

J. D. & R. E. ADAMS.
ROAD GRADER.
APPLICATION FILED DEC. 23, 1910.

1,014,989.

Patented Jan. 16, 1912.

4 SHEETS-SHEET 1.

Fig. 1.

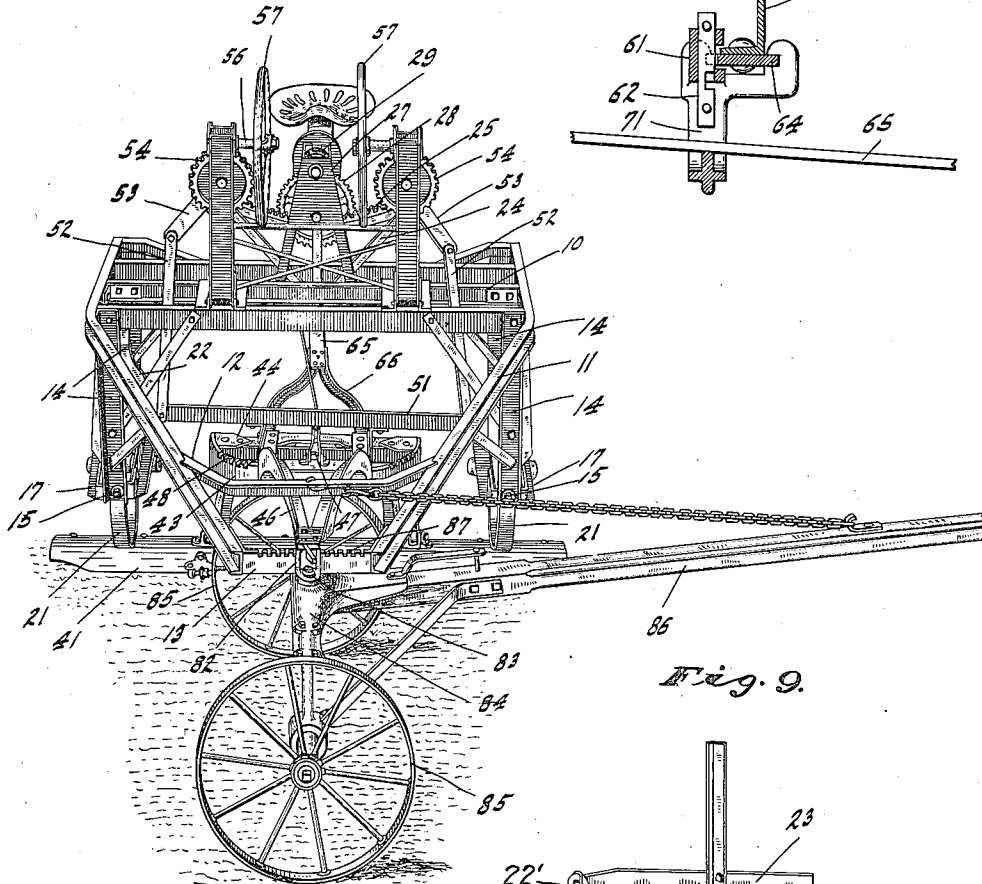


Fig. 10.

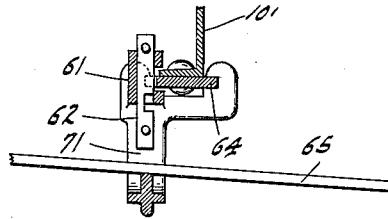


Fig. 9.

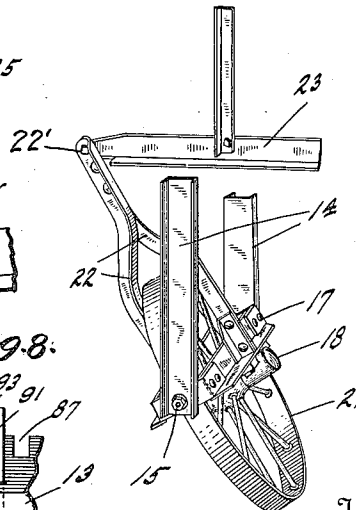


Fig. 7.

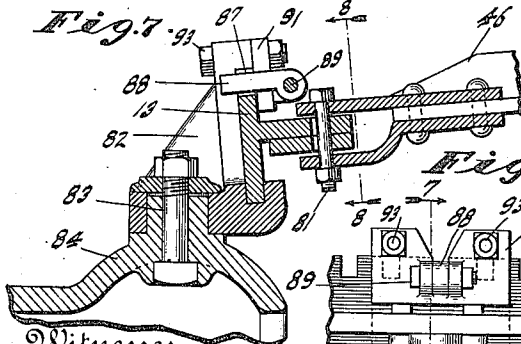
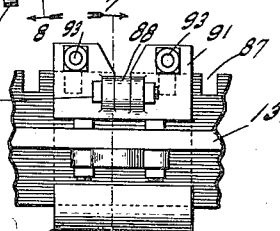


Fig. 8.



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4 SHEETS—SHEET 2.

Fig. 2.

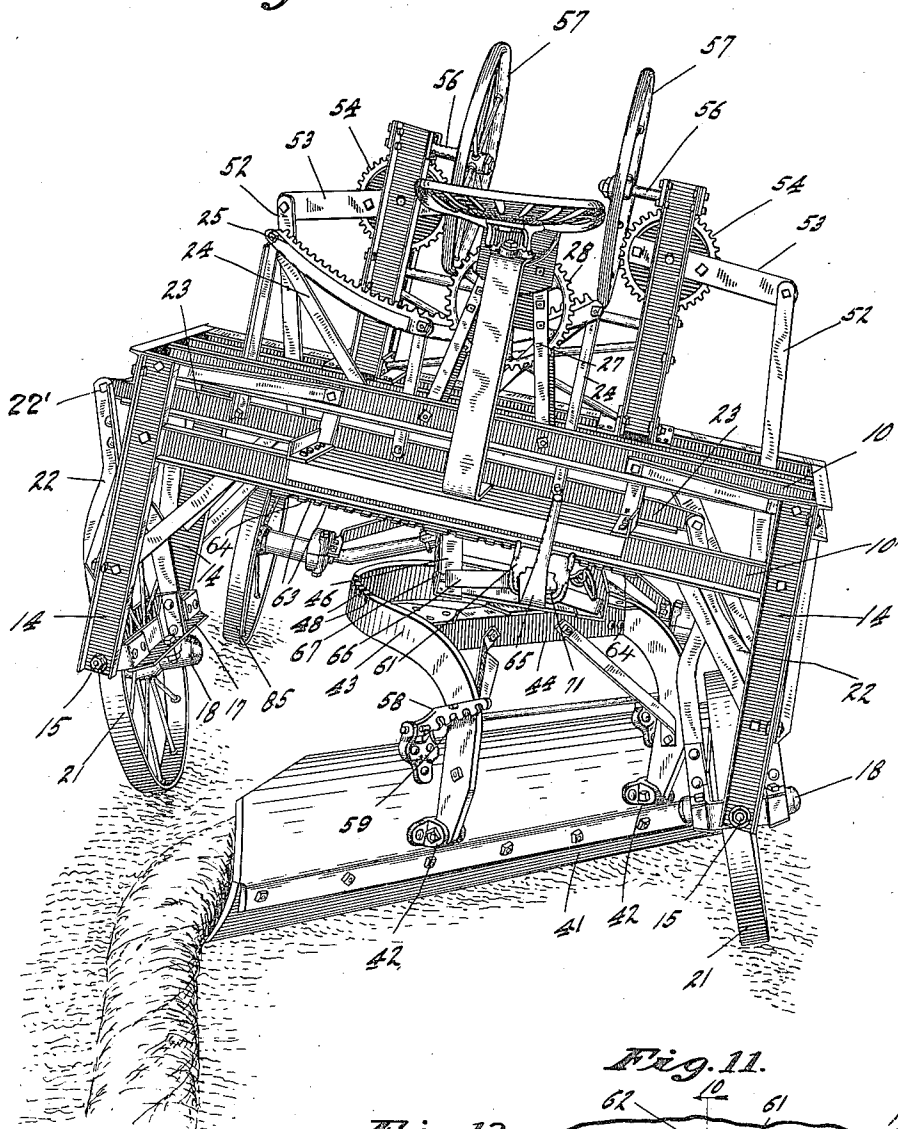


Fig. 11.

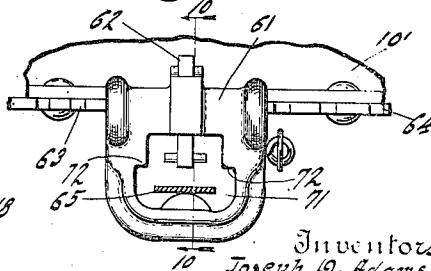
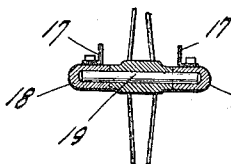


Fig. 12.



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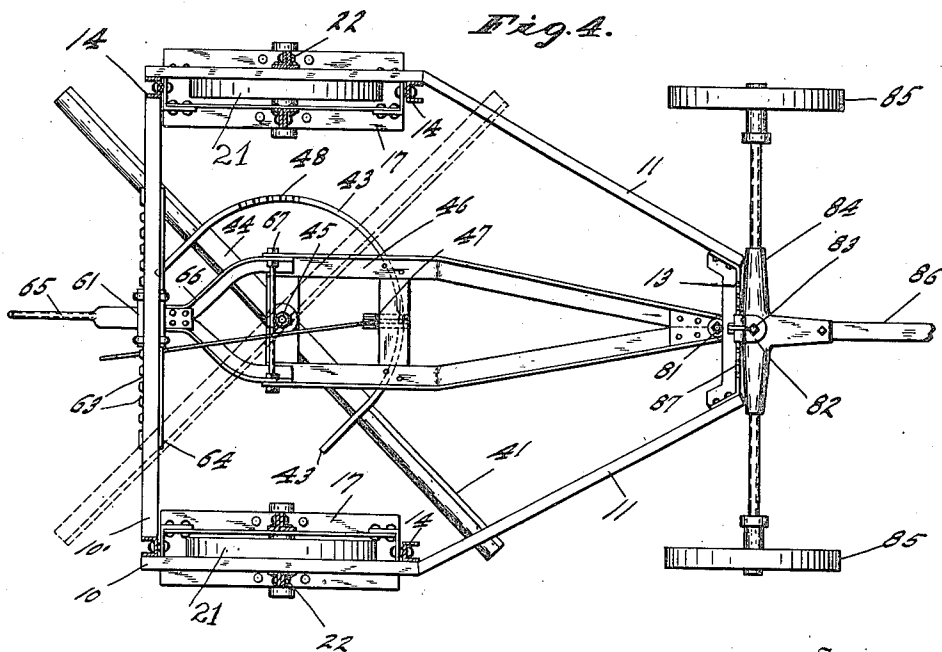
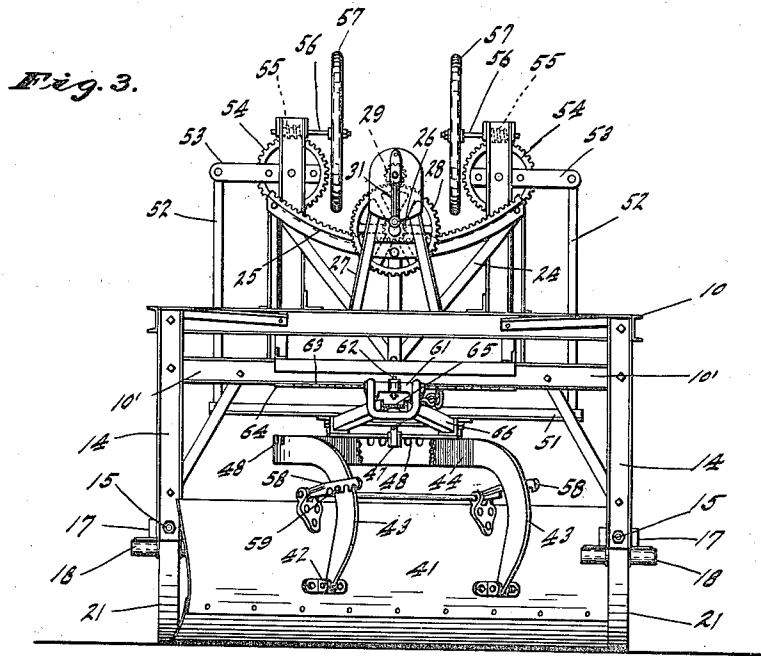
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4 SHEETS—SHEET 3.



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4 SHEETS-SHEET 4.

Fig. 5.

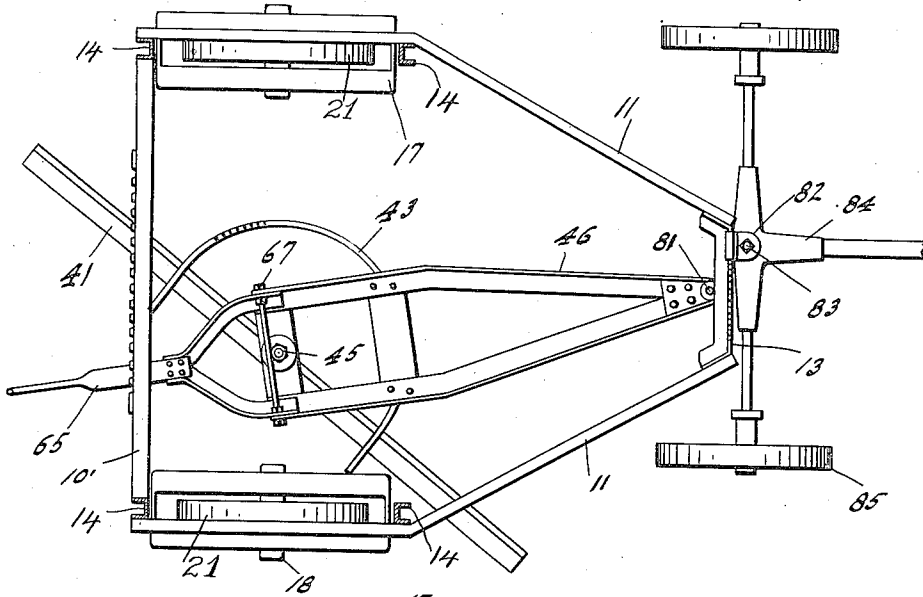


Fig. 6.

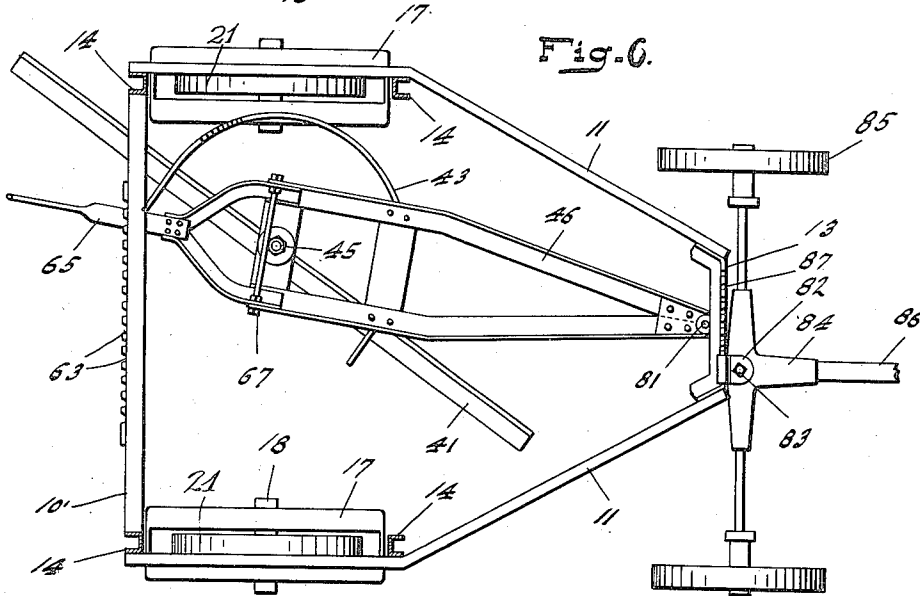
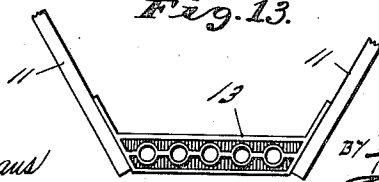


Fig. 13.

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UNITED STATES PATENT OFFICE.

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ROAD-GRADER.

1,014,989.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed December 23, 1910. Serial No. 598,945.

To all whom it may concern:

Be it known that we, JOSEPH D. ADAMS and ROY E. ADAMS, citizens of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Road-Grader, of which the following is a specification.

The object of this invention is to produce a road grader having a mold board or scraping blade mounted directly between the rear or main supporting wheels of the structure and of a length exceeding the distance between the wheels, the construction being such, however, that the angle of the blade relative to the roadway may be reversed in order to reverse the direction of discharge of material from the blade.

A further object of the invention, is to provide means by which the discharge throw between the rear end of the mold board and the adjacent supporting wheel of the main frame may be widened so as to prevent the discharge of dirt into the adjacent wheel.

Further objects of said invention will appear from the detailed description and claims.

The accompanying drawings illustrate our invention.

Figure 1 is a perspective view of the machine in an intermediate position during the act of reversing the mold board relative to the supporting frame; Fig. 2 a perspective view showing the machine in position to move dirt from a side gutter; Fig. 3 is a rear elevation; Fig. 4 a plan; Figs. 5 and 6, plans showing different adjustments of the mold board and front wheels; Fig. 7 a section of the front axle connection on line 7-7 of Fig. 8; Fig. 8 an elevation of the coupling member taken from line 8-8 of Fig. 7; Fig. 9 a fragmentary perspective detail of one of the main supporting wheels; Fig. 10 a section in line 10-10 of Fig. 11; Fig. 11 a rear elevation of the retaining means for the rear end of the mold board frame; Fig. 12 an axial sectional detail of one of the supporting wheels and its frame, and Fig. 13 a fragmentary detail of a modified connection between the mold board frame and main frame.

In the drawings, 10 indicates a suitable main frame, the side bars 11 of which are brought together at their forward ends and connected by suitable brace 12 and front bar 13. At its rear end the main frame 10 is

provided at each side with a pair of depending legs 14-14 between the lower ends of which is pivoted, upon a longitudinal horizontal axis 15, a yoke or frame 17. Secured to the lower face of each side bar of frame 17 is a boxing cap 18 the outer end of the bore thereof being closed. Journaled in the two caps 18 are the ends of a shaft 19 of a supporting wheel 21. By this arrangement a very firm, substantial and long-bearing for the wheel 21 may be secured and dirt cannot readily enter. Secured to the side bars of frame 17 are bars 22 which, at their upper ends, are brought together and pivotally connected to a cross bar 23 at 22'. Bar 23 connects the two sets of arms 22 and forms the lower member of a frame 24, the upper member of which is a segmental rack 25 meshing with a pinion 26, journaled in a suitable bracket 27 on the main frame 10. Pinion 26 is carried by a gear 28 which meshes with a suitable operating pinion 29 to which is connected an operating crank 31, the arrangement being such that, by turning crank 31, the two frames 17 may be simultaneously tilted upon their axes 15 in the same direction so as to tilt the wheels 21 simultaneously in order to overcome the side draft due to the angular placing of the scraper blade to which reference will now be made.

The scraper blade or mold board 41 is of an ordinary type and is pivotally connected by brackets 42, on horizontal axis, to the lower ends of a supporting yoke or semicircle 43, the middle portion of this yoke being substantially horizontal and semicircular. The yoke 43 is provided with a diametrical cross bar 44 which is pivoted at 45 on a vertical axis to the rear end of a scraper frame 46 and this frame carries a latch 47 adapted to cooperate with any one of the series of notches 48 in the semicircular portion of yoke 43, to hold the scraper blade at any desired angle relation to the scraper frame 46. The details of this construction are quite common and need no further description.

Secured to the rear end of frame 46 is a cross bar 51 to each end of which is secured a link 52. Each link is connected to an arm 53 carried by a gear 54 and each gear 54 is operated by means of a worm 55 carried by a shaft 56 provided with a hand wheel 57, in a well known manner. The vertical angle of blade 41 is maintained in any de-

sired adjusted position by means of notched links 58 carried by brackets secured to the upper edge of the blade and cooperating with pins 59 carried by the depending arms of yoke 43.

Slidably mounted upon the cross bar 10' of the main frame 10 is a bracket 61 which carries a gravity latch pin 62 adapted to enter any one of a series of notches 63 formed in a blade 64 carried by the cross bar 10'. Extended through the bracket 61, beneath the lower end of the latch pin 62 is an operating arm or lever 65 having a bifurcated inner end 66 pivoted at 67 to the rear end of frame 46. The lever 65 passes through an opening 71 in the bracket 61. This opening at its lower side is provided with shoulders 72 beneath one of which the lever 65 will normally lie, so that it will not accidentally engage the gravity latch 62 so as to withdraw it from the desired notch 63 and plate 64 (see Fig. 11).

The forward end of frame 46 is pivoted upon an inclined axis at 81 to cross bar 13. Slidably mounted upon the cross bar 13 is a bracket 82. Pivoted upon a vertical axis, at 83, to bracket 82 is the front axle structure 84, said front axle structure being carried by suitable supporting wheels 85. The structure 84 also carries a suitable tongue 86. Any suitable means may be provided to hold the bracket 82 in any desired position of adjustment upon bar 13. In the form shown in the drawings, we have provided the upper edge of bar 13 with a plurality of notches 87 adapted to receive a latch pin 88 pivoted at 89 on bracket 82. The pivot pin 89 may be conveniently carried by a clamping plate 91 between which and the main body of the bracket 82, the upper edge of the cross bar 13 may be firmly clamped by means of clamping bolts 93.

In operation, the blade 41 may be set at any desired angle to the line of a road by swinging the same upon pivot 45 and also by swinging the blade carrying frame 46 upon its forward pivot. In order to reverse the road angle of the blade, links 58 are disconnected from pins 59, the blade turned down flat upon the ground, and latch 47 withdrawn. Thereupon, by lowering arms 53 to the position shown in Fig. 1, the entire main frame of the machine may be lifted from the ground, the weight being supported upon the blade resting upon the ground. Thereupon, the machine may be turned as a whole so that the rear supporting wheels 21 will pass over the blade in the manner illustrated in Fig. 1, and when this has been accomplished, the blade carrying frame 46 may be shifted about the pivot 45 so as to reverse the road angle of the blade as indicated in dotted lines in Fig. 4. The mold board being placed between the rear wheels places practically all the side draft,

due to the angular position of the mold board, upon the rear wheels, so that these rear wheels are the only ones which need to be adjusted to a vertical angle in order to take care of the side draft. When it is desired to move dirt from the extreme side of the road toward the other side it is necessary to provide some means by which the horses may travel along lines separated from the windrow or loose dirt engaged by the forward end of the mold board and therefore, in order to obtain a maximum movement of dirt, the parts are adjusted as shown in Fig. 5, the front axle structure being shifted in the direction opposite to the shifting of the mold board so that the adjacent front wheel runs to the delivery side of the advance end of the mold board. This places the horses to the center of the road and projects the forward edge of the mold board beyond the adjacent rear wheel. If dirt is to be moved from the center of the road to one side the parts will be adjusted in the manner shown in Fig. 6 thus placing the front axle in such position that the horses will walk upon the opposite sides of the windrow. It will be understood of course, that the same relative adjustments may be produced with the road angle of the mold board reversed. It will also be understood that similar adjustment results can be obtained, although not quite so advantageously, by keeping the front axle fixed relative to the forward end of the main frame and shifting the front end of the mold board frame 46 transversely, as illustrated in Fig. 13.

We claim as our invention:

1. In a road scraper, the combination with a main frame provided with a pair of carrying wheels, means for adjusting the vertical angle of said wheels relative to the main frame, a mold board frame pivotally connected at its forward end to the forward end of the main frame, means for adjusting the rear end of the mold board frame transversely, a mold board pivotally mounted upon the rear end of the mold board frame upon a vertical axis, and adjusting means carried by the main frame and engaging the rear end of the mold board frame for adjusting the mold board vertically.

2. In a road scraper, the combination with a main frame provided with a pair of carrying wheels, a mold board frame pivotally connected at its forward end to the forward end of the main frame, means for adjusting the rear end of the mold board frame transversely, a mold board pivotally mounted upon the rear end of the mold board frame upon a vertical axis, and adjusting means carried by the main frame and engaging the rear end of the mold board frame for adjusting the mold board vertically.

3. In a road scraper, the combination with

a main frame provided with a pair of carrying wheels, means for adjusting the vertical angle of said wheels relative to the main frame, a mold board frame pivotally connected at its forward end to the forward end of the main frame, a mold board pivotally mounted upon the rear end of the mold board frame upon a vertical axis, and adjusting means carried by the main frame and engaging the rear end of the mold board frame for adjusting the mold board vertically.

4. In a road scraper, the combination with a main frame provided with a pair of carrying wheels, a mold board frame pivotally connected at its forward end to the forward end of the main frame and extended rearwardly between the rear wheels, a mold board pivotally mounted upon the rear end of the mold board frame upon a vertical axis, and adjusting means carried by the main frame and engaging the rear end of the mold board frame for adjusting the mold board vertically.

5. In a road scraper, the combination of a main frame, supporting wheels for said main frame, a mold board frame carried by the main frame, a mold board carried by said mold board frame upon a substantially vertical axis, and means carried by the main frame for raising and supporting the main frame and its supporting wheels above the mold board whereby the mold board may be swung beneath the supporting wheels.

6. In a road scraper, the combination with a main frame and supporting wheels therefor, of means for adjusting the vertical angle of said supporting wheels relative to the main frame, a mold board frame flexibly connected at its forward end to the forward end of the main frame, a mold board mounted upon the rear end of said mold board frame upon a substantially vertical axis, a pair of independent adjusting devices mounted upon the main frame, links connecting said independent adjusting devices with opposite sides of the rear end of the mold board frame and of character that the mold board may be thereby lowered to the ground and the main frame lifted from the ground enough to bring the supporting wheels above the mold board, a front axle and the supporting wheels therefor, and means for shifting said front axle transversely on the main frame.

7. In a road scraper, the combination with a main frame and supporting wheels therefor, of a mold board frame flexibly connected at its forward end to the forward end of the main frame, a mold board mounted upon the rear end of said mold board frame upon a substantially vertical axis, a pair of independent adjusting devices mounted upon the main frame, links connecting said independent adjusting devices

with opposite sides of the rear end of the mold board frame and of character that the mold board may be thereby lowered to the ground and the main frame lifted from the ground enough to bring the supporting wheels above the mold board, a front axle and the supporting wheels therefor, and means for shifting said front axle transversely on the main frame.

8. In a road scraper, the combination with a main frame and supporting wheels therefor, of means for adjusting the vertical angle of said supporting wheels relative to the main frame, a mold board frame flexibly connected at its forward end to the forward end of the main frame, a mold board mounted upon the rear end of said mold board frame upon a substantially vertical axis, a pair of independent adjusting devices mounted upon the main frame, links connecting said independent adjusting devices with opposite sides of the rear end of the mold board frame and of character that the mold board may be thereby lowered to the ground and the main frame lifted from the ground enough to bring the supporting wheels above the mold board, and means for shifting a front axle transversely on the main frame.

9. In a road scraper, the combination with a main frame and supporting wheels therefor, of a mold board frame flexibly connected at its forward end to the forward end of the main frame, a mold board mounted upon the rear end of said mold board frame upon a substantially vertical axis, a pair of independent adjusting devices mounted upon the main frame, links connecting said independent adjusting devices with opposite sides of the rear end of the mold board frame and of character that the mold board may be thereby lowered to the ground and the main frame lifted from the ground enough to bring the supporting wheels above the mold board, and means for shifting a front axle transversely on the main frame.

10. In a road scraper, the combination with a main frame provided with a pair of carrying wheels, means for adjusting the vertical angle of said wheels relative to the main frame, a mold board frame pivotally connected at its forward end to the forward end of the main frame, means for adjusting the rear end of the mold board frame transversely, a mold board pivotally mounted upon the rear end of the mold board frame upon a vertical axis, adjusting means carried by the main frame and engaging the rear end of the mold board frame for adjusting the mold board vertically, a front axle and the supporting wheels therefor, supporting the forward end of the main frame, and means for causing a relative lateral adjustment between the said front axle

and the forward end of the mold board frame.

11. In a road scraper, the combination with a main frame provided with a pair of carrying wheels, a mold board frame pivotally connected at its forward end to the forward end of the main frame, means for adjusting the rear end of the mold board frame transversely, a mold board pivotally mounted upon the rear end of the mold board frame upon a vertical axis, adjusting means carried by the main frame and engaging the rear end of the mold board frame for adjusting the mold board vertically, a front axle and the supporting wheels therefor, supporting the forward end of the main frame, and means for causing a relative lateral adjustment between the said front axle and the forward end of the mold board frame.

12. In a road scraper, the combination with a main frame provided with a pair of carrying wheels, means for adjusting the vertical angle of said wheels relative to the main frame, a mold board frame pivotally connected at its forward end to the forward end of the main frame, a mold board pivotally mounted upon the rear end of the mold board frame upon a vertical axis, adjusting means carried by the main frame and engaging the rear end of the mold board frame for adjusting the mold board vertically, a front axle and the supporting wheels therefor, supporting the forward end of the main frame, and means for causing a relative lateral adjustment between the said front axle and the forward end of the mold board frame.

13. In a road scraper, the combination with a main frame provided with a pair of carrying wheels, a mold board frame pivotally connected at its forward end to the forward end of the main frame, a mold board pivotally mounted upon the rear end of the mold board frame upon a vertical axis, adjusting means carried by the main frame and engaging the rear end of the mold board frame for adjusting the mold board vertically, a front axle and the supporting wheels therefor, supporting the forward end of the main frame, and means for causing a relative lateral adjustment between the said front axle and the forward end of the mold board frame.

14. In a road scraper, the combination with a main frame provided with a pair of carrying wheels, means for adjusting the vertical angle of said wheels relative to the main frame, a mold board frame pivotally connected at its forward end to the forward end of the main frame, means for adjusting the rear end of the mold board frame transversely, a mold board pivotally mounted upon the rear end of the mold board frame upon a vertical axis, adjusting means

carried by the main frame and engaging the rear end of the mold board frame for adjusting the mold board vertically, a front axle and its supporting wheels, and a laterally adjustable connection between said front axle and the forward end of the main frame whereby the front axle may be shifted laterally on the main frame.

15. In a road scraper, the combination with a main frame provided with a pair of carrying wheels, means for adjusting the vertical angle of said wheels relative to the main frame, a mold board frame pivotally connected at its forward end to the forward end of the main frame, a mold board pivotally mounted upon the rear end of the mold board frame upon a vertical axis, adjusting means carried by the main frame and engaging the rear end of the mold board frame for adjusting the mold board vertically, a front axle and its supporting wheels, and a laterally adjustable connection between said front axle and the forward end of the main frame whereby the front axle may be shifted laterally on the main frame.

16. In a road scraper, the combination with a main frame provided with a pair of carrying wheels, a mold board frame pivotally connected at its forward end to the forward end of the main frame, means for adjusting the rear end of the mold board frame transversely, a mold board pivotally mounted upon the rear end of the mold board frame upon a vertical axis, adjusting means carried by the main frame and engaging the rear end of the mold board frame for adjusting the mold board vertically, a front axle and its supporting wheels, and a laterally adjustable connection between said front axle and the forward end of the main frame whereby the front axle may be shifted laterally on the main frame.

17. In a road scraper, the combination with a main frame provided with a pair of carrying wheels, a mold board frame pivotally connected at its forward end to the forward end of the main frame, a mold board pivotally mounted upon the rear end of the mold board frame upon a vertical axis, adjusting means carried by the main frame and engaging the rear end of the mold board frame for adjusting the mold board vertically, a front axle and its supporting wheels, and a laterally adjustable connection between said front axle and the forward end of the main frame whereby the front axle may be shifted laterally on the main frame.

18. In a road scraper, the combination of a main frame, a wheel frame pivotally mounted on the main frame on a substantially longitudinal axis, a wheel projected through said wheel frame and journaled at its opposite ends in said wheel frame and

means for swinging the wheel frame upon its longitudinal axis.

19. In a road scraper, the combination of a main frame, a wheel frame pivoted upon the main frame on a substantially longitudinal axis, a pair of shaft bearings carried by the wheel frame at opposite sides thereof, each of said shaft bearings consisting of a capped bearing having an opening at one end only, a wheel projected through the wheel frame and having the ends of its shaft journaled in said cupped bearings,

and means for swinging the wheel frame upon its longitudinal axis.

In witness whereof, we, have hereunto set our hands and seals at Indianapolis, Indiana, this nineteenth day of November, A. D. one thousand nine hundred and ten.

JOSEPH D. ADAMS. [L. S.]
ROY E. ADAMS. [L. S.]

Witnesses:

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