

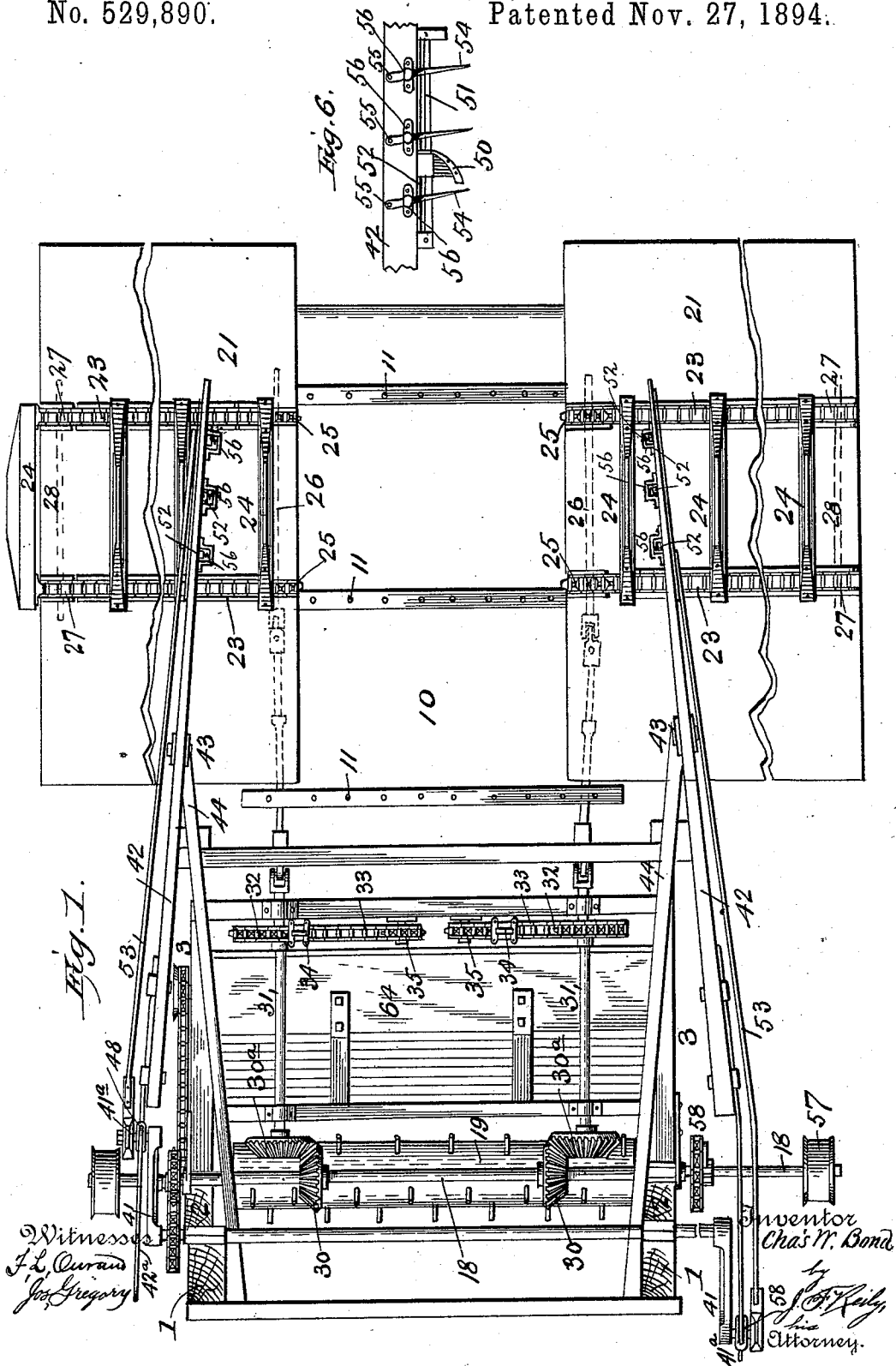
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4 Sheets—Sheet 1.

C. W. BOND.
BAND CUTTER AND FEEDER.

No. 529,890.

Patented Nov. 27, 1894.



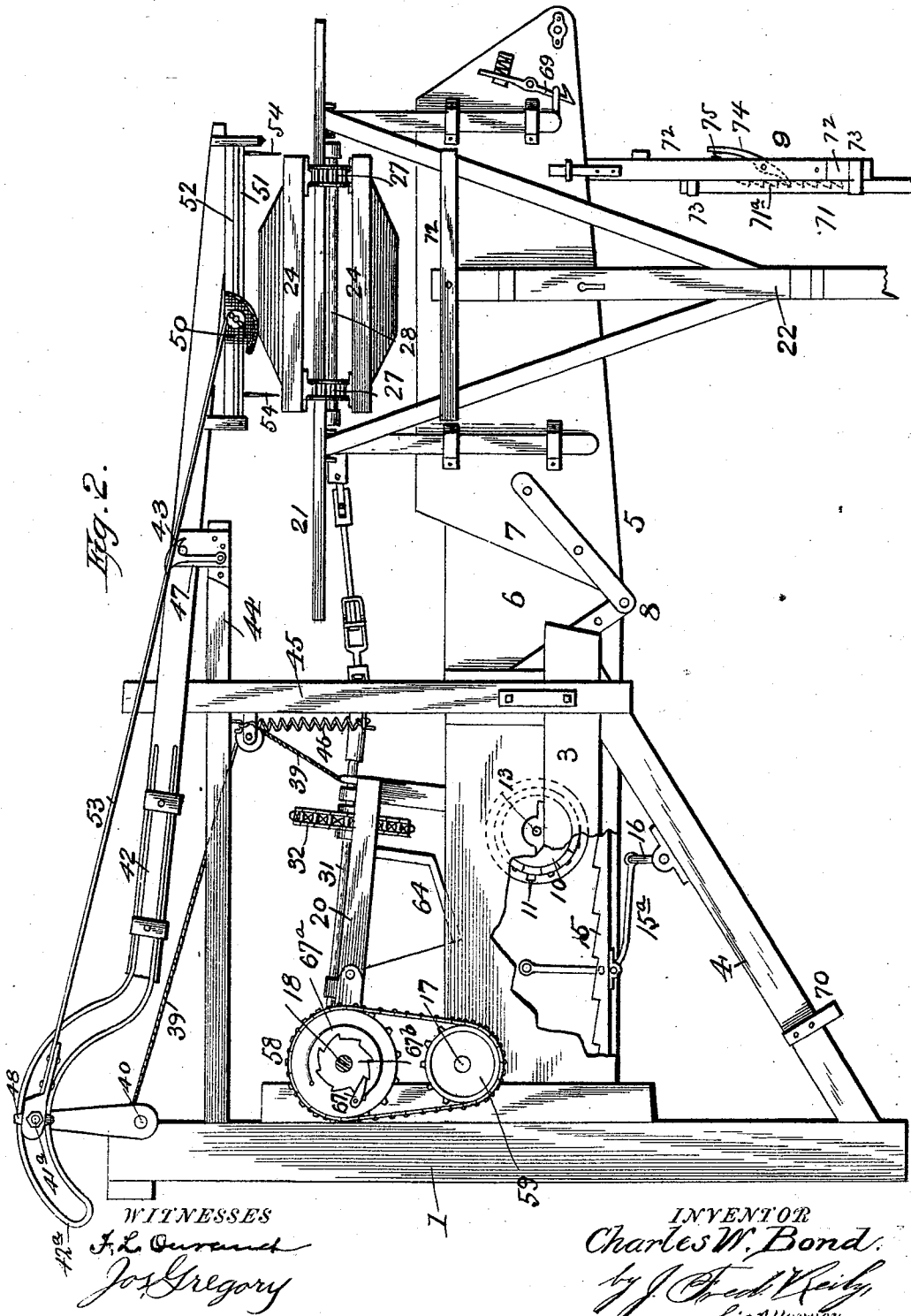
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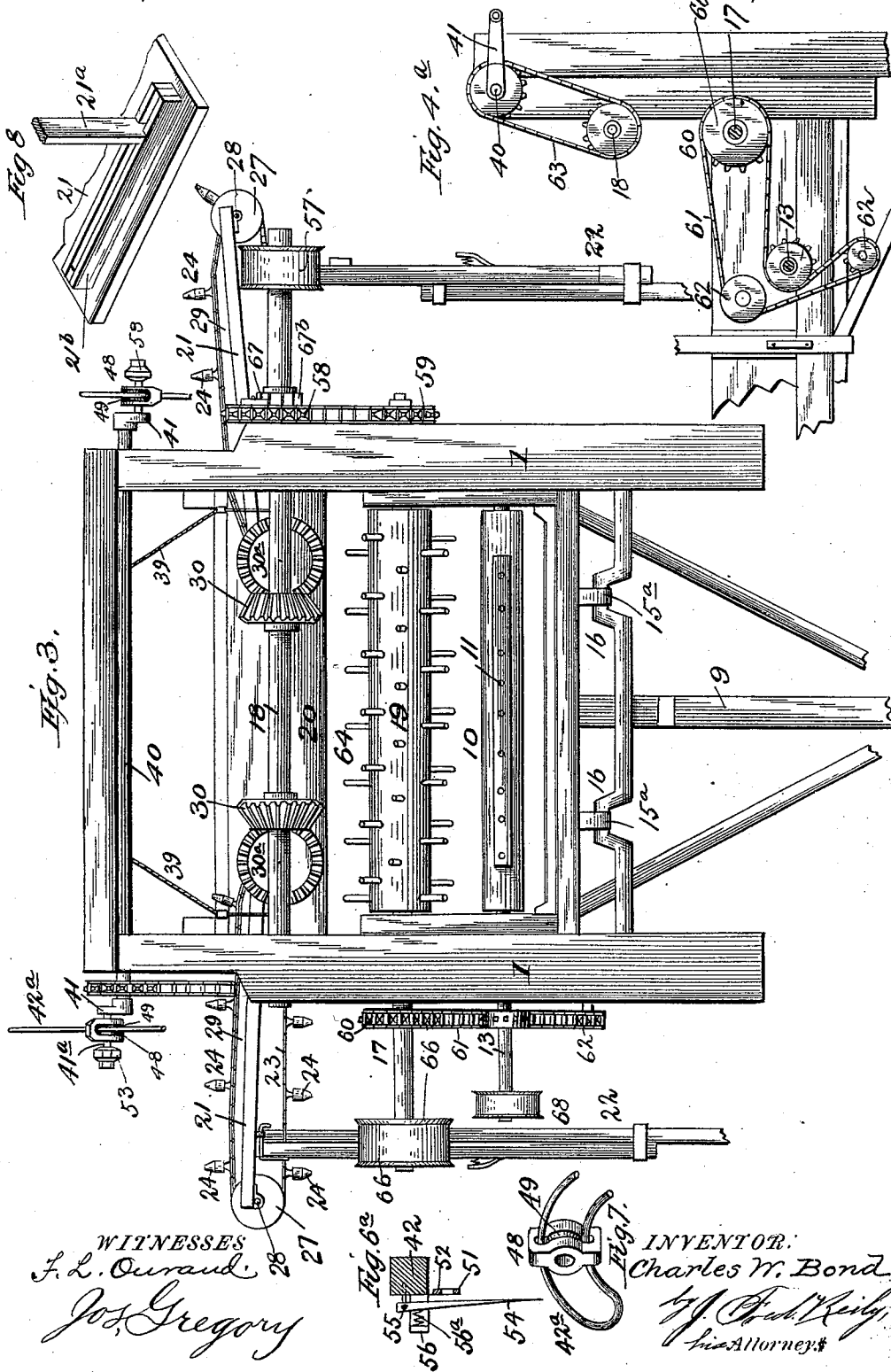
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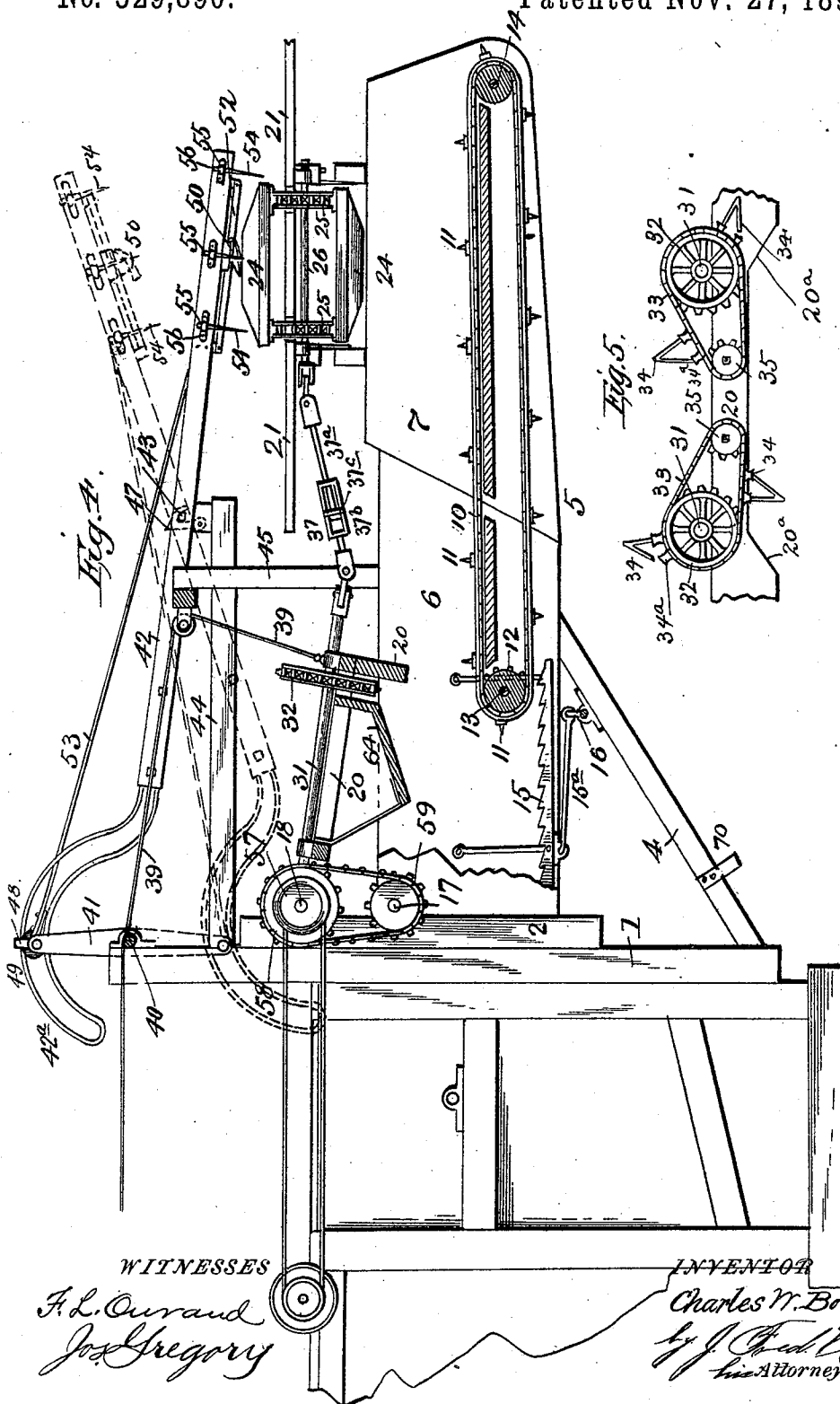
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UNITED STATES PATENT OFFICE.

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BAND-CUTTER AND FEEDER.

SPECIFICATION forming part of Letters Patent No. 529,890, dated November 27, 1894.

Application filed July 26, 1893. Serial No. 481,558. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. BOND, a citizen of the United States, residing at Rippyville, in the county of Anderson and State of Kentucky, have invented certain new and useful Improvements in Band-Cutters and Feeders; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

15 This invention relates to band cutters and feeders for thrashing machines, and is intended as an improvement on Patent No. 445,668, which was granted to me February 3, 1891; and it consists in the improved construction and arrangement of parts which will be hereinafter fully described and claimed.

Referring to the accompanying drawings, Figure 1 is a top plan view of my new and improved band cutter and feeder. Fig. 2 is a side view of the same partly in section. Fig. 3 is an end view of the end which is connected to the thrasher. Fig. 4 is a longitudinal central vertical sectional view, with the extreme inner end of the frame shown in side elevation. Fig. 4^a is a detail view of the gearing on the left-hand side of the view shown in Fig. 3. Fig. 5 illustrates in detail the spreading mechanism. Fig. 6 is a detail view of the outer end of one of the cutter arms. Fig. 6^a is a transverse sectional view of the same. Fig. 7 is a detail view of one of the journal boxes 48, hereinafter described. Fig. 8 is a detail view.

Referring to the several parts by their designating numerals, the same numerals of reference indicating corresponding parts in all the figures, 1 indicates the vertical end of the main frame, which is connected with the thrasher when the machine is attached for operation. Connected to the frame 1 are the frame-pieces 2, 3, and braces 4, forming a supporting and strengthening frame for the carrier frame 5, which is made in two parts or sections, 6, 7, which are hinged together at 8; the outer end of part 7 being supported by the removable leg 9, which will be hereinafter described.

Within the carrier frame is mounted the endless carrier 10, composed of two chains connected by cross-bars and covered by an endless apron, the said cross-bars having teeth, 11, which project out through the apron, as shown in Fig. 2. The outer end of this carrier passes around a roller, 14, journaled in the outer end of the carrier-frame, while the chains at its inner end pass around sprocket-wheels, 12, at the ends of the roller which is secured on shaft 13; the carrier being run by the revolution of this shaft. At the inner end of the carrier 10 is arranged the serrated connecting section, or shaker, 15, which makes connection between the inner end of carrier 10, and the cylinder of the thrashing machine, being connected by pitmen, 15^a, with the transverse crank-shaft 16.

Mounted in suitable bearings on the vertical supporting frame are transverse shafts 17 and 18. On the lower shaft, 17, is constructed, or secured, a toothed roller, 19, which assists in conveying the grain into the cylinder of the thrasher. The shaft 18 is the main drive-shaft, and its ends pass through the end-bearings of an adjustable rectangular frame 20, hereinafter described.

21, 21, indicate the grain tables, which are detachably connected to the outer end of the carrier frame 5 by the upright supporting pieces 21^a, the upper ends of which engage with longitudinally slotted guide-bars 21^b (see Fig. 8) on the under side of the grain tables, for the purpose hereinafter specified, their outer ends being supported by the removable legs 22. Around the middle of each grain table passes an endless carrier composed of two chains, 23, on which are secured cross-bars 24, connecting the chains. These cross-bars are spaced and arranged at such a distance apart as to allow room for a bundle of grain between any two of said bars, the bars being raised along the center as shown to insure holding the bundle securely between them, inclining down at each end to the level of the bar proper, as shown, this tapering raised projection on the bars adding to their effectiveness in taking each bundle separately as the latter are fed to the endless carriers. The chains of these carriers pass around sprocket wheels 25 secured on shaft 26, at the inner ends of the carriers, the revo-

lution of said shafts running the carriers; the outer ends of the carriers running around idlers 27 on shafts 28; shafts 26 and 28 being mounted in suitable boxes secured to the under surface of the grain tables. The said carriers are raised slightly above the tables by elevating track-pieces 29, secured on the tables beneath the chains, as shown.

On the main drive shaft 18, within the supporting frame, are secured bevel gear-wheels 30 which mesh with similar wheels 30^a on the ends of shafts 31, which are mounted in the frame 20. A sprocket wheel, 32, is mounted on each shaft 31 (see detail view of the spreading mechanism, Fig. 5), and an endless sprocket chain 33 passes around each of said wheels and at its inner end around a sprocket pinion 35, mounted on that part of the frame 20, as shown. Upon each chain 33 are secured two or more spreading arms, 34, each of said arms consisting of a straight member which is secured at its inner end upon a seat formed on the chain, and a member inclining back from the top of the straight member, as shown, so that while its free inner end is lifted in passing around one of the sprocket-wheels, when the chain straightens out and the arm is brought into operation the inner end of said member will rest upon a seat 34^a on the chain and thus prevent the spreader arm from leaning backward when engaging with any weight while working.

The connecting rods 37, 37^a, which connect the ends of shafts 31 and 26, are connected at their outer ends to the ends of shafts 31 and 26 respectively by swivel joints; and the rods 37, 37^a, are connected by a sliding joint or connection, the inner end of each rod 37 being formed with an open link, 37^b, and the inner part of rod 37^a passing through the apertured inner end of this link and carrying at its inner end a guide-plate, 37^c, the recessed ends of which slide on the side-bars of the open link. It will be seen how through these connections motion is imparted to the table carriers from the drive-shaft 18, while the extension or sliding connection between rods 37 and 37^a will allow the end of frame 20 which carries the spreading mechanism to be raised or lowered by means of cords 39 for regulating the spreading of the grain, without interfering with the connection of the several parts, even while the machine is running.

Journalled in bearings at the top of the vertical frame 1 is a transverse shaft 40, having at its ends the crank-arms 41, having the crank-pins 41^a.

42 indicates the cutter-bars, which are pivotally mounted near the center of their length in bearings 43 on the outer ends of arms 44; the pivots of the cutter-bars being held in their open bearings by the spring-hooks 47. The bearing-arms 44 are pivotally attached at their inner ends to the vertical frame 1, and rest near their outer ends in slotted vertical bars 45, so that the outer ends of arms 44 may

be freely raised a few inches. Coiled springs, 46, connected to the bars 45 and arms 44, hold said arms down, but will give to allow them to rise to thus automatically give sufficient room under the cutters for different sized bundles, and will hold the cutter-arm on the bundle to insure the cutting of the bands.

On the crank-pin 41^a of each crank 41 is journalled a journal box, 48, shown in detail in Fig. 7; and on the inner end of each cutter-bar 42 is secured a double guide-rod, 42^a, which is formed of a single rod which is doubled, its ends secured to the bar, and is then curved in a semi-circle, as shown. The doubled rod is passed through the upper and lower openings of its journal box 48 before being secured to the cutter-bar; and it will be seen that the journal boxes, pivotally mounted on the crank-pins, will run freely on the curved doubled guide-rods as the cranks revolve.

49 is a grooved anti-friction roller in the center of the box 48, through the center of which the crank-pin passes, and which reduces friction with either the upper or lower half of the doubled guide-rod with which it may come in contact.

On the outer end of each cutter-bar 42 is mounted a cutter, 50, having a curved blade and arranged to travel back and forth between the horizontal bars 51, 52; which are mounted as shown at the outer end of each cutter-bar. To these cutters are pivotally connected the outer ends of rods 53, the other ends of which have bearings pivotally mounted on the crank-pins, 41^a, on the outer side of the boxes 48, and entirely separate therefrom, as most clearly shown in Fig. 3.

It will now be seen that when the shaft 40 is revolved the ends of the cutter bars will be given a vertical movement, while the rods 53 will slide the cutters 50 back and forth along the slots in which they work. As each crank 41 rises it will lower the outer end of its cutter-bar 42 down upon the bundle beneath it; and after the crank reaches the vertical position shown in Fig. 2 and travels forward the curvature of the guide-rods 42^a will prevent any motion being imparted to the cutter-bar from the crank, while the rod 53 will slide the cutter 50 forward to cut the band of the bundle. When this stroke of the cutter is finished and the crank starts downward in its revolution it will raise the outer end of the cutter-bar, while the cutter 50 will be drawn back along its slotted frame, ready for the next stroke. The several parts are so geared and adjusted with relation to each other, that each cutter makes one stroke in the center of each space between the cross-bars 24 of the table-carriers as the said carriers pass along, the cutters making alternate strokes.

In order to hold each bundle steady while its bands are being cut, each cutter-bar is provided at its outer end with the downwardly-

projecting teeth 54. To allow for the forward movement of the table-carrier while the cutter is making its stroke, each of said teeth is pivoted at its upper end, at 55, and then passes down through a slotted guide, 56, in which is mounted a small spring, 56^a, bearing against the side of the tooth; the springs allowing the points of the teeth to be drawn out from the side of the bar by the moving table-carrier and bundle, while when released the spring will cause them to fly back into their normal vertical position. Motion is imparted from a suitable shaft of the thrasher by a drive-belt running to pulley 57 on the drive-shaft 18; thence from said shaft through sprocket-wheels 58 and 59 to the shaft 17. The sprocket-wheel 60 on the other end of shaft 17 (see Fig. 4) imparts motion to the endless carrier 10 and connecting-section 15 by means of sprocket-chain 61 running around the wheel 60 and sprocket-wheels on the ends of the shafts 13, and 16; the idler 62 being used as shown for a proper arrangement of the gearing. Motion is imparted to the shaft 40, by which the cutters are operated, by a sprocket-chain 63 passing around sprocket-wheels on the drive-shaft 18 and shaft 40, as most clearly shown in Fig. 4.

Attached to the lower part of frame 20 is the inclined deflecting-board, 64, under which the grain passes, and which tilts the grain enough to make it pass under the toothed roller 19, and also to assist in keeping it from being tangled by the spreading mechanism. The frame 20 is formed with the inclines 20^a as shown in Fig. 5, to prevent the straw from being carried around by the spreading arms 34 and entangled in the machinery.

The operation of my band cutter and feeder is as follows: When bundles of grain are thrown on the tables, parallel to the cross-bars 24 of the carriers, they will of their own weight take a position between the said cross-bars; and as they are carried forward in this way their bands are cut, as described, when they pass under the cutter bars. They are then delivered from the grain-tables to the central part of carrier 10, which conveys them under the spreading mechanism, where each cut bundle is evenly spread out over the whole width of the carrier, and conveyed by it and the toothed roller 19 to the cylinder of the thrasher; the tilting-board 64 operating as above described. The oscillating connecting-section 15, with its serrated surface, carries all shattered grain from the carrier 10 toward the cylinder of the thrasher, and prevents it being carried back by the returning under part of the carrier 10, as will be readily understood.

The position of the cutter-bars may be adjusted before starting the machine to suit the size of bundles to be handled, by means of the removable bolts 65, which pass through series of holes in the lower ends of bars 45, so that said bars may be raised or lowered; while

the springs 46 will automatically adjust the cutter-bars to different sized bundles while the machine is running.

This machine is intended to feed automatically, but by having it geared to the driving power by loose belts and idlers it may be under the complete control of one man, and he can instantly adapt it to any condition which may be required. For example, the belt from a shaft on the thrasher to pulley 57 on the drive-shaft 18 will run the whole machine; but by loosening that and tightening one from the same thrasher-shaft to pulley 66 which is arranged on shaft 17 the grain from the main carrier 10 may be fed into the thrasher-cylinder without running the cutters and table carriers; the spring-actuated pawl 67, which is pivoted on the side of the loosely mounted sprocket-wheel 58, then running over the inclined sides of the teeth of the ratchet-wheel 67^b which is fixed on shaft 18.

The supporting legs 9 and 22, which rest on the ground, are made adjustable so that they may be lengthened or shortened to suit uneven ground. The vertical part of each of said legs is made in two pieces or sections, 71, 72, having metal bands 73 to enable the lower section, 71, to be slid up or down; where it is held at the height to which it is adjusted by a locking-pawl, 74, which is pivoted in a longitudinal slot in the section 72, and has a spring, 75, under its upper end which holds its lower end in engagement with a series of teeth, 71^a, formed in the inner side of leg-section 71.

The grain tables are connected to the main carrier frame as before described, so that when folding the machine for transportation the couplings 38 may be disconnected and the tables 21 be drawn inward over the main carrier frame, one table resting on top of the other, the longitudinally slotted guide-bars 21^b admitting of this movement, without detaching the tables; and after securing them in that position, and removing the supporting legs, 9, 22, the outer part, 7, of the carrier-frame may be folded downward until the spring hook 69 (see Fig. 2) engages with the loop 70, attached to brace 4 of the main frame; thus holding the parts together in a folded position, and leaving only the supporting legs disconnected, which may be carried at some convenient place about the machine. Should the cutter bars, 42, be in the way they may be turned backward on the top of the thrasher without disconnecting their connections with the cranks 41. The front end, 1, of this machine is to be attached to the front of the thrasher as a permanent part of it.

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

1. The combination, with the reciprocating cutters, of the bundle carriers traveling across the grain tables and formed with the cross bars having the elevated central part inclin-

ing down at each end to the level of the bar proper, and arranged at such distances apart as to receive and hold a bundle of grain between each two of said bars; substantially as set forth, for the purpose specified.

The combination, with the grain tables and the bundle carriers traveling across the same and having the cross bars arranged to receive and hold a bundle of grain between each two of said bars, of pivoted cutter bars 42 having the outer end frames, cutters mounted and sliding on said frames and means for reciprocating said cutters, and means for depressing and holding depressed the outer ends of said cutter bars while the cutters are sliding in one direction, and for raising said ends while the cutters are making their return stroke; substantially as set forth.

3. The combination, with the grain tables and the bundle carriers traveling across the same and having the cross bars arranged to receive and hold a bundle of grain between each two of said bars, of the revolving shaft having the end cranks, the centrally pivoted cutter bars having the outer end frames and the curved inner ends actuated by said end cranks, and the reciprocating cutters having the operating rods pivotally connected to them and to said crank-arms; substantially as set forth.

4. The combination, with the bundle carriers, of the revolving shaft having the end crank-arms, the journal boxes pivotally mounted on the crank pins of said arms, the centrally pivoted cutter bars having the outer end frames and having at their inner ends the curved guide rods, running through the journal boxes on the crank-pins, and the cutters mounted and sliding on said outer end frames and having the operating rods pivotally connected to them and to the crank pins; substantially as set forth.

5. The combination, with a bundle carrier having transverse bars between which the bundles are received and held, of a cutter bar having its outer end swinging vertically above said carrier and having at said outer end a reciprocating cutter, and the slotted guides, the teeth pivoted at their upper ends and passing down through said guides, and the springs contained in said slotted guides and bearing against the side of the pivoted teeth and means for oscillating said swinging cutter bar; substantially as and for the purpose set forth.

6. The combination, with the bundle carriers, of the revolving shaft having the end crank arms, the journal boxes pivotally mounted on the crank pins of said arms, the centrally pivoted cutter bars having at

their outer ends the end-frames, the slotted guides, the teeth pivoted at their upper ends and passing down through said slotted guides, and the pressure springs engaging said teeth, the curved guide rods secured to the inner ends of the cutter bars and running through the journal boxes on the crank-pins, and the cutters mounted and sliding on the outer end frames of the cutter bars and having the operating rods pivotally connected to them and to the crank pins; substantially as set forth.

7. In a band cutter and feeder, the combination with the main carrier, 10, of the spreading mechanism comprising the pairs of sprocket wheels mounted transversely above the inner end of said carrier, the sprocket chains passing around said wheels and having the spreading arms consisting of the straight members, secured at their inner ends to the chains, and the backwardly-inclined members having the free inner ends, seats 34^a formed on the chains to receive said free ends when the chain straightens, and means for revolving said sprocket-wheels; substantially as set forth.

8. The combination, with the main carrier 10, of the transverse main drive shaft, having the bevel gear wheels, the frame 20 hinged or pivotally secured at its inner end, the parallel shafts mounted in said frame and having bevel gear wheels at their inner ends, the sprocket wheels mounted on the outer part of said parallel shafts, the inner sprocket wheels, the chains passing around the sprocket wheels and having the spreader arms, and means for raising the outer end of the adjustable frame 20; substantially as and for the purpose set forth.

9. The combination, with the main carrier 10, of the bundle carriers passing at their inner ends around the shafts 26, the transverse main drive-shaft, having the bevel gear wheels, the frame 20 hinged or pivotally secured at its inner end, the parallel shafts 31 mounted in said frame and having the bevel gear wheels at their inner ends, the spreading mechanism mounted at the outer end of frame 20, as specified, the rods swiveled at their outer ends to the shafts 26 and 31, and connected by the sliding joint or connection, and means for raising the outer end of the adjustable frame 20; substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES W. BOND.

Witnesses:

J. H. LYEN,

H. B. CARPENTER.