

No. 619,504.

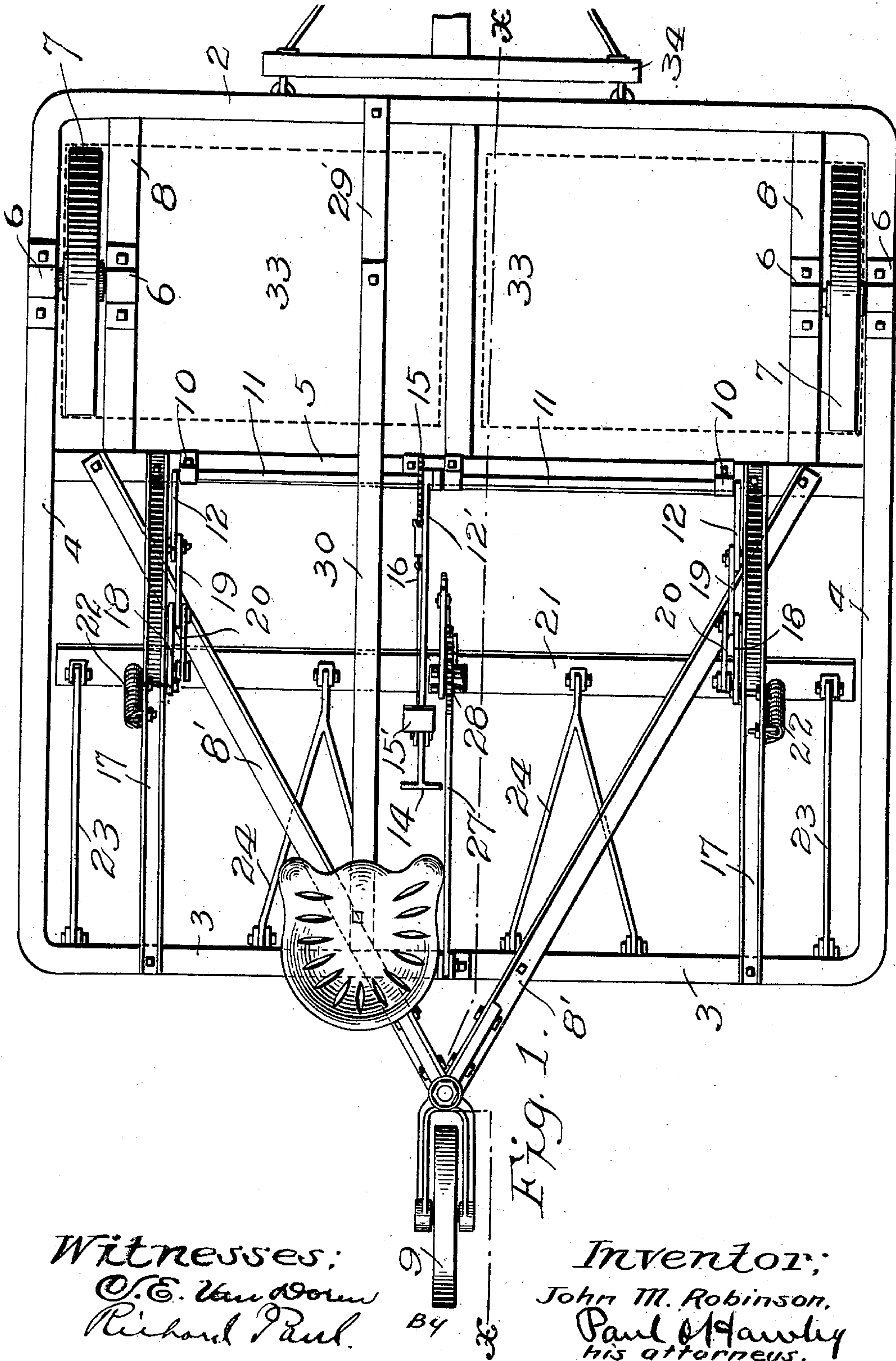
Patented Feb. 14, 1899.

J. M. ROBINSON.  
COMBINED LAND GRADER AND ROLLER.

(Application filed June 13, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:  
C. E. Van Dorn  
Richard Paul.

Inventor:  
John M. Robinson,  
Paul Hawley  
his attorneys.

No. 619,504.

Patented Feb. 14, 1899.

J. M. ROBINSON.  
COMBINED LAND GRADER AND ROLLER.

(Application filed June 13, 1898.)

(No Model.)

2 Sheets—Sheet 2.

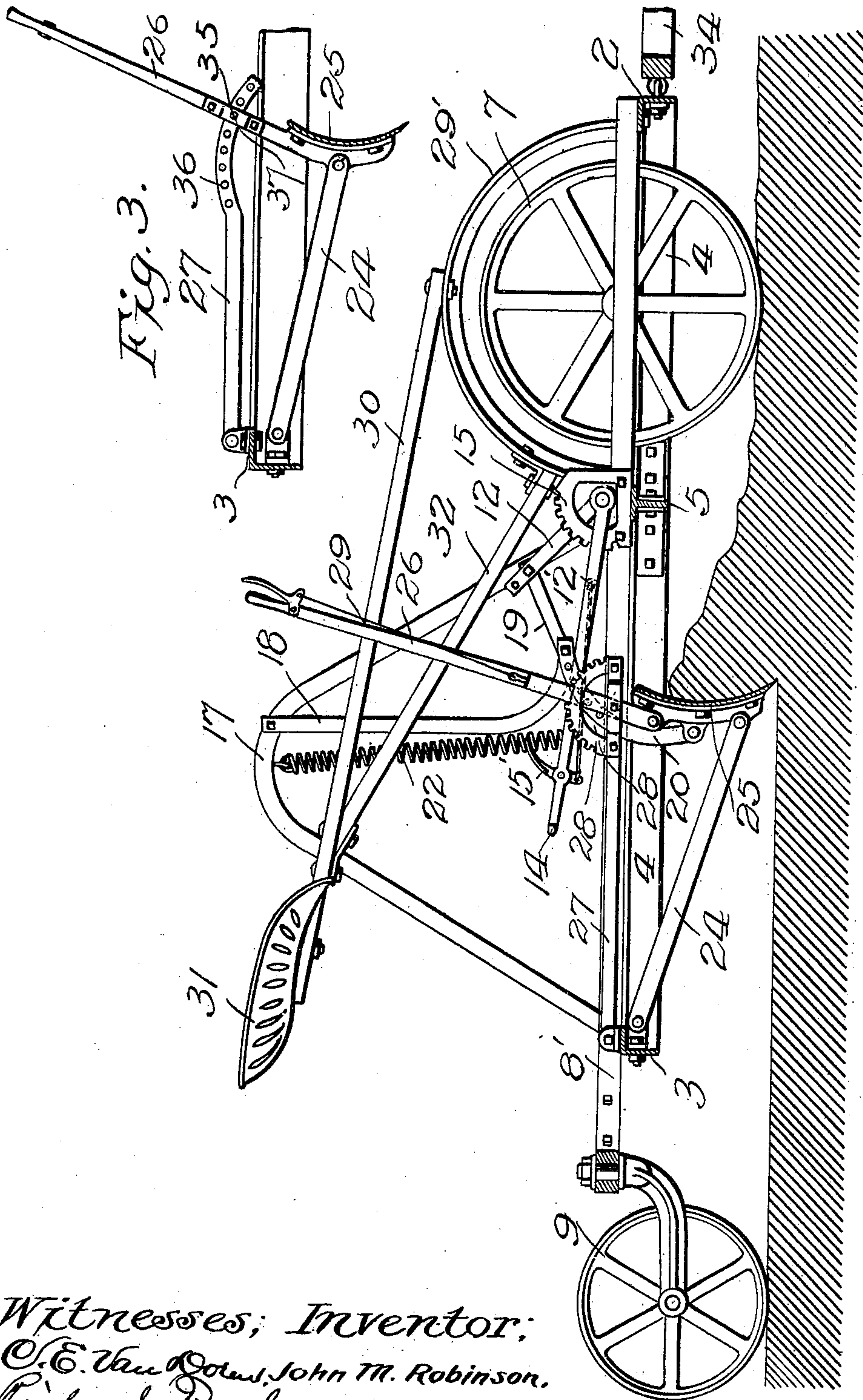


Fig. 3.

Fig. 2.

Witnesses; Inventor:  
C. E. Van Dusen, John M. Robinson,  
Richard Paul.

By Paul & Hawley  
his attorneys



# UNITED STATES PATENT OFFICE.

JOHN M. ROBINSON, OF BOZEMAN, MONTANA, ASSIGNOR OF ONE-HALF TO  
EMIL KETTERER, OF SAME PLACE.

## COMBINED LAND GRADER AND ROLLER.

SPECIFICATION forming part of Letters Patent No. 619,504, dated February 14, 1899.

Application filed June 13, 1898. Serial No. 883,264. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN M. ROBINSON, of Bozeman, Gallatin county, Montana, have invented certain new and useful Improvements in a Combined Land Grader and Roller, of which the following is a specification.

The invention relates to machines for grading and leveling uneven surfaces, the objects of the invention being to provide a vertically-movable grader over which the person riding upon the machine will have absolute and complete control either for dropping it to the surface or raising it therefrom, to provide means for rolling the surface in advance of the grader, and, further, to provide a light machine, but of very strong and durable construction, by means of which a rough uneven surface can be quickly leveled and smoothed.

The invention consists generally in a wheeled frame, a vertically-movable grader-blade supported thereby, and means in connection with said grader-blade to permit the operator to force the same into the ground and to permit the automatic withdrawal of said blade when it is desired to drop a load or pass an obstruction.

Further, the invention consists in means for changing the vertical angle or slant of the grader-blade.

Further, the invention consists in the combination of a land-grader and a roller operating in advance of the same; and, further, the invention consists in various constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of a land grader and roller embodying my invention. Fig. 2 is a longitudinal section on the line *xx* of Fig. 1. Fig. 3 is a detail of a modified construction of the grader-tilting device.

In the drawings, 2 and 3 represent, respectively, the forward and rear bars or beams of the supporting-frame, which is preferably square and composed of angle-iron bolted together at the corners, though, if preferred, wood may be used in the construction of the frame.

4 are the side beams or bars, and 5 a trans-

verse beam arranged near the middle of the frame. Bearings 6 6 for the wheels 7 are provided upon the side bars 4 and upon short braces 8, arranged between the forward and middle bars 2 and 5. A V-shaped frame 8', bolted to the bars 3 and 5, projects back over the rear end of the machine and is bolted or otherwise secured to the rear bar 3 and provided at its apex with a pivoted caster-wheel 9, which supports the rear end of the machine. Mounted in bearings 10 on the rear face of the bar 5 is a rock-shaft 11, having backwardly-turned ends 12 and near its middle point provided with a backwardly-extending lever 12', having a T-shaped end 14 to facilitate the movement of the lever and the rocking of the shaft by the foot of the operator. A toothed segment 15 is secured to the beam 5 near the lever 12', and a latch 16, carried by said lever, engages the teeth of said segment to lock the lever and rock-shaft, said latch being provided with a short arm or lever 15', in position to be engaged by the foot of the operator when it is desired to trip the latch and move the lever and rock-shaft. The rock-shaft 11 extends, preferably, about one-half the width of the machine, and at each end thereof I provide arched frames 17, having their ends securely bolted to the rear and middle bars 3 and 5. Levers 18 are pivotally secured at their upper ends to the arched frame 17, and are curved forward near their lower ends, which are pivotally connected with the backwardly-turned ends 12 of the rock-shaft by short levers 19. Several holes are provided in the ends of the levers 18 and the arms 12, rendering the levers 19 adjustable and regulating the travel of the rock-shaft and the vertical movement of the grader-bar. Levers 20 are also provided, connecting the lower ends of the levers 18 with a transverse grader-bar 21, said levers 20 being also provided with a series of holes to facilitate the adjustment of the connections between the grader-bar and rock-shaft, and thereby regulate the travel or throw of the same. The system of levers and connections described forms a toggle-joint mechanism, which enables the operator to force the grader-blade into the surface of the ground, and when the arms 12 and the levers immediately connected thereto are depressed the toggle-



levers will be straightened, and the locking device on the foot-lever 12' engaging the gear segment will hold the grader rigidly in position until such time as the operator releases it by the movement of the foot-lever. Heavy spiral springs 22 are provided at each end of the grader-bar, connecting the same with the top of the arched frames 17, said springs being put under tension when the grader-bar is depressed by the operator.

For holding the grader-bar in position while in use I provide the end links 23 and the V-shaped tie-rods 24, pivotally connecting said bar with the rear beams 3 of the frame of the machine.

Bolted to the face of the grader-bar is a blade 25, having a sharpened lower edge to permit the blade to dig into the surface and facilitate the work of grading.

In order that the operator may be able to change the vertical angle or slant of the grader-blade, I provide a hand-lever 26, pivotally secured at its lower end to the grader-bar and pivotally connected at a point just above the bar to a long arm or link 27, which is in turn pivoted at its rear end to the beam 3. A toothed segment 28 is provided on the forward end of said link 27, and a latch 29, provided on said lever 26, engages the teeth of said segment and locks the lever and the grader-bar at any desired angle. The lever 26 is arranged near the foot-lever heretofore described and within easy reach of the operator of the machine.

In Fig. 3 I have shown a modification of the device for tilting the grader-bar, which consists in rigidly securing the lever 26 at its lower end to the grader-bar and providing a guide 35 on said bar to receive the curved forward end of the link 27, said curved end being provided with a series of holes 36 to be engaged by a pin 37, arranged upon said lever and adapted to be thrust into one of said holes or withdrawn therefrom by a mechanism within the control of the operator.

At the forward end of the machine, near the middle thereof, I provide a semicircular frame 29', preferably of angle-iron, having its ends secured to the beams or bars 2 and 5 and provided with a backwardly-extending arm 30, upon which is arranged a seat 31, said arm being supported by a brace 32 or in any other suitable manner. As shown by dotted lines in Fig. 1, I may provide a roller 33 in two sections. (Not shown in the drawings.) The roller is adapted to crush the clods of earth and prepare the surface for the leveling and grading process of the grader-blade. A suitable draft connection 34 is attached to the forward beam 2.

The operation of my improved grader and roller is as follows: The operator placing his foot upon the lever 12 trips the locking mechanism and permits the grader-blade to drop to the surface, and then by pressing upon the foot-lever a powerful leverage is obtained through the medium of the compound or toggle

levers 18, 19, and 20 to force the edge of the grader-blade into the soil, the desired angle or pitch of the blade having been previously obtained by means of the hand-lever 26. As the machine is moved along the grader-blade will gradually accumulate the gravel or soil until a point is reached where it is desired to dump the load, when the operator will disengage the locking mechanism with his foot, permitting the coil-springs 22, which have previously been put under tension by the depression of the grader-bar, to raise the blade from the surface and allow the accumulation in the front of the blade to drop into a depression or any other place where it may be desired to leave the load.

Adjustable connections being provided between the several parts of the compound or toggle levers, I am able to regulate the throw of the rocking shaft, and consequently the depth that the grader-blade is forced into the soil. The operator can also by means of the hand-lever 26 tilt the grader bar and blade to such an angle that the blade will discharge its load without releasing the locking mechanism connected with the foot-lever or raising the grader-bar.

Obviously the details of this construction may be varied considerably by any one skilled in the art, and I therefore do not confine myself to the exact construction herein shown.

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

1. The combination, with a wheeled frame, of a grader-blade carried thereby, means for depressing said blade, means for locking the same in a depressed position, and means for automatically raising said blade when unlocked, substantially as described.

2. The combination, with a wheeled frame, of a grader bar and blade carried thereby, means for depressing said blade, means for tilting said bar to change the vertical angle or pitch of said blade, and means for automatically raising said bar and blade, substantially as described.

3. The combination, with a wheeled frame, of a grader bar and blade carried thereby, a toggle-joint mechanism for depressing said blade, means for locking said blade in a depressed position, and means for automatically raising said blade when released, substantially as described.

4. The combination, with a wheeled frame, of a grader bar and blade carried thereby, a toggle-joint mechanism for depressing said blade, means for locking the same in a depressed position and springs adapted to be placed under tension during the depression of said blade for raising the same when the locking mechanism is released, substantially as described.

5. The combination, with a wheeled frame, of a grader bar and blade carried thereby, a rock-shaft 11 having arms 12, a foot-lever 12', a locking mechanism connected therewith,



toggle-levers connecting said arms 12 and said grader-bar, the arched frames 17 and the coil-springs 22 connecting said grader-bar and said frames, substantially as described.

5 6. The combination, with a wheeled frame, of a transverse grader bar and blade, a rock-shaft 11 having arms 12 and a foot-lever 12', a locking mechanism provided on said lever, toggle-levers connecting said arms 12 with  
10 said grader-bar, and a pivoted hand-lever 26 provided on said grader-bar, substantially as described.

7. The combination, with a wheeled frame, of a grader bar and blade, a rock-shaft 11, a  
15 foot-lever 12' provided thereon, a locking mechanism for said lever, the arched frames 17, the toggle-levers 18, 19 and 20 connecting said rock-shaft, said arched frames and said grader-bar, coil-springs 22 connecting said  
20 frames and said grader-bar, and the connections between said toggle-levers and said rock-shaft being adjustable, whereby the throw of said shaft and the movement of said grader-bar may be regulated, substantially as de-  
25 scribed.

8. The combination, with a frame, of a transverse grader bar and blade carried thereby, means for depressing said bar and blade, means for locking the same in a depressed  
30 position, means for automatically raising said bar and blade when said locking mechanism is released, and a roller also carried by said frame in advance of said grader bar and blade, substantially as described.

9. The combination, with a wheeled frame, of a transverse grader-blade, a rock-shaft, a lever mechanism provided thereon, an arched frame mounted on said wheeled frame, and toggle-levers connecting said rock-shaft and  
40 arched frame and said grader-blade, whereby when said lever mechanism is operated said grader-blade may be raised or lowered, substantially as described.

10. The combination, with a wheeled frame,  
45 of a transverse grader-blade, a rock-shaft, a

lever mechanism in connection therewith, an arched frame mounted on said wheeled frame, toggle-levers connecting said rock-shaft, said arched frame and grader-blade, and means for changing the vertical angle or pitch of said  
50 blade, substantially as described.

11. The combination, with a wheeled frame, of a grader-bar, a blade carried thereby, a toggle-lever mechanism connected to said bar, a foot-operable lever mechanism connected  
55 with said toggle mechanism for operating said toggles to depress said blade and lock the same, and means for changing the vertical angle or pitch of said blade, substantially as described. 60

12. The combination, with a frame, of a grader bar and blade carried thereby, a toggle-lever mechanism mounted upon said frame and connected with said bar for de-  
65 pressing the same, a foot-operable lever mechanism connected with said toggles for operating the same, said toggle-lever mechanism being adjustable to permit the vertical movement of said blade to be regulated, and a roller  
70 mounted in bearings in said frame in advance of said grader-blade, substantially as described.

13. The combination, with a frame, of a grader bar and blade carried thereby, a toggle-lever mechanism mounted in said frame  
75 and connected with said bar, means for operating said toggle-lever mechanism to depress said blade, said toggle-levers being adjustable, to permit the vertical movement of said blade to be regulated, and a roller mounted  
80 in said frame in advance of said bar and blade, substantially as described.

In testimony whereof I have hereunto set my hand, this 25th day of May, 1898, at Bozeman, Gallatin county, Montana.

JOHN M. ROBINSON.

In presence of—

E. H. SCHUMACHER,  
W. O. PECK.