

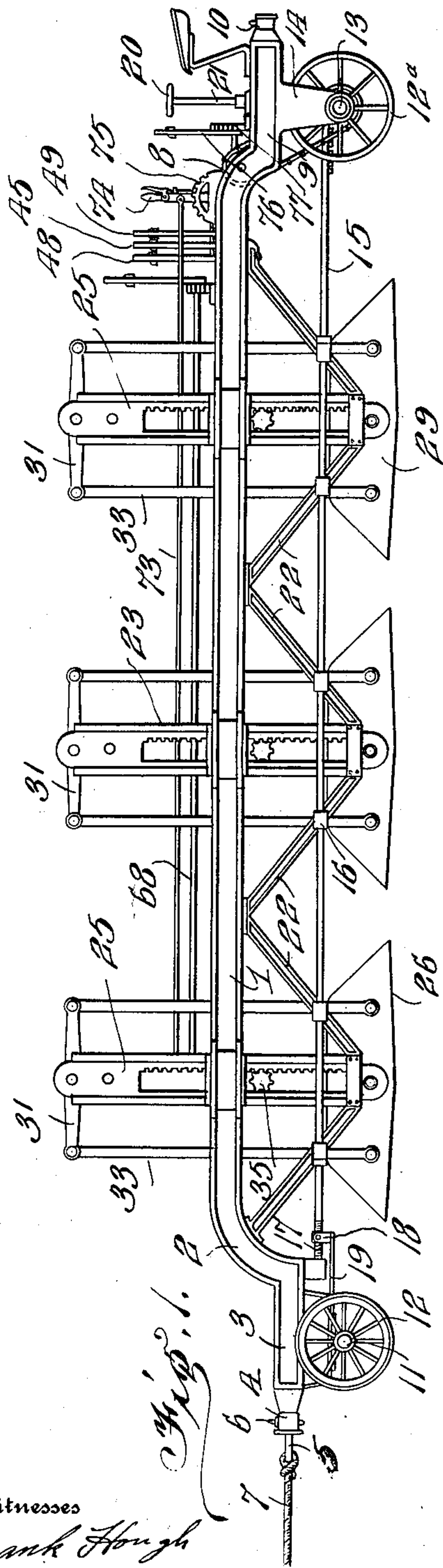
W. H. BEAM.
ROAD GRADER.

APPLICATION FILED JUNE 1, 1909.

Patented Mar. 29, 1910.

3 SHEETS—SHEET 1.

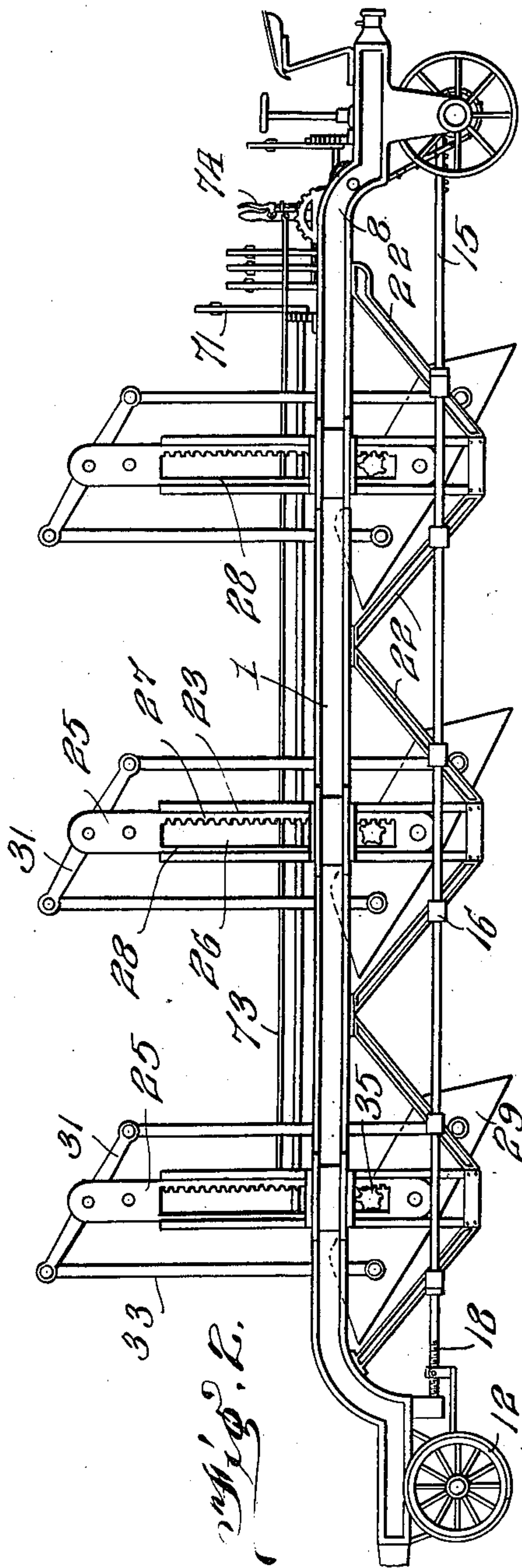
953,406.



W.H.B.

Witnesses
Frank Hough

[Signature]



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Inventor
William H. Beam.

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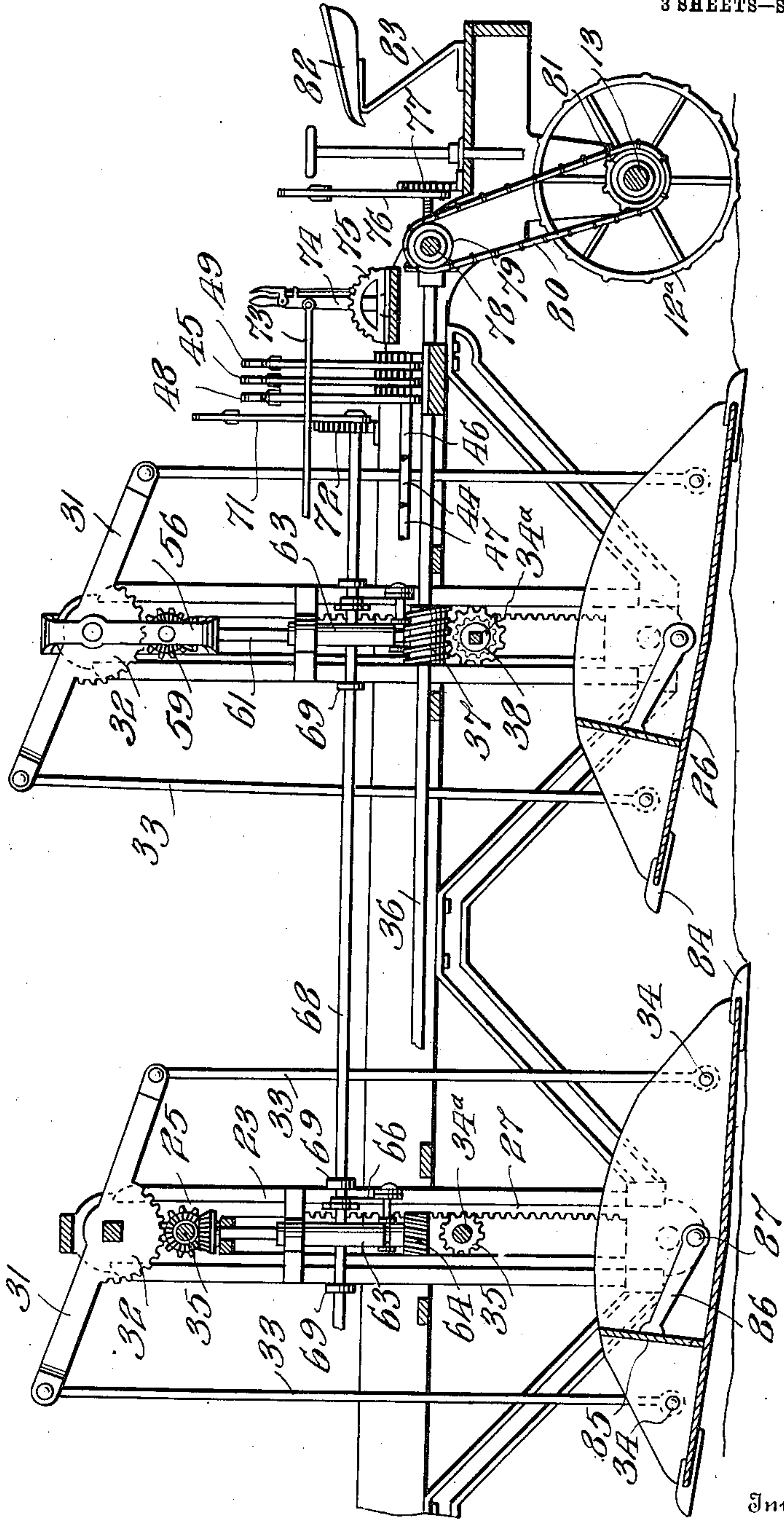
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3 SHEETS—SHEET 3.

Fig. 5.

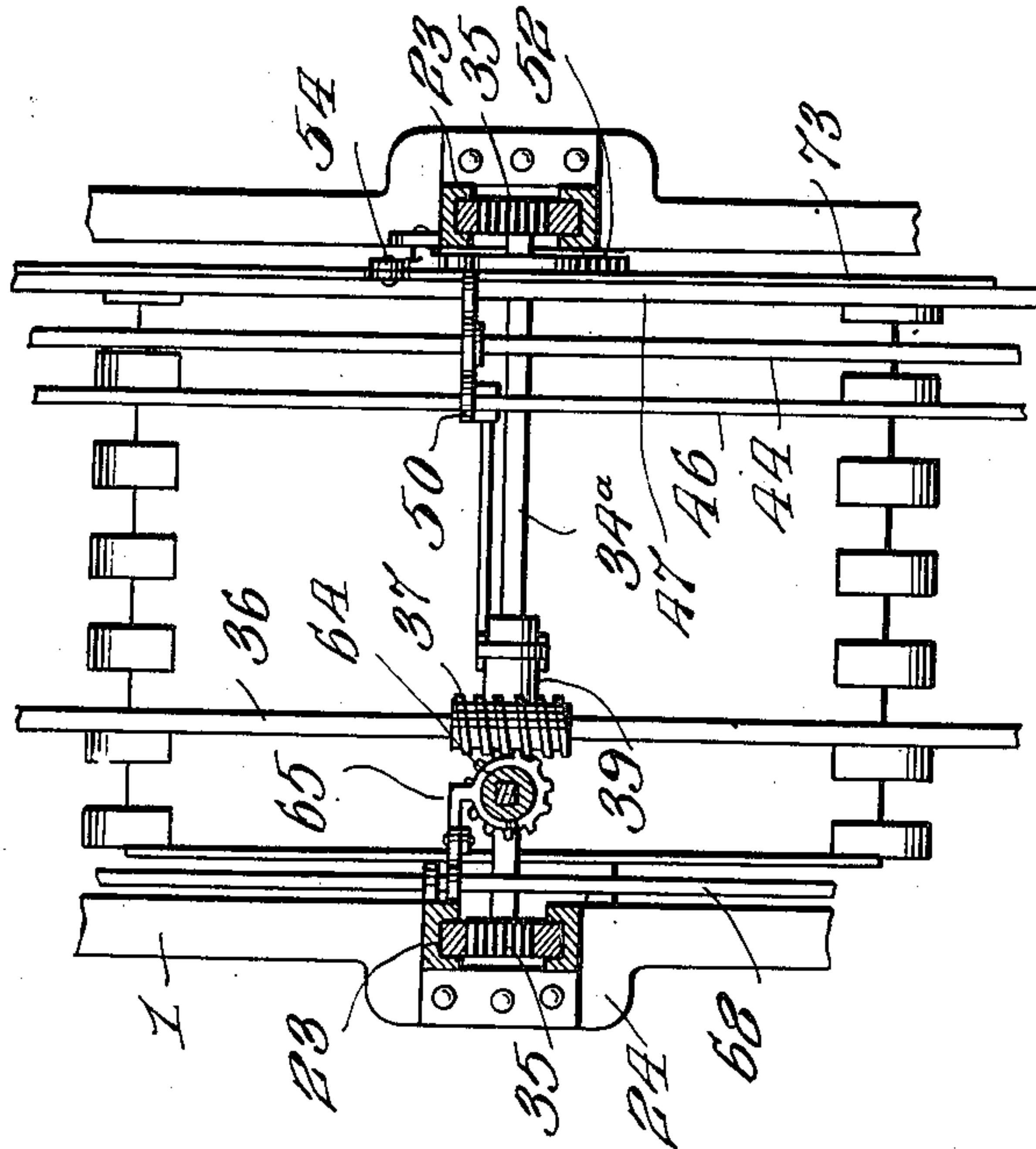
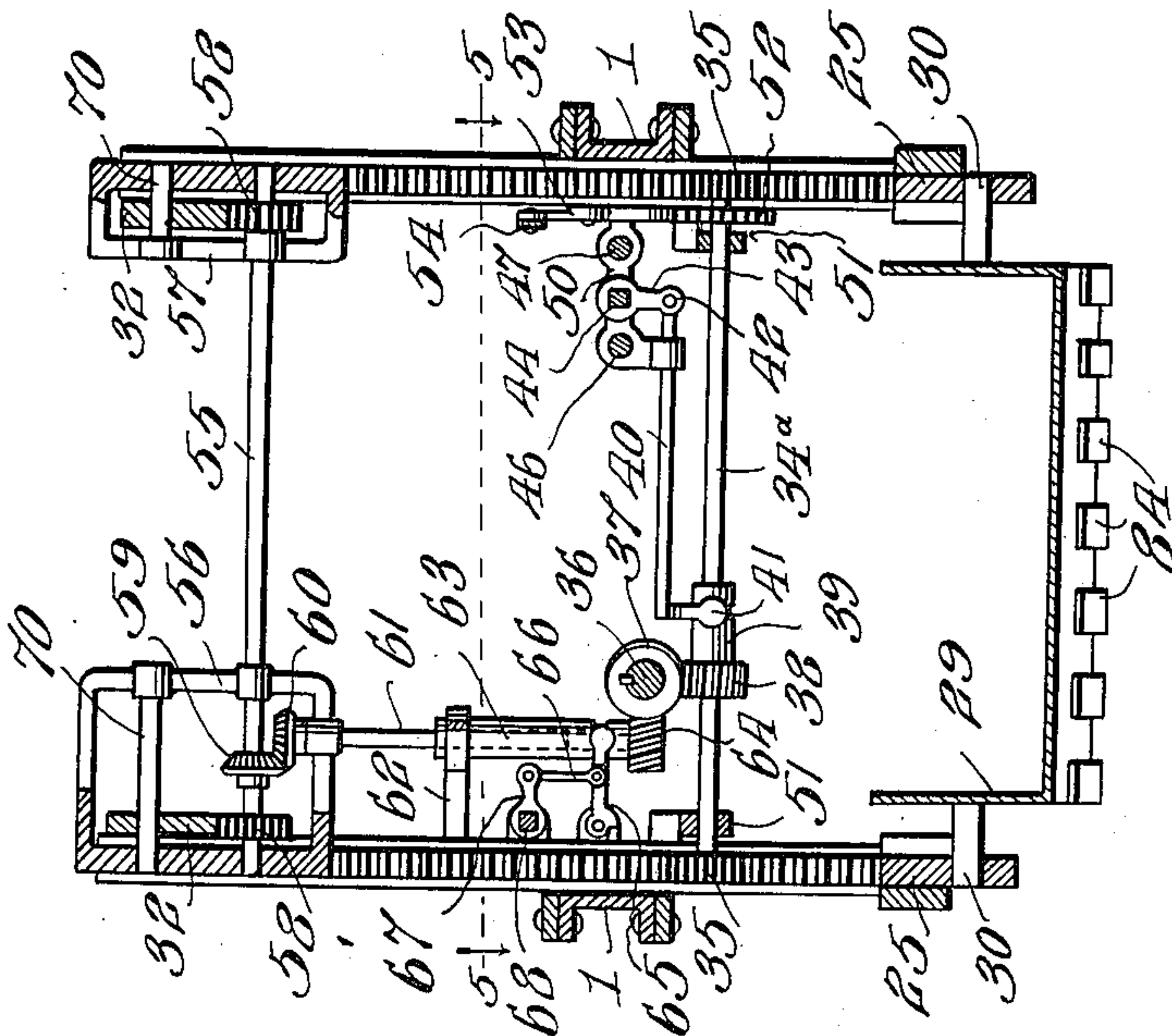


Fig. 4.



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UNITED STATES PATENT OFFICE.

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ROAD-GRADER.

953,406.

Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed June 1, 1909. Serial No. 499,316.

To all whom it may concern:

Be it known that I, WILLIAM H. BEAM, a citizen of the United States of America, residing at Purcell, in the county of McClain and State of Oklahoma, have invented new and useful Improvements in Road-Graders, of which the following is a specification.

This invention relates to road graders, and one of the principal objects of the same is to provide a machine mounted on wheels and adapted to be drawn back and forth by traction or stationary engines, said machine embodying a series of shovels or scoops and means for independently raising and lowering said scoops and for tilting and discharging the same.

Another object of the invention is to provide a machine comprising a series of independently operable scoops or shovels, said shovels being pivotally mounted to incline the same for scraping up the earth, means being provided for bodily raising the shovels or scoops independently, mechanism being provided for tilting the shovels for discharging the contents.

Still another object of the invention is to provide a grading machine comprising a frame having a series of independently operable shovels or scoops, said shovels being pivoted to a movable rack, means being provided for independently operating the racks for raising and lowering any of the shovels and means for tilting said shovels toward the front for operative purposes and toward the rear for discharging the same.

These and other objects may be attained by means of the construction illustrated in the accompanying drawings, in which,—

Figure 1 is a side elevation of a grader made in accordance with my invention, the shovels or scoops being shown in horizontal position ready to be elevated and to be carried to a place of discharge. Fig. 2 is a similar view of the machine, showing the shovels or scoops inclined in position for operation. Fig. 3 is an enlarged vertical sectional view of the rear portion of the machine. Fig. 4 is a vertical sectional view taken through the central portion of one of the racks for raising and lowering one of the shovels. Fig. 5 is a horizontal sectional view on the line 5—5 of Fig. 4, looking in the direction indicated by the arrow.

Referring to the drawings, the numerals 1 designate the side bars of the frame of the

machine, these bars being curved downwardly, as at 2, in front and extending forwardly, as at 3. A coupling head 4 is connected to the front end of the frame, and a link 5 is connected to the coupling head by means of a pin 6. A cable 7 is connected to the link 5.

At the rear end of the machine the bars 1 are curved downwardly, as at 9, and a coupler head is provided at the rear of the machine for a cable to be led to a traction engine. Pivotaly mounted under the front end of the frame is an axle 11 carrying wheels 12, and at the rear wheels 12^a are mounted upon an axle 13 journaled in hangers 14 extending downward from the projecting portions 9 of the side bars 1. For steering the machine longitudinal shafts 15 are mounted in bearings 16, the front ends of said shafts being threaded, as at 17, to engage travelers 18 connected to bars 19, said bars being attached to the axle 11 upon opposite sides thereof.

At the rear end of the machine a hand wheel 20 is mounted on a shaft 21, said shaft being connected at its lower end to mechanism for operating the shafts 15 for steering the machine. Connected to the side bars 1 are strong metal braces 22, said braces converging at their lower ends to support the mechanism for raising and lowering the shovels or scoops. Guideways 23 are supported at their lower ends upon the braces 22, said guideways extending upwardly through recesses in the said bars 1, said bars having outwardly extending portions 24 to accommodate the guideways 23, as shown more particularly in Fig. 5. There being a plurality of shovels or scoops and mechanism for operating the same of like construction, the description of one will suffice for the description of all.

Mounted in each of the guideways 23 is a sliding standard 25, said standard having a recess 26 in the central portion thereof and a rack bar 27 at one side of said recess, the other side having a plain bar or connection 28. Pivotaly mounted in the lower end of the standard 25 is the shovel or bucket 29, said bucket having oppositely disposed trunnions 30, said trunnions extending through the lower ends of said standard. A walking beam 31 provided with a curved and toothed central portion 32 is mounted upon opposite sides at the

top of said standard. Connected to the opposite ends of the walking beams 31 are connecting rods 33, said rods being pivoted at 34 to the opposite side portions of the
 5 shovels or scoops 29. Mounted upon the opposite ends of a shaft 34^a are the pinions 35 which engage the teeth of the rack bars 27. A line shaft 36 carrying worms 37 is journaled in the frame, said worms meshing
 10 with worm gears 38 mounted to slide on the shaft 34^a. The worm gears 38 are each mounted upon a sleeve 39, and said sleeve is operated by means of a lever 40 provided with a yoke 41 which engages a groove in
 15 the sleeve 39, said lever 40 being connected at 42 to a crank 43 on a shaft 44. The shaft 44 extends longitudinally of the frame and at its forward end is provided with a lever 45 for operating the same. The parallel
 20 shafts 46 and 47 are each provided with a lever 48 and 49 by means of which anyone of the worm gears 38 may be thrown into and out of engagement with the worms 37. The shaft 44 is squared at its point of en-
 25 gagement with the crank 43, and the shafts 46 and 47 are similarly formed at the point at which they are connected with similar cranks so that each shaft operates independently, one of the other. These shafts 44,
 30 46 and 47 are mounted in brackets 50. The shaft 34^a is mounted in brackets 51, and at one end said shaft carries a ratchet wheel 52. A pawl 53 pivoted at 54 engages the ratchet wheel 35 to prevent the shovel 29
 35 from descending by gravity.

A shaft 55 journaled in brackets 56 and 57 have fixed thereto gear wheels 58 which mesh with the sectors 32 for tilting the shovels. A beveled gear 59 on the shaft 55
 40 meshes with a similar gear 60 on a shaft 61, said shaft being mounted in a bracket 62. Mounted to slide on the shaft 61 is a sleeve 63 carrying a worm gear 64 at one end, said worm gear adapted to be moved
 45 into and out of mesh with the worm 37 by means of a lever 65, a link 66 and a crank 67 mounted on the squared portion of a shaft 68 journaled in brackets 69. The walking beams 31 are pivoted on short
 50 shafts 70 supported in the brackets 56 and 57. The shaft 68 is operated by means of a lever 71 connected to its end and provided with a rack 72 and a pawl for holding said shaft in adjusted position. The
 55 pawls 54 are operated by means of a connecting rod 73 pivoted to a lever 74 provided with a rack 75 for holding said lever in adjusted position. The line shaft 36 is provided with a lever 76 for holding said
 60 shaft in adjusted position, and a rack 77 engaged by a pawl on the lever holds said lever in position.

A shaft 78 journaled in the frame carries a sprocket wheel 79, and a chain 80 passes
 65 around said sprocket wheel and around a

sprocket wheel 81 on the rear shaft 13. An operator's seat 82 is mounted on a bracket 83 supported on the framework of the machine at the rear.

The shovels are preferably provided with 70 steel points or fingers 84. A partition 85 connected to arms 86 is pivotally mounted upon the pins 87 secured in the sides of the shovel. This partition serves to prevent the contents of the shovel from passing from 75 the front end out at the back until it is desired to discharge the contents. Then said partition is thrown up out of the way. These partitions may be thrown to opposite ends of the shovels when the machine is op- 80 erating in the other direction.

The grader is designed to be connected by cables 7 to traction engines, one at each end of the machine and at some distance therefrom. The shovels 29 are tilted to the 85 desired inclination, and the front shovel may be raised slightly above the others in order that each shovel shall have its share of work to do. After a load has been placed upon each shovel the latter is righted up 90 and lifted to be carried to a place for discharge. If a hill is to be graded off, the contents of the shovels may be discharged into the hole at one side of the hill, and as the machine is moved back and forward the 95 contents of the shovels are discharged on one side or the other of the hill.

From the foregoing it will be obvious that a grader made in accordance with my invention will operate quickly to level off hills 100 or for grading railroad beds, and that owing to the fact that the shovels operate in both directions the machine is quick in operation.

I claim:—

1. In a road grader, the combination of a 105 frame, guideways mounted on the frame, standards movable in the guideways, shovels pivotally connected to the standards, a rack on each of the standards, pinions for moving said standards independently, a walking 110 beam pivotally mounted on each standard, connecting rods leading from the walking beams to the shovels, and means for operating the walking beams for independently tilting the shovels. 115

2. A road grader comprising a frame, a series of guideways mounted on the frame, standards movable in the guideways, shovels pivotally mounted on the standards, worm gearing for raising the standards and shov- 120 els, walking beams pivotally mounted in the standards, toothed sectors connected to the walking beams, and gearing for engaging the sectors for tilting the shovels.

3. In a road grader, the combination of 125 a frame, guideways mounted on the frame, standards mounted to slide in the guideways, shovels pivotally connected to the standards, means for raising and lowering the shovels independently, means for tilting 130

the shovels independently, and a pivoted partition in the shovel.

5 4. A road grader comprising a frame mounted on wheels, vertically disposed guideways connected to said frame, standards mounted to slide in the guideways, shovels pivotally mounted in said standards, means for moving said standards vertically in the guideways, means for tilting said

shovels, drawheads connected to said frame, 10 and cables connected to said drawheads.

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

WILLIAM H. BEAM.

Witnesses:

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JNO. R. FELAND.