No. 662,508. Patented Nov. 27, 1900.

F. B. TAYLOR.

BAND CUTTER AND FEEDER.

(Application filed Feb. 27, 1900.)

(No Model.) 4 Sheets—Sheet 1.

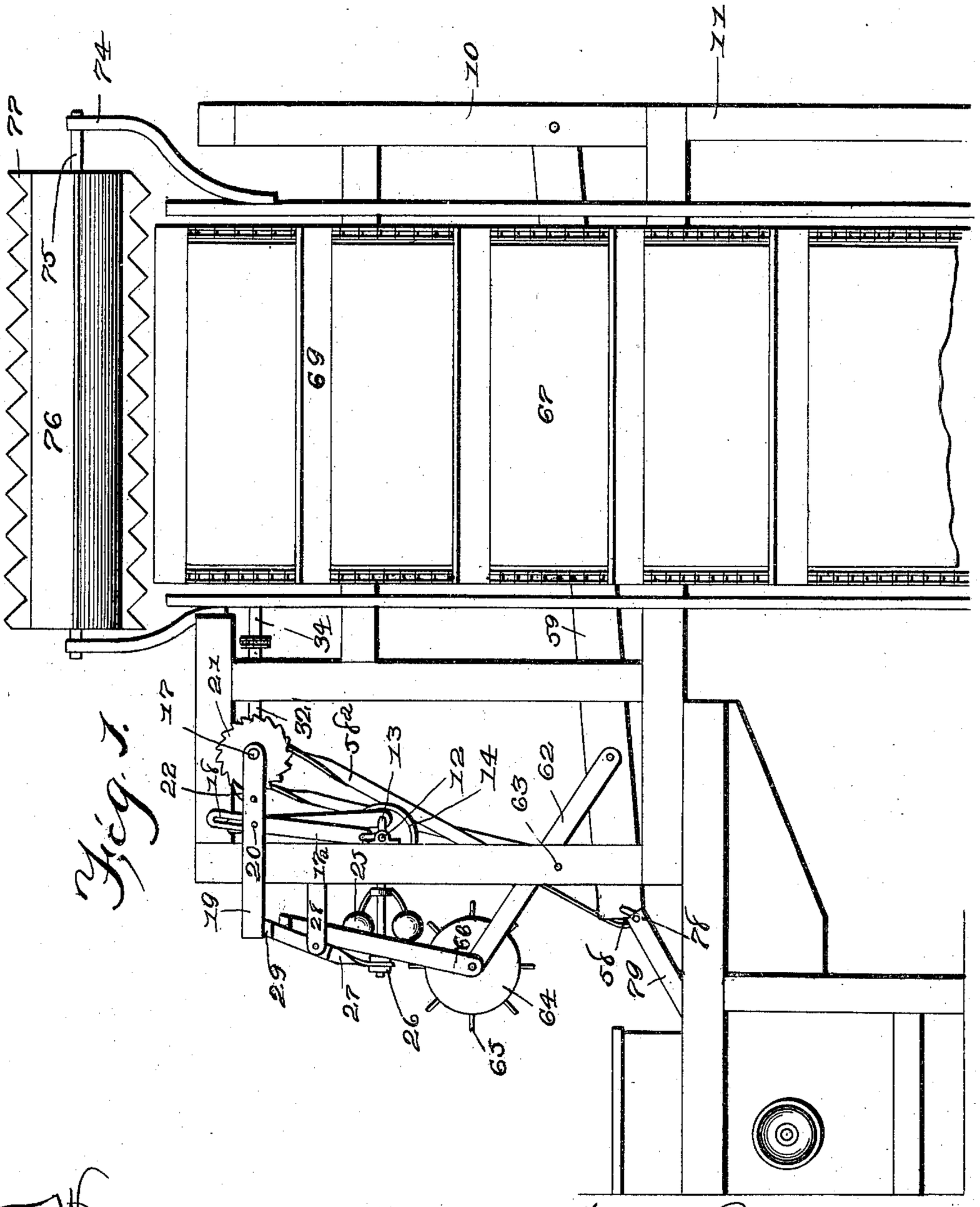

Fig. 1.

Witnesses:
R. S. Orwig
F. C. Stuart

Inventor: Francis B. Taylor,
By Thomas G. Orwig, Attorney

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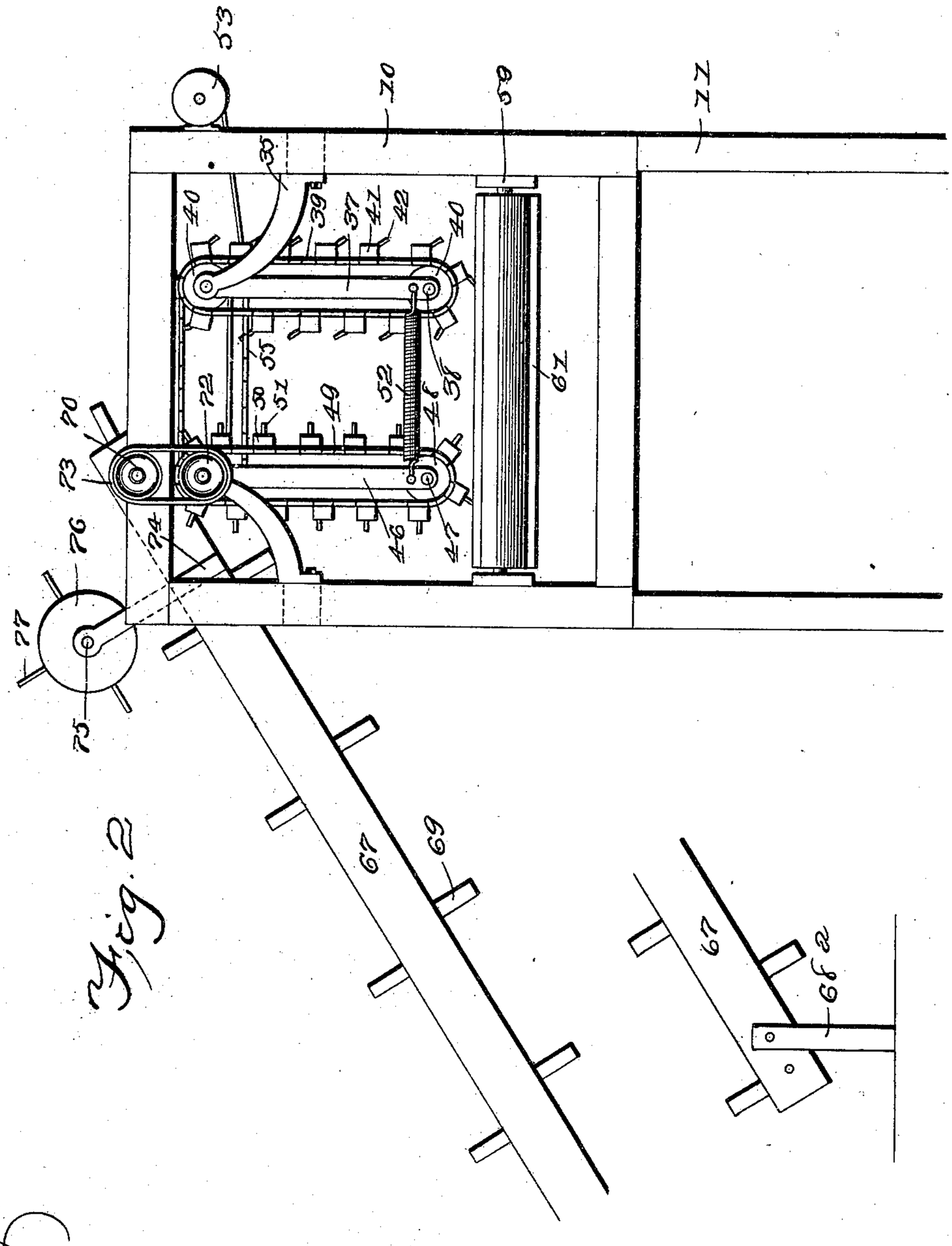

Fig. 2.

Witnesses:
R. S. Orwig
H. C. Stuart

Inventor: Francis B. Taylor,
By Thomas G. Orwig, Attorney.

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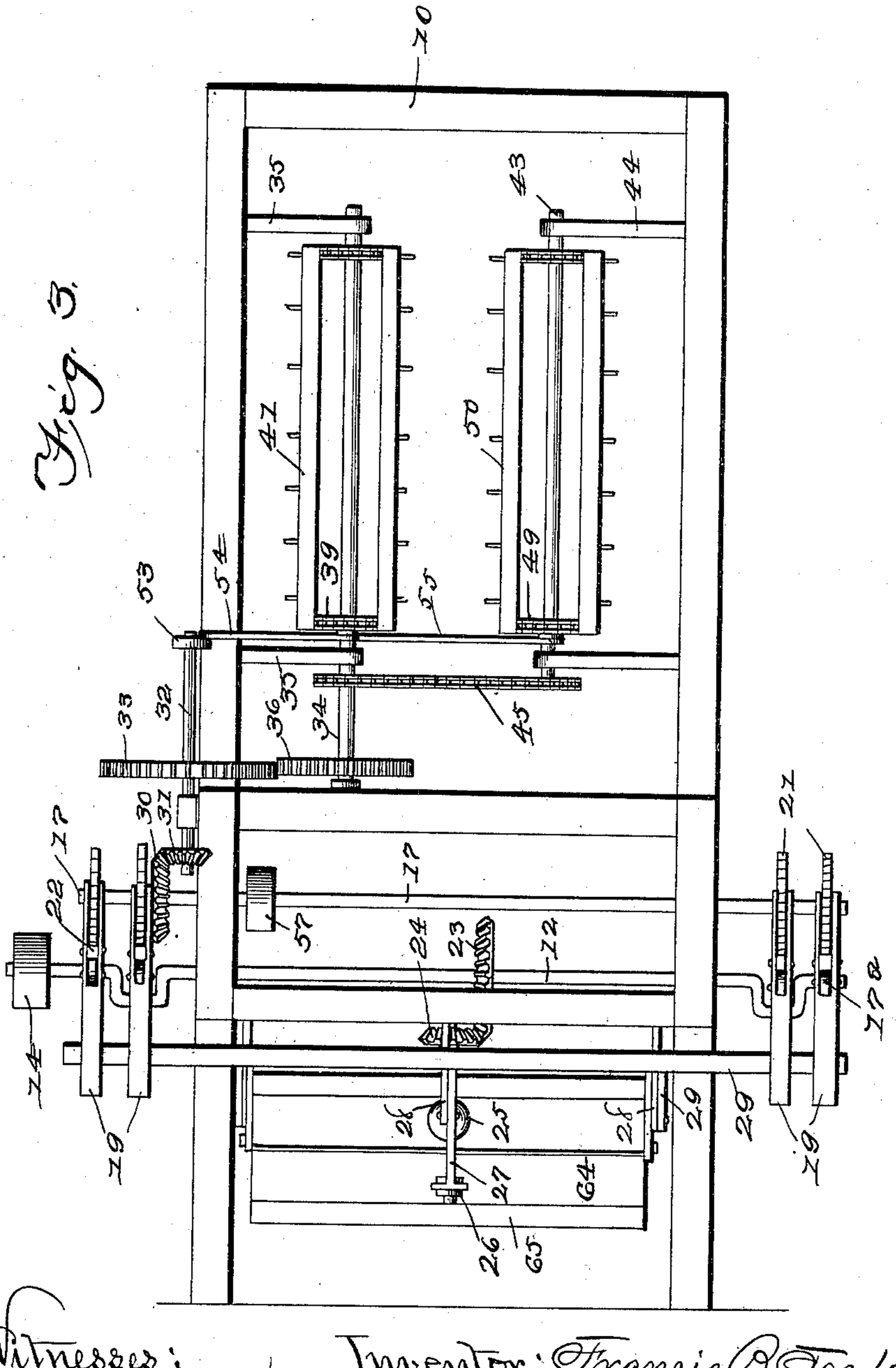
Fig. 3.



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By Thomas G. Orwig, Attorney.

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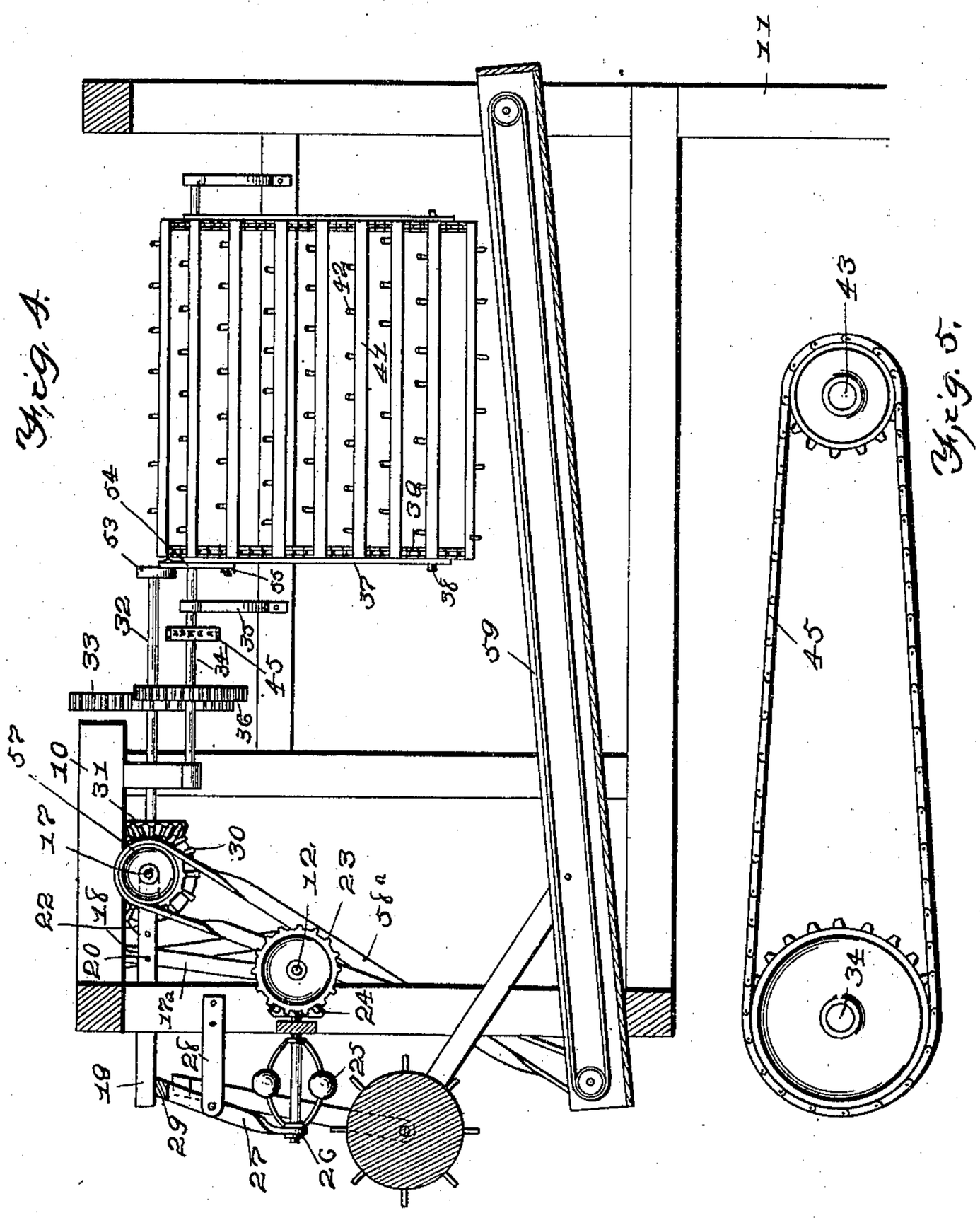

Witnesses:
R. S. Orwig.
R. H. Orwig.

Inventor: Francis B. Taylor.
By Thomas G. Orwig, Atty.

UNITED STATES PATENT OFFICE.

FRANCIS B. TAYLOR, OF TAYLOR, IOWA.

BAND-CUTTER AND FEEDER.

SPECIFICATION forming part of Letters Patent No. 662,508, dated November 27, 1900.

Application filed February 27, 1900. Serial No. 6,692. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS B. TAYLOR, a citizen of the United States, residing at Taylor, in the county of Pottawattamie, in the State of Iowa, have invented certain new and useful Improvements in Band-Cutters and Self-Feeders, of which the following is a specification.

One object of this invention is to provide a band-cutter and self-feeder of simple, strong, durable, and inexpensive construction upon which the sheaves of grain may be placed from a wagon or from the stack of grain at the side of the machine and the sheaves be conveyed upwardly to the band-cutter, where the band will be automatically severed, after which the grain is distributed evenly over the conveyer leading to the cylinder of the threshing-machine in a regular and uniform manner.

A further object is to provide means whereby the speed of the conveyer leading to the threshing-cylinder will be regulated proportionately to the thickness of the layer of grain upon the conveyer leading to the cylinder, so that when a large quantity of grain is on the conveyer the conveyer will run slowly, and vice versa; and my object is, further, to provide an automatic governor whereby the grain is held from passing through the threshing-cylinder until a certain predetermined speed is attained by the threshing-cylinder and to stop the movement of the grain to the threshing-cylinder as soon as this speed falls below a certain number of revolutions.

My invention consists in certain details in the construction, arrangement, and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of a portion of the threshing-machine with my improved band-cutter and self-feeder in position thereon, part of the conveyer leading to the band-cutter being broken away. Fig. 2 shows a rear end elevation of the band-cutter and feeder complete, and Fig. 3 shows a top or plan view of the machine with the band-cutter and the conveyer leading to the band-cutter removed. Fig. 4 shows a central vertical longitudinal sectional view of the complete machine, and Fig. 5 shows a detail illustrating the means for driving one of the supporting-conveyers from the operating-shaft of the mating conveyer.

Referring to the accompanying drawings, I have used the reference-numeral 10 to indicate the frame of the band-cutter and feeder, the forward end of which is designed to rest upon a portion of the threshing-machine and the rear end thereof is supported upon the upright 11. Mounted in the frame 10 near the end toward the threshing-machine is a shaft 12, having on each end two cranks 13, and on one end thereof is a pulley 14, which pulley is geared direct to a pulley on the cylinder-shaft by means of a belt. (Not shown.) I transmit motion from this shaft 12 to another shaft 17, which latter shaft drives the operative mechanism of the device as follows: Mounted upon each of the crank-arms 13 is a pitman 17ª, having a slot 18 in its upper end. This pitman is passed through a lever 19, and a pin 20, fixed to the lever, passes through the said slot 18. The outer ends of these levers 19 are bifurcated and pivoted to the shaft 17, and fixed to the said shaft between the parts of each of said levers is a ratchet-wheel 21, and a gravity-pawl 22, pivoted in each of said levers 19, engages the ratchet-wheel 21. The said cranks 13 are arranged at angles of forty-five degrees with relation to each other. Hence one of the pitmen 17 will be moving upwardly at all times during the rotation of the shaft 12, and this upward movement will of course raise the lever 19 to which the pitman is connected, thereby rotating the ratchet-wheel 21 by means of the pawl 22. I have arranged that the stroke of the said pitman will when working to its full limit operate to rotate the ratchet-wheel 21 about one-quarter of a revolution. Hence when the levers 19 are working full stroke motion will be transmitted to the shaft 17 to substantially correspond with the rotation of the shaft 12. However, in this connection attention is directed to the slots 18 just described, and by reason of these slots the levers 19 are not pulled downwardly with the pitmen 17, so that if means were provided for holding the ends of the levers 19 in an elevated position the said levers could not operate a full stroke.

Hence the movement of the shaft 17 with relation to the shaft 12 will be changed in proportion to the amount of elevation given to the levers 19. On the shaft 12 I have placed a bevel gear-wheel 23, meshed with a like wheel 24, which bevel gear-wheel 24 is fixed to the shaft of a centrifugal ball-governor 25. The sliding block 26 on the end of the ball-governor shaft is connected with a lever 27, fulcrumed to a support 28 and having at its top a horizontal frame 29, which is designed to be capable of passing under the levers 19 when in their elevated position to thereby prevent them from lowering.

It is obvious from the foregoing that upon starting the band-cutter and feeder the frame 29 will hold the levers 19 in their elevated positions until the speed of the governor reaches such a degree as to throw the balls of the governor outwardly sufficiently to operate the lever 27, so as to bring the said lever 27 inwardly beyond the ends of the levers 19. Then when the speed of the shaft 12 falls below a certain speed the said lever 27 will be operated to move the frame 29 under the ends of the levers 19 to again stop their operation before the rotation of the threshing-cylinder is entirely stopped.

Mounted upon the shaft 17 is a bevel gear-wheel 30 to mesh with a like wheel 31 on a shaft 32, which has its bearings upon the side of the machine-frame. On the opposite end of this shaft 32 is a cog-wheel 33. A shaft 34 is mounted in the bearings 35 to extend longitudinally of the machine-frame. On the said shaft 34 is a cog-wheel 36, in mesh with the aforesaid cog-wheel 33. Mounted upon this shaft 34 is a frame 37 to project downwardly therefrom, and in the lower end of this frame 37 is a shaft 38. An endless chain conveyer 39 is passed over sprocket-wheels 40 on these shafts and is provided with cross-strips, and in these strips are the inclined teeth 42, the inclination of said teeth being such that they project upwardly on the inner surface of the conveyer thus formed for purposes hereinafter made clear. A shaft 43 is supported in bearings 44, so as to be parallel with the shaft 34. Motion is transmitted to the shaft 43 by means of a sprocket-gearing 45, which sprocket-gearing is so arranged as to drive the shaft 43 about twice as fast as the shaft 34. On this shaft 43 a frame 46 is mounted, and in the lower end of this frame is a shaft 47. Sprocket-wheels 48 are attached to these shafts, and the endless-chain conveyer 49 passes over these sprocket-wheels, and on these chains are the cross-strips 50, having the straight teeth 51 thereon. These two devices are placed side by side in parallel positions and separated to such a distance as to permit a sheaf of grain to enter between them without dropping through, and the lower ends of these devices are connected by means of the coil-springs 52, which serve to draw the lower ends of said frames together, so that small bundles cannot drop through between the devices without being engaged by the teeth thereof and so that large bundles of grain may cause the devices to spread, so that they will not choke.

As will hereinafter appear, the bundles of grain after being cut will pass between the devices just described to be separated or spread thereby over a conveyer leading directly to the cylinder, which will be hereinafter described. To aid in spreading the grain upon this conveyer leading to the cylinder, I have provided a crank-wheel 53 on the shaft 32, and a pitman 54 is connected with a wrist-pin on the said crank-wheel and also to the frame 37, and an arm 55 connects the two frames 37 and 46. Hence by this means it is obvious that the lower ends of said devices will swing across the surface of the conveyer leading to the threshing-cylinder and deposit the grain in even layers upon said conveyer. I have provided the upwardly-projecting teeth 42 on one conveyer and the straight teeth 51 on the other conveyer, which travels twice as fast, for the purpose of spreading the grain as it passes between these conveying devices. On the shaft 17 is a pulley 56, which pulley is connected with a pulley 57, mounted on a shaft 58, by a belt 58^a, which shaft is supported in the conveyer-frame 59. This conveyer-frame 59 extends from a point adjacent to the threshing-cylinder to a point at the outer end of the conveyer-frame. In the outer end of the frame 59 is a shaft 60, and an endless conveyer of ordinary construction (indicated by the numeral 61) passes over the shafts 60 and 58 toward the threshing-cylinder. This conveyer 61 is of such a width that the grain delivered by the laterally-swinging conveyers may all be received upon its top surface.

I have provided means whereby the feeding of grain to the cylinder may be regulated by the thickness of the layer of grain upon the conveyer 61, so that when the grain on the conveyer is too thick the movement of the feeding mechanism will be slowed, so as to permit the threshing-cylinder to receive the grain fed to it as follows: On opposite sides of the frame 59 are two arms 62 to project inwardly and upwardly, the downward movement of said arms being limited by pins 63 on the frame. Between the inner ends of said arms 62 is a roller 64, having radial projections 65 thereon, and from the shaft of the roller 64 a frame 66 projects upwardly and then transversely of the machine to the other side of the roller and then downwardly to the shaft, to which it is pivoted. It is obvious that when this frame 66 is moved upwardly it will engage the levers 19 and hold them in an elevated position. It is obvious that if they are held elevated to such a degree that the levers 19 can only operate through half a stroke instead of the full stroke the speed of the conveyers will be reduced

one-half. Then of course as the roller 64 is lowered the speed will again increase to the original degree.

I have provided means for raising the bundles of grain from the ground-surface, so that they will discharge between the swinging conveyers, as follows: The reference-numeral 67 indicates an endless conveyer of ordinary construction detachably supported on the machine-frame. The upper end of this conveyer projects above the space between the said swinging conveyers, and the lower end is supported on the uprights 68ª upon the ground-surface. On this conveyer are cross-pieces 69, which project a considerable distance above the conveyer proper. The conveyer is driven by means of a sprocket-wheel 70 on the shaft of the conveyer and a sprocket-wheel 72 on the shaft of the conveyer 49, a sprocket-chain 73 connecting the sprocket-wheels 70 and 72.

In use the sheaves of grain are placed upon this conveyer 67 between cross-pieces 69 and in a position transversely of the conveyer, so that the band on the sheaves will present themselves in such a manner as to be readily cut by the cutter, hereinafter described.

The band-cutting mechanism comprises uprights 74 on the conveyer-frame and a shaft 75, supported in said uprights, directly over the upper end portion of the conveyer 67. A cylinder 76 is fixed to the said shaft, having blades 77 projecting radially therefrom and provided with serrated teeth. This band-cutting device is located in such position with relation to the conveyer that each sheaf of grain as it passes under it will be engaged thereby and will turn the cylinder bearing the knives, so that the knives will sever the bands thereof. By being attached to the conveyer it will operate the same when the conveyer is in any position. On the ends of the shaft 58 of the conveyer 61 are the crank-arms 78, and connected with these crank-arms is an apron 79, leading toward the cylinder. It is obvious that during the rotation of the crank 58 the said apron will be shaken, so that the loose grain thereon will be delivered into the concave of the threshing-machine.

In practical use and assuming that the band-cutting and feeding attachment were applied to a thresher it is obvious that the sheaves of grain may be readily and easily loaded upon the conveyer 67, either from the wagon or from a stack of grain at either side of the thresher, and that the bands of the sheaves will readily be severed by the band-cutting knives. Then as the severed grain is passed between the swinging conveyers it is obvious that on account of the difference in travel between the conveyers the grain in the sheaves will be spread out, and on account of the fact that these conveyers are swinging this grain will be discharged upon the conveyer 61 in a layer to cover the entire surface of said conveyer 61. It is then advanced by the said conveyer 61 to the threshing-cylinder. It is obvious, further, that when the grain upon the conveyer 61 is in layers too thick to readily enter the threshing-cylinder the cylinder 64 will be elevated, and by means heretofore described the movement of all of the conveyers will be retarded until the thickness of grain upon the conveyers 61 will again reach its normal level. It is obvious, further, that by means of the governing device described heretofore the threshing-machine must be operated at a certain predetermined speed before the feeding of grain will start, and in the event that the speed of the threshing-machine falls below a certain predetermined point at any time the feeding of grain will instantly stop.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States therefor, is—

1. In an improved feeder for threshing-machines, the combination of two parallel endless conveyers, arranged to move vertically in different directions, means for swinging said conveyers jointly, a conveyer beneath the same, to move in a substantially-horizontal plane approximately at right angles to the said parallel conveyers, whereby grain passing between the parallel conveyers will be distributed from side to side of the horizontal conveyer, as the parallel conveyers swing laterally.

2. In an improved feeder for threshing-machines, the combination of two parallel endless conveyer-frames pivoted at their upper ends, yielding pressure devices for connecting their lower ends whereby the said lower ends are normally held toward each other and are capable of moving in a direction from each other, an endless conveyer on each of said frames, means for moving the endless conveyers vertically in different directions, means for swinging said conveyer-frames jointly, a conveyer beneath same, to move in a substantially horizontal plane at right angles to said parallel conveyer, whereby the grain passed between the parallel conveyers may be distributed from side to side of the horizontal conveyer as the parallel conveyers swing laterally.

3. In a self-feeder for threshing-machines, the combination with a conveyer leading to the threshing-cylinder, of two endless conveyers arranged parallel with each other above the central portion and at right angles to the conveyer leading to the cylinder, said conveyers being pivoted at their upper ends to swing laterally, teeth on one of the conveyers which incline upwardly when on the side between the two conveyers, and straight teeth on the other conveyer, means for driving the conveyer having straight teeth at a speed greater than the other conveyer, springs for holding the lower ends of said conveyors toward each other, means for swinging the conveyers jointly in a direction transversely of the conveyer leading to the cylinder, and means for discharging grain between the said

conveyers, substantially as, and for the purposes stated.

4. In a band-cutter and self-feeder for threshing-machines, the combination of a shaft to be driven from the threshing-machine and having a pair of crank-arms thereon, a pitman connected with each crank-arm, a second shaft rotatably mounted adjacent to the first, a series of ratchet-wheels thereon, levers pivoted to the said shafts, and means for providing a limited sliding connection between said levers, and said pitman, pawls on each of said levers to engage said ratchet-wheels, a conveyer leading to the threshing-cylinder, and a device located above the conveyer leading to the threshing-cylinder, capable of being moved vertically by the grain carried on the conveyor, and a frame connected with said device, designed when in elevated position to engage the forward ends of said levers and hold them in elevated positions, substantially as, and for the purposes stated.

5. In a band-cutter and self-feeder for threshing-machines, the combination with a conveyer leading to a threshing-cylinder, of a shaft to be driven from the threshing-machine, and having a pair of crank-arms thereon, a pitman connected with each crank-arm, a second shaft rotatably mounted adjacent to the first, a series of ratchet-wheels thereon, levers pivoted to the said shafts, and means for providing a limited sliding connection between said levers and said pitman, pawls on each of said levers to engage said ratchet-wheels, and a centrifugal ball-governor geared to the first-mentioned shaft, a lever fulcrumed to a suitable support and connected with the ball-governor and having a cross-piece at its top, designed to pass under the said levers when the speed of the first-mentioned shaft is below a certain predetermined number of revolutions per minute, for the purposes stated.

FRANCIS B. TAYLOR.

Witnesses:
GEO. T. RING,
WILL. F. LYMAN.