

No. 720,685.

PATENTED FEB. 17, 1903.

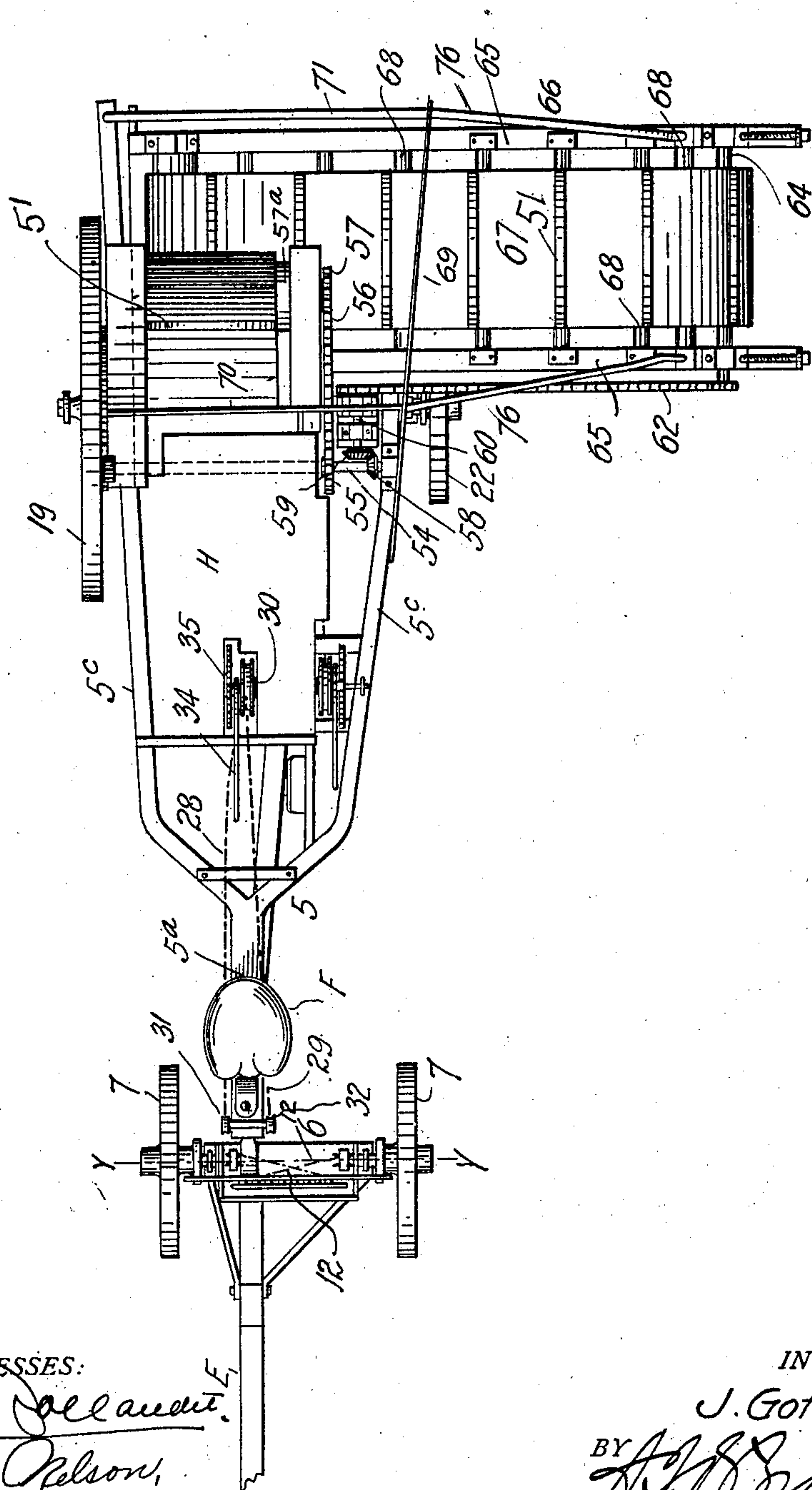
J. GOTTLANDER.
GRADER.

APPLICATION FILED DEC. 16, 1901.

NO MODEL.

5 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:
[Signature]
Dana Nelson,

INVENTOR.
J. Gottlander
BY *[Signature]*
ATTORNEY.

No. 720,685.

PATENTED FEB. 17, 1903.

J. GOTTLANDER.
GRADER.

APPLICATION FILED DEC. 16, 1901.

NO MODEL.

5 SHEETS—SHEET 2.

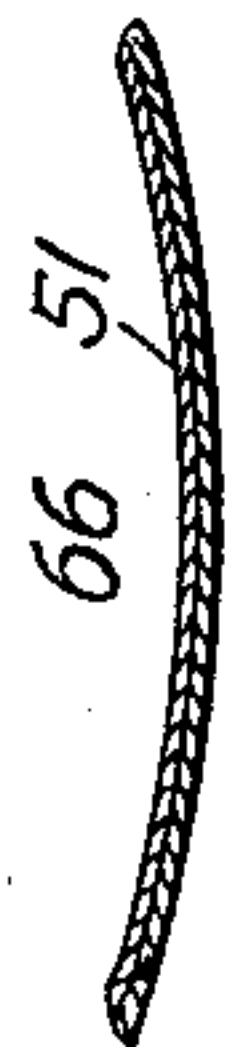
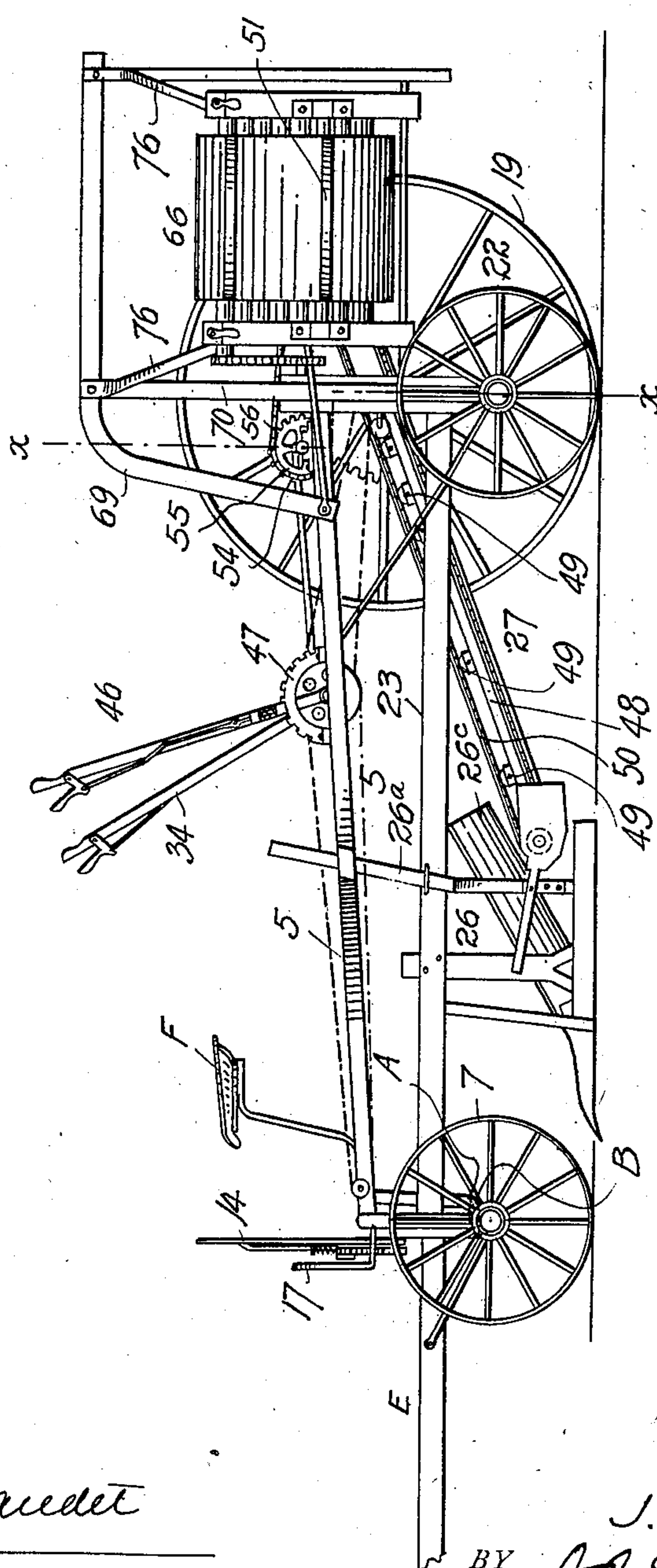


FIG. 12

FIG. 2.

WITNESSES:

G. J. O. Bellandier
Dana Nelson.

INVENTOR.

J. Gottlander.

BY

[Signature]
ATTORNEY.

No. 720,685.

PATENTED FEB. 17, 1903.

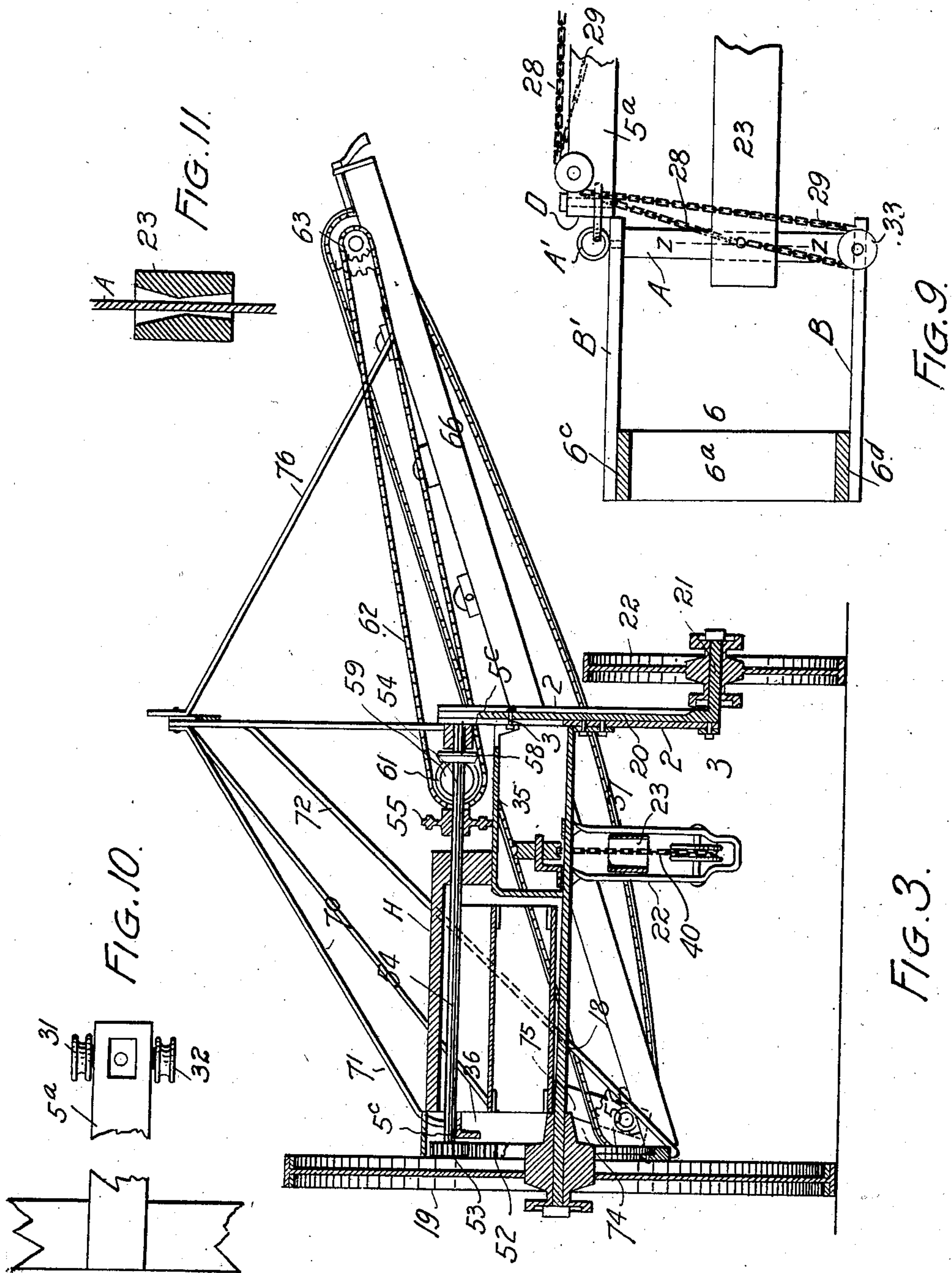
J. GOTTLANDER.

GRADER.

APPLICATION FILED DEC. 16, 1901.

NO MODEL.

5 SHEETS—SHEET 3.



WITNESSES:
J. F. O. O'Connell
Dena Nelson.

INVENTOR.
J. Gottlander.
BY *[Signature]*
ATTORNEY.

No. 720,685.

PATENTED FEB. 17, 1903.

J. GOTTLANDER.
GRADER.

APPLICATION FILED DEC. 16, 1901.

NO MODEL.

5 SHEETS—SHEET 4.

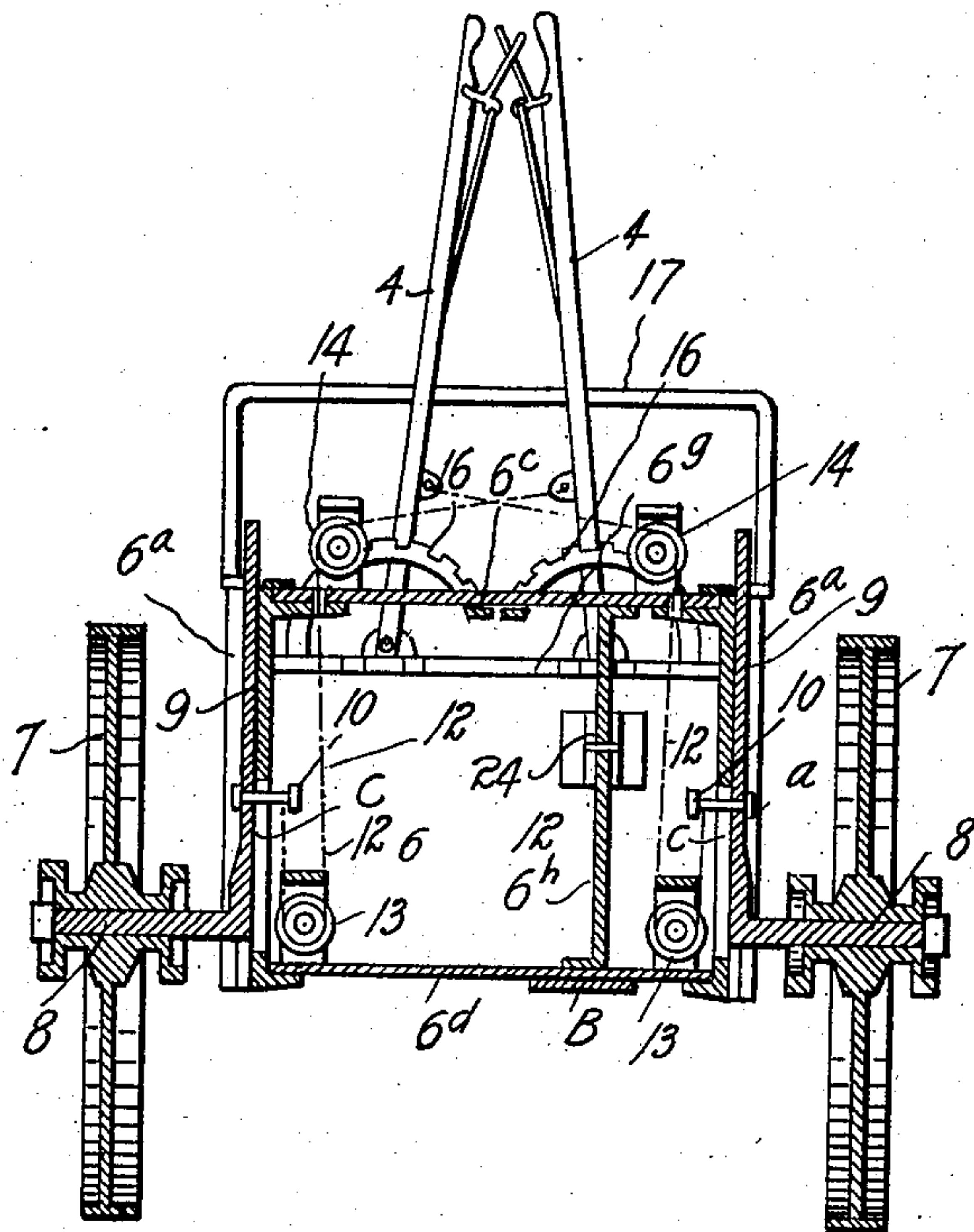


FIG. 4.

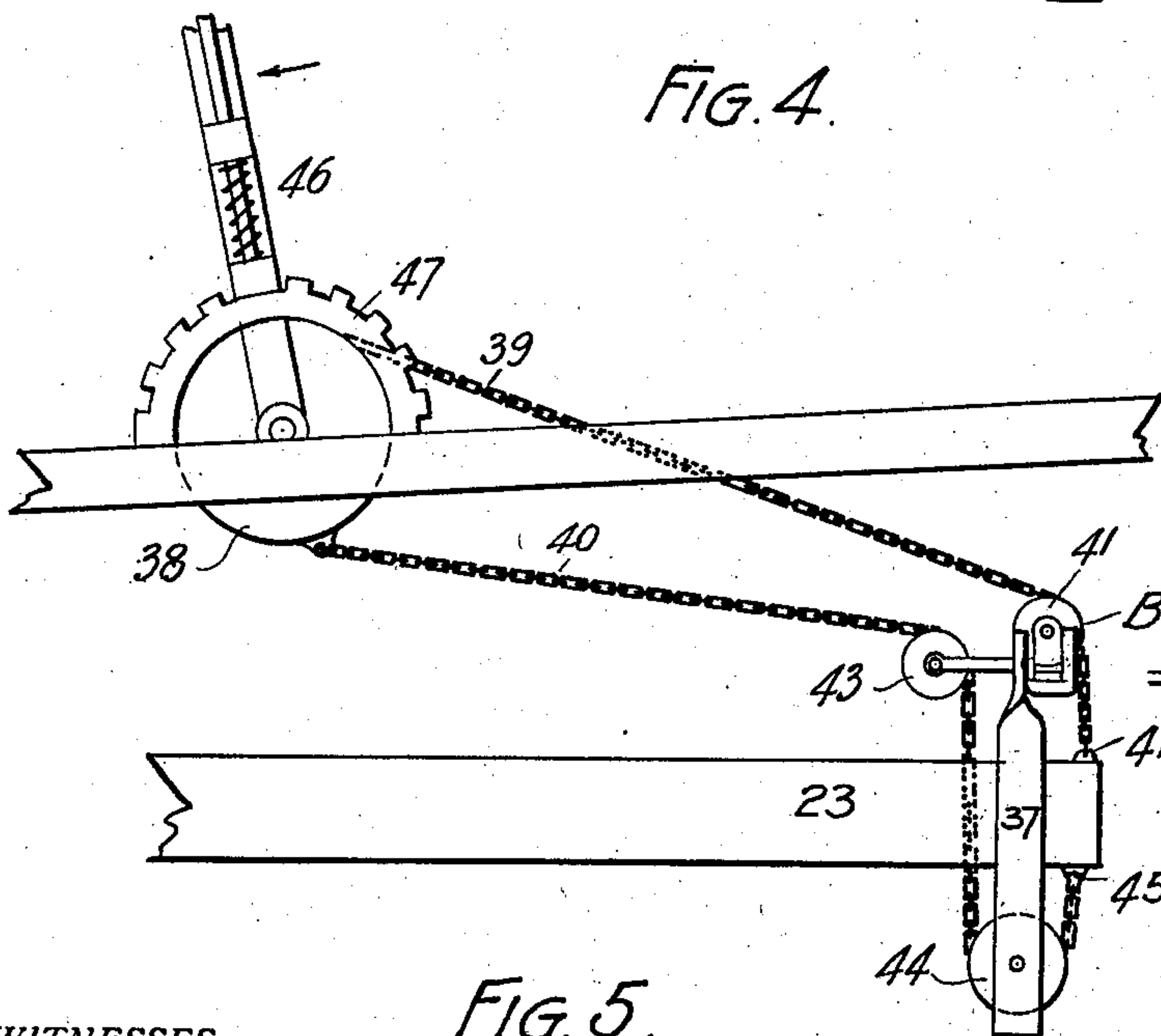
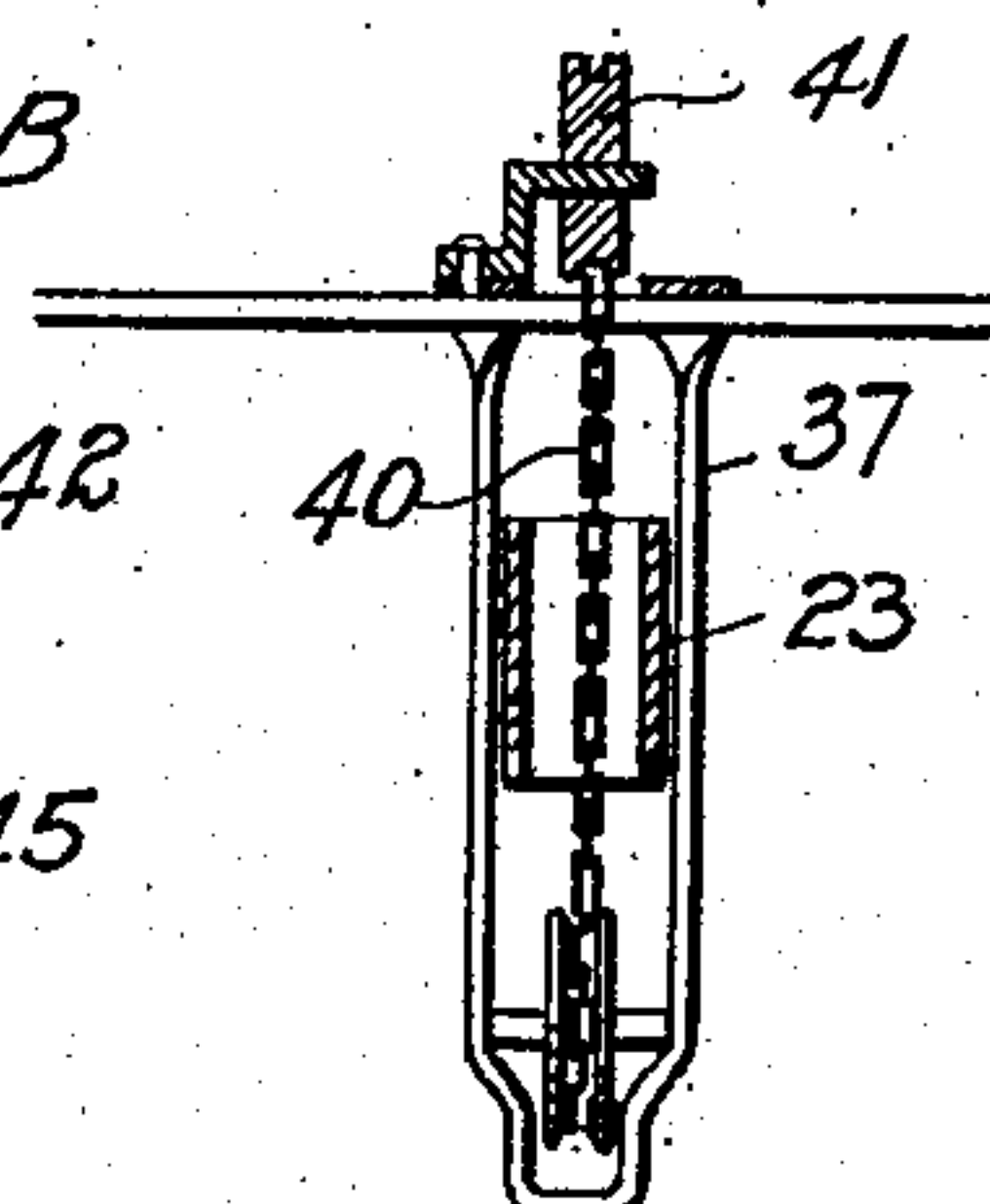


FIG. 5.

FIG. 6



INVENTOR.

J. Gottlander.

BY

A. G. Baker
ATTORNEY.

WITNESSES:
J. J. O'Connell
Dana Nelson.

No. 720,685.

PATENTED FEB. 17, 1903.

J. GOTTLANDER.
GRADER.

APPLICATION FILED DEC. 16, 1901.

NO MODEL.

5 SHEETS—SHEET 5.

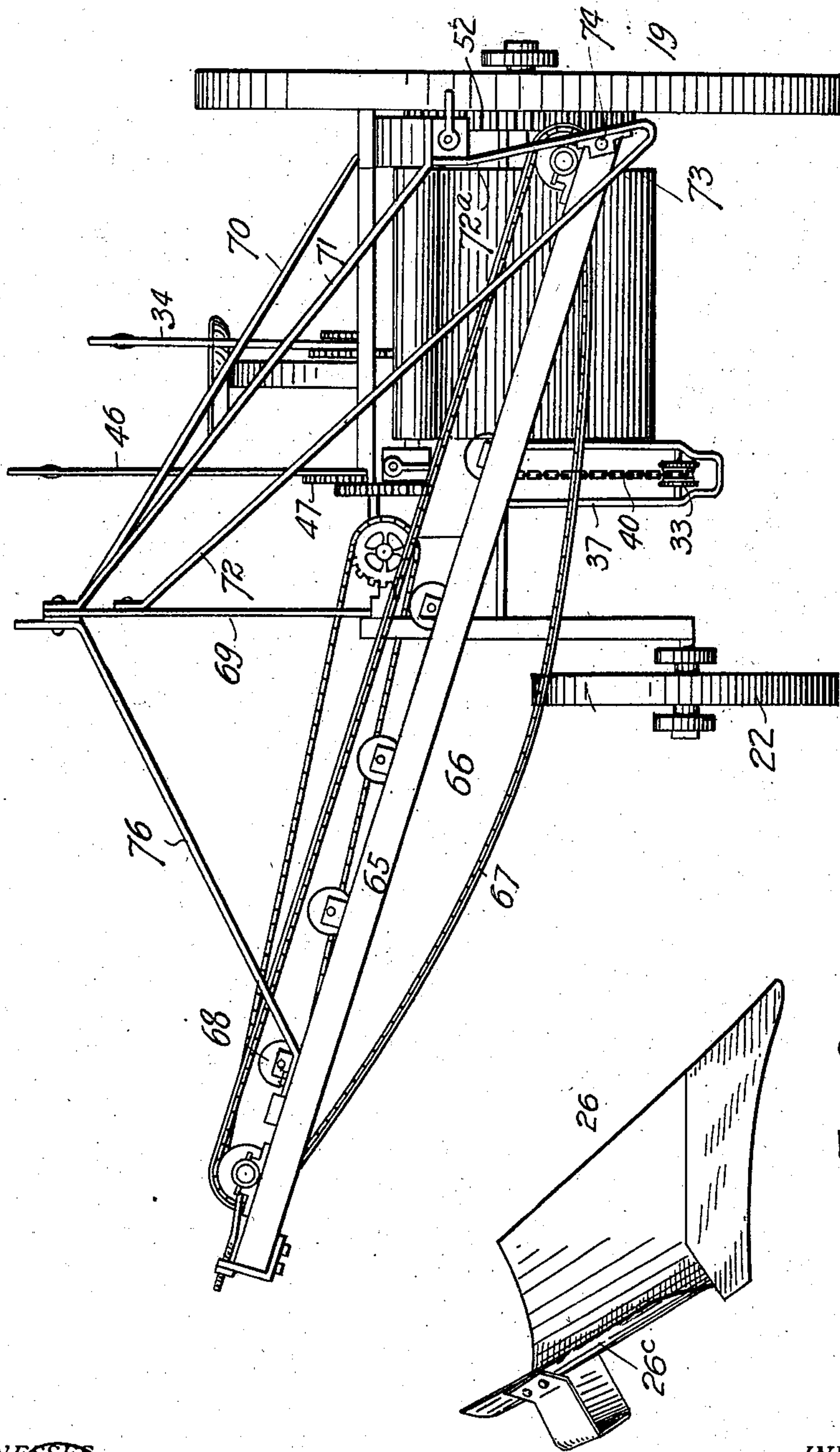


FIG. 7.

FIG. 8.

WITNESSES:
G. J. Belland
Dena Nelson

INVENTOR.
J. Gottlander
BY *A. B. Baker*
ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN GOTTLANDER, OF DENVER, COLORADO, ASSIGNOR OF ONE-HALF TO
THOMAS STARK, OF COLORADO SPRINGS, COLORADO.

GRADER.

SPECIFICATION forming part of Letters Patent No. 720,685, dated February 17, 1903.

Application filed December 16, 1901. Serial No. 86,175. (No model.)

To all whom it may concern:

Be it known that I, JOHN GOTTLANDER, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Graders; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in graders; and it consists of the features, arrangements, and combinations hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a top or plan view of my improved grading apparatus. Fig. 2 is a side elevation of the same. Fig. 3 is a section taken on the line *x x*, Fig. 2, looking toward the right, shown on a larger scale. Fig. 4 is a section taken on the line *y y*, Fig. 1, looking toward the left, shown on a larger scale. Fig. 5 is a side elevation illustrating the means for controlling the rear extremity of the plow-beam, the parts being shown on a larger scale. Fig. 6 shows the depending guide-bracket viewed in a direction at right angles to Fig. 5. Fig. 7 is a rear elevation of the machine viewed in a direction opposite Fig. 3. Fig. 8 is a perspective view in detail of the plow detached from the beam. Fig. 9 is a side elevation, partly in section, showing the forward end of the frame and plow-beam. This is a distorted view. Fig. 10 is a top view of a portion of the same construction. Fig. 11 is a section taken through the forward extremity of the plow-beam where the vertical bar *A* passes therethrough. Fig. 12 is a section taken through the carrier fabric and one of the bent cross-bars of the carrier *66*.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the upper longitudinal framework of the machine. As shown in the drawings, the forward part 5^a

of this framework consists of a single bar, while its rear part is bifurcated and consists of two separated arms 5^c. The forward extremity of the part 5^a is made fast to a rectangular front frame 6, consisting of vertical side bars 6^a and horizontal top and bottom bars 6^c and 6^d, respectively. The front part of the machine is supported by wheels 7, journaled on stub-axles 8, whose inner extremities are provided with vertical standards 9, upon which the rectangular frame 6 is vertically movable. The sides 6^a of the frame are open to receive the bars 9, which are slidable therein. The lower part of each bar 6^a is slotted on the outside, as shown at *a*, to make room for the inner extremity of the axle as the frame moves vertically. The lower part of each bar 6^a is also slotted on the inside, as shown at *c*. Through each slot *c* is passed a bolt 10, which is made fast to a vertical bar 9. To each bolt 10 is secured one extremity of a chain 12, which passes downwardly under a pulley 13, mounted on the lower part of the frame 6, thence upwardly over a pulley 14, mounted on the upper part of the frame 6, and thence to a lever 4, whose lower extremity is fulcrumed on a cross-bar 6^e of the frame 6. The bar 6^e is located a short distance below the top bar 6^c. The levers 4 are arranged a suitable distance apart, and the chain 12, which passes upwardly on the right, is connected with the lever 4 farther to the left, while the left-hand chain 12 is connected with the right-hand lever 4. Each lever is provided with a cooperating notched quadrant 16 of ordinary construction. By means of these levers the frame part 6 may be raised and lowered one side at a time on the standards 9 of the axles 8. To raise the right-hand side of the frame 6, referring to Fig. 4, the left-hand lever is pulled toward the left, while to raise the left-hand side of the frame 6 the right-hand lever 14 is pulled toward the right. A U-shaped bar 17 is attached to the top of the frame 6 and extends above the same. This bar strengthens the structure.

The rear extremities of the arms 5^c of the framework are supported above the axle 18, (see Fig. 3,) upon which the large ground-wheel 19 is journaled. The extremity of the axle remote from the wheel 19 is secured to

an upright bar 2, in which is slidable vertically a bar 20, whose lower extremity is rigidly connected with a stub-axle 21, upon which the smaller ground-wheel is journaled.

5 By loosening or removing the bolts 3, which connect the frame-bar 2 with the bar 20, the rear part of the frame may be adjustable vertically on the bar 20. This may be necessary when the machine is running on a side hill
10 or for any reason the wheels 19 and 22 occupy surfaces in different horizontal planes.

Mounted on the rear axle 18 is a depending guide 37, through which the rear extremity of the plow-beam 23 passes. This plow-beam
15 is located beneath the framework 5. The plow 26 is rigidly secured to this beam intermediate its extremities. The plow is provided with a bar 26^a, which extends upwardly above the beam and passes through a guide-
20 strap fast on the upper framework 5. The rear portion of the moldboard 26^c of the plow is curved to cause the dirt to pass upwardly to the apron of an endless carrier or elevator 27 instead of passing off to one side, as the
25 dirt is thrown by a moldboard of ordinary construction. This result is obtained by curving the free edge of the moldboard upwardly, as shown in Fig. 8. The forward extremity of the plow-beam is vertically mov-
30 able on an upright bar A, whose lower extremity is pivoted in a short plate B, extending rearwardly from the frame-bar 6^d, to which it is attached. The bar A passes through an opening in the forward extremity of the
35 plow-beam, while its upper extremity is pivoted in a projection B', extending rearwardly from the bar 6^c. Above the part B the bar A terminates in an eye A', which is connected with a U-shaped part D, rigidly secured to the
40 frame-bar 5^a. This construction permits of sufficient movement between the plow-beam and the frame 6 to allow the machine to be turned when a team is hitched to a tongue E. The latter is secured to a frame part 6^h, as
45 shown at 24. The opening in the plow-beam through which the bar A passes is provided with inclined walls, the opening being largest at its upper extremities to permit the lateral tilting of the frame 6 without interfering with
50 the position of the beam. (See Fig. 11.) The forward extremity of the plow-beam is connected with two chains 28 and 29, whose rear extremities are attached to the periphery of a grooved pulley 30 at different points, one
55 above and the other below the axis of the pulley. The chain 28 passes over the top of the pulley and the chain 29 underneath the pulley. This pulley 30 is journaled on the upper framework 5. The chain 28 passes
60 forwardly from this pulley over a small guide-pulley 31 and thence downwardly, its lower extremity being directly connected with the forward extremity of the plow-beam. The other chain 29 passes forwardly from its
65 pulley over a small guide-pulley 32, thence downwardly under a guide-pulley 33, and thence upwardly to the forward extremity of

the plow-beam, to which it is made fast. The pulley 30 is made fast to a rock-shaft, to which is secured the lower extremity of a
70 hand-lever 34, arranged to coöperate with a notched quadrant 35. The guide-pulleys 31 and 32 are mounted on the forward extremity of the frame-bar 5^a, while the pulley 33 is mounted on the projection B of the bar 6^d.
75 As the lever 34 is moved rearwardly or toward the right (referring to Fig. 2) the forward extremity of the plow-beam is raised, while when said lever is moved in the opposite di-
80 rection the forward extremity of the plow-beam is lowered. The two chains when operated as aforesaid hold the plow-beam in the adjusted position, the one preventing it from moving upwardly and the other from
85 moving downwardly, as will be readily understood.

The rear extremities of the frame-bars 5^c are mounted on the frame parts 35 and 36, supported by the axle 18. The rear extremity of the plow-beam is vertically movable in
90 a depending guide 37, mounted on the framework, and is controlled through the instrumentality of a wheel 38, journaled on the frame, and two chains 39 and 40, the one being connected with the periphery of the wheel
95 above its axis and the other below its axis. The chain 39 passes over a pulley 41, mounted on the frame, and thence downwardly, its lower extremity being connected with the rear extremity of the plow-beam, as shown
100 at 42. The chain 40 passes over a pulley 43, thence downwardly under a pulley 44, and thence upwardly, its extremity being connected with the plow-beam, as shown at 45. The wheel 38 is operated by a lever 46, co-
105 operating with a notched quadrant 47. As the lever is moved in the direction indicated by the arrow in Fig. 5 the rear extremity of the plow-beam is raised by the chain 39. When properly adjusted, the chain 39 holds
110 it against further downward movement, while the chain 40 holds it against upward movement.

Pivotally mounted on the rear extremity of the plowshare and projecting thereunder
115 is an elevator or carrier frame 48, whose upper extremity is suitably supported on the framework. Journaled in this frame are rollers 49, supporting an endless carrier 50, the fabric of which is strengthened and shaped to
120 hold the dirt by transverse metal strips 51. This carrier is operated from the large rear wheel 19, which is provided with a fast gear-wheel 52, meshing with a pinion 53, fast on a transverse shaft 54, to which is made fast
125 a sprocket-wheel 55, connected by a chain 56 with a sprocket 57, fast on a journal of a drum or roller 57^a at the upper extremity of the carrier-frame. The shaft 54 is journaled on the rear upper portion of the framework and is
130 provided with a bevel-gear 58, meshing with a similar gear 59, fast on a short shaft 60, whose extremity remote from the gear 59 is provided with a sprocket-wheel 61, which is

connected by a chain 62 with a sprocket 63, fast on the journal extension of a roller or drum 64, journaled in the upper extremity of the side bars 65 of the frame of an inclined elevator or carrier 66, extending at right angles to the carrier 27. The lower extremity of the carrier 66 occupies a position underneath the upper extremity of the carrier 27, whereby the dirt discharged from the upper extremity of the one carrier falls on the lower extremity of the endless apron 67 of the other carrier. This apron is supported by rollers 68, journaled in suitable boxes mounted on the frame-bars 65.

15 An arm 69, whose lower extremity is made fast to the stationary framework of the machine, extends upwardly and is then bent rearwardly nearly at right angles and projects over the carrier 66. The rearward extremity of this arm 69 is supported by braces 20 70, 71, and 72, whose upper extremities are connected directly with the said arm 69 and whose lower extremities are secured to the frame. The brace 72 extends downwardly 25 from the frame, as shown at 72^a, and is then bent abruptly upward. Near the angle of this bend a box or bracket 73 is mounted on the part 72^a of the brace. This bracket supports one extremity of a rod or bar 74, whose 30 opposite extremity is supported in a hanger 75, depending from the stationary framework of the machine. (See Fig. 3.) From the rearward extension of the arm 69 lead two bars 76 to the bars 65 of the carrier-frame. These 35 bars 76 form the support for the outer extremity of the carrier 66.

When the apparatus is in use, a team is hitched to the tongue E and the plow-beam properly adjusted. The driver occupies a 40 position on the seat F, while the person who operates the levers 34 and 46 whereby the plow-beam is raised and lowered stands on a platform H, supported by the upper framework. As the plow passes through the ground 45 the abrupt curve of the moldboard causes the dirt to pass rearwardly to the apron of the carrier 27, whereby the dirt is carried upwardly and discharged on the lower extremity of the apron 67 of the carrier 66, whereby it 50 is carried laterally and discharged in a wagon or other suitable receptacle. (Not shown.)

Both carriers 27 and 66 are provided with transverse metal strips 51, which are bent to give them the dished appearance shown in 55 Fig. 12 while they are in the carrying position.

Having thus described my invention, what I claim is—

60 1. In a grading-machine, the combination with a suitable framework, of a plow whose moldboard is curved upwardly at its outer edge to prevent the dirt from passing over said edge, whereby the dirt is made to pass over the rear edge of the moldboard as the machine 65 moves forward, a beam to which the plow is secured, and a depending stirrup-shaped guide through which the rear extremity of

the plow-beam passes, and means connected with the front and rear extremities of the plow-beam for adjusting the latter vertically 70 and holding the same in the adjusted position against upward or downward movement, substantially as described.

2. In a grading-machine, the combination with a suitable frame, and ground-wheels 75 upon which the frame is mounted, of a plow-beam vertically movable, a plow mounted thereon, a depending stirrup-shaped guide through which the rear extremity of the plow-beam passes, and means for adjusting the 80 plow-beam vertically, substantially as described.

3. In a grading-machine, the combination with a suitable frame, of a plow mounted thereon and vertically movable, a wheel 85 mounted on the frame, chains connected with the periphery of the wheel at points respectively above and below its axis, their opposite extremities being connected with the forward extremity of the plow-beam, and suitable 90 guides for the chains, one of the chains passing over a guide above the plow-beam, and thence downwardly, being directly connected with the latter, while the other chain passes over a guide above the beam, thence 95 downwardly under a guide, and thence upwardly to the beam with which it is connected, substantially as described and for the purpose set forth.

4. In a grading-machine, the combination 100 with a suitable frame, of a plow mounted thereon and vertically movable, a wheel mounted on the frame, chains connected with the periphery of the wheel at points respectively above and below its axis, their oppo- 105 site extremities being connected with the rear extremity of the plow-beam, and suitable guides for the chains, one of the chains passing over a guide above the plow-beam, and thence downwardly being connected with the 110 latter, while the other chain passes over a guide above the beam, thence downwardly under a guide and thence upwardly to the beam with which it is connected.

5. In a grading-machine, the combination 115 with a suitable frame, and ground-wheels, of a plow mounted on the frame and vertically movable, wheels mounted on the frame, chains connected with the wheels at points respectively above and below their axes, one set of 120 chains being connected with the forward part of the plow-beam, and the other set of chains with the rear part of the plow-beam, and suitable guides mounted on the frame, two 125 of the chains, one from each wheel, passing over guides and thence downwardly to the respective extremities of the plow-beam, the other two chains, one from each wheel, passing over guides above the beam, and under guides below the beam and thence to the re- 130 spective extremities of the beam, substantially as described and for the purpose set forth.

6. In a grading-machine, the combination

with a plow, the front ground-wheels and stub-axles having upwardly-projecting parts at their inner extremities, of a forward frame part vertically adjustable upon the uprights
5 of the axles, the forward extremity of the plow-beam being connected with said frame from the rear, and a suitable draft-tongue connected with the said frame in front, substantially as described and for the purpose set
10 forth.

7. In a grading-machine, the combination with an upper framework, a plow and ground-wheels, of stub-axles upon which the front ground-wheels are journaled, said axles hav-
15 ing upright bars at their inner extremities, a front frame part vertically movable on the front parts of the stub-axles, and suitable means for moving said frame upwardly one side at a time, whereby it may be tilted, a
20 suitable connection between the forward extremity of the upper frame part, and a suitable connection between the forward extremity of the plow-beam and said front frame part, substantially as described.

25 8. In a grading-machine, the combination with the ground-wheels and upper frame part, of stub-axles having uprights at their inner extremities, a front frame part vertically movable in said uprights, hand-levers
30 fulcrumed on the said frame part, chains connected with said levers, and chain-guides mounted on the front frame part, the two chains passing from the levers in opposite directions, thence over two guides, thence

downwardly under two of the guides, and 35
thence upwardly, their extremities being connected with the uprights of the stub-axles, substantially as described.

9. In a grading-machine, the combination with a frame, and front and rear ground- 40
wheels, of a plow, a suitable connection between the frame and the plow-beam, whereby its extremities are independently adjustable, a stirrup-shaped guide through which the rear extremity of the plow-beam passes, and 45
in which it is free to move vertically, the moldboard of the plow-beam being curved to cause the dirt to pass over its rear extremity, as the machine moves upwardly, an inclined carrier whose lower extremity is supported 50
in the rear of the plow, said carrier having an endless apron for carrying the dirt upwardly and rearwardly as it leaves the plow, and another inclined carrier mounted on the frame and extending transversely to the line 55
of travel, the lower extremity of the transverse carrier being arranged to receive the dirt from the upper extremity of the other carrier, and suitable means operated from one of the ground-wheels for actuating the 60
carriers, substantially as described.

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

JOHN GOTTLANDER.

Witnesses:

DENA NELSON,
A. J. O'BRIEN.