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A. GANSER.
ROAD GRADER.
APPLICATION FILED JULY 16, 1909

Patented Apr. 5, 1910.

2 SHEETS—SHEET 1.

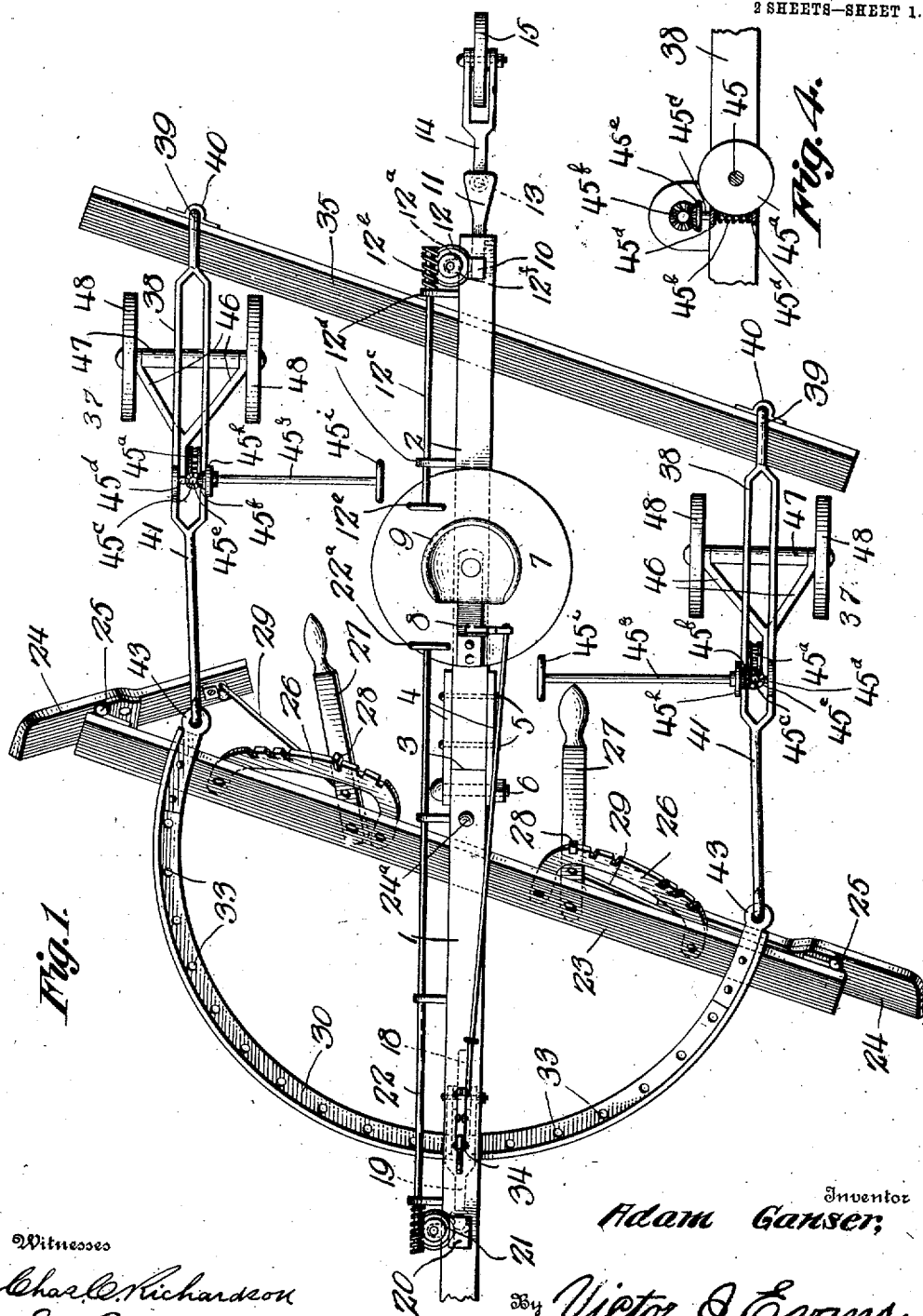


Fig. 1.

Fig. 4.

Witnesses

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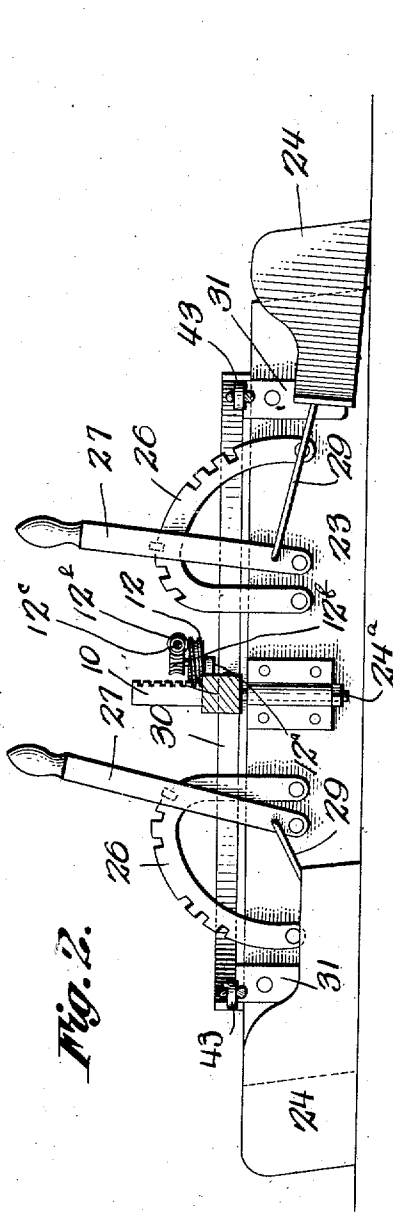


Fig. 2.

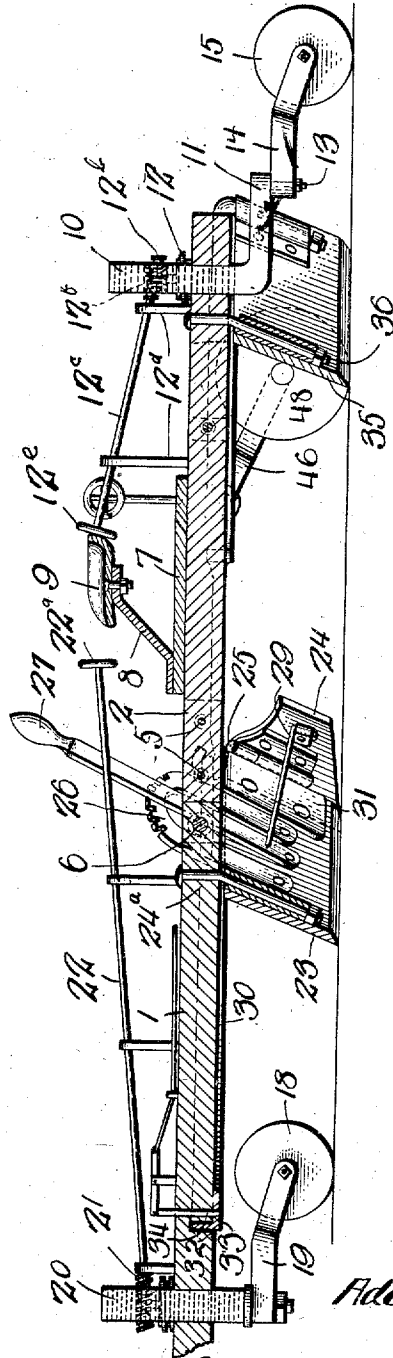


Fig. 3.

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ROAD-GRADER.

954,386.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ADAM GANSER, a citizen of the United States, residing at Lodi, in the county of Columbia and State of Wisconsin, have invented new and useful Improvements in Road-Graders, of which the following is a specification.

This invention is an improved road grading machine and consists of the construction, combination and arrangement of devices hereinafter described and claimed.

One object of the invention is to provide an improved machine of this character with scraper elements which are adjustable angularly so that the effective area thereof or path scraped thereby may be varied in width as may be required.

A further object is to effect improvements in the construction of the scraper elements.

A further object is to provide improved means for adjusting the scraper elements.

A further object is to effect improvements in the construction of the machine whereby the same is provided with means for raising and lowering the frame and the scraper elements and for supporting the same when in elevated position.

In the accompanying drawings:—Figure 1 is a plan of a grader constructed in accordance with my invention. Fig. 2 is a transverse sectional view of the same on the plane in rear of the front scraper element, and looking forwardly. Fig. 3 is a vertical longitudinal central sectional view of the same. Fig. 4 is a detail view of the gear for operating the truck frames.

In the present embodiment of the invention and for the purposes of this specification, the frame of the machine is shown as comprising a tongue or draft element 1, the rear portion thereof being shown, and a reach 2 which is coupled to the rear end of the tongue or draft element as at 3, the coupling devices comprising plates 4 on opposite sides of the meeting portions of the tongue and reach, bolts 5 securing said plates to the reach and a bolt 6 securing said plates to the tongue. A platform 7 which is preferably circular as here shown, but may be of any suitable shape, is secured on the reach at a suitable point and supports a spring standard 8 at the upper end of which is a seat 9. Near the rear end of the reach is a vertical opening in which operates a vertical removable standard 10 which has a rearwardly extending arm 11

at its lower end and is provided on one side with teeth which are engaged by a worm gear 12 said worm gear having suitable bearing which is indicated at 12^a. A smaller worm gear 12' which is connected to the worm gear 12 is engaged by a worm 12^b which is at the rear end of a shaft 12^c said shaft being mounted in bearings 12^d and being provided at its front end with an operating wheel 12^e which is close to the seat 9 so that it may be readily turned to cause the worm gear to co-act with the teeth of the standard 10 to raise and lower the latter. At the rear end of the arm 11 of the standard is a downwardly extending pivot 13. A fork 14 between the arms of which is mounted a rear supporting wheel 15 has its front end mounted on the pivots 13 so that a pivotal connection is effected between the standard and the fork and hence the wheel 15 is adapted to turn angularly with respect to the lever and to trail in any direction as may be required by the motion of the machine. It will be understood that by moving the standard upwardly or downwardly with respect to the reach the rear end of the reach may be raised or lowered as may be required to raise or lower the scraper hereinafter described which is near the rear end of the reach.

A supporting wheel 18 is mounted in a fork 19 the round end of which is pivotally connected to the lower end of a standard 20 which is similar in construction to the standard 10 and correspondingly provided with gear teeth on one side and is operated vertically by a worm mechanism indicated at 21 and which is identical with the worm mechanism described in connection with the standard 10. The operating shaft 22 of the worm mechanism 21 is provided at its rear end with an operating wheel 22^a which is also near the seat 9.

Under the tongue is the front scraper element 23 which is pivotally mounted as at 24^a, said pivot connecting the central portion of said scraper element to the tongue so that the said scraper element may be disposed at any desired angle with respect to the tongue. The said scraper element is provided at its ends with wings 24 forming extensions thereof, which wings are pivotally connected thereto as at 25 so that they may be disposed in line with the scraper element or at any desired angle with re-

spect thereto. The said scraper element is provided on its rear side at a suitable distance from its ends with segments 26 and is also provided with hand levers 27 which have suitable dogs, indicated at 28 for coaction with said segments to lock said levers at any desired adjustment. The said levers are connected by link rods 29 to the inner end portions of the wings 24. It will be observed that the said wings are mounted on the rear sides of the front scraper element and that their inner end portions partially overlap the same. A yoke 30 which is here shown as semi-circular in form and L-shaped in cross-section, is connected near its ends to the upper side of the front scraper element as at 31 and the said yoke bears on and is movable under the tongue, its vertical flange operating in a vertical recess 32 in the under side of the tongue. The horizontal flange or wing of the said yoke is provided with adjusting openings 33 and a bolt or pin 34 is employed, disposed in a vertical opening in the tongue and adapted to engage any one of the said openings 33 to lock the yoke at any desired point to the tongue and hence thereby secure the front scraping element at any desired angle. A rear scraper element 35 is pivotally mounted as at 36 under the reach near the rear end of the latter. Supporting trucks 37 are disposed between and connected to the front and rear scraper elements. Each of the said supporting trucks is here shown as having a link-shaped frame 38 provided at its rear end with a rearwardly extending arm 39 which is pivotally connected to the rear scraper element as at 40. The said link frames have hooks 41 at their front ends which engage eyes at the ends of the yoke 30 as at 43.

In each link-shaped frame 38 is pivotally mounted a fork 46, the pivot of the fork being indicated at 45. A worm gear 45^a which is concentric with the pivot 45 is secured to the pivoted end of the fork and is engaged by a worm 45^b at the lower end of a shaft 45^c which is mounted in bearing 45^d and has at its upper end a miter gear 45^e. Said miter gear is engaged by a similar gear 45^f at one end of a shaft 45^g, the said shaft being mounted in bearings 45^h with which the fork shaped frame is provided. The said shaft has at its inner end a hand wheel 45ⁱ near the seat 9 and which hence may be turned readily by the driver to cause the gears 45^a, 45^b, 45^d, 45^e and 45^f to turn the fork 46 angularly in a vertical plane. At the rear end of each of the said forks 46 is mounted an axle 47 on the ends of which are supporting wheels 48. Hence said supporting wheels may be raised and lowered with respect to the machine or, in other words, the said supporting wheels remaining at all times on the ground, the said levers and

connections enable the frame and hence the scraper elements to be raised and lowered, the vertical adjustable front and rear supporting wheels also being employed in co-operation with the supporting trucks to raise and lower the frame and scraper elements and support the same in an adjusted position. The supporting trucks serve to connect the front and rear scraper elements together so that they may be adjusted simultaneously at any desired angle with respect to the frame. They also enable one side of the machine or one end of the scraper element to be raised or lowered independently of the other side so that the scraper element 80 may be caused to operate from end to end or at only one end as may be necessary by the work.

It will be observed by reference to Fig. 1 of the drawings that the levers which control the supporting trucks and the rear trailing wheel and also the levers which control the wings of the front scraper element are disposed near the driver's seat so that the driver may readily operate any required lever and hence control the machine.

I do not desire to limit myself to the precise construction, and combination of devices herein shown and described as it is evident that modifications may be made therein within the scope of the appended claims.

What is claimed is:—

1. A grading machine of the class described having a frame, scraper elements pivotally connected thereto, vertically adjustable supporting elements for the frame and vertically adjustable supporting elements for the ends of the scraper elements, the last named vertically adjustable supporting elements being disposed between and connected to the said scraper elements.

2. A grading machine comprising a frame having vertically adjustable supporting elements at its front and rear ends, scraper elements pivotally connected to the frame and supporting elements for the ends of said scraper elements, disposed between and connected to the end portions thereof, each of said last-named supporting elements comprising a frame, a fork pivotally mounted therein for angular movement in a vertical plane, supporting wheels carried by said fork, and means to adjust the latter.

3. A grading machine comprising a frame having vertically adjustable supporting elements at its front and rear ends, scraper elements pivotally connected to the frame and disposed between said vertically adjustable supporting elements, a semi-circular yoke slidably connected to the frame and having its ends secured to the front scraper element, and vertically adjustable supporting elements for the ends of the said scraper elements, each of the last-named vertically adjustable supporting elements comprising a

link frame having its front end connected to one end of the said yoke, its rear end connected to one end of the rear scraper element, a fork pivotally mounted in said link
5 frame for angular movement in a vertical plane, supporting wheels carried by said fork, and means to adjust said fork.

4. A grading machine comprising a frame having vertically adjustable supporting ele-
10 ments at its front and rear ends, scraper elements pivotally connected to the frame and disposed between said vertically adjustable

supporting elements, and vertically adjustable supporting elements for the ends of said scraper elements disposed between and con- 15 nected to the end portions of said scraper elements.

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

ADAM GANSER.

Witnesses:

O. W. LAFF,
HERBERT PALMER.