No. 703,977. Patented July 8, 1902.

J. H. ALDRICH.

ROAD GRADER.

(Application filed Sept. 28, 1901.)

(No Model.) 2 Sheets—Sheet 1.

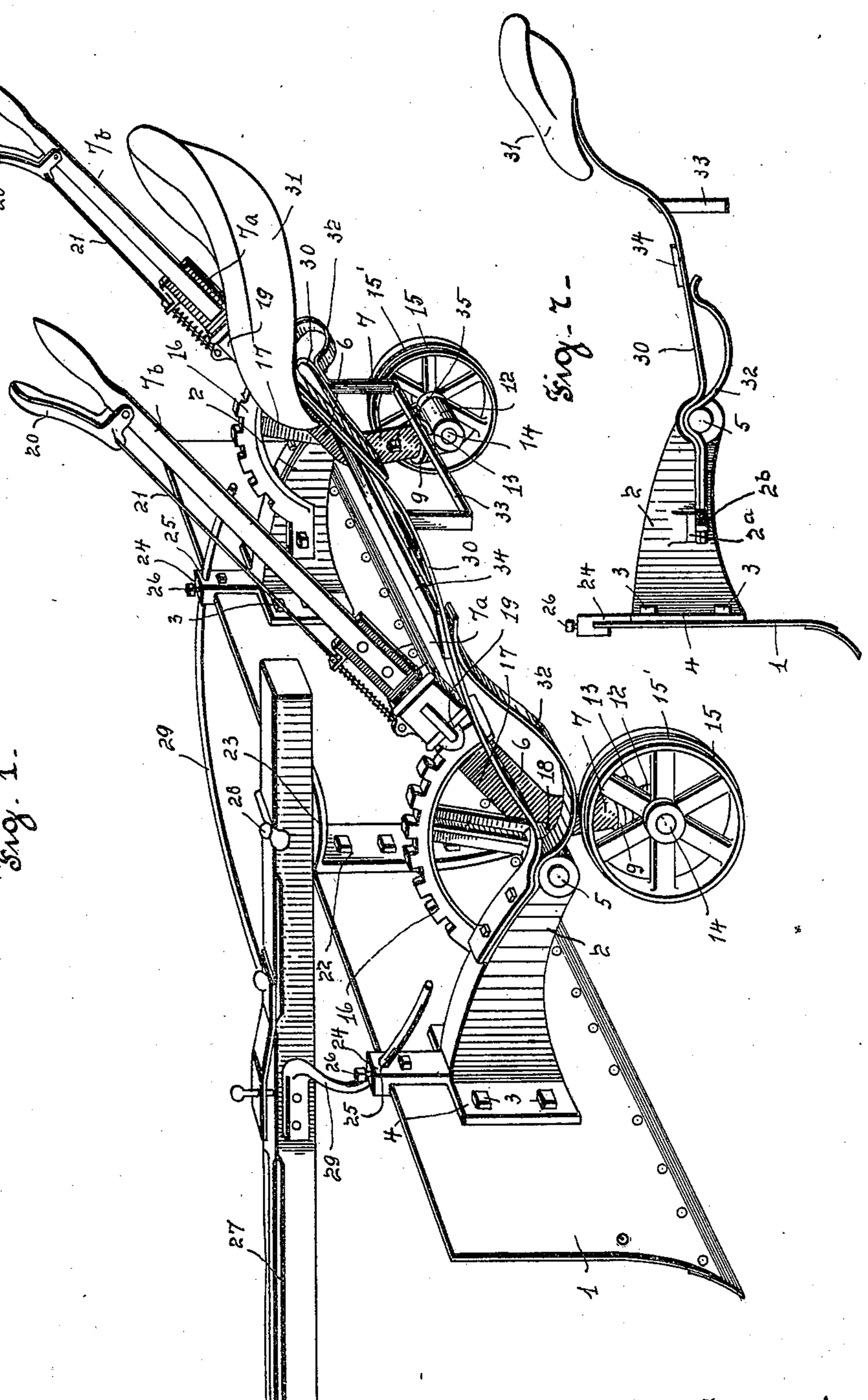

Fig. 1.

Fig. 2.

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No. 703,977. Patented July 8, 1902.

J. H. ALDRICH.

ROAD GRADER.

(Application filed Sept. 23, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig-2-

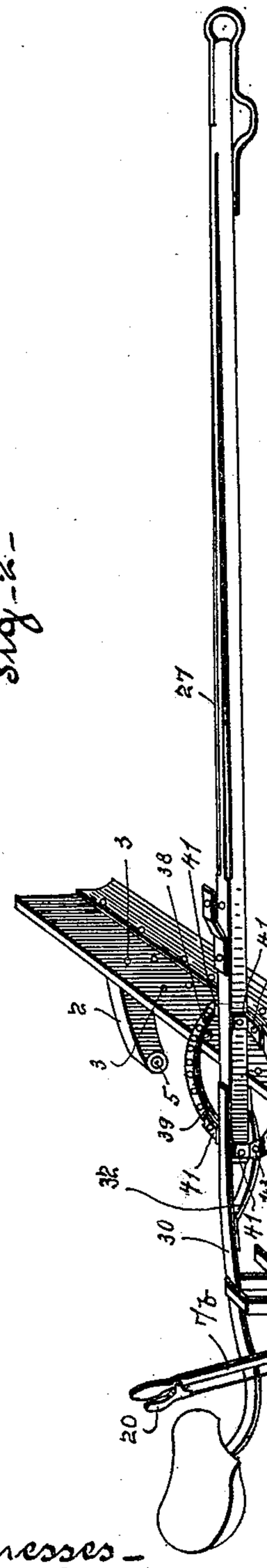


Fig-6-

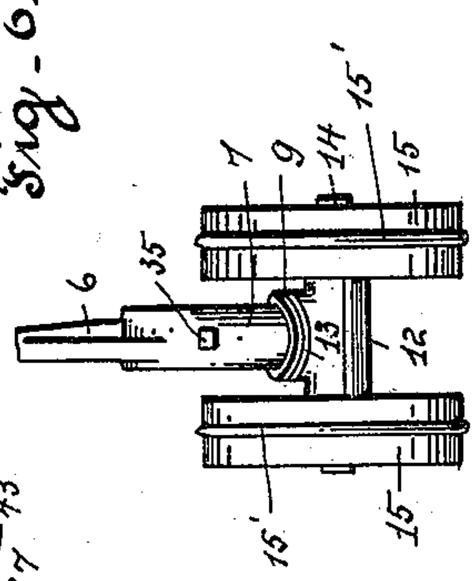


Fig-3

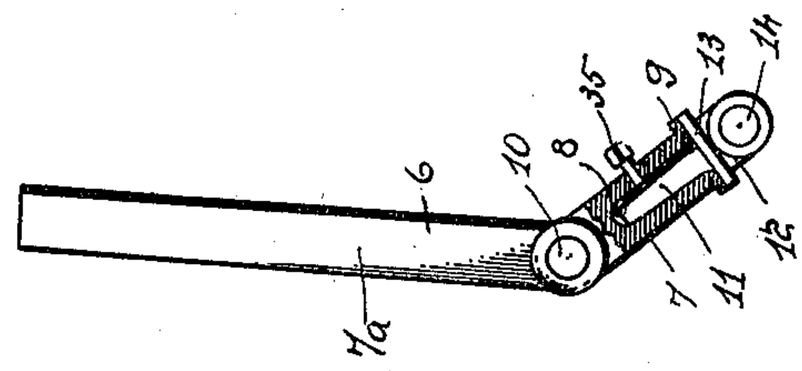


Fig-4-

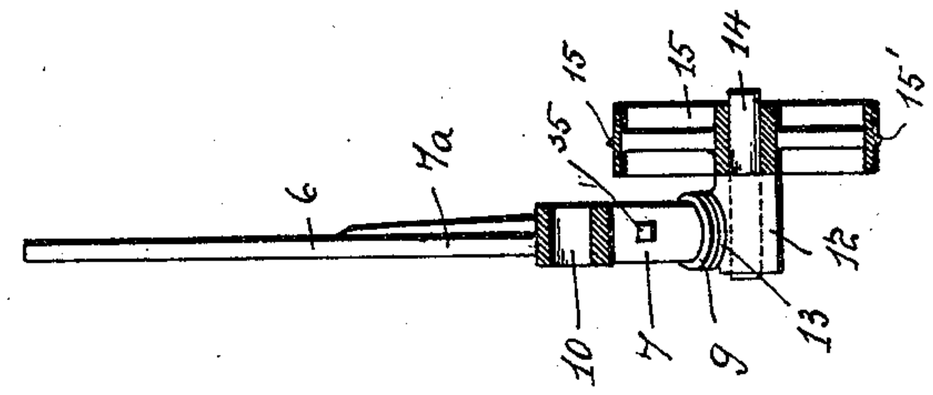
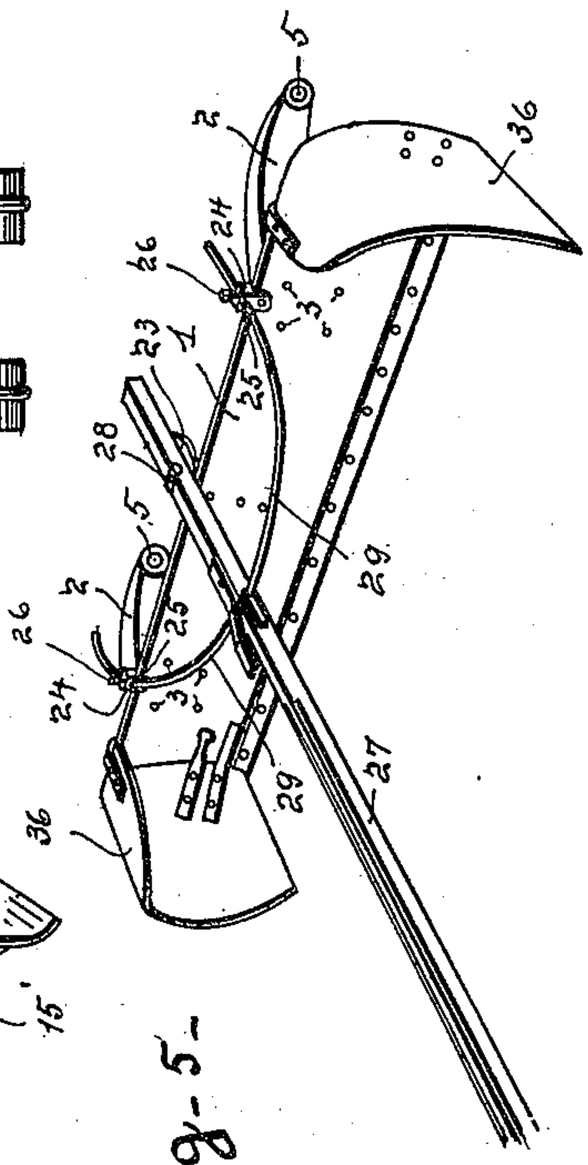


Fig-5-



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UNITED STATES PATENT OFFICE.

JONAS H. ALDRICH, OF BUTLER, INDIANA.

ROAD-GRADER.

SPECIFICATION forming part of Letters Patent No. 703,977, dated July 8, 1902.

Application filed September 23, 1901. Serial No. 76,199. (No model.)

To all whom it may concern:

Be it known that I, JONAS H. ALDRICH, a citizen of the United States, residing at Butler, in the county of Dekalb and State of Indiana, have invented a new and useful Improvement in Road-Graders, of which the following is a specification.

My invention relates to road graders or levelers, and has for its object to provide an implement of the kind that is simple and inexpensive in construction, of light draft, readily controlled, economical in operation, in which the cutter or scraper may be adjusted at various angles to the line of draft and from the horizontal, that will level a rough surface to an even grade without being affected by the inequalities of the surface, and that may be adapted for use as a scoop for grading. I accomplish these objects by constructing my invention as hereinafter described, and illustrated in the drawings, in which—

Figure 1 is a rear view in perspective of a grader constructed in accordance with my invention. Fig. 2 is a front view in perspective of the same, with one lever and rack detached, showing a cutter constructed partly of wood and partly of steel and provided with fifth-wheel attachment for the tongue and showing seat supported from the rear end of tongue. Fig. 3 is a side view, in elevation and partly in section, of a controlling-lever and the body of the caster attached thereto. Fig. 4 is an end elevation of the same, partly in section and with wheel attached. Fig. 5 is a perspective view of a cutter adapted as a scoop. Fig. 6 is a rear view of a two-wheeled caster attached to the lower arm of a lever, and Fig. 7 is a side view of a bracket attached to a cutter and showing modified means of attaching the seat-support.

In the drawings, 1 designates the cutter, which is preferably formed of a single steel plate, with the lower edge slightly curved forward, as shown in Fig. 1, and shod with a renewable cutting edge, but may be constructed of a suitable wood plate provided with a curved steel plate for a cutting edge, as shown in Fig. 2. To the back of the cutter, at equal distances from the center, are secured a pair of brackets 2 by bolts 3 through the flanges 4 and the cutter-plate. The free ends of the brackets 2, which project a suitable distance to the rear of the cutter, are provided with pivots 5, which are secured thereto horizontally and transversely, and upon the pivots 5 are mounted the bell-crank levers 6, with the angled lower arms 7 trailing. Arms 7 of the levers are made cylindrical at their lower ends and provided with end sockets 8 and concentric bearing-flanges 9, and the upper and longer arms 7^a are provided at their upper ends with suitable handles 7^b. At the angles of the levers 6 are provided the orifices 10 for mounting the levers on the pivots 5 of the brackets.

In the sockets 8 of the lower arms 7 are journaled the shanks 11 of the caster-bodies 12, the shanks 11 being provided with the concentric bearing-flanges 13, upon which rest the flanges 9 when the shanks 11 are inserted in the sockets, and projecting at right angles to the caster-bodies 12 are the axle-journals 14, upon which are mounted the wheels 15, which latter are preferably provided with peripheral flanges 15′ to resist the side thrust of the cutter. The casters may be adapted for single wheels, as in Figs. 1, 2, and 4, or two wheels, as in Fig. 6.

16 designates racks for the levers 6, the racks being in the form of segments of circles, and are provided with radial standards 17, having hub portions 18, by which they are mounted on the pivots 5 of the brackets 2 in a plane parallel with the plane of the levers 6 and are rigidly secured in such position by having the front ends of the segments bolted to the brackets, as shown in Fig. 1.

Levers 6 are provided with the spring-dogs 19, adapted to mesh with the cogs of the racks and hold the levers in different positions in the arc of their movements, and the dogs are linked to the hand-grip 20 by the rod 21, whereby the dogs are withdrawn when it is desired to change the position of the levers. The rear ends of the racks are provided with suitable stops to limit the rearward movement of the levers.

Central between the ends there is secured by suitable bolts to the back of the cutter 1, as shown in Fig. 1, a bracket 22, having a table 23 projecting rearward at right angles to the body of the bracket, and at equal distances from the central bracket there are also

secured to the top of the cutter the clips 24, having eyelets 25, provided with set-screws 26. Preferably clips 24 are made integral extensions of the flanges 4 of brackets 2, as shown in Figs. 1 and 7.

27 designates the tongue of the grader, the rear end of which rests upon the table 23 and is pivoted thereto by the pin 28. Secured to opposite sides of the tongue are the hounds 29, which project in opposite directions and are curved to describe arcs of a circle drawn through the eyelets 25, with the pin 28 taken as a center. When the outer ends of the hounds 29 are inserted through the eyelets 25 and the tongue is pivoted to the table 23, it is apparent that the tongue may be set at any desired angle to the cutter 1 and secured in such position by the set-screws 26.

To the top of the rear ends of the brackets 2 there is secured by bolts through the brackets a support 30 for the driver's seat 31. Support 30 is preferably formed of a bar curved to locate the seat a suitable distance and height to the rear of and central between the wheels of the casters and in convenient reach of the levers 6 and is provided with spring brace-bars 32, adapted to be secured to the brackets 2 by the bolts of the seat-bar 30, from which they are suitably curved to meet and yieldingly brace the seat-bar. Bar 30 is also provided with the step 33, which is attached to the bar in any suitable manner, and with a foot-rest 34. Bars 30 may be detachably supported, as shown in Fig. 7, by providing brackets 2 with the flanges 2^a, having pins 2^b, and extending the outer ends of pivots 5 and by curving bars 30 to rest thereon, with the ends underneath the flanges 2^a. The tongue 27 is provided with doubletrees and neck-yoke for two or four horses, as required, and the depth of cut of the cutter may be in part regulated by lengthening or shortening the neck-yoke straps. The lever-arms 7 are provided with set-screws 35, by which when the wheels are adjusted to the line of draft the casters may be locked against turning in their sockets. Thus constructed the cutter 1 may be rested upon the surface of the ground by setting the levers 6 in a vertical position, and it is apparent that it may be raised from the ground by a rearward movement or set to cut into the ground by a forward movement of the levers from a vertical position. It is also apparent that by setting the levers forward at different degrees from the vertical the cutter may be adjusted to cut at different angles from the horizontal and that in this manner the cutter may be readily adjusted to grade the crown of a roadway or street.

By locating the wheels 15 back of the cutter they travel on a leveled surface and maintain the cutter at the desired grade however unequal the surface in front of the cutter.

By supporting the driver's seat by the rear ends of brackets 2 and in the rear of the wheels 15 the weight of the driver is taken off the cutter and tends to lighten the weight of the tongue on the horses' necks. However, for some purposes when it is desired to add weight to the cutter a suitable seat-support may be attached to the rear end of the tongue, as shown in Fig. 2. A grader thus constructed, it is manifest, may be drawn by two or four horses and readily operated by one person, and the few and simple parts employed render its construction inexpensive.

In Fig. 5 is shown a cutter adapted for use as a scoop by bolting to its ends the curved end plates 36. With these attached and the tongue set at right angles to the cutter the implement may be used as a scoop to move soil from high to low places in the road-bed preparatory to its use as a grader to complete the grade.

For the means of attaching and securing the tongue to the cutter at different angles, shown in Fig. 1, there may be substituted, as shown in Fig. 2, a fifth-wheel 37, mounted and secured on the top of the cutter by suitable clips 38, integral with the stationary under section 39 of the wheel, the rear end portion of the tongue being secured to the top section 40 of the wheel by the clips 41, which are secured to the top section 40 at diametric opposite points on its rim. Sections 39 and 40 are each provided with bolt-orifices 42 in their rims at intervals around circles of equal diameter, by means of which the tongue may be locked at any angle to the cutter by one or more bolts 43, inserted through coincident orifices 42 of the upper and lower wheel sections.

What I claim to be new is—

1. In a road-grader, the combination with a cutter, of a pair of brackets secured to and projecting from the back of the cutter; bell-crank levers pivoted at their angles to the rear ends of the brackets and having their lower ends trailing behind the cutter and provided with casters; a tongue for the cutter; means for securing the tongue to the cutter and adjusting it at different angles thereto; means to lock each lever in different positions throughout the arc of its movement; and means to set and lock the casters against turning in their sockets with their wheels adjusted to the line of draft.

2. In a road-grader, the combination with a cutter, of a pair of brackets secured to and projecting from the back of the cutter; bell-crank levers pivoted at their angles to the rear ends of the brackets and having their lower ends trailing behind the cutter and provided with casters; a tongue for the cutter; means for securing the tongue to the cutter and adjusting it at different angles thereto; means to lock each lever in different positions throughout the arc of its movement; a seat-supporting bar secured to the rear ends of the tongue and extending to the rear of the caster-wheels; and a seat mounted on the outer end of the bar.

3. In a road-grader, the combination with a cutter, of a pair of brackets secured to and

projecting rearward from the back of the cutter and provided at their free ends with transverse horizontal pivots; bell-crank levers mounted on the pivots by bearings at their angles with their lever-arms trailing behind the cutter and provided with casters; a tongue for the cutter; means to secure the tongue to the cutter at various angles thereto, comprising a table-bracket centrally secured to the back of the cutter and pivotally supporting the rear end of the tongue, clips integral with the lever-brackets engaging the top of the cutter and provided with eyelets, hounds secured to the tongue and projecting through the eyelets, and set-screws in the eyelets adapted to engage the hounds; and means to lock each lever in different positions throughout the arc of its movement.

In witness whereof I have hereunto set my hand this 17th day of September, A. D. 1901.

JONAS H. ALDRICH.

Witnesses:

E. B. DUNTEN,

DAVID KINSELY.