(No Model.)

2 Sheets—Sheet 1.

J. M. HOLLAND.

ROAD GRADER.

No. 442,975. Patented Dec. 16, 1890.

Fig. 1.

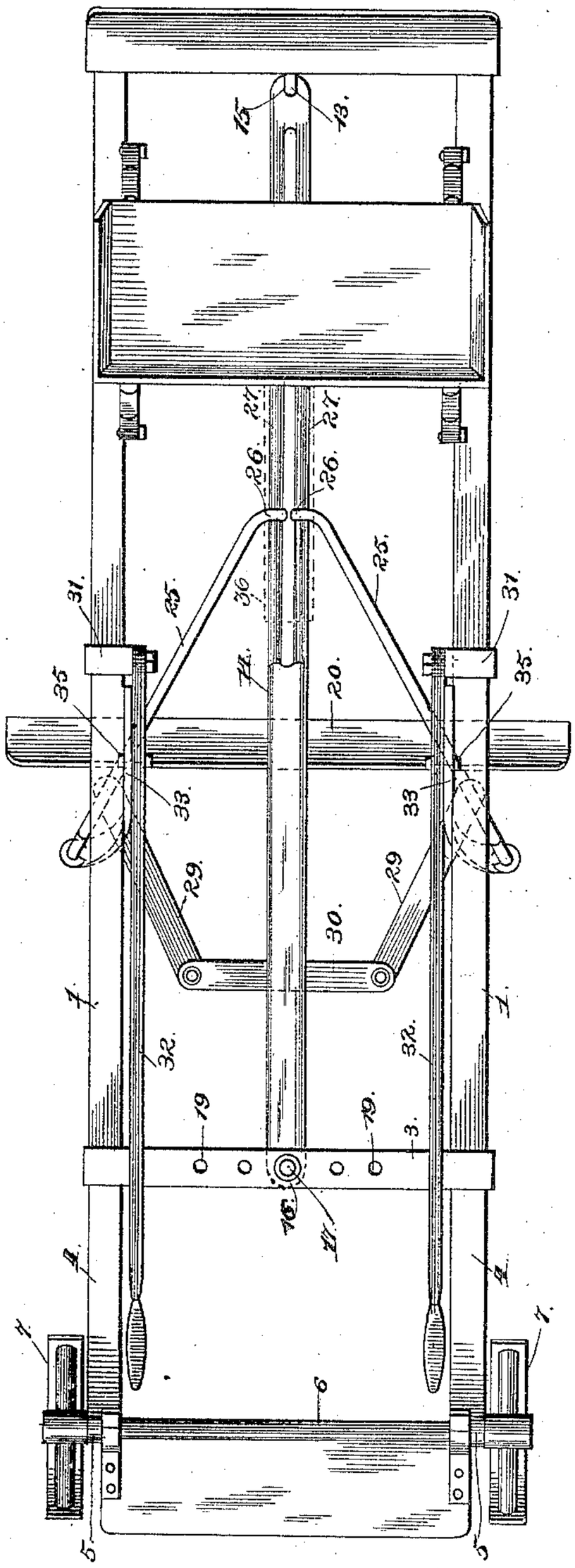
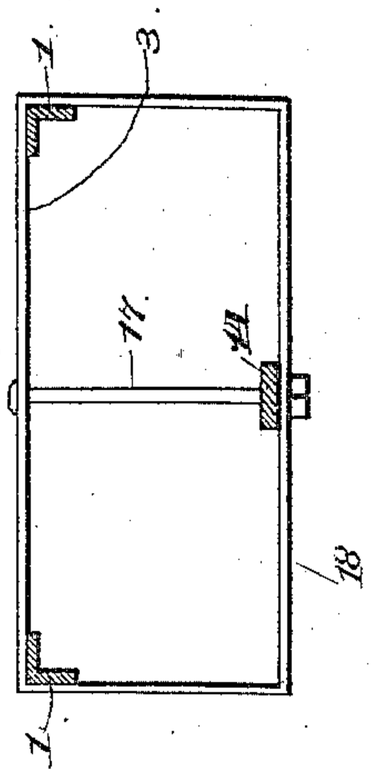


Fig. 4.



Witnesses:

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W. S. Dowell

Inventor

James M. Holland

By his Attorneys

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(No Model.) 2 Sheets—Sheet 2.

J. M. HOLLAND.

ROAD GRADER.

No. 442,975. Patented Dec. 16, 1890.

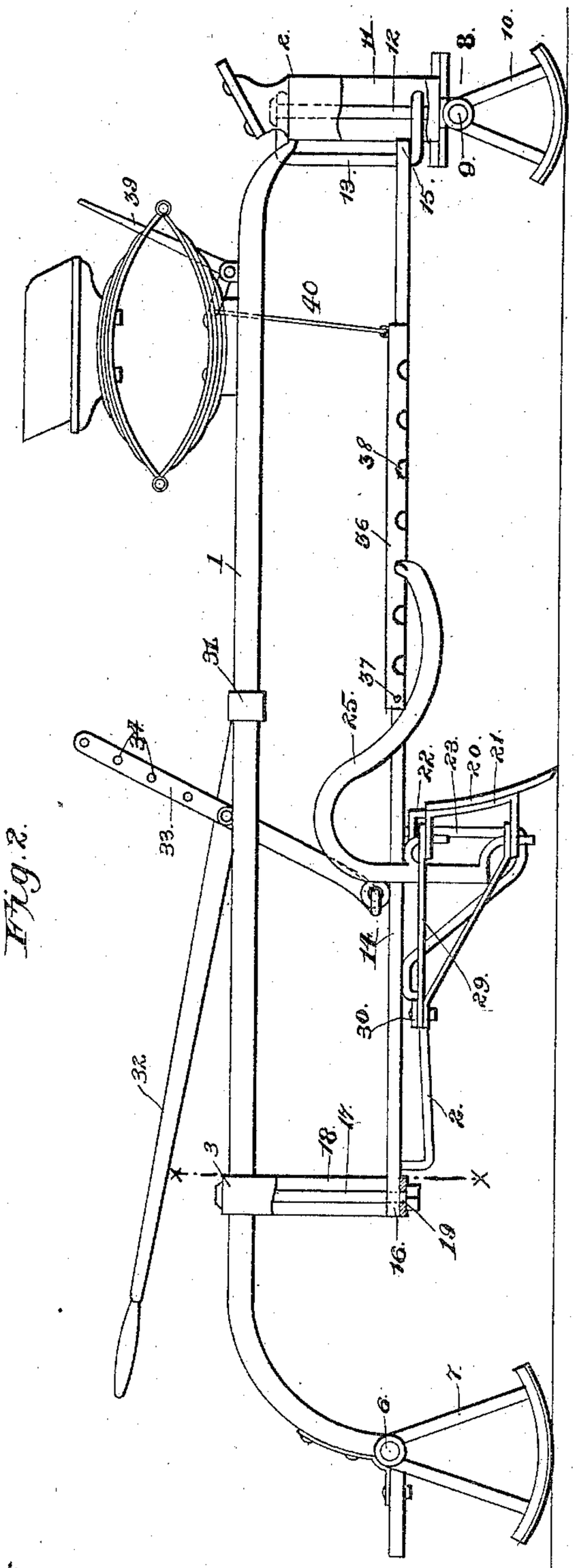

Fig. 2.

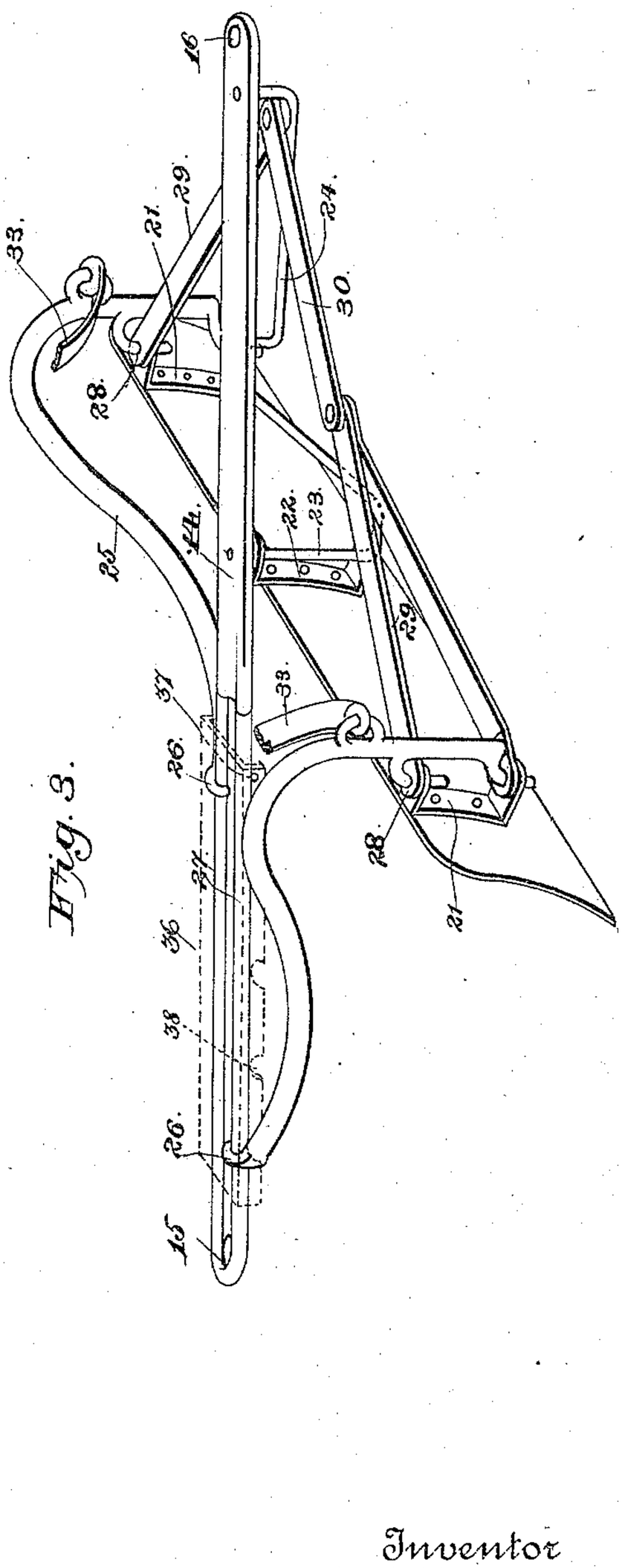

Fig. 3.

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UNITED STATES PATENT OFFICE.

JAMES M. HOLLAND, OF MOUNT PLEASANT, IOWA.

ROAD-GRADER.

SPECIFICATION forming part of Letters Patent No. 442,975, dated December 16, 1890.

Application filed November 26, 1889. Serial No. 331,598. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. HOLLAND, a citizen of the United States, residing at Mount Pleasant, in the county of Henry and State of Iowa, have invented a new and useful Road Scraping or Grading Machine, of which the following is a specification.

This invention has relation to road-scrapers or grading-machines, and has particular reference to the scraping mechanism, and, further, is intended as an improvement upon Patents Nos. 383,574, granted May 29, 1888, and 397,291, granted February 5, 1889.

Among the main objects in view are to provide a simple and convenient scraper-reversing mechanism, whereby the machine is adapted to discharge earth either to the right or left of the machine, said mechanism being within easy reach and control by the operator, and to so hang the scraper-blade as to be readily adapted for opening or filling ditches at either side of the machine, cutting down banks at the sides, and for scraping roads when formed upon grades or at the side of grades, and this without the usual waste of time caused by having to return the machine, as is the case with what is commonly known as "one-way scrapers."

A further object of the invention is to reduce the number of parts and otherwise simplify and strengthen the machine as a whole, thus adding lightness, durability, and strength, and these at a minimum cost of manufacture.

Other objects of the invention will hereinafter appear in the following description, and the novel features will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a plan of a road-scraping machine constructed in accordance with my invention. Fig. 2 is a side elevation. Fig. 3 is a detail in perspective of the scraping and its controlling mechanism. Fig. 4 is a transverse section on the line $x\ x$ of Fig. 2, with parts removed.

Like numerals of reference indicate like parts in all the figures of the drawings.

1 represents the side sills of the frame of the machine, and 2 the front and 3 the rear cross-sills, the whole constituting a rectangular frame-work. For the purpose of strength and lightness I prefer to form this frame of light angle-iron, though I do not limit the invention to this particular. The side sills 1 of the frame are continued beyond the cross-sill 3, and are correspondingly curved, as at 4, and are provided at their lower ends with bearings 5, in which is mounted an axle 6, to the ends of which are either applied ordinary ground wheels or runners 7. The front of the machine is supported upon a suitable truck 8, having an axle 9 and wheels or runners 10. Interposed between the front of the frame and the truck is a bolster 11, and through the frame, bolster, and truck is passed an ordinary king-bolt 12. Swiveled upon the king-bolt 12 by means of eyes formed at its terminals is an expanded U-shaped clevis 13.

14 represents the scraper-blade-supporting bar, and the same is preferably formed with front and rear eyes 15 and 16, the front eye 15 mounted upon and adapted to ride vertically in the U-shaped clevis and the rear eye 16 being for the reception of a locking-pin 17, which is passed vertically through the rear end sill 3 and a depending stirrup 18, said sill and stirrup being provided with a series of pin-holes 19 for the reception of said pin.

20 represents the scraper-blade, which is of the usual well-known form, and is provided on its rear face with perforated brackets 21 and an intermediate central bracket 22. The central bracket 22 is loosely connected with a depending standard 23, formed on the scraper-bar, which standard is, in this instance, of triangular shape, and continued to the rear to form a loop 24 elongated, and is then connected to the scraper-bar near its rear end.

Swiveled in the end brackets of the scraper-blade are curved forwardly-disposed braces 25, the front ends of which are either provided with means for or adapted to embrace the edges of the bifurcated scraper-bar, as at 26, and designed to ride freely upon beads 27, formed upon the opposite edges of said bar.

Loosely connected, as at 28, to the end brackets of the scraper-blade are hinged braces 29, the outer ends of which are connected by a transverse connecting-link 30, loosely riding in the loop 24, and when the scraper-blade is at a right angle to the scraper-bar said link is in a similar relative position to the bar and

bears at about its middle against the front end of the loop, and as the blade is swung to a greater or less angle said link rides around the front end of the loop until it is gradually moved therefrom by the increasing of the angle between the link and one of the brace-bars. When the blade is set at an angle to the beam that is other than a right angle, or to such a degree as to cause such a movement of the parts being described, that brace 29 which is at that end of the blade which is in advance is brought into line with the connecting-link so as to form an extended diagonal brace, the end of the shorter opposite brace 29 abutting against the rear end of the loop 24, and said shorter brace is at substantially a right angle to the scraper-blade. In this manner and in connection with the front curved movable braces the scraper-blade is most effectually braced, and the great and inordinate strain usually thrown upon the center of the scraper-bar is removed therefrom or from any portion thereof liable to weakness and transferred to the rear end of the bar, where it is strong and able to bear the necessary and consequent strain.

36 designates a gravity locking-latch of inverted-U shape in cross-section, adapted to embrace the opposite edges of and lie upon the scraping-blade-supporting bar 14, to which bar the rear end of the latch is pivoted, as at 37. The opposite depending sides or flanges of the latch are provided at intervals with notches 38, adapted to take over the bifurcated ends of the curved braces 25, whereby they are securely locked in a rigid adjusted position. A bell-cranked hand-lever 39 is pivoted near the front end of one of the side sills 1 in close proximity to the driver's seat, and a rod 40 loosely connects the lower end of the lever with the free end of the gravity locking-latch, whereby in shifting the scraper-blade the latch may be operated. If desired, the lever may be located back of the driver's seat to be operated by the attendant.

It now remains to provide means for elevating and depressing the blade, and, further, to so mount the pressure-conveying agents as to bring the weight which controls the blade at a proper point directly over the blade, notwithstanding the angle at which it may be set. For the purpose of convenience, saving, &c., I prefer to mount movable fulcrum 31 upon each of the side sills of the frame, and to these movable fulcrums pivot ordinary hand-levers 32, which are adjustably connected with the ends of the scraper-blade by means of connecting-levers 33, having perforations 34 at their upper ends for the reception of pivot-pins 35, passing through the connecting-levers and hand-levers, the lower ends of the levers 33 being loosely connected to the connecting-eyes formed on the curved movable braces 25. It will at once be apparent that to reverse the scraper-blade so as to throw the dirt to either side of the road, regardless of the direction in which the machine is traveling, it is simply necessary to slide one of the levers 32 forward or in rear of the other, the fulcrum thereof riding upon its side sill, when, through the medium of the connecting-lever, the corresponding end of the blade is carried to the front or rear, as the case may be. It will be apparent that while the blade can be thus thrown to reverse angles it is also perfectly free for vertical movement either when turning the machine to go to the opposite side of the road or for transporting the machine to different points of operation.

When it is desired to either raise one end or the scraper-blade wholly from contact with the surface of the ground, it may be accomplished by elevating either or both of the hand-levers, in which case the scraper-bar is also elevated, the ends thereof riding upon the clevis and the adjustable pin at the front and rear ends of the machine, respectively. If it be desired to throw the scraper-bar and scraper out of line of draft at any angle whatever, it is simply necessary to withdraw the locking-pin 17, move the rear end of the bar to the right or left, and reinsert the pin in one of the series of pin-holes. In this manner the scraper-blade is projected from the machine for scraping the sides of the roads and for filling ditches, to the edges of which it would be dangerous to bring the machine too close.

Various modifications may be substituted in regard to the details of my invention, and more especially with regard to the simple manner I have shown and described for connecting the various parts, and this without departing from the spirit of my invention, and I would therefore have it understood that I do not herein limit my invention to the exact details mentioned.

My invention possesses many advantages over the one-way scrapers, in that when employed in the construction of roads on the sides of and parallel with hills the dirt can be taken from the upper side of the proposed road and delivered at the opposite side thereof whichever way the machine may be traveling, whereas in the one-way scraper the road is only scraped while the machine is moving in one direction and one-half of the time is lost in returning to the starting-point.

Further advantages are apparent when the machine is being employed for the construction of roads on heavy grades—that is, ascending or descending a hill—in that the scraping operation may be carried on at either side of the road while the machine is descending, whereas in the one-way scraper one-half the scraping must be accomplished while the machine is going uphill. The stirrup 18, in which is secured the rear end of the scraper-bar, may be and in this instance is constructed in the form of a rectangle, the two ends attached to the rear end of the main frame and one side depending. It may also be formed by cranking the hind axle, and I do not limit myself to the exact shape or po-

sition in which the stirrup may be made or attached either as a depending or inverted stirrup.

Having described my invention, what I claim is—

1. In a machine of the class described, a frame-work provided at its rear end with a stirrup, in combination with a scraper-bar loosely connected to the front end of the frame-work and having its rear end adjustably mounted for lateral movement in the stirrup, substantially as specified.

2. In a machine of the class described, a frame-work provided at its rear end with a depending stirrup, in combination with a scraper-bar the front end of which is loosely connected to the front end of the frame and the rear end of which terminates in and is connected to the stirrup, substantially as specified.

3. In a machine of the class described, a frame-work having side and end sills, the rear end sill being perforated and provided with a stirrup having similar registering perforations, in combination with a scraper-bar loosely connected at its front end to the frame-work and provided with an eye at its rear end adapted to register with the perforations, and a locking-pin for insertion through the perforations in the sill and stirrup and the eye, substantially as specified.

4. In a machine of the class described, a frame-work provided at its front end with a swiveled U-shaped clevis and at its rear end with a depending perforated stirrup, in combination with a scraper-bar having eyes at both ends, the front eye connecting with the clevis and the rear eye with a locking-pin passing therethrough and through the perforations, substantially as specified.

5. In a machine of the class described, a scraper-bar provided near its front end with opposite longitudinal beads and in rear thereof with a depending standard, in combination with a scraper-blade loosely mounted on the standard, side braces loosely connected at each end of the blade and forwardly extended and provided with eyes for embracing the beads of the bar, and means for locking the braces in adjusted positions upon the bar, substantially as specified.

6. In a machine of the class described, a scraper-bar provided with a depending standard continued to form an elongated loop, in combination with a scraper-blade, opposite hinged braces connected at each end of the blade, a connecting-link connecting the ends of the braces and riding in the loop, and means for rigidly and adjustably connecting the scraper-blade to the bar, substantially as specified.

7. In a machine of the class described, a scraper-bar provided with a depending standard, in combination with a scraping-blade loosely connected with the standard and provided with opposite hinged braces connected by a link, said link being mounted in a loop formed on the scraper-bar and adapted when the blade is swung to a sufficient angle to be thrown into line with one of the braces and abut against the rear end of said loop, and means for rigidly connecting the blade and bar, substantially as specified.

8. In a machine of the class described, a frame-work provided at its front end with an expanded U-shaped clevis, in combination with a scraper-bar adjustably connected at its rear end in a stirrup and to which is loosely attached a scraper-blade, the bar being provided with an eye at its front end engaging the expanded U-shaped clevis, substantially as specified.

9. In a machine of the class described, a scraper-bar provided at or near its rear end with a loop, in combination with a scraper-blade, opposite hinged braces connected at each end of the blade, a connecting-link connecting the ends of the braces and riding in the loop, and means for rigidly connecting the blade and bar, substantially as specified.

10. In a road-scraper, the combination, with the frame, of a longitudinally-disposed scraper-bar connected thereto, a scraper-blade pivoted to the bar, opposite braces having their rear ends connected pivotally to the ends of the blade and their front ends connected with and adapted to slide freely upon the bar, and a gravity-latch pivoted upon the scraper-bar and adapted to drop over and lock said braces, substantially as specified.

11. In a road-scraper, the combination, with the frame, of a scraper-bar having opposite beaded edges supported by and longitudinally disposed under the frame, a scraper-blade pivoted near its center to the bar, opposite braces having their rear ends pivotally connected to the ends of the blade and their forward ends mounted for sliding freely on the opposite beaded edges of the bar, the forward ends of said braces being adapted to pass each other, an inverted-U-shaped gravity-latch pivoted to the bar and having its opposite edges embracing said bar and provided with notches adapted to take over said braces, a lever mounted on the frame, and a rod connecting the lever and free end of the latch, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JAMES M. HOLLAND.

Witnesses
H. D. ANDREWS,
H. J. ROUSE.