(No Model.) 3 Sheets—Sheet 1.

C. C. HIERS.

PNEUMATIC STRAW STACKER.

No. 589,125. Patented Aug. 31, 1897.

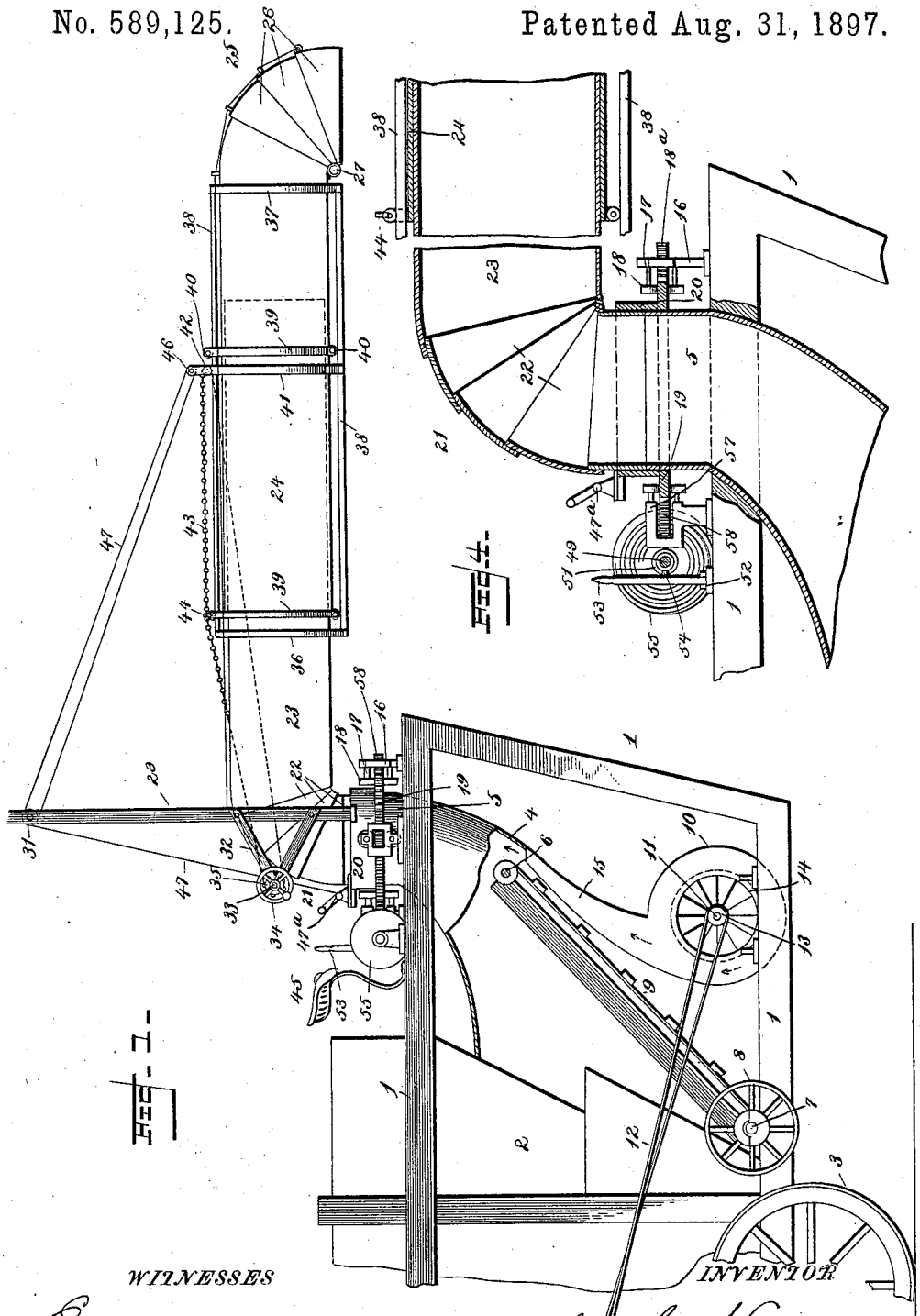


FIG. 4.

FIG. 1.

WITNESSES

Edwd. S. Duvall Jr.

Frank S. Beaelistone

INVENTOR

Chas. C. Hiers

by W. W. Duvall.

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

C. C. HIERS.

PNEUMATIC STRAW STACKER.

No. 589,125. Patented Aug. 31, 1897.

Fig. 7.

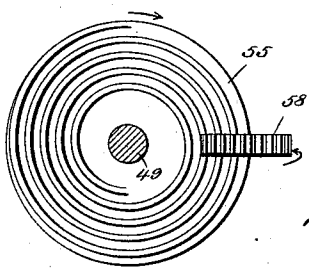


Fig. 5.

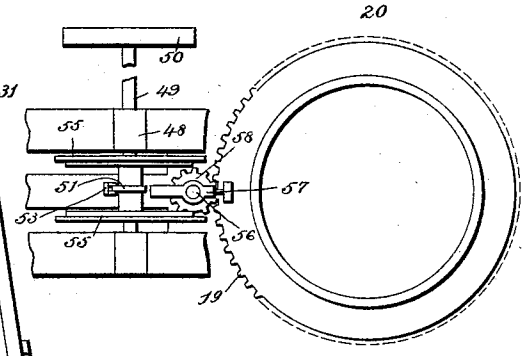


Fig. 2.

WITNESSES

Edw. S. Duvall, Jr.

Francis F. Beechstone.

INVENTOR

Chas. C. Hiers

by W. S. Duvall. Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 3.

C. C. HIERS.

PNEUMATIC STRAW STACKER.

No. 589,125. Patented Aug. 31, 1897.

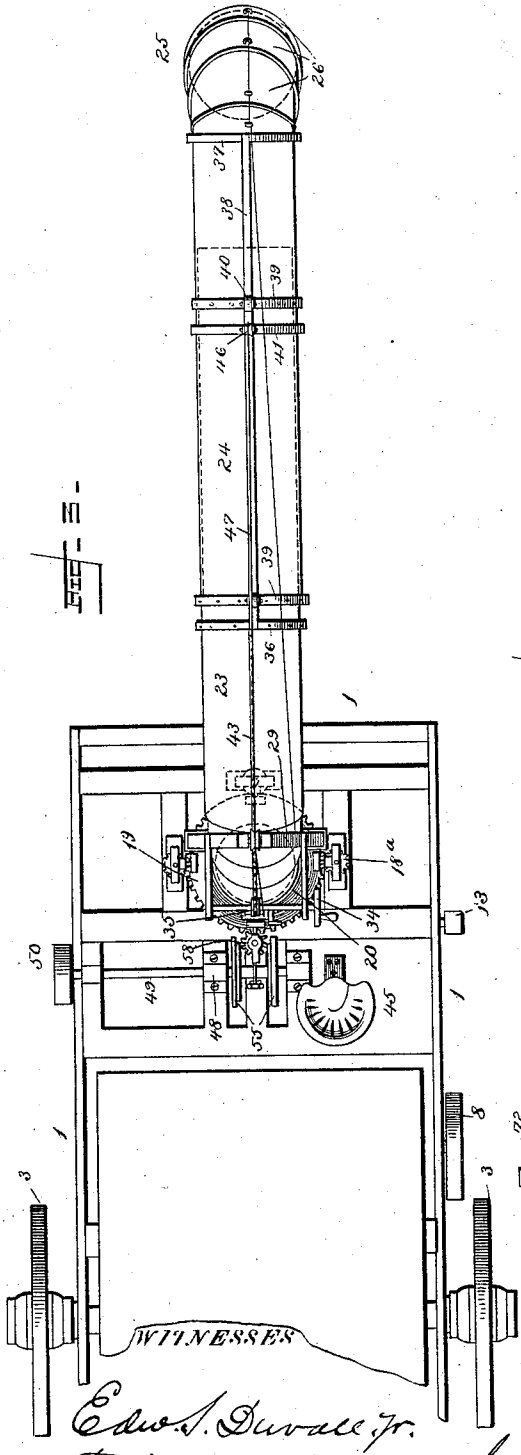


FIG. 4.

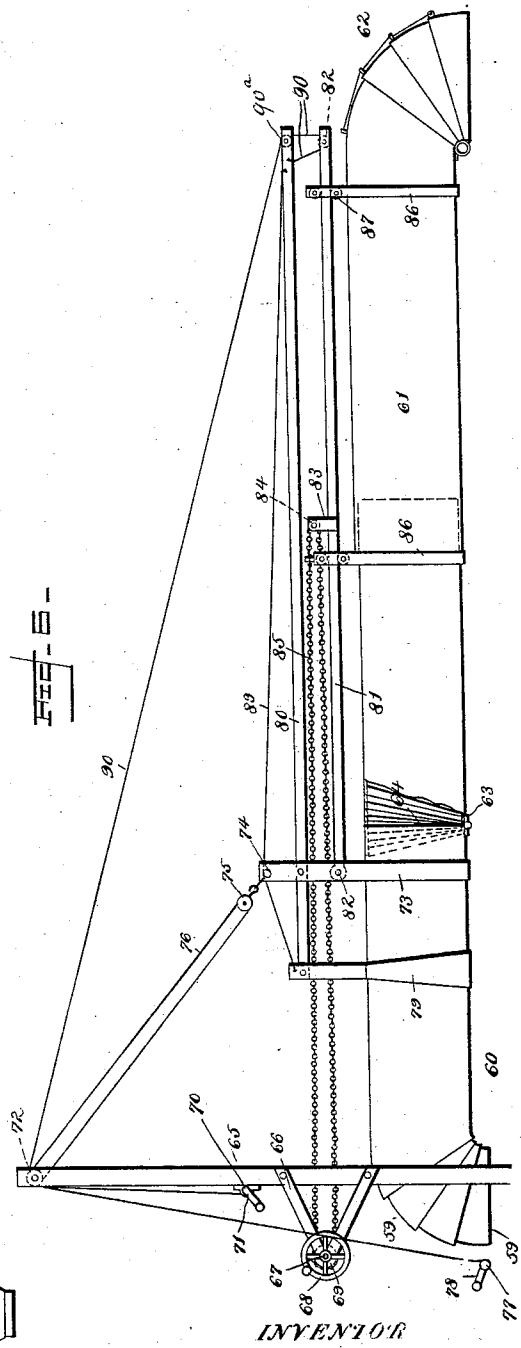


FIG. 5.

WITNESSES

Edw. S. Duvall Jr.

Francis D. Brandstone

INVENTOR

Chas. C. Hiers

by W. S. Duvall Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES C. HIERS, OF CONNERSVILLE, INDIANA, ASSIGNOR TO THE INDIANA MANUFACTURING COMPANY, OF INDIANAPOLIS, INDIANA.

PNEUMATIC STRAW-STACKER.

SPECIFICATION forming part of Letters Patent No. 589,125, dated August 31, 1897.

Application filed March 14, 1894. Serial No. 503,579. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. HIERS, a citizen of the United States, residing at Connersville, in the county of Fayette and State of Indiana, have invented certain new and useful Improvements in Straw-Stackers; and I do hereby 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.

My invention relates to improvements in straw-stacking attachments for threshing-machines, the objects in view being to produce a simply-constructed mechanism thoroughly under the control, as to its adjustability, of the operator while perched upon the seat provided for him upon the machine, and which will effectually collect from the threshing mechanism the stripped straw, elevate the same, and discharge it in a convenient manner, so as to form a compact stack.

Various other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a side elevation of a portion of a threshing-machine provided with my improved stacking mechanism. Fig. 2 is an end elevation thereof. Fig. 3 is a plan. Fig. 4 is a longitudinal sectional view. Fig. 5 is a detail of the ring. Fig. 6 is an elevation of a modified construction of stacking mechanism. Fig. 7 is an elevation of one of the shifting gears.

Like numerals of reference indicate like parts in all the figures of the drawings.

I have illustrated my stacking mechanism as mounted upon the usual threshing-machine, wherein the numeral 1 represents the frame-bars thereof, and 2 the casing, the machine being mounted upon the usual ground-wheels 3.

Connected with the casing 2 and supported by the frame-bars 1 is the elevator-casing 4, the same having its upper end disposed toward the end of the machine and gradually rounded or made cylindrical, forming the neck 5. Located within the elevator-casing 4 are upper and lower transverse shafts 6 and 7, the latter being extended beyond one wall of the casing and having mounted thereon a pulley 8, that may be driven from the separator-shaft or any other moving part of the machinery desired. Connecting the shafts 6 and 7 is an endless carrier 9, the same being inclined and terminating at its upper end in the neck 5.

Arranged below the carrier 9 is a blower-casing 10, the shaft 11 of which extends beyond one wall thereof and is provided with a pulley 13, that is driven by a cross-belt 12, leading from the separator-shaft and operated thereby. The blower has an opening 14 in its side wall that communicates with the outer atmosphere, from which the air expelled through the blower is taken. The blower-casing 10 is provided upon its upper side with a discharge-spout 15, that terminates below the upper end of the carrier 9, so that as the straw is collected from the casing 2 and is elevated by the carrier 9 and discharged into the neck 5 of the casing 4 it is operated upon by the blast of air from the blower and consequently forced through the neck into the stacking-pipe to be discharged.

Arranged around the neck some distance therefrom and supported upon the platform of the machine is a series of bearing-standards 16, each of which has an upper and lower shaft 17, at whose inner ends idlers 18 are located and loosely journaled and an intermediate idle-gear 18^a. These idlers receive between them and consequently support a rotatable ring 19, which encircles a cylinder 20, that loosely incloses at its lower end the upper end of the neck 5 of the casing 4. The outer edge or periphery of the ring 19 is toothed, as shown.

Arranged in the upper end of the cylinder 20 is the lower section of an adjustable elbow 21. This elbow consists of a series of segmental elbow-sections 22, in this instance three in number, and the uppermost section has connected therewith the stationary discharge-pipe section 23, over which is loosely slipped and adapted to telescope the movable discharge-pipe section 24. The latter section has connected to its outer or free end an adjustable elbow 25, the same consisting of a series of segmental sections 26, telescopically arranged and connected at their under sides to a coiled spring 27, that has a tendency to distend the sections.

A pair of horizontal supporting-lugs 28 are

arranged at diametrically opposite sides of the upper end of the cylinder, and hinged to these supporting-lugs and adapted to fold down upon the machine or elevated so as to be perpendicular therewith is a pair of standards 29, which converge toward and are connected at their upper ends to form a derrick. A transverse shaft 30 is located in the upper end of the derrick, and arranged thereon is a loose pulley 31.

Bearing-brackets 32 extend rearward from the standards and have loosely journaled therein a transverse winding-shaft 33, the same having at one end a hand-wheel 34 and between its bearings provided with a sprocket-gear 35.

A band 36 encircles the stationary pipe-section 33 and is secured rigidly thereto. A similar band 37 encircles the outer end of the movable pipe-section 24, and the two are connected at their upper and lower sides by upper and lower tracks 38. Bands 39 are arranged upon the rear end and intermediate point of the movable section 24 of the pipe and are provided at their upper and lower sides with guide-rollers 40, the upper rollers resting upon the upper track 38 and the lower rollers upon the lower track 38. A band 41 connects the tracks 38 between the bands 36 and 37 and has journaled in its upper side a sprocket-wheel 42. A sprocket-chain 43 passes around the sprocket-wheel 42 and the sprocket-wheel 35 of the winding-shaft 33, and between these points passes over a vertical stud 44 on the upper side of the band 39 of the movable pipe-section, so that, as will be obvious, the operator when mounted upon the seat 45, arranged for his accommodation upon the platform of the machine, may by rotating the hand-wheel 34 cause the sprocket-chain to feed in either direction in accordance with the direction of rotation of said hand-wheel and thus cause the movable pipe-section 24 to move upon the stationary pipe-section, so as to increase or decrease, as may be desired, the length of the discharge-pipe as a whole.

Above the sprocket-wheel 42, with which the band 41 is provided, a pulley 46 is arranged, and an elevating cable or rope 47, after being secured to the pulley 31 of the derrick, passes about the pulley 46, back over the pulley 31 of the derrick, and down to and around a winding-shaft 47^a. It will thus be seen that through the medium of this cable or elevating-rope the operater may while mounted upon his seat raise and lower the discharge-pipe as a whole and in accordance with the height of the stack, so that the straw may be discharged directly upon the top of the stack.

In a pair of journal-boxes 48, arranged in rear of the stacking attachment and in front of the seat for the accommodation of the driver, I locate a rotatable shaft 49, which is also capable of longitudinal movement, the same having a pulley 50 at one end, which is connected by a belt (not shown) with any movable part of the driving mechanism—for instance, the separator-shaft. Upon this shaft 49, at or about the center thereof, a flange 51 is formed, and below the shaft I pivot, in a suitable bearing 52, a vibratory shifting lever 53, the upper end of which is within easy grasp of the operator. The lever 53 engages loosely with the flange 51 of the shaft by means of a slotted bracket 54, and by a manipulation of said lever it will be obvious that the shaft may be moved longitudinally in its bearing. The shaft is provided at opposite sides of its center with spiral gear-wheels 55, and located between the said gear-wheels upon a vertical shaft 56, suitably journaled in a standard 57, is a spur-gear 58, the latter being always in engagement with the teeth of the ring 19. By throwing the lever 53 in one direction one of the gears 55 will be thrown into engagement with the gear 58, and thus motion be imparted through this gear to the gear-ring and cause a turning of said ring and a swinging of the discharge-pipe in one direction. By a reverse movement of the lever the opposite gear 55 will be thrown into engagement with the gear 58 and the latter operated and cause a reverse operation upon the part of the ring 19 and pipe. Inasmuch as the derrick is carried by the ring it will likewise turn.

In the operation of the machine the straw, it will be understood, is discharged from the casing upon the endless carrier, by which it is delivered to the upper end of the casing 4, where, being acted upon by the blast of air induced from the outer atmosphere, it is blown upwardly through the neck 5 and into the discharge-pipe and delivered by the latter upon the stack. The induction of air from the atmosphere in lieu of from the interior of the casing renders the blower capable of being operated by much less power than when the air is induced from the interior of the casing, in that dust and grain are not drawn into the blower and hence do not require to be expelled.

From the foregoing description, in connection with the accompanying drawings, it will be seen that I have provided a very simple straw-stacking attachment for threshing-machines wherein the same is capable of being swung over the machine and compactly arranged thereupon, so as to be out of the way when not in use and the machine is in motion, and which when in use is thoroughly under the control of a single operator, who may extend or contract the discharge-pipe with but little exertion, so as to adapt it to deliver at a proper distance from the machine, and which may be raised and lowered as the stack increases in height and its ends disposed angularly with relation thereto so as always to discharge directly upon the top of the stack.

Referring to Fig. 6, wherein I have illustrated a modified construction of my device, 59 designates the adjustable elbow, which is

connected to the movable ring in the manner before described. 60 designates the stationary section of the pipe, and 61 the telescopic section, at whose outer end is located the adjustable elbow 62. The section 60 is subdivided transversely at its center, the two sections being connected upon their under side to a hinge 63 and connected by a section of canvas 64, formed bellows-like, so that the front section of the pipe 60 may swing at an angle to the rear section. The derrick 65 is provided with bearing-brackets 66, in which is journaled the transverse winding-shaft 67, having the hand-wheel 68 and the sprocket-wheel 69. A second winding-shaft 70 is journaled in bearings above the shaft 67 and is operated by a crank 71. A pulley 72 is arranged in the upper end of the derrick. A bail 73 encircles the pipe 60 in rear of the hinge 63 and its upper ends form standards which are connected by a transverse bolt 74, with which is connected a sheave 75. An elevating-rope 76 is made fast to the pulley 72, passes through the sheave 75 back to the pulley 72, and is secured at its rear end to a winding-shaft 77, located at the foot of the operator, said shaft being operated by a crank-handle 78. By the operation of this shaft 77 the rear section of the pipe 60 may be elevated or lowered in a manner obvious. A band 79 encircles the pipe-section 60 in rear of the bail 73 and above the same terminates in standards. The bar or rod 80 is secured to the upper end of the band 79 and between the standards of the bail 73 and extends forward and terminates above the front end of the discharge-pipe. Below this bar or rod 80 a track-rod 81 is located, the same being pivoted at its rear end at 82 between the standards at the upper end of the bail 73, which extends forward and terminates under the front end of the bar or rod 80 and is loosely connected to the latter, as hereinafter described. This track 81 has an intermediate bearing-standard 83, the same supporting a pulley 84, around which passes a sprocket-chain 85, the same also passing around the sprocket-wheel 69 of the winding-shaft 67. A pair of bands 86 is located upon the front and rear ends of the telescoping section 61 and are provided with upper and lower rollers or wheels 87, which embrace the upper and lower sides of the track-bar 81 in the manner shown. The upper end of the rear band 86 engages with the links of the sprocket-chain 85. A truss-rod 89 is secured to the front end of the bar or rod 80, passes over the pin 74, and is finally secured to the rear end of the bar 80, thus serving to strengthen said bar or rod. An elevating cable or rope 90 passes over a pulley 90^a in the front end of the bar or rod 80, down under a pulley 90^b in bar 81, and is fastened to bar 80, the remaining end passing around the winding-shaft 70. The operation of this mechanism is much the same as that of the one heretofore described, in that by operating the hand-wheel 68 the front or telescoping section may be fed back and forth upon the pipe 60, and thus the pipe as a whole lengthened or shortened. The pipe as a whole may be elevated through the medium of the elevating rope or cable 90, or, on the other hand, the rear section may be raised, and thus the joint 64 utilized by operating the rope 76.

Having described my invention, what I claim is—

1. The combination, with a threshing-machine, of an elevator-casing connected with the casing of the machine, a discharge-pipe connected with the upper end of the elevator-casing, an inclined carrier arranged in said casing and leading from the casing of the machine and terminating at its upper end below the discharge-pipe of the stacker, and a blower arranged under the elevator and terminating in a discharge-spout below the upper end of said elevator, substantially as set forth.

2. The combination with a threshing-machine, of an elevator-casing arranged therein and terminating at the platform thereof, a series of standards arranged about the casing and provided with horizontal shafts with rollers thereon arranged in pairs, a ring mounted between the upper and lower sets of rollers, a cylinder within the ring, a discharge-pipe carried by the ring, and means for rotating the ring in either direction, substantially as set forth.

3. The combination with a threshing-machine, of a discharge-casing, a ring revolubly supported in a horizontal position around said casing, teeth on said ring, a cylinder arranged in said ring, a discharge-pipe connected with said cylinder, a transverse shaft capable of longitudinal movement mounted at one side of said ring, means for driving said shaft, gears on said shaft a distance apart, one on each side of the center thereof, an intermediate gear-wheel engaging the teeth of the ring and adapted to be operated by either of said gears on said shaft, and means for moving said shaft longitudinally to throw either of said gears into engagement with said intermediate gear-wheel, according as it is desired to drive it in one or the other direction, substantially as set forth.

4. The combination with a threshing-machine and a casing leading therefrom, of a toothed ring revolubly mounted around said casing, a cylinder within the ring, a discharge-pipe within the cylinder, a vertical standard or shaft at one side of the ring with a journal formed thereon, a horizontal gear-wheel mounted thereon and engaging with the teeth of said ring, a horizontally-disposed shaft at one side of said ring mounted to be moved longitudinally, a central flange thereon, gears thereon arranged on each side of and near to said horizontal gear-wheel, and a pivoted lever arranged in the rear of the shaft and adapted to loosely engage said flange, whereby it may be operated to shift said shaft to throw either of its gears into engagement with said

horizontal gear-wheel, substantially as set forth.

5. The combination with a threshing-machine and discharge-casing, of a ring and a cylinder arranged thereon, means for rotating the ring, and an adjustable elbow connected with the upper end of the cylinder, telescopic pipe-sections connected with the elbow, an adjustable elbow at the outer end of said pipe-sections, means for raising and lowering said sections, and means for contracting and distending said sections, substantially as set forth.

6. The combination with a threshing-machine and the discharge-casing, of telescoping pipe-sections, one of which is stationary and the other movable, means for telescoping said sections, a series of segmental pipe-sections connected to each other and arranged at the outer end of the movable section, a coiled spring for normally distending said segmental sections, and an operating-cord connecting the sections and leading to the machine, substantially as set forth.

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

CHARLES C. HIERS.

Witnesses:
JOHN HIERS,
R. O. ADAMS.