

(No Model.)

8 Sheets—Sheet 1.

D. W. HANSON & J. S. FARNHAM.

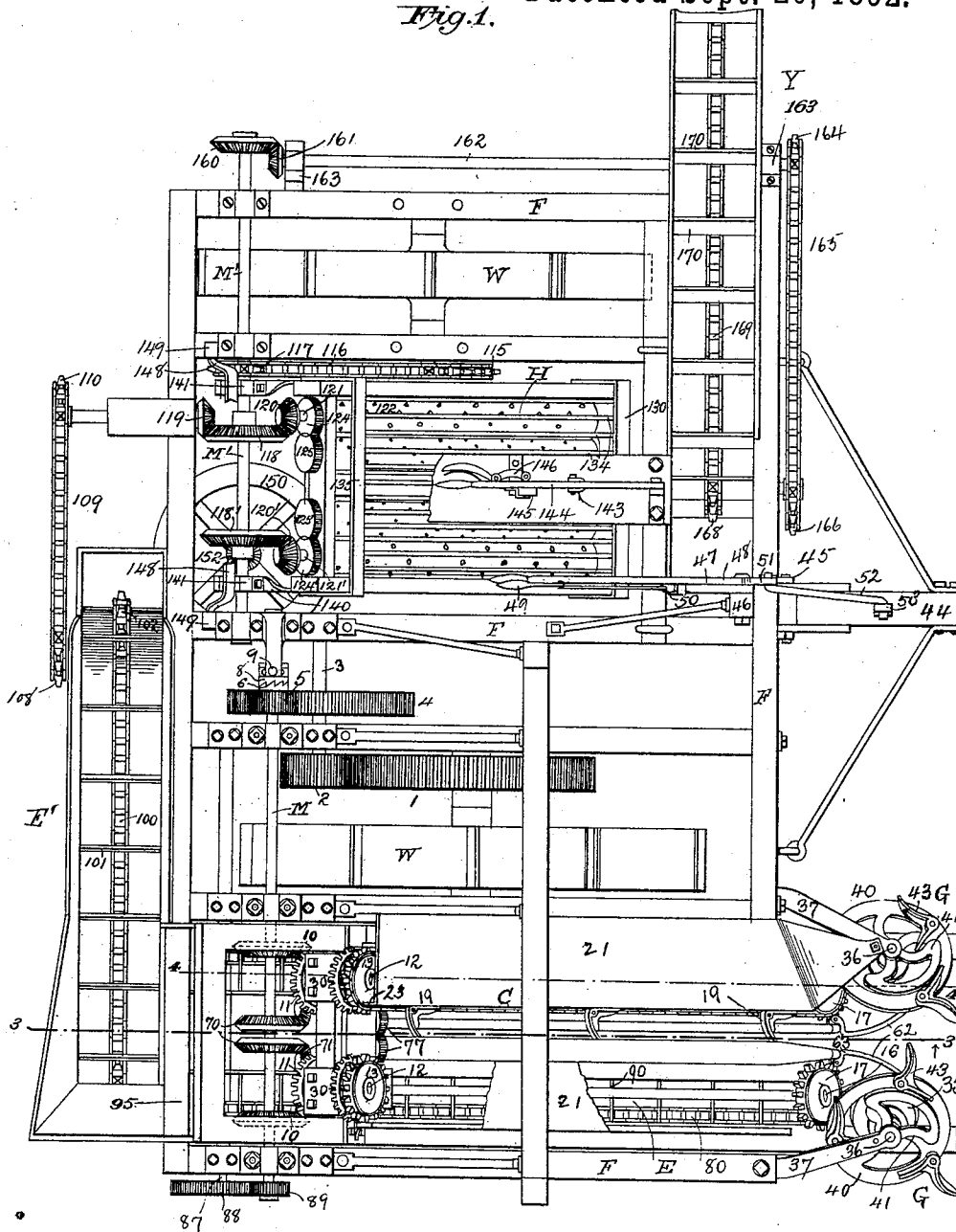
A. M. HANSON, Administratrix of D. W. HANSON, Deceased.

CORN HARVESTER.

No. 482,945.

Patented Sept. 20, 1892.

Fig. 1.



Witnesses

M. Fowler

A. J. Collamer

By their Attorneys,

C. A. Snow & Co.

Inventors

*Daniel W. Hanson and
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(No Model.)

6 Sheets—Sheet 2.

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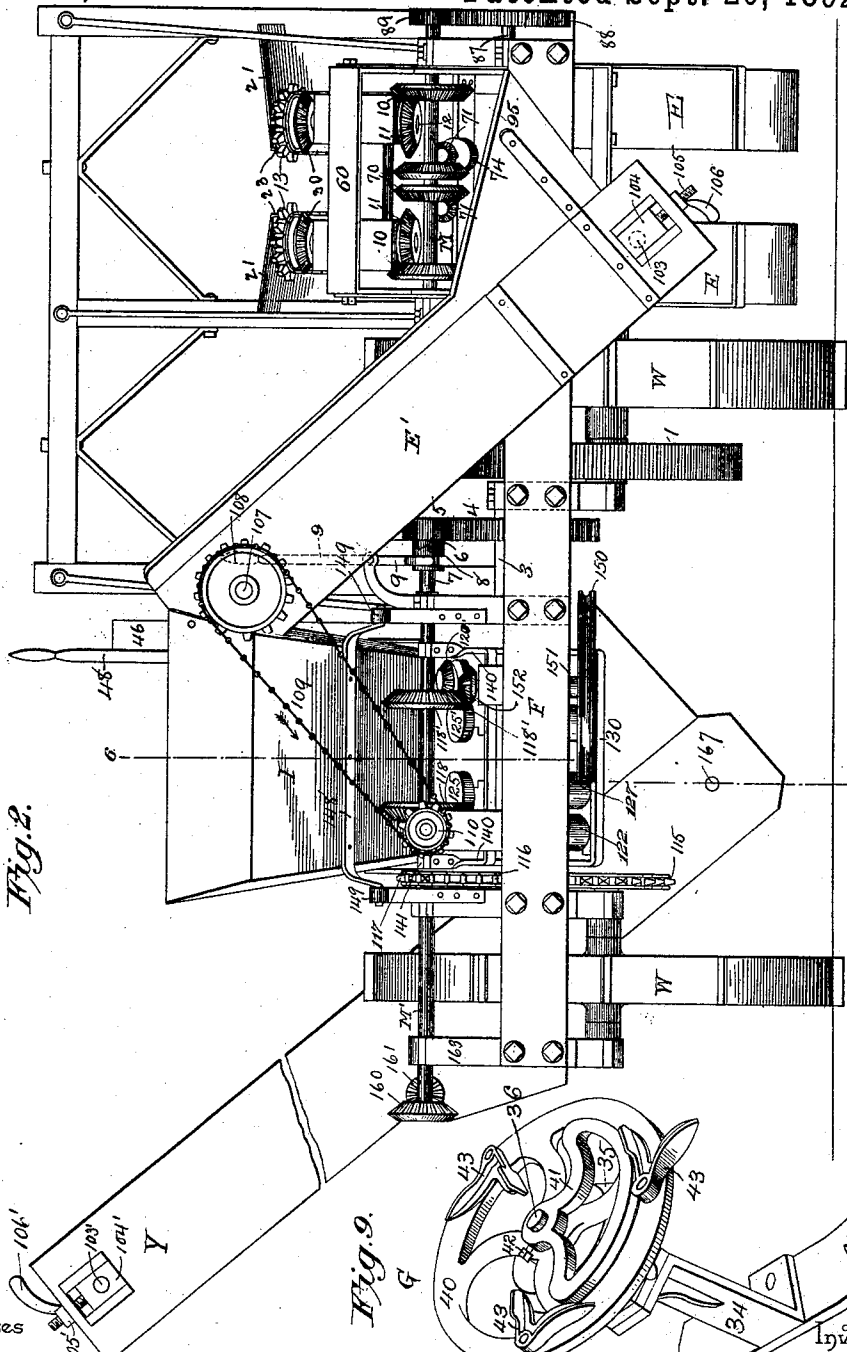


Fig. 2.

Fig. 9.

Witnesses

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6 Sheets—Sheet 3.

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Fig. 3.

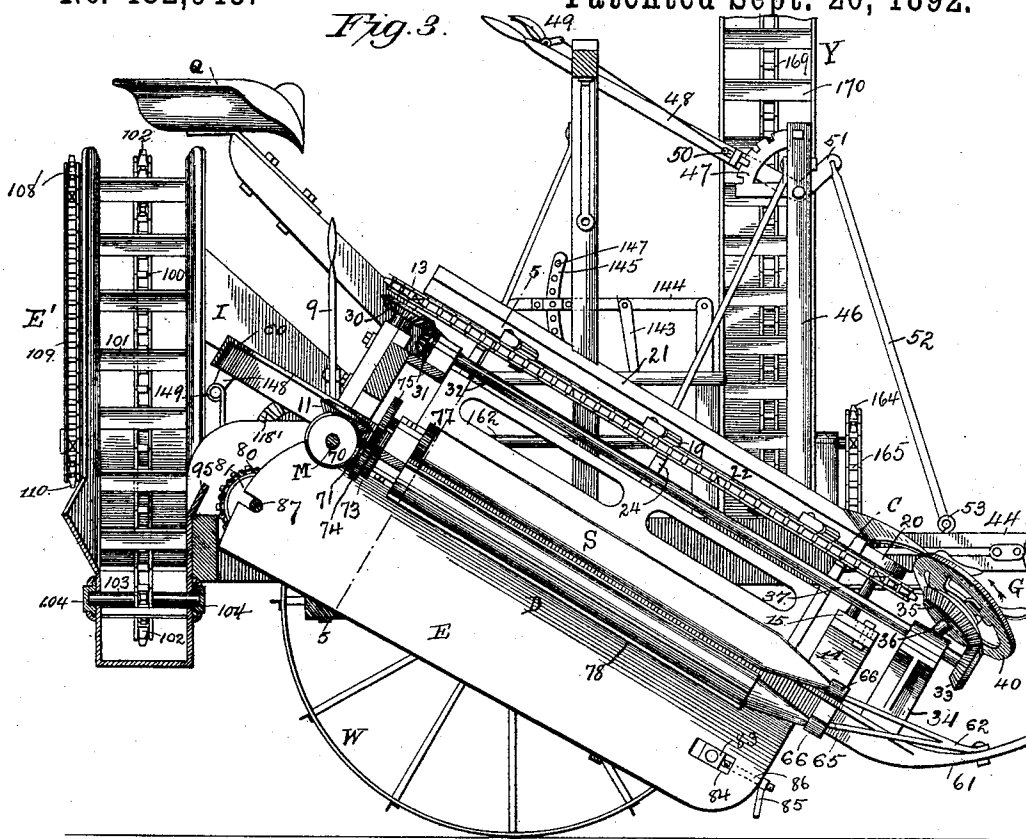
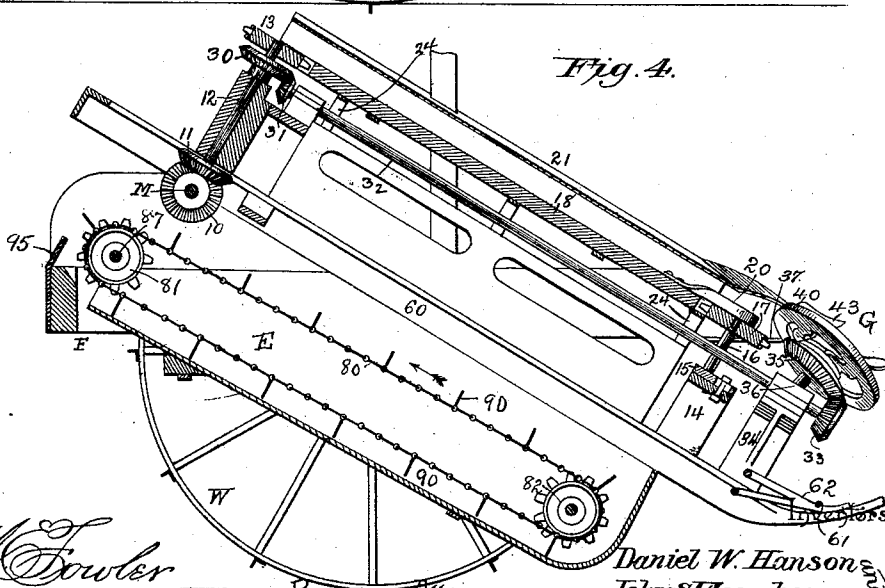


Fig. 4.



Witnesses

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(No Model.)

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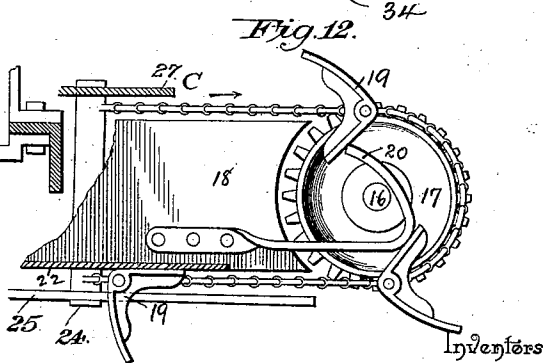
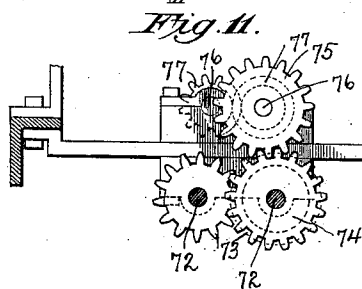
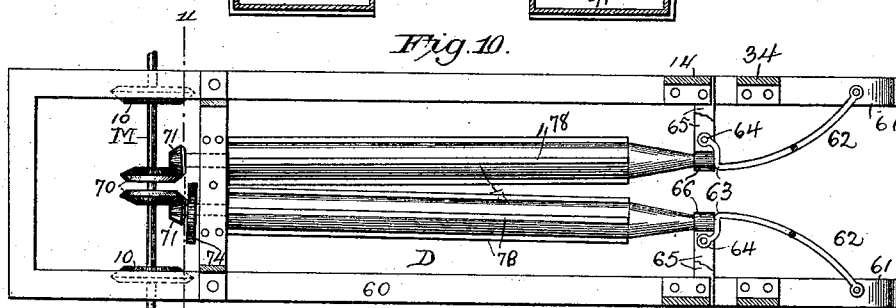
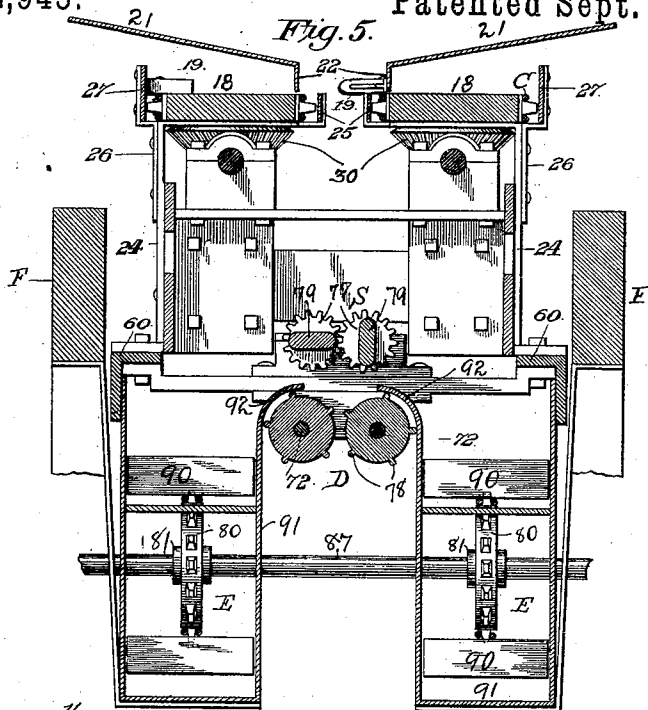
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(No Model.)

6 Sheets—Sheet 5.

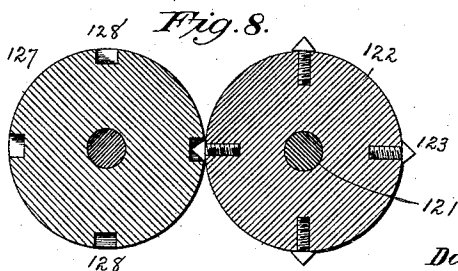
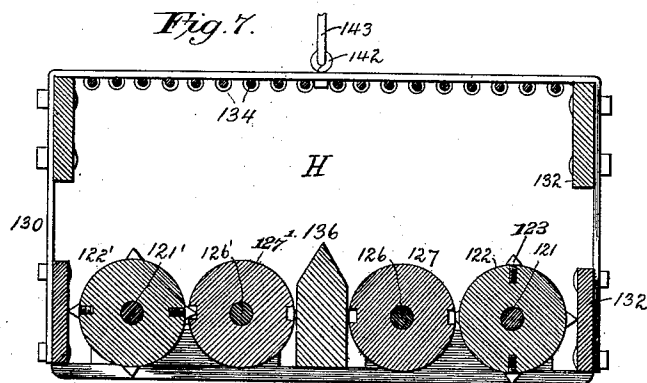
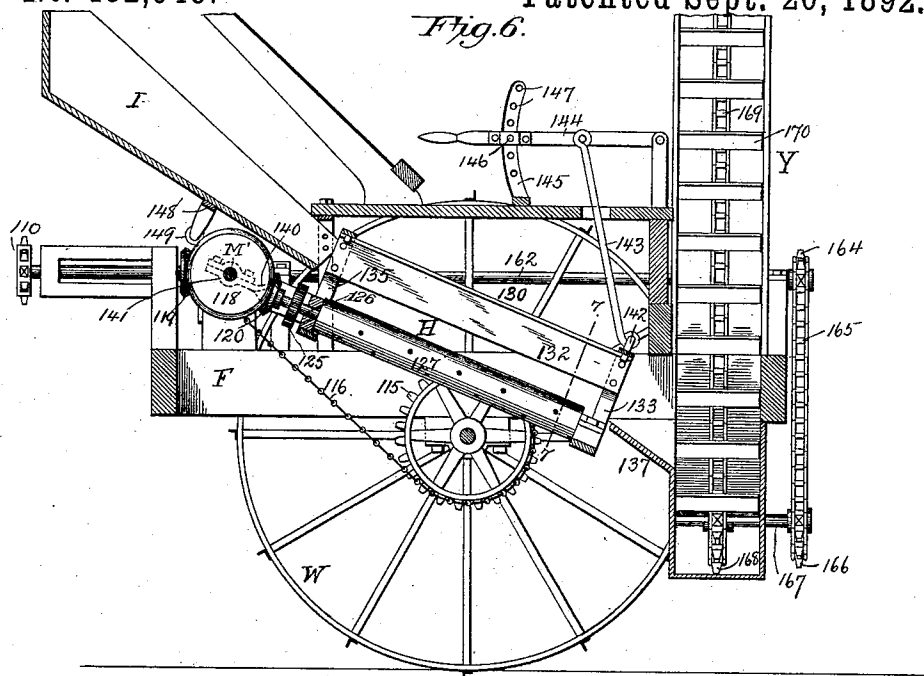
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Witnesses

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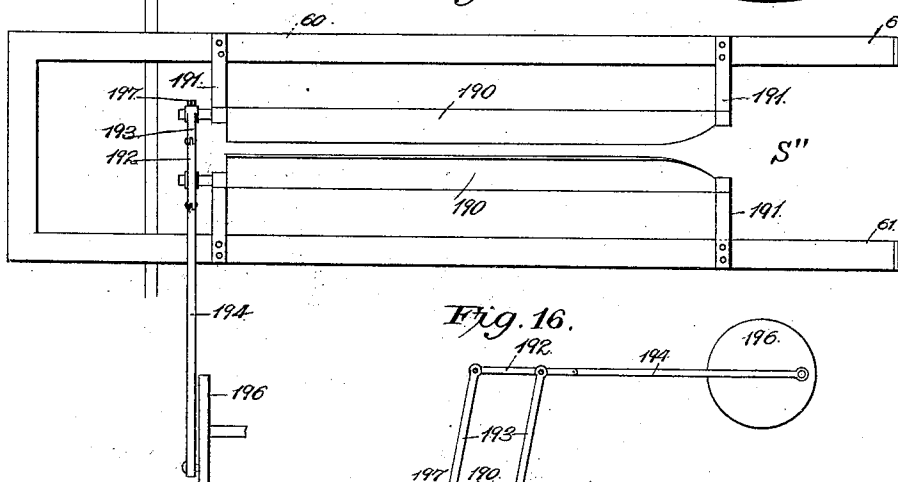
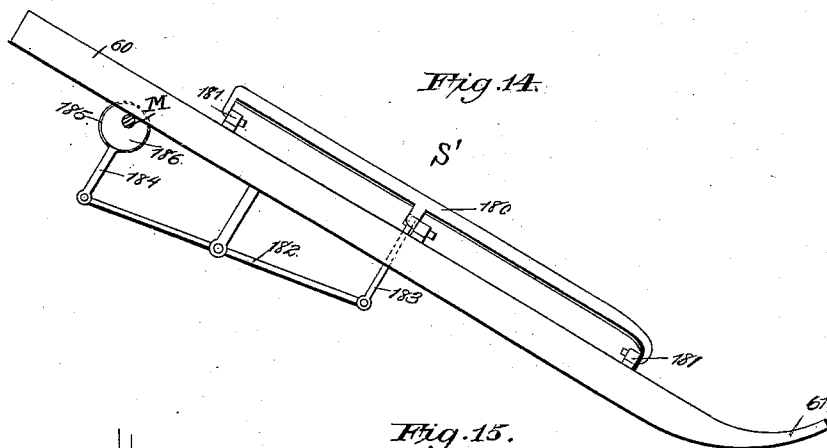
6 Sheets—Sheet 6.

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Witnesses

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UNITED STATES PATENT OFFICE.

DANIEL W. HANSON AND JOHN S. FARNHAM, OF MINERAL, ILLINOIS;
ALICE M. HANSON, ADMINISTRATRIX OF SAID DANIEL W. HANSON,
DECEASED, ASSIGNOR TO SAID FARNHAM.

CORN-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 482,945, dated September 20, 1892.

Application filed April 30, 1891. Serial No. 391,108. (No model.)

To all whom it may concern:

Be it known that we, DANIEL W. HANSON and JOHN S. FARNHAM, citizens of the United States, residing at Mineral, in the county of Bureau and State of Illinois, have invented a new and useful Corn-Harvester, of which the following is a specification.

This invention relates to harvesters, and more especially to that class thereof which are adapted for harvesting corn by drawing the ears from the stalks without pulling the latter from the ground and then husking such ears.

To this end the invention consists in the details of construction hereinafter more fully described and claimed, and as illustrated on the accompanying six sheets of drawings, wherein—

Figure 1 is a plan view of this improved machine, omitting the inclined chute. Fig. 2 is a rear elevation. Figs. 3 and 4 are sections on the lines 3 3 and 4 4 of Fig. 1, the latter figure omitting that portion of the machine shown in the background of Fig. 3. Fig. 5 is a section on the line 5 5 of Fig. 3 and on an enlarged scale. Fig. 6 is a section on the line 6 6 of Fig. 2. Fig. 7 is an enlarged section on the line 7 7 of Fig. 6. Fig. 8 is an enlarged section of one pair of the husking-rollers. Fig. 9 is an enlarged perspective view of one of the gathering-wheels. Fig. 10 is a plan view of the frame containing the drawing-rolls. Fig. 11 is a rear elevation of the gears connecting the drawing-rolls with the snapper-rolls and a section on the line 11 11 of Fig. 10. Fig. 12 is an enlarged plan view of the lower end of one of the stalk-chains. Fig. 13 is a plan view, and Fig. 14 a side elevation, of a modified form of a snapper. Fig. 15 is a plan view of still another form of snapper. Fig. 16 is a rear elevation of the device as illustrated in Fig. 15, showing the means for driving this modified form of snapper.

In the drawings are shown in various views and positions the gatherers G, the stalk-chains C, the drawing-rolls D, the snapper-rolls S, the elevators E, the rear elevator E', the inclined chute I, the husker H, the delivery-elevator Y, and two modified forms of

snappers S' and S'', all mounted on a supporting-framework F, carried by main wheels W, whose rotation also drives the main shafts M M', to which the operating mechanism is connected. These various parts are of the specific construction set forth below or of equivalent constructions adapted to perform the same functions in practically the same manner.

One of the main wheels W carries a gear 1, which intermeshes with a gear 2 on the end of a short shaft 3, journaled in the frame. This shaft carries another gear 4, which intermeshes with a gear 5, whose toothed hub 6 turns loosely on the main shaft M. The latter is provided with a spline 7, which engages a toothed clutch 8, adapted to be moved longitudinally thereon by a hand-lever 9, and by this means the driver, sitting on the seat Q, can move the clutch 8 so as to throw the main shaft M into or out of connection with the driving-wheel to start or to stop the movement of this portion of the machine. The main shaft M is provided outside the right-hand wheel W with bevel-gears 10, which intermesh with bevel-gears 11 on the lower end of forwardly-inclined shafts 12, to whose upper ends are secured sprocket-wheels 13.

To brackets 14 are adjustably bolted blocks 15, from which rise stub-shafts 16, and on the upper ends of the latter are journaled sprocket-wheels 17, which stand adjacent each other at the lower front side of the framework. Around the sprocket-wheels 13 and 17 extend two stalk-chains C, which are driven by the intermeshing gears 10 and 11 above described and which may be tightened by adjusting the blocks 15 on the brackets 14, as best seen in Fig. 4. Inside these endless chains are preferably located boards 18, around whose edges the chains travel, and to the chains are pivoted at intervals L-shaped fingers 19. At the lower end of each board 18 is a cam 20, against which the fingers strike as they move downwardly on the outer side of the chain and by which they are turned, as best seen in Fig. 12, so that as the fingers on the two chains ascend between the boards 18 they will project toward each other and into the slot between but slightly above the plane of the boards.

Above the boards are arranged inclined shields 21, whose inner edges 22 are turned downwardly, so as to form guides or tracks, against which the inner ends of the fingers 19
5 press as they travel upwardly, and the fingers are held thus until they slip off the upper ends 23 of the tracks. 24 are uprights supporting the boards 18, and the inner ends of these uprights are connected in pairs by parallel bars 25, as seen in Fig. 5, to form shields
10 for the chains. Rising from the uprights 24 are brackets 26, whose upper ends are connected by broader guides 27, which also serve as tracks for the fingers on the descending
15 sides of the chains, and by these tracks the fingers are kept folded as they move downwardly.

Upon the shafts 12 are bevel-gears 30, meshing with bevel-gears 31 on shafts 32, journaled
20 in boxes beneath the boards 18. These shafts extend downwardly beyond the front sprocket-wheels 17 and pass through brackets 34, wherein they are journaled. On their front ends they carry bevel-gears 33, which mesh
25 with bevel-gears 35, that are journaled on the upper ends of stub-shafts 36, rising and inclining outwardly and forwardly from said brackets 34, and whose upper ends may be supported by brace-straps 37, projecting from the
30 frame F.

The gatherers G consist of wheels 40, journaled upon these shafts 36 and connected with and rotating by the gears 35, but turning beneath cams 41, which are rigidly though
35 adjustably secured to the upper ends of the shafts 36 by set-screws 42. Upon the upper side of each wheel 40 are pivoted fingers 43, each of which is of nearly the same shape as the L-shaped fingers 19, and which is likewise
40 pivoted at its angle, and as these fingers pass around the cams 41 they are turned, as best seen in Fig. 9, so that one of their arms shall project outwardly. When they pass over the upper ends of the cams, their inner arms drop,
45 owing to the lateral inclination of the wheel 40, and they no longer project beyond the periphery of that wheel. By these gatherers G the stalks of corn are caused to pass into the open front end of the slot between the
50 boards 18 and between the inner edges 22 of the shields 21, and the upwardly-moving fingers 19 of the stalk-chains C then carry the stalks upwardly in this slot at somewhat greater speed than the machine is progressing
55 over the ground, owing to the multiplying-gearing 1 2 and 4 5.

The pole or tongue 44 of the machine is hinged or pivoted, as at 45, to the main frame F, and rising from the latter near this point
60 is an upright 46, carrying a toothed segment 47. Pivoted at the center of the segment is a lever 48, to which is pivoted a pawl-operating lever 49, the pawl 50 engaging the segment, as is usual. The front end of this lever
65 is bent upwardly, as at 51, and a stout rod 52 connects it with an eye 53 in the pole. By this arrangement the adjustment of the

lever 48 adjusts the angle of the main frame F to the pole 44, and hence adjusts the height
70 from the ground at which the gatherers G will grasp the cornstalks.

Beneath the stalk-chains C is a rectangular framework 60, Fig. 10, within which are located the drawing-rolls D and the snapper-rolls S,
75 hereinafter described, and at the front ends of the side bars of this framework are upwardly-curved shoes 61. Bolted to these shoes and extending rearwardly therefrom are Y-shaped guides 62, which have elbows 63 in their bodies and whose rear ends 64 are turned
80 outwardly and bolted to brackets 65, extending inwardly from the side bars of said rectangular framework 60. At the inner ends of these brackets are eyes 66, in which are journaled the lower ends of the shafts of the draw-
85 ing-rolls and the snapper-rolls. By this construction the lower ends of the stalks as the latter are drawn in by the gatherers G are passed between the guides 62, pass over the elbows 63, and are thereby directed between
90 the eyes 66 and between the rolls.

Upon the main shaft M are mounted bevel gear-wheels 70, which intermesh with bevel gear-wheels 71, keyed upon the upper ends of the shafts 72 of the drawing-rolls, and said
95 shafts also have intermeshing gears 73, by which they are caused to rotate simultaneously and in opposite directions. One of these shafts also carries a larger gear 74, intermeshing with a gear 75, keyed upon the shaft or
100 trunnion 76 of one of the snapper-rolls S, and these two rolls are also caused to travel in directions opposite to each other by intermeshing gears 77.

The drawing-rolls D are provided with longitudinal ribs 78 upon their faces, and the
105 snapper-rolls S have oval bodies 79, as best seen in Fig. 5. By this construction as the stalks are caused to pass up the slot between the two chains the drawing-rolls D (which, as will be seen in Fig. 3, are considerably inclined) will draw the stalks downwardly, because they are turning toward each other, and meanwhile the snapper-rolls S, which are turning in the other direction, are picking the
110 ears from the stalks in a manner which will be obvious. The front ends of the rolls D and S are slightly tapered toward the eyes 66 and the rolls diverge slightly, as shown, whereby as the stalks pass therein and pass farther up the rolls will more tightly grasp them. The
115 snapper-rolls are preferably so arranged by the intermeshing of their connecting-gears 77 that their flat bodies 79 will always stand at the same distance from each other, by which means the ears will be neatly nipped from the stalk.
120

Beneath and outside each drawing-roll D is an elevator E, which comprises an endless chain 80, moving over sprocket-wheels 81 and
130 82, the latter of which has its shaft mounted in a block 83, sliding in a slot 84 and adjustable by a hand-nut 85, turning on a screw 86, connected with said block, by which means the

chain may be kept taut. The upper sprocket-wheels 81 are fast on the shaft 87, which at one end has a gear 83, meshing with a gear 89 on the main shaft M. The chain 80 has outwardly-projecting wings 90, so as to move in the casing 91 in the direction of the arrow in Fig. 4, and as the ears are nipped from the stalks by the snapper-rolls S they fall upon outwardly-curved guides 92, whereby they are directed into the elevators E, and by the latter they are carried upwardly and backwardly and dropped over a guide 95 into the rear elevator E', by which they are carried upwardly at the rear of the machine and dropped into the inclined chute I. This elevator E' comprises an endless chain 100, having secured thereto outwardly-projecting wings 101. The chain moves over sprocket-wheels 102, the lowermost one of which has the ends of its shaft 103 mounted in blocks 104, from which projects a screw 105, that extends through the casing, and on this screw is a hand-nut 106, as shown. When this nut is adjusted, the blocks 104 will be moved, and hence the chain 100 may be kept taut. On the shaft 107 of the upper sprocket-wheel 102 is a sprocket-wheel 108 outside the casing, and this is connected by a chain belt 109 with a sprocket-wheel 110 beneath the inclined chute I. Thus it will be seen that motion is transmitted from the left-hand part of the entire machine to drive the elevator E'.

On the left-hand supporting-wheel W is a sprocket-wheel 115, connected by a chain belt 116 with a sprocket-wheel 117, mounted upon the left-hand section M' of the main shaft, and this shaft carries a bevel-gear 118, meshing with a smaller one 119, which is secured upon the shaft of the sprocket-wheel 110, by which means the elevator E' is caused to travel, as above set forth. The gear 118 meshes with a smaller gear 120, which is fast upon the upper end of the shaft 121 of one of the husking-rollers 122, and this roller has sharp-headed screws 123 seated in its face, as best seen in Fig. 8. Upon the shaft 121 is a gear-wheel 124, meshing with another 125 on the shaft 126 of a companion roller 127, the latter having cavities 128 in its face, with which the screws 123 engage. These screws and cavities are arranged spirally around the rollers, as seen in Fig. 1. There is a second set of these devices, such as those bearing numbers 118, 120, 121, 122, 124, 125, 126, and 127, similarly arranged, and to whose reference-numerals we have added a prime-mark, ('), and all four rollers are located within the husking-box 130, (best seen in Fig. 7,) and which box has vertical sides 132, an open lower end 133, and a number of longitudinal parallel wires 134, forming a top. By this construction the ears of corn which pass down the chute I fall into the open upper end 135 of the husking-box 130 and are thrown by the division-board 136 onto one or the other pair of the husking-rollers. If the ears should be shot up within the box, they will strike the wires 134 or the sides 132

and be thereby prevented from getting out of the box; but the screws 123 soon grasp the husks on the ears and drag the latter downwardly, so as to tear them from the cob and from the kernels of corn and drop them on the ground. The cob, with the kernels thereon, then passes downwardly over the rollers, out the lower end 133 of the husker, over the guide 137, and into the delivery-elevator Y. From the upper end of the box 130 lead straps 140, having bearings 141 at their upper ends, embracing the main shaft M'. At the front end of the box is an eye 142, from which rises a rod 143, connecting with a hand-lever 144, which moves over an arc-shaped guide 145 and has a spring-actuated pawl 146, adapted to engage one of a number of holes 147 in said guide 145. By this means the operator, sitting on the seat Q, can move the lever 144 upwardly to elevate the front end of the husker H, and as the box 130 is pivotally mounted by the straps 140 and bearings 141 on the main shaft M' it is obvious that when this box is moved around said shaft in the arc of a circle the gears 120 and 120' will still be kept in mesh with the gears 118 and 118'.

Beneath the inclined chute I is a strap 148, whose ends are mounted in eyes 149, rising from the framework, and which may be otherwise rigidly or detachably supported.

150 is a weighted balance or fly wheel mounted upon a vertical shaft 151, upon the upper end of which is a bevel gear-wheel 152, which intermeshes with the gear 118', and this fly-wheel serves to cause the parts of the husker to rotate steadily and firmly. When the machine is ascending a hill and the husker would thereby be raised from its angle to a position undesirably near a horizontal, so that the husks would not properly travel down the rollers and be treated, the operator can lower the hand-lever 144, as may be necessary to produce the successful operation of this husker.

Upon the main shaft M' is a gear-wheel 160, meshing with another 161, mounted on a shaft 162, which extends forwardly and is journaled in suitable bearings 163. At the front end of this shaft is a sprocket-wheel 164, connected by a chain belt 165 with another sprocket-wheel 166, mounted upon a shaft 167, which extends into the elevator-box Y and carries the lower sprocket-wheel 168 therein. From this sprocket-wheel an endless chain 169, having wings 170, passes upwardly over the upper sprocket-wheel in a manner which will be readily understood. The shaft 103' of this upper sprocket-wheel is journaled in sliding bearings 104', to which is connected a screw 105', extending through the upper end of the casing, and on this screw is mounted a hand-nut 106', as shown in Fig. 2. By this means the chain 169 may be tightened in substantially the same manner as above described for tightening the chain 100 in the rear elevator E' or for tightening the chain 80 in the elevator E.

In Fig. 13 is shown in plan, and in Fig. 14 in side elevation, a modified form of snapper which we sometimes use. This comprises open wings or doors 180, hinged at their outer edges at 181 to the rectangular framework 60, and the doors are of such width that their adjacent edges will never quite come in contact. 182 is a rock-lever, (of which it will be understood there are two, one for each door,) and the front end of this lever is connected by a link 183 with its door, while its rear end is connected by a link 184 with a circular band 185, that surrounds an eccentric wheel 186, which is mounted upon the main shaft M or upon any other suitable shaft. In Figs. 15 and 16 the doors 190 are similarly hinged or mounted in bearings 191, and upon the shafts of these doors are mounted arms 193, adjustable by means of set-screws 197. The upper ends of these arms are pivotally connected to a rod 192, and the latter connects by a pitman 194 with a crank-wheel 196, driven by or from the main or any other suitable shaft. The eccentric wheels 186 in one case and the arms 193 in the other case are so set that the doors will have a slight swinging motion in opposite directions, and this will effect the snapping of the ears of corn from the stalks in a manner similar to the action of the drawing-rolls D. Snappers of this character may be used instead of the rotating snapper-rolls D above described without departing from the spirit of our invention, and these swinging doors possess the possible advantage that they may be readily adjusted.

A team being hitched to the tongue 44 and the lever 48 being adjusted to bring the shoes 61 and the gatherers G sufficiently near the ground, the horses are driven forward and the machine properly guided to cause the shoes 61 to pass to either side of a row of corn-stalks. The fingers 43 of the gatherers reach out and draw in whatever stalks may be slightly out of the row or may not be upright, and the fingers 19 of the stalk-chains C pass all the stalks upwardly between the boards 18. At the same time the bodies of the stalks pass between the downwardly-rotating drawing-rolls D and the upwardly-turning snapper-rolls S, and as the stalks are drawn downwardly the ears are snapped or nipped upwardly from the stalks, the latter passing beneath the shaft 87 and resuming an upright position and without being drawn from the ground while the ears drop from the snapper-rolls over the guides 92 onto the belts 80 of the elevators E and by the wings 90 are carried upwardly and dropped over the guide 95. Thence the ears fall into the rear elevator E', upon whose apron or belt they are carried upwardly and dropped into the inclined chute I. In the latter they slide downwardly into the husker H, by whose rollers their husks are torn off and dropped upon the ground, while the husked ears pass out the lower end 133 of the husker, over the guide 137, and into the

delivery-elevator Y. The upper end of the latter, Fig. 2, is quite high, and, if desired, a wagon may be driven along at the side of the harvester, so that the delivery-elevator will drop the ears into the wagon. Thus it will be seen that the gathering devices are located outside the right-hand supporting-wheel W and slightly forward of the same, where they automatically gather up the stalks before the latter fall under the wheel. The strippers or snappers pull the ears off the same, and the husked ears are delivered into the wagon or onto the ground. The lever 9 may be operated to disengage the clutch members 6 and 8, and thereby to stop the motion of the devices at the right of the frame. The lever 48 is serviceable for adjusting the angle of the frame to the ground, and thereby stripping the stalks near their upper ends only or throughout their entire lengths, as may be desired, and the lever 144 is, as above stated, for the purpose of keeping the rollers of the husker at a proper angle to cause them to operate successfully.

Considerable change may be made in the details of construction without departing from the spirit of our invention, and much of the specific structure of the parts is illustrated on the drawings, but not elaborately described here, because it is believed that it will be obvious to any person skilled in the art.

What is claimed as new is—

1. In a corn-harvester, the combination, with drawing-rolls and snapper-rolls located within a rectangular frame, brackets projecting inwardly from said frame, eyes at the inner ends of said brackets in which the shafts of the rolls are journaled, and means for rotating the rolls, of guides 62, connected to shoes at the front ends of said frame and curving rearward and inwardly, their bodies being bifurcated and having elbows 63 standing forward of each eye and their rear ends 64 extending outwardly from the elbows and being secured to said brackets, substantially as described.

2. In a corn-harvester, the combination, with a rectangular frame, of drawing-rolls journaled therein and diverging toward their front ends, means for turning said rolls toward each other, snapper-rolls journaled in the frame above the drawing-rolls, and means for turning them in the opposite direction, the front ends of all said rolls being tapered, substantially as described.

3. In a corn-harvester, the combination, with a rectangular framework, a pair of inwardly-turning drawing-rolls journaled therein and having longitudinal ribs on their faces, and guides covering the said rolls, of a pair of outwardly-turning snapper-rolls located above the drawing-rolls and comprising flat bodies 79 and intermeshing gears 77, connecting said bodies, substantially as and in the manner set forth.

4. In a corn-harvester, the combination, with the inwardly-turning drawing-rolls having ribs on their faces and diverging toward their

front ends, the guides leading to their front ends, the curved guides 92, partially covering said rolls, and the elevators E outside said curved guides, of the snapper-rolls S, located 5 above and turning in opposite directions to said drawing-rolls, and intermeshing gears 74 75 between one of each pair of rolls, substantially as described.

5. In a corn-harvester, the combination, with 10 a board 18, rotating sprocket-wheels at the extremities thereof, a guide 27 adjacent one side of said board and rising above the same, and a shield 21 above the board, having a depending edge 22, of an endless chain moving 15 around said board and sprocket-wheels and L-shaped fingers pivoted at their angles to the upper sides of certain links of said chain, substantially as described.

6. In a corn-harvester, the combination, with 20 a board 18, rotating sprocket-wheels at the extremities thereof, a shield 25 near the inner edge of said board, and an inclined shield 21 above the board and having a depending edge 22, of an endless chain moving around said 25 board and sprocket-wheels and inside said shield and L-shaped fingers 19, pivoted at their angles to the upper sides of certain links of the chain, substantially as described.

7. In a corn-harvester, the combination, with 30 a pair of gatherers, a pair of rearwardly-moving chains, and means for moving said gatherers and chains in unison, of a pair of forwardly-inclined drawing-rolls rotating toward each other at greater speed than the machine 35 progresses forwardly, a pair of oppositely-rotating snapper-rolls above said drawing-rolls and connected therewith by gearing, and elevators into which said snapper-rolls deliver, substantially as described.

40 8. In a corn-harvester, the combination, with a frame mounted on supporting-wheels, rotating gatherers, rearwardly-moving stalk-chains, drawing-rolls and snapper-rolls beneath said chains, elevators beneath said rolls, 45 and gearing from one of said driving-wheels for driving all of said mechanisms, of a rear elevator into which said other elevators deliver, a husker, and connections from the other supporting-wheel for driving said rear elevator 50 and husker, substantially as described.

9. In a corn-harvester, the combination, with the rearwardly-moving stalk-chains, the shields 21, covering the same, the frame F, supporting the whole, and the straps 37, pro-

jecting from said frame, of brackets 34, forwardly and outwardly inclined shafts 36, carried by said brackets and their upper ends being connected to said straps, gathering-wheels journaled on said shafts and carrying gear-wheels beneath them, and connections 60 between said gear-wheels and the chain-driving shafts, substantially as described.

10. In a corn-harvester, the combination, with a main shaft M', driven from a supporting-wheel, a gear 118 on said shaft, an elevator E', driven through connections leading to 65 an intermeshing gear 119 at one side of said gear 118, and at the other side thereof an intermeshing gear 120, driving a pair of husking-rollers, of the gathering and stripping devices driven from the other supporting-wheel 70 and delivering into said elevator, as and for the purpose set forth.

11. In a corn-harvester, the combination, with a main shaft M', driven from a supporting-wheel, main gears 118 and 118' on said 75 shaft, two pairs of husking-rollers driven by intermeshing gears 120 and 120' at one side of said main gears, an elevator E', driven by connections leading to a bevel-gear at the 80 other side of the main gear 118, a bevel-gear 152, intermeshing with the other main gear 118', and a balance-wheel 150, mounted on the shaft of this bevel-gear, of the gathering and stripping devices driven from the other 85 supporting-wheel and delivering into said elevator, as and for the purpose set forth.

12. In a corn-harvester, the combination, with the gathering and stripping devices and an elevator leading therefrom, of a husker 90 comprising a box 130, having longitudinal wires 134 in its upper side, inwardly-turning husking-rollers within said box, one of which has headed screws and the other cavities in its face, receiving said screws, the elevator delivering into the upper end of said box, and a delivery-elevator leading from the lower end 95 thereof, as and for the purpose hereinbefore set forth.

In testimony that we claim the foregoing as 100 our own we have hereto affixed our signatures in presence of two witnesses.

DANIEL W. HANSON.
JOHN S. FARNHAM.

Witnesses:

J. F. RUFT,
H. W. BOOTH.