

Dec. 25, 1923.

C. DUEKER

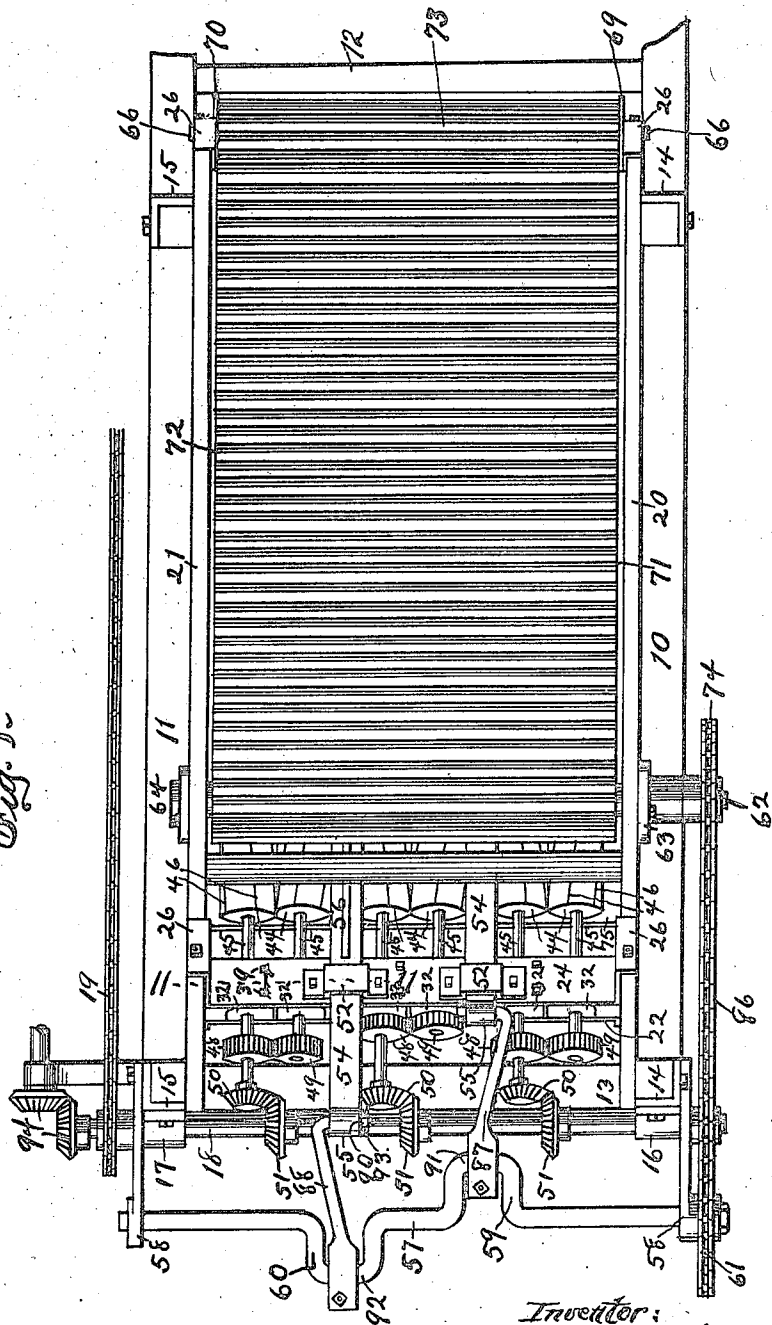
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HUSKING MECHANISM FOR CORN HARVESTING MACHINES

Filed May 11, 1920

5 Sheets-Sheet 1

Fig. 1.



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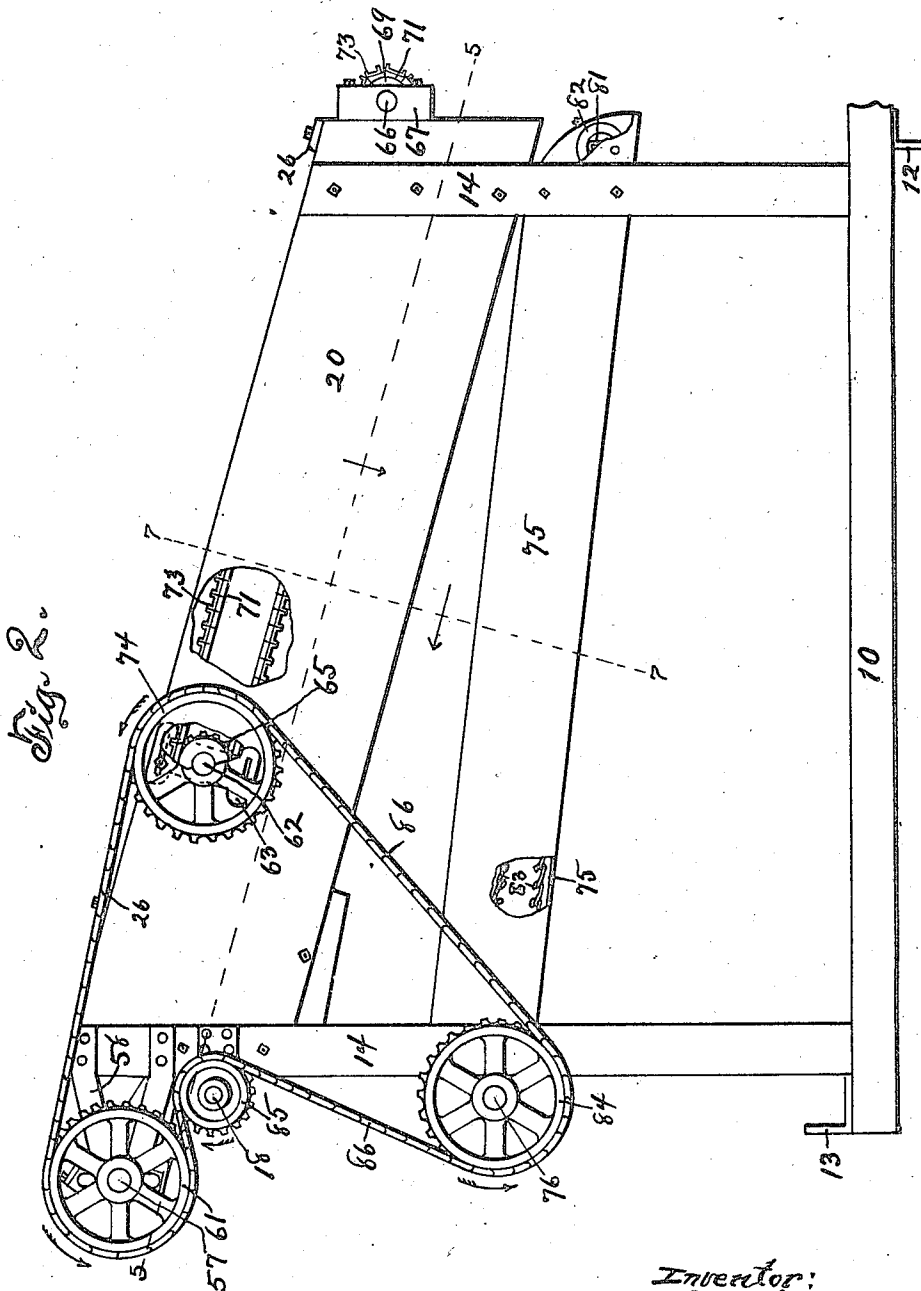
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5 Sheets-Sheet 2



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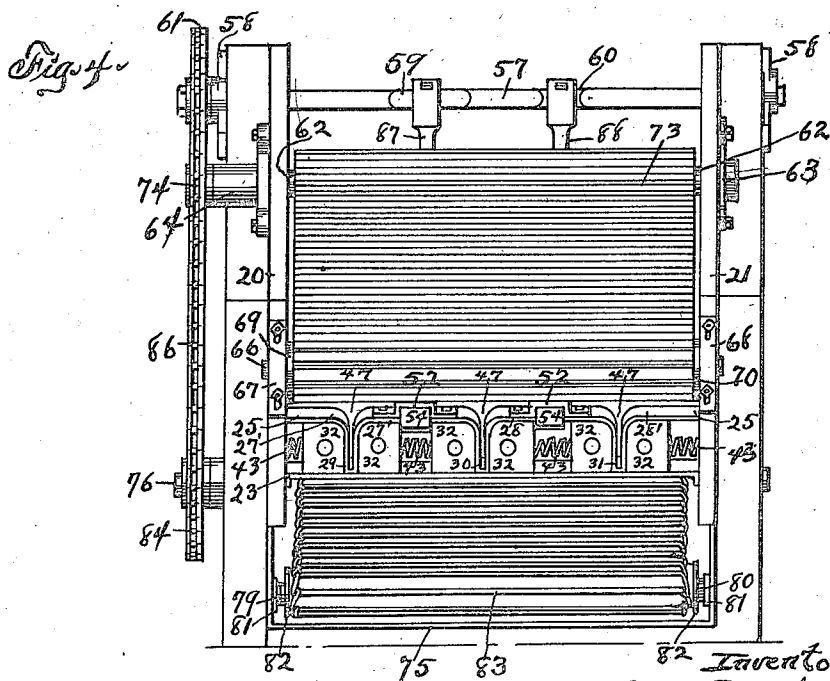
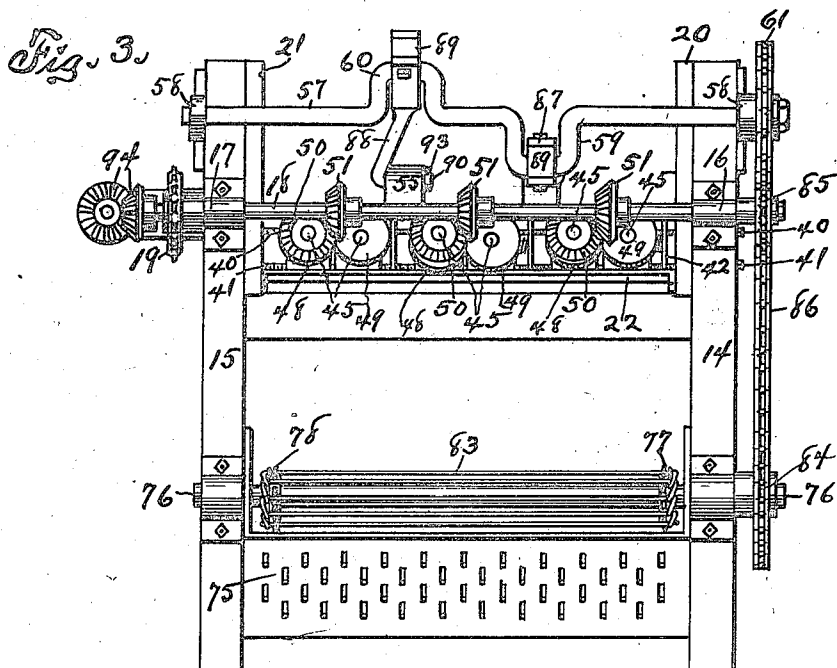
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5 Sheets-Sheet 3



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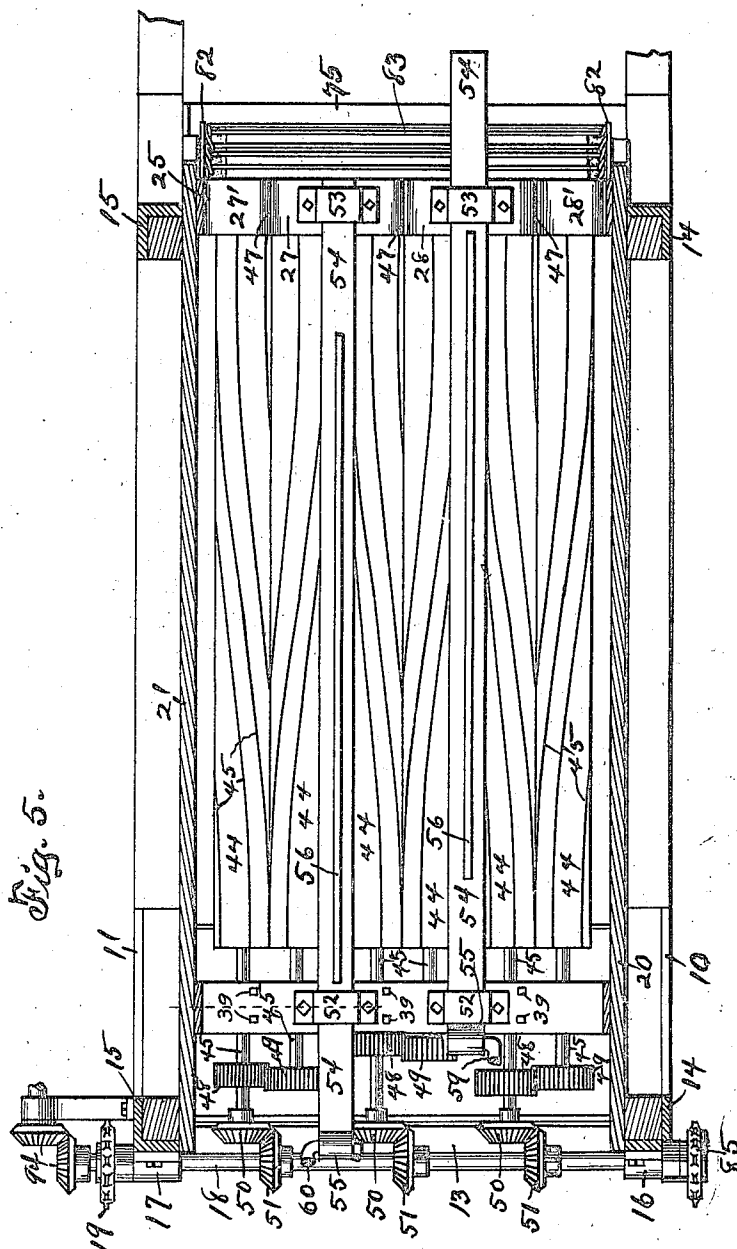
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HUSKING MECHANISM FOR CORN HARVESTING MACHINES

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5 Sheets-Sheet 4



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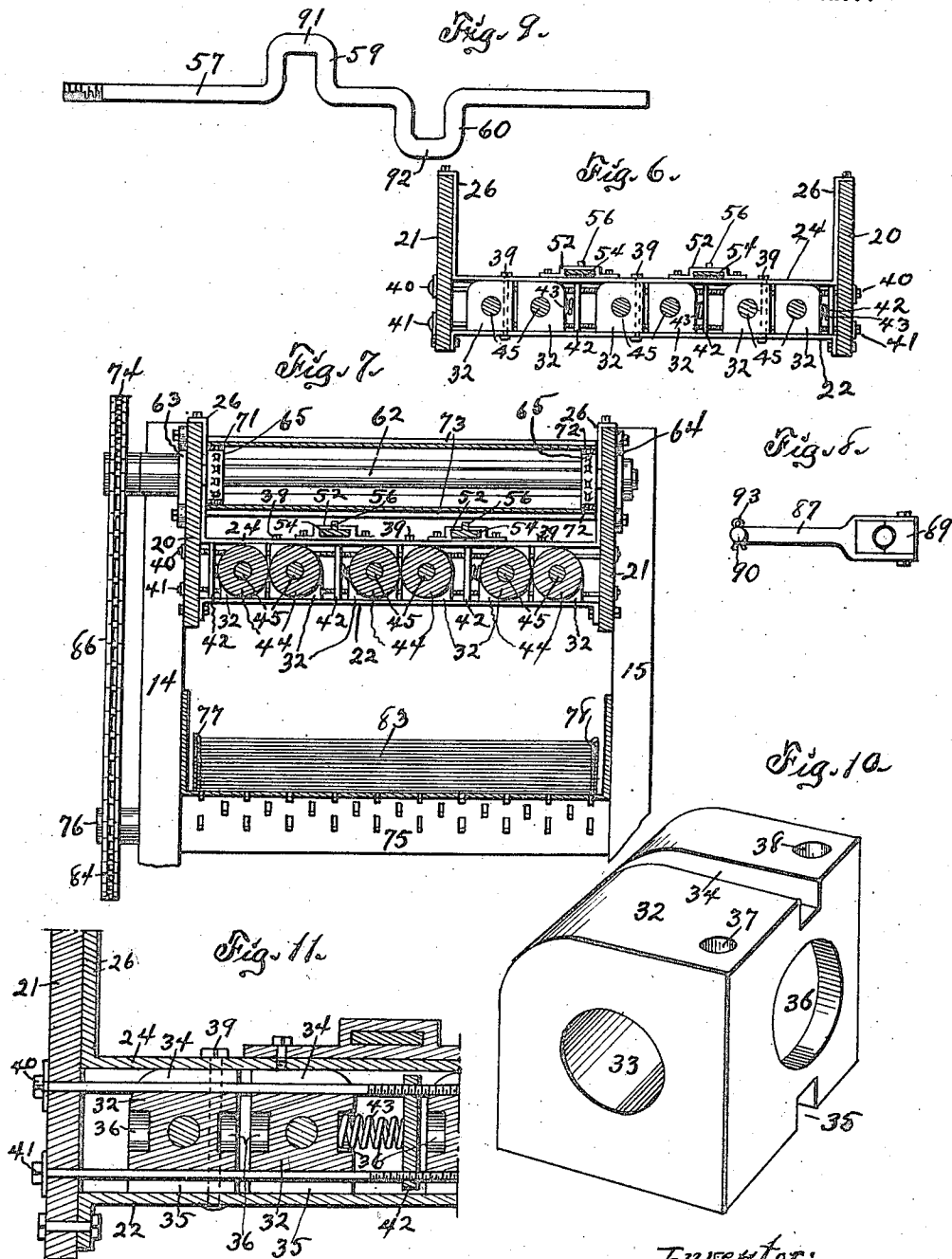
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HUSKING MECHANISM FOR CORN HARVESTING MACHINES

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5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE.

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HUSKING MECHANISM FOR CORN-HARVESTING MACHINES.

Application filed May 11, 1920. Serial No. 380,544.

To all whom it may concern:

Be it known that I, CARL DUEKER, a citizen of the United States of America, and resident of Cooper Township, Webster County, Iowa, have invented a new and useful Husking Mechanism for Corn-Harvesting Machines, of which the following is a specification.

The object of this invention is to provide an improved construction for husking mechanism.

A further object of this invention is to provide improved means for supporting and spacing husking rollers.

A further object of this invention is to provide improved means for cushioning one of each pair of husking rollers relative to the other.

A further object of this invention is to provide improved means for receiving and conveying waste products, such as husks, silk and stems, from the husking rollers.

A further object of this invention is to provide improved means for receiving waste products such as husks, silk and stems and shelled corn from the husking rollers and conveying the waste products in one direction and the shelled corn to the point of delivery of ear corn from said husking rollers.

A further object of this invention is to provide improved means for agitating, positioning and conveying ears of corn on and relative to husking rollers, before, during and following the operation of husking said ears.

A further object of this invention is to provide improved means for agitating and positioning ears of corn on and relative to husking rollers, before, during and following the operation of husking said ears.

A further object of this invention is to provide an improved construction for an interchangeable bearing adapted for use on either end of any husking roller.

My invention consists in the construction, arrangement and combination of elements hereinafter set forth, pointed out in my claims and illustrated by the accompanying drawing, in which—

Figure 1 is a plan, Figure 2 is a side elevation, Figure 3 a rear elevation and Figure 4 a front elevation of a husking mechanism embodying my improvements. Figure 5 is a plan of the husking roller assembly and bearings therefor, parts of the frame being removed, on the line 5—5 of Figure 2. Figure 6 is a cross-section on the indicated line 6—6 of Figure 1. Figure 7 is a cross-section on the indicated line 7—7 of Figure 2. Figure 8 is a detail elevation of a pitman. Figure 9 is a detail view of a crank shaft. Figure 10 is a perspective of a journal bearing. Figure 11 is a cross-section, on an enlarged scale, on the indicated line 11—11 of Figure 1.

In the construction and mounting of the mechanism as shown the numerals 10, 11 designate longitudinal beams and 12, 13 cross-bars of the frame of a land vehicle, such as is described in my companion application filed March 25, 1920, and serially numbered 368,705. Angle-iron standards 14, 15 are fixed to and rise from rear end portions of the beams 10, 11 and carry journal bearings 16, 17, in which a counter-drive shaft 18 is mounted. The shaft 18 is adapted to be driven by sprocket gearing 19 from a main shaft suitably located and, in turn, driven by traction or other power of or on the land vehicle. Wooden frame members 20, 21 are arranged parallel with each other and spaced apart and are supported at their rear ends on the standards 14, 15.

The members 20, 21 are inclined forwardly and are suitably supported at their front ends. Truss-bars 22, 23, having downturned end portions, extend from one to the other of members 20, 21 and are bolted thereto adjacent the ends and lower margins thereof. Hanger-bars 24, 25 are formed with angle-hooks 26 on their ends which overhang and are bolted to the upper margins of the members 20, 21 and overlie and are spaced from the truss-bars 22, 23. The body portions of the truss-bars 22, 23 and the hanger-bar 24 are straight; but the body of the hanger-bar 25 is formed with arches 27, 27', 28, 28' end to end, thus providing looped legs 29, 30, 31 adapted to rest on the truss-bar 23. A plurality of journal bearings 32, two for each husking roller, are mounted in the spaces between the truss-bars and hanger-bars, in this instance six in each space. Each bearing 32 (Figure 10) is substantially cubical with one edge rounded off, and is formed with a horizontal hole 33 adapted to receive and journal a shaft, grooves 34, 35 in its top and bottom, respectively, at right angles to the hole 33, end recesses 36 between and having a common axis parallel with the grooves; and bolt holes 37, 38 on opposite sides of the grooves.

and at one side of the hole 33 and at right angles to the axis of said hole. A suitable number of bearings 32 are mounted in pairs (Figure 6) between the truss-bar 22 and hanger-bar 24. One bearing 32 of each pair is fixed by bolts 39 mounted through holes in the bars 22, 24 and the holes 37, 38. The other bearing 32 of each pair is arranged with its plane vertical face adjacent to the like face of the first-named bearing. Guide and adjusting rods 40, 41 are arranged parallel with each other between the bars 22, 24, are pivoted in the frame members 20, 21, are threaded between said members, and extend loosely within the grooves 34, 35 respectively across the bearings 32. Bar washers 42, in this instance three in number, are threaded on the rods 40, 41 and extend across the adjacent face of bearings 32; expansive springs 43 being interposed between said bearings and washers, seated in recesses 36 and tending to press the loose bearing to the fixed bearing of each pair. The tension of the springs 43 may be adjusted by manual rotation of the rods 40, 41 by a wrench applied to the heads of said rods, thus traveling the bar washers relative to the fixed bearings. Other bearings 32 are mounted between the bars 23, 25 in positions reversed relative to the mounting above described, the bearings in each pair being arranged with their rounded faces adjacent each other and close to or in contact with the rounded ends of the arches 27, 27', 28, 28'. All of these bearings are relatively loose, those at the sides, within the arches 27', 28' being backed by springs 43 engaging the angle-hooks 26 and seating in recesses 36 in the plane faces of said bearings; the bearings within the arches 27, 28 being arranged with their plane faces adjacent and separated by springs 43 having their ends in recesses 36 in said plane faces. Husking rollers 44, in this instance six in number, are mounted rigidly on shafts 45 of like number, and said shafts are journaled in the holes 33 of the bearings 32. The husking rollers 44 are arranged in pairs revolving involutely, are slightly inclined, have their lower (forward) ends adjacent the bars 23, 25 and their upper (rear) ends spaced from the bars 22, 24 and the bearings between said bars and preferably are formed of wooden cylinders having spiral grooves in their peripheries and metal fins 46 seated in and projecting substantially one-half their depth from said grooves. Each roller 44 is formed, preferably, with five spiral grooves, and a like number of fins 46, each groove and fin extending from end to end of a roller and comprising substantially one-half the circumference thereof, thus providing spirals of very steep pitch. The spiral grooves and fins are arranged oppositely on the rollers of each pair. Each fin is relatively thin and broad and has its width disposed radially of its roller. It is the function of the fins 46, extending from end to end of the rollers 44 and arranged in steep spiral relation compassing (each) substantially one-half the circumference of a roller, to engage husks and silks on snapped ears of corn and draw said husks and silks from the ears and between the rollers. The continuous and spiral arrangement of the fins has an advantage over intermittently-located pegs in that the fins may engage husks on an ear at any point within the length of the fins and maintain that engagement until all the husks are removed. The fins, also, do not penetrate and remove kernels of corn from the ears. The depressions or troughs formed by and between rollers in each pair register with depressions 47 between the arches 27, 27', 28, 28', so that husked ears of corn may pass freely longitudinally of and from said rollers. End portions of the shafts 45, at the rear of the upper (rear) bearings 32, are connected in pairs by intermeshing gears 48, 49 for conjunctive rotation of each pair of rollers 44. Each shaft 45 (which is journaled in a fixed bearing 32) is provided on its rear end with a bevel gear 50 meshing with and driven by a bevel gear 51 on the counter-drive shaft 18, the arrangement being such as to drive the rollers of each pair involutely. Slide seats or bearings 52, 53 are mounted rigidly on the hanger-bars 24, 25, over the spaces between pairs of bearings 32, and register in pairs longitudinally of the roller bed. Agitators 54 are mounted for rectilinear reciprocation in the slide seats or bearings 52, 53, one agitator for each pair of slide seats, and extend longitudinally of and above the spaces between pairs of the husking rollers 44, and each agitator is formed with a journal eye 55 at one end and a fin 56 on and rising from its median line between and spaced from the slide seats. A crank shaft 57 is journaled in suitable bearings 58 on the posts 14, above and projecting rearwardly from the bearings 15, and is formed with cranks 59, 60 connected by pitmen to the journal eyes 55 on the agitators. The crank shaft 57 carries a sprocket wheel 61, hereinafter referred to, whereby it is driven. A shaft 62 extends loosely through holes in the frame members 20, 21, crosses above the rear end of the roller bed and is journaled at its ends in bearings 63, 64 fixed to said members, and sprocket wheels 65 are carried on said shaft between said members. A shaft 66 is journaled at its ends in bearings 67, 68 mounted for vertical adjustment on the forward (lower) ends of the frame members 20, 21 and smooth flanged wheels 69, 70 are carried by said shaft between said frame members. Sprocket chains 71, 72 are

mounted on the sprockets 65 and ride loosely on the flanged wheels 69, 70, and said chains are connected transversely by channel bars 73 extending across the bed of husking rollers. The chains 71, 72 and channel bars 73 may sag to and ride at times on the fins 56 of the agitators. The shaft 62 carries a sprocket wheel 74, hereinafter referred to, whereby it is driven. It is the function of the agitators to direct the ears (husked or unhusked) into and longitudinally of the troughs formed by and within the pairs of rollers. It is the function of the conveyor, formed by the chains 71, 72 and channel bars 73, to assist the agitators in placing the ears longitudinally of the rollers, and to feed said ears along the rollers during and following the husking operations. A pan or trough 75, of perforated sheet metal concaved slightly in cross-section, is mounted on the posts 14, is inclined from rear to front, beneath the husking bed, and is adapted to receive shelled corn from the husking rollers and deliver it forwardly to and beneath the point of delivery of the husked ears. A shaft 76 is journaled in suitable bearings on the posts 14 beneath and parallel with the shaft 61 and sprocket wheels 77, 78 are mounted rigidly on said shaft 76 in the rear end portion of the pan 75. Stub shafts 79, 80 are journaled in suitable bearings 81 adjustably mounted on the forward ends of the sides of the pan 75, and flanged rollers 82 are fixed to the inner ends of said shafts and have their flanges adjacent the bearings. An endless carrier 83 is mounted on and driven by the sprocket wheels 77, 78 and runs loosely around the flanged rollers 82, within the pan, the lower portion of said carrier traveling forwardly adjacent to or in contact with the perforated bottom of said pan and tending to drag shelled corn forwardly therein to a point of delivery, the dust and dirt falling through the holes in the pan. The upper portion of the carrier 83 travels rearwardly and receives husks, silks, stems and the like from the husking bed and delivers them at the rear of the machine. The carrier 83 is formed of inter-engaging wire slats formed with lateral hooked arms on their ends; and may be slackened and disconnected or tightened manually by adjustment of the bearings 81. A sprocket wheel 84 is fixed to one end of and drives the shaft 76. A sprocket wheel 85 is fixed to one end of the counter-drive shaft 18. The sprocket wheels 61, 74, 84 and 85 lie in the same plane, at one side of the machine frame and are connected by a sprocket chain 86 in such manner that the wheel 85 drives the other wheels in turn as indicated by the arrows in Figure 2. The pitmen above referred to are designated my numerals 87,

88 in Figures 3 and 4 and one of them is shown in detail in Figure 8. It is formed of a forked stem or body portion having a divided wooden bearing 89 removably and replaceably mounted in its fork and a lateral arm 90. The bearing 89 is adapted to embrace and pivot on the journals 91, 92 of the cranks 59, 60. The stems of the pitman are inclined to the axis of the crank shaft 57 and the arms 90 pass through and pivot in the eyes 55 of the agitators 54, thus operatively connecting the cranks to the agitators. The arms 90 may be secured to the pitmen by cotter pins or keys 93. Suitable gear connections 94 are provided to connect the counter-drive shaft 18 to and drive suitable elevating mechanism (not shown) adapted to receive snapped corn from snapping mechanism and deliver it on the upper rear portion of the husking bed.

I claim as my invention—

1. A husking mechanism for corn harvesting machines, comprising a husking bed mounted in an inclined plane and composed of a plurality of husking rollers arranged in pairs, non-toothed agitator bars mounted above the spaces between pairs of said rollers and arranged for rectilinear reciprocation and an endless conveyor superposed in close relation to the agitators and extending substantially the length of said husking bed, said conveyor also being adapted to travel with its lower portion sliding on said agitators and to cooperate with said agitators in moving ears of corn longitudinally of said husking bed.

2. A husking mechanism for corn harvesting machines, comprising a husking bed mounted in an inclined plane and composed of a plurality of husking rollers arranged in pairs, agitators mounted above the spaces between pairs of said rollers and arranged for rectilinear reciprocation and adapted to direct ears of corn into paths parallel with the rollers and a conveyor adapted to engage snapped corn on the husking bed, and move the same in said paths, said conveyor also being adapted to co-operate with said agitators, said agitators being formed with longitudinal fins cooperating with said conveyor.

3. In a husking mechanism for corn-harvesters, the combination with a husking bed of a stationary inclined pan located beneath said bed and an endless conveyor separate from and mounted between said bed and pan, said conveyor being adapted to carry some substances on its upper portion in one direction above the pan and also adapted to drag other substances by its lower portion in the opposite direction in contact with said pan.

4. In a husking mechanism for corn-harvesters, the combination with a husking bed

of an inclined perforated pan located beneath said bed and an endless conveyor of slatted form mounted between said bed and pan, said conveyor being adapted to carry some substances in one direction above the pan and also adapted to release some substances to the pan and also adapted to drag some substances in the opposite direction within the pan, the perforations in the pan permitting some of the substances to fall away from the pan.

5. In a husking mechanism for corn-harvesting machines, the combination with a husking bed mounted in inclined position and adapted to discharge husked ears of corn at its lower end, of a perforated pan located beneath said bed and inclined in the same direction therewith, and an endless slatted conveyor wholly interposed between said bed and pan, the upper portion of said conveyor operating to move substances in one direction and the lower portion of said conveyor operating to drag shelled corn in the opposite direction within the pan and discharge the same coincident with the discharge of ear corn.

6. In a husking mechanism for corn-harvesters, the combination with a husking bed of a plurality of agitators superposed relative to said bed, slide bearings supporting said agitators, each agitator being formed with an eye on one end, a crank-shaft arranged transversely of the husking bed, pitmen pivoted at one end to said crank-shaft and pivoted at the other end to the eyes on the agitators, each pitman being inclined laterally between its ends and having one end portion bent laterally, forming an acute angle with the body and serving as a pivot for the eye, and means for driving the crank-shaft and husking bed in unison.

7. In a husking mechanism, having a crank shaft, the combination of an agitator formed with an eye on one end and a pitman formed with a fork at one end having a divided wooden bearing removably and replaceably mounted in the fork and adapted to journal on a pin of the crank-shaft, the stem of the pitman being inclined to the axis of the crank-shaft, said stem being formed with an arm at an acute angle to the body and adapted to journal in said eye, the eye and pin being parallel and directly opposed, and means for retaining the arm in the eye.

8. In a husking mechanism, having spaced supports, a truss-bar connecting said supports, a hanger-bar superposed relative to, spaced from and substantially parallel with said hanger-bar and connecting said supports, the combination with a series of interchangeable bearing members mounted between said truss and hanger bars and arranged in pairs, each of said bearing members being formed with a journal seat adapt-

ed to support one end of a husking roller, one bearing of each pair being fixed to the truss and hanger bars, the other member of each pair being movable, adjusting rods mounted transversely of and connecting said supports, each bearing member being formed with grooves in opposite faces, at right angles to the journal seat therein, adapted to receive said adjusting rods, bar-washers threaded on said adjusting rods and arranged adjacent the movable bearing members, and expansive coil springs interposed between the bar-washers and the movable bearing members, said bearing members being formed with recesses in opposite faces, between and in a plane parallel with said grooves, adapted to receive end portions of said springs, of a series of husking rollers journaled in said bearings.

9. In a husking mechanism for corn-harvesters, spaced supports, spaced bars connecting said supports, one of which bars is substantially straight and the other is formed with arches, a series of journal-bearings mounted in the arches of one bar and resting on the other bar, expansive springs interposed between end bearings of the series and said supports and other expansive springs interposed between and acting on intermediate bearings of the series.

10. In a husking mechanism for corn-harvesters, spaced supports, pairs of spaced bars connecting said supports, a series of journal-bearings mounted within one pair of said bars and arranged in pairs, one bearing of each pair being fixed to the bars and the other bearing of each pair being adjustable and spring pressed toward the fixed bearing, one bar of the other pair being formed with arches, another series of journal-bearings mounted within said arches and between the bars of said other pair, springs interposed between said supports and end bearings of the latter series and other springs interposed between intermediate bearings of the latter series, said springs tending to hold the bearings of the latter series in contact with sides of the arches, and husking rollers journaled in said bearings and extending substantially through the space between said pairs of bars.

11. In a machine of the class described, a pair of bars spaced apart, spaced supports therefor, bearings mounted in pairs between said bars, one bearing of each pair being fixed to the bars, adjusting rods extending through said bearings and supports loosely, bar washers threaded on said rods, expansive springs interposed between said bar washers and the loose bearings, another pair of bars connecting said supports and parallel with and spaced from the first pair of bars, one bar of the latter pair being formed with arches, another series of journal bearings mounted within said arches and be-

tween the latter bars, springs interposed between the supports and end bearings of the latter series, other springs interposed between intermediate bearings of the latter series, said springs tending to hold the bearings of the latter series in contact with sides of the arches, all of said bearings being interchangeably usable, together with husking rollers journaled in said bearings and means for rotating the same.

12. In a husking mechanism for corn-harvesters, spaced supports, spaced pairs of bars connecting said supports, said bars being spaced apart in the pairs, a series of journal bearings mounted within one pair of said bars and arranged in pairs, one bearing of each pair being fixed to the bars and the other bearing of each pair being adjustable and spring-pressed toward the fixed bearing, one bar of the other pair being formed with arches, another series of journal bearings mounted within said arches and between the bars of said other pair, springs interposed between said supports and end bearings of the latter series, other springs interposed between intermediate bearings of the latter series, said springs tending to hold the bearings of the latter series in contact with sides of the arches, and husking rollers journaled in said bearings and arranged in pairs conforming to the pairs of bearings first mentioned herein

at one end, the rollers of each pair cooperating at the other end with selected bearings in separate arches, whereby the sides or legs of the arches intersect the respective pairs of rollers.

13. In a husking mechanism for corn-harvesters, spaced supports, spaced pairs of bars connecting said supports, said bars being spaced apart in the pairs, a series of journal bearings mounted within one pair of said bars and arranged in pairs, one bearing of each pair being fixed to the bars and the other bearing of each pair being adjustable and spring-pressed toward the fixed bearing, one bar of the other pair being formed with arches, another series of journal bearings mounted within said arches and between the bars of said other pair, springs interposed between said supports and end bearings of the latter series, other springs interposed between intermediate bearings of the latter series, said springs tending to hold the bearings of the latter series in contact with sides of the arches, and husking rollers journaled in said bearings and arranged in pairs conforming to the pairs of bearings first mentioned herein, all of the bearings being interchangeably usable.

Signed at Fort Dodge, in the county of Webster and State of Iowa, this 30th day of April, 1920.

CARL DUEKER.