

No. 782,522.

PATENTED FEB. 14, 1905.

F. B. PIERCE.  
CORN HARVESTER.

APPLICATION FILED MAR. 9, 1904.

4 SHEETS—SHEET 1.

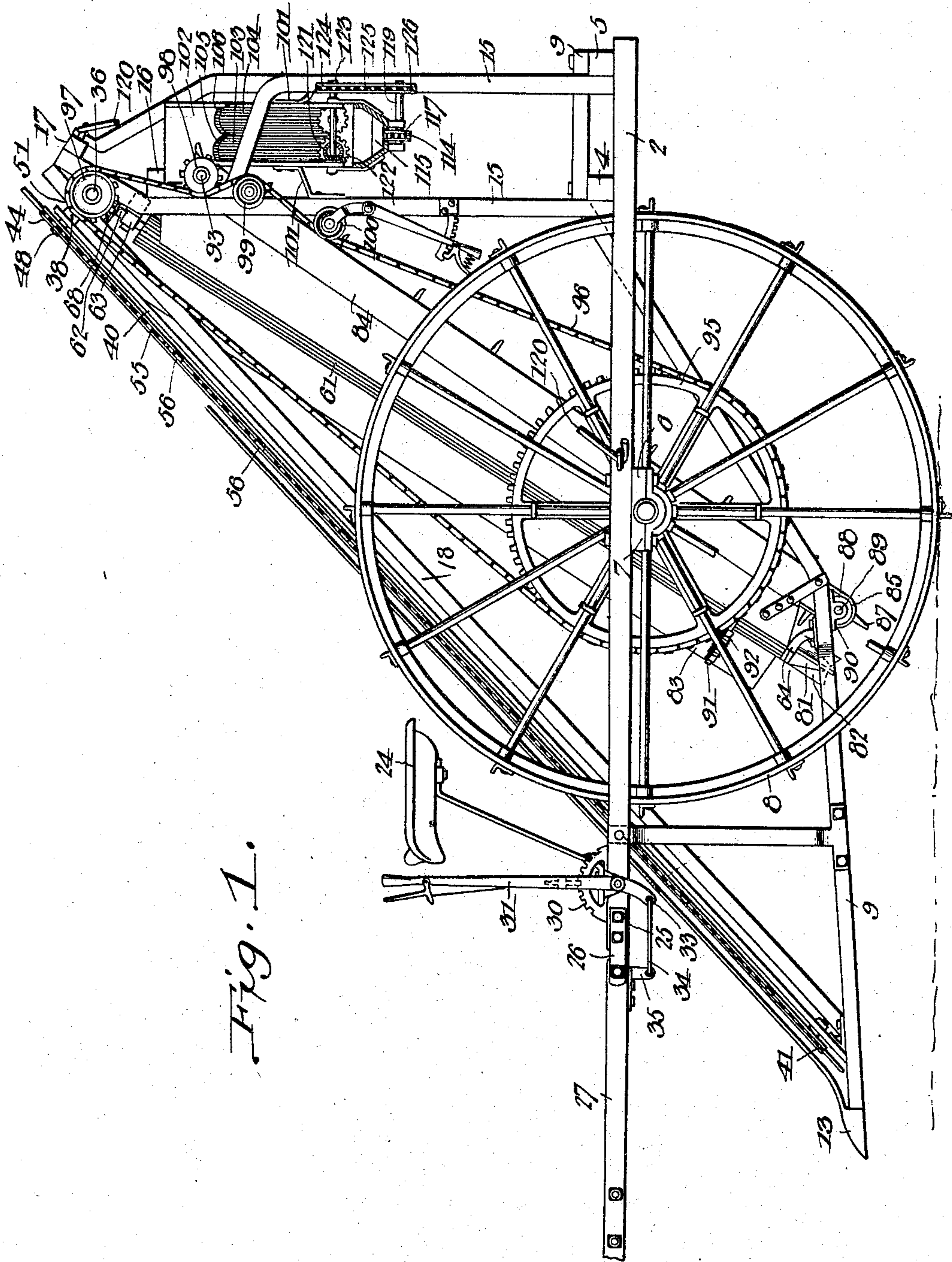


Fig. 1.

Witnesses

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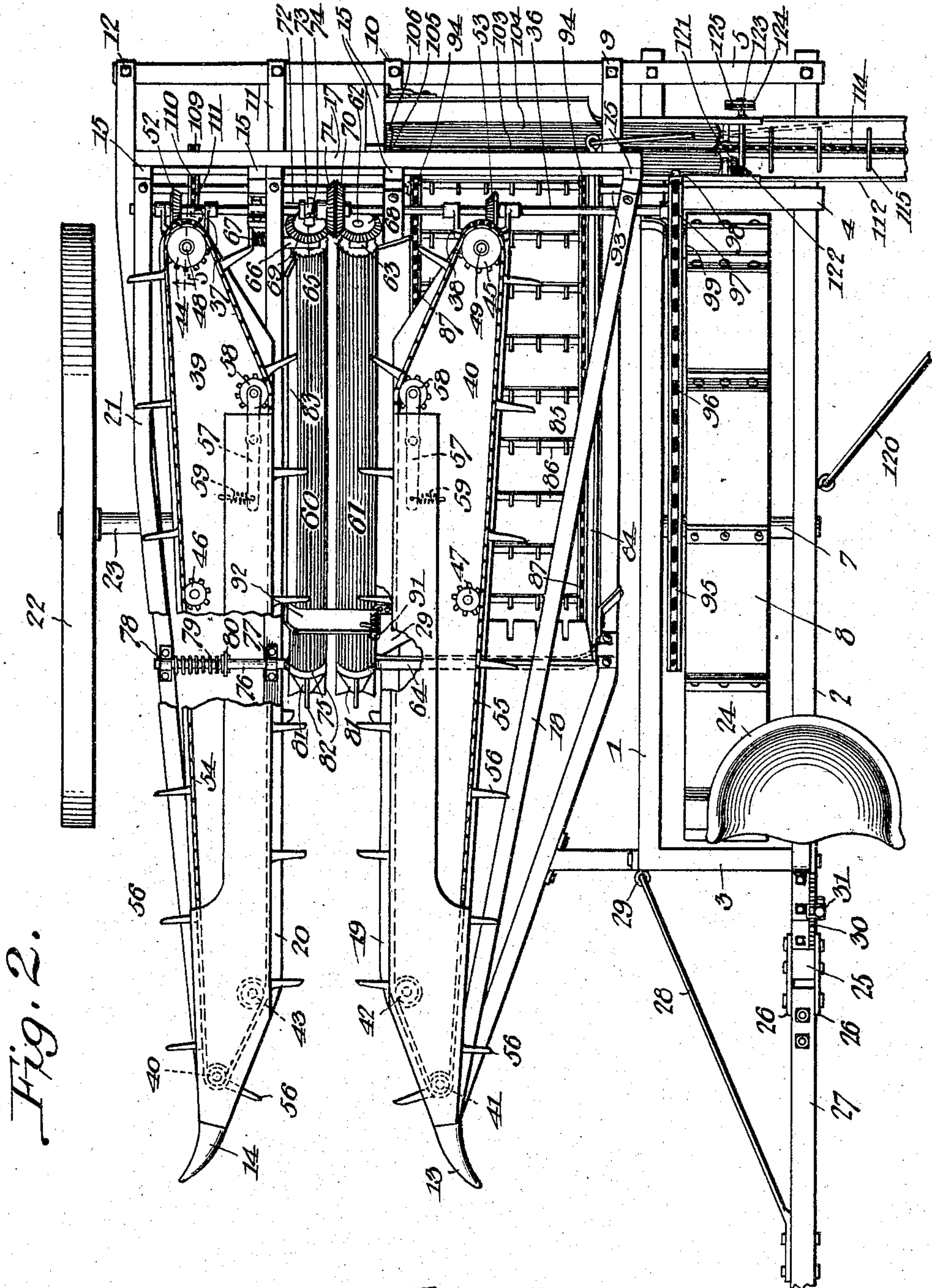
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4 SHEETS—SHEET 2.



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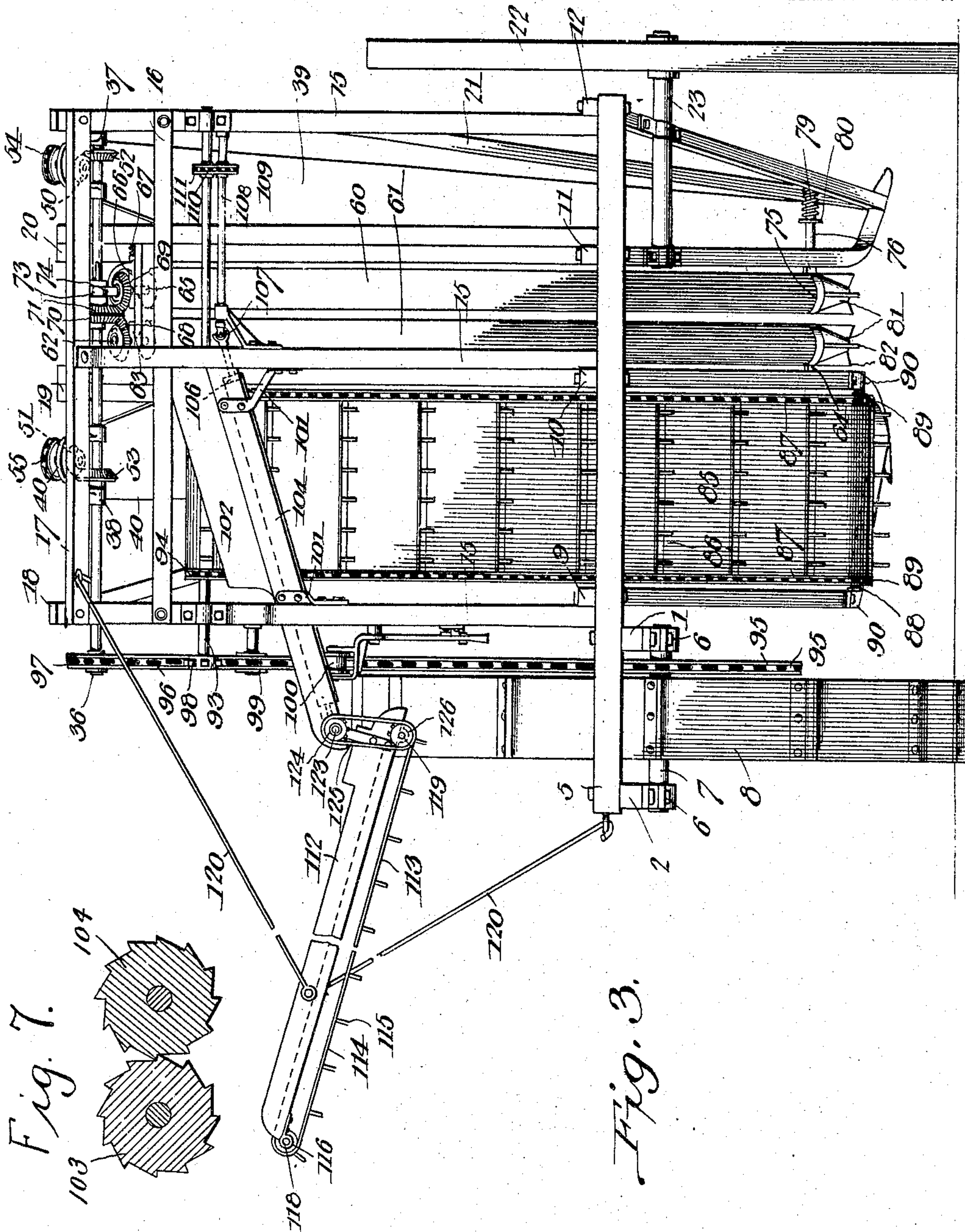


Fig. 7.

Fig. 3.

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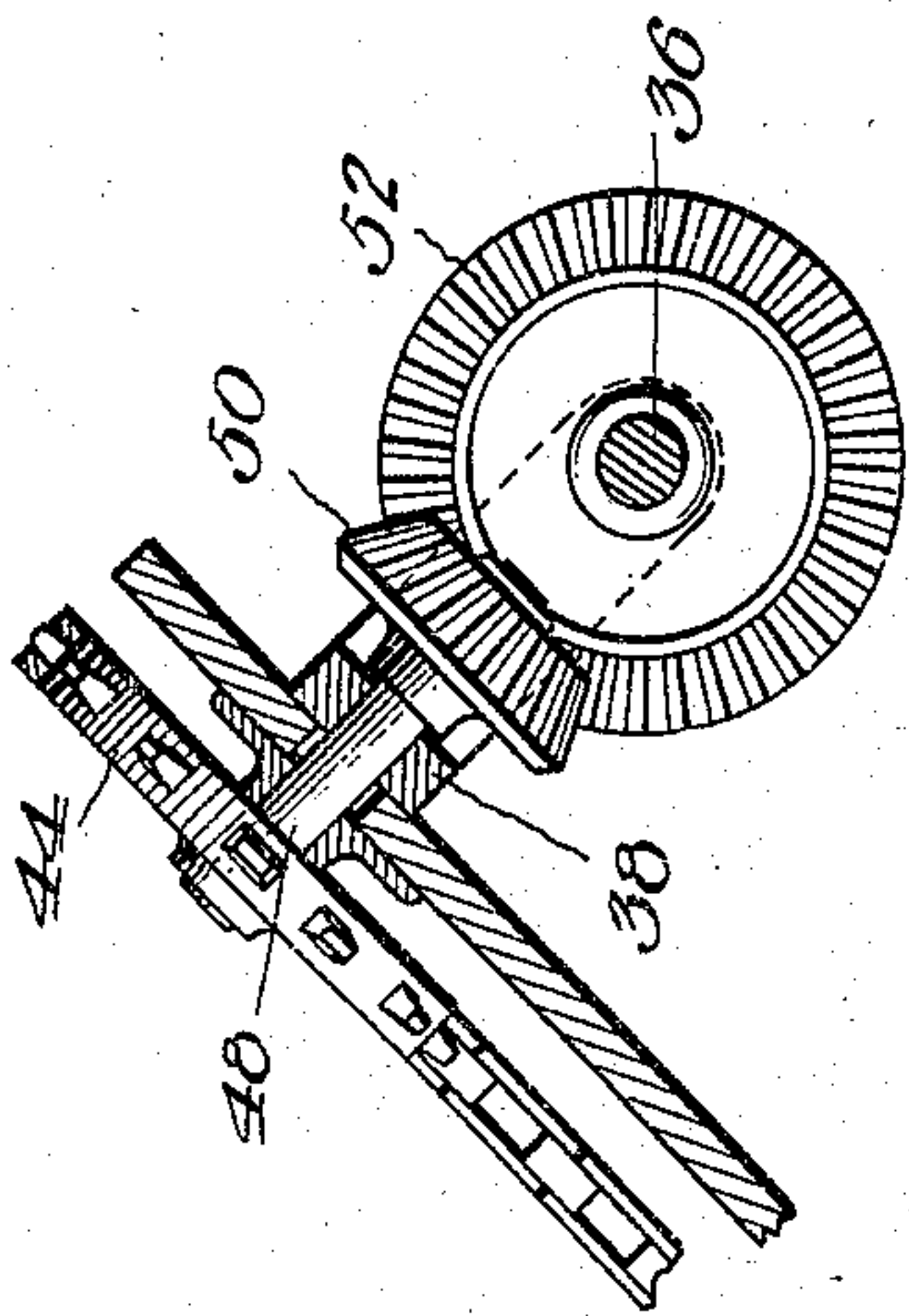


Fig. 5.

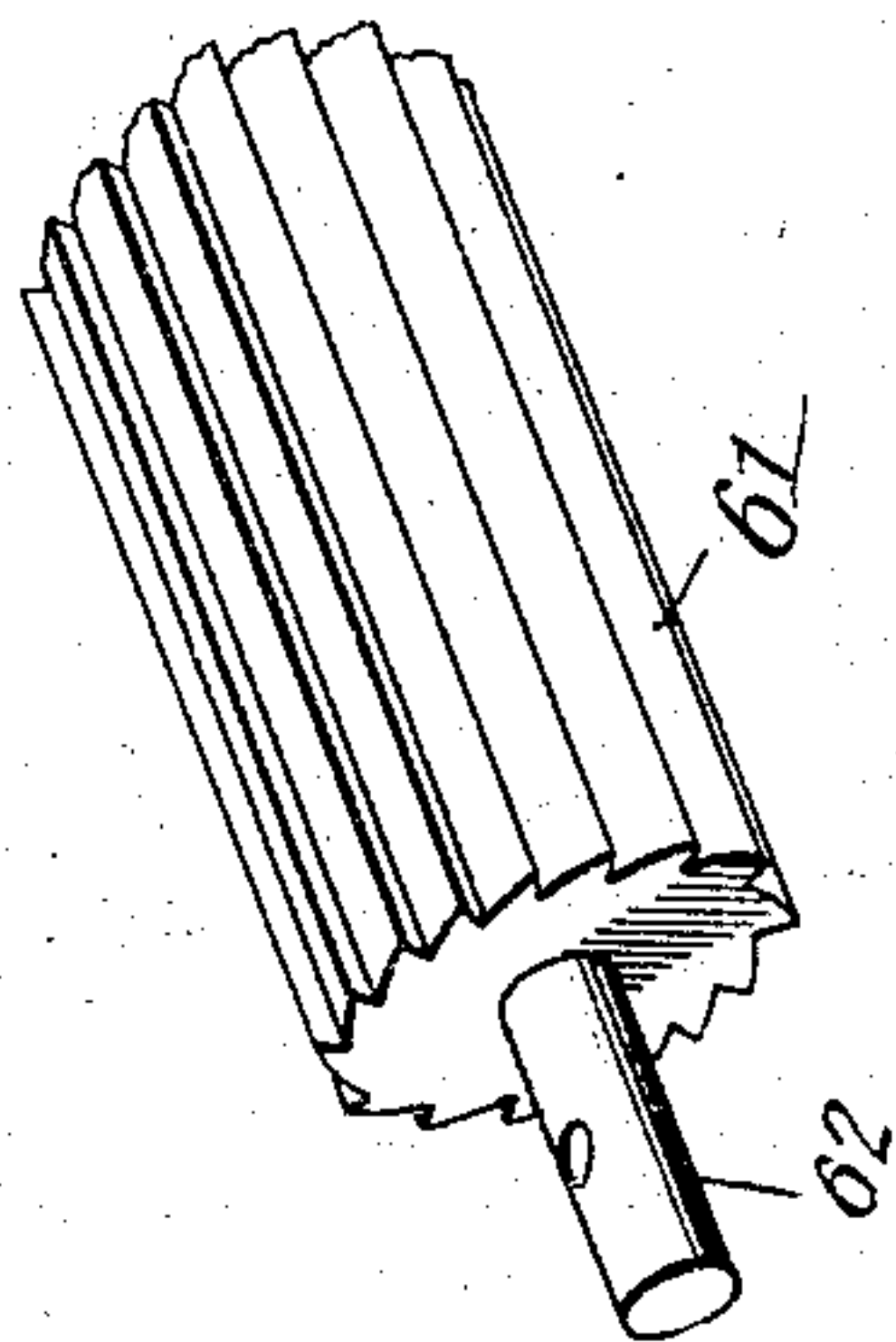


Fig. 6.

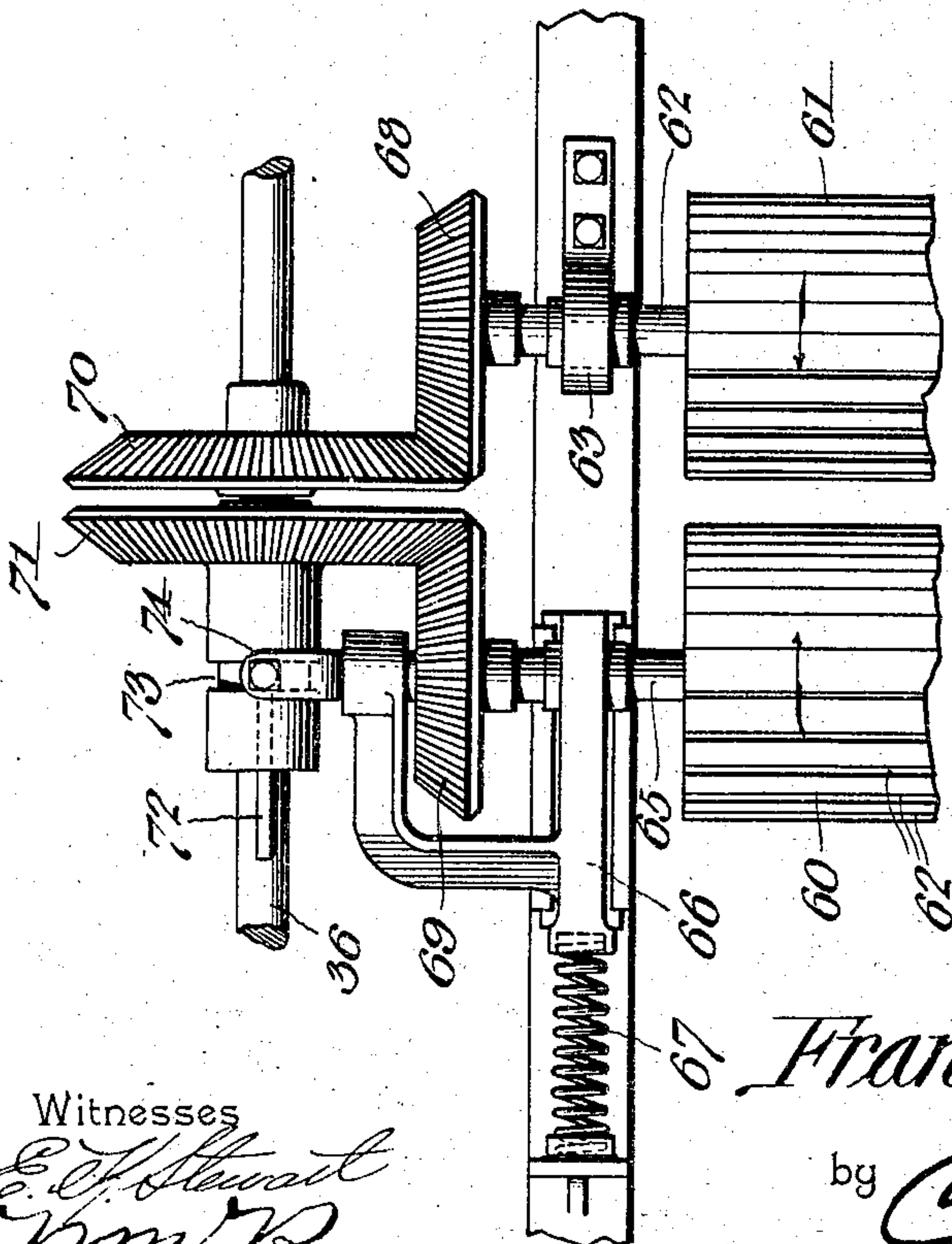
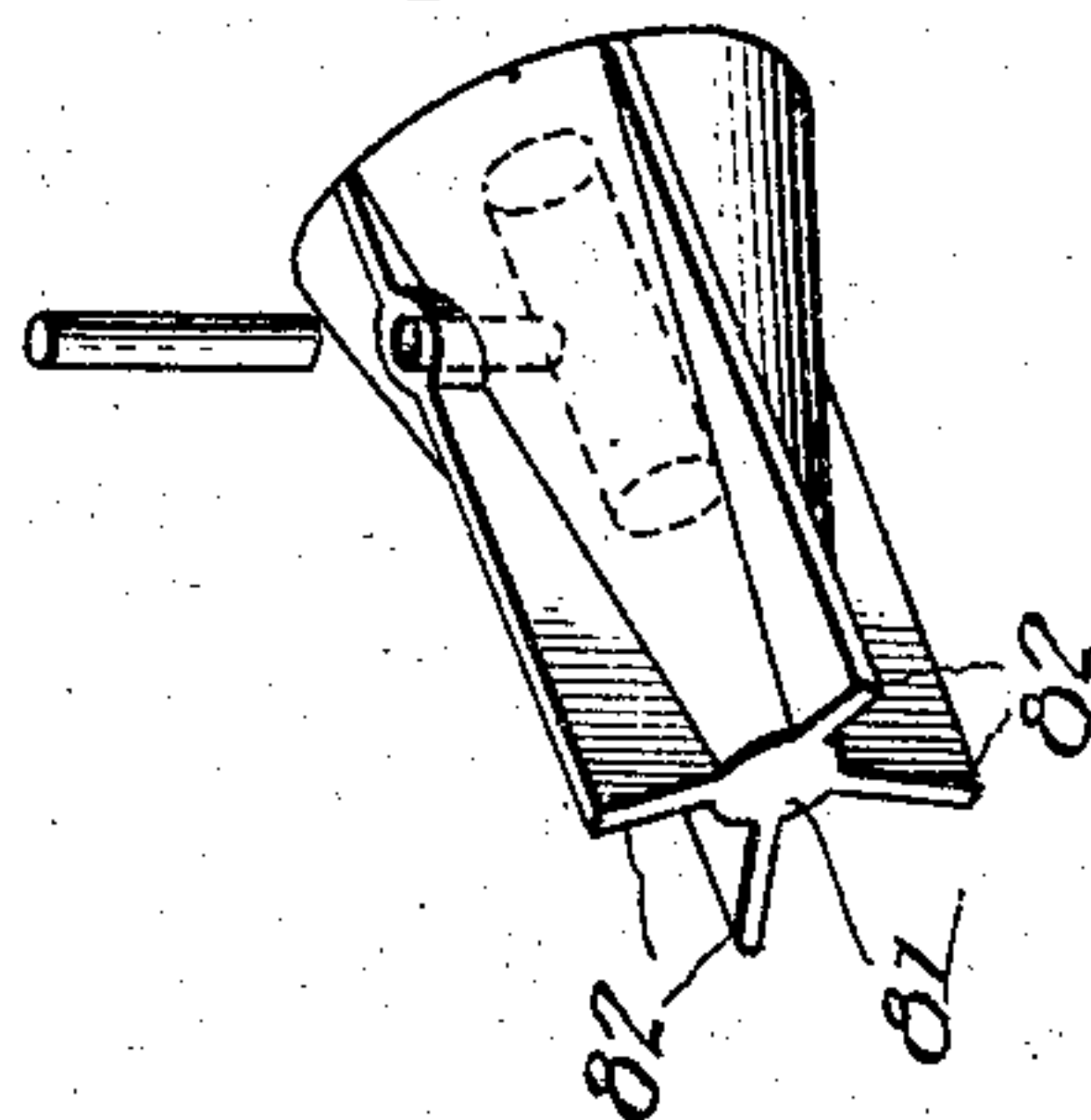


Fig. 4.

Witnesses

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# UNITED STATES PATENT OFFICE.

FRANKLIN B. PIERCE, OF RIDGEFARM, ILLINOIS.

## CORN-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 782,522, dated February 14, 1905.

Application filed March 9, 1904. Serial No. 197,314.

*To all whom it may concern:*

Be it known that I, FRANKLIN B. PIERCE, a citizen of the United States, residing at Ridgefarm, in the county of Vermilion and State of Illinois, have invented a new and useful Corn-Harvester, of which the following is a specification.

This invention relates to that class of corn-harvesters which are adapted to operate upon corn standing in the field for the purpose of snapping or removing the ears from the stalks, the ears being further operated upon by husking mechanism, after which they are discharged by elevating mechanism into a receptacle which may consist of a wagon driven alongside of the harvesting-machine.

The invention has for its object to provide a machine or device of this class which shall possess superior advantages in point of simplicity, durability, and general efficiency; and with these and other ends in view, which will appear as the nature of the invention becomes better understood, the same consists in the improved construction, arrangement, and combination of parts, which will be fully hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of embodiment of my invention, it being understood, however, that I do not necessarily limit myself as to the structural details therein exhibited, but reserve the right to all changes, alterations, and modifications which come fairly within the scope of the invention and which may be resorted to without departing from the spirit or sacrificing the efficiency of the same.

In said drawings, Figure 1 is a side elevation of a corn-harvesting machine constructed in accordance with the principles of my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a rear elevation. Fig. 4 is a detail plan view, on an enlarged scale, illustrating the mounting of the upper ends of the snapping-rollers. Fig. 5 is a sectional detail view taken on the line 5 5 in Fig. 2. Fig. 6 is a perspective detail view illustrating the lower end of one of the snapping-rollers and the de-

tachable point for the same. Fig. 7 is a cross-sectional view of the husking-rollers.

Corresponding parts in the several figures are indicated by similar numerals of reference.

The frame structure of my improved machine includes, primarily, a pair of longitudinal frame-bars 1 and 2, connected at their front ends by a cross-piece 3 and supporting at their rear ends a pair of cross-bars 4 and 5. The frame-pieces 1 and 2 are provided on their under sides with boxes 6, forming bearings for the shaft 7 of the bull-wheel 8, which constitutes the main transporting-wheel from which the power to drive the operative parts of the machine is derived. The cross-bars 4 and 5 are extended laterally in an outward direction from the frame supported upon the bull-wheel, and said cross-bars support four forwardly-extending suitably-bent or angular bars 9, 10, 11, and 12, which extend downwardly and forwardly, the bars 9 and 10 being converged at their front ends to form the nose or point 13 and the bars 11 and 12 being likewise converged to form the nose or point 14.

Suitably supported by the rear cross-bars 4 and 5 are a plurality of uprights 15, supporting a pair of cross bars or braces 16 and 17, which latter is disposed above the former. Connected with the brace 17 are the upper ends of a plurality of frame-bars 18, 19, 20, and 21, which extend downwardly and forwardly, the lower ends of the bars 18 and 19 converging with the bars 9 and 10, while the bars 20 and 21 converge with the bars 11 and 12. The four lower frame-bars or nose-bars 9 10 and 11 12 may be described as constituting a base-frame, the four upper frame-bars as constituting the top frame, and the rear uprights and the cross-braces 16 and 17 as constituting a rear frame. The bars constituting the top and bottom frames, as will be seen, are caused to converge so as to form the points or noses of the machine between which the cornstalks are received to be operated upon by means to be hereinafter described.

I desire it to be understood that while the construction of the frame structure herein de-



scribed will be generally adhered to I do not limit myself as regards the precise construction, arrangement, or disposition of the individual frame members, the principal feature of my improved frame structure consisting in the construction of an upper and a lower frame, spaced apart by uprights at their rear ends and converging at their front ends to form the noses between which the cornstalks will be admitted to be operated upon.

A supporting-wheel 22 for the outer side of the machine is journaled upon a shaft 23, which is secured to the under sides of the frame-bars 11 and 12. The machine is thereby operatively supported. The frame, composed of the side pieces 1 2, the front cross-piece 3, and the inner ends of the cross-pieces 4 and 5, supported upon the side pieces 1 2, may be designated the "draft-frame." The side piece 2 of said draft-frame supports the seat 24, and said side piece is extended forwardly to form a bracket 25, to the sides of which are secured forwardly-extending clip-plates 26, between which the tongue 27 is pivotally mounted. A brace 28, suitably connected with the tongue, extends rearwardly and is connected with the frame-bar 1 by means of an eyebolt 29. The side frame-piece 2 is provided near its front end with a rack-segment 30, concentrically with which is pivoted a lever 31, having a spring-actuated pawl or dog, which by engaging the rack serves to maintain the lever 31 in adjusted position. The lever 31 has an arm 33 extending below the fulcrum thereof, and said arm is connected, by means of a link 34, to a bracket 35, extending downwardly from the tongue. By this means I provide for the relative adjustment of the tongue and the wheel-supported frame of the machine, which may rock upon the axes of the wheels 8 and 22, so as to tilt the front end of the frame upwardly and downwardly, as may be required.

The frame-bars constituting the upper frame of the machine are provided near their upper ends with bearings for the main shaft 36, upon which are mounted a pair of arched frames 37 and 38, which support the upper ends of the deck-boards 39 and 40, the lower ends of which converge with the noses 14 and 13, respectively. The deck-boards support near their points a pair of sprocket-wheels 40 41, a short distance above these the guide-rollers 42 and 43, at their upper ends the sprocket-wheels 44 and 45, and intermediately disposed guide sprocket-wheels 46 and 47. The sprocket-wheels 44 and 45 are mounted upon shafts 48 and 49, which extend through the deck-boards and through the arched frames 37 and 38 and carry bevel-gears 50 51, meshing with pinions 52 53 upon the main shaft. The several sprockets or guide-pulleys are mounted rotatably upon stub-shafts suitably connected with the deck-board, and they serve

to support and to guide the endless feed-chains 54 and 55, each of which is constructed of links provided at suitable intervals with fingers 56. Each of the deck-boards supports a lever 57, carrying at its free end a chain-tightening sprocket 58, which is held in operative engagement with the chain by means of a tension-spring 59, suitably disposed to press the free end of the lever in the proper direction.

It will be observed from the foregoing description that the deck-boards supporting the guide-chains or gathering-chains extend from the extreme points or noses of the machine to the upper rear part of the frame where the main shaft is supported; also, that the gathering-chains derive their motion from the main shaft directly. The function of these chains, as is usual in this class of machines, is not merely to guide the stands of corn to the operating mechanism, which is to be hereinafter described, but also to assist in picking up down corn in guiding it to the operative parts of the machine.

60 and 61 designate the snapping-rollers of my device. My improved snapping-rollers are of equal diameter throughout their lengths and are longitudinally corrugated, so as to present in cross-section the configuration of ratchet-wheels, the teeth 62 of which intermesh closely with each other when the rollers are in contact with each other. The inner snapping-roller 61 is mounted upon a shaft 62, the upper end of which is journaled in a boxing 63, permanently bolted to the frame of the machine, and the lower end of which is likewise journaled in a bearing formed at the end of the brace-bar 64, which connects the frame-bars 9 and 10. The shaft 65 of the outer snapping-roller 60 is mounted in movable bearings, the upper end of which consists of a box 66, mounted slidably between flanges upon a frame-bar of the machine and actuated by means of a spring 67, which serves to force it in the direction of the boxing 63, which forms the bearing for the upper end of the shaft of the snapping-roller 61. The upper ends of the shafts 62 and 65 carry bevel-pinions 68 and 69, which mesh with bevel-gears 70 and 71 upon the main shaft 36. The bevel-gear 70 is permanently mounted upon the main shaft, while the bevel-gear 71 is rotatable with and slidable upon said main shaft, the latter being provided with a fin 72, which engages the corresponding groove in the hub of the gear-wheel. The latter is provided with an annular groove 73, engaged by a forked member 74, which extends upwardly from the slidable spring-actuated box 66. It will be seen that by this construction the bevel-gear 69 of the snapping-roller 60 will be maintained in operative engagement with the bevel-gear 71 upon the main shaft no matter what may be the position of the snapping-roller.



The lower end of the snapping-roller 60 is journaled in a bearing 75 at the outer end of an arm 76, which is slidably mounted in lugs 77 and 78 upon the frame of the machine. Upon the frame 76 is coiled a spring 79, the inner end of which abuts upon a key 80, extending transversely through the arm 76 near the inner end of the latter, said spring thus tending to force the bearing 75, carrying the lower end of the shaft of the snapping-roller 60, in the direction of its mate 61.

The shafts 62 and 65 of the rollers 61 and 60 are extended below the bearings for the lower ends of said roller and are provided with the points 81, which are connected detachably with said shafts in any suitable manner. The points 81 are conical in shape and are provided with radially-extending ribs or flanges 82, which extend from the bases to the apices of said conical points, said flanges being approximately triangular in shape and of greater width at the apices than at the bases of the conical points. Let it be understood that the points 81 are not necessarily of true conical shape, but may be of any desired tapering form.

The described construction of the snapping-rollers and the manner of mounting the same is an essential feature of my invention. It will be observed that the lower bearings of the rollers are some distance from the lower extremities of the rollers and that consequently the entrance of cornstalks between the points of the rollers will not be obstructed by said bearings. It will also be noticed that while the lower extremities of the rollers are tapered or pointed they are also provided with wings or flanges, the upgoing sides of which on being brought into contact with prostrate stalks of corn will positively elevate the latter and carry them between the snapping-rollers, where they will be operated upon in the usual manner.

Adjacent to the outer side of the outer snapping-roller 60 is located a fender 83 for the purpose of preventing ears of corn from being lost over said outer snapping-roller. Adjacent to the inner snapping-roller 61 is disposed the trough or frame 84 of an elevator or endless carrier 85, which is composed of a plurality of toothed cross-bars 86, connecting a pair of chains 87, the lower ends of which run upon sprocket-wheels 88, supported upon a shaft 89, which is journaled in suitable bearings 90 upon the under sides of the frame-bearings 9 and 10, which support the lower end of the elevator trough or casing. The latter, it will be observed, is located in a plane parallel to, but somewhat below and in rear of the axis of the snapping-rollers, the lower ends of which latter are journaled a considerable distance in rear of the noses or points of the frame of the machine. Pivotaly mounted closely adjacent to the lower end of the

outer snapping-roller 60, as upon a short shaft 91, is a spring-actuated deflector 92, which normally extends over the snapping-rollers and in the direction of the lower end of the elevator trough or casing, into which ears of corn which may happen to slide downwardly upon the snapping-rollers will be intercepted and deflected into the elevator-casing, thereby preventing loss. This spring-actuated deflector will obviously yield freely to the passage of stalks of corn entering between the snapping-rollers, as will be readily understood, and will after the passage of stalks be returned automatically to its normal position by the action of its actuating-spring.

Suitably mounted in bearings upon the rear upright frame-bar of the machine is a shaft 93, which is disposed some distance below the main shaft 36, and which I designate the "elevator-shaft." Said elevator-shaft carries a pair of sprocket-wheels 94, carrying the upper ends of the chains 87 of the elevator or carrier, to which motion is thereby transmitted, the elevator-shaft being driven directly from the bull-wheel 8 of the machine. Said bull-wheel is connected with a sprocket-wheel 95, from which a chain 96 passes over a sprocket-wheel 97 upon the main shaft 36, said chain passing also in engagement with a sprocket-wheel 98 upon the elevator-shaft, with an idler 99, and with a chain-tightening sprocket 100.

Suitably supported, as upon brackets or braces 101, upon the rear part of the frame of the machine, is a trough or casing 102, which receives the material discharged from the elevator 85 and which contains the husking-rollers 103 104, which are journaled in suitable bearings at the ends of the casing, which latter is tipped or tilted in a downward direction, so that the ears of corn operated upon by the husking-rollers shall be caused to travel by gravity toward the discharge end of the casing. The rollers 103 and 104 are provided with spur wheels or pinions 105 106, meshing together, and the inner roller 103 is connected by a knuckle-joint 107 with a shaft 108, journaled in suitable bearings parallel to the elevator-shaft and provided with a sprocket-wheel 109, connected by a chain 110 with a sprocket 111 upon said elevator-shaft, whereby it is driven.

The lower end of the casing 102 is open and is supported directly above the receiving end of a trough or casing 112, containing an endless carrier 113, consisting, essentially, of a chain 114, the links of which are provided at suitable intervals with spurs 115, said chain traveling upon sprocket-wheels 116 and 117, which are journaled upon shafts 118 and 119, respectively, at the outer or delivery end and at the inner or receiving end of the elevator-trough. The latter is sustained in an upwardly-tilted position by means of braces or guy-rods 120, connecting said trough or cas-



ing with the frame of the machine. The shaft of one of the husking-rollers carries at its lower end a bevel-pinion 121, meshing with a bevel-gear 122 upon a shaft 123, having at its opposite outer end a sprocket-wheel 124, connected by a chain 125 with a sprocket-wheel 126 upon the shaft 119, supporting the lower end of the endless carrier 113, to which motion is thus transmitted.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of my improved corn-harvesting machine will be readily understood by those skilled in the art to which it appertains.

When the machine progresses over the field, it is obviously intended to straddle the row of corn that is to be operated upon. The cornstalks will be held between the noses 13 and 14 of the frame of the machine, which will be assisted in raising down corn by the guiding-chains, which are supported upon the deck-boards, whereby the stalks will be elevated and guided between the lower ends of the snapping-rollers. Any down corn that may be missed by the guide-chains will be picked up by the flanged points of the snapping-rollers and all the cornstalks will be conducted unfailingly between the latter, which rotating against each other will cause the cornstalks to be buckled downwardly and rearwardly between the snapping-rollers, which on coming in contact with the butt end of the ears will snap the latter from the stalks, the ears being delivered into the elevator 86 either directly over the inner snapping-roller or through the medium of the deflector 92. The ears are carried by the elevator in an upward direction and are discharged into the upper end of the casing 102, containing the husking-rollers, which latter, it should be observed, are disposed parallel to each other and are, like the snapping-rollers, of equal diameter throughout and, again like the snapping-rollers, are longitudinally corrugated to present in cross-section the appearance of ratchet-wheels meshing with each other. Rollers of this construction have been found peculiarly adapted to seize forcibly upon the husks of the corn, which being torn from the ears will pass between the husking-rollers and be delivered downwardly through the husking-rollers in the bottom of the husker-casing. The ears being deprived of their husks will slide in a downward direction over the husking-rollers and will pass through the lower open end of the husker-casing into the trough or casing of the elevator, whereby they are carried upwardly and outwardly and finally deposited in a suitable receptacle, which, as hereinbefore stated, may consist of a wagon driven alongside of the machine when the latter is in operation.

It will be seen from the foregoing that the

construction and operation of my improved machine are extremely simple and of such a nature that all the corn will be unfailingly gathered without loss or injury.

Having thus described my invention, I claim—

1. A wheel-supported draft-frame having laterally-extended cross-pieces, pairs of frame-bars supported upon said extended cross-pieces, an upper cross-brace, and frame-bars connected in pairs with said upper cross-bar, said upper frame-bars converging downwardly and forwardly with each other and with the lower frame-bars.

2. A wheel-supported draft-frame having laterally-extending cross-pieces, forwardly-converging nose-bars supported upon said cross-pieces, suitably-supported uprights, an upper cross-piece, downwardly and forwardly extending frame-bars supported at their upper ends by the upper cross-piece and connected at their lower front ends with the nose-bars, deck-boards supported by the framework, and endless guide-chains supported and guided upon the deck-boards.

3. A wheel-supported draft-frame having laterally-extended cross-pieces, a base-frame, a rear frame, and a top frame supported by said cross-pieces, a shaft mounted upon the under side of the outer portion of the draft-frame, an outer supporting-wheel upon said shaft, a main shaft journaled near the top of the rear frame, means for transmitting motion to said main shaft from the supporting-wheel of the draft-frame, arched frames journaled upon the main shaft, deck-boards connected with the top frame and supported at their upper ends upon said arched frames, shafts extending through the latter and through the deck-boards, sprocket-wheels at the upper ends of said shafts, bevel-pinions upon the lower ends of said shafts, bevel-gears upon the main shaft meshing with said bevel-pinions, endless guide-chains upon the deck-boards engaging the sprockets upon the shafts receiving motion from the main shaft, and supporting and guiding means upon the deck-boards for said endless guide-chains.

4. A frame, a main shaft in said frame, arched frames journaled upon the main shaft, deck-boards supported upon the main frame and upon the arched frames, endless guide-chains supported upon the deck-boards, and means for transmitting motion to said chains direct from the main shaft.

5. Corn-snapping rollers having tapering points provided with radially-extending flanges.

6. Corn-snapping rollers having tapering points provided with radially-extending approximately triangular flanges, the outer sides of which are in alinement with the outer sides of the rollers.

7. Corn-snapping rollers having shafts pro-



jecting at their lower ends, bearings for said shafts and tapering points mounted upon the ends of the shafts projecting below the lower bearings and having radially-extending pick-up flanges.

8. Corn-snapping rollers provided at their lower extremities with radially - extending stalk-engaging pickers.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

FRANKLIN B. PIERCE.

Witnesses:

JOHN C. BAUM,

J. C. LARRANCE.