No. 775,964. PATENTED NOV. 29, 1904.

D. BINNS.

CORN HARVESTER.

APPLICATION FILED APR. 30, 1904.

NO MODEL. 4 SHEETS—SHEET 1.

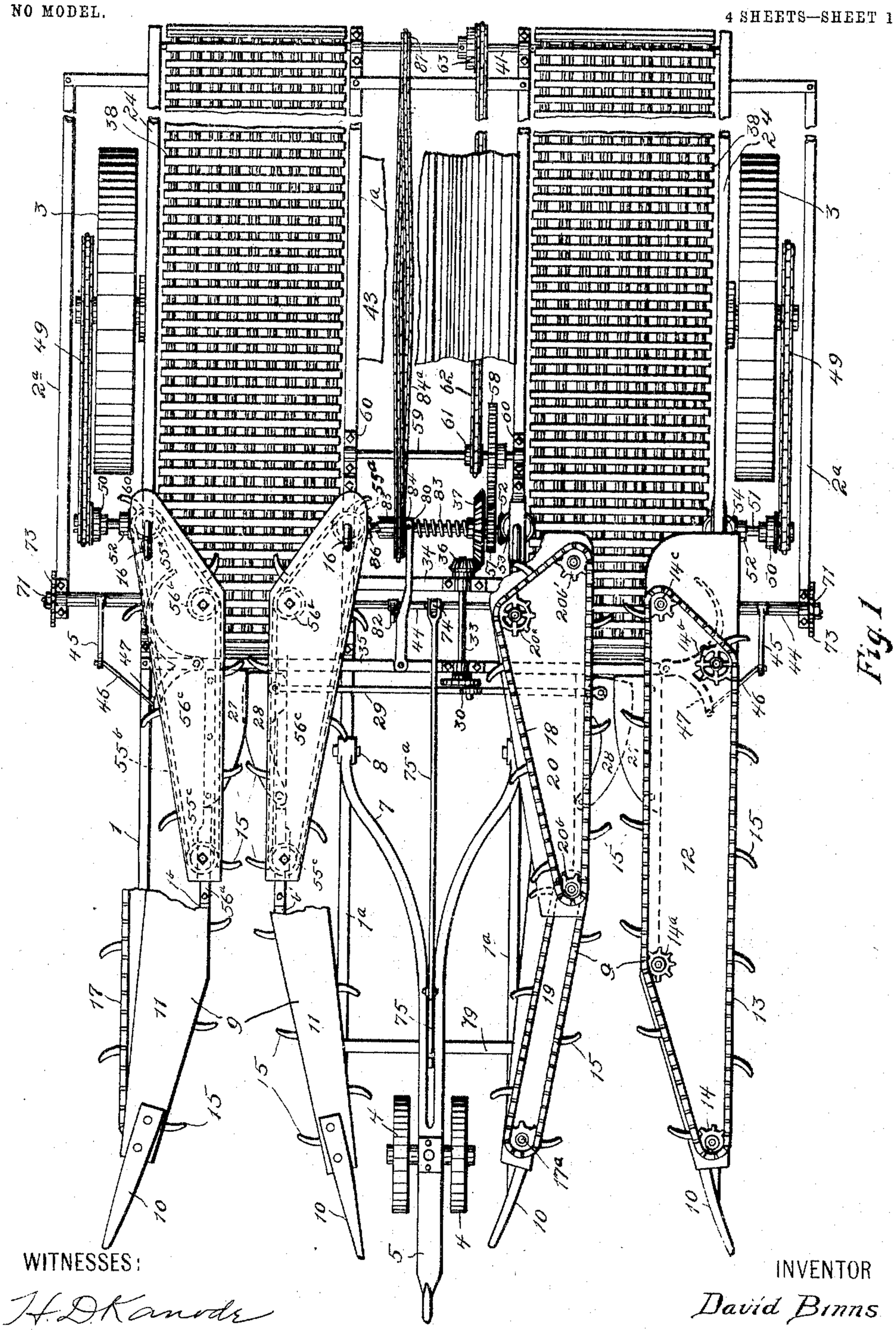

Fig. 1

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NO MODEL. 4 SHEETS—SHEET 2.

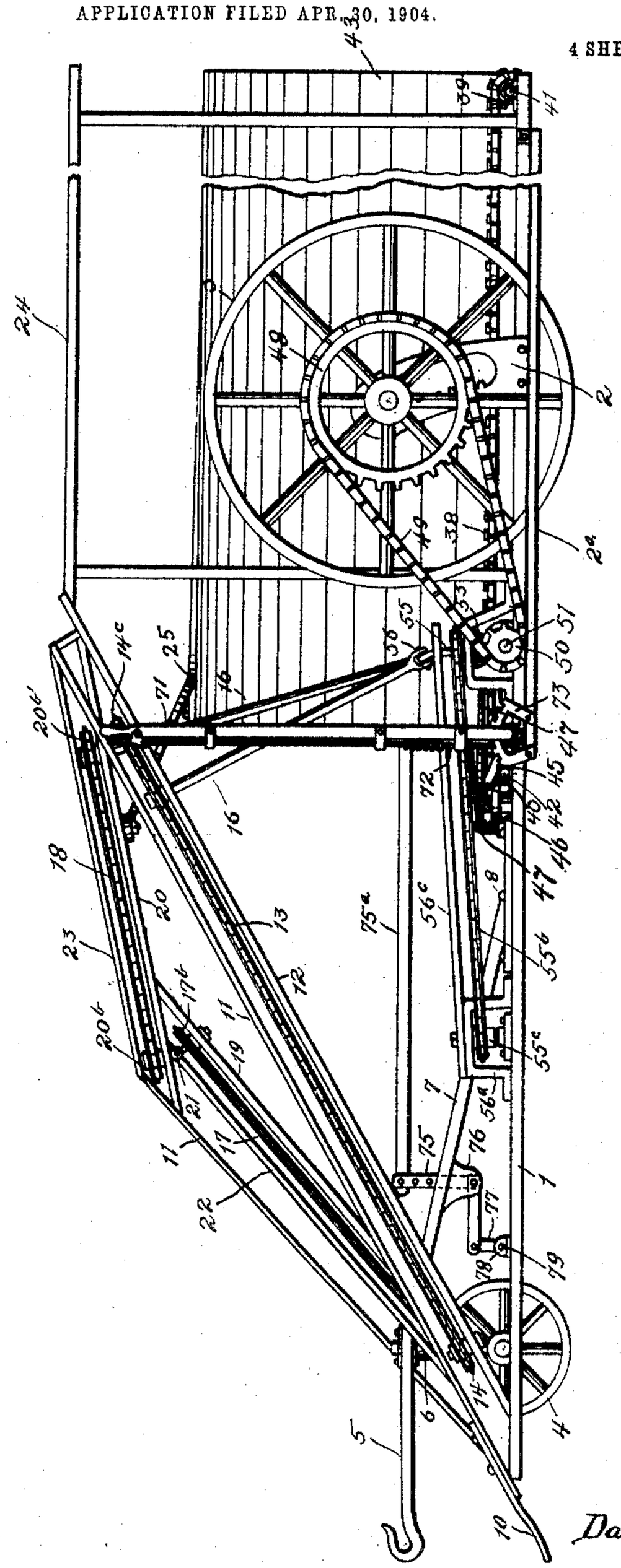

Fig. 2

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NO MODEL. 4 SHEETS—SHEET 3.

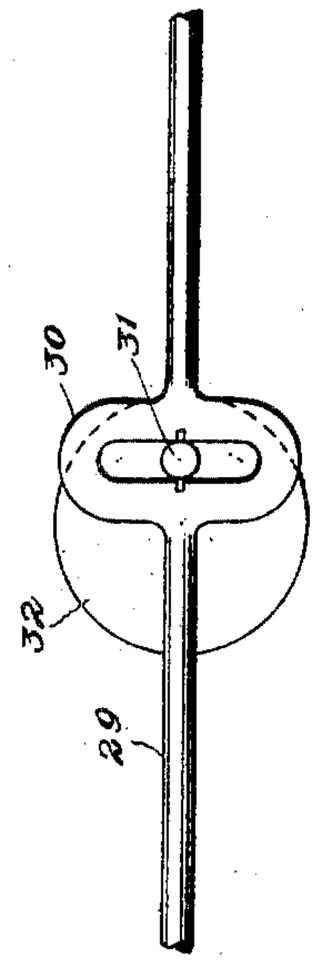

Fig. 5

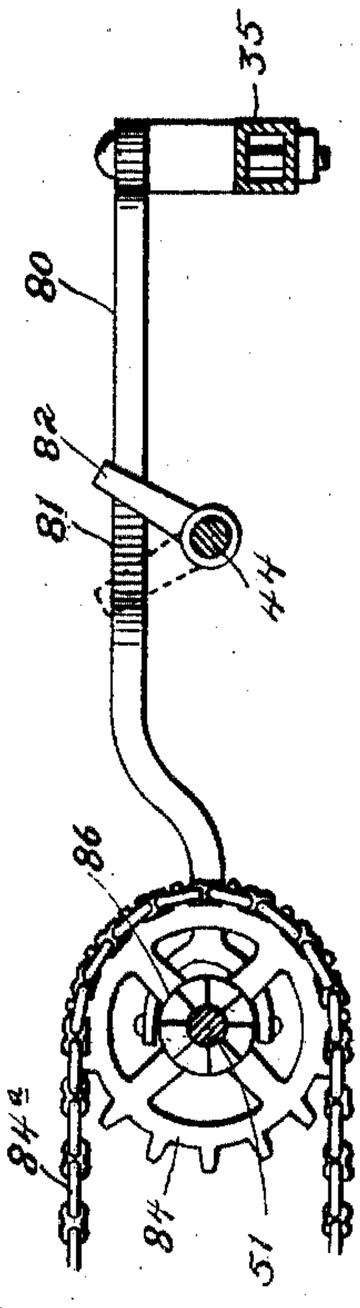

Fig. 6

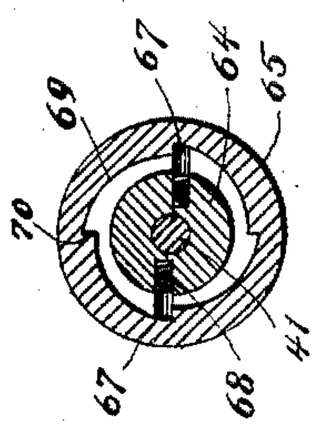

Fig. 3

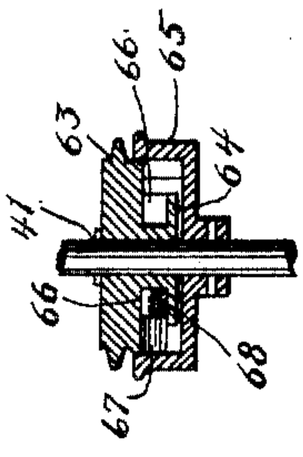

Fig. 4

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NO MODEL. 4 SHEETS—SHEET 4.

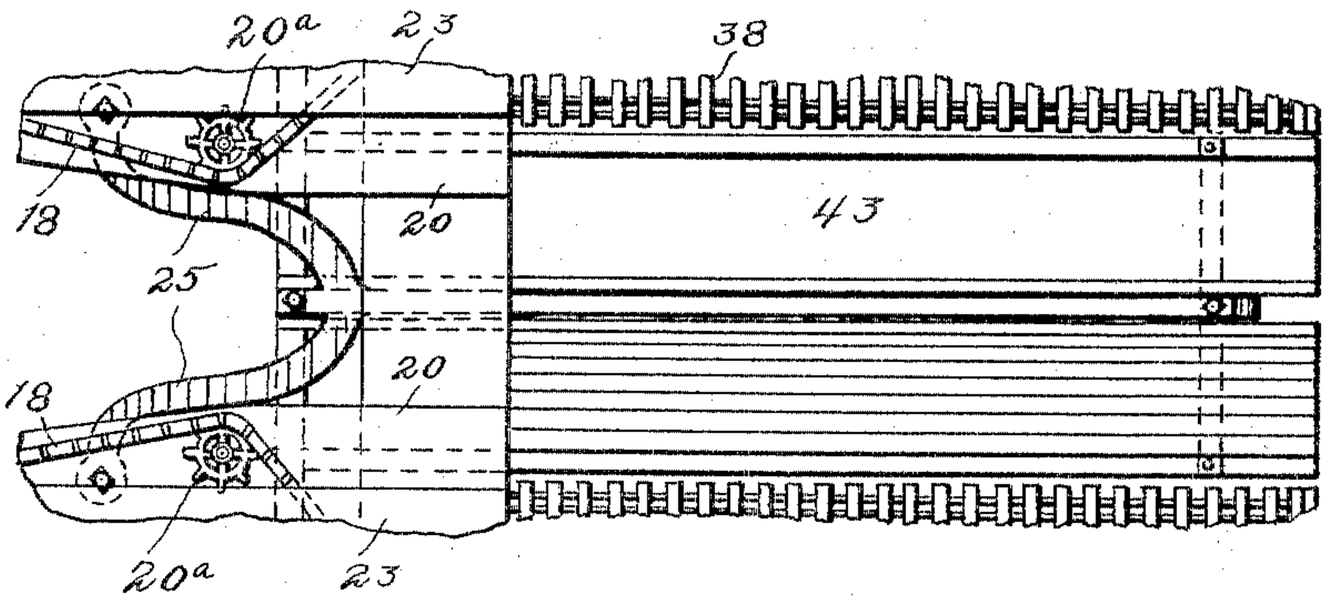

Fig. 7

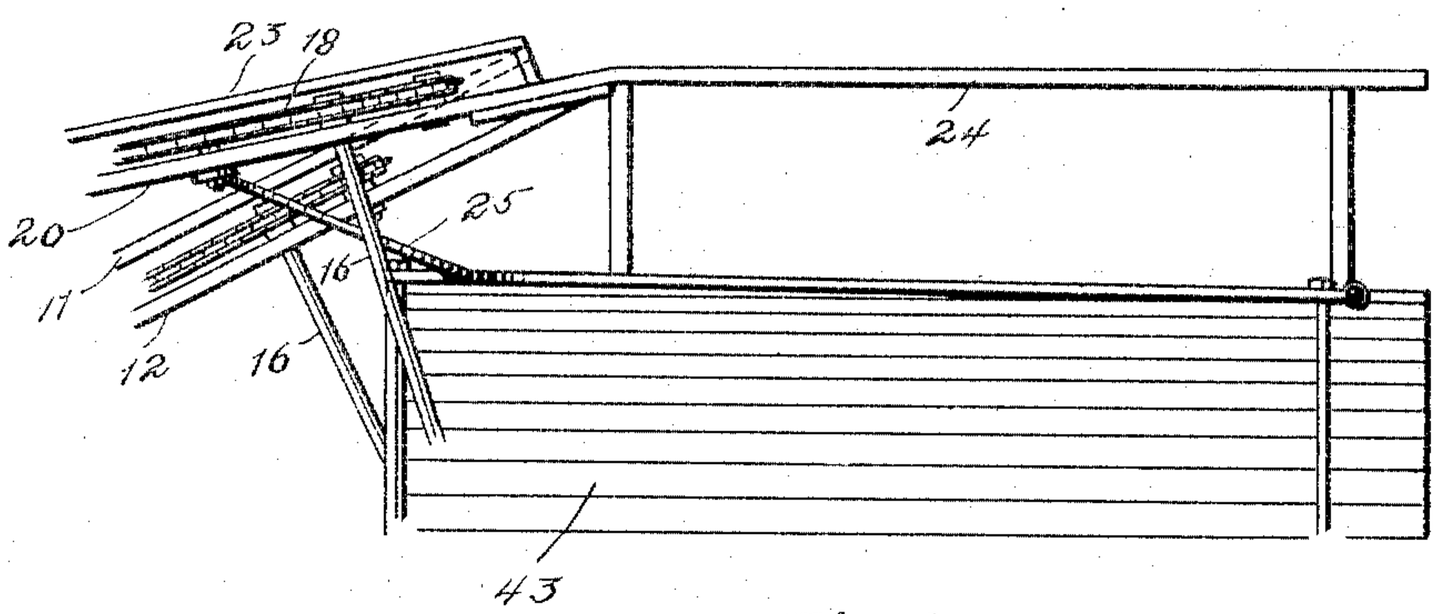

Fig. 8

WITNESSES:

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No. 775,964. Patented November 29, 1904.

UNITED STATES PATENT OFFICE.

DAVID BINNS, OF CAMPCHASE, OHIO.

CORN-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 775,964, dated November 29, 1904.

Application filed April 30, 1904. Serial No. 205,765. (No model.)

To all whom it may concern:

Be it known that I, DAVID BINNS, a citizen of the United States, residing at Campchase, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Corn-Harvesters, of which the following is a specification.

This invention relates to a new and useful improvement in corn harvesting and shocking machines.

The object of the invention resides in a superior means for guiding the stalks, cutting the same, and delivering them on a pair of endless aprons.

Another object lies in a tilting means whereby the forward end of the machine may be lowered toward the ground for the purpose of operating on fallen stalks or whereby the rear end may be lowered to facilitate the dumping of the shocks which are formed on the slowly-moving endless belts.

A further object resides in an automatic means set to operate by the tilting operating-lever, whereby the speed of travel of the aprons is increased to expedite the dumping of the shocks.

Finally, the object of the invention is to provide a device of the character described that will be strong, durable, and efficient and simple and comparatively inexpensive to make and one in which the several parts will not be liable to get out of working order.

With the above and other objects in view the invention consists of the novel details of construction and operation, a preferable embodiment of which is described in the specification and illustrated in the drawings, wherein—

Figure 1 is a top plan view broken away to show hidden parts. Fig. 2 is a side elevation. Fig. 3 is a vertical sectional view of the speed-clutch. Fig. 4 is a transverse sectional view of the same. Fig. 5 is a detail front elevation of the knife-operating mechanism. Fig. 6 is a detailed elevation view of the clutch-operating mechanism, showing the supporting means in section. Fig. 7 is a partial plan view of the machine, showing the means for supporting the base-plates 20; and Fig. 8 is a side elevation of the same parts.

In the drawings the numeral 1 designates the frame of the machine, which may be of any suitable construction and which is supported at its rear by segmental brackets 2, which at their ends are suitably connected with ground-wheels 3. The forward end of the frame is supported by a pair of gage-wheels 4, disposed on either side of the tongue 5, which is supported by a standard 6, extending vertically between the wheels 4. The tongue 5 is formed with a bifurcated end, the furcations 7 of which are pivotally connected at 8 to the frame 1. It will thus be seen that the frame is supported at two points, one at the forward end by the gage-wheels 4 and the other at the rear by the ground-wheels 3.

The machine herein shown and described is especially adapted to operate on two rows of corn at a time, and therefore the necessary parts are provided in duplicate. Arranged on either side of the machine are inclined guides 9, provided at their lower ends with shoes 10, which are secured on the guard-plates 11. The outer guards each comprise an inclined plate 12, on which is arranged a single endless chain 13, guided over the sprockets 14, 14^a, 14^b, and 14^c. The chains are provided with outwardly-extending curved fingers 15, which project over the edge of the plate, extending into the guideway. The chains are given motion through the sprockets 14^b, which are mounted on the upper end of the shaft 16, which will be hereinafter described. Disposed opposite to the outer guide means are endless guide-chains 17 and 18. The chains 18 are supported upon base-plates 19, which are inclined upward at a greater angle than the plates 12, causing the chains 17 to lie above the chains 13. The chain 17 is formed with the outwardly-extending fingers 15, as provided on the chains 13, and is guided over sprockets 17^a and 17^b, suitably mounted on the base-plates 19. Extending from the upper end of the base-plates 19 at slight incline rearwardly is a second base-plate 20, which supports upon sprockets 20^a, 20^b, and $20^{b'}$ the chain 18, which is also provided with the fingers 15. The chains 17 and 18 are so arranged as to overlap each other at

their adjacent ends, and the sprockets 20^b and 17^b are connected by a universal shaft 21, whereby motion being transmitted to the chain 18 by the sprocket 20^a will be conveyed to the chain 17 by means of the universal shaft 21 and sprocket 17^b. It will thus be seen that stalks passing between the guides will be carried therealong by the projecting fingers 15 and engaged thereby at different points along the height of the same, thus obviating the tendency of machines of this character to create a lifting or pulling action on the stalks. The chains 17 and 18 are covered by guard-plates 22 and 23. The inclined plates 12 are supported at their upper ends by the vertical side frames 24 and rest at their lower ends upon the forward end of the main frame 1. The plates 19 are likewise supported at their lower ends upon the forward end of the frame 1 and are secured at their upper ends to the plates 20, which have their rear ends supported upon a yoke 25, which is suitably arranged along the top of the shield 43, as shown more particularly in Fig. 7.

Secured upon the frame 1 and projecting into the guideways are fixed knives 27, which are adapted to act in conjunction with pivoted ledger-blades 28, projecting from the opposite sides of the guideways and overlapping said knives 27. The ledger-blades 28 are given a slight swinging action by means of a rod 29, formed with a vertical loop 30, in which plays the eccentrically-mounted pin 31 of the revolving disk 32, which imparts to the rod 29 a reciprocating movement. The disk 32 is supported upon a shaft 33, supported in boxes mounted on cross-bars 34 and 35 and carrying at its rear end a pinion 36, meshing with the beveled gear 37, which will be hereinafter described. Mounted back of and extending rearwardly from the cross-bar 35 are a pair of endless aprons 38, which are guided over sprockets 39 and 40, mounted on transverse shafts 41 and 42. Supported on the longitudinal frame-bars 1^a between the endless aprons is a triangular-shaped shield or hood 43, which in connection with the side frames 24 prevents the lateral displacement of the cornstalks as they are carried back by the aprons. Arranged transversely and near the forward ends of the endless aprons is a transverse shaft 44, supported in boxes mounted on the guard-frames 2^a, from which project inclined arms 45, connected at their outer ends by links 46 to swinging guard-arms 47, pivotally mounted on the bar 35 and adapted to be swung by an oscillation of the shaft 44 into the path of the cut cornstalks to support the same while the shock is being delivered.

Secured to the ground-wheels 3 are sprocket-wheels 48, which are connected, by means of chains 49, to sprocket-wheels 50, mounted on the ends of the transverse shaft 51, extending across the machine, and thus imparting a rotary motion to the said shaft. The shaft carries a plurality of beveled gears 52, which mesh with beveled gears 53, supported in brackets 54 upon vertical shafts 55, which are connected through the medium of universal joints 56 to the inclined shafts 16, which impart motion to the chains 13 and 18. Fixed on the shafts 55 are sprockets 55^a, which are connected by means of endless chains 55^b, having the outwardly-projecting fingers 15, to sprockets 55^c, suitably mounted within brackets 56^a, supported on the frame-beams 1^b. The chains are caused to travel over idle sprockets 56^b and are covered by plates 56^c. The especial purpose of these chains is to carry the stalks between the knives and to deliver them upon the endless aprons 38. The beveled gear 37 heretofore described is secured on the shaft 51 and through the pinion 36 and shaft 33 imparts motion to the disk-plate 32. Mounted in juxtaposition to the beveled gear 37 upon the shaft 51 is a spur-gear 57, which meshes with a gear-wheel 58, mounted on a transverse shaft 59, supported in boxes 60 upon the central frame-bars 1^a. A sprocket 61 is fixed on the shaft 59 adjacent to the gear-wheel 58 and supports one end of an endless chain 62, which is carried at its outer end by a sprocket-wheel 63, loosely mounted on the shaft 41. As will best be seen in Fig. 4, the sprocket-wheel 63 is provided upon its inner side with a reduced hub-like extension 64, that is projected into a cup 65, rigid upon the shaft 41. The hub is provided with two or more radial sockets or recesses 66 for the reception of radial slidable boxes 67, which are normally pressed outward by means of helical springs 68, disposed in the back portion of the sockets. As clearly shown in Fig. 3, it will be seen that the outer ends of the dogs are beveled and work in frictional engagement with the cam or eccentric portions 69 of the inner periphery of the cup, its eccentric portion terminating in an abrupt radial shoulder 70, against which the adjacent dog is adapted to engage, and thereby interlock the sprocket and the cup for simultaneous rotation in one direction, and thus transmitting motion to the shaft 41, which shaft supports the sprocket-wheel 39 of the endless aprons 38 and gives a rearward motion to the same.

From the foregoing description it will readily be discernible that upon imparting a forward motion to the machine the cornstalks will be guided between the shoes 10 and into the guideways 9, where they will be engaged by the rearwardly-moving fingers 15 of the endless chains and carried between the knives 27 and ledger-blades 28, thus being severed and the severed portions carried on to the endless aprons 38, which having a slow rearward movement gradually carry the stalks

backward, thereby forming the shock. When the shock has been formed and snared and it is desired to deliver the same to the ground, the frame of the machine is tilted rearwardly. This is accomplished by rocking the shaft 44 rearwardly, the operator grasping either of the levers 71 and lifting the pawl 72 out of engagement with the segmental rack 73, secured to the frame-bar 2^a, pulling the same rearward, thus rocking the shaft 44. The shaft 44 has projecting upwardly from its center portion a fixed arm 74, which is pivoted to the rod 75^a, extending forward therefrom and pivotally connected at its forward end to a bell-crank lever 75, which is fulcrumed upon an ear 76, projecting from the yoke 7. The bell-crank lever 75 is connected at its outer end by means of a pivoted link 77 and an ear 78 to a transverse bar 79, disposed between and supported by the frame-bars 1^a. Thus it will be seen that upon the rearward rocking of the shaft 44 the bell-crank lever is tilted backward through the rod 75^a, causing the link 77 to lift the forward end of the frame-bars 1^a, and thus raising the entire forward end of the machine, causing the rear end thereof and the endless aprons 38 to approach the ground and occupy a position in close proximity thereto. In order to facilitate the expeditious delivery of the shock from the endless aprons 38, I provide means for increasing the rate of travel of the aprons. This means comprises a lever 80, pivotally mounted on the transverse bar 35 and formed with an angular portion 81 intermediate to its length, against which an arm 82, fixed to the shaft 44, is adapted to bear, so that when the said shaft is rocked rearwardly the arm 82 will travel along the cam-face 81, allowing the lever 80 to swing to one side. The swinging of the lever 80 is accomplished through a coiled spring 83, encircling the shaft 51 and bearing at one end against the beveled gear 37 and impinging at its opposite end a slidably-mounted sprocket-wheel 84, to which the lever 80 is pivoted, so as to allow the sprocket to turn. The sprocket 84 carries on its opposite side a clutch-collar 85, which is adapted to engage with the clutch-face 86 of the beveled gear 52. It is obvious that when the shaft 44 is rocked rearwardly, causing the arm 82 to move along the cam-face 81, the spring 83 will force the sprocket 84 and its collar 85 into engagement with the clutch-face 86 of the beveled gear 52, thus imparting motion to said sprocket. The sprocket 84 is connected, by means of an endless crossed chain 84^a, to a sprocket 87, fixed on the shaft 41, which sprocket, being of less diameter than the sprocket 63, will increase the speed of revolution of the shaft, causing the endless aprons 38 to travel faster, and thus expeditiously deliver the shocks to the ground. It is to be observed that the sprocket 63 being loosely mounted on the shaft 41 will allow the same to travel at its increased rate of speed. During this delivering operation the guard-arms 47, as hereinbefore described, will be swung into the path of the cut corn, thus retaining the same until the machine is again brought to its normal position, which is accomplished by swinging the lever 71 to a perpendicular position, which rocks the shaft 44 forward, swinging the guard-arms 47 to one side, as shown in Fig. 1, and causing the arm 82 to travel back over the cam-face 81, and thereby throwing the clutch-collar 85 out of engagement with the clutch-face 86. It is to be observed that that portion of the lever 80 extending from the cam-face 81 to the bar 35 has a plain face, so that should it be desired to lower the forward end of the machine the shaft 44 may be rocked forward and the arm 82 moved without effecting an engagement of the collar 85 and the clutch-face 86. It is readily discernible that the tilting and delivering of the shocks are accomplished by a single operation and that it is merely necessary to slightly rock the shaft 44 to cause all the parts to be brought into action.

I do not wish to limit myself to the exact details of construction and operation herein set forth, as I may make various changes in the same without departing from the spirit of my invention.

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

1. In a corn-harvester, a frame adapted to be tilted bodily, a transverse rock-shaft mounted on the frame, endless aprons mounted on the frame, a drive-shaft for the aprons, a clutch-sprocket carried by the last-named shaft, means connecting the sprocket and the main drive-shaft for imparting a slow continuous rearward movement to the aprons, and means for increasing the speed of the aprons comprising a clutch member fixed on the main drive-shaft, a clutch-sprocket sliding on said shaft, means connecting the sprocket with the drive-shaft of the aprons, a spring for forcing the sprocket into engagement with the fixed clutch member, a lever having a cam offset connected with the clutch-sprocket for sliding the same, and a projection from the rock-shaft engaging with the cam offset of the lever for operating the same.

2. In a corn-harvester, the combination with a bodily-tilting frame, endless aprons arranged on the frame, and means for tilting the frame and changing the speed of the aprons, of means for guiding stalks to the aprons comprising inclined plates of unequal length extending at diverging angles, one of said plates carrying a guide-chain, and guiding means extending from the shorter guide-

plate at an angle thereto and terminating near the rear end of the long guide-plate.

3. In a corn-harvester, a frame adapted to be tilted bodily, endless aprons arranged on the frame, means for accelerating the speed of the aprons, and means pivoted on the frame adapted to be swung over the aprons to retain the stalks when the frame is tilted, in combination with a transverse shaft connected with the swinging retaining means, the speed-accelerating means and the frame so that a single movement of the shaft operates the said parts.

DAVID BINNS.

In presence of—
A. L. PHELPS,
W. L. MORROW.