

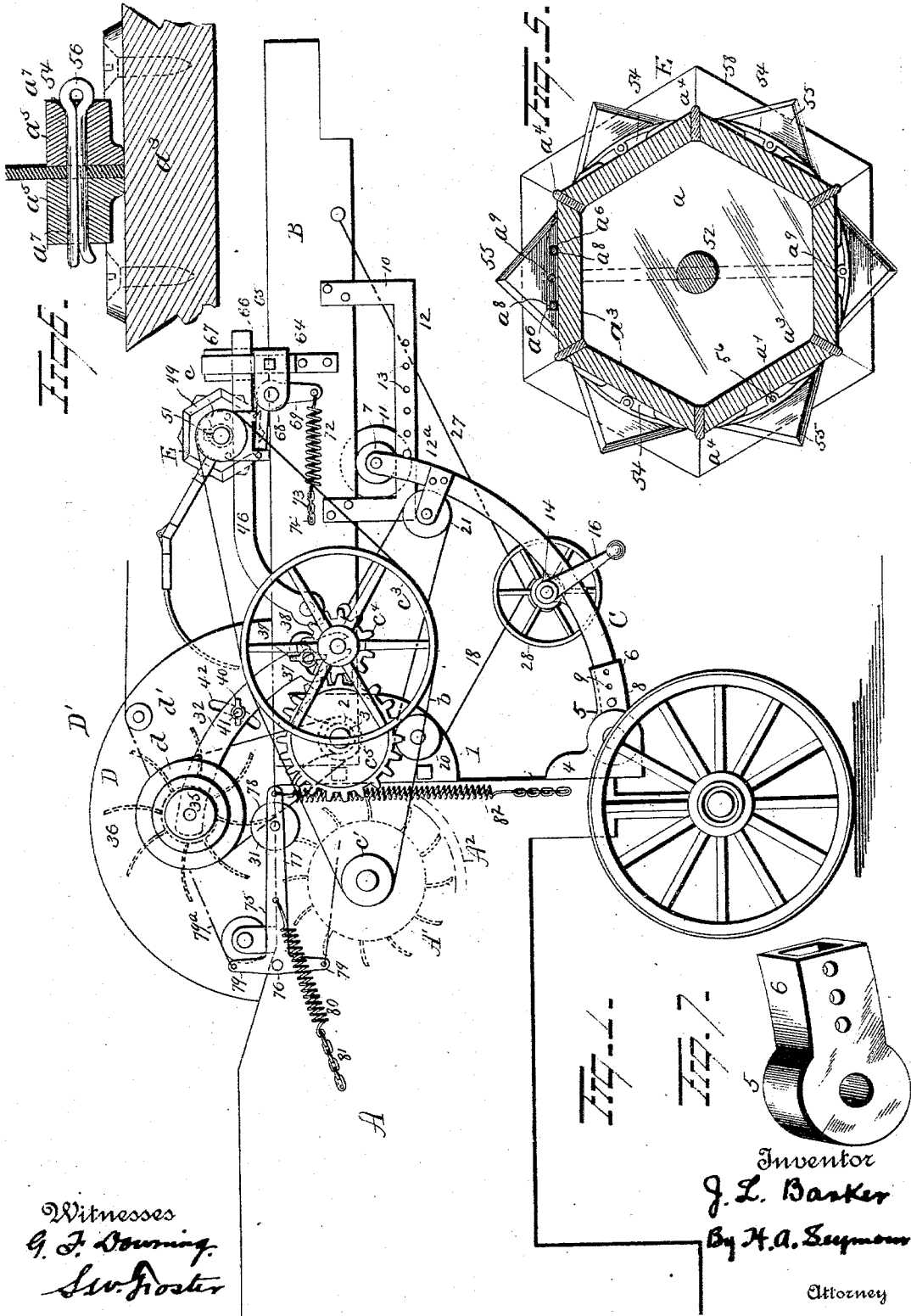
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5 Sheets—Sheet 1.

J. L. BARKER.
BAND CUTTER AND FEEDER.

No. 546,291.

Patented Sept. 17, 1895.



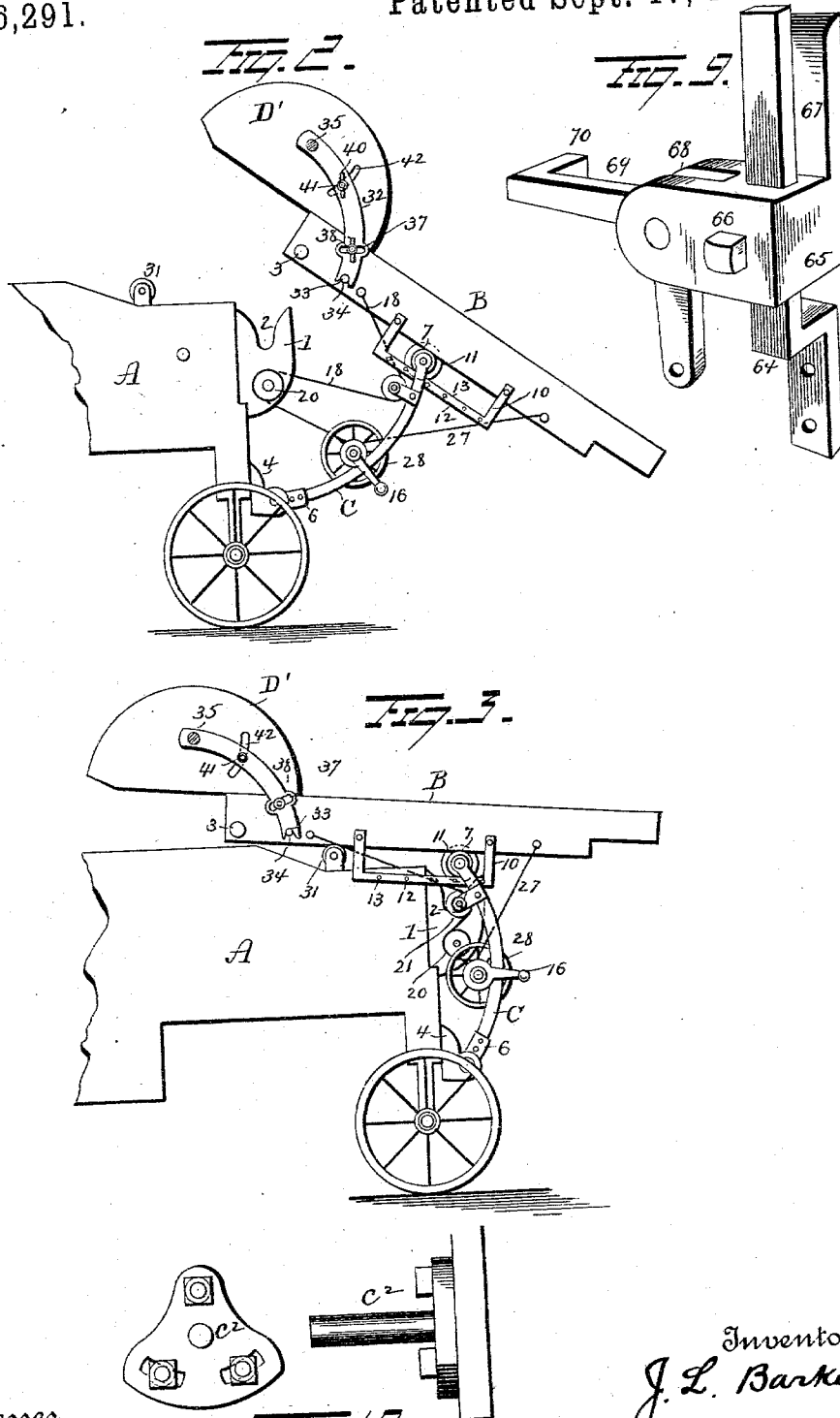
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5 Sheets—Sheet 2.

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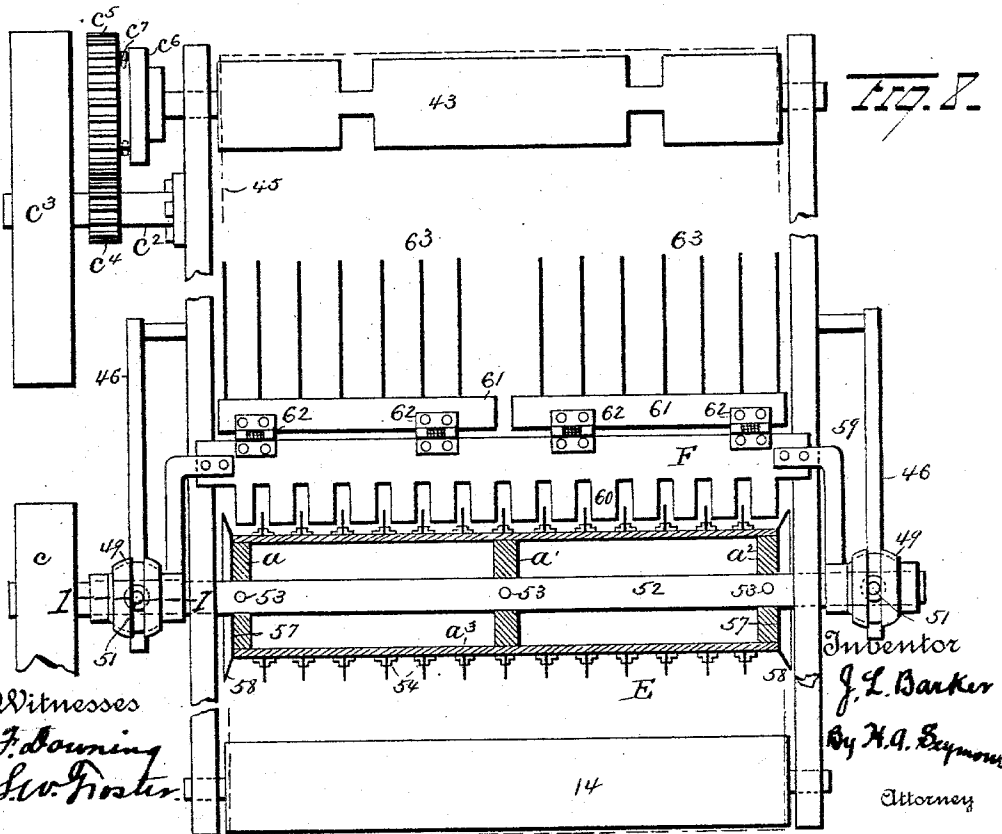
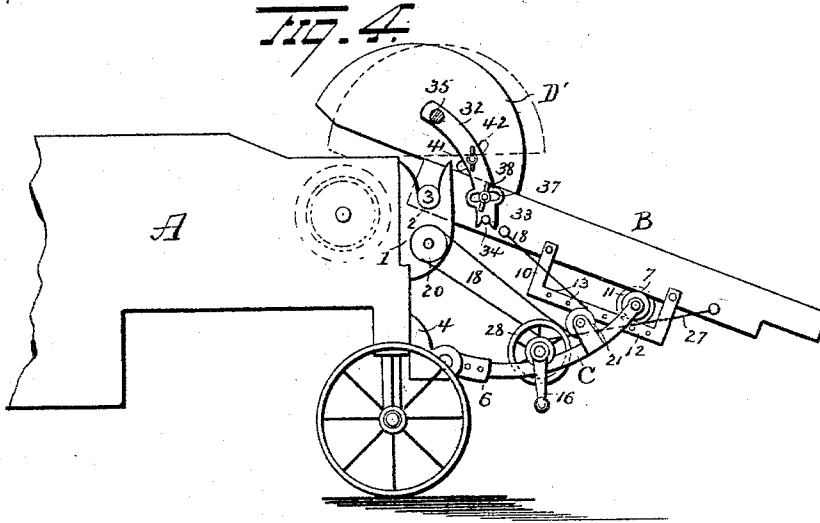
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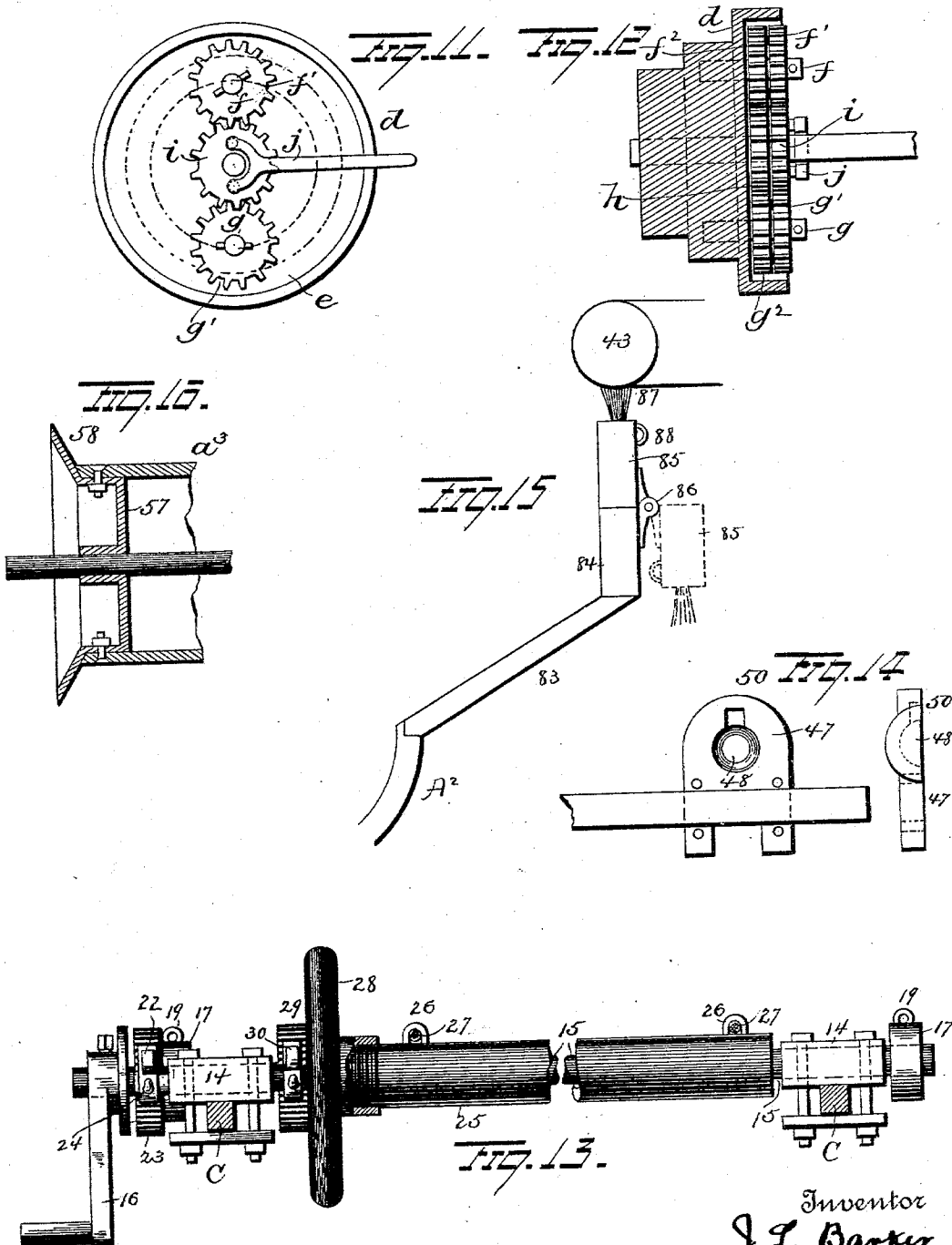
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J. L. BARKER.
BAND CUTTER AND FEEDER.

No. 546,291.

Patented Sept. 17, 1895.



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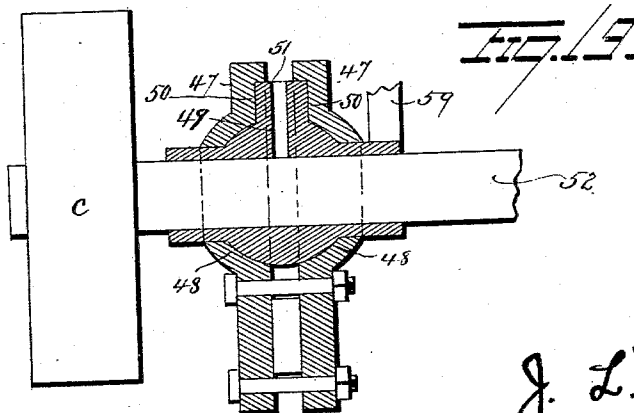
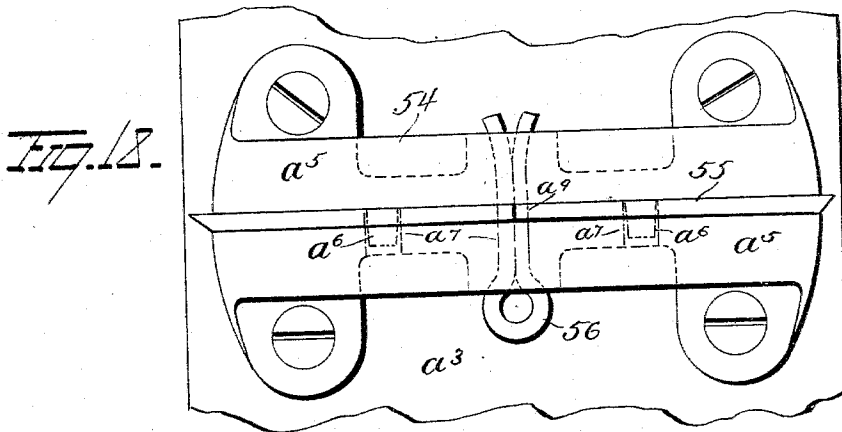
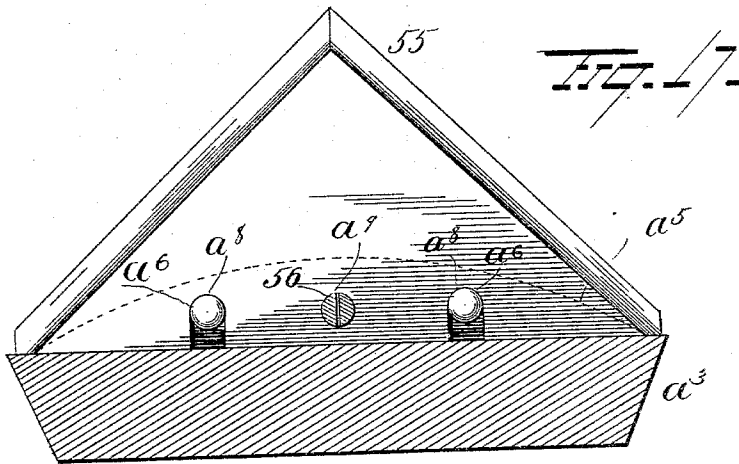
(No Model.)

5 Sheets—Sheet 5.

J. L. BARKER.
BAND CUTTER AND FEEDER.

No. 546,291.

Patented Sept. 17, 1895.



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UNITED STATES PATENT OFFICE

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BAND-CUTTER AND FEEDER.

SPECIFICATION forming part of Letters Patent No. 546,291, dated September 17, 1895.

Application filed May 1, 1894. Serial No. 509,702. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. BARKER, a citizen of the United States, residing at Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Band-Cutters and Feeders; 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 an improvement in band-cutters and feeders for grain-separators, the object of the invention being to produce simple and efficient means for loading the same onto a separator when the latter is to be moved from place to place.

A further object is to produce simple and efficient means whereby to support the band-cutter at any desired height above the carrier and at the same time to enable the band-cutter to readily rise to permit the passage under it of large bundles of grain without bearing too heavily on said large bundles, thereby rendering it unnecessary to apply more power to operate the machine than is absolutely necessary under all conditions and sizes of the bundles of grain.

A further object is to generally improve the construction of a band-cutter and feeder and render it effectual in every respect in the performance of its functions.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation showing the application of my improvements to a separator. Fig. 2 is a side elevation showing the band-cutter and feeder casing disposed in a diagonal position. Fig. 3 is a side view showing the band-cutter and feeder loaded on the top of the separator. Fig. 4 is a view showing the band-cutter and feeder adjusted so as to permit it to be readily cleaned. Figs. 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15 are detail views. Fig. 16 is a view of a modification of a portion of the band-cutter. Fig. 17 is a transverse section through one of the staves a^3 , showing a knife in position thereon. Fig. 18 is a plan view in detail showing the construction of knife-clamps,

and Fig. 19 is an enlarged vertical section on line 11 of Fig. 8.

A represents the outline of a thrasher or separator, the general construction of which is not material to the purposes of my present invention, and said separator is provided at its inlet end with a cylinder and concave A' A^2 , of any preferred form of construction.

Brackets 1 are secured to the inlet end of the separator-frame, and are made with sockets or bearings 2 for the reception of trunnions 3, projecting laterally from the inner end of the band-cutter and feeder-frame B. To the front end of the separator-frame, at or near the bottom thereof, brackets 4 are secured, to which castings 5 are hinged or pivotally connected. Each casting 5 is made with a socketed portion 6 for the reception of the lower ends of curved legs or supports C, which are retained in said sockets by means of pins 8, and the legs or supports will each preferably be provided with a series of perforations 9 for the reception of securing-pins 8, whereby their relation to the hinged castings can be readily adjusted. The upper end of each leg or support C is provided with a roller 7, adapted to operate between the feeder case or frame B and an elongated bracket 10, secured thereto, one of such brackets being, of course, secured to each side of said frame, and each roller 7 is made with a flange 11, adapted to project within the side bar of the case or frame B and within the horizontal bar 12 of the bracket 10, thus preventing accidental lateral displacement of the connection between the upper ends of the legs or supports C and the feeder case or frame. By this construction and arrangement of parts it will be seen that the connection of the legs or supports C with the feeder case or frame is movable, so as to permit the ready manipulation of the latter to secure the adjustments which will be hereinafter fully explained; but when the feeder-frame is in its operative position relatively to the separator the upper ends of the arms or supports C will be retained at or near the inner end of the elongated brackets 10 by means of pins 12^a, passing through perforations 13 in the horizontal bars of said brackets. A number of perforations will be made in the horizontal bar of each bracket, so that the upper ends of the

legs or support C can be secured in any desired position relatively thereto.

On the legs or supports C, preferably at a point somewhat below their center, journal-boxes 14 are located, as shown in Fig. 13, for the accommodation of a shaft 15, one end of which is provided with a crank-handle 16. At or near each end of the shaft 15 a drum 17 is secured thereto, to which one end of two ropes 18 are secured by means of staples 19 or other suitable fastening devices. From their connection with the drums 17 the ropes 18 extend inwardly and pass over pulleys 20, mounted on the brackets 1, (or the end of the separator, if desired,) and from these pulleys said ropes extend outwardly and after passing over pulleys 21, mounted on the legs or supports C near their upper ends, are secured to the sides of the feeder case or frame B. The shaft 15 can be turned freely in one direction by means of the handle 16, and will be prevented from accidental retrograde rotation by means of a pivoted spring-actuated dog 22, which engages a ratchet-wheel 23, carried by said shaft. During some of the manipulations of the feeder-frame it is necessary, as will hereinafter appear, that the shaft be permitted to have a retrograde rotation, and for this reason the dog 22 is provided with a handle 24, by means of which it can be readily moved out of engagement with the ratchet-wheel 23. A hollow shaft 25 is mounted loosely on the shaft 15, so as to be capable of rotating independently of the latter, and in proximity to its ends is provided with perforated lugs 26, through both of which a rope 27 is passed, the ends of said rope being extended outwardly and at their free ends are secured to the free end of the feeder case or frame B. To one end of the hollow shaft 25 a hand-wheel 28 is secured, by means of which to turn it. A ratchet-wheel 29 is made integral with or secured to the hand-wheel 28, and is adapted to be engaged by a pivoted spring-actuated dog 30 to prevent retrograde rotation of said hollow shaft. The dog 30 is provided with a handle, (the same as the dog 22, Fig. 13,) whereby to release it from the ratchet-wheel 29 and thus permit retrograde movement of the shaft 25. Assuming now that the feeder case or frame B is in its operative position and it is desired to load it on the separator, as shown in Fig. 3, the shaft 25 will be rotated by means of the hand-wheel 28 to wind the rope 27 thereon. This operation will cause the case or frame B to assume the position shown in Fig. 2. When the feeder case or frame is in this position, the cylinder and concave can be readily adjusted, if desired, and, if this be the only object of shifting the case or frame B to the position shown in Fig. 2 it can be readily replaced to its operative position, as shown in Fig. 1, by simply permitting the rope 27 to unwind. When, however, the feeder is to be loaded onto the separator, after it shall have been made to assume the position shown in Fig. 2 it can be

drawn up onto the separator by rotating the shaft 15 to wind the ropes 18 on the drums 17. When the feeder shall have been drawn up as far as the legs or supports C will permit, it can be drawn back still farther on the frame of the separator by removing the pins 12^a and winding up the rope 27 and permitting the ropes 18 to slacken, the feeder resting on the rollers 7 and rollers 31, mounted on the separator.

To unload the feeder and cause it to assume its operative position, as shown in Fig. 1, the rope 27 will be permitted to unwind or slacken and the ropes 18 will be wound on the drums 17 until the rollers 7, at the upper ends of the legs or supports C, reach the inner end of the elongated bracket 10. The rope 27 will then be further unwound or slackened until the feeder drops into the position for work.

When the feeder is in operation, there will be no strain on the ropes 18 and 27, but the weight which would come upon these ropes will be sustained by the pins 12^a.

If it be desired to lower the end of the feeder, as it is sometimes necessary to do in cleaning it and in order to make it easier to shovel the loose and shelled grain into the feeder, the feeder can be thus lowered by taking up the slack in the ropes 18, removing the pins 12^a from the brackets 10, and then unwinding the ropes 18 until the outer end of the carrier or feeder is as low as desired, as shown in Fig. 4. To raise the feeder into a level position again, it is only necessary to wind the ropes 18 and replace the pins 12^a and then slacken the ropes 18, as before. The lower ends of two preferably curved bars 32 are disposed parallel with diametrically-opposite sides of the feeder-frame B in proximity to the inner end thereof, and each provided at its lower extremity with a slot 33 for the accommodation of a pin or bolt 34, projecting from said feeder-frame. The upper ends of the bars 32, which terminate over the cylinder and concave of the separator when the parts are in their working positions, are provided with suitable boxes for the accommodation of the shaft 35 of a governor or regulator D. In construction the governor or regulator D comprises the shaft 35 and a series of curved fingers 36, said governor being made to rotate (in a manner hereinafter explained) in the same direction as the cylinder A', only at a greatly-reduced speed, and is adapted to so control the feed of grain to the cylinder and concave as to prevent the grain from clogging and hold the stubs of the grain elevated as nearly as possible in the position in which they would be held if fed into the machine by hand. Each bar or arm 32 is provided (preferably near its lower end) with a transverse slot 37, through which a screw 38 from the feeder-frame B projects, said screw being provided with a thumb-nut 39. By this construction the bars or arms 32 may be adjusted to raise or lower the governor D, according to the condition of the grain being

treated, and retained at any desired adjustment. A hood D' incloses the governor D and is pivotally mounted on the shaft of said governor, being retained at any desired adjustment by means of thumb-nuts 40 on screws 41, projecting through the bars or arms 32 and elongated slots 42 in the hood.

At the respective ends of the feeder-frame B shafts or rollers 43 44 are mounted, over which an endless carrier-apron 45 travels to convey the grain from one end of the feeder-frame to the other.

To the sides of the feeder-frame the lower extremities of the depending portions of L-shaped arms 46 are pivotally connected, the horizontal portion of said arms being disposed above and practically parallel with the feeder-frame. On each of these arms clamps 47 are secured, the two parts of each clamp being made with recesses 48 for the reception of the spherical portion of a journal-box 49, and the parts of said clamps are also made with recesses 50 for the reception of a hollow projection 51 on said journal-box, whereby to prevent the latter from turning, said hollow projections also serving as oil-receptacles. In the journal-box 49 (one being arranged on each arm 46) the ends of the shaft 52 of a band-cutter E are mounted. In constructing the band-cutter E three blocks a a' a'' , preferably hexagonal in form, are secured on the shaft 52 by means of pins 53, the various edges of said blocks being in parallel planes. To the edges of the blocks six wooden plates or staves a^3 are secured, each plate or stave being secured to all the blocks. To the edges of the plates or staves a^3 metallic strips or plates a^4 are secured to prevent the wearing away of said staves, and also to act somewhat as beaters to spread the grain passing over the carrier-apron. To each plate or stave a^3 a number of clamps 54 are secured, each clamp comprising two plates a^5 a^5 , placed in proximity to each other, connected by integral pins a^6 , and having aligned transverse perforations a^7 . Between the plates a^5 of each clamp the butt of a V-shaped knife 55 is placed, said knife being made with recesses a^8 for the accommodation of the pins a^6 and with a perforation a^9 for the accommodation of a key 56, which also passes through the aligned perforations a^7 , thus retaining said knives in place in the clamps 54. On the outer face of each block a a'' of the band-cutter a thin circular disk 57, having flaring edges 58, is attached and designed to protect the end of the boxes 49 from straw which would otherwise become wound around the shaft of the band-cutter. If desired, the heads of the band-cutter may be made of metal, in which case the staves would be secured to them and the flaring edges 58 made integral therewith, as shown in Fig. 16. An arm 59 projects laterally from each journal-box 49, and at their outer ends said arms are secured to the respective ends of a guard F, having inwardly-projecting fingers 60, adapted to enter be-

tween the knives 55. To the edge of the guard opposite the fingers 60 two bars 61 61 of equal length are connected by means of spring-hinges 62, said bars constituting heads of two series of curved fingers 63, preferably of spring metal. The purpose of these fingers is to assist the governor in holding back very wet and tough grain.

It is desirable that the band-cutter above described shall be vertically adjustable; that the arms 46, which carry said band-cutter, shall be guided in their movements so as to prevent lateral play of the same, and that said band-cutter shall have a yielding action, so that it will effectually operate to cut the bands of small as well as large bundles of grain. For the accomplishment of these purposes the devices now to be described will be employed.

To the sides of the feeder-frame B, in proximity to the free ends of the pivoted L-shaped arms 46, brackets 64 are secured and adapted to project somewhat laterally from and some distance above said frame. The brackets 64 pass loosely through perforations in blocks 65, one at each side of the feeder-frame.

The blocks 65 are secured to the respective brackets 64 by means of bolts 66, and where said brackets pass through the blocks they will each preferably be made with a series of perforations, so that the connection between said brackets and blocks can be adjusted, whereby the free ends of the arms 46, which rest on these blocks, can be raised or lowered to raise and lower the band-cutter carried by said arms. Each block is provided with an upwardly-projecting arm 67, disposed parallel with the upper ends of the brackets 64, and between these brackets 64 and the arms 67 the arms 46 are guided in their vibratory movements. Each block 65 is bifurcated to produce lugs 68, between which an L-shaped lever 69 is pivotally connected at the junction of its two arms. The horizontal arm of each lever 69 is provided with a laterally-projecting finger 70, adapted to bear against the under sides of the respective pivoted arms 46. To the free end of the depending arm of each lever 69, one end of a spring 72 is attached. Each spring 72 projects in a horizontal direction from its connection with lever 69, and at its outer end is attached to a chain 73, the other end of which is attached to a pin 74, projecting from the frame of the feeder. By the employment of the spring 72 it will be seen that the arms 46 will be permitted to vibrate, and that as the band-cutter is carried by these arms it will be permitted to yield as bundles of different sizes pass under it. By connecting the springs 72 with the feeder by means of the chains 73 the tension of said springs can be readily regulated by attaching said chains to the pins 74 by one or another link thereof.

The shaft of the band-cutter is provided with a pulley c , and the shaft of the cylinder A' is provided with a pulley c' . An adjust-

able stud c^2 projects from the side of the feeder and is located intermediate of the cylinder and band-cutter. On this adjustable stud a pulley c^3 , considerably larger than the pulleys c c' , is mounted. The hub of the pulley c^3 is provided with a pinion c^4 , adapted to transmit motion to a gear-wheel c^5 , carried by a cone-pulley c^6 , and the cone-pulley is adapted to drive the shaft 43 of the endless carrier 45. A strap or belt b passes over the pulleys c c' c^3 , so that motion will be imparted from the cylinder A' to both the carrier and the band-cutter by means of a single strap or belt. I prefer to employ a clutch or ratchet device c^7 , by means of which to stop the motion of the carrier without stopping the engine. Motion is transmitted from the cone-pulley c^6 to a cone-pulley d on the shaft 35 of the governor or regulator D by means of a belt d' . It is important that the rotation of the governor or regulator should be much slower than that of the carrier, so that said governor or regulator shall act to comb the grain and, so to speak, to retard the passage of the grain from the feeder to the cylinder and concave of the separator, and in this manner prevent the grain from clogging between the feeder and the separator. To accomplish this slow motion of the governor in the same direction as the flow of the grain by the use of a straight belt from one of the shafts of the carrier, a peculiar construction of devices by which motion is imparted from the cone-pulley d to the governor will be employed, and the construction and operation of these devices will now be explained. The pulley d is made with a recess e at its larger end, into which pintles f g , carried by the pulley, project. Pinions f' g' are loosely mounted on the pintles f g , and each is provided with an odd number of teeth—say fifteen—said pinions being rigidly connected with pinions f^2 g^2 , each having, say, fourteen teeth, and they are mounted on said pintles f g . A pinion h , having fifteen cogs, is keyed to the governor-shaft. A pinion i , having fourteen cogs, is mounted loosely on said shaft, but held from rotating by means of a bifurcated arm j , said arm being connected to the frame of the feeder. In operation pinions f' g' travel around stationary pinion i and make one and one-fifteenth revolutions upon their own axes, but make one-fifteenth revolution in relation to the shaft, and as pinions f' g' are connected with pinions f^2 g^2 and as pinions f^2 g^2 have each fourteen cogs pinion h is caused to revolve at each revolution of the cone-pulley one-fifteenth plus one-fifteenth equals two-fifteenths revolutions of the shaft to one of the cone-pulley, or one revolution of the shaft to seven and one-half revolutions of the cone-pulley. The arrangement of pinions above described will cause the shaft of the governor to move in the same direction as the cone-pulley, but by simply reversing the positions of the fourteen and fifteen cogged pinions the shaft will rotate in the

opposite direction. Any desired speed in either direction can be secured by using pinions with the requisite number of cogs. By constructing the cone-pulley d as above described three slow speeds may be attained, and by removing the bifurcated arm j and dropping a pin through pinion i and the governor-shaft and by using a crossed belt three fast speeds may be attained. This is sometimes very desirable.

In order to control the operation of the band-cutter and feeder, a belt-tightener such as will now be explained will be employed. A T-shaped lever 75 is pivotally connected at 76 to the frame of the separator. The long arm 77 of the T-shaped lever projects forward and carries a loose pulley 78. At the ends of the short arms 79 of the lever 75 ropes 79^a are attached and preferably extend to the engine and within easy reach of the operator. A spring 80 is attached near the center of the long arm 77 of the lever 75, and the other end of said spring is attached to the separator at a point below the pivotal connection of the lever 75 thereto, thus causing spring 80 to draw pulley 78 down tight on the belt b . The tension of the spring is regulated by means of a chain 81 attached thereto, different links of said chain being connected to the pin, which projects from the separator. When from any cause the operator desires to stop the feeder, he will pull the lower rope 79. This throws the spring 80 over the center of the pivotal support of the lever 75, and the pulley 78 will be held away from the belt by means of said spring, thereby slackening the belt and stopping the feeder. By pulling the upper rope 79 the pulley 78 will be again brought into contact with the belt and the feeder again started. Should it not be desired to run the ropes 79 to the engine, a spring 82 may be attached to the long arm of lever 75 and hooked into a chain attached to the separator-frame. By connecting the feeder to the separator, as above set forth, the feeder can be loaded onto the separator without removing the supporting-legs or folding the feeder.

To the feed-board 83, between the concave A^2 and the carrier-roller 43, a board 84 is secured in any suitable manner. To the board 84 a bar 85 is connected by means of spring-hinges 86, and to the upper edge of said bar 85 a brush 87 is secured and adapted to engage the carrier-roller 43. The bar 85 is provided with a handle 88, by means of which it can be turned back when desired, as shown in dotted lines in Fig. 15.

Numerous slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope, and hence I do not wish to limit myself to the precise details of construction herein set forth; but,

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

1. The combination with a machine frame, of a feeder attachment supported at its outer end upon and pivotally connected with a support pivoted to and carried by said frame, and a windlass journaled on said support, to move with it and connected with the machine frame and feeder attachment for moving the latter longitudinally.

2. The combination with the frame of a separator, a feeder and elongated brackets secured to said feeder, of legs or supports pivotally connected to said separator frame, rollers at the upper ends of said legs or supports and adapted to run on said elongated bracket, flanges on said rollers projecting within the brackets and feeder frame, and removable pins adapted to enter holes in the brackets, to limit the extent of sliding connection between the legs and the feeder frame substantially as set forth.

3. The combination with a machine frame, and supports pivotally connected therewith, of a feeder attachment detachably connected with the machine frame and adapted to be supported at its inner end thereon, of elongated brackets having holes therein, said supports connected with the feeder through these brackets, of means for raising and lowering and loading the feeder, and removable pins adapted to enter one of the holes at one side of the supports to limit the movement of the upper ends of the supports to the space between the pins and the end of the brackets, substantially as set forth.

4. The combination with a separator, legs or supports extending therefrom, and a feeder adjustably connected with the outer ends of these legs or supports, of a pair of concentric shafts, and pairs of ropes and cables, one rope or cable connected with each end of the feeder and one extending therefrom to one of the concentric shafts and the other having connection with the legs and the separator and connected with the other concentric shaft, substantially as set forth.

5. The combination with a separator and legs or supports pivotally connected at their lower ends thereto, of a feeder pivotally mounted between its ends on said legs or supports, concentric shafts mounted on said legs or supports, ratchet wheels carried by said shafts, adjustable dogs adapted to engage said ratchet wheels, and ropes attached at two points to the feeder, one of said ropes being connected with the feeder or separator and one of the shafts, and the other extending directly to the other shaft, substantially as set forth.

6. The combination with a separator, and legs or supports pivotally connected at their lower ends thereto, of a feeder pivotally supported between its ends on said legs or supports, concentric shafts mounted on said legs or supports, means for turning said shafts independently of each other, drums carried by said shafts, a pulley mounted in proximity to the upper end of each leg or support, pulleys

mounted on the separator and ropes adapted to pass over said pulleys, the ends of said ropes being secured respectively to the drums on the two shafts and the feeder in proximity to its two ends, substantially as set forth.

7. The combination with a separator and legs or supports pivotally connected at their lower ends thereto, of a feeder mounted between its ends on said legs or supports, two concentric shafts mounted on said legs or supports between their ends, a rope secured at its ends to the free end of the feeder and wound on one of said shafts, pulleys carried by the upper ends of the legs or supports, pulleys carried by the separator, and ropes secured at one end to the inner end of the feeder, passing over said pulleys, and at their other ends secured to the other shaft on the legs or supports, substantially as set forth.

8. The combination with a separator and legs or supports pivotally connected at their lower ends thereto, of a feeder pivotally supported between its ends on said legs or supports, a shaft mounted on said legs or supports, pulleys mounted at the upper ends of said arms, pulleys mounted on the separator, ropes secured at one end to the separator, passing over said pulleys and connected at their other ends to said shaft, a hollow shaft mounted loosely on said first-mentioned shaft, a rope secured at its ends to the free end of the feeder and wound on said hollow shaft, devices for rotating said shafts, and adjustable devices for preventing the retrograde rotation of said shafts, substantially as set forth.

9. The combination with a separator having brackets thereon with open sockets in them, of legs hinged to the separator, a band cutter and feeder frame connected with the free ends of the legs and capable of adjustment relative thereto, a pair of concentric winding drums, and cables one of which extends from the feeder directly to one of the winding drums, and the other extending from the feeder to the other drum and having sliding connection with the separator, substantially as set forth.

10. The combination with a feeder attachment, arms having pivotal connection with the attachment, said arms having transverse slots therein, and clamping device extending through said slots for adjustably securing them in place, of a governor revolvably supported in the upper end of the adjustable arms, a hood inclosing the governor and pivotally mounted on the governor shaft, said hood having slots therein substantially concentric with the governor shaft and clamping means extending through these slots and connected with the arms for adjusting the hood, substantially as set forth.

11. The combination with a separator and a feeder, of arms secured at one end to the feeder and terminating above the separator, a governor or regulator mounted at the free end of said arms, a hood pivotally mounted on the shaft of said governor or regulator

and inclosing the governor or regulator and means for retaining said hood in position, substantially as set forth.

12. The combination with a feeder for a separator, of arms pivotally connected at one end thereto, a band cutter mounted on said arms, brackets secured to the feeder and extending above said arms, blocks secured to said brackets and arms projecting from said blocks above said pivoted arms and at the opposite sides thereof from the upper ends of said brackets, substantially as set forth.

13. The combination with a feeder for a separator, of arms pivotally connected at one end thereto, a band cutter mounted on said arms, brackets secured to said feeder, and blocks adjustably secured to said brackets under the free ends of said arms between which and the brackets the free ends of the arms rest, substantially as set forth.

14. The combination with a feeder for a separator, of arms pivotally connected at one end thereto, a band cutter mounted on said arms, and spring actuated levers bearing against the under faces of said pivoted arms, substantially as set forth.

15. The combination with a feeder for a separator, of arms pivotally connected at one end thereto, a band cutter mounted on said arms, bell-crank levers pivoted below the pivoted arms, one arm of each lever bearing on the under face of said pivoted arms, and springs attached at one end to the other arms of said bell-crank levers and at their other ends to the feeder, substantially as set forth.

16. The combination with a feeder for a separator, of arms pivotally connected at one end thereto, a band cutter mounted on said arms, and adjustable yielding devices bearing against the under face of said pivoted arms, substantially as set forth.

17. The combination with a feeder for a separator, of arms pivotally connected at one end thereto, a band cutter mounted on said arms, brackets secured to the feeder, blocks secured to said brackets under the free ends of said arms, a bell-crank lever pivoted to each block, lateral fingers projecting from one arm of said levers, under said pivoted arms, and a spring secured to the other arm of each bell crank lever and to the feeder, substantially as set forth.

18. The combination with a band cutter comprising a frame and a series of knives, of boxes mounted loosely on the shaft of said cutter, arms projecting from said boxes, and a guard secured to said arms and having fingers entering between the knives of the band cutter, substantially as set forth.

19. The combination with a feeder frame, of arms pivotally connected at one end thereto, clamps carried by said arms, boxes mounted in said clamps, a band cutter having its shaft mounted in said boxes, arms projecting from said boxes and a guard secured to said arms,

said guard having fingers entering between the knives of the band cutter, substantially as set forth.

20. The combination with a feeder frame and arms pivotally connected at one end thereto, of clamps mounted on said arms and having recesses therein, boxes in said clamps, hollow projections on said boxes and extending into said recesses in the clamps, a band cutter having its shaft mounted in said boxes, arms extending from said boxes, and a guard secured to said arms, said guard having fingers adapted to enter between the knives of said band cutter, substantially as set forth.

21. The combination with a feeder and clamps carried thereby, of journal boxes mounted in said clamps, a band cutter having its shaft mounted in said boxes, arms projecting from said boxes, a guard secured to said arms, and spring fingers carried by said guard, said fingers extending toward the outlet of the feeder and terminating over the carrier of said feeder, substantially as set forth.

22. The combination with a feeder, a band cutter and a guard, of bars connected to said guard by means of spring hinges, and curved fingers secured to said bars and terminating over the carrier of said feeder, substantially as set forth.

23. The combination with a feeder attachment, arms pivoted thereto, and means for yieldingly supporting the free ends of the arms, of clamps secured on the arms, journal boxes held between said clamps, a band cutter revolvably supported in the journal boxes, arms extending laterally from these journal boxes, a guard connected to these arms, and a bar hinged to the guard and carrying fingers, substantially as set forth.

24. The combination with a feeder attachment, arms pivoted thereto, and guides for the free ends of these arms, of clamps secured to the arms and having journal-boxes therein, a band cutter revolvably supported in the journal-boxes, arms projecting from the journal-boxes, a guard secured to these arms, bars having fingers thereon, and spring hinges connecting these bars to the guard, substantially as set forth.

25. The combination with the shell or body of a band cutting cylinder, of clamping plates secured to the surface thereof in pairs, said clamps separated slightly, a knife inserted between the pairs of plates, said plates having outwardly projecting lugs thereon adapted to engage the sides of the knives, the knives and lugs having holes formed therein in alignment with one another, and a removable device adapted to be passed through these holes to hold the knife in place, substantially as set forth.

26. The combination with the shell or body of a band cutting cylinder, of clamping plates secured thereon in pairs and between which knives are adapted to be held, knives having

notches in their inner edges, pins extending across from one clamping plate to the next and adapted to enter these notches, and a removable key passed through the plates and knife for holding the knife in place between them, substantially as set forth.

27. The combination with a separator, a feeder and a governor or regulator, of gearing for driving the feeder, a pulley carried by one of the shafts of the feeder, a pulley carried by the governor or regulator, a belt passing over said pulleys and a set of intermeshed gear wheels within the governor pulley for reducing the speed of the governor below that of the cylinder of the separator and the feeder, substantially as set forth.

28. The combination with a separator, a feeder and a governor or regulator, of gearing for driving the cylinder of the separator and the feeder, a pulley carried by one of the shafts of the feeder, a cone pulley carried by the shaft of the governor or regulator, a straight belt passing over said pulleys, and gearing within the governor pulley constructed and adapted to reduce the speed of the governor below that of the cylinder and feeder and in a reverse direction, substantially as set forth.

29. The combination with a separator, a feeder and a governor or regulator, of a pulley mounted loosely on the shaft of the governor or regulator, a fast and a loose pinion on said shaft, a device to prevent the rotation of the loose pinion, pintles carried by said pulley, and two pinions carried by each pintle and adapted to rotate together and respectively

mesh with the pinions on the shaft, substantially as set forth.

30. The combination with a separator, a feeder and a governor or regulator, of a loose pulley mounted on the shaft of the governor or regulator, a fast and a loose pinion on said shaft, one having an even and the other an odd number of cogs, pintles carried by said pulley, two pinions mounted loosely on each of said pintles, one pinion of each pair having an even number of cogs and the other an odd number of cogs, the pinions having the even number of cogs meshing with the pinion on the shaft having the odd number of cogs and the pinions carried by the pintles and having the odd number of cogs meshing with the pinion on the shaft having the even number of cogs and a device to prevent the pinion mounted loosely on the shaft from rotating, substantially as set forth.

31. The combination with the concave of a thrashing machine and the forward roller of a carrier, of a feed board located between said concave and roller, a board located at the outer end of said feed board, a bar hinged to said board and a brush secured to said bar and adapted to engage the roller, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOHN L. BARKER.

Witnesses:

JNO. W. KNIGHT,
WM. H. LUECK.