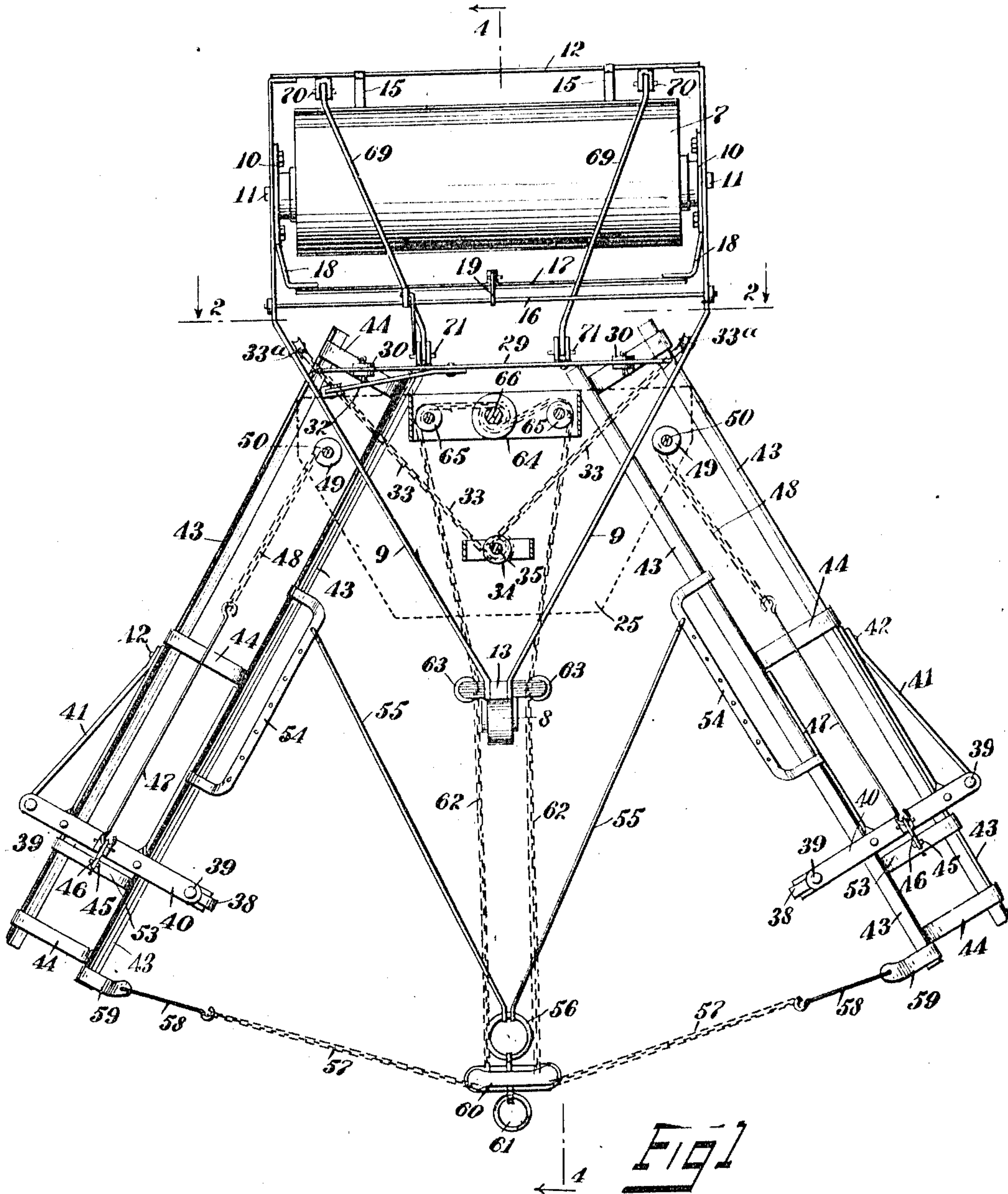


O. A. NESS.  
ROAD GRADER.  
APPLICATION FILED OCT. 22, 1909.

Patented Aug. 16, 1910.

3 SHEETS—SHEET 1.

967,656.



WITNESSES  
H. L. Murdock  
J. P. Davis

INVENTOR  
Ole Andrew Ness  
BY *Mumford & Co.*  
ATTORNEYS

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3 SHEETS—SHEET 2.

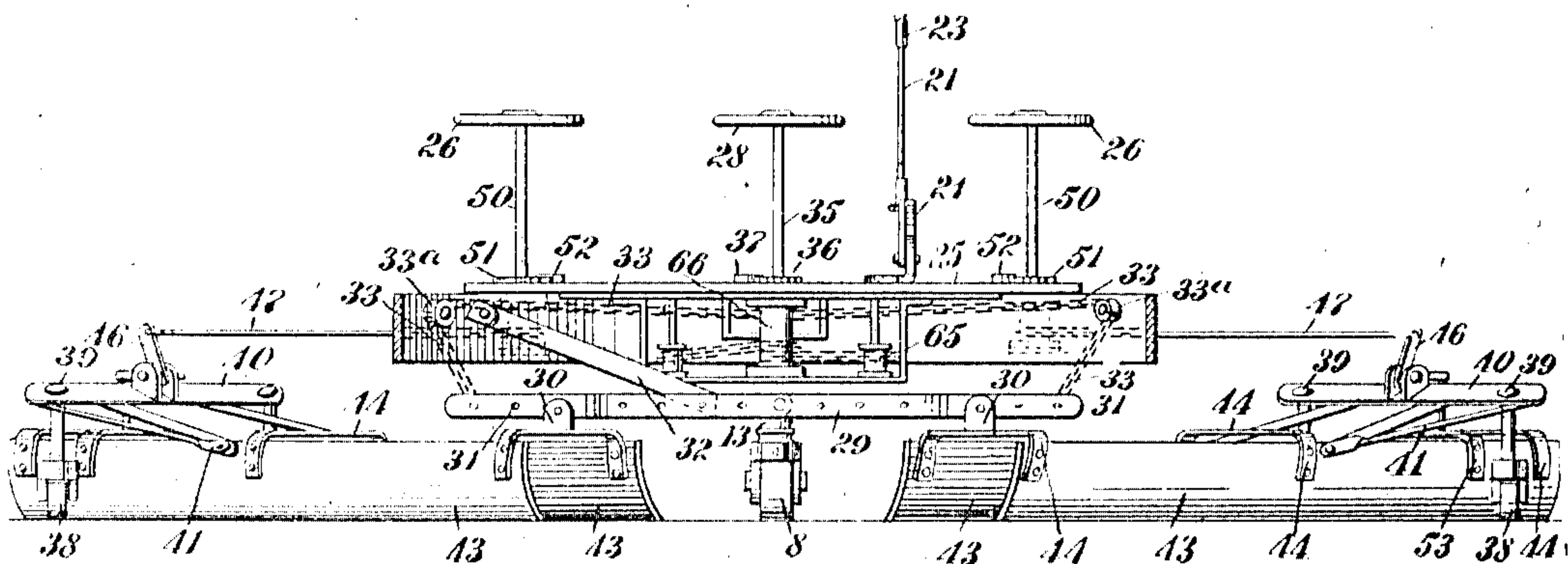


FIG 2

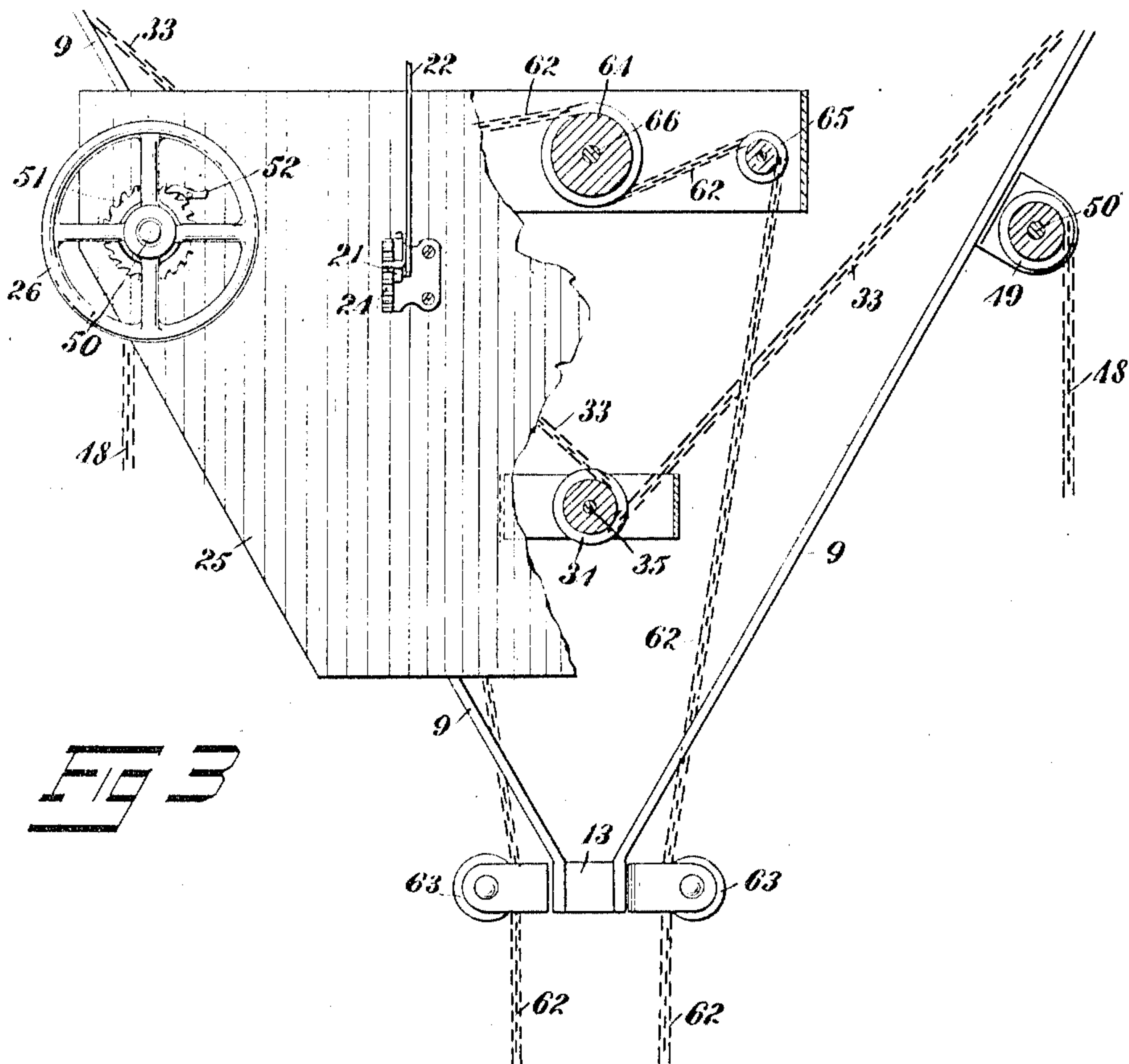


FIG 3

WITNESSES  
H. L. Murdock,  
J. P. Davis

INVENTOR  
Ole Andrew Ness  
BY *Mumford*  
ATTORNEYS



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3 SHEETS—SHEET 3.

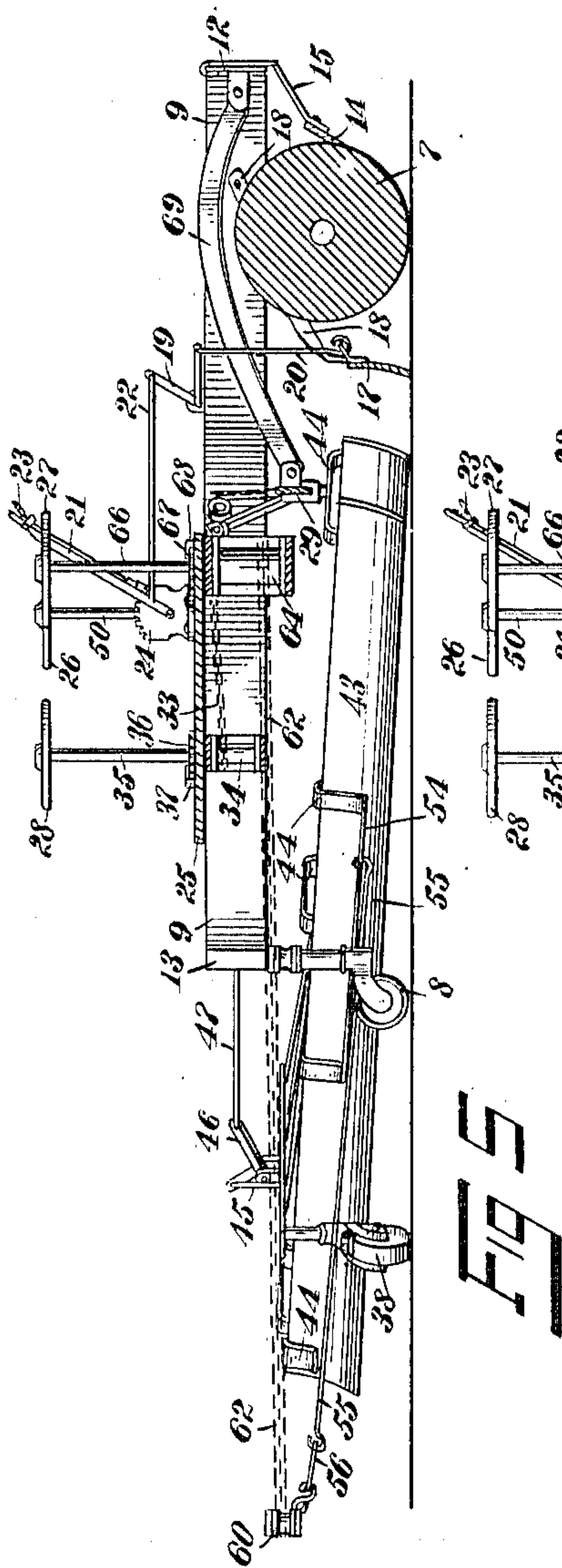


FIG 5

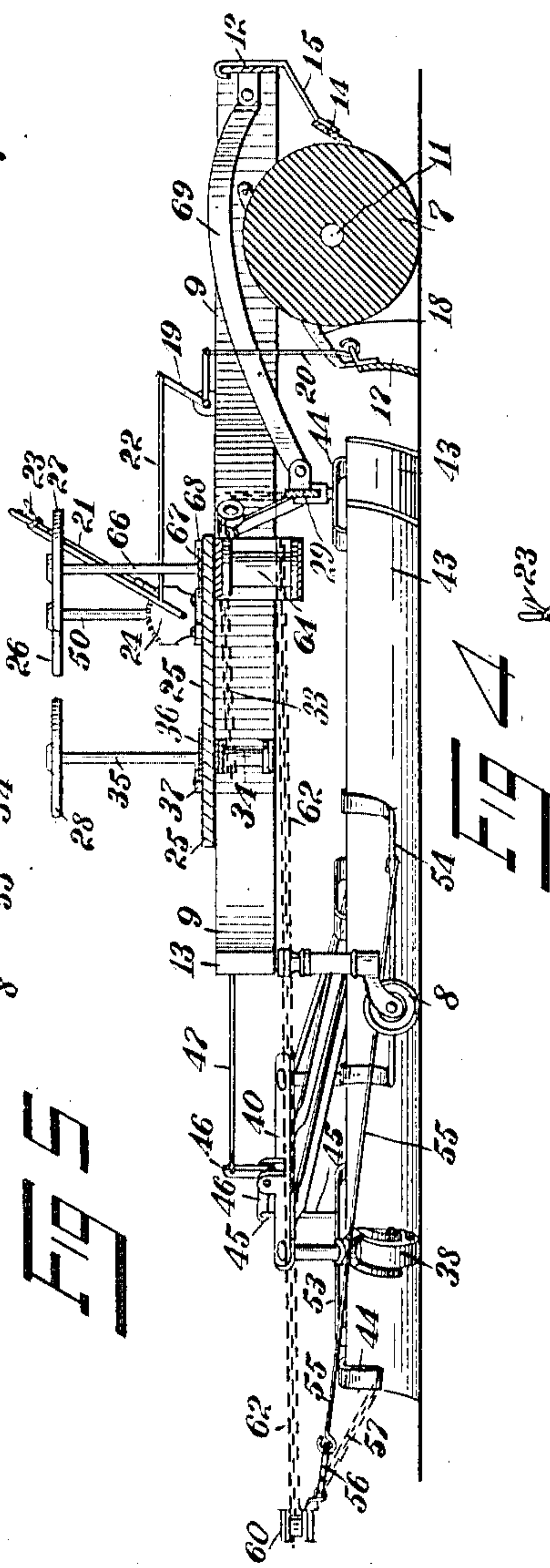


FIG 4

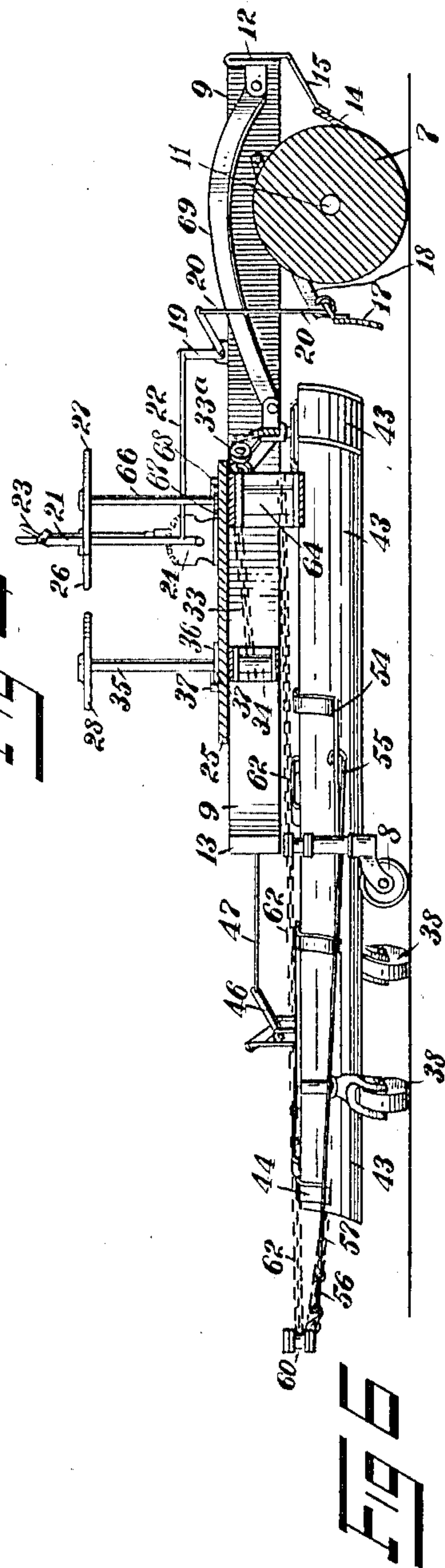


FIG 6

WITNESSES  
H. L. Murdock.  
J. P. Davis

INVENTOR  
Ole Andrew Ness  
BY *Murdoch*  
ATTORNEYS



# UNITED STATES PATENT OFFICE.

OLE ANDREW NESS, OF ZUMBROTA, MINNESOTA.

## ROAD-GRADER.

967,656.

Specification of Letters Patent. Patented Aug. 16, 1910.

Application filed October 22, 1909. Serial No. 524,019.

*To all whom it may concern:*

Be it known that I, OLE ANDREW NESS, a citizen of the United States, and a resident of Zumbrota, in the county of Goodhue and State of Minnesota, have invented a certain new and useful Road-Grader, of which the following is a full, clear, and exact description.

The principal objects which the present invention has in view are: to provide a machine wherein a road bed may be leveled and rolled simultaneously; to provide a mechanism wherein the excess material constituting the surface is conveyed to, and deposited in the path of a pressure roller; to provide a mechanism of the character mentioned, the area of operation of which may be varied at will; and to provide a mechanism for manipulating the various parts constituting the grader,

One embodiment of the present invention is disclosed in the construction illustrated in the accompanying drawings, wherein like characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of a grader constructed in conformity with my invention; Fig. 2 is a sectional rear view of the grader wings, taken on the line 2—2 in Fig. 1; Fig. 3 is a plan view of the platform and device for manipulating the grader wings; Fig. 4 is a longitudinal sectional elevation taken on the line 4—4 in Fig. 1; Fig. 5 is a view similar to Fig. 4, showing the forward end of the grader wings raised from surface contact with the ground; and Fig. 6 is a view similar to Figs. 4 and 5, showing the grader wings completely raised from surface contact with the ground.

The body of the machine is carried upon a roller 7 and a forward caster wheel 8. The frame comprises principally side bars 9 upon which the brackets 10 carrying the journals for the axle 11 of the roller 7 are mounted. At the rear the side bars 9 are connected by a cross brace 12, while at the front the side bars 9 are converged, and bolted to a post 13 in which the pivot mounting of the caster wheel 8 is formed.

The roller 7 is of any desired construction, and is provided with a scraper 14 suspended from the brace 12 by springs 15. The side bars 9 are braced forward of the roller by a tie rod 16, which serves as a bearing for suspending a leveler 17 which extends in line with the axle of the roller 7

and across the path traveled by the same. This leveler operates to more evenly distribute such dirt as is delivered in the path of the roller 7 by the grader wings, hereinafter described. The leveler is braced by arms 18 which are mounted upon the side bars 9.

The leveler is raised from the ground by means of a bell crank lever 19, mounted upon the rod 16. The lever 19 is connected to the leveler 17 by a lifting rod 20 and to a lever 21 by a connecting rod 22. The lever 21 is held in position by a hand grip detent 23, which plays in the teeth of a toothed quadrant 24 secured upon the side bars 9—9.

The platform 25 is constructed of any suitable material, and is preferably in the shape shown in Figs. 1 and 3 of the drawings. The purpose of the platform is to provide a stand for the driver of the machine, and to furnish mountings for the lever 21 and hand wheels 26—26 and 27 and 28.

The grader wings above mentioned are similar in construction on both sides of the center of the machine, but for the convenience of description, one only will be described, the designating letters being duplicated on both constructions. The two pairs of wings are connected at their rearward ends by a connecting bar 29, to which they are joined by means of ears 30, which are perforated to register with perforations 31 formed in the said connecting bar. When so registered, a cotter or other suitable pin is driven through the aligned perforations, and the lateral adjustment of the wings become fixed. The rod 29 is steadied and maintained in position by a brace 32, which is suitably pivoted to the said rod and to one of the side bars 9, 9. This construction permits the rise and fall of the rod 29 but maintains the said rod in its lateral location.

The wings are suspended at the rear end by chains 33, at one end attached to the bar 29, the other ends of which are wound upon a spool 34 provided on a post 35. The post 35 is suitably mounted on the platform and has provided in the upper end, the hand wheel 28. The post 35 has fixedly attached thereto a ratchet 36 which is held by a pawl 37 adapted to be operated by the foot of the operator, and mounted upon the platform 25. The chain 33 is guided in its operation by the sheaves 33<sup>a</sup>. By releasing the pawl



37 from the ratchet 36, the post 35 may be rotated to lower or raise the rear ends of the grader wings, as desired.

The forward end of the wings is carried upon caster wheels 38, mounted upon suitable spindles 39 which are seated in suitable vertical bearings set in the carrying truck bars 40. Each truck bar 40 is braced in relation to the grader wings by a rod 41, which is pivotally mounted at 42 on the rearmost grader wing. The grader wings 43 are formed as elongated scoops or grading shovels, and are braced in their parallel relation by the cross braces 44. They are separated as shown particularly in Fig. 1 of the drawings, so that the road being treated is given a double cut by each pair of wings, the forward wing being provided to take the rough of the grading, and to expose the lower or more tractable stratum to the influence of the rearward wing. The wings are connected to the truck bar 40 by a lifting rod 45, to which a bell crank 46 is connected. The bell crank 46 is pivotally mounted on the truck bar 40, and the upper end is connected with a pull rod 47, engaged by a chain 48, which is adapted to be wound upon a spool 49 on a post 50. The post 50 is provided with a ratchet 51 and a pawl 52, to hold the said post in position when the chain 48 is wound upon the spool 49. The post 50 carries the wheel 26 and is rotated thereby.

When the post 50 is rotated to wind the chain 48, the bell crank lever 46 is rocked to raise the outwardly extended arm connected by the lifting rod 45 with a cross brace 53 connecting the parallel wings 43. The wheels 38 remaining on the ground, the height of the truck bars 40 is unchanged, while the bell crank 46 being moved as above described, raises the outer or forward ends of the grader wings from contact with the ground. With a lifting arrangement such as above described, the grader wings are lifted at either end, or at both ends, by rotating the posts 35 and 50, these posts being rotated by means of the hand wheels 26, 26 and 28, as shown in the drawings.

The pairs of grader wings are arranged to be set at angles widely or acutely divergent, and it is to regulate the outward spread of these grader wings, that I have provided adjusting racks 54. These racks are perforated as shown in Fig. 1 of the drawings, to receive a hooked end of pull rods 55, which are provided with eyelets at the forward end to receive a ring 56. As the rods 55 are connected with the various perforations in the racks 54, it will be seen that the outward extension of the wings 43 is limited to the spread of the rods 55. For instance, if the rods 55 are connected, as shown in Fig. 1 of the drawings, with the racks 54, the wings are in position to spread

to their extreme capacity. Should the hooks in the ends of the rods 55 be now transferred to the perforations in the extreme forward ends of the racks, it will be seen that the extent of the spread of the wings 43 is limited over that shown in the former position. As an adjunct to the rods 55 there are provided connecting chains 57 which are connected to pull rods 58, the latter being provided with hook ends for that purpose. The pull rods 58 are pivotally connected with ears 59 located on the outer ends of the wings 43. In the present construction, the chains 57 are connected to a link 60 to which, likewise, the ring 56 is joined. The chains 57 may be adjusted with reference to the pull rods 55 so as to permit a greater extension between the ends of the wings 43. The machine is drawn over the road by a team, the single tree whereof is connected to a ring 61.

It is to provide means for spreading or contracting the wings 43 during the progress of the machine that I employ a chain 62. The chain 62 is extended on both sides of the caster wheel 8 and is guided by sheaves 63 at this point. Between the sheaves 63 and a spool 64 upon which both extensions of the chain are wound, are sheaves 65. The spool 64 is fixedly mounted upon a post 66 which is controlled by the hand wheel 27. This post, like those heretofore mentioned, is controlled by a ratchet 67 and pawl 68. The outer ends of the chain 62 are secured to the link 60 to which are likewise secured the draft team and the pull bars 55, 55. When now the post 66 is manipulated to wind the chain upon the spool 64, the chain 62 and with it the link 60 are drawn toward the platform 25 of the machine. In thus moving the link 60, the tension upon the chains 57 and the draw rods 55 is released, permitting the outer ends of the wings 43 to extend farther laterally. There is practically no limit to the lateral extension of the wings 43, although it is designed that the inclination of the same to the line of draft shall be such as to deliver the loose or surface dirt into the path of the roller 7.

It will be seen that by the manipulation of the hand wheel 27, the extension laterally of the wings 43 may be changed without stopping or changing the speed of the draft team. The position of the connecting bar 29 relative to the roller 7 is maintained by braces 69, pivoted at 70 to the cross brace 12 of the frame of the machine, and also pivoted at 71 to the connecting bar 29.

The operation of a machine constructed as shown in the accompanying drawings is as follows: When passing to the field of operation the wings 43 are raised out of contact with the ground. The hand wheel 27 is also manipulated to unwind the chains 62, which permits the pull of the team to draw the wings 43 into close alignment, or



so that the same stand extended in the line of draft. In this position the machine does not occupy more space than an ordinary wagon. The structure is supported in this position upon the caster wheels 38, the caster wheel 8 and the roller 7. Having arrived at the field of operation, the hand wheel 27 is manipulated to wind the chains 62 upon the spool 64 to draw the link 60 toward the platform 25. If the road to be treated is wide, the extension of the wings 43 is according to such width. If, for any reason, such as the interposition of a metal man-hole head, it is desired to raise the one or the other pair of wings 43, this is accomplished by manipulating one or the other of the wheels 26, to raise the forward ends of the pair of wings desired to be lifted. Having passed the obstruction, the wings are dropped to position. If it is desired to contract the wings during the operation, due to a contraction in the road bed, or other cause, this is accomplished by releasing the hand wheel 27 and permitting the draft chains 62 to extend, so that the chains 57 will draw the outer ends of the wings 43 toward each other. The work having been completed, the wings 43 are raised from contact with the ground by the manipulation of the wheels 26 and 28, and the outer ends are drawn together by the manipulation of the wheel 27, permitting the draft chains 62 to extend, and the chains 57 to draw the ends of the wings into close relation.

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

1. A road grader, comprising a plurality of grader wings extended in inclined position to the line of draft and adapted to deliver the loose dirt to the center of said grader, and a pressure roller mounted to track in the space to which the said dirt is delivered.

2. A road grader, comprising a plurality of grader wings extended in inclined position to the line of draft, means for changing the inclined position of the said wings, and a pressure roller mounted to track in the space to which the said wings deliver the dirt.

3. A road grader, comprising a plurality of grader wings extended in inclined position to the line of draft, means for chang-

ing the inclined position of each of the said wings independently, and a pressure roller mounted to track in the space to which the said wings deliver the dirt.

4. A road grader, comprising a plurality of grader wings extended laterally from the line of draft, hitching tackle for drawing the said grader, connecting members for attaching the said wings to said hitching tackle, and means for extending and contracting the said hitching tackle in the line of draft, to extend and contract the lateral separation of the forward end of said wings.

5. A road grader, comprising a plurality of grader wings extended laterally from the line of draft, means for supporting said wings, embodying wheeled trucks located at the forward ends and a pressure roller located at the rearward ends, said wings being contracted to deliver the dirt in the path of the said roller, and means for raising the said grader wings from contact with the ground.

6. A road grader, comprising a plurality of grader wings extended laterally from the line of draft, means for supporting said wings, embodying trucks located at the forward ends mounted on caster wheels and a pressure roller located at the rearward ends to track in the path of the dirt delivered by said wings, levers mounted on the said trucks for lifting the said forward ends of the said wings, and means for independently operating the said levers on said trucks.

7. A road grader, comprising a plurality of grader wings extended laterally from the line of draft, means for supporting said wings, embodying trucks located at the forward ends and mounted on caster wheels and a pressure roller located at the rearward ends to track in the path of the dirt delivered by said wings, lifting devices mounted upon said trucks and frame carried by said roller, means for operating said lifting devices from a central point, and means for moving the outstretched ends of said wings toward each other and in line with said roller.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

OLE ANDREW NESS.

Witnesses:

L. M. LARSON,  
E. H. ERBAR.