

No. 713,433.

Patented Nov. 11, 1902.

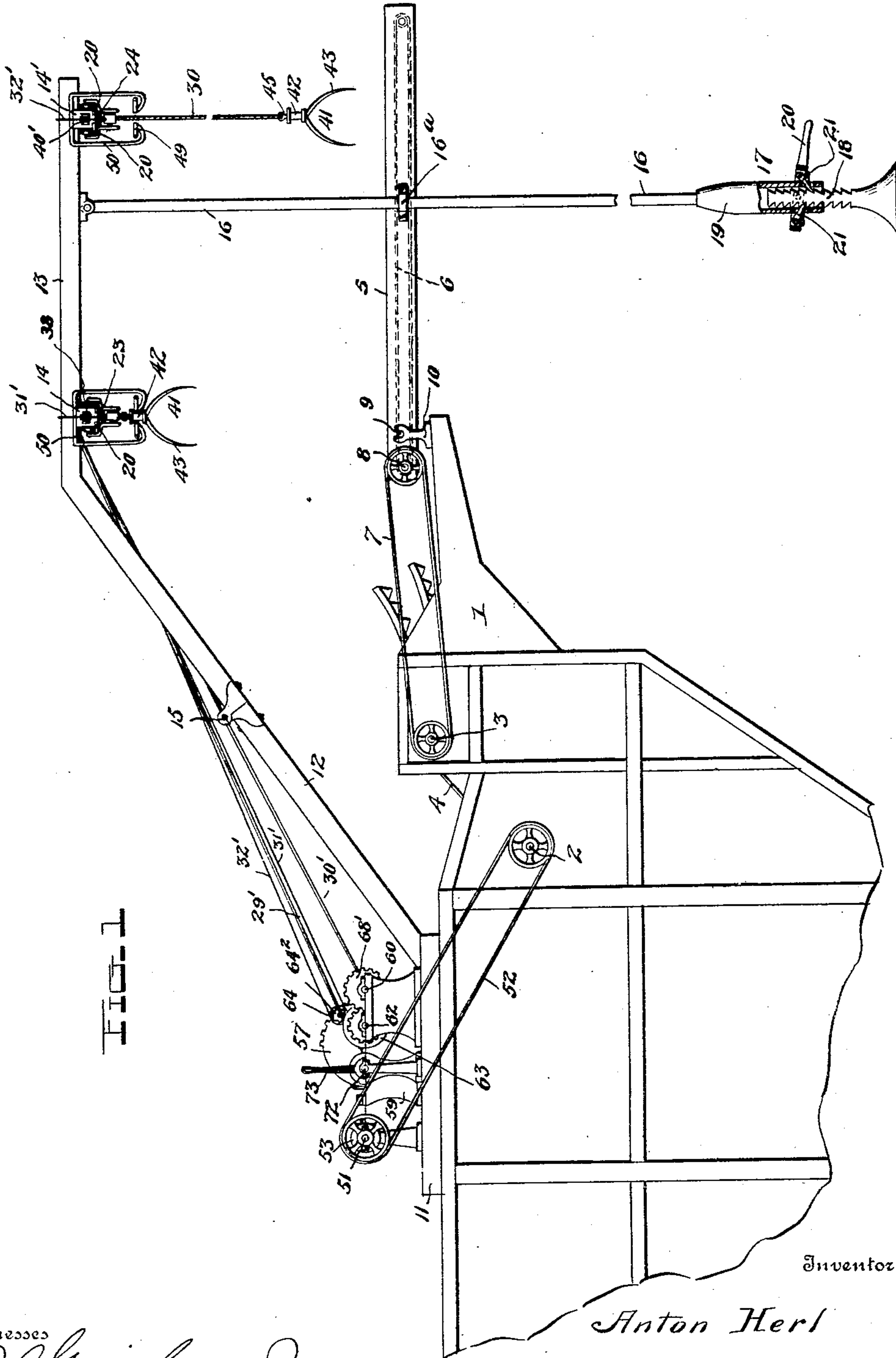
A. HERL.

SELF FEEDER FOR THRESHING MACHINES.

(Application filed June 2, 1902.)

(No Model.)

4 Sheets—Sheet I.



Inventor

Anton Herl

Witnesses

J. A. Guisbaur Jr. By
J. P. Wilson

A. P. Wilson & Co.
Attorneys

No. 713,433.

Patented Nov. 11, 1902.

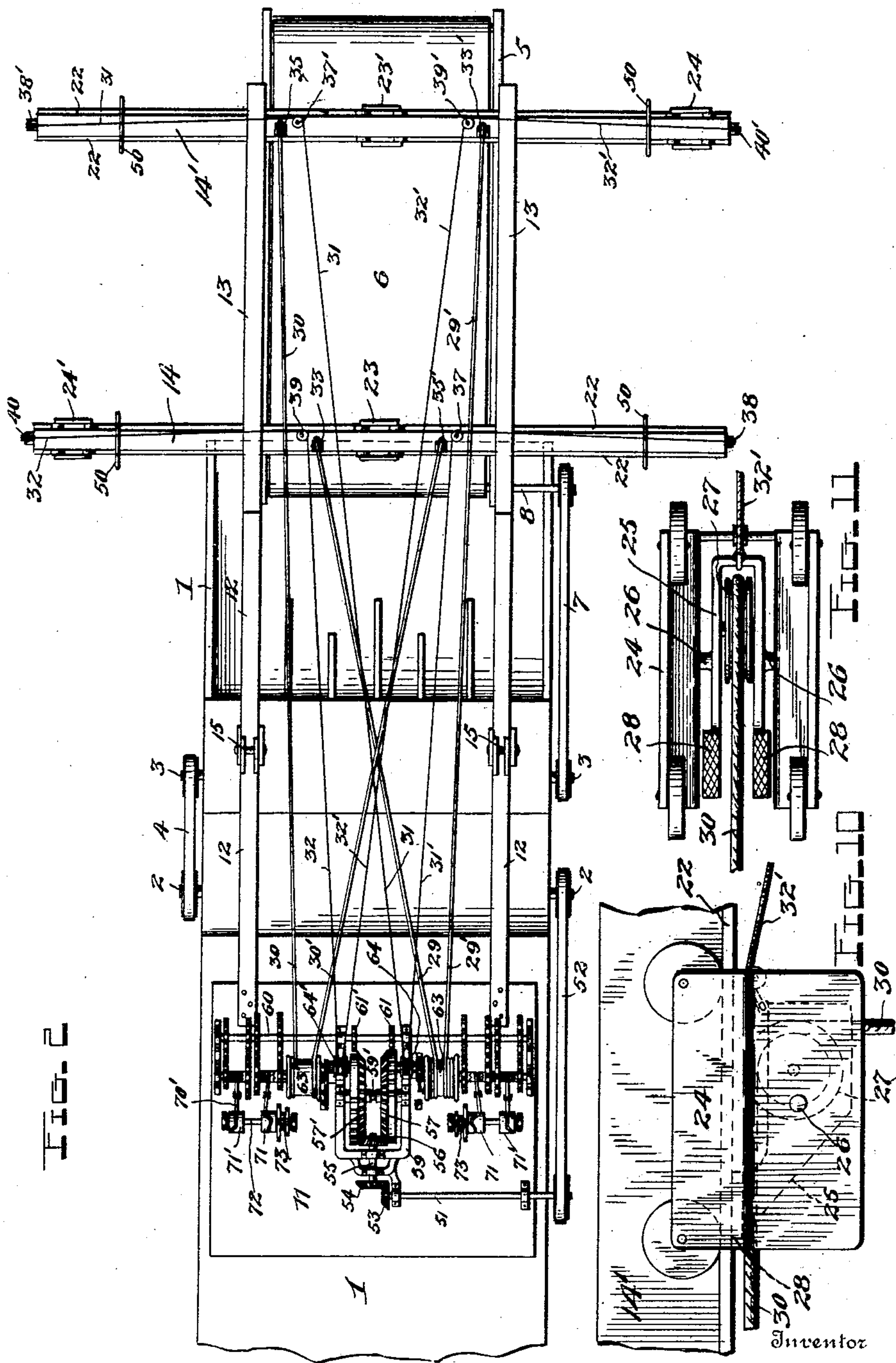
A. HERL.

SELF FEEDER FOR THRESHING MACHINES.

(Application filed June 2, 1902.)

(No Model.)

4 Sheets—Sheet 2.



Witnesses
J. A. Grieshaber, Jr.
J. A. Grieshaber, Jr.

By Anton Herl
A. B. Wilson & Co.
Attorneys

No. 713,433.

Patented Nov. 11, 1902.

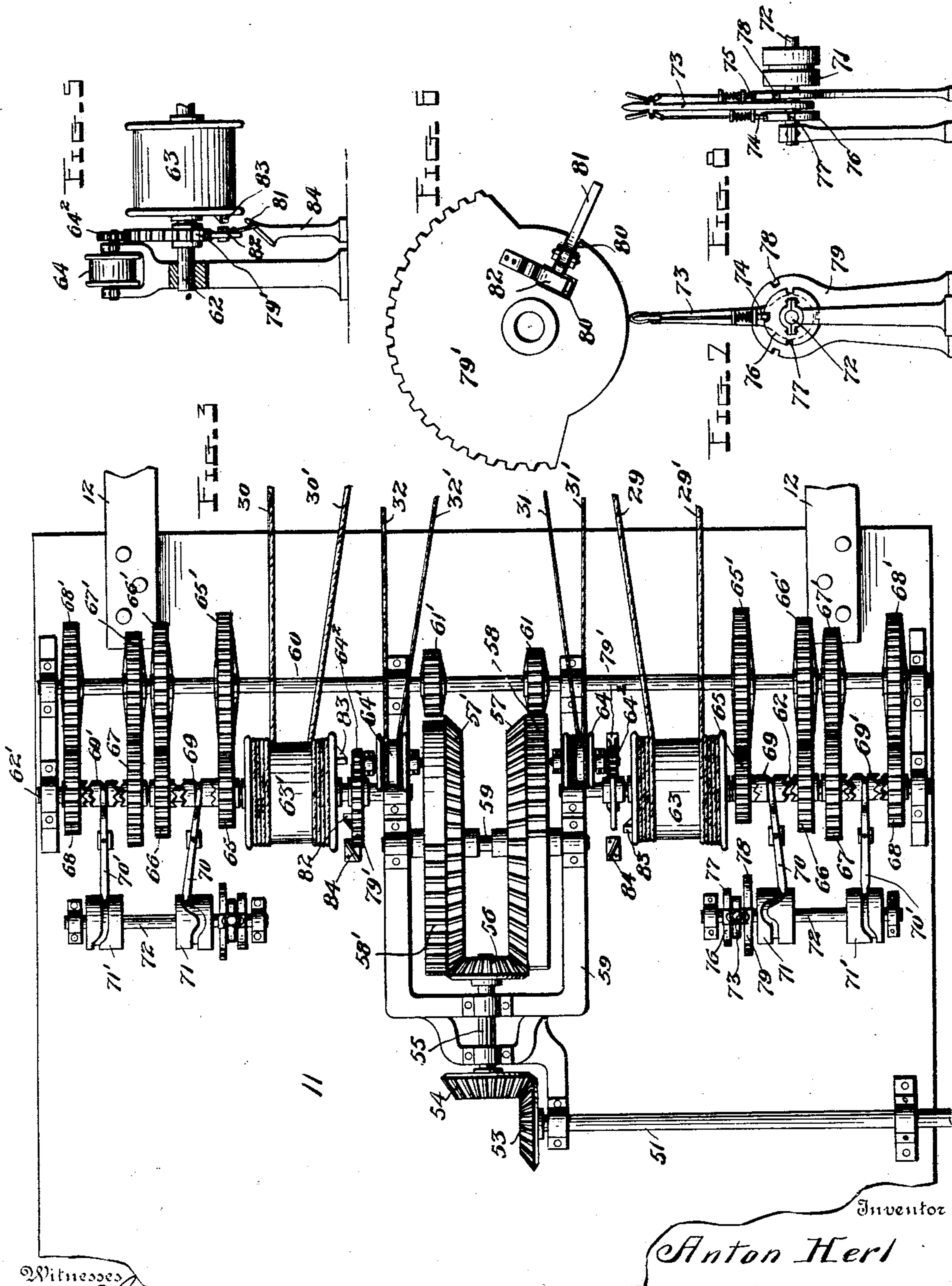
A. HERL.

SELF FEEDER FOR THRESHING MACHINES.

(Application filed June 2, 1902.)

(No Model.)

4 Sheets—Sheet 3.



Inventor

Anton Herl

Witnesses

J. A. Greenbauer, Jr.
J. A. Greenbauer, Jr.

331

A. B. Wilson & Co.
Attorneys

No. 713,433.

Patented Nov. 11, 1902.

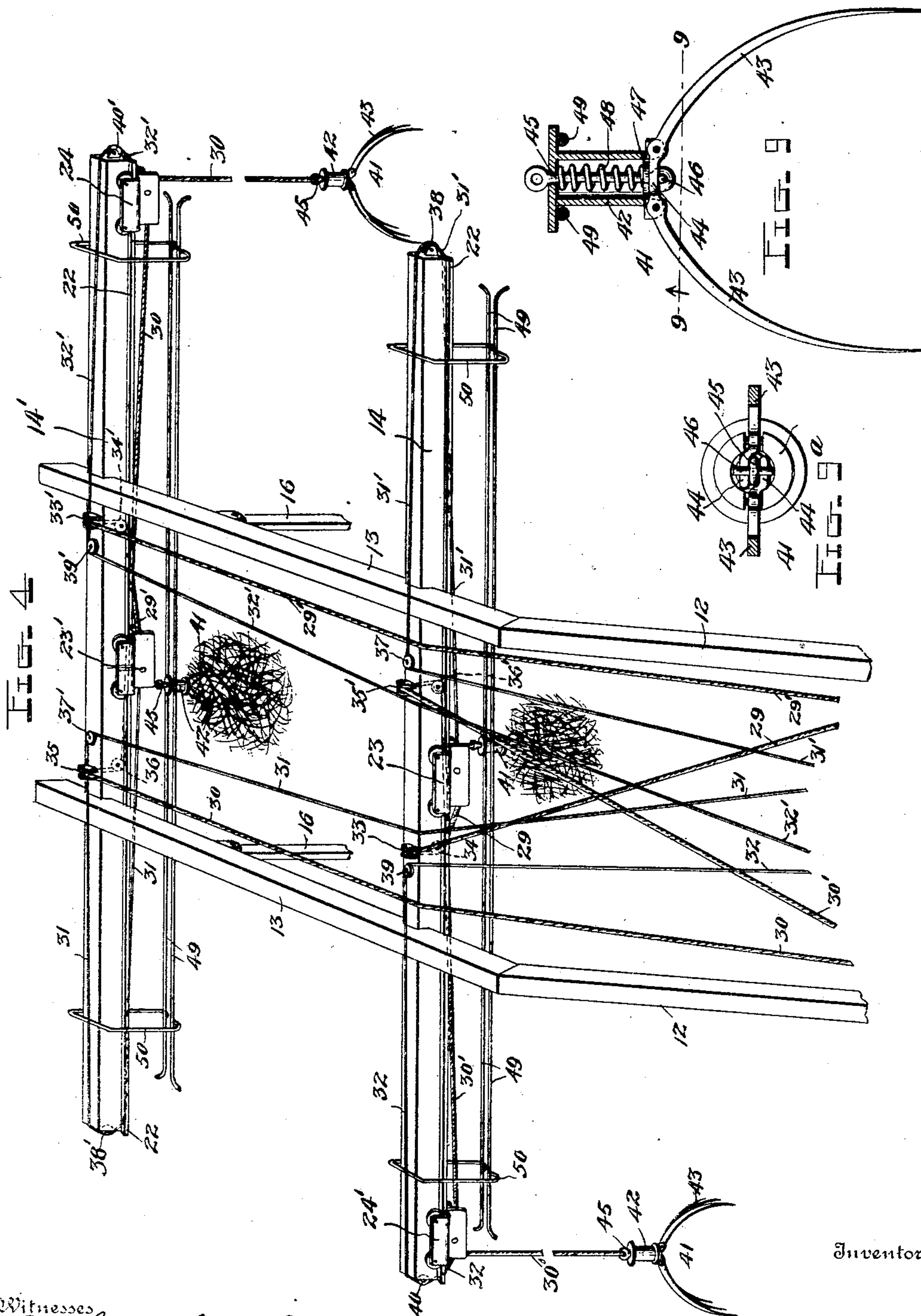
A. HERL.

SELF FEEDER FOR THRESHING MACHINES.

(Application filed June 2, 1902.)

(No Model.)

4 Sheets—Sheet 4.



Inventor

Witnesses
J. A. Graubauer, Jr.
J. A. Wilson

By

Anton Herl
St. Paul, Minn.
Attorneys

UNITED STATES PATENT OFFICE.

ANTON HERL, OF HAYS CITY, KANSAS.

SELF-FEEDER FOR THRESHING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 713,433, dated November 11, 1902.

Application filed June 2, 1902. Serial No. 109,940. (No model.)

To all whom it may concern:

Be it known that I, ANTON HERL, a citizen of the United States, residing at Hays City, in the county of Ellis and State of Kansas, have invented certain new and useful Improvements in Self-Feeders for Threshing-Machines; 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.

This invention relates to a self-feeding attachment for threshing-machines.

The object of the invention is to provide mechanism applicable to any ordinary form of threshing-machine, whereby the operation of feeding the grain in loose condition or in bundles may be conveniently and rapidly performed and whereby the feed of the grain may also be controlled to accord with the capacity of the machine.

With the above and other objects in view, which will readily appear as the nature of the invention is better understood, said invention consists in certain novel features of construction and combination and arrangement of parts, which will be hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a fragmentary side elevation of one end of a threshing-machine equipped with my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a plan view, on an enlarged scale, of the controlling-gearing. Fig. 4 is a perspective view of the frame of the feeder, showing the arrangement of the parts when two of the forks are in position to dump and the other two forks are in position to load. Fig. 5 is a detail rear elevation of one of the large drums and its companion small drum, showing the means for operating said small drum and the means for throwing said operating means out of action. Fig. 6 is a side view of the gear-segment which operates the small drum. Figs. 7 and 8 are respectively an end and a side elevation of the clutch-shifting lever and cooperating parts. Fig. 9 is a vertical section of one of the forks, showing the grappling-arms spread out. Fig. 9^a is a section on the line 9 9 of Fig. 9 looking in the direction of the arrow. Fig. 10 is a detail side elevation of a carriage and a por-

tion of the support therefor. Fig. 11 is a top plan view of the carriage.

Referring now more particularly to the drawings, 1 represents the inlet end of a threshing-frame; 2, the cylinder-shaft; 3, the band-cutter shaft, which is driven by the belt 4 from the cylinder-shaft; 5, a feeder-frame in which is mounted the endless apron 6, which conveys the grain placed thereon to the band-cutters, and 7 a belt which imparts motion from the shaft 3 to the drive-shaft 8 of said apron. The conveyer-frame 5, as shown in Fig. 1, is provided at its inner end with trunnions 9, journaled in open bearing-brackets 10, thus permitting of the ready removal of the conveyer when not in use. The manner of supporting the conveyer will be hereinafter described.

Mounted upon the top of the threshing-frame is a base 11, from which project diagonal arms 12, terminating in outwardly-extending horizontal bars 13, connected by cross-bars 14 14', forming a frame to support the automatic feeding mechanism, said arms 12 being composed of sections united by hinges 15, whereby said frame may be swung back over upon the threshing-machine to facilitate transportation of the threshing-machine from place to place. The outer end of this frame is supported from the ground by standards 16, hinged to the bars 13 and provided at their free ends with jacks 17 to rest upon the ground, each of said jacks consisting of a base or pedestal carrying a rack-bar 18, receiving a sleeve 19 on the lower end of the standard, said sleeve carrying a pivoted lever 20, provided with pawls 21, whereby the standard may be adjusted to conform to inequalities of ground surface and raise the frame to the desired elevation.

The cross-bars 14 14' are provided with laterally-extending track-rails 22, on which run carriages 23 23' and 24 24', each of which is provided with suitable wheels or rollers to traverse said rails. The carriages are arranged in pairs upon the two bars, the carriages 23 and 24' being mounted upon the bar 14, while the carriages 23' and 24 are mounted upon the bar 14', and the means for controlling the operation of the same is so constructed and arranged that when one carriage of each pair has moved to the outer end of the

bar in position adapting the fork carried thereby to receive a load the other carriage will be located at the center of the bar immediately above the feed-apron 6 in position for the fork thereof to deposit the load upon said apron, the carriages thus moving alternately inwardly and outwardly, the one to discharge and the other to receive a load, as will be readily understood.

Each carriage has mounted therein a swinging bail-frame 25, having trunnions 26 pivotally connecting it to the carriage and having mounted therein a supporting-pulley 27, said pulley being eccentrically arranged with relation to said trunnions. On the opposite side of the center from the pulley the swinging frame is provided with brake-shoes 28, which are adapted to engage the track-rails to arrest the motion of the carriage when the latter reaches the discharge position, as hereinafter described.

Connected to the carriages are the controlling ropes or cables 29 29', 30 30', 31 31', and 32 32'. As shown, the cable 29 passes over a pulley 33 on the bar 14, thence passes downward through said bar and over a pulley 34 on the under side thereof, and thence extends over the supporting-pulley 27 on the carriage 23, whereby said cable is arranged in such manner that when drawn thereon it will pull the carriage 23 inwardly or toward the center of the bar 14. The cable 29' passes in a similar manner over a pulley 33' on the bar 14', thence downward through said bar and over a pulley 34' upon the under side thereof, and from said pulley 34' it extends over the supporting-pulley 27 of the carriage 23', the arrangement being such that when said cable is drawn upon the carriage 23' will be moved inwardly or toward the center of the bar 14'.

The cable 30 passes over a pulley 35 on the bar 14', downward through said bar and over the pulley 36, and thence passes over the supporting-pulley 27 of the carriage 24, while the cable 30' extends downward over a pulley 35' on the bar 14, through said bar, as before, and over a pulley 36' on the under side thereof, and thence passes over the supporting-pulley 27 of the carriage 24', by which construction the two carriages 24 and 24' are mounted to move in opposite directions upon the bars 14 14'.

The cables 29 29' and 30 30' control the operation of the feed-forks hereinafter described and provide means for moving the carriages inwardly from the outer ends of the bars to a point above the feed-apron 6 to deposit the load thereon, while the cables 31 31' and 32 32' are provided for moving the carriages outwardly or toward the ends of the bars to again bring the forks in position to receive the load. As shown, the cables 31 31' pass over pulleys 37 37' on the bars 14 14' and extend in reverse directions and pass around pulleys 38 38' at the ends of the bars 14 14' at opposite sides of the frame and thence ex-

tend beneath said bars and are respectively connected to the carriages 23 23'.

The cables 32 32' pass around pulleys 39 39' on the two bars and thence extend reversely to the cables 31 31' toward the ends of said bars at opposite sides of the frame and pass down over pulleys 40 40' on said bars and beneath the same and are connected to the carriages 24' 24. It will thus be seen that the carriage 23' is drawn inwardly through the medium of the cable 29 and outwardly through the medium of the cable 31; that the carriage 24 is drawn inwardly by the cable 30 and outwardly by the cable 32'; that the carriage 23 is drawn inwardly by the cable 29 and outwardly by the cable 31'; that the carriage 24' is drawn inwardly by the cable 30' and outwardly by the cable 32.

Each of the controlling cords or cables employed for moving the carriages inwardly carries a fork or grapple 41, each of which consists of a tubular head or guide-frame 42, flanged at its upper and lower ends and having pivoted to its lower flange a series of grapple-arms 43, having inwardly-extending fingers 44. Vertically adjustable in the tubular head is a guide-rod 45, through the lower end of which is passed a pin 46, which bears against the under side of the fingers 44, and upon said rod is a head or washer 47, which bears against the upper surface of said fingers and is pressed thereagainst by a coil-spring 48, surrounding the rod between the washer and upper flanged end of the tubular head. The guide-rod is provided at its upper end with an eye to receive the connecting end of the controlling-cable. The tubular head 42 is mounted to slide between guide-rails 49, suspended by hangers 50 from the bars 14 14', and in the normal operation of the parts the controlling-cable holds the upper flange of the head above the rails and draws upon the guide-rod, whereby the pin 46 is drawn upward against the tension of the spring 48 and caused to press against the fingers 44, whereby the grapple-arms are swung inwardly and held in such position to retain the load. When, on the other hand, the carriage carrying the grapple reaches the discharge position above the apron 6, the controlling-cable is relaxed, thus allowing the rod to descend under the action of the spring 48, which exerts pressure from above against the fingers 44, thereby forcing the grapple-arms 43 outwardly and releasing the load, which falls down upon the apron 6.

The controlling mechanism for operating the cables is mounted upon the base 11 and is constructed as follows: 51 is a drive-shaft which receives motion through the medium of a belt 52 from the cylinder-shaft 2 and carries a beveled gear-wheel 53, meshing with a beveled gear-wheel 54 on a shaft 55, carrying a beveled pinion 56. This pinion 56 meshes with the inner beveled toothed faces of two master gear-wheels 57 57', loose upon a shaft 59', journaled in a suitable supporting-frame

59. These master gear-wheels are provided also with spur-gear teeth 58 58', extending each half-way around the periphery thereof, the toothed surface 58 of the gear 57 being disposed on the opposite side of the center of the axis of the gears from the toothed surface 58' of the gear 57', so that said toothed surfaces will alternately come into play to operate the parts to be driven thereby. As the pinion 56 is located between and meshes with the beveled surfaces of both gears 57 and 57', it will be seen that said gears will be driven in reverse directions. A counter-shaft 60 extends parallel with the shafts 51 and 59' and carries two spur-gears 61 and 61', which are adapted to respectively mesh with the spur-toothed portions 58 and 58' of the gears 57 and 57', said toothed portions 58 and 58' being adapted upon the rotation of the master-gears to alternately rotate the gears 61 and 61' in opposite directions and to transfer corresponding motion to the shaft 60. Two winding-shafts 62 62' are disposed upon opposite sides of the frame 59 between the drive-shaft 51 and counter-shaft 60 and are arranged in longitudinal alinement. The shaft 62 carries a winding-drum 63, to which are connected the controlling ropes or cables 29 29', while the shaft 62' carries a similar drum 63', to which are connected the controlling ropes or cables 30 30'. Located alongside the two drums 63 63' are smaller drums 64 64', to which are respectively connected the controlling cords or cables 31 31' and 32 32'. The controlling mechanism of the apparatus embodies in addition to the gearing previously described and the winding-drums gearing whereby the speed of rotation of the drum may be varied and readily controlled to pay out more or less rope, as required, and whereby also the smaller drums 64 64' are periodically operated to draw upon the cables 31 31' and 32 32' to move the carriages and the grapples supported therefrom to the outer ends of the bars 14 14' to bring the grapples into position to receive a load. As this mechanism is employed in duplicate, one set of devices coöperating with the winding-drum 63, while the other coöperates with the winding-drum 63', a description of one set will suffice for both, and therefore I will proceed to describe a set of devices coöperating with the winding-drum 63.

The drum 63 is fixed upon the shaft 62, and loosely mounted upon said shaft are a series of gears 65, 66, 67, and 68, which mesh with corresponding gears 65' 66', 67', and 68' upon the shaft 60, said gears being of varying sizes or diameters, so that the speed of the shaft 62 may be increased or diminished by bringing different sets of said gears into operation. Mounted to move between the gears 65 and 66 and to engage clutch-faces thereon is a double clutch-sleeve 69, and movable between the two gears 67 and 68 and performing a similar function with respect thereto is a double clutch-sleeve 69'. Connected with

these clutch-sleeves are shipper-bars 70 70', which are intermediately pivoted to suitable supports and have their outer ends fitted within grooves in cams 71 71', mounted upon a controlling-shaft 72. The grooves in the cams are of a similar formation and are disposed reversely, so that their working portions come upon opposite sides of the cams in order that the movement of one of the shipper bars or levers to throw the clutch-sleeve connected thereto into action will cause a reverse movement of the other lever, so as to throw the clutch-sleeve connected thereto out of action. By reference to Fig. 3 it will be seen that each groove has a substantially straight portion extending approximately half-way around the cam and a working portion extending the remaining distance, said working portion having two inclined surfaces, one of which acts to throw the lever in one direction and the other to throw the lever in the reverse direction, the straight portion of the groove acting to maintain the clutch-lever in a position at right angles to the shaft 72, in which the clutch-sleeve connected thereto is brought to a neutral position—that is, out of engagement with either of the gears. Of course it will be understood that when the shaft 72 is turned in one direction the outer end of the lever 70 will occupy one portion of the working surface of the groove in the cam 71 and will be shifted in a position to bring the clutch-sleeve 69 into engagement with the gear-wheel 65, thus adapting the shaft 62 to rotate at a certain rate of speed, while at the same time the lever 70' will occupy the straight portion of the groove in the cam-head 71' and will be shifted to a position in which the clutch-sleeve 69' is out of engagement with either of the gears 67 or 68. The cam-grooves of the two cams are so arranged that each quarter-revolution of the shaft brings one or the other of the operative portions of the cam-grooves into play, thus shifting the shipper-levers alternately, thereby enabling either lever to be thrown into action, while at the same time throwing the other lever out of action. The action of the levers is controlled through the medium of an adjusting-lever 73, loosely mounted upon the shaft 72 and provided with two spring-actuated pawls 74 75, connected with suitable retracting devices. The pawl 74 is adapted to engage a head 76, fixed upon the shaft 72, the said head being provided with notches 77, (four in number,) arranged equidistantly around its periphery, so that each quarter-revolution of the shaft about its axis will bring the pawl in position to interlock with either of said notches, by which the lever may be adjusted to shift the shaft 72 to control the shipper-bars 70 and 70' through the medium of the cam-heads. The other pawl 75 is adapted to engage notches 78, formed in a standard 79, to hold the lever fixed in adjusted position. It will thus be seen that by the simple manipulation of the lever 73 either of

the sets of gears 65 65' and 66 66', &c., may be brought into action to regulate the speed of the shaft 62, as desired.

In the operation of the apparatus, as previously explained, the controlling-cables 29 29' are employed for moving the carriages 23 23' inwardly to bring the bundles or loads of grain carried by the cooperating grapples to a position above the endless conveyer 6, and with the cables 31 31' are employed on the other hand for moving the carriages outwardly again after the grain has been dropped to bring the grapples at the outer ends of the bars 14 14' for reloading. As the pinion 56 drives the gears 57 57' in reverse directions, and as the toothed surfaces 58 58' come alternately into engagement with the pinions 61 61', it will be apparent that the shaft 60 will be alternately driven by said gears in reverse directions. In one direction of movement of this shaft the cables 29 and 29' are wound upon the drum 63, thereby drawing the carriages 23 23' toward the center of the two bars 14 14' and bringing the cooperating grapples above the conveyer to discharge the grain carried thereby, after which the cables 31 31' are operated to unwind the cables 29 29' and move the carriages in the reverse direction or, as heretofore stated, toward the outer ends of the bars 14 14'. To effect this operation, an intermittent or periodic motion must be given the drum 64, and to this end I provide a gear-segment 79', which is loose upon the shaft 62 and is in gear with a pinion 64², fixedly connected with the drum 64. In the gear 79' is formed a T-shaped slot 80, occupied by a pivoted trip-arm 81, secured to the free end of a spring contact-piece 82, adapted to be engaged by a fixed contact-piece 83 upon one side of the drum 63. The trip-arm 81 at a certain point in its path of travel is adapted to engage a stationary trip or retracting member 84, located below the shaft 62. When in the operation of the apparatus the drum 63 is revolved in the proper direction to wind up the cables 29 29', which is accomplished by the engagement of the toothed surface 58 with the pinion 61, the cables 31 31' are unwound from the drum 64, allowing the carriages 23 23' to be drawn toward the center of the bars 14 14'. Then after sufficient slack in the cables 29 29' has been given to allow the forks to dump their loads the toothed surface 58 moves out of gear with the pinion 61, while the toothed surface 58 moves into gear with the pinion 61', thereby revolving the shaft 60 in the reverse direction, and at the same time the lug 83 on the drum 63 contacts with the spring contact member 82 on the gear 79 and rotates said gear, whereby the pinion 63 is driven and motion is transferred to the small drum 64 to wind up the cables 31 31' while the cables 29 29' are unwinding from the drum 63, whereby the carriages 23 23' are drawn outwardly or toward the ends of the bars 14 14' to bring their grapples in position to be reloaded. It will thus be seen

that as the shaft 60 is alternately driven in opposite directions the cables of the two drums are alternately wound and unwound. It will also be seen that when the two carriages 23 and 23' are at the center of the frame ready to deliver their loads the other two carriages 24 24' are disposed at the ends of the frame ready to receive their loads and that as the carriages 23 23' move in the other carriages move out, and vice versa. When the carriages reach the limit of their upward movement, the arm 81 contacts with the inclined trip 84 and is pressed away from the drum 63, thus forcing the yielding or spring contact-piece 82 out of engagement with the lug 83, leaving the gear 79 inoperative until the parts are again brought into the position heretofore described for rotating said gear to wind up the cords 31 31' and unwind the cords 29 29'. As the carriages move into dumping position and the cables—say the cables 29 29', supporting the grapples—are slackened the heads 42 of the grapples drop down until their upper flanges rest upon the guide-rods 49, whereupon as the pull is removed from the guide-rod 45 the spring 48, acting on the washer 44, forces the grapple-arms 43 to spread apart, thereby releasing the load, which drops down upon the bundle-conveyer 6. When the carriage moves outwardly again and the draft-cords are drawn taut, the pin 46 lifts the fingers 44 and swings the grapple-arms inwardly, and this operation is effected also when the carriage is positioned at the outer end of one of the bars, so that as the carriage moves inwardly the grapple-arms will tightly grip the load and will not release it until sufficient slackness exists in the controlling-ropes to allow the load to drop down upon the conveyer.

By means of the controlling-gear it will be seen that by increasing or decreasing the speed of either drum the amount of rope paid out therefrom may be regulated as desired.

When either carriage—say the carriage 23—reaches a dumping position and the rope 32 slackens, the forward end of the swinging frame 25 tilts downwardly, thereby bringing the brake-shoes 28 into engagement with the track-rails, holding the carriage firmly against movement while the load is being dumped.

The outer end of the conveyer-frame 5 is supported by the standards 16 and may be secured thereto in any desired manner, as by clips 16^a, which are removable to permit of the disconnection of said parts for detaching the conveyer and folding back the feeder when the threshing-machine is not in use.

From the foregoing description, taken in connection with the accompanying drawings, it is thought that the construction, mode of operation, and advantages of my improved threshing-machine will be readily apparent without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be

resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having now particularly described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a self-feeding attachment for threshing-machines, the combination of a supporting-frame secured to and projecting beyond one end of the thresher-frame and provided with transverse trackways, carriages movable on said trackways and each having a swinging frame carrying a pulley and a brake-shoe, and controlling-cables one secured to the carriage and the other passing over the pulley and carrying a grapple whereby when the grapple descends and the first-named cable slackens, the swinging frame will be tilted and the brake-shoe forced into engagement with the trackway, thus holding the carriage against movement, substantially as described.

2. In a self-feeding attachment for threshing-machines, the combination with a thresher-frame; of a supporting-frame projecting therefrom and provided with transverse trackways, guides below the trackways, carriages movable on the trackways, controlling-cables one of which is connected to the carriage and the other passed over a pulley thereon, and a grapple attached to the latter-named pulley and movable between the guides and comprising pivoted grapple-arms, a head limited in its downward movement by said guides, a guide-rod to which the cable is connected and having opposite portions bearing upon the grapple-arms to swing the same open and closed, and a spring acting upon one of said bearing portions to force the arms open when the cables become slack, substantially as specified.

3. In a self-feeding attachment for threshers, the combination with a thresher-frame; of a supporting-frame projecting therefrom and provided with transverse trackways, carriages arranged in pairs upon each trackway, cables arranged in pairs, one cable of each pair being connected to a carriage and the other cable passed downward over a pulley thereon, grapples connected to the latter-named cables, guides for the grapples, automatic brake devices thrown into action when the carriage is moved into unloading position, and means for controlling the cables whereby one carriage on each trackway will be moved outwardly while the other moves inwardly, substantially as set forth.

4. In a self-feeding attachment for threshers, the combination with a thresher-frame, and a supporting-frame having a transverse trackway; of a carriage upon said frame, cables one connected to the carriage and the other passed over a pulley thereon and connected with a grapple, drums to which the

cables are connected, means for alternately operating one of the drums in opposite directions, and means for operating the other drum in one direction at a predetermined time from the first-named drum, substantially as specified.

5. In a self-feeding attachment for threshing-machines, the combination with the thresher-frame; of a supporting-frame provided with a transverse trackway, a carriage traversing said trackway, cables one connected to the carriage and the other passed over a pulley thereon and connected with a grapple, drums to which the cables are connected, means for alternately rotating one of the drums in reverse directions, means for varying the speed of rotation of said drum, and means for operating the other drum at a predetermined time from the first-named drum, substantially as and for the purpose set forth.

6. A drive-shaft, a counter-shaft, means for alternately rotating the counter-shaft in opposite directions from the drive-shaft, a winding-shaft, a traveling carriage, cables one connected with the carriage and the other passed over the pulley thereon and connected with a grapple, a drum on said winding-shaft and having one of the cables connected thereto, means for driving the winding-shaft at various rates of speed from the counter-shaft, a second drum to which the other cable is connected, and means for imparting motion from the first-named drum to the second-named drum, substantially as described.

7. A drive-shaft, a counter-shaft, means for alternately rotating the counter-shaft in opposite directions from the drive-shaft, a winding-shaft, a traveling carriage, cables one connected with the carriage and the other passed over the pulley thereon and connected with a grapple, a drum on said winding-shaft and having one of the cables connected thereto, means for driving the winding-shaft at various rates of speed from the counter-shaft, a second drum to which the other cable is connected, said drum being mounted upon an independent shaft and provided with a gear, a gear-segment loosely mounted upon the winding-shaft and meshing with said gear, means for connecting the first-named drum with the gear-segment at a predetermined time in the operation of said drum, whereby said segment is caused to operate the other drum, and means for automatically releasing said connection, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ANTON HERL.

Witnesses:

C. H. WOLFE,
C. W. MILLER.