-carrier B. Strips of toothed sheet metal *f* are fixed on the tops of the grain-carriers D, as shown in Fig. 7, or in any suitable way to aid in advancing straws that fall thereon toward the threshing-cylinder.

H is the driving-shaft, on the outer end of which is fixed a band-wheel H^2, that is designed to be connected with a pulley or small band-wheel on the end of the cylinder-shaft of a threshing-machine in such a manner that it will rotate at a slower speed than the cylinder.

H^3 is a sprocket-wheel on the shaft H, and H^4 is a mating wheel on the outer end of the shaft C^2, and H^5 is a chain on said mating wheels, by which motion is communicated from the driving-shaft H to the shaft C^2, as required to operate the endless cutter-carrier B^2 on the mating sprocket-wheels C^4.

J and J^2 are idler-wheels that support the cutter-carrier B^2 in an arched position over the inner end of the sheaf-carrier B, and J^3 is an idler-wheel that supports the endless carrier B under the apex of the double-inclined bottom A^3 of the sheaf-carrier B, as shown in Fig. 1.

K is a pawl-carrier in the form of a disk that has a flange K^2 at its circumference and is keyed on the shaft H, as shown in Fig. 4.

Pawls *l* are pivoted to the face of the disk in such a manner that their free ends are swung outward by centrifugal force. Wire springs *m*, fixed to the disk and the pawls *l*, as shown in Fig. 6, in their normal condition retain the pawls stationary, but yield to the centrifugal force to which the pawls become subject at times.

N is a sleeve placed loosely on the shaft H. It has an integral band-wheel N^2 at one end and a disk N^3 at its other that extends within the circumferential flange K^2 of the pawl-carrier K, as shown in Fig. 5. Pins *o* project from the face of the disk N^3 to engage the free ends of the pawls *l*.

N^4 is a twisted band on the wheel N^2 and a band-wheel on the shaft *r*, by which motion is communicated to the sheaf-carrier B by means of the sprocket-wheels on the shaft *r*. *r'* is a sprocket-wheel on the end of the crank-shaft D^2, and *r''* is a chain on the wheels *r* and D^2, that connects the end shafts, as shown in Fig. 3.

r''' represents sprocket-wheels on the shaft *r* and engage the chains of the sheaf-carrier B, and *r''''* represents idler-wheels on which the chains of the sheaf-carrier are supported. The crank-shaft D^2 is connected with the shaft *r* by means of a chain D^3 on the wheels *r'* and *r''*, as shown in Fig. 3.

In the practical operation of my invention when combined with a thresher sheaves of bound grain thrown on the endless sheaf-carrier will be advanced toward the cylinder under the endless cutter-carrier and their bands severed. The cutter-carrier being arched over the inner end portion and apex of the sheaf-carrier aids in advancing the straw over the apex of the sheaf-carrier and upon the reciprocating carrier at the same time that it cuts the bands, and the automatic mechanism, combined with the driving-shaft of the band-cutter and connected with the sheaf-carrier, regulates the speed of the sheaf-carrier as required to prevent clogging. Grain that may be loosened from the straw will fall from the sheaf-carrier upon the vibrating grain-carriers that extend from under the sheaf-carrier to the cylinder. To prevent clogging and choking by advancing the straw too rapidly, the advance of the straw will be checked by the automatic governing devices in the following manner, to wit: When the speed of the cylinder is as it should be, the force of the springs *m* will be overcome by centrifugal force and the pawls *l* will remain in engagement with the pins *o*, projecting from the disk N^3, and the motion of the shaft H will be communicated, by means of the band-wheels and band N^4, to the shaft *r* and sheaf-carrier B; but when the straw is advanced to the cylinder so rapidly as to diminish the speed of the cylinder and shaft H the centrifugal force of the pawl-carrier is reduced, and the force of the springs *m* will restore the pawls *l* to their normal positions, and thereby disengage the pins *o* as required to stop the motion of the band-wheel N^2, the shaft *r*, and the sheaf-carrier B until the cylinder recovers its proper speed again and the pawls *l* on the carrier K are again thrown into engagement with the pins *o* by a centrifugal force that overcomes the force of the springs *m*.

Having thus described the construction and functions of the various operative elements, the practical operation and utility of my invention will be obvious to persons familiar with the art to which it pertains; and

What I therefore claim as new, and desire to secure by Letters Patent therefor, is—

1. In a band-cutter and feeder an endless cutter-carrier consisting of two mating chains, cross-pieces fixed to the chains and cutters fixed to the cross-pieces, mounted on sprocket-wheels that engage the chains and idlers that retain the carrier in an arched position, an endless sheaf-carrier that has an apex under the arch of the cutter-carrier and a reciprocating carrier under the inner and downwardly-inclined end portions of the cutter-carrier and sheaf-carrier, arranged and combined, as shown and described for the purposes stated.

2. In a band-cutter and feeder, an endless cutter-carrier composed of two parallel chains, cross-pieces fixed to the chains, cutters fixed to the cross-pieces to project outward and an endless canvas fixed to the inside faces of the cross-pieces, sprocket-wheels at the ends of the said carrier and idlers at the center, a sheaf-carrier on a lower plane and supported upon sprocket-wheels at its ends and idlers at its center, means for operating the two carriers simultaneously in double-inclined positions and a downwardly-inclined vibrating grain-carrier under the downwardly-inclined inner ends of the cutter-carrier and sheaf-carrier, and means for automatically governing the motion of the sheaf-carrier, all arranged and combined as set forth for the purposes stated.

3. In a band-cutter and feeder, automatic mechanism for preventing crowding the straw and clogging and choking the cylinder of a thresher consisting of a driving-shaft for operating an endless cutter-carrier, a pawl-carrier consisting of a disk having a continuous flange at its circumference fixed to said shaft, pawls pivoted at their small and light ends to the inside face of the pawl-carrier, springs fixed to the pawls and the pawl-carrier, a sleeve having a fixed band-wheel at one end and a disk at the other end mounted loosely on the driving-shaft, pins projecting from the disk to engage the pawls, arranged and combined with a sheaf-carrier to operate in the manner set forth for the purposes stated.

4. In a band-cutter and feeder, automatic mechanism for preventing crowding the straw and clogging and choking the cylinder of a thresher consisting of a driving-shaft for operating an endless cutter-carrier, a pawl-carrier consisting of a disk having a continuous flange at its circumference fixed to said shaft, pawls pivoted at their small and light ends to the

inside face of the pawl-carrier to extend in opposite directions and at some space from the flange of the disk, springs fixed to the pawls and the pawl-carrier, a sleeve having a fixed band-wheel at one end and a disk at the other end mounted loosely on the driving-shaft, pins projecting from the disk to engage the pawls, an endless sheaf-carrier, a rotatable shaft having fixed sprocket-wheels to engage the chains of the endless sheaf-carrier, a band-wheel on said shaft, and a band for connecting the band-wheels on the said two shafts, arranged and combined to operate in concert in the manner set forth for the purposes stated.

5. An automatic band-cutter and feeder, comprising a frame adapted to be fixed to the end of a threshing-machine and provided with an extension for supporting an endless sheaf-carrier, an endless sheaf-carrier mounted in said extension and inclined downward at its inner end, one or more vibratory grain-carriers extended under the inner end of the sheaf-carrier, an endless cutter-carrier mounted over the inner end of the sheaf-carrier in an arched manner, an endless canvas fixed to the cutter-carrier, a driving-shaft for operating the sheaf-carrier, the cutter-carrier and the vibratory grain-carriers, a pawl-carrier fixed on the end of the driving-shaft, pawls pivoted to the pawl-carrier, springs fixed to the pawls and pawl-carrier, a sleeve having a disk at one end and a band-wheel at its other end mounted loosely on the driving-shaft, pins projecting from the disk to engage the pawls, a shaft having fixed sprockets to operate the sheaf-carrier, a band-wheel on said shaft and a band for connecting the two shafts, a crank-shaft connected with the vibratory grain-carriers and means for connecting the crank-shaft with the shaft of the sheaf-carrier, all arranged and combined to operate in the manner set forth for the purposes stated.

JESSE H. WARD.

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