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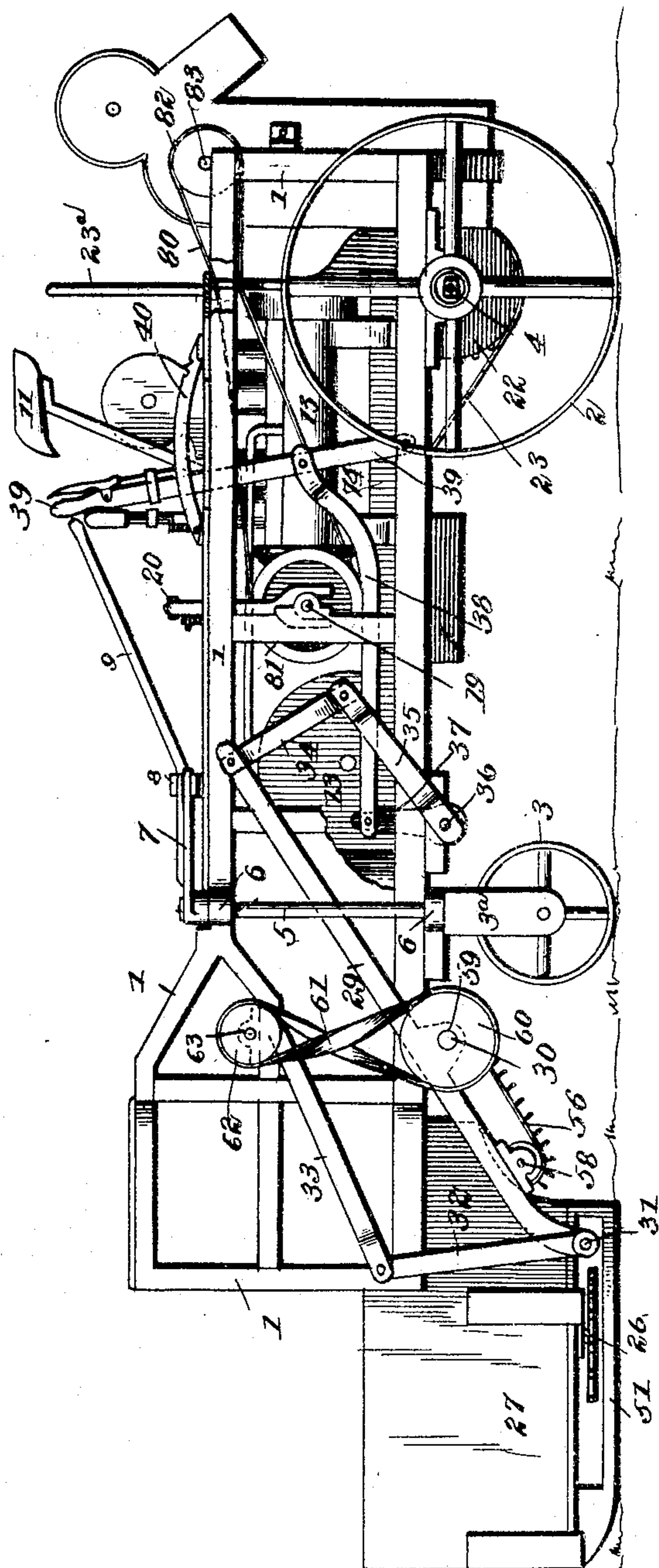
PATENTED JAN. 10, 1905.

R. H. PURNELL.
COTTON HARVESTER.

APPLICATION FILED MAY 16, 1904.

6 SHEETS—SHEET 1.

Fig. 1.



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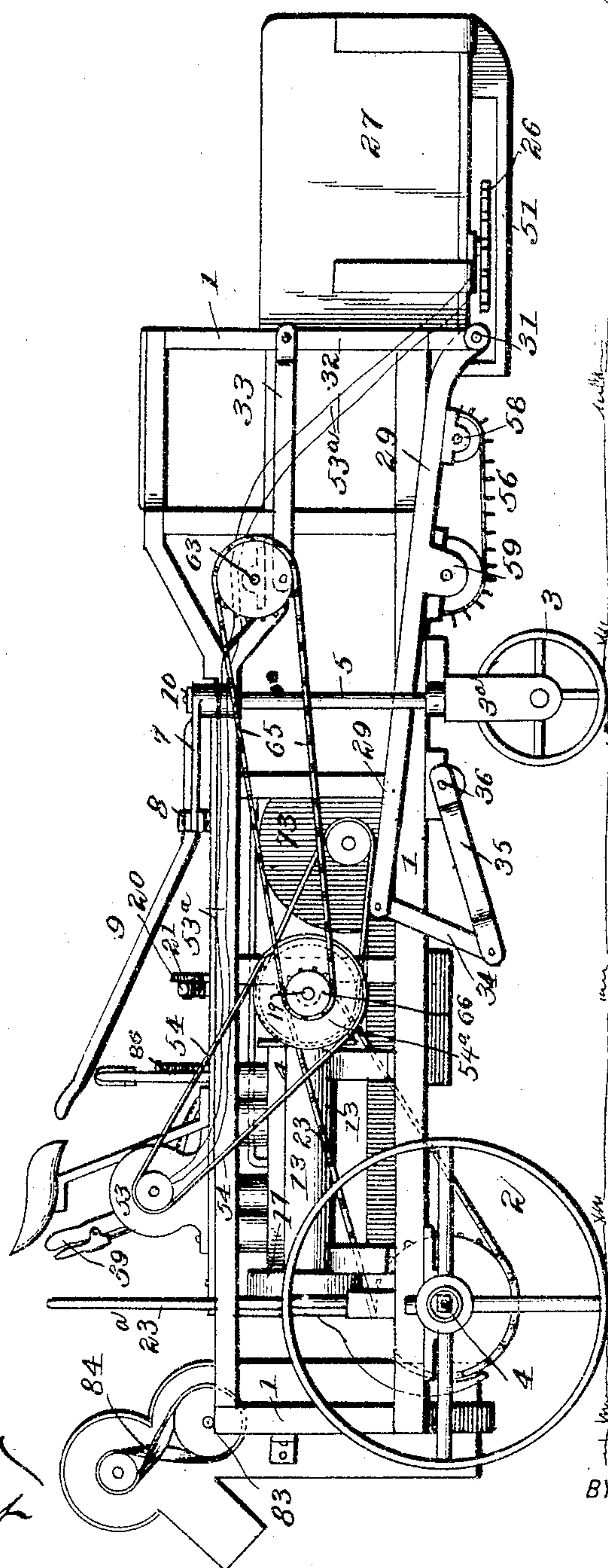
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6 SHEETS—SHEET 2.



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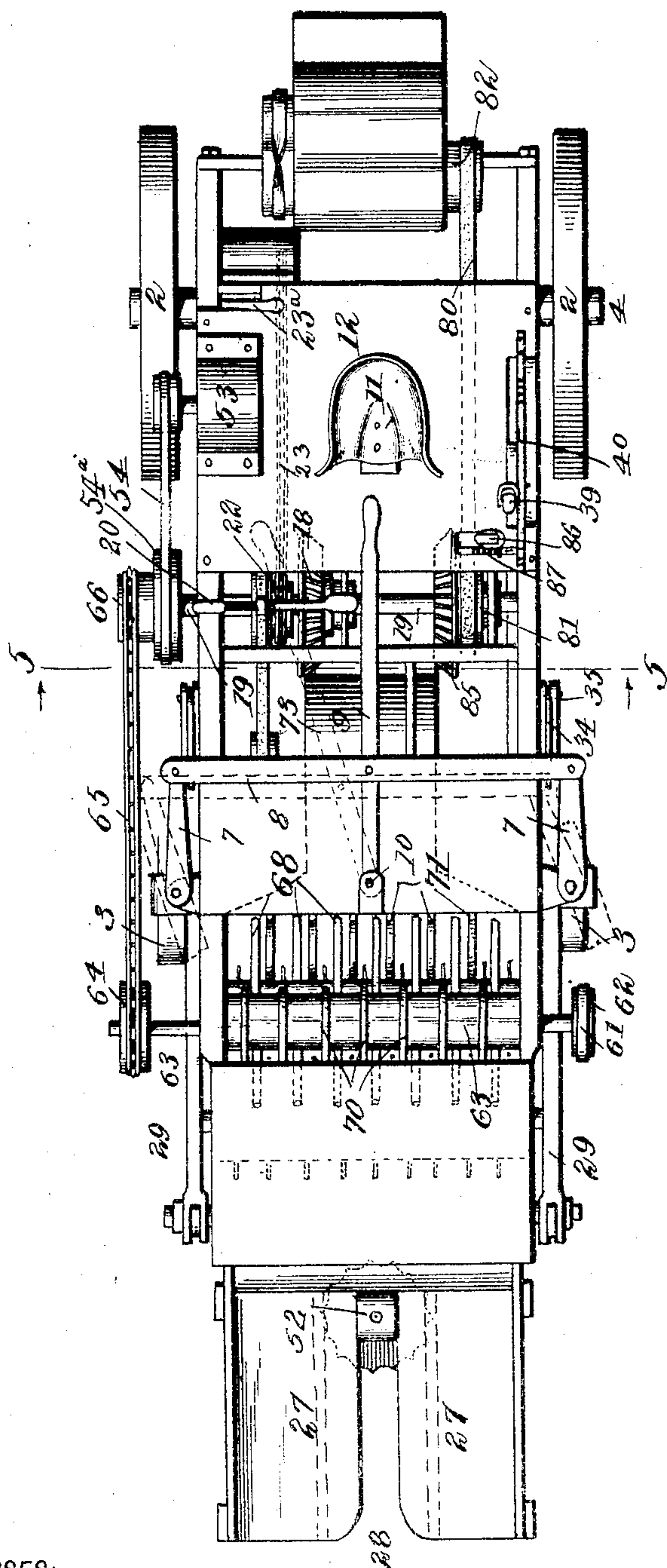
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Fig. 3.



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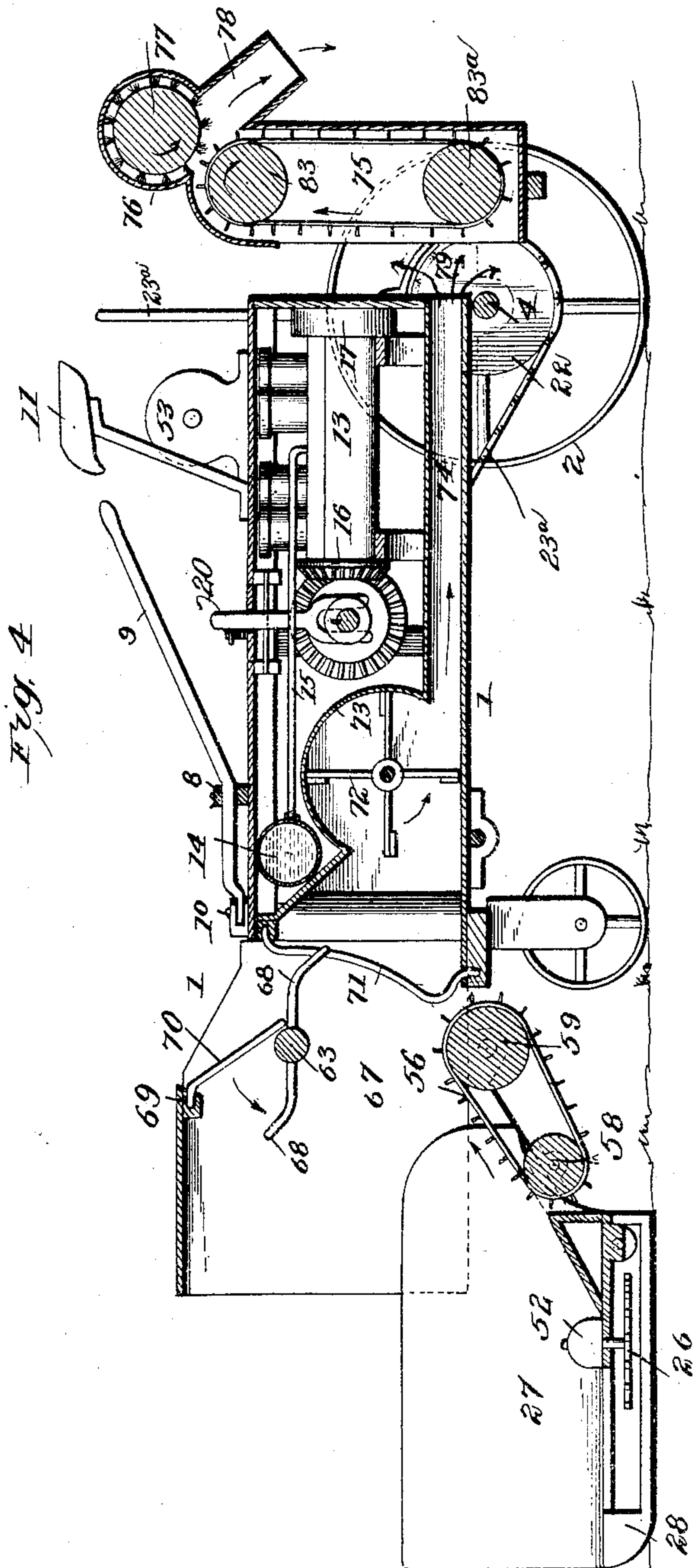
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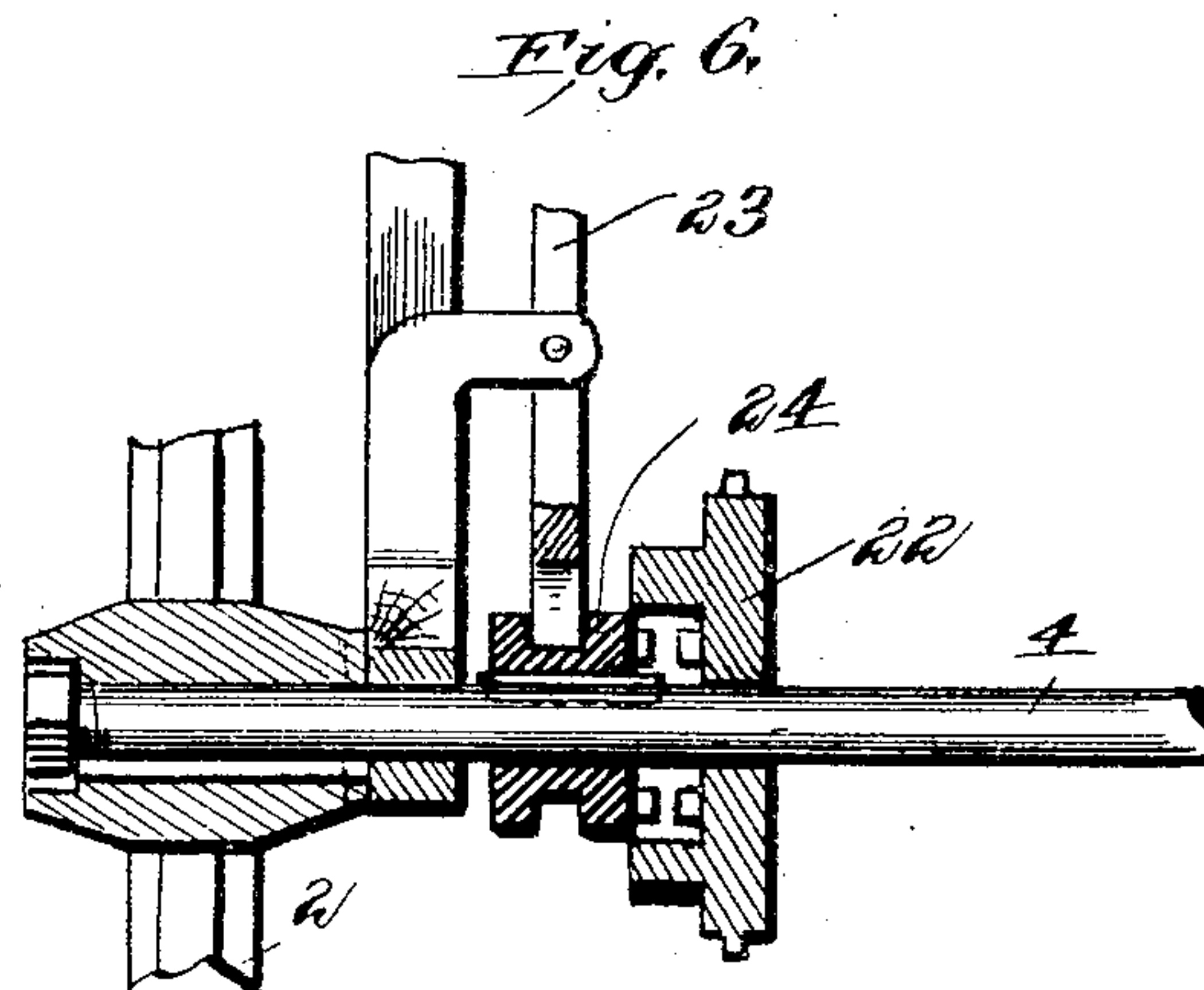
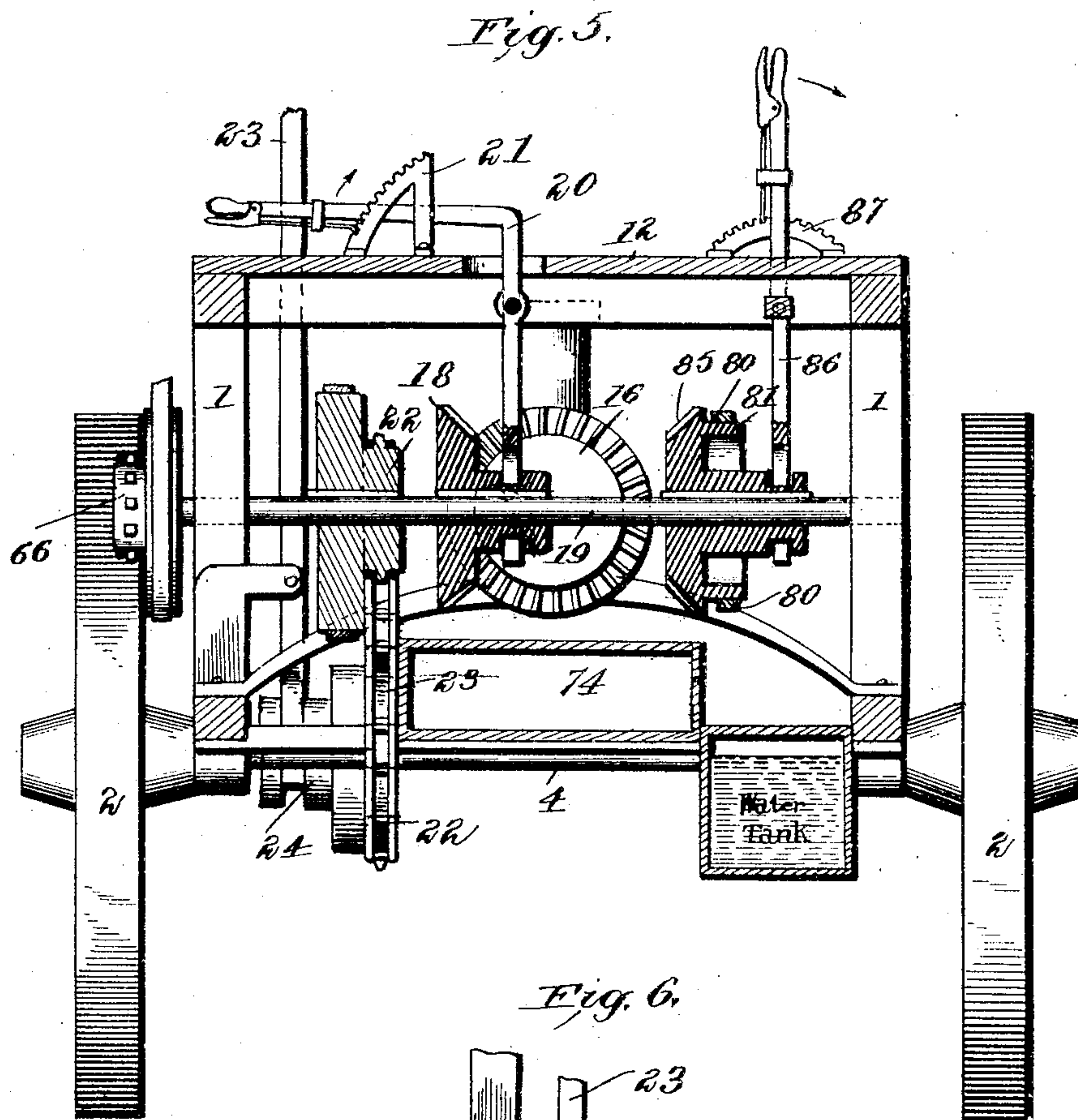
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UNITED STATES PATENT OFFICE.

RICHARD H. PURNELL, OF ROSEDALE, MISSISSIPPI.

COTTON-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 779,965, dated January 10, 1905.

Application filed May 16, 1904. Serial No. 208,197.

To all whom it may concern:

Be it known that I, RICHARD HOPE PURNELL, a citizen of the United States, residing at Rosedale, in the county of Bolivar and State of Mississippi, have made certain new and useful Improvements in Cotton-Harvesters, of which the following is a specification.

My invention is an improvement in that class of cotton harvesters or pickers in which mechanical appliances are employed for separating the cotton from the stalks and bolls.

My improved machine severs the cotton-stalks as it advances along a row of cotton-plants, and the cotton is then separated from the stalks and bolls by pneumatic means all practically at one operation.

A principal feature of the machine is the provision of a cutter for severing the stalks and the arrangement of the same upon a vertically-adjustable support and carrier and the special means for effecting the vertical adjustment of the same, which corresponds to the inclination of the surface of the cotton-field or the height of the cotton-ridge relative to the adjacent surface, and also to any obstructions or obstacles, such as stumps or rocks, which may be located in the field.

Another principal feature of the machine is the means for effecting the operation of the stalk-cutting device. I employ for this means a dynamo which is connected with a motor applied directly to the cutter and carried and supported by the same part of the machine as the cutter.

My invention also includes an improved arrangement in the pneumatic and mechanical means for separating the cotton from the stalks and bolls.

The details of construction, arrangement, and operation of parts are as hereinafter described, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved machine. Fig. 2 is an elevation of the opposite side of the same. Fig. 3 is a top plan view. Fig. 4 is a central longitudinal section. Fig. 5 is a vertical transverse section on the line 5 5 of Fig. 3. Fig. 6 is a detail section illustrating the brake attachment and

the spline connection between the rear axle and wheels.

The main frame 1 of the machine is practically oblong and rectangular and is supported by four wheels 2 2 and 3 3. The rear wheels 2 have a spline connection with the rear axle 4, as indicated in Fig. 6, and the axle is driven by a motor, as will be presently described. These wheels therefore serve as means for propelling the machine in the cotton-field and on roadways, &c. The smaller front wheels 3 are journaled in the forks 3^a (see Figs. 1 and 2) of vertical shafts 5, the same being journaled in suitable bearings 6 on the sides of the frame 1. Crank-arms 7 (see Fig. 3) are keyed upon the vertical shafts 5, and their free ends are connected by a transverse bar 8. This bar is pivotally connected with the hand-lever 9, which is pivoted at 10 and extends back horizontally into proximity with the operator's seat 11. The latter is supported upon a platform 12, which forms a means for connecting and bracing the sides of the frame. It is apparent that by shifting the free end of the lever 9 laterally, as indicated by full and dotted lines, Fig. 3, the crank-arm 7 will be shifted correspondingly, and thus the forward wheels 3 may be set at any desired lateral angle or inclination to the general line of travel of the machine, so that the latter may be guided to the right or left or driven straight ahead, as conditions require.

In order to provide for turning the machine easily from right to left, or vice versa, the rear wheels 2 will in practice be provided with a pawl engaging a ratchet on the rear axle 4. Since this is a common attachment of harvesters and traction-engines, it is unnecessary to describe it.

A gasolene-engine 13 (see Figs. 1, 2, and 4) is located centrally in the rear portion of the frame, and a gasolene-tank 14 is arranged in the forward portion and connected with the engine by a pipe 15. The engine-shaft is arranged horizontally, and on its forward end is keyed a beveled driving-gear 16 and on its rear end a balance-wheel 17. As shown best in Figs. 3 and 5, the gear 16 meshes with a

corresponding one, 18, which is keyed upon a transverse shaft 19, the latter being journaled in the frame 1. The gear 18 has a sliding-spline connection with the shaft 19 and may
 5 be adjusted for throwing it into and out of gear with the driver 16 by means of an elbow-lever 20, (see Fig. 5,) the same being pivoted beneath the top platform 12 and its free end provided with a locking device which engages
 10 a segmental rack 21. The shaft 19 is connected with the rear axle 4 by sprocket-chain 23, running on wheels 22. (See Figs. 2 and 5.) When gear 18 is engaged with the driver 16, the machine will be run backward, provided the rear axle is duly locked with the
 15 rear wheels. This is effected by a clutch 24, (see Fig. 6,) the same sliding upon a feathered portion of the axle and being adapted to lock with the sprocket-wheel 22. The clutch is
 20 adjusted by a hand-lever 23^a.

I will now describe the principal features of my machine, whereby it is adapted for the harvest operation proper.

A rotary cutter 26 is mounted upon a support and carrier 27, arranged at the front of
 25 the frame 1 and adapted for vertical adjustment by means which will be presently described. The support and carrier 27 has a horizontal bottom and vertical sides, it being
 30 open at each end and preferably, also, at the top, as shown. It is slotted longitudinally at 28 up to the axis of the cutter 26 in order to provide a passage-way for the cotton-stalks. The means for supporting and adjusting the
 35 part 27, with the attached cutter, higher or lower are as follows: On each side of the machine is pivoted a long lever 29, the same being pivoted on a transverse shaft 30, which is journaled in suitable bearings beneath the
 40 frame 1 and in front of the guide-wheels 3. The forward ends of these side levers 29 are pivotally connected with a transverse shaft 31, which extends across beneath the rear portion of the cutter-carrier 27 and is secured
 45 thereto in such manner that its journals may rock or turn freely in the levers. It is apparent that by depressing the rear ends of the levers 29 the cutter-carrier 27 may be raised, and it of course may be lowered by
 50 reversing the movement. In order to maintain the cutter-carrier 27 horizontal during such vertical adjustment, I provide the axle 31 with rigid crank-arms 32 and connect their upper ends with the frame 1 by means of links
 55 or rods 33. (See Figs. 1 and 2.) Thus the arms 32 being fast with the axle 31, they maintain a nearly vertical position when the cutter-carrier 27 is being raised or lowered by means of the levers 29. In other words, while the
 60 upper ends of the levers 32 necessarily move through the arc of a circle the curvature is so slight that the carrier 27 remains practically horizontal. For the purpose of adjusting the levers 29, and thereby raising or lowering the
 65 cutter-carrier 27, I provide the following

means, (see especially Fig. 1:) The rear ends of said levers 29 are connected by a link 34 with the crank-arms 35 of a rock-shaft 36, which is journaled horizontally in bearings on the under side of the frame 1 just in rear
 70 of the guide-wheels 3. This shaft 36 has a shorter arm 37, which is connected by a rod 38 with a hand-lever 39, that is pivoted to the sill of the frame 1 and extends above the top of the latter frame, as shown in Fig. 1, it being
 75 provided with means for locking it to the segment 40. This lever 39 is thus accessible to the driver seated at 11, and by shifting it forward or back the compound system of levers is operated as required for adjusting the
 80 cutter-carrier down or up, as conditions require. The arrangement of parts and the power of the lever system is such that the adjustment may be effected without difficulty.

The cutter-carrier 27 is provided on its under
 85 side with two parallel runners 51, the same being arranged parallel to the edges of the slot 21 and in close proximity thereto, as indicated by dotted lines, Fig. 3. It will be understood that the cutter-carrier 27 may be
 90 lowered so that the runners slide on the ridge adjacent to the cotton-row, or it may be held, by means of the lever system, raised above the ground, and thus supported by the levers
 95 alone while the cutter is in action. It will ordinarily, however, be supported upon the runners 51.

The cutter 26 is operated by means of an electrical motor 52. (See especially Fig. 3.) This motor is driven from a dynamo 53, located upon the operator's platform 12, wires
 100 53^a connecting them, as shown in Fig. 2. The dynamo is driven by a belt 54, which connects its shaft with a pulley 54^a on the main shaft 19. It is apparent that the motor 53
 105 may be arranged upon the slotted platform of the cutter-carrier and so incased as to occupy comparatively small space, and thus furnish no serious obstruction to the passage of the severed cotton-stalks over it. The stalks pass
 110 rearwardly up an incline (see Fig. 4) upon an endless traveling and toothed belt 56, that runs on rollers 58 and 59. The roller 58 is journaled in bearings attached to the levers 29 just in rear of their points of connection
 115 with the cutter-carrier 27. The rear roller 59 is keyed upon the transverse shaft 30, whereon the levers 29 are journaled, as before described. This shaft 30 is driven, so as to cause the toothed belt to travel in the direction
 120 indicated by arrows in Fig. 4, by the following means: As shown in Fig. 1, a pulley 60 is keyed upon one end of the roller-shaft 30 and connected by a crossed belt 61 with a pulley 62, which is fast upon a transverse shaft 63. On the other side of the machine (see Fig. 3) the shaft 63 is provided with a sprocket-wheel 64, and a chain 65 connects this with a sprocket-wheel 66 on the main shaft 19. Thus the latter drives
 125 130

the shaft 63 through the medium of the sprocket connection, and the shaft 63 in turn drives the roller-shaft 30 through the belt connection. The severed cotton-stalks, with the bolls attached, are carried backward by the toothed belt 56 into a chamber or space 67, (see Fig. 4,) which is provided in the front portion of the machine. Here the stalks are separated from the cotton by means of rotary beaters and grids, as will now be described. The rotary shaft 63, before referred to, is provided with two series of bent arms 68, which are arranged opposite and bent at an obtuse angle at about the middle of their length. They are constructed of metal, so as to have maximum strength and rigidity combined with lightness and reduction in size. From a cross-bar 69, arranged in the upper front portion of the frame, arms 70 project downward at an angle of about forty-five degrees, their lower ends being just in rear of and above the shaft 63. These arms 70 constitute practically a grid, (see Fig. 3,) their arrangement being such that the arms 68 of shaft 63 pass between them as the latter rotates. Another grid, 71, is arranged in a nearly vertical position at the rear of the chamber 67. This grid is formed of a series of supplemental rods, the same being bent forward slightly near their lower ends and the arrangement being such that the ends of the arms 68 pass between them in the course of rotation. The direction of rotation is indicated by arrow in Fig. 4. It will be seen that the stalks and the cotton are swept together upward against the grid 71 by means of the bent arms 68 of shaft 63, the inclined portions of the arms having in this operation an important function, since they clear themselves of the stalks as the rotation proceeds and they pass between the arms of the grid 70. In rear of the grid 71 is arranged a suction-fan 72, the same being provided with a suitable casing or hood 73, having its front end enlarged, as shown. This fan being driven at a rapid rate a strong blast is created, which takes the ripe cotton from the bolls, and thus separates it from the stalks at the time they are swept upward and broken and compressed against the grid 71. From the fan-chamber the cotton, together with such foreign matter as may be mingled therewith, is swept along through a capacious channel 74 to the rear end of the machine, where the cotton is driven forcibly against a toothed belt 75. The latter conveys it upward into a hood 76, where a rotary brush 77 removes it from the toothed belt and delivers it into a spout 78, from whence it is discharged into a suitable receptacle, (not shown,) forming a traveling attachment of the machine. It will be noted that at 79 (see Fig. 4) a space is provided between the rear end of the cotton-conduit 74 and the toothed belt 75. This is done for the purpose of providing escape for

leaves and other material, which may be carried backward with the cotton—that is to say, while the cotton will adhere to the belt by impact the other material will be for the most part diverted or fall away and escape laterally or upward and downward, as the case may be, the blast from the fan 72 being effective in producing this result.

The means for driving the toothed belt 75 are the following: As shown in Fig. 1, a belt 80 runs from a pulley 81 on the driving-shaft 19 to a pulley 82, which is keyed upon the journal of the upper belt-roller 83. (See Fig. 4.) The lower belt-roller 83^a is an idler or driven by the belt itself. On the opposite side of the machine from that shown in Fig. 1 a crossed belt 84 (see Fig. 2) connects the belt-rollers 83 with the brush-roller 77. Thus the latter is driven in the opposite direction to the belt-roller 83, as indicated by arrows in Fig. 4.

As before described, the rear wheels 2 and axle 4 may be locked together by clutch 24, engaging sprocket 22, Fig. 6. If now the bevel-gear 18 be thrown out of mesh with gear 16 on the driving-shaft and the opposite gear 85 be thrown into mesh with 16, the machine will be driven forward, since the gear 85 is splined with shaft 19, as shown in Fig. 5. The same is adjusted by a pivoted hand-lever 86, which locks with a segment 87.

The cotton-separator, comprising the toothed belt 75 and brush 77, is operated by a belt 80, which runs from pulley 81, formed integrally with gear 85, to a pulley 82, (see Fig. 1,) which is keyed on the roller 83. As shown in Fig. 2, a crossed belt 84 connects the brush roller or shaft 77 with belt-roller 83.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a harvester, the combination with the body having a front portion provided with a chamber, of a suction-fan located at the rear side of said chamber, a vertically-adjustable front part extended beyond the body, means for effecting the vertical adjustment of the front part, and supplemental means for maintaining the latter horizontal in any adjustment, a cutter located on the vertically-adjustable portion, and means for conveying the severed crop from the vertically-adjustable portion into the chamber of the body, substantially as described.

2. In a harvester, the combination, with the body, of a vertically-adjustable front portion having a central lengthwise slot, a rotary cutter located at the rear end of said slot, levers pivoted on the body and to the adjustable front portion, supplemental lever mechanism connected with such pivoted levers for raising and lowering the latter and maintaining it in horizontal position, an endless toothed belt and rollers on which the same runs, one being located at the rear end of the aforesaid

adjustable front portion, and the other having its journals coincident with the pivots of the levers by which the said front portion is adjusted, substantially as described.

5 3. In a harvester, the combination with the body, and a vertically-adjustable front portion having a slot for receiving the growing crop, a cutter located thereon for severing the crop from its base, and a system of compound
10 levers connected with the adjustable front portion and forming the support and means of adjustment for the same, and a supplemental lever duly connected with the aforesaid lever system for operating the same in the manner
15 described.

4. In a harvester, the combination with the body, of an adjustable front portion, and a cutter carried thereby and adapted for severing a growing crop, means for operating said cutter,
20 and means for supporting and vertically adjusting the front portion, the same comprising levers pivoted on the body and pivotally connected with the front portion, means for holding the front portion horizontal while being
25 adjusted, a rock-shaft, and means for connecting it with the rear ends of the levers which support and adjust the said front portion, and a hand-lever arranged vertically and a link and crank-arm by which it is connected
30 with the aforesaid rock-shaft, substantially as described.

5. In a harvester, the combination with a body, of a vertically-adjustable front portion and means for adjusting it and holding it parallel in any adjustment, the said portion being provided with a lengthwise slot and runners arranged parallel and on opposite sides of said slot, and a rotary cutter arranged at the rear end of the slot, and means for operating it, for severing a growing crop, substantially
40 as described.

6. In a harvester, the combination with a body having a suction-fan, and a passage leading therefrom, of a front portion having a cutter for severing the standing crop, a grid located in front of said fan, and a device arranged in front of the grid and serving to carry the stalk and cotton-bolls upward against the grid, substantially as described.

50 7. In a harvester, the combination with the body, and a suction-fan located thereon, and a passage leading rearward from the latter, of a cutter located in the front and adapted for severing a standing crop, and a grid arranged
55 between the fan and cutter, substantially as and for the purpose specified.

8. In a harvester, the combination with a body having a suction-fan, and a passage leading therefrom, of a cutter arranged in the front, means for operating said cutter, means for conveying the severed crop backward from the cutter, a grid arranged practically vertical in rear of the conveyer, and means for releasing the stalks and bolls upward along the
60 grid, and a second grid arranged opposite and

above the first-named one, whereby the cotton is separated from the stalk and the latter ejected, substantially as described.

9. In a harvester, the combination with the body and a suction-fan having a discharge-passage, of a cutter located in the front, a grid arranged intermediately of the fan and cutter, and a rotary shaft provided with a series of arms adapted to coact with the grid, the front portion of the machine above the grid being
75 open, whereby the stalks separated from the cotton are forced upward and ejected, substantially as described.

10. In a harvester, the combination with the body, and a suction-fan arranged thereon and
80 provided with a discharge-passage, of a cutter arranged in the front, and means for operating the same, and a rotary device having a series of bent arms, the same being arranged in front of the fan, and adapted to act upon the
85 crop for forcing the stalks upward while the cotton is removed by suction, substantially as described.

11. In a harvester, the combination with the body having a suction-fan and a discharge-passage, of a cutter located in front and means for operating it, a grid arranged in front of the fan, a second grid located above and diagonally from the first-named grid, the top of the machine being open adjacently, a rotary
90 shaft arranged below the second grid and having a series of curved arms adapted to pass between the bars of both grids, substantially as described.

12. In a harvester, the combination with the body, and dynamo located thereon, of a cutter located on the front portion of the machine, an electrical motor connected with said cutter, and conductors extending between the dynamo and motor for operating the latter, substantially
105 as described.

13. In a harvester, the combination with the body having a dynamo arranged thereon, and means for operating the same, a rotary cutter arranged on such adjustable portion, an electrical motor applied to the shaft of the cutter, and conductors extending between the dynamo and motor whereby the latter is operated at whatever vertical height the cutter may be,
110 substantially as described.

14. In a harvester, the body having a rotatable rear axle, and wheels locked therewith, of means for guiding the said wheels for propelling the harvester, front guide-wheels journaled in the forks of vertical shafts and a lever connected with said shafts and for locking them to change the angle of the front wheels as required for guiding the machine right or left, and a vertically-adjustable front portion having a cutter carried thereby, means for
120 operating the cutter, and means for adjusting such front portion higher or lower, substantially as described.

15. In a cotton-harvester, the combination with the body, of a suction-fan located there-
125

on, and having a rearward-extending passage, of means located on the front of the body for severing and receiving the cotton-stalks, a movable device arranged opposite the discharge end of the passage from the fan, but separated therefrom by a space which allows lateral discharging of foreign substances carried along with the cotton, substantially as described.

10 16. In a cotton-harvester, the combination with the body, and means for severing the stalks, a grid arranged in the front of the body, a rotary shaft provided with arms adapted to cooperate with the grid for forcing the stalks and bolls upward against and along the grid, a suction-fan arranged in rear of the grid and having a rearward discharge-passage,

an endless traveling belt arranged opposite the discharge end of such passage, and a rotary brush arranged to act upon the belt for freeing the cotton that adheres to it, substantially as described.

17. In a cotton-harvester in combination with the body, of a suction-fan located thereon, means for severing and receiving the cotton-stalks, and a movable device arranged at the rear end of such passage against which the cotton is discharged, and means for removing the cotton from such device, substantially as described.

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