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W. M. PIATT.

CORN HARVESTER.

No. 565,026. Patented Aug. 4, 1896.

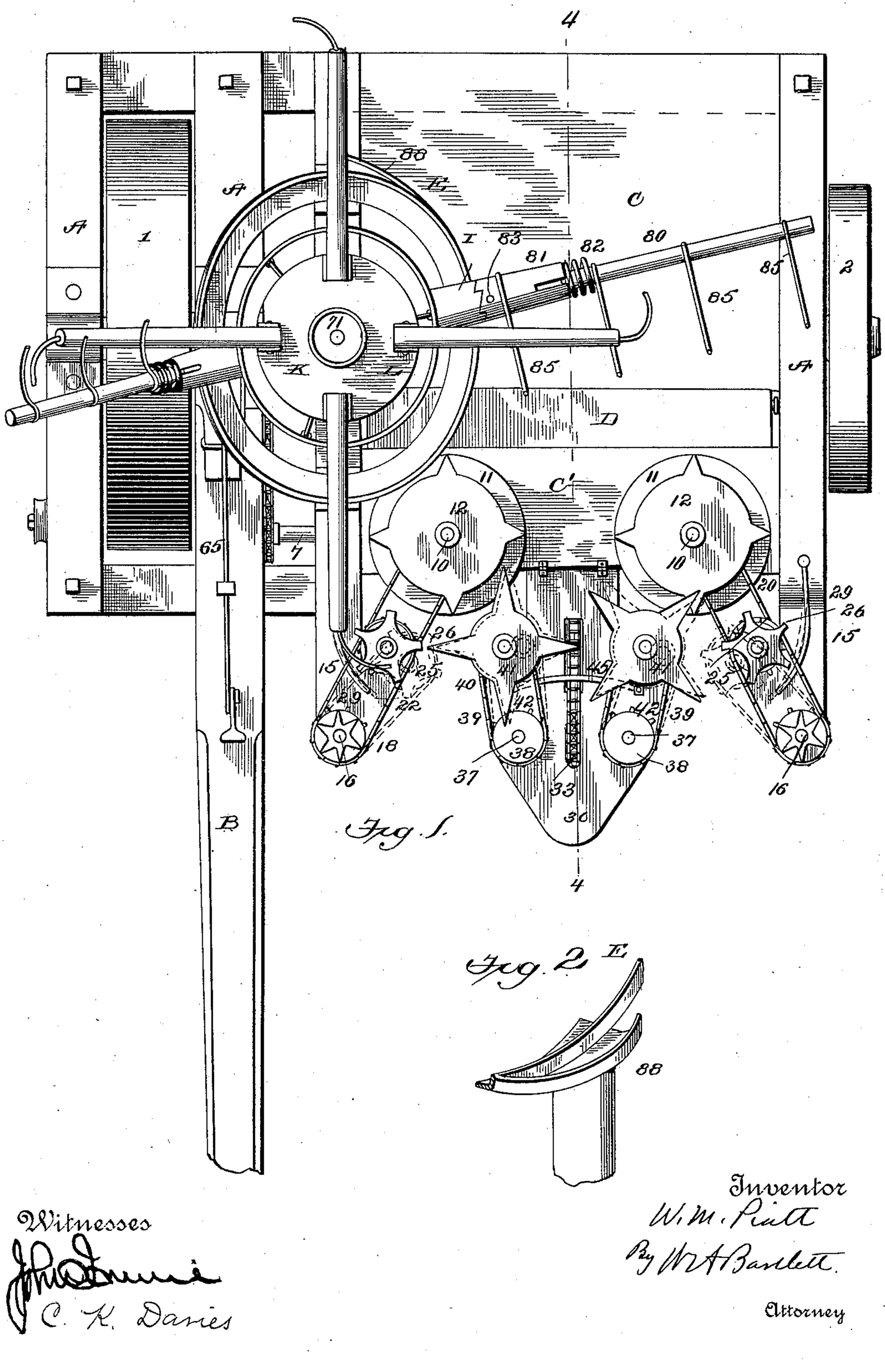

Fig. 1.

Fig. 2

Witnesses

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Fig. 3

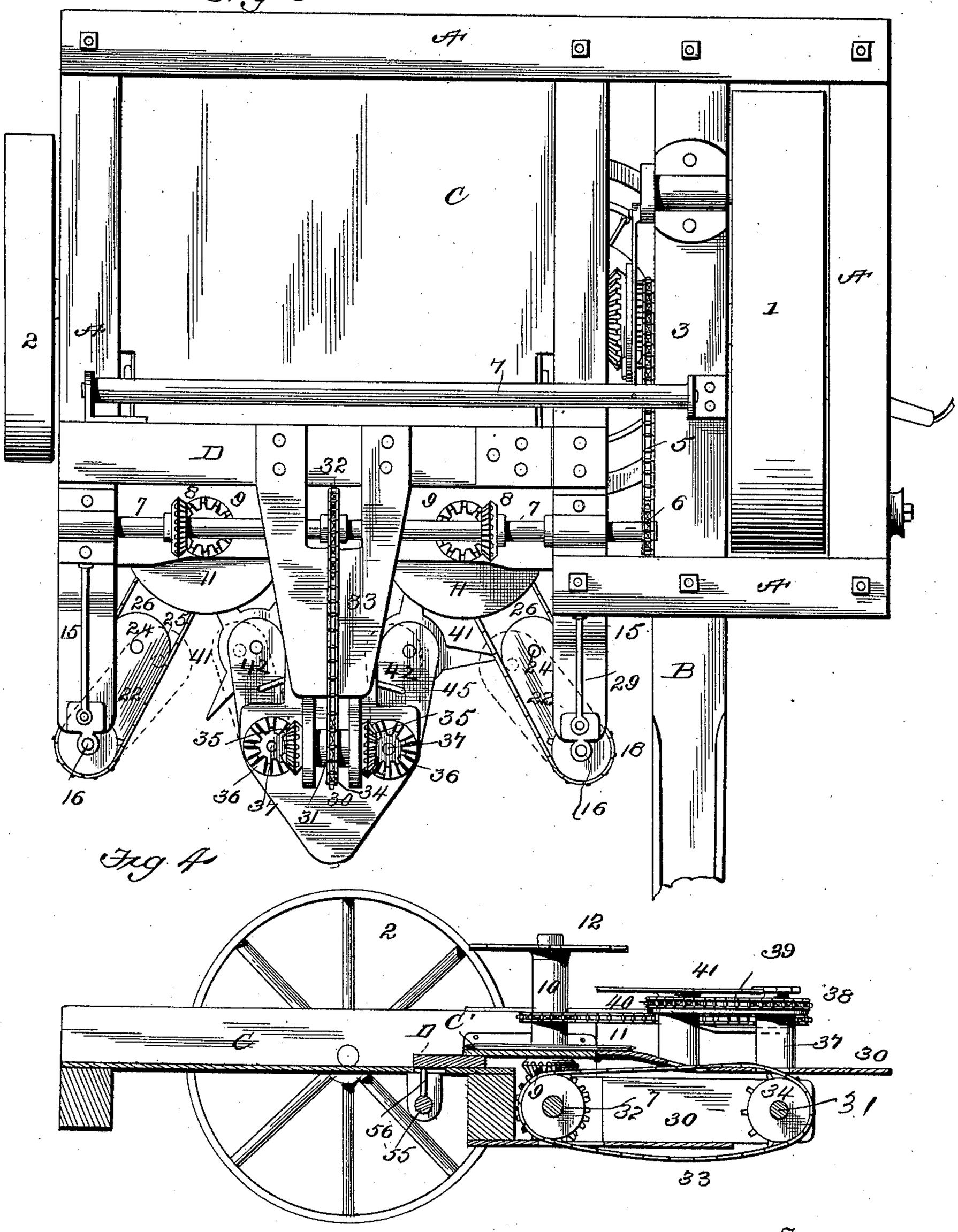

Fig. 4

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Fig. 5.

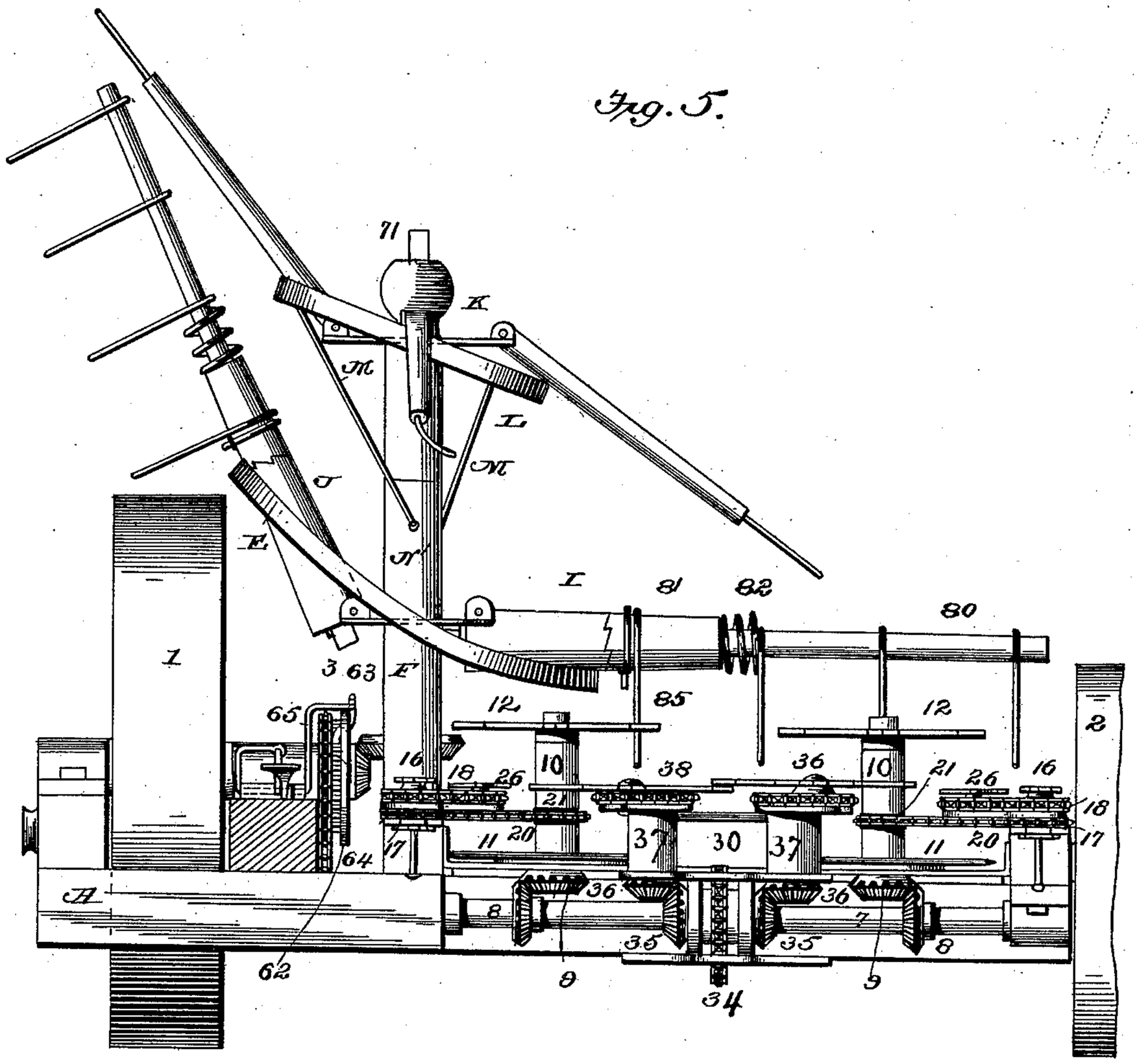
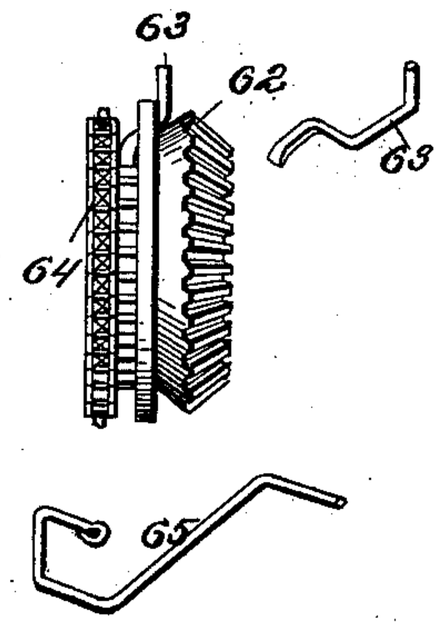


Fig. 8.



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No. 565,026. Patented Aug. 4, 1896.

Fig. 6

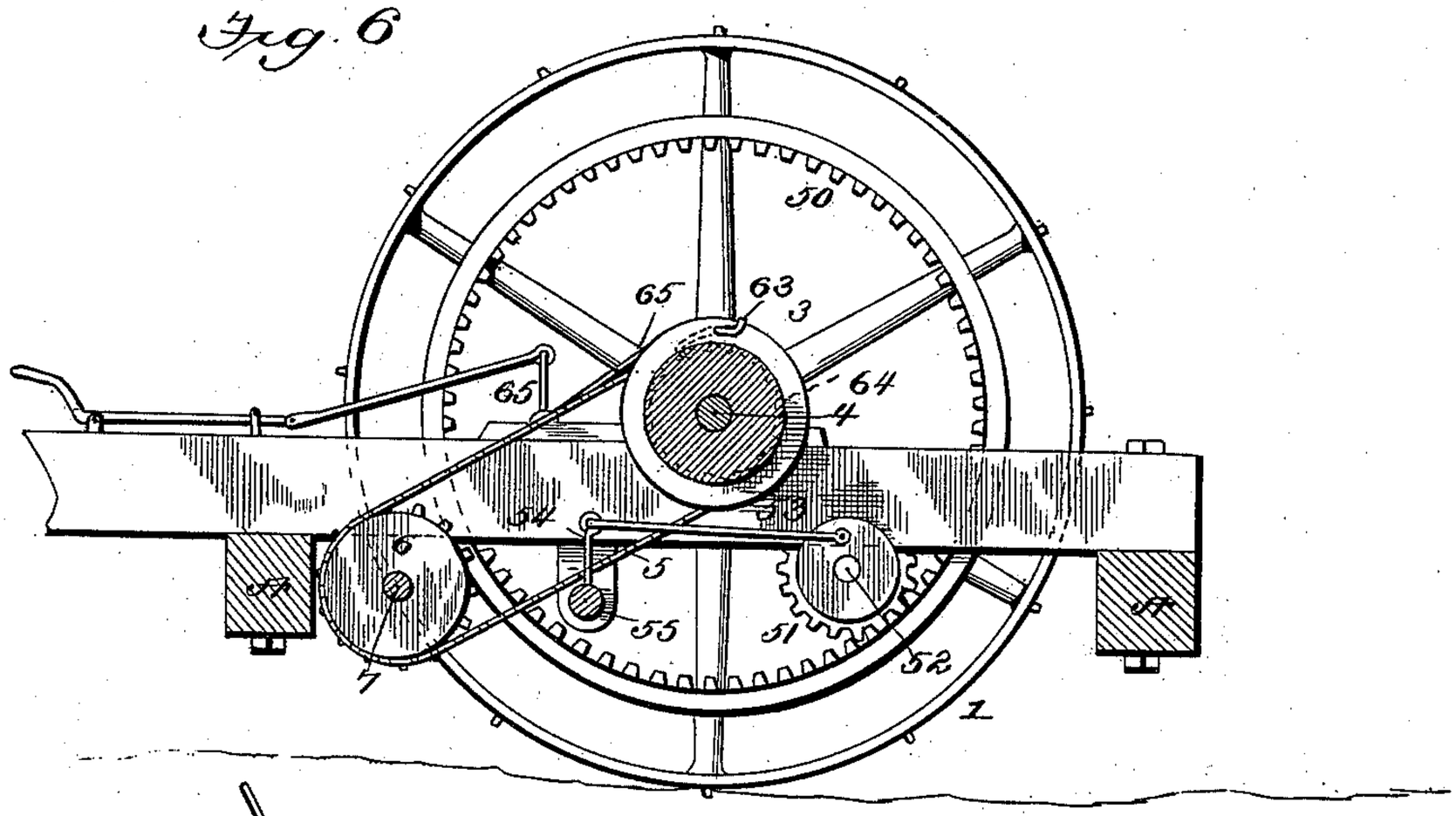
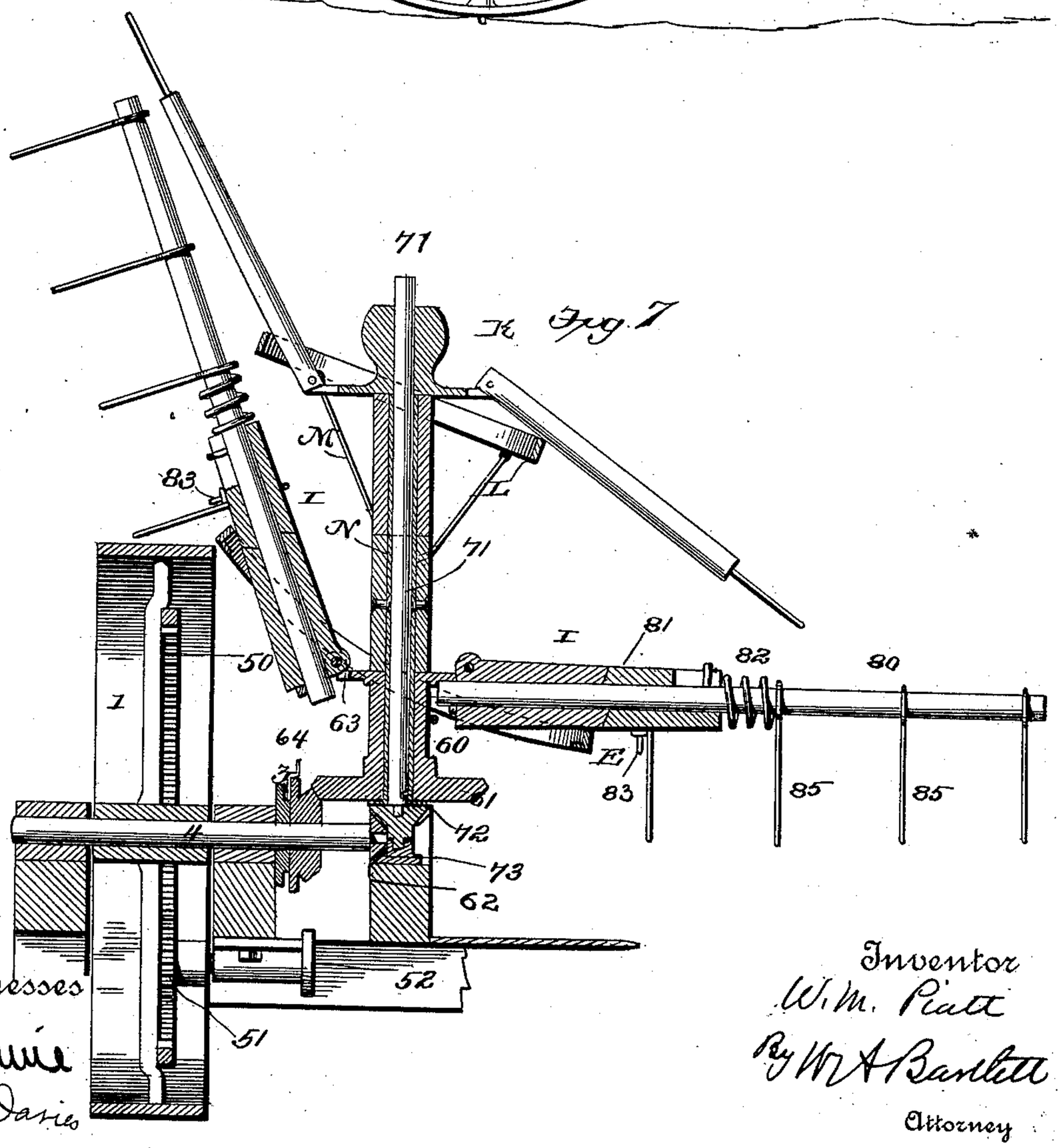


Fig. 7



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UNITED STATES PATENT OFFICE.

WILLIAM M. PIATT, OF WEST LIBERTY, OHIO.

CORN-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 565,026, dated August 4, 1896.

Application filed June 17, 1893. Serial No. 477,912. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. PIATT, residing at West Liberty, in the county of Logan and State of Ohio, have invented certain new and useful Improvements in Corn-Harvesters, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to corn-harvesters.

The object of the invention is to construct a corn-harvester in which the cornstalks shall serve as a guide to the pushers or conveyers, so that the knives shall be in the proper relation for cutting said stalks, notwithstanding the swaying of the machine; also, to improve the construction and operation of the devices for packing the stalks; also, to improve the mechanism for conveying shocks from the platform; also, to improve the machine in various particulars, as will be explained.

Figure 1 is a plan or top view of the machine. Fig. 2 is a perspective detail of camway and switch. Fig. 3 is a bottom plan view of the machine, showing the parts beneath the platform. Fig. 4 is a section on line 4 4, Fig. 1. Fig. 5 is a front elevation and partial section of the machine. Fig. 6 is a section showing the driving-wheel connections. Fig. 7 is a vertical section through the main shaft, showing part of the mechanism, and especially that part which constitutes and governs the shock supports and reels. Fig. 8 is a detail plan of the clutch-wheel and connections on driver-shaft.

The machine has a main frame A, of any suitable and convenient construction. This frame is supported on the driving-wheel 1 and the grain-wheel 2, and has a tongue B or other means for the attachment of a team. The grain-platform C is attached to the frame at suitable height to support the corn-shocks when cut.

The driving-wheel 1 has a sprocket or driving wheel 3 firmly secured to the axle or shaft 4. A driving sprocket-chain 5 connects sprocket-wheel 3 to a sprocket-wheel 6, which is rigid with shaft 7, which shaft 7 is supported in suitable bearings under the frame or platform, and extends lengthwise of the machine.

Shaft 7 has beveled gears 8 8 thereon, which bevel-gears mesh with the gears 9 9 on the lower ends of the vertical shafts 10 10.

The vertical shafts 10 extend up through the platform of the machine, and are supported in suitable bearings. Just above the platform the shafts 10 have rotary cutting disks or knives 11 11, which lie close to the platform and overlap the front edge thereof. The shafts 10 extend upward some little distance above the upper surface of the platform, and on their upper ends these shafts have star-wheels or packing-wheels 12. The function of these star-wheels is to press the cornstalks backward and to hold them up to the operation of the disks or knives 11.

At each side of the grain-platform an arm 15 extends forward, so as to enter between the corn-rows in advance of the platform and the cutters thereon. These arms 15 support short vertical shafts 16 in suitable bearings. The shaft 16 has a driving-pulley 17 and a sprocket-wheel 18 connected firmly thereto. Pulley 17 is driven from shaft 10 by a belt or chain running around pulley 21 on said shaft, and around pulley 17 on shaft 16.

Shaft 16 is the pintle or pivot on which a swinging arm 22 is pivoted. Arm 22 carries a short vertical shaft 24, having a sprocket or chain wheel 25 and star-wheel 26 thereon. The sprocket is driven by a chain from the sprocket-wheel 18 on shaft 16. Thus the star-wheel 26 is near the inner end of arm 22, and overhangs the end of said arm. Power is carried to the shaft at the outer or front end of said arm, and thence back along the arm to the star or packing wheel at the rear end thereof. The free end of arm 22 is pressed toward the center of the grain-platform by a spring 29, which yields under pressure and permits said arm 22 to swing sidewise. As has been described, these arms 22 and their connections are supported at opposite sides of the platform. The arms 22 and their star-wheels form guides and packers. The cornstalks are stiff and will yield but little to the machine, but as the platform of the machine sways with the inequality of the ground or from other cause the arms 22 and their packers yield, so that the packers are guided to the stalks and the stalks are pressed by the guides or packers toward the cutting-disks.

The star-wheels and sprocket-chains form

conveyers or pressers which guide the stalks to the cutters and hold the machine to its proper working position.

The central part of the platform has a shelf or pilot 30 projecting forward. On the under surface of this shelf there is a short counter-shaft 31, which is supported in bearings and is parallel with the driving-shaft 7. A sprocket-wheel 32 on shaft 7 has a driving-chain 33 leading to sprocket-wheel 34 on the counter-shaft, so that the counter-shaft revolves with the shaft 7, although not necessarily at the same speed.

The counter-shaft 31 has bevel-gears 35 at its opposite ends, and their gears engage with bevel-gears 36 on short upright shafts 37, which extend through and above the shelf and are supported in suitable bearings. These shafts 37 have sprocket-wheels 38 connected near their upper ends. The sprocket-wheels and chains act as conveyers or pressers against the standing cornstalks, as in the case described.

The sprocket-wheels 38 are connected by chains 39 with sprocket-wheels 40, which wheels 40 are on the same axis with and connected to star-wheels 41, the axis of said star-wheels being supported on arms 42, which arms are pivoted to the shafts 37, so as to swing therefrom.

The free ends of arms 42 are connected to each other by a link 45, so that these arms will swing together, but around their different pivots. The natural position of the arms 42 is to project equally at the sides of the shelf 30; but if the pressure of the stalks is greatest on one side of the shelf both arms are swung in the opposite direction. The result of this arrangement of arms 22 and 42, and the star-wheels supported near the inner ends of said arms, is that the arms form guides which yield so as to embrace the cornstalks and guide the cutters to the stalks, notwithstanding the swaying of the machine. As the cutters are circular disks, in a rapid rotation they will cut the stalks whether the same be presented at the front or at the side of the disks.

The projecting arms and the conveyers carried thereon must be distinguished from arms pivoted at the rear near the cutters. In the latter construction, which is well known, the free end of the arm first encounters the cornstalk. As the machine advances and the stalk nears the pivot, such an arm bears with increased pressure against the stalk and frequently bends down the stalk just before the cutter reaches the position to be operative. In my construction, where the arm is pivoted at the front, the arm bears against the stalk with greatest pressure when it first engages therewith. As the machine advances the stalk has a longer lever to act on, and even though it may be somewhat bent at first by the arm its natural tendency to stand erect will have opportunity to assert itself, and the arm will be swung aside and the stalk stand erect by the time the cutter reaches working position. The device must also be distinguished from a conveyer having fixed side walls or arms and an endless-belt conveyer moving along the same, the belt being held taut by a wheel which yields under pressure. In such a construction, which is described in patent to Long, No. 467,110, of June 12, 1892, there is a direct pressure of the stalk against the belt, which is probably greatest as the cutter approaches the stalk, and there is no leverage, as in my construction, by which the stalk is in better condition to right itself as the cutter approaches it.

My machine is specially designed to operate in fields planted by machinery, in which the rows are intended to be straight; but in such a field where one row diverges from a straight line the adjacent row generally has a similar divergence, and the distance between rows is uniform. So when a machine which cuts two rows is used the conveyers will generally act to good advantage if connected so as to move together.

The operation is not like that of a mowing-machine or wheat-harvester, where no attention is generally paid to the rows or drills of grass or grain.

It should be understood that many of the details of my invention are applicable to machines which operate on a single row as well as on a plurality of rows of corn.

The front portion C′ of the platform C is a thin plate or mask. A plate or bar D lies partly under this mask C′ and projects over the main part C of the platform. The bar D reciprocates lengthwise of the machine, being driven by gear 50 on the driving-wheel engaging a gear 51 on the short shaft 52. The gear 51 has a wrist-pin or crank thereon, and a pitman 53 connects said crank to an arm 54 on the rock-shaft 55, and the rock-shaft 55, under the platform, is rocked as the gear 51 rotates. (See Fig. 6.) Rock-shaft 55 has arms 56, connecting to plate D, (see Fig. 4,) so that the plate reciprocates as the shaft rocks. This reciprocation of plate D tends to crowd back the butts of the cut stalks on the platform.

I will now describe the shock-supporting arms, the reel, and operating mechanism therefor.

A cam-track E is supported on suitable standards F, connected to the frame. The office of this track is to lift the arms so that they will pass the drive-wheel and to hold them up when in operative position. A vertical hollow shaft or sleeve 60 has a bevel-gear 61, engaging a bevel-gear 62 on the driving-wheel shaft 4. The gear 62 runs loosely on shaft 4, but has a pawl 63, which may be thrown into engagement with ratchet-wheel 64, fixed to shaft 4, and when the pawl is in engagement it becomes a clutch-gear. This pawl 63 engages the ratchet by gravity or spring-pressure. A trip-lever 65, under control of the operator, normally engages an arm

of the pawl 63 and holds said pawl out of engagement with the ratchet-wheel, and also holds the bevel-gear 62 against rotation. The trip 65 is preferably a crank-arm, held in bearings on the frame and arranged to fall into the path of movement of pawl 63 by its own weight or by spring action. The pulling of the trip out of the way permits the pawl engagement, so that the gear 62 will rotate once when so engaged, but as the trip should be immediately released again the pawl will be caught and gear 62 stopped as soon as gear 72 has made one rotation. Bevel-gear 61 should by preference have twice as many teeth as bevel-gear 62. Thus the revolution of gear 62 will turn gear 61 and sleeve 60 half-way around. The proportions are not imperative.

Sleeve 60 has two arms I I hinged near its upper end. These arms project across the camway E and are supported thereby. The engagement of trip 65 with the pawl 63 holds the gears and sleeve 60 and holds arm I projected across the platform. The release of said trip causes the pawl 63 to make clutch connection, so that the shaft or sleeve 60 will make a half-revolution, carrying the arms I around with it, for a purpose to be hereinafter explained. When arm I extends across the platform, it serves as a support against which the cut stalks rest. The butts of the stalks are fed back on the platform by means of the star-wheel packers and reciprocating plate before described. The tops are forced back by reel K, which is carried by a shaft 71, which passes through the sleeve 60. Shaft 71 has a bevel-gear 72, which is in constant engagement with bevel-gear 73 on shaft 4, so that the reel K always rotates when the drive-wheel is moving. Reel K has a number (preferably four) of hinged arms, which rest on the cam-guideway L and are turned up out of the way of the drive-wheel and arms I by said cam-track. The track L may be supported by braces M, which braces are attached to a filler N′, attached to the sleeve N. Sleeve N extends through the sleeve 60, and is attached to the frame. The sleeve N forms a bearing for shaft 71.

The rotation of reel K, while the machine is moving, tends to press back the tops of the stalks, the arms of the reel riding over said stalks as they move beyond the resting place of the stalks. When enough stalks have accumulated on the platform to form a shock, the machine is stopped and the tops of the stalks bound together by the use of a hand-windlass or otherwise. Then the machine is again started and the trip 65 released. The arms I will be carried around, as well as the reel F, and the shock will be carried off the platform and deposited on the ground nearly in rear of the driving-wheel.

Arms I I are hollow and have extension-shafts 80 passing through them. The shafts 80 have hubs 81 thereon, said hubs being held to rotate with the shafts 80, but having a lengthwise movement on the shafts. A spring 82 on each shaft 80 presses the hub 81 toward the end of arm I. The ends of hub 81 and of arm I are provided with clutch-teeth, which are forced into engagement by the spring 82. A pin 83 projects from the side of the hub 81. The shafts 80 are provided with fingers 85, which project between the cut grain and support the same while the shocks are forming. When arms I are put in motion to carry the shock back off the platform, the pin or projection 83 engages switch-cam 88, which branches from the camway, and the clutch engagement of hub 81 with arm I is released by pressing back the hub against the action of spring 82, and the shaft 80 and hub 81 will rotate automatically, thus removing the fingers 85 from contact with the shock.

From the foregoing it will be understood that I do not intend to confine myself strictly to the construction shown in most cases, as it is evident that modifications may be made without departing from the spirit of my invention.

I have not described mechanism for adjusting the cutters to corn-rows of different widths, as I propose to avail myself of known constructions. So, also, where driving-gears and other elements are described, I expect to use mechanical equivalents and substitutes where advisable.

What I claim is—

1. In a corn-harvester, the grain-platform and moving cutters, the shelf or pilot projecting forward about midway of the platform and having a yielding arm pivoted at each side thereof and extending rearwardly toward the cutters, and a link connecting these arms to cause them to swing together, all combined substantially as described.

2. In a corn-harvester, the grain-platform and its rotary disk cutters, the central projection or pilot and an arm pivoted at the front and near each side thereof the free ends of the arms projecting toward the rear and into proximity with the different cutters, the links connecting said arms, and the moving conveyers carried by said arms all combined substantially as described.

3. In a corn-harvester, the grain-platform and moving cutters, the shelf or pilot projecting forward about midway of the platform and having a yielding arm pivoted at each side thereof and extending rearwardly toward the cutters, and a link connecting these arms to cause them to swing together and flanked right and left by a projection extending forward from said platform and having yielding arms pivotally supported thereon and extending from the pivots rearward toward the cutters, a moving conveyer supported by said arms and means engaging said arms tending to hold them in correlation all combined substantially as set forth.

4. In a corn-harvester, the platform, the shock-supporting arms supported on a hollow

shaft and projecting above said platform as described, the reel supported from a shaft extending through the hollow shaft, and driving-gears connecting said shafts to operative parts of the machine all combined substantially as described.

5. In a corn-harvester, the platform, the shock-supporting arms, the camways by which said arms are supported, the reel and its cam-guide, and driving-gears connecting said arms and reel to the operative parts of the machine all combined substantially as described.

6. In a corn-harvester, the platform, the shaft projecting upward in proximity thereto, the shock-supporting arms connected to opposite sides of said shaft, driving-gears connecting said shaft to the driving-wheel shaft, and a trip and clutch, substantially as described whereby the shock-arm shaft makes a half-revolution when the trip is released and is then stopped by the trip, all combined substantially as described.

7. In a corn-harvester, the platform and shock-supporting arm extending over the same, the extension-shaft connected to said arm and having a clutch engagement therewith, said shaft having projecting fingers, and means for disengaging said clutch to permit the rocking of said extension-shaft, all combined substantially as described.

8. In a corn-harvester, the platform, the shock-supporting arm projecting over said platform and the camway supporting the same, the extension-shaft connected to said arm by a clutch as described, and a switch on the camway by which said clutch may be disengaged, all combined substantially as described.

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

WILLIAM M. PIATT.

Witnesses:
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I. N. JORDAN.