(No Model.) 2 Sheets—Sheet 1

J. HEUERMANN.

ROAD GRADER.

No. 556,313. Patented Mar. 10, 1896.

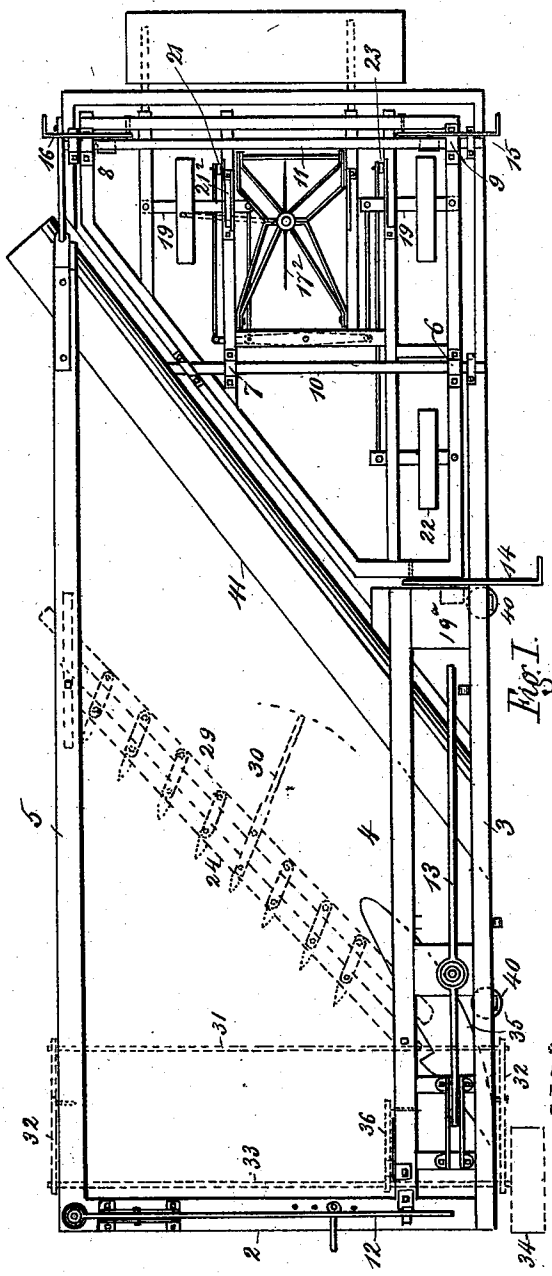

Fig. I.

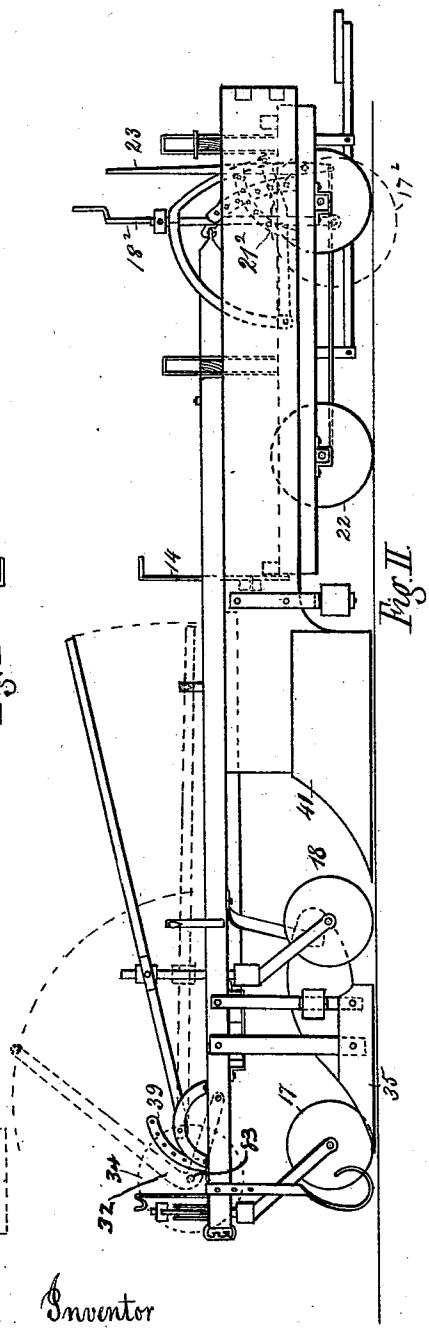

Fig. II.

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Inventor
Jno. Heuermann
By J. Bailey Atty.

ANDREW B. GRAHAM, PHOTO-LITHO. WASHINGTON, D.C.

(No Model.)

2 Sheets—Sheet 2.

J. HEUERMANN.

ROAD GRADER.

No. 556,313.

Patented Mar. 10, 1896.

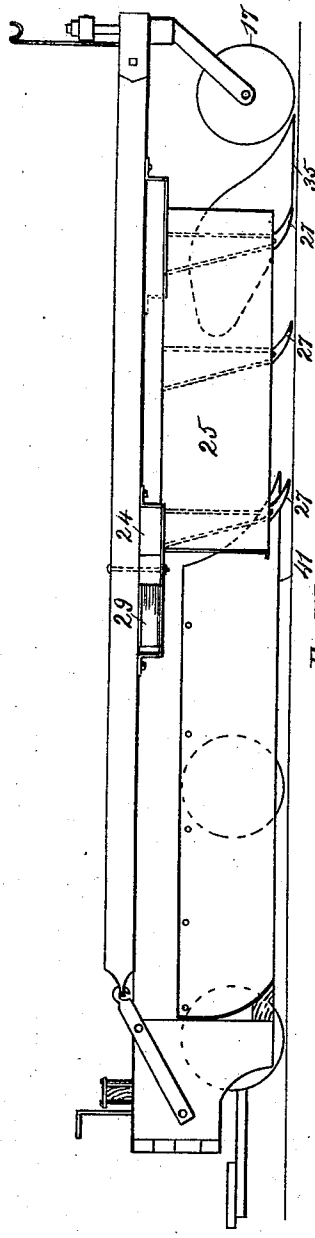

Fig. III.

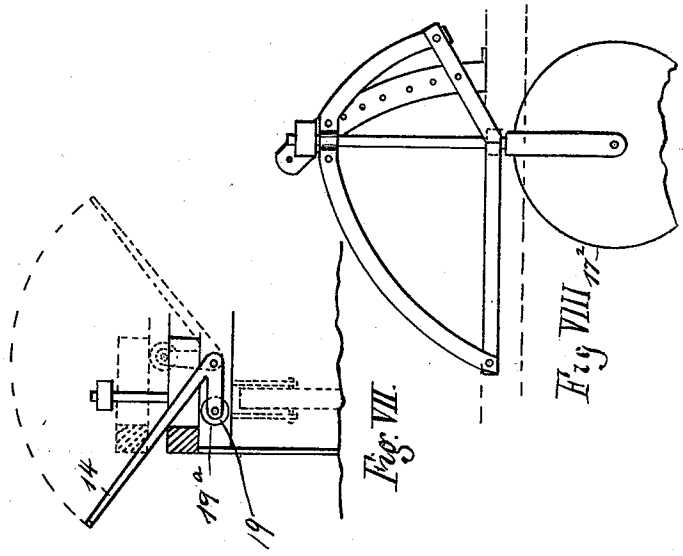

Fig. VIII.

Fig. VIII.

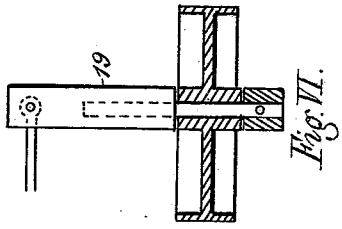

Fig. VII.

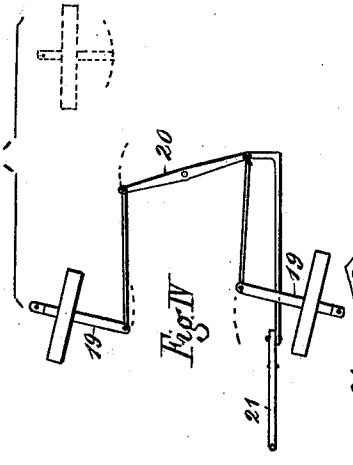

Fig. IV.

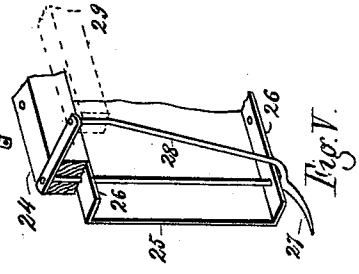

Fig. V.

Witnesses

R. S. Millar

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UNITED STATES PATENT OFFICE.

JOHN HEUERMANN, OF OAK PARK, ILLINOIS.

ROAD-GRADER.

SPECIFICATION forming part of Letters Patent No. 556,313, dated March 10, 1896.

Application filed September 30, 1895. Serial No. 564,229. (No model.)

To all whom it may concern:

Be it known that I, JOHN HEUERMANN, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Road-Graders, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a plan view of my improved road-grader; Fig. 2, a view of the near or left-hand side of the machine; Fig. 3, a view of the opposite side; Fig. 4, a diagram showing the method of operating the rear truck-wheels by a single lever; Fig. 5, a detail showing the manner of mounting the teeth of the oblique breaker attachment; Fig. 6, a detail illustrating the method of journaling the truck-wheels; Fig. 7, a cross-section on line *x x* of Fig. 1, and Fig. 8 a detail side view of the rotating colter and the spider-frame in which it is journaled.

My invention relates to sundry improvements in machines designed for grading streets or highways, leveling earth surfaces, filling trenches, &c., and its special object is to improve the device described in my Patent No. 541,546, issued June 25, 1895, by providing a grading-plow having increased capacity for service and capable of being readily and conveniently controlled in its operation to meet the varying conditions and requirements of work, such as adjustability to depth, lateral inclination, short curves, adaptation to stony ground, and other features which will appear by reference to the accompanying drawings, in which the main frame is represented by the front cross-beam 2, near side beams 3 and 4, the off-side beam 5 and an approximately triangular sub-section secured in fixed relation to the aforementioned parts and forming the rearward portion of the framework. Within the triangular sub-frame is a truck-frame adapted to move vertically on rigid guide-standards 6, 7, 8 and 9, the bases of which are secured on the truck-frame. Cross-pieces 10 and 11 pass freely through the guide-standards and have their extremities suitably secured to the triangular sub-section.

It being desirable to have means for governing the vertical adjustment of the machine, I provide levers 12, 13, 14, 15 and 16. Lever 12 connects with the vertically-projected stem of the caster-wheel 17 located under the right-hand corner of the main frame. Lever 13 is connected with the caster-wheel 18. The angle-lever 14 (see Fig. 7) is connected with the forward portion of the truck-frame and its short arm carries a roller 19^a, which engages under the offset of the main frame. When this lever is thrown over, as indicated by the dotted lines in Fig. 7, the frame will be borne upward in relation to the truck. The levers 15 and 16 operate in a similar manner, but may be independently employed to secure a lateral tilt of the main frame in either direction, or, if desired, can be operated together to secure a direct vertical adjustment.

Within the central portion of the truck-frame is a spider-frame having its forward extremity pivotally attached and the rear arranged to swing in close proximity to vertical segmental standards, which are perforated to receive fastening-pins by which the frame may be adjusted to any desired pitch or inclination. The spider-frame is provided with bearings to receive the vertical stem of a rotary colter 17^2 operated by a lever 18^2, which forms a steering-rudder for the machine.

In order to secure concurrent action in the steering operation the truck-wheels are journaled in oscillating axles 19, (see Fig. 6,) the free extremities of which are linked to an oscillating arm 20. (See Fig. 4.) This arm is operated by an angle-rod connected to a lever 21, which moves upon a locking-segment 21^2. The forward truck-wheel 22 is independently operated by a lever 23. The truck-wheels can thus be inclined in either direction. An oblique beam 24, supported by stirrups beneath the side beams of the main frame, carries a metal plate 25, the upper and lower edges of which are turned rearwardly, forming bearing-flanges 26, which are perforated to engage the stems of the oscillating teeth 27, each of which has a branch brace 28 whose upper extremity engages a perforation in a reciprocating beam 29 operated by a lever 30. A detail of this arrangement is clearly shown in Fig. 5.

The forwardly-projecting points of the teeth

can be adapted, if preferred, to receive small shovels of any desired pattern.

31 represents an attachment (shown in dotted lines) to the forward portion of the main frame by means of a pair of elbow-arms 32 engaged respectively at the outer sides of the frame, the free extremities of the arms being secured to a transverse tie-bar 33, by which the arms are moved in unison.

34 represents a wheel whose shaft passes through the elbows of the arms. This wheel is adapted to run upon the street-curb and serves to gage the depth of the advance plow 35. In order to adjust the curb attachment to any fixed position a supplemental arm 36 is secured pivotally in alignment with the shorter projections of the side arms, the said arm being connected to one of the inner frame-pieces, and the shaft passes through its free extremity. In order to secure the curb-wheel at any desired elevation the supplemental arm 36 is swung upwardly and fixed to the curved standard 39 by a pin or bolt thrust through one of the apertures.

The landside of the machine is provided at suitable intervals with rollers 40 to protect it from friction with the curb.

In operation as a combined breaker and grader the machine is drawn forward, and the advance plow takes the initial cut defining the limit of the grade course, and the breaker-teeth, engaging the ground, loosen the soil, gravel or broken stone, which is next subjected to the action of the main plow 4, which is fully described in my Patent No. 541,546, and the accumulated mass is forced aside, leaving a clear surface for the truck-wheels.

The lateral pressure to which the machine is subjected is overcome by shifting the levers which control the truck and bringing the wheels in oblique adjustment to the line of travel, a similar obliquity being given to the rotary colter, it being understood that the draft attachment is optional as to location. Should an elevation of the right-hand extremity of the main plow be desired, the lever governing that side is thrown over. If the elevation of the entire frame be required, the caster-controlling levers are depressed and fastened and the respective elbow-levers are turned to bring their rollers to an upbearing position under the respective frame-timbers.

It is obvious that the free action of the advance caster-wheels will permit the machine to be freely turned about (when elevated) and the course of the plow be directed around curves by the co-operative action of the rear truck-wheels.

What I claim as new is—

1. In a grading-machine, a main frame supported in front on caster-wheels, the rear portion being carried by a truck disposed within the limits of the main frame, and the wheels of the truck arranged on oscillating axles whose movements are governed by lever mechanism as described, said truck-frame being vertically adjustable in relation to the main frame by the operation of upbearing levers in conjunction with the caster-controlling levers to elevate or depress the main frame, an advance plow and oblique breaker-beam attached to said frame, a series of oscillating plow points or stems projecting in front of said breaker, in combination with the main plow, all arranged substantially as and for the purposes herein set forth.

2. In a grading-machine as described a main frame supported rearwardly by a truck-frame, freely movable within the limits of the main frame, said truck-frame having oscillating axles controlled by lever mechanism, the spider-frame pivotally mounted near the rear end of said truck-frame and carrying the vertical axial stem of a rotary colter-disk governed by a rudder-lever and operative independently of, or in conjunction with, the truck-wheels, substantially as and for the purposes herein set forth.

3. In a grading-machine, as described, the main frame supported rearwardly by a truck-frame, freely movable within the limits of the main frame and having oscillating axles controlled by lever mechanism, substantially as described, the spider-frame pivotally mounted near the rear end of said truck-frame and carrying the vertical axial stem of a rotary colter-disk governed by a rudder-lever and operated independently of, or in conjunction with the truck-wheels, and a gage-wheel having its shaft secured in arms at the front of the main frame, the curb end of said shaft having the gage-wheel thereon adapted to travel on the street-curb and limit the working depth of the machine, as herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand, this 17th day of September, 1895, in the presence of witnesses.

JOHN HEUERMANN.

Witnesses:
WM. EINFELDT,
HENRY EINFELDT.