

No. 701,397.

Patented June 3, 1902.

A. ROSENTHAL.

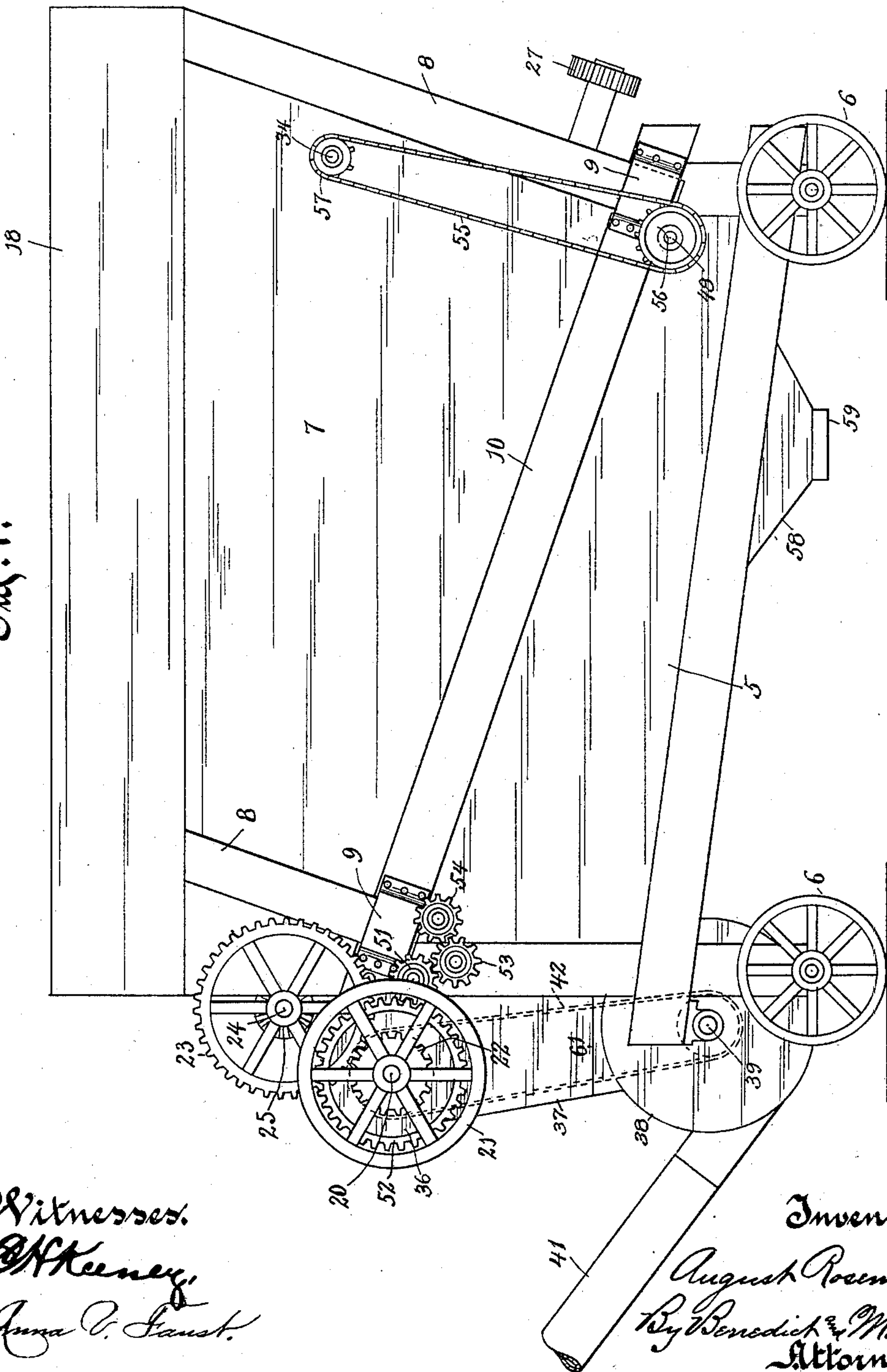
CORN HUSKER AND SHREDDER AND ENSILAGE CUTTER.

(Application filed June 14, 1901.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



Witnesses.
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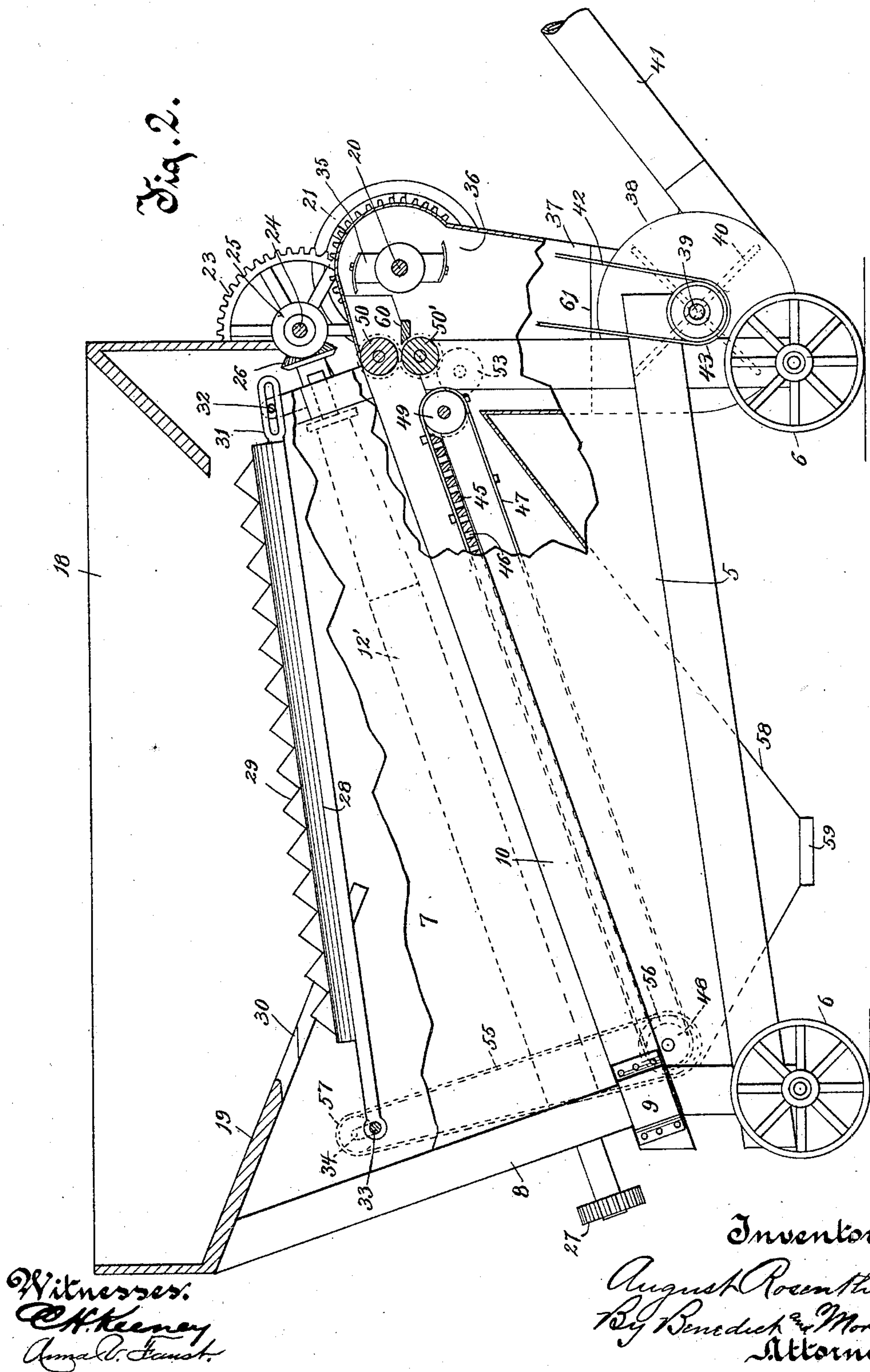
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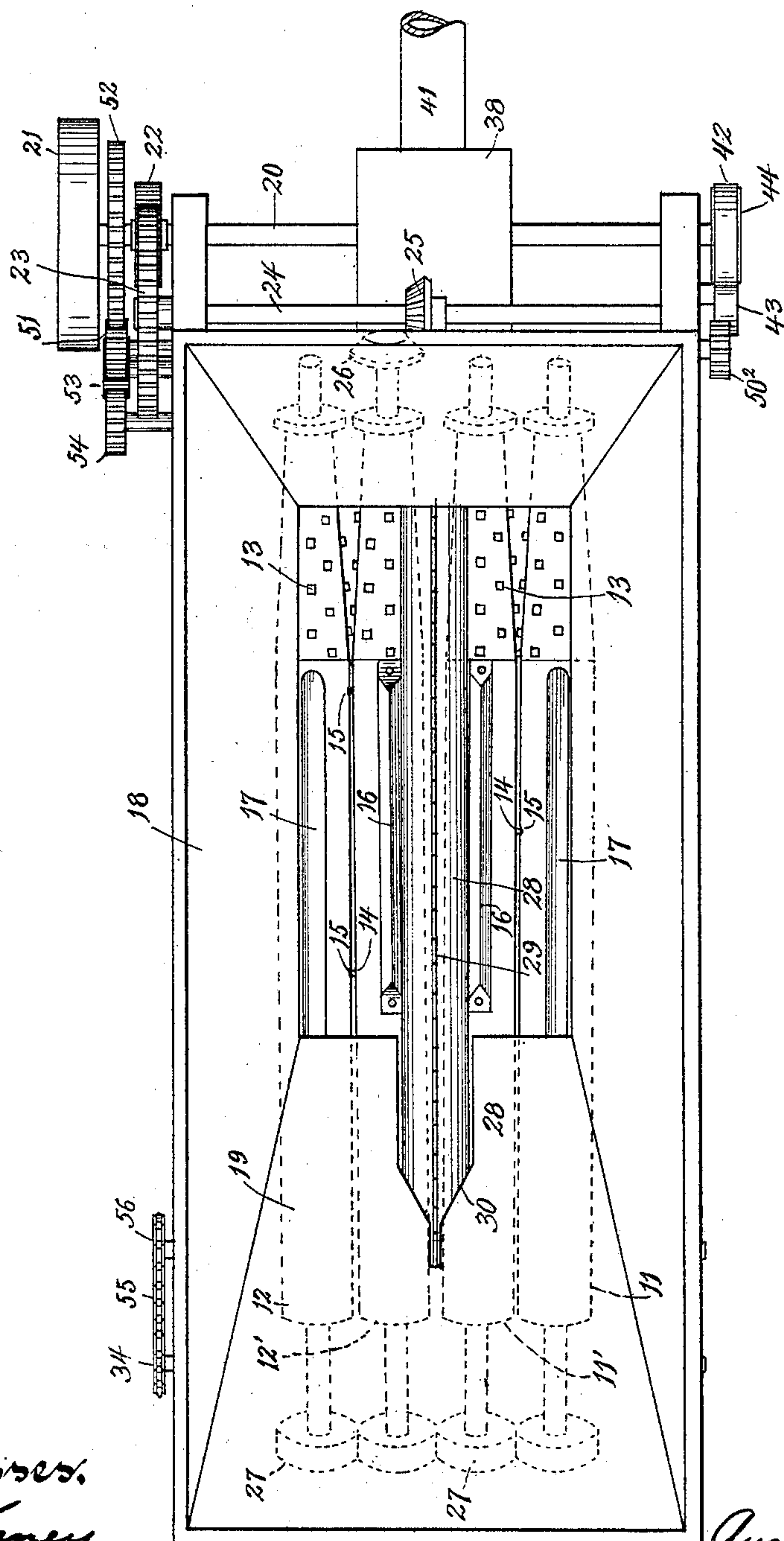
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4 Sheets—Sheet 3.

Fig. 3.



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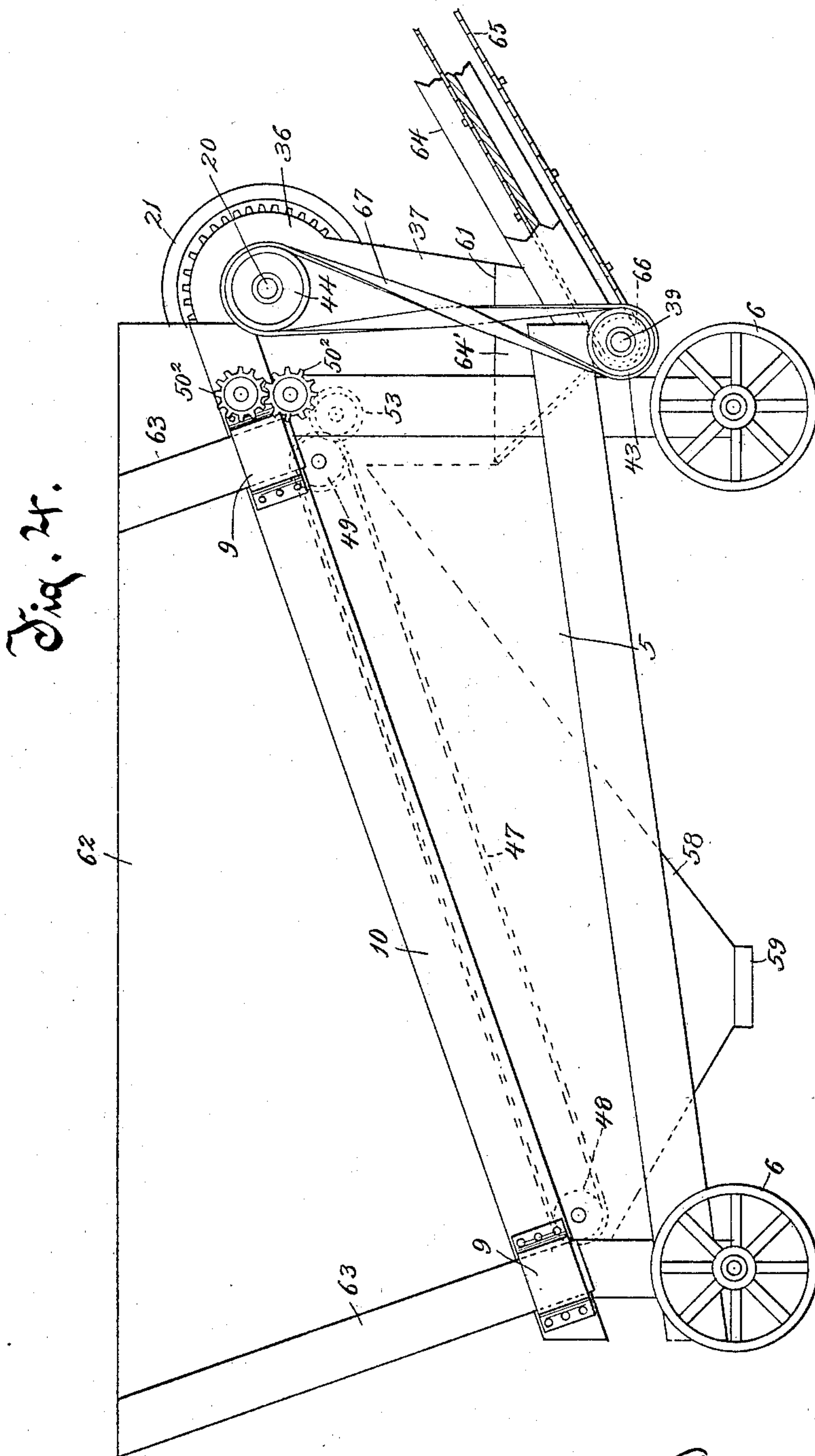
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UNITED STATES PATENT OFFICE.

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CORN HUSKER AND SHREDDER AND ENSILAGE-CUTTER.

SPECIFICATION forming part of Letters Patent No. 701,397, dated June 3, 1902.

Application filed June 14, 1901. Serial No. 64,504. (No model.)

To all whom it may concern:

Be it known that I, AUGUST ROSENTHAL, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Corn-Huskers and Shredders and Ensilage-Cutters, of which the following is a description, reference being had to the accompanying drawings, which are part of this specification.

My invention has relation to improvements in corn huskers and shredders and ensilage-cutters.

The primary object of the invention is to provide a construction whereby the machine ordinarily adapted as a corn husker and shredder is readily convertible into a machine for cutting ensilage.

A further object is to provide an improvement in the general arrangement and combination of the machine as a whole whereby efficiency and convenience in operation is promoted.

A further object resides in the provision of means whereby the stalks when initially fed to the machine are compelled to assume a vertical position, thereby permitting the front ends of the husking-rollers to readily sever the stalks from the ears.

A still further object resides in an improved construction for separating the shelled corn from the stalks.

With the above objects and other incidental objects in view the invention consists of the devices and parts or their equivalents, as hereinafter set forth.

In the accompanying drawings, Figure 1 is a side elevation of the machine arranged as a corn husking and shredding machine. Fig. 2 is an elevation of the opposite side to that shown in Fig. 1, parts being broken away and in section. Fig. 3 is a plan view of Fig. 1, and Fig. 4 is a side elevation of the machine arranged as an ensilage-cutter.

Any desired form of framework for supporting the operative parts of the machine may be provided. The framework 5 shown in the accompanying drawings, however, has been found to be desirable. If it is desired that the machine should be portable, the framework is mounted upon wheels 6.

Referring to the form of construction shown

in Figs. 1 and 3, an upper removable frame 7 is supported on top of the lower frame 5, said upper frame being provided with end posts 8, which fit loosely in keepers 9, secured at opposite ends of inclined side beams 10 10, arranged at the top of the frame 5, the said beams being on a gradual decline from the front end of the frame to the rear thereof. The lower edges of the side boards of the frame 7 are on a gradual decline and rest on the top edges of the side beams. Arranged longitudinally in the lower portion of the frame 7 and journaled in the end pieces of said frame and on a gradual upward incline from the rear to front of the machine are husking-rollers. These several rollers may be of any desirable construction; but I prefer to employ rollers of the specific construction shown in the drawings. These rollers are arranged in pairs, two of the rollers of one pair being indicated by the numerals 11 11' and the two rollers of the other pair by the numerals 12 12'. A substantial space is left between the two pairs of rollers, while the two rollers of each of the two pairs are in close proximity, so as to almost contact. The highest ends of these several rollers constitute the receiving ends thereof, while the remaining portions thereof constitute the husking parts. The front receiving ends are provided with longitudinal rows of radially-projecting teeth 13, which rows of teeth alternate with each other longitudinally, the rows of teeth of one roller of one pair entering the intermediate spaces axially or longitudinally of the other roller as the rollers revolve. These teeth as the corn is fed to the rollers take hold of the stalks and pull said stalks between the rollers. The husking portions of the inner rollers 11' and 12' are provided with a number of projecting husking-pins 14 and the outer rollers 11 and 12 with registering recesses 15 to receive said pins as the rollers revolve. The rollers 11' and 12' are also shown as having secured thereto diamond-shaped nippers 16 16, and the rollers 11 and 12 are formed with recesses 17 17, which are so located as to receive therein the projecting edges of the nippers as the rollers revolve toward each other.

The upper portion of the frame 7 is in the form of a hopper 18. Within this hopper and

extending from the rear end thereof forwardly toward the feed end of the rollers is a downwardly-inclined board 19. The cornstalks are fed horizontally into the hopper, with the ears pointing toward the rear end of the hopper. The inclined board will permit only the ends of the stalks which point toward the forward end of the hopper being acted upon in the first instance by the rollers, the feed ends only of said rollers being permitted to grasp the stalks. The teeth 13 at these feed ends of the rollers act on the stalks and effect the pulling of said stalks between the rollers, the pulling action drawing the stalks toward a more or less vertical position, and hence thereby adapting them to pass readily between the rollers and gradually work down into the more narrow spaces between the feed ends of the rollers. The nippers 16 also come into play as the rollers are revolved. Said nippers during such revolution pass into the recesses 17, and the stalks are thereby necessarily pulled in between the points or edges of the nippers and the walls of the recesses, being thereby compelled to make a very short turn. The sharpened edges of the nippers then sever the stalks from the ears, and the severed stalks pass between and below the rollers. The ears of corn of course slide down on the top surfaces of the rollers and are acted upon by the husking-pins 14 and are thereby stripped of their husks, said husks being carried between the rollers. The husked ears finally slide off the rear ends of the rollers into a suitable receptacle.

Heretofore a long inclined board, such as 19, has not been employed in this class of machines, and consequently the cornstalks fed horizontally to the rollers are not always effectually grasped by the teeth 13 and pulled between the rollers. By the provision of this inclined board the pulling of the stalks between the rollers is made positive and certain, and at the same time a considerable saving in the length of the rollers is effected. In other machines of the same class in which the cornstalks are fed in sheaves or bundles horizontally and lengthwise of the rollers, so that the full length of the stalks is at once deposited on the rollers, the portions of said rollers containing the teeth 13 and the nippers 16 must be equal in length to the length of the cornstalks, as otherwise said cornstalks would extend onto the husking portions of the rollers and be acted upon by the husking-pins before the operation of separating the cornstalks from the ears was effected. By my improved arrangement, however, the portions of the rollers containing the teeth 13 and the nippers 16 may be considerably shorter than the stalks, and yet the severing of the stalks from the ears accomplished before the stalks can reach the husking portions of the rollers.

The numeral 20 indicates the main driving-shaft from which motion is conveyed to the several moving parts of the machine. This

shaft carries on one end a belt-pulley 21, around which a belt (not shown) leading from any suitable source of power is passed. Also mounted on shaft 20 is a toothed wheel 22, which meshes with a larger toothed wheel 23 on a transverse shaft 24. This shaft has mounted thereon at an intermediate point a beveled gear-wheel 25, which meshes with a beveled gear-wheel 26 on the extended journal of one of the rollers, said extended journal being shown in the accompanying drawings as extending from the roller 12'. The journals of the rear ends of the rollers have mounted thereon intermeshing gears 27. It is obvious that the rotation of the driving-shaft will cause the transverse shaft 24 to be rotated, and that the rotation of this latter shaft will be communicated to one of the rolls, and the rotation of this roll in turn communicated to all of the several rolls by means of the intermeshing gear-wheels 27.

Extending longitudinally of the lower portion of the hopper is mechanism for cutting the twine which binds the bundles or sheaves of corn, it being understood that the corn is not deposited in the hopper in a loose condition, but in bundles or sheaves tied with twine. This cutting mechanism consists of a longitudinal bar 28, having on its upper edge a series of saw-like teeth 29. The inclined board 19 is slotted, as indicated by the numeral 30, in order to permit of the free reciprocation of the toothed bar 28. At its forward end the bar 28 is provided with a projecting link or elongated slotted portion 31, which link or slotted portion receives a transverse pin 32. The rear end of the bar 28 is hung on a crank 33, formed on a transverse shaft 34. The driving-shaft 20 has also mounted thereon the shredding and cutting mechanism 35. A casing 36 surrounds this cutting and shredding mechanism, and from the open bottom of the casing leads downwardly a conduit 37, which communicates with an opening in the top of a fan-casing 38. A shaft 39 passes through this casing, and mounted on the shaft within the casing is a fan 40. Extending from the fan-casing is a conduit 41, into which the cut and shredded cornstalks are forced from the fan-casing by the action of the fan and through said conduit to the place of deposit. The fan-shaft is rotated by means of a belt 42, which passes around a belt-pulley 43, mounted on the fan-shaft, and also around a belt-pulley 44, mounted upon the main driving-shaft 20. By the particular arrangement and disposition of the parts described the shredding and cutting mechanism and the fan mechanism are compactly arranged at the forward end of the machine with one immediately below the other.

Extending longitudinally of the upper portion of the lower frame 5 and beneath the husking-rollers and on the same incline as said rollers is a platform 45, composed of a series of slats spaced apart, and thereby pro-

viding a series of openings or spaces 46, forming a sieve. Over this slatted platform or sieve runs a conveyer-belt 47. This belt passes around a roller 48 at the rear end of the machine and around another roller 49 at the front end of the machine arranged on a plane above the plane of the roller 48, so as to bring the belt on the same incline as the slatted platform.

Between the cutting and shredding mechanism and the forward end of the conveyer 47 are two feed-rolls 50 50', one arranged above the other. On one end of one of these feed-rolls is a pinion 51, and this pinion is in mesh with a toothed wheel 52 on the driving-shaft 20. The pinion 51 is also in mesh with an idle pinion 53, and said idle pinion in turn is in mesh with a pinion 54 on the axis of the roller 49 of the conveyer-belt 47. By this gearing the conveyer-belt 47 is driven from the drive-shaft 20. The motion given to the conveyer-belt will of course rotate the rear roller 48, and the rotation of this rear roller is utilized for imparting rotation to the shaft 34, this being accomplished by means of a sprocket-chain 55, which passes around a sprocket-wheel 56 on the roller 48 and thence upwardly and around another sprocket-wheel 57 on the shaft 34.

Below the slatted platform or sieve 45 is a receptacle 58, having its bottom inclined from opposite ends to a common discharge-opening 59.

In the use and application of my invention as a corn shredding and husking machine the main shaft 20 is rotated in the manner hereinbefore pointed out, and this will cause movement to be imparted to the several rotatable and movable portions of the machine.

A tied bundle of the cornstalks is then deposited in the hopper 18, with the ears of corn pointing toward the rear of the machine. The stalks of course lie on the inclined board 19 and project beyond the inner edge of said board to the receiving ends of the husking-rollers. As these rollers rotate the stalks are grasped by the radially-projecting teeth 13 thereof and are pulled between the rollers and toward a vertical position and gradually work down to the portions of said rollers carrying the nippers 16. These nippers act to sever the stalks from the ears, and the stalks so severed drop onto the slatted platform 45 and from said platform are conveyed by the conveyer-belt 47 to and between the feed-rollers 50 50', passing from between said feed-rollers onto a guide-strip 60 and thence into the casing 36 of the shredding and cutting mechanism. This shredding and cutting mechanism then acts to cut and tear the cornstalk into shreds, and these cut or shredded portions pass down the conduit 37 and into the fan-casing, where they are acted upon by the fan and forced up the conduit 41 to the place of deposit. The ears of corn are of course left on the top surfaces of the husking-rollers and slide down said rollers and before leaving

the rear ends thereof are acted upon by the husking-pins 14 and stripped of their husks, the said husks passing between the rollers with the stalks and being caught by the slatted platform 45. The husked ears pass off the rear ends of the rollers and into a suitable receptacle for receiving the same. If in the operation of husking any of the corn should be shelled from the ears and pass between the rollers onto the slatted platform 45, said shelled corn is free to pass through the spaces or openings 46 of said platform and be caught in the receptacle 58. Such shelled corn is free to pass out of the discharge-opening 59 of the receptacle and into a suitable containing device. This provides an efficient means for separating the shelled corn from the husks and stalks, and the movement of the conveyer-belt 47 over the platform 45 causes an agitation of the stalks, husks, and shelled corn, and consequently effectually separates the shelled corn and permits the same to pass through the openings 46. It will be understood that the bundles or sheaves placed in the hopper 18 are tied with a band or cord, and as the cutter-bar 28 is given a reciprocating movement by means of its crank connection with the shaft 34, which shaft is rotated through the medium of the sprocket-chain 55, the cord or band is readily cut and the stalks thereby permitted to spread over the lower portion of the hopper.

It is necessary that the rotation of the lower feed-roll 50' should be communicated to the upper feed-roll 50, and to accomplish this I provide corresponding ends of the journals of said feed-rolls with intermeshing pinions 50² 50³.

The fan-casing and contiguous parts are separable from the framework 5 at the line 61, being detachably connected at that point by any desired means. When it is desired to convert the machine from a corn husking and shredding machine into an ensilage-cutter, the belts 42 and 55 are removed. The entire upper frame 7 is next removed, and as the cutter-bar 28 and the husking-rollers, together with related parts, are carried by this frame said parts are necessarily removed therewith. The fan-casing 38 is next removed. An upper frame 62, which is in the form of a hopper, is now adjusted to the inclined beams 10. This frame is provided with end posts 63, which are adjusted to fit within the keepers 9, so as to be removably secured thereto, the same as in the case of the frame 7. A part 64', which constitutes the lower end of the conduit 37, is now adjusted and detachably secured to said conduit at the point 61. This lower end of the conduit leads to conveyer mechanism, which is of the usual form of construction, consisting of a framework 64 and an endless carrying-belt 65. The endless belt 65 at its lower end passes around a roller 66, mounted on the shaft 39, and thence extends upwardly at an incline and around another roller (not shown) at the up-

per end of the conveying mechanism. A crossed belt 67 connects the pulleys 43 and 44, and thereby drives the carrying-belt in the proper direction to elevate the material deposited thereon.

In the operation of the ensilage-cutter the ensilage is placed in the hopper 62 and thence falls onto the conveyer 47 and is carried upwardly thereby and between the rolls 50 50', said rolls carrying the material into the casing 36, where it is acted upon by the cutting and shredding mechanism. After the material is cut it passes down the conduit 37 and is deposited on the endless carrier 64 and conveyed thereby to a place of deposit.

From the foregoing description of my machine it will be seen that the construction is such that most of the working parts are disposed compactly at the forward end of the machine and that also the construction of the lower frame is such as to adapt either an upper frame carrying husking-rollers and other necessary parts to make the machine operative as a husking and shredding machine to be readily attached and detached and when detached another hopper-like frame substituted therefor, which, together with the removal of the fan-casing and the substitution therefor of an endless carrier, will convert the husking and shredding machine into a complete and efficient ensilage-cutter.

While I have heretofore taken out Letters Patent No. 677,471, dated July 2, 1901, for improvements in combined corn-huskers and fodder-shredders, yet I do not herein claim any features claimed in said prior patent; but

What I do claim is—

1. The combination of a lower frame, an upper frame removably fitted thereto, means for causing the material fed into the machine to pass from one end of said machine toward the opposite end thereof, rotatable feed-rolls at the end of the machine adapted to receive the material so fed therebetween, rotatable cutting and shredding mechanism adapted to act on the material as it leaves the feed-rolls, and means for conveying material from the machine, after said material has been acted upon by the cutting and shredding mechanism.

2. The combination of a frame, cutting mechanism carried by the frame, rotatable husking-rollers journaled in the frame, a platform below the husking-rollers and provided with a series of open spaces through which shelled corn is adapted to pass, and an endless conveyer running over said platform and adapted to convey to the cutting mechanism the material passing between and falling below the husking-rollers.

3. The combination of a frame, a main drive-shaft mounted therein at the forward end of the frame and having a toothed wheel

thereon, an auxiliary shaft having a toothed wheel engaged by the toothed wheel of the main shaft, and also having a beveled gear-wheel mounted thereon, husking-rollers journaled in the frame, the corresponding ends of the journals of said rollers provided with intermeshing gear-wheels, and the opposite journal of one of the rollers provided with a beveled gear-wheel meshing with the beveled gear-wheel of the auxiliary shaft, an endless conveyer below the husking-rollers, feed-rollers at the forward end of the conveyer, said feed-rollers being geared together, and the journal of one of said rollers provided with a pinion, said pinion being in mesh with a toothed wheel on the drive-shaft, a system of gearing between said pinion of the feed-roll and the forward roll of the conveyer mechanism, cutting and shredding mechanism mounted on the main shaft, a fan-casing below the cutting and shredding mechanism, a fan within said casing, and a belt connection between the fan-shaft and the main shaft.

4. The combination of a frame, rotatable husking-rollers journaled therein, the forward portions of said rollers provided with means for separating the stalks from the ears of corn, and the remaining portions of said rollers provided with husking means, a hopper at the upper portion of the frame, and a board arranged above the rollers and extending at a downward incline from the rear end of the hopper toward the front end thereof for such a distance as to compel, in the first place, the grasping by the separating ends of the rollers of the ends of the cornstalks which project beyond the inclined board, and said inclined board thereby also adapted to tilt the stalks toward a vertical position.

5. The combination of an upper frame, means for causing the material fed into the machine to pass from one end of said machine to the other, rotatable feed-rolls carried by the upper frame, and arranged at one end of said frame, and adapted to receive therebetween the material fed through the machine, rotatable cutting and shredding mechanism carried by the upper frame and arranged in said upper frame in position to act on the material as it leaves the feed-rolls, a lower frame to which the upper frame is removably fitted, and means for conveying the material from the machine, after said material has been acted upon by the cutting and shredding mechanism, said means being carried by the lower frame.

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

AUGUST ROSENTHAL.

Witnesses:

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ANNA V. FAUST.