No. 652,681. Patented June 26, 1900.

J. NAMUR.

SELF FEEDER AND BAND CUTTER.

(Application filed June 6, 1899.)

(No Model.) 2 Sheets—Sheet 1.

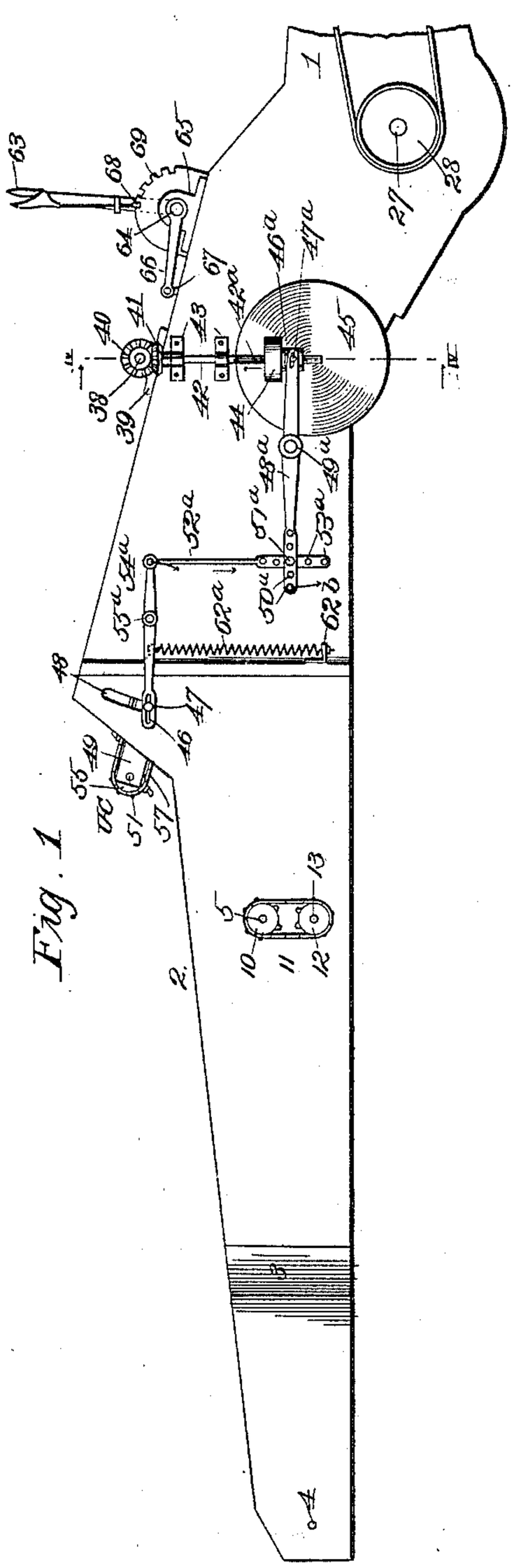

Fig. 1.

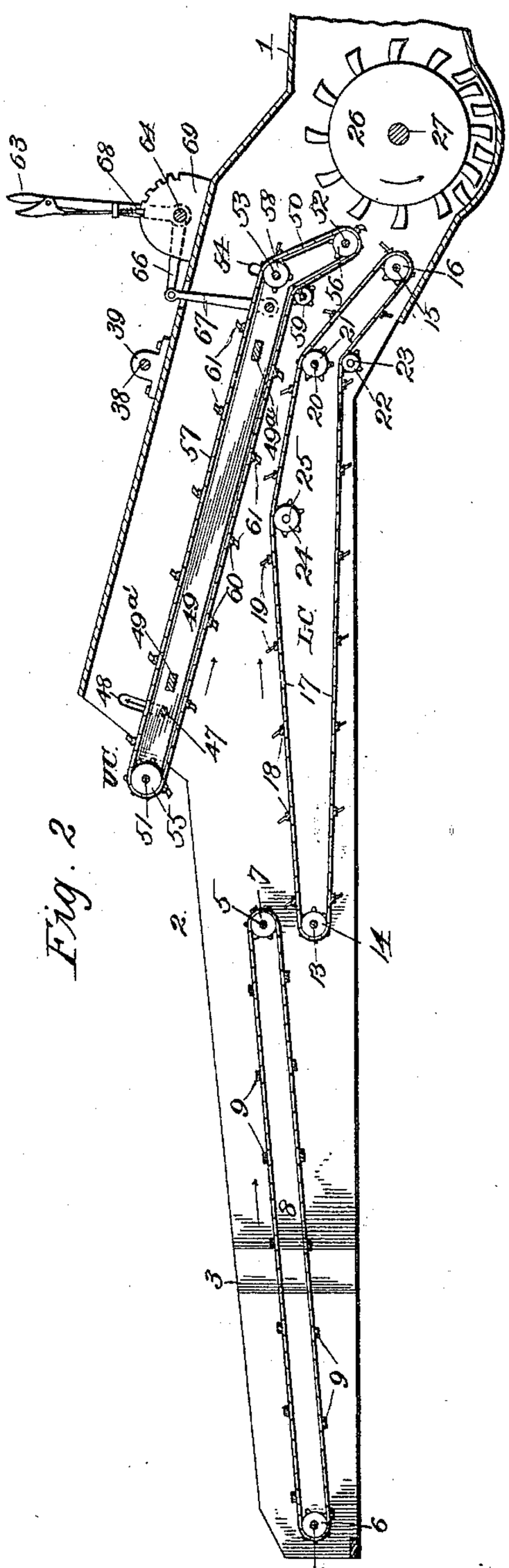

Fig. 2.

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Fig. 3

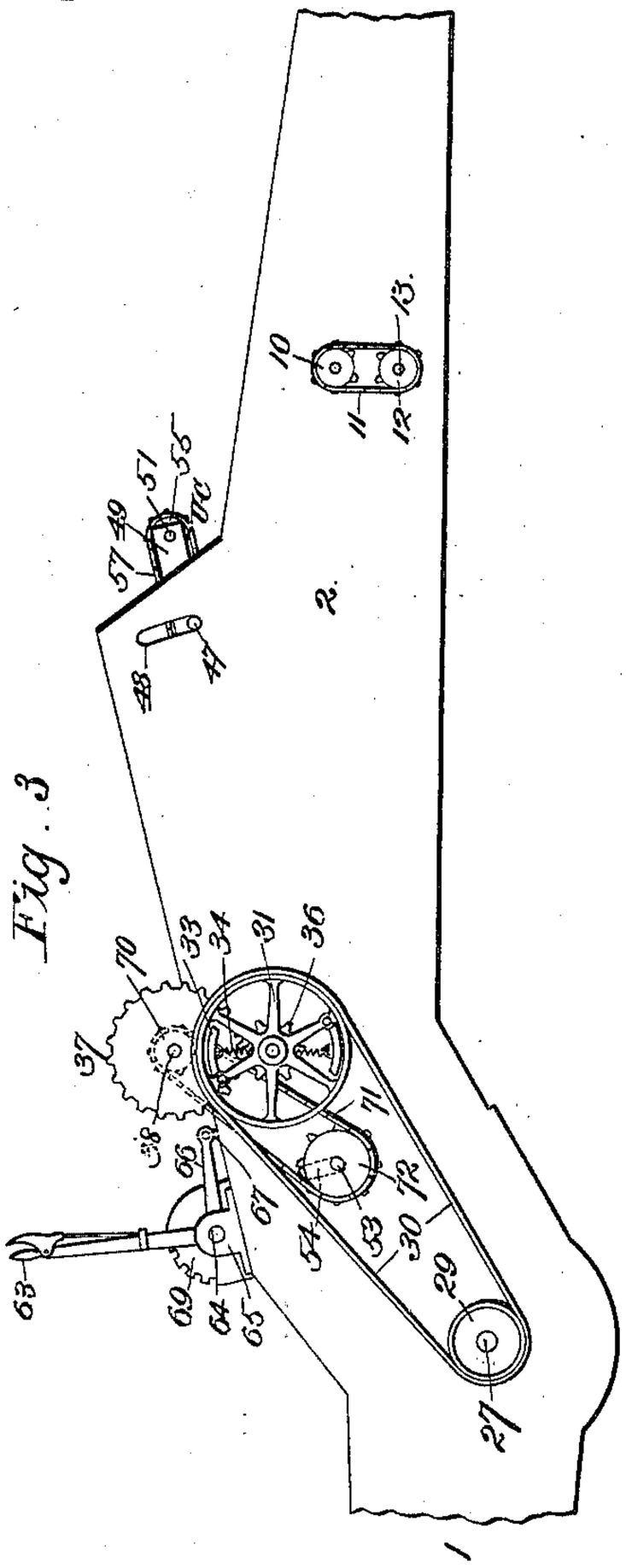

Fig. 6.

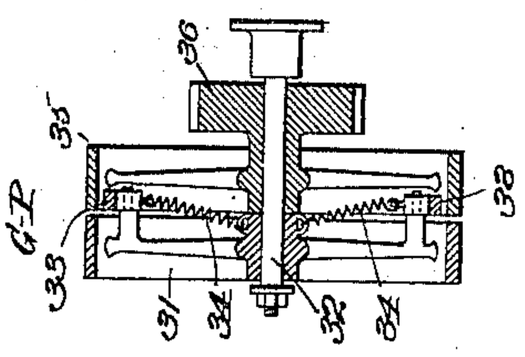

Fig. 4.

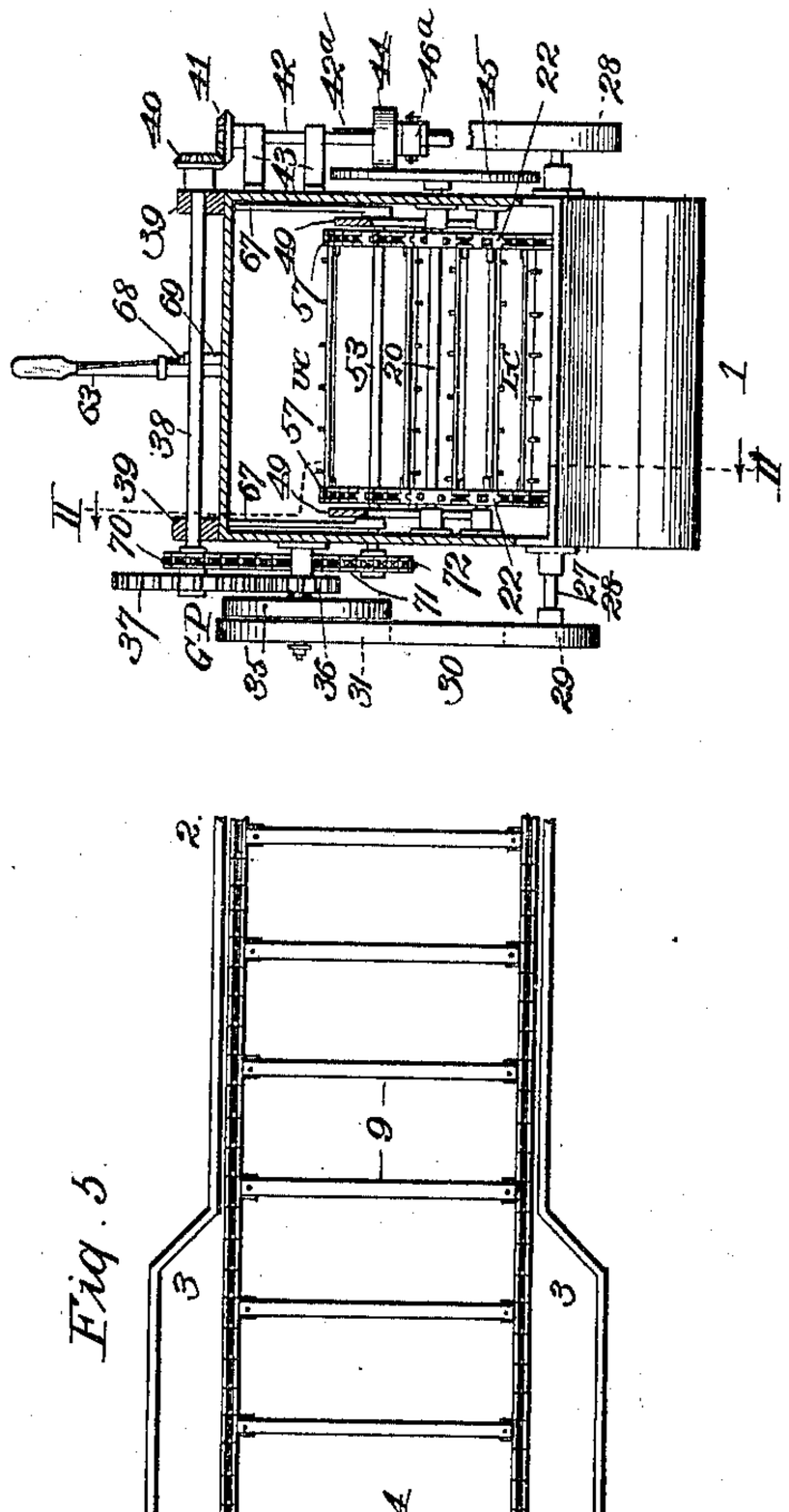

Fig. 5

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UNITED STATES PATENT OFFICE.

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SELF-FEEDER AND BAND-CUTTER.

SPECIFICATION forming part of Letters Patent No. 652,681, dated June 26, 1900.

Application filed June 6, 1899. Serial No. 719,525. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH NAMUR, of La Crosse, Rush county, Kansas, have invented certain new and useful Improvements in Self-Feeders and Band-Cutters, of which the following is a specification.

My invention relates to self-feeders and band-cutters for threshing-machines, and more particularly to that class wherein the speed of grain-delivery to the cylinder is automatically increased or diminished accordingly as the supply of grain to the carriers falls below or rises above a certain standard, thereby insuring a practically-constant and full delivery to the cylinder in order that the latter shall operate at its maximum capacity; and my object is to produce a self-feeder and band-cutter which is positive and reliable in action and of simple, strong, durable, and comparatively-inexpensive construction.

With this object in view the invention consists in certain novel and peculiar features of construction and combinations of parts, as hereinafter described, and pointed out in appended claims, and in order that the invention may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1 represents a side view of a self-feeder and band-cutter constructed in accordance with my invention. Fig. 2 is a vertical longitudinal section taken on the line II II of Fig. 4. Fig. 3 is a view of the opposite side of the machine. Fig. 4 is a vertical section taken on the line IV IV of Fig. 1. Fig. 5 is a top plan view of the rear or receiving end of the machine. Fig. 6 is a vertical section, enlarged, of the centrifugal rim-friction governor-pulley and spur-gear.

Referring to the drawings, where like reference characters designate corresponding parts, 1 designates the receiving end of a threshing-machine, and 2 the self-feeder frame, forming a rear extension of the threshing machine, said frame near its rear end being increased in width, as at 3, in order to obviate the annoyance caused by the projecting ends of the feed lodging against the edge of the frame, the converging front ends of said enlargement (see Fig. 5) serving to push the projecting bundles inward and straighten them upon the carrier, hereinafter referred to.

The carrier, termed the "extension-carrier," arranged longitudinally of the feeder-frame, is constructed as follows: 4 and 5 designate parallel shafts journaled in and extending transversely of the frame, the shaft 5 occupying, by preference, a higher plane than shaft 4. Similar sprocket-wheels 6 7 are arranged in pairs upon said shafts, respectively, and are connected by the parallel endless chains 8, connected in turn by the cross-bars 9. The shaft 5 projects through the frame at one end and carries a sprocket-wheel 10, connected by a short sprocket-chain 11 with a similar sprocket-wheel 12 of the lower carrier L C, constructed as follows: 13 designates a shaft carrying on its projecting end the said sprocket-wheel 12 and provided also with the sprocket-wheels 14. 15 designates a shaft also journaled in the feeder-frame adjacent to its front or discharge end and occupying a lower plane than shaft 13, and 16 designates a pair of sprocket-wheels upon shaft 15 and connected by the endless chains 17 to sprocket-wheels 14, said chains being connected by the cross-bars 18, provided with metallic teeth 19, said teeth extending, preferably, at a slight angle in order to facilitate the delivery of the feed to the cylinder hereinbefore referred to. In order that the grain may be delivered to the cylinder at a tangent and that motion may be imparted to it in the direction indicated by the adjacent arrow, Fig. 2, the shaft 20, occupying, approximately, the same horizontal plane as shaft 13 and arranged some distance to the rear of shaft 15, is journaled in the frame and carries a pair of drive sprocket-wheels 21, engaging the upper strand of the chains from below, the under strand being also deflected upward by means of the idler-sprockets 22, journaled upon stub-shafts 23, projecting from the frame. That portion of the upper strand of the carrier extending from sprocket-wheels 13 to drive-sprockets 21 is also deflected upward by means of the intermediate idler-sprockets 24, journaled upon stub-shafts 25, projecting from the frame for a purpose which hereinafter appears.

26 designates the cylinder of the threshing-machine of the usual or any preferred construction, and 27 the shaft of the same, motion being imparted to said shaft through the

medium of the belt-pulley 28 and driving connections and imparted by said shaft by means of the belt-pulley 29 at the opposite end of the shaft and the belt 30 to the centrifugal rim-friction governor-pulley G P, said governor-pulley being constructed as follows: 31 designates a pulley engaged by belt 30 and journaled on stub-shaft 32, projecting outward from the feeder-frame, said pulley carrying the pivoted friction-shoes 33 and the retractile springs 34, connecting said shoes to the hub of the pulley. 35 designates a similar pulley journaled upon said shaft and adapted to be engaged on the inner side of its rim by means of the friction-shoes 33 when the cylinder is rotating at the desired rapidity, and said pulley 35 is cast integral with the spur-gear 36, meshing continuously with a relatively-large gear-wheel 37, secured upon the transverse shaft 38, said shaft being journaled in bearing-boxes 39 upon the feeder and carrying a bevel-gear 40, meshing with a similar gear 41 upon the vertical shaft 42, journaled in the bearing-brackets 43, secured to the feeder-frame. The lower half of this shaft is provided with a vertical spline or feather 42^a, and mounted to slide upon and rotate only with said shaft is a friction-pinion 44, said pinion being in frictional engagement with the outer face of the friction-disk 45 upon the adjacent end of shaft 20 of the lower carrier in order to operate the latter. The speed of said carrier varies according to the position of the friction-pinion 44 upon its shaft—that is to say, when the pinion engages the disk at the center of the latter the speed of said disk is greater than when the pinion engages it nearer its periphery, as will be readily understood—and in order that the volume of feed conveyed by the carriers shall determine the speed at which it shall be conveyed the following mechanism is provided to vertically adjust said friction-pinion upon its shaft: A ring 46^a is mounted in a groove in the hub of the pinion and has its oppositely-projecting pins 47^a engaged by the bifurcated end of the rock-lever 48^a, said lever being pivoted upon a pin 49^a, projecting from the feeder-frame, and provided with a series of apertures 50^a, through one or the other of which a pin 51^a extends to pivotally unite said lever with the vertical link 32^a, the latter being also provided with a series of apertures 53^a, one of the latter being adapted to register with the aperture 50^a, through which the pin 51^a extends. By means of these series of apertures it is obvious that the adjustment of the friction-pinion can be accomplished with greater or less rapidity, as desired. The link 52^a is connected pivotally to one end of the rock-lever 54^a, pivoted at the side of the feeder-frame, as at 55^a, and provided at its rear end with a longitudinal slot 46, engaging one end of the rod 47, projecting through the slots 48 of the feeder-frame. Said rod 47 is secured to the rear end of the upper carrier U C, which converges with respect to the lower carrier, and is constructed as follows: 49 designates a pair of parallel bars having their rear ends bent abruptly downward, as at 50, so as to converge downward with respect to the downwardly-inclined front end of the lower carrier, and said bars are connected by the cross-bars $49^{a'}$, so as to constitute a rigid skeleton framework, in the opposite end of which are journaled the shafts 51 52, a third shaft 53 being journaled in the frame at its bending-point, the shaft 53 projecting through the short slots 54 in the sides of the feeder-frame and forming, practically, the fulcrum or pivot upon which the upper carrier pivotally operates, the slots 54 being provided in order that the pivotal or fulcrum end of said carrier may also be adjusted toward or from the lower carrier to accommodate the action of the cylinder or when the condition of the grain requires or makes necessary the contraction or expansion of the passage between the carriers. The shaft 51 carries within said frame the sprocket-wheels 55, connected to the similar sprocket-wheel 56 upon shaft 52 by the endless belts 57, said belts being caused to bend in conformity to the frame by means of the actuating or drive sprocket-wheels 58 of shaft 53 and by the idler sprocket-wheels 59. These endless chains, in order to constitute at once a carrier and a band-cutter, are connected at intervals by cross-bars 60, provided with cutting blades or knives 61, projecting outward therefrom, these blades being adapted as the carrier travels in the direction indicated by the adjacent arrow, Fig. 2, to cut the band which holds the grain in bundles. The upper carrier when in its most depressed position converges slightly with respect to that portion of the lower carrier between sprocket-wheels 21 and 24; but this angle of convergence increases by the impinging of the feed against the under side of the upper carrier, the latter rising and falling automatically, according to the volume of feed passing through the machine, the travel of the feed, however, being made positive and reliable by supplementing the gravitative action of the upper carrier with the positive power or pull of the spring 62^a, connecting the lever 54^a with the stationary bracket 62^b of the feeder-frame. The oscillatory action of the upper carrier imparts corresponding movement through the medium of lever 54^a, link 52^a, and lever 48^a to the friction-pinion 44, causing the latter to slide up and down upon the friction-disk 45, and thereby cause the latter to rotate at a lower or a higher speed. The lower carrier being driven by this disk it is obvious that an overcharge of feed by raising the upper carrier automatically decreases the speed of travel with which such charge approaches the cylinder and that as said charge is disposed of and the carrier is again depressed the speed of travel again increases. It will therefore be seen that practically an even feed to the cyl-

inder is maintained, because the fluctuations in the amount of feed is compensated for by the rapidity of its approach toward the cylinder.

The front or fulcrum end of the upper carrier may be raised or lowered to accommodate the speed of the cylinder or different conditions of the grain by means of the lever 63, mounted upon the rock-shaft 64, journaled in bearing-brackets 65 upon the feeder and connected by the crank-arms 66 with the links 67, extending down into the feeder and pivoted to the bars 49 of the upper carrier, said lever being locked at the desired point by means of the spring-actuated dog 68, engaging one of the notches of the sector 69, secured to the feeder-frame.

As the functions of the various parts have been explained in connection with the description of the detail construction, it is only necessary to state that the bundles, as usual, are deposited longitudinally upon the extension-carrier and are discharged therefrom upon the lower carrier, and traveling in the direction indicated by the arrow adjacent to the lower carrier, Fig. 2, impinge endwise against the upper carrier, the latter being operated by means of the small sprocket-wheel 70 on shaft 38 through the medium of the chain 71 and the sprocket-wheel 72 upon the corresponding end of shaft 53. As the feed affords a certain amount of resistance to the operation of the carriers and swings the upper carrier upward, its approach toward the cylinder is retarded by the upward adjustment of the friction-pulley upon shaft 42, as hereinbefore described. The near approach of the knives or blades 60 of the upper carrier to the lower carrier insures the cutting of the bands, and the contiguous front or discharge ends of the carriers insures the even delivery of the feed to the cylinder. If the speed of the cylinder should for some unforseen reason fall below a predetermined number of revolutions, the operation of the carriers is arrested by reason of the retractive action of the springs 34, which withdraw the friction-shoes from engagement with pulley 35, these springs yielding to the centrifugal power generated when the cylinder attains or exceeds a predetermined number of revolutions to permit the friction-shoes to engage and lock the wheels 31 and 35 rigidly together.

From the above description it will be apparent that I have produced a self-feeder and band-cutter wherein the delivery to the cylinder is always constant and full, because of the fact that the volume of grain makes up for a diminished speed and increased speed makes up for a diminished volume of grain. It will also be noticed that the machine is of simple, durable, and comparatively-inexpensive construction, and it is to be understood that while this application embodies the preferred form of my invention I reserve the right to make such variations in its construction as properly fall within the spirit and scope of the invention.

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

1. In a machine of the character described, an endless carrier, a companion endless carrier, held toward the former with a yielding pressure, a disk geared to the first-named carrier, a driven shaft geared to the companion carrier, a friction-pinion mounted upon said shaft and engaging said disk, and connections between the companion carrier and said pinion, whereby the movement of the former causes the latter to vary its position upon said shaft and thus impart a variable speed to the first-named carrier, substantially as described.

2. In a machine of the character described, a suitable framework, an endless carrier therein, a companion endless carrier above, and held yieldingly depressed, a drive-shaft for the first-named carrier and provided at one end with a friction-disk, a drive-shaft for the upper or companion carrier, a shaft geared to said last-named drive-shaft and extending radially of the friction-disk, a friction-pinion adjustable on said radial shaft and engaging said friction-disk, a lever mounted on the framework and connected so as to raise or lower the friction-pinion without interrupting its rotary action, a second lever pivotally connected to the upper-carrier frame, and a link pivotally connecting the opposite end of said lever with the rear end of the first-named lever, substantially as described.

3. In a machine of the character described, a suitably-slotted framework, an endless carrier therein below the slots of the framework, a companion endless carrier therein above the first-named carrier, a drive-shaft for the companion endless carrier, having its ends projecting through a pair of said slots, a guide-rod for said carrier near its opposite end and projecting through the other slots of the framework, a shaft geared to the first-named carrier, a drive-shaft geared to the companion or upper carrier and having a connection with the shaft of the first-named carrier whereby movement of the upper carrier shall vary the movement or speed of the lower carrier, a shaft mounted on the framework and provided with a crank-arm linked to the upper carrier near its front end, a lever for operating said shaft and thereby varying the distance between the pivoted or front ends of the carriers, and means for securing said shaft at the desired point of adjustment, substantially as described.

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

JOSEPH NAMUR.

Witnesses:
F. H. DAVIS,
F. K. GROVES.