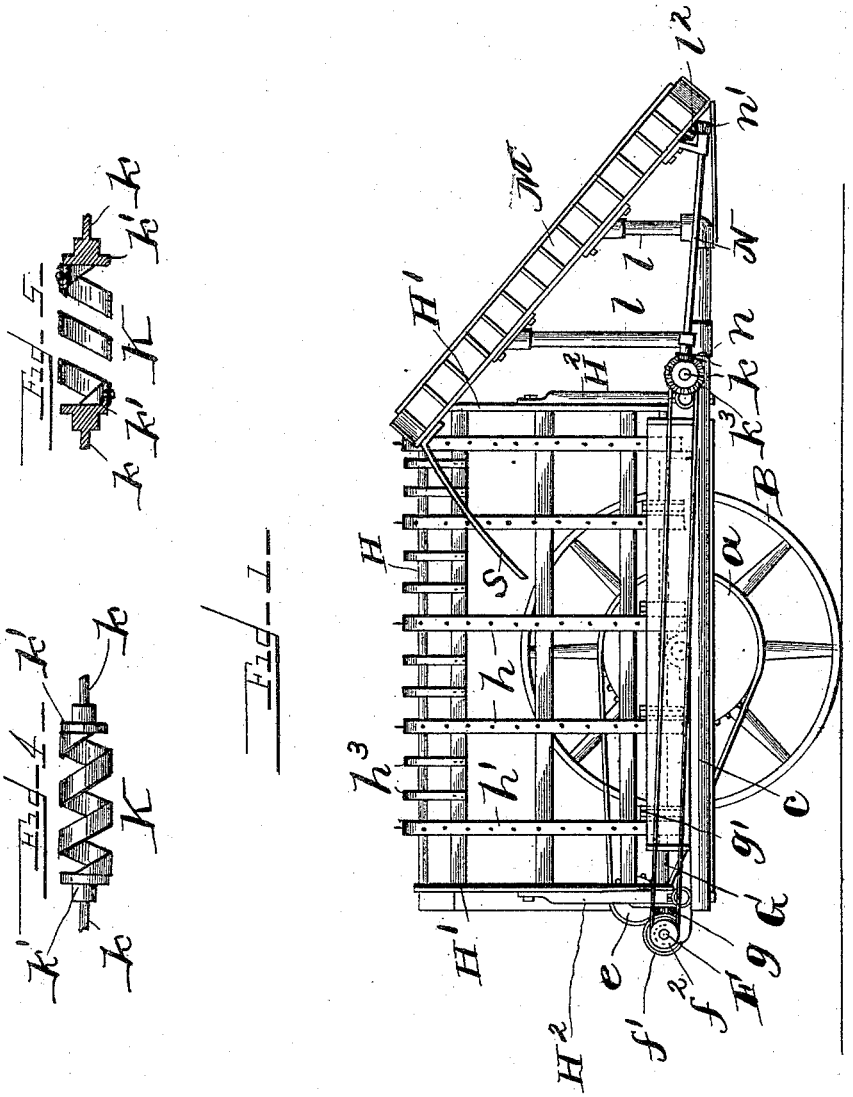
(No Model.) 4 Sheets—Sheet 1.

P. F. HODGES.

CORN HARVESTER.

No. 489,680. Patented Jan. 10, 1893.



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(No Model.) 4 Sheets—Sheet 2.

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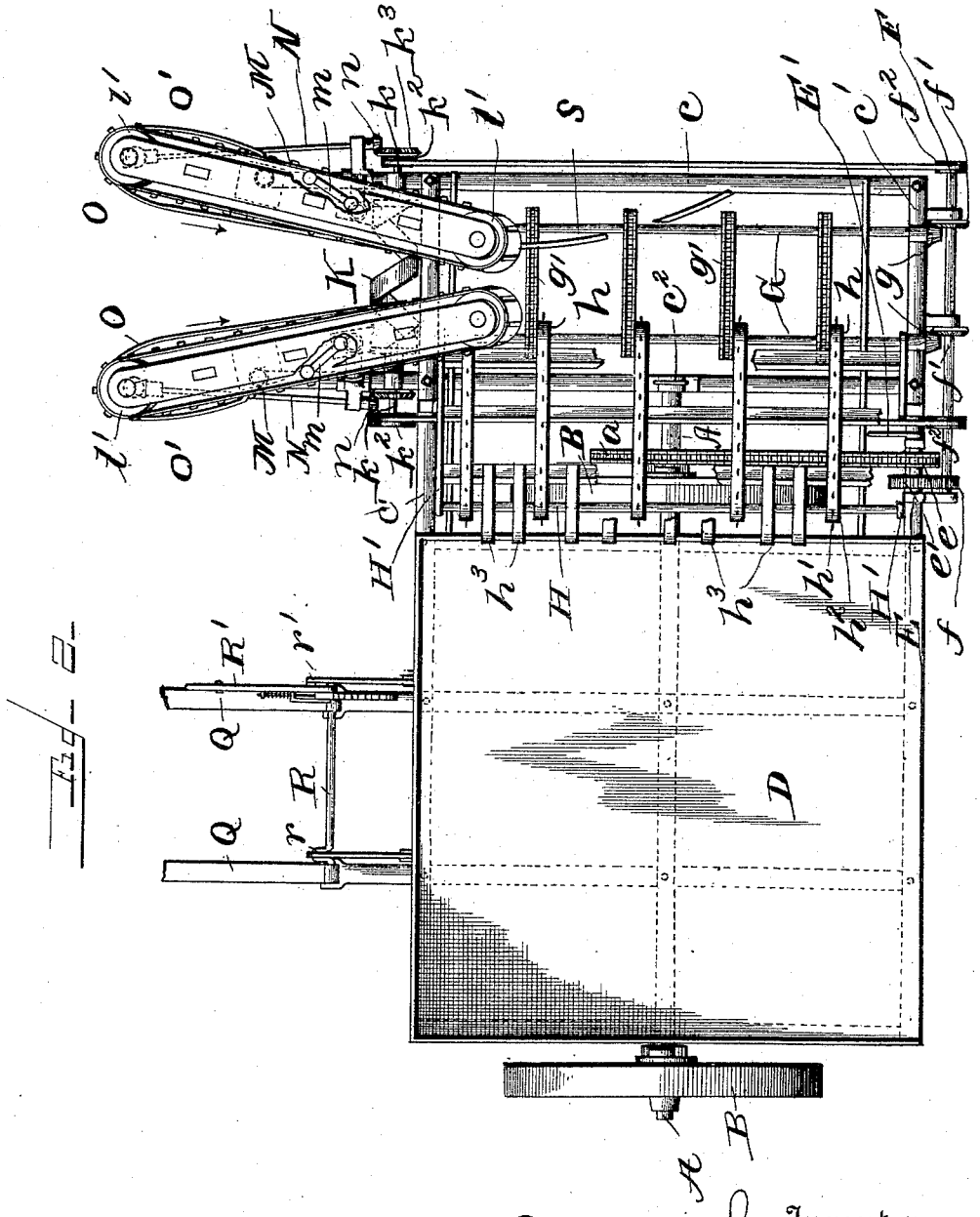

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4 Sheets—Sheet 3.

P. F. HODGES.

CORN HARVESTER.

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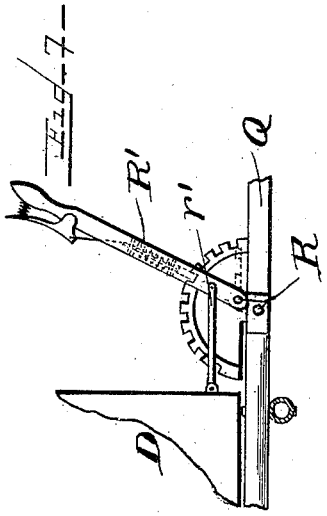

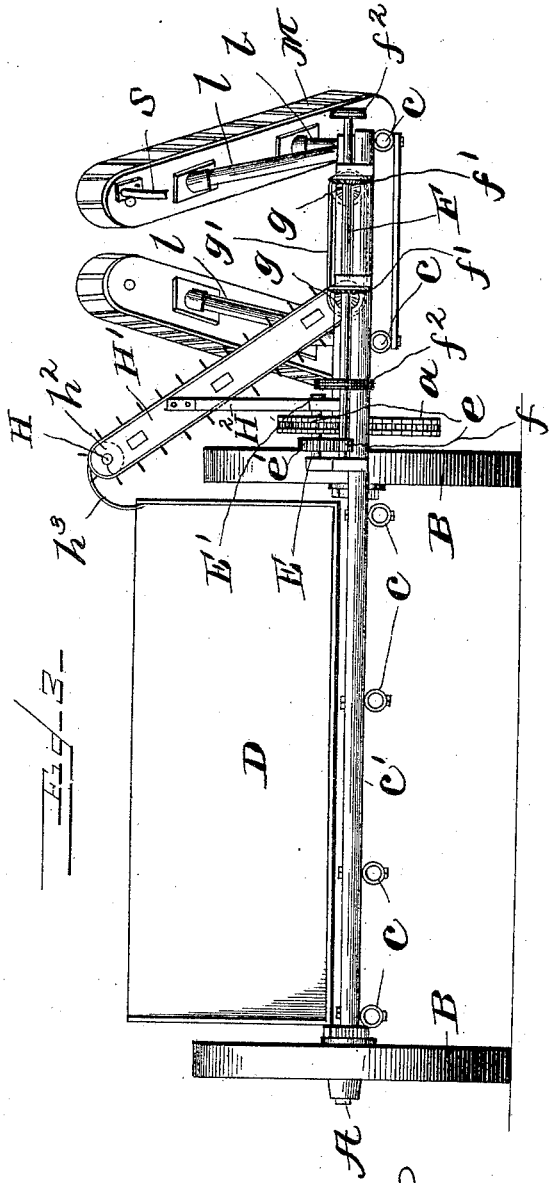

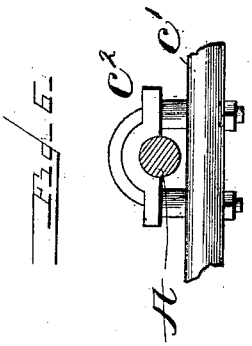

Witnesses.
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(No Model.) 4 Sheets—Sheet 4.

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CORN HARVESTER.

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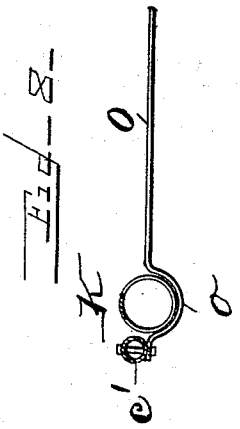

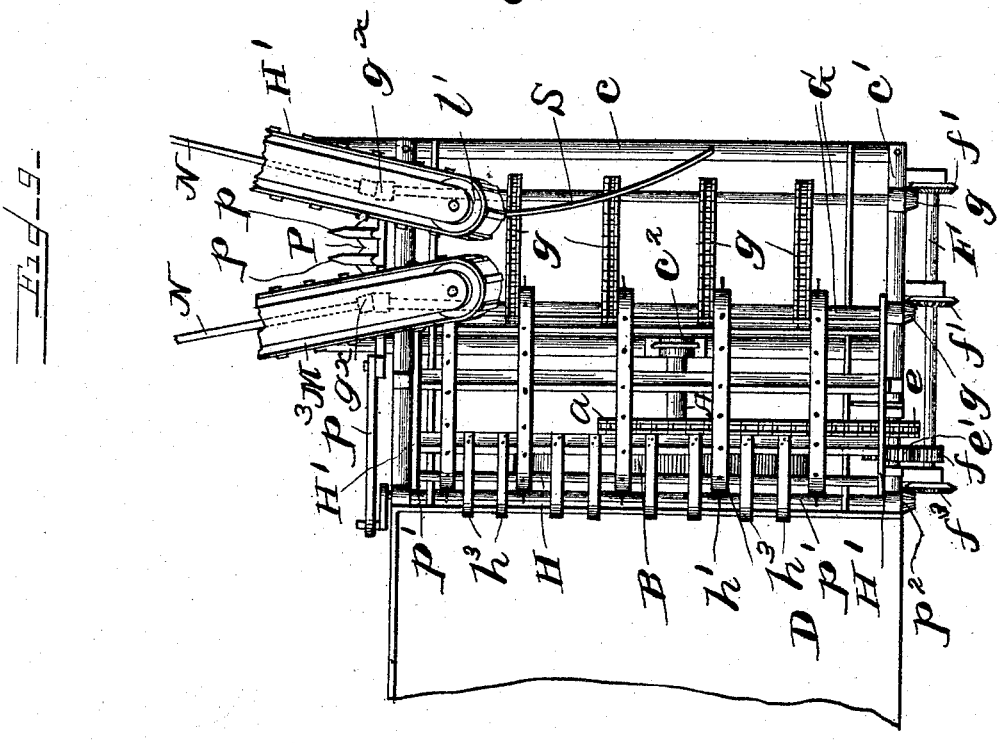

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UNITED STATES PATENT OFFICE.

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CORN-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 489,680, dated January 10, 1893.

Application filed February 4, 1892. Serial No. 420,305. (No model.)

To all whom it may concern:

Be it known that I, PLINY F. HODGES, a citizen of the United States, residing at Goochland Court-House, in the county of Goochland and State of Virginia, have invented certain new and useful Improvements in Corn-Harvesters; 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 is an improvement in corn harvesters and consists in the novel features of construction and combination of parts hereinafter fully described.

In the accompanying drawings I have illustrated one form in which I have contemplated embodying my invention and my said invention is fully disclosed in the following description and claims.

Referring to the said drawings Figure 1 represents a right side elevation of a machine for harvesting corn, embodying my invention. Fig. 2 is a top plan view of the machine. Fig. 3 is a rear elevation of the same. Figs. 4 and 5 are detail views of the spiral rotating cutter. Figs. 6, 7 and 8 are detail views of parts of the mechanism, and Fig. 9 is a partial plan view of the machine showing a reciprocating cutter, embodied therein.

In the accompanying drawings reference being had to the letters marked thereon, A represents the supporting axle or driving shaft of my machine supported by the wheels B B, which are both connected to said axle by means of pawls and ratchets in the usual manner, so that both wheels drive the shaft, when the machine is moving forward and turn freely on the shaft in the opposite direction.

Upon the shaft or axle A is supported the main frame of the machine which consists in this instance of a series of parallel rods or bars *c c* preferably of gas pipe, arranged parallel with the line of draft, and a series of cross bars *c' c'* suitably connected to the bars *c c* so as to form a strong, light and rigid frame.

Upon the main frame between the wheels B B is located the receptacle D which receives the cut corn harvested by the machine. This receptacle or box D is secured to the frame work in any desired manner, and is so located that its central portion will be substantially over the shaft or axle A. The frame work is provided with suitable bearings c^2 which engage the axle A and support the machine, while permitting the shaft or axle to revolve. In Fig. 6 I have shown one of these bearings and the manner in which I prefer to attach the same to the machine frame. The bearing block c^2 engages the axle A and is secured to the frame preferably by a U-shaped bolt which engages the bearing block and has its extremities secured to one of the bars *c* of the frame. By means of the construction described it will be obvious that the entire machine may be tilted upon the axle if desired. I provide mechanism for tilting the machine and for adjusting it to desired positions, which mechanism will be presently described.

To the axle or driving shaft A is secured the driving sprocket *a* which imparts motion to the various operating parts of the machine. Adjacent to the rear of the machine, preferably supported by suitable bearings attached to the rear cross-bar *c'* of the frame is a short shaft E upon which is loosely mounted a sprocket wheel *e*, geared by a chain or other means of transmitting motion, with the driving sprocket wheel *a*. This shaft is also provided with a spur wheel or pinion *e'* mounted to revolve with the sprocket wheel *e*, and this pinion engages a pinion *f* on a counter shaft F which extends along the rear of the frame at one side of the box or body D, and is supported in suitable bearings attached to the rear cross bar *c'*. The bearings which support the short shaft E are eccentric to the said shaft and I provide a hand lever E' for rotating said shaft in its eccentric bearings to throw the spur wheel *e'* into and out of gear with the pinion *f*. This is a well known construction in common use and need not be herein specifically described.

The shaft F is provided with a pair of bevel pinions *f' f'* which engage similar pinions *g g*, on shafts G G which extend longitudinally of the machine and are supported in suitable bearings attached to the main frame. The shafts G G are provided with a laterally mov-

ing carrier or carriers which may consist of a single wide apron, or as shown in the drawings a series of endless chains or carriers g' g' supported upon sprocket wheels g^2 g^2 in the usual manner. I prefer to employ a series of chains as shown. The shaft G which is nearer to the body D is also provided with a series of sprocket wheels h engaged by a series of elevator chains or carriers h' which at their upper extremities pass around wheels h^2 on a shaft H journaled in the upper end of the elevator frame H' which is supported by the braces H^2. These elevator chains h' are provided with teeth or projections in the usual manner to enable them to raise the corn stalks delivered to them. The elevator frame is provided intermediate the chains h' with guards h^3 secured preferably at one end to the elevator frame and at the other end to the side of the box or body. These guards have portions adjacent to the shaft H, curved in the plane of the elevator chains, so that the stalks carried up by the said chains will be delivered to the said guards and thereby conducted into the box or body D.

The cutting mechanism of my corn harvester is secured to the frame work of the machine adjacent to its front edge and near the right hand side of the same as clearly shown in Fig. 2 and I provide a reel which extends forward of the cutting mechanism and is designed to raise bent or fallen stalks and bring them into proper position to be cut.

In Figs. 1, 2, 3, 4 and 5 I have shown my improved cutter or knife which consists primarily of a strip K preferably of steel sharpened on one of its longitudinal edges, and bent or curved into a spiral form, as clearly shown in the detail views Figs. 4 and 5. I prefer to place this strip K upon a mandrel and give it the desired spiral form. The ends of the knife K are then secured in any desired manner to horizontal shafts k k which are journaled in suitable bearings, supported by the frame work, and at such a distance forward of the front cross bar of the machine that the knife will pass by said cross bar without striking.

In the drawings, I have shown the ends of the spiral knife secured to peripheral flanges extending laterally from disks k' k' which are rigidly secured upon the inner ends of shafts k k, so that the two shafts k k are connected together by the knife and virtually form one shaft, which I term the knife shaft. In order to prevent any twisting strain upon the knife I prefer to apply power to both ends of the knife shaft.

In the drawings I have shown the shafts k k each provided with a belt pulley k^2 which pulleys are connected by belts with pulleys f^2 on the counter shaft F at the rear of the machine, the said belts being arranged to clear the frame work of the machine. This arrangement enables me to positively drive both ends of the cutter shaft and at the same time if the knife should meet with an unyielding obstruction the belts would slip and prevent the breaking of the knife. It is obvious that the shafts k k might be made integral and form one continuous shaft if desired. It will be observed that as the knife revolves its action on the stalk is lateral and the direction of the cut is parallel with the axis of rotation.

Two of the bars c of the frame work of the machine adjacent to the right side are extended forward the required distance to support the reel, as shown in Figs. 1 and 2. Each of these extensions is provided with vertically disposed posts l l which support the inclined frame L of one part of the reel. Upon each of these frames L is mounted an endless apron M, preferably provided with slats on its outside, which engage suitable drums or rollers l' l' mounted in bearings secured to the frame L of the reel, and I prefer to provide the frame L with a suitable tightener for engaging the inner side of the apron M and tightening the same as indicated in the drawings at m.

Motion is imparted to the two aprons M M of the reel in any desired or convenient manner. Where I employ the spiral form of cutter shown in Figs. 1, 2, 3, 4 and 5, I prefer to transmit motion to the aprons of the reel from the knife shaft in the following manner, each of the shafts k k is provided with a bevel wheel k^3 which engages a bevel pinion n on a shaft N mounted in bearings supported from the forwardly extending portions of the main frame. The shafts N N extend forward and have their extremities provided with bevel pinions n' n' which engage similar pinions l^2 l^2 secured to the shafts of the forward drums or rollers l' l' of the reel, thereby imparting motion to said drums or rollers and to the aprons M M.

In order to guide the stalks to the knife and to prevent them from becoming entangled with the frame supports, or driving mechanism of the reel, I provide suitable guards O, O which extend from the front ends of the reel frames, along the lines of the inner sides of the same, to the spiral knife K in such a manner as to direct all the stalks to the knife. I also, prefer to give the guards O O a semicircular form at o o as shown in Fig. 8, so that they will pass around the lower side of the knife, following very closely the circle of movement of the cutting edge, and said guides are secured to the frame work of the machine in rear of the knife. By this construction, should any great downward strain be brought to bear upon the knife K, it would engage the curved portions o o of the guards O O and be supported, thus avoiding straining and breaking of the knife and its connected mechanism. I also provide suitable guides O' O' on the outer sides of the reel aprons, as shown to hold the stalks of adjacent rows from being caught in the machine.

I may if I desire employ the well known reciprocating cutter instead of the spiral cut-

ter hereinbefore described, and in Fig. 9 of the drawings I have shown my improved machine embodying the reciprocating cutter. In this form of machine P represents the reciprocating cutter bar and $p\,p$ the guards, of ordinary construction. Motion is imparted to said cutter bar in any desired way. I have shown a longitudinal shaft p' suitably mounted upon the frame work, and driven from the shaft F by means of gears f^3 and p^3 the forward end of said shaft p' being provided with a crank plate connected by pitman p^3 with the cutter bar P in the usual manner. In this form of machine I have shown the shafts N which transmit power to the apron drums or rollers driven from the horizontal conveyer shafts G G. To this end the shafts G G are extended forward the required distance and are coupled to the shafts N N by universal joints $g^\times$.

In Figs. 2 and 7 I have shown one form of mechanism by means of which the machine can be tilted on its supporting axle to dump the contents of the box or body D upon the ground. In these figures the machine is shown provided with two tongues, which would be necessary where three horses are to draw the machine. The tongues Q Q are pivotally connected to the machine or preferably to forwardly extending portions of the bars $c\,c$, by any convenient or suitable means. A horizontal rock shaft R is mounted in bearings which are preferably secured to the tongues directly over their points of pivoting to the frame, and said rock shaft is provided with a crank r. Said rock shaft is also provided with an operating lever R′ for rotating said shaft and one of the tongues is provided with a ratchet segment r^2 adjacent to said lever which is engaged by a pawl connected to the lever so that the lever may be maintained in any desired position to which it may be adjusted. The lever R′ and crank r are connected to some portion of the frame, as the box D by links r'. When it is desired to dump the machine, the lever is seized and drawn rearward, thereby tilting the whole machine on its supporting axle, and dumping the contents of the box or body D upon the ground. It is obvious that any other form of dumping mechanism might be employed as found most convenient or desirable.

The machine will be provided with a driver's seat located and supported in any desired manner.

The operation of my improved corn harvester is as follows:—The machine is drawn through the field, the reel and cutter taking in one row of stalks, the reel raising bent or fallen stalks and presenting them to the cutter in vertical or substantially vertical position. When the spiral cutter is employed, the spiral knife by reason of its peculiar form will present an inclined edge to the stalks and by reason of its forward movement with the advance of the machine and its revolving movement, it will have a laterally drawing movement with respect to the stalks which will enable it to cut the stalks readily and easily, all of the motions imparted to the cutting edge by the machine, and by the knife operating mechanism having a direct effect to assist the knife in severing the stalks, the direction of the cut of the knife being parallel with the axis of rotation. The aprons M M of the reel extend somewhat in rear of the vertical plane of the cutter and continue to feed in the upper portions of the talkss after their lower portions have been severed. The effect of this will be that the stalks after being severed will be carried past a vertical position and thrown down upon the horizontal conveying chains g' and to prevent the stalks from falling off of the right side of the machine, I provide an inclined guide S secured at one end to the frame of the reel. The horizontal conveying chains will carry the stalks laterally and if their butts should not have been entirely disengaged from the knife the spiral construction of said knife will cause it to act as a conveyer and move the butts laterally in the same direction as the travel of the upper portions of the chains g'. The horizontal conveyers carry the stalks laterally into engagement with the elevator which elevates them and deposits them in the box or body D of the machine. The upper surface of the horizontal conveyer will be in a slightly higher plane than the cutter so that as the stalks fall upon said conveyer their butts will be ordinarily lifted above the cutter. The supports for the inclined aprons of the reel are located in advance of the cutter so that there are no obstructions in the path of the stalks as they are moved laterally and they will be carried by the conveyer just as they fall. This enables me to dispense with an auxiliary device for moving the butts of the stalks rearwardly which is commonly employed in corn harvesting machines. I prefer to make the box or body D of the machine of such size that it will hold a large quantity of stalks, and when it becomes filled the machine can be drawn to a "silo" or curing ground, or other suitable place where the machine can be dumped in the manner before described. If it is desired to shock the corn upon the field, the machine can be dumped upon the field whenever the desired quantity has been collected in the receptacle or box D. As before stated however, I prefer to employ this machine to collect a large quantity of stalks and then remove them from the field to any desired place where they can be dumped.

It is obvious that the machine herein shown and described could be arranged to harvest two or more rows of stalks simultaneously by continuing the frame work and its support laterally to the right, and duplicating the cutting apparatus, reel and horizontal conveyer herein shown, for each row to be cut. It will also be seen that the receptacle or box might be dispensed with and the stalk elevator could

then deliver the stalks into a wagon or conveyance drawn along side of the machine.

I do not desire to be limited to the exact details of construction herein shown and described as variations may be made therein without departing from the spirit of my invention.

What I claim and desire to secure by Letters Patent is:—

1. A corn harvester, provided with cutting mechanism consisting solely of a spiral rotating cutter having a forward movement on its under side, substantially as described.

2. A corn harvester provided with cutting mechanism having a forward movement on its under side and consisting solely of a single strip of metal curved spirally in a cylindrical form about its axis of rotation, one edge of said strip being sharpened to form a cutting edge, substantially as described.

3. A corn harvester provided with cutting mechanism consisting solely of a spiral cutter having a forward movement on its under side and means for operating both ends of said cutter positively whereby torsional strain of said cutter is prevented, substantially as described.

4. In a corn harvester the combination with the cylindrical rotary spiral cutter, having a rearward movement on the upper part of its periphery, of a lateral conveyer having its upper portion above the plane of the cutter and having its forward edge near the cutter, and a reel consisting of two aprons extending rearwardly over said conveyer whereby an auxiliary device for moving the butts of the corn backward from the cutters is dispensed with, substantially as described.

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

PLINY F. HODGES.

Witnesses:

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JESSE D. KINGSBERY.