March 24, 1931. C. A. GUSTAFSON 1,797,288

ROAD FINISHING MACHINE

Filed Aug. 28, 1926 4 Sheets-Sheet 1

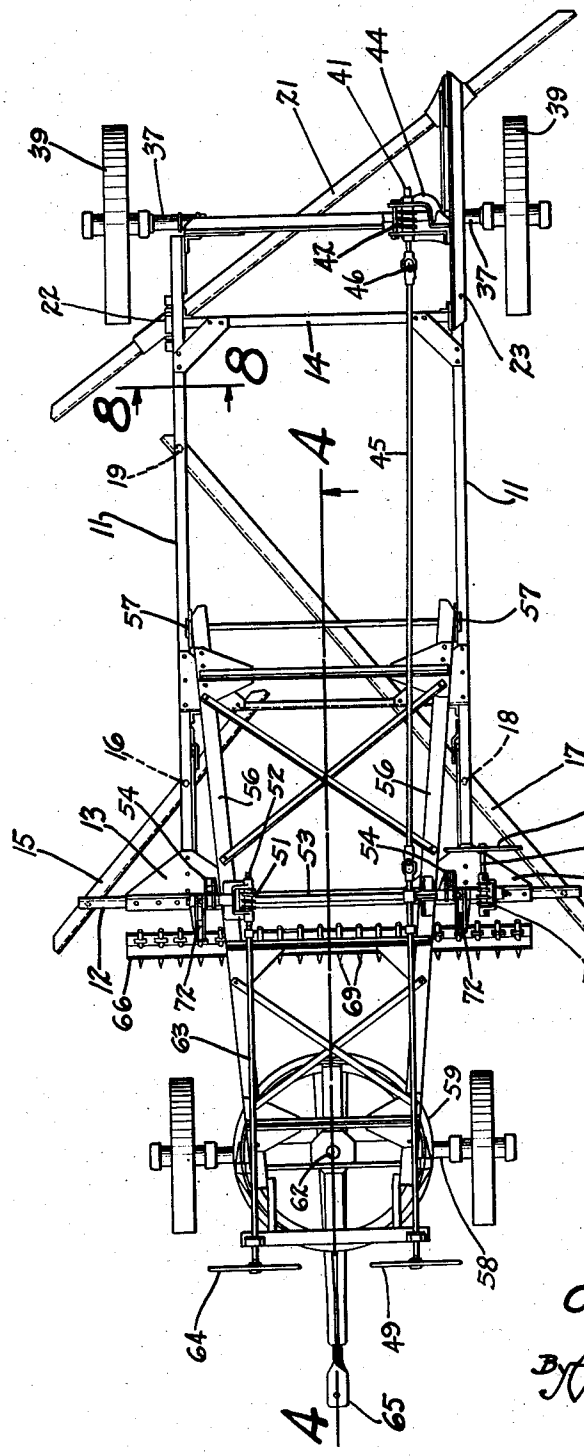


FIG. 1

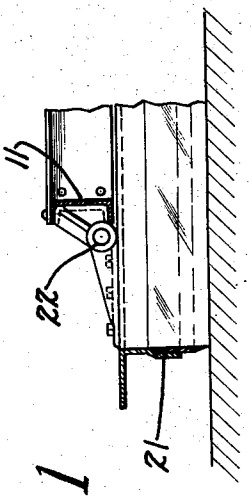


FIG. 8

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ROAD FINISHING MACHINE

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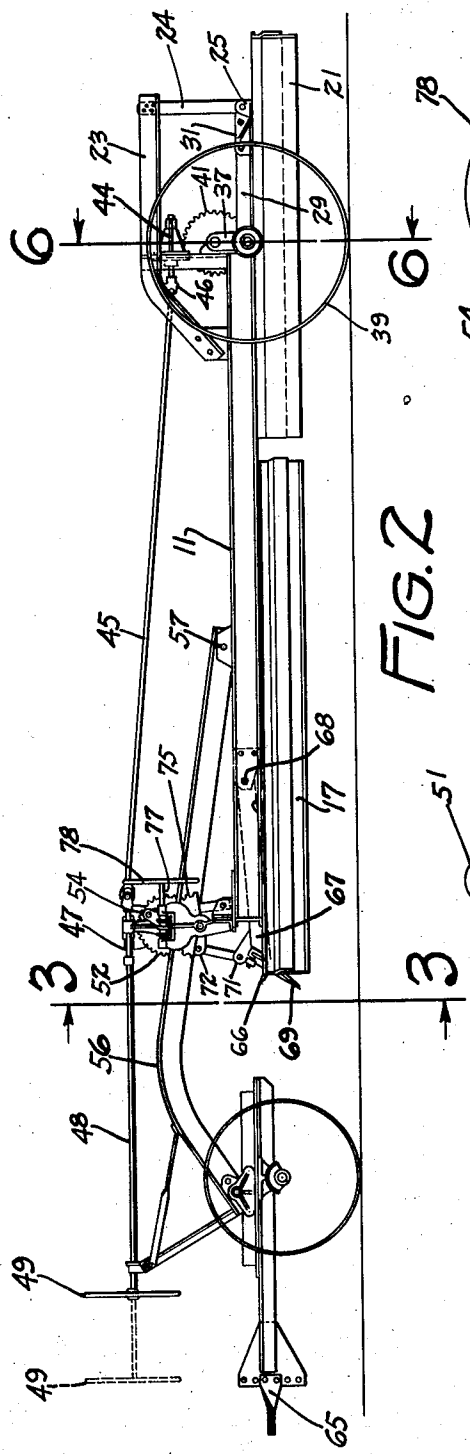


FIG. 2

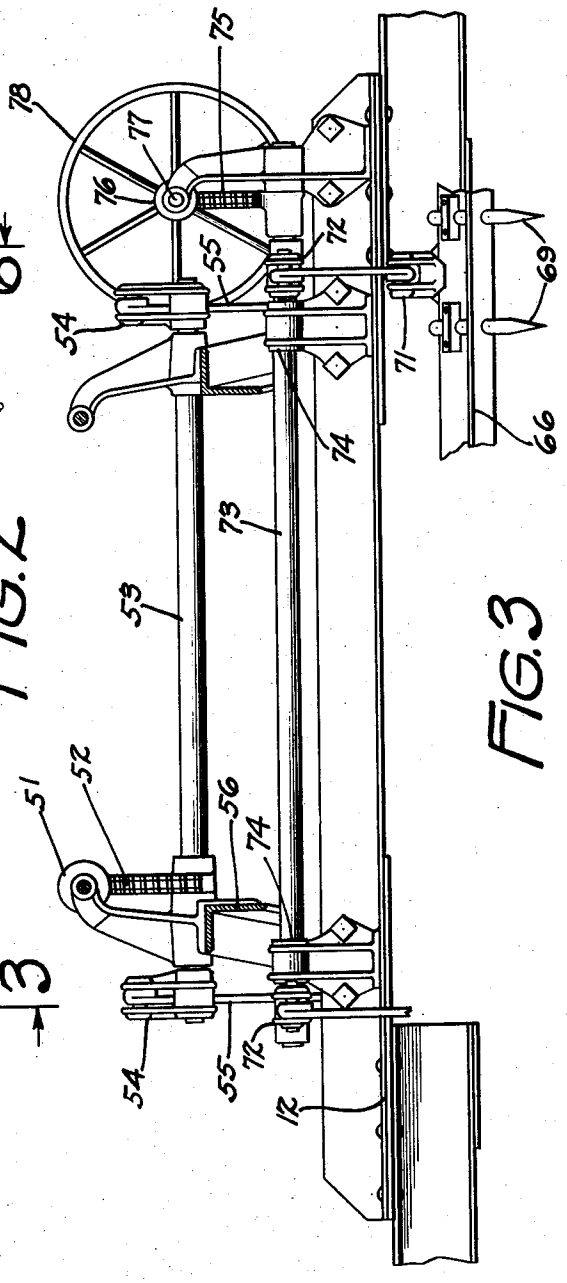


FIG. 3

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ROAD FINISHING MACHINE

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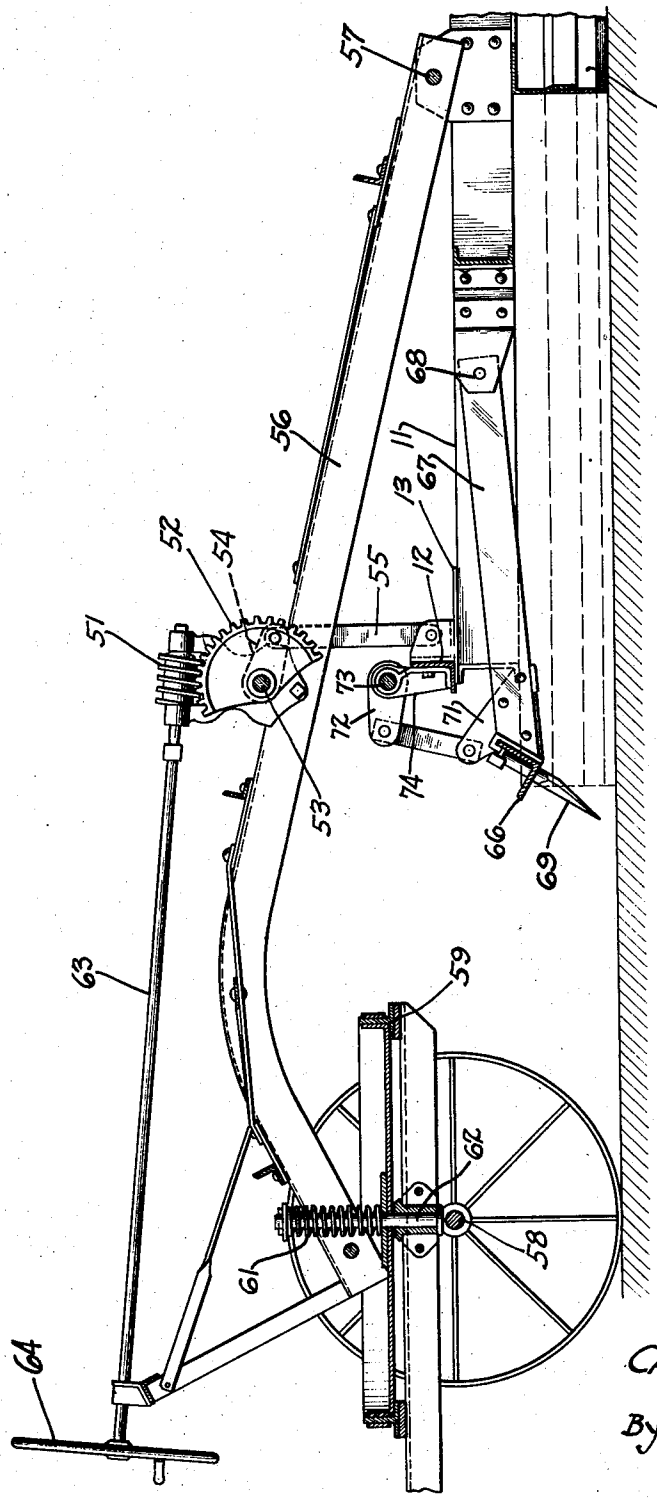


FIG. 4

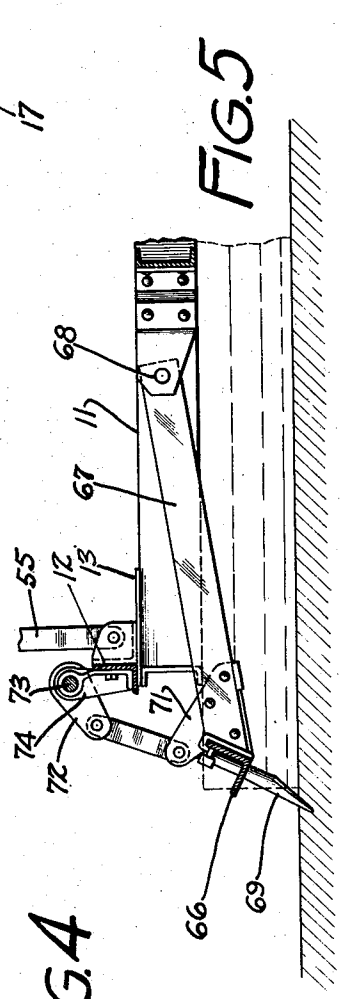


FIG. 5

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ROAD FINISHING MACHINE

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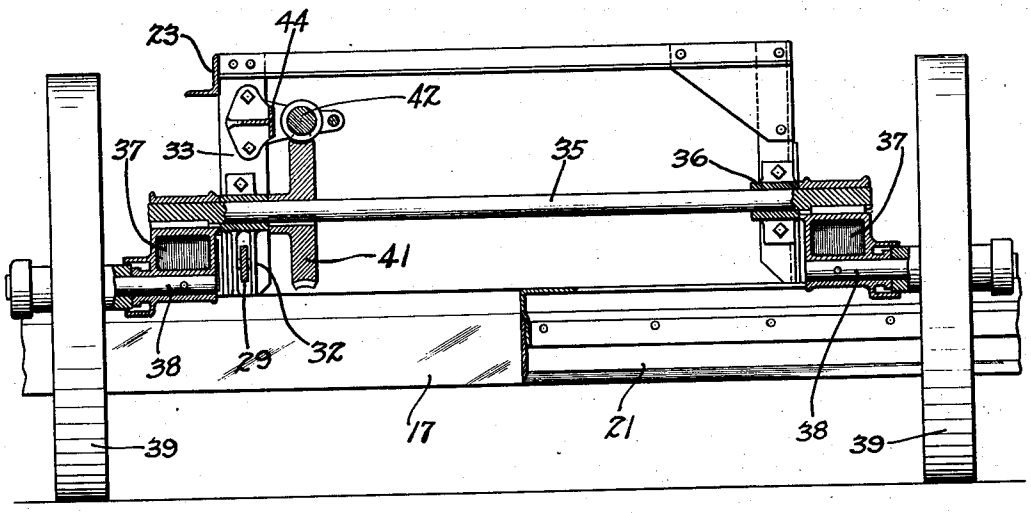


FIG. 6

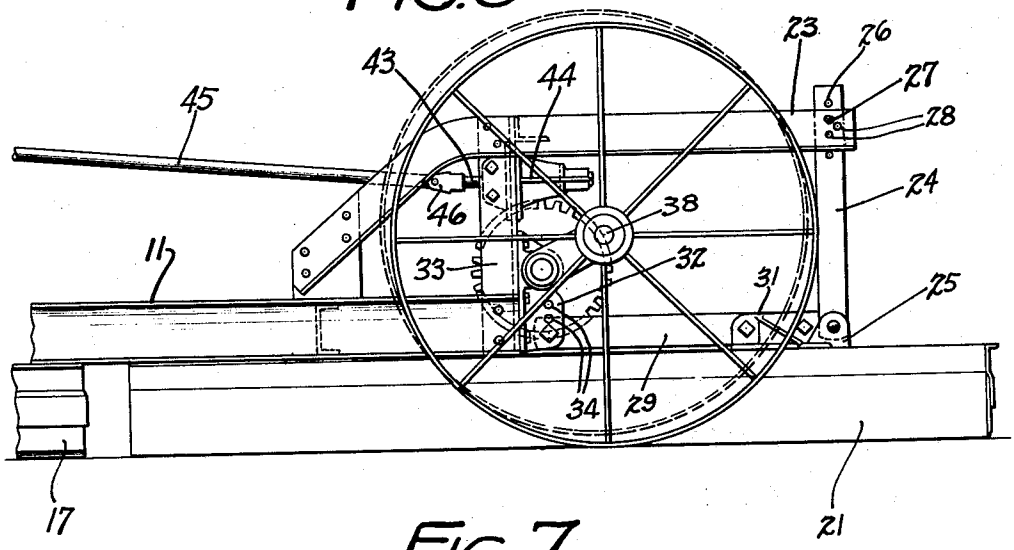


FIG. 7

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UNITED STATES PATENT OFFICE

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ROAD-FINISHING MACHINE

Application filed August 28, 1926. Serial No. 132,200.

This invention relates to new and useful improvements in road finishing machines, commonly known as road drags.

An object of the invention is to provide a road finishing machine comprising a frame having a plurality of blades disposed at different angles, and adapted to be moved into engagement with the road surface and to carry substantially the weight of the frame, thereby preventing the blades from chattering when operating over the road surface.

A further object of the invention is to provide a road drag comprising a frame having two or more blades rigidly secured thereto, and also having a blade pivotally connected thereto with means for adjusting it with relation to the frame, whereby the loose dirt or gravel gathered by the rigidly mounted blades and delivered to the adjustably mounted blade, which preferably is positioned at the rear of the machine, may be distributed over the road surface to fill depressions and uneven places.

A further object is to provide a road drag comprising a plurality of blades mounted upon a frame supported upon suitable carrying wheels, the rear wheels having means for lifting them out of contact with the road surface when the blades are moved into contact therewith, whereby substantially the entire weight of the frame will be carried upon the blades, the forward end of the machine having a fifth wheel of comparatively large diameter which functions to minimize side tilting or rocking of the frame and to keep the blades in close contact with the ground surface.

The particular object of the invention, therefore, is to provide an improved road finishing machine or drag.

Other objects of the invention will appear from the following description and the accompanying drawings and will be pointed out in the annexed claims.

In the accompanying drawings, there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown, as various changes may be made within the scope of the claims which follow.

In the accompanying drawings,

Figure 1 is a plan view of my improved machine showing the angular position of the blades thereon;

Figure 2 is a side elevation of the machine with the blades in inoperative position;

Figure 3 is a detail sectional view on the line 3—3 of Figure 2;

Figure 4 is an enlarged detail sectional view on the line 4—4 of Figure 1, showing the means provided for adjustably supporting the scarifier frame and showing the scarifier teeth positioned out of engagement with the ground surface;

Figure 5 is a detail sectional view showing the scarifier teeth adjusted to engage the road surface;

Figure 6 is a detail sectional view on the line 6—6 of Figure 2;

Figure 7 is an enlarged detail view of the rear portion of the machine showing the means provided for adjusting the rear carrying wheels to permit the blades to be moved into and out of engagement with the road surface; and

Figure 8 is a detail sectional view on the line 8—8 of Figure 1 showing the pivotal connection of the rear blade with the main frame.

The main supporting frame of the machine comprises a pair of beams 11, preferably of channel iron, having their forward ends secured together by means of a cross member 12 secured thereto by gusset plates 13, as shown in Figure 1. The rear end portion of the side channels 11 are connected together by means of a cross member 14.

A feature of the invention resides in the particular arrangement of the ground work-

ing blades as shown in Figure 1. The blade 15, shown at the right hand side of Figure 1, has its forward end terminally secured to the cross member 12 and its rear end secured to the side beam 11, as indicated at 16. A comparatively longer blade 17 has its forward end similarly secured to the opposite end of the cross member 12 and its intermediate portion secured to the left hand side channel 11, as indicated at 18, and its rear end secured to the right hand channel 11, as indicated at 19. The blades 15 and 17 are, therefore, fixedly secured to the main supporting frame and are movable therewith as a unit.

A third blade 21 is mounted at the rear end of the main frame and has a pivotal connection with the right hand side channel 11, as indicated at 22 in Figure 8. The opposite end of the blade 21 is adjustably connected to a superframe 23, secured to the rear end of the main supporting frame and extending rearwardly therefrom as shown in Figure 7. The means provided for adjustably connecting the blade 21 to the frame 23 consists of a bar or link 24 having a pivotal connection with the blade 21 by means of a bracket 25. A series of apertures 26 are provided in the upper end of the link 24 whereby it may be adjustably secured to the frame 23 as by a pin 27. A plurality of apertures 28 are also preferably provided in the frame 23 whereby a comparatively fine adjustment may be had of the blade 21 with respect to the main frame and the blades 15 and 17 fixedly secured to the frame. By means of this adjustment, the rear end of the blade 21 may be vertically adjusted so as to move the rear portion thereof out of engagement with the road surface, thereby causing the loose dirt and gravel delivered to the blade 21 by the blade 17, to be distributed over the surface of the road with the resultant filling of all depressions and uneven places therein.

A draft bar or link 29 has its rear end portion secured to the blade 21 by means of a bracket 31, integral with bracket 25, and its forward end adjustably secured to a bracket 32 secured to an upright post 33 of the main frame. (See Figure 7.) A plurality of apertures 34 are provided in the bracket 32 whereby the forward end of the draft bar 29 may be vertically adjusted to vary the cutting angle of the blade 21 with respect to the road surface.

The means provided for moving the blades into and out of engagement with the road surface is shown in Figures 2, 4, 6 and 7. A cross shaft 35 is pivotally mounted in a bearing provided in the bracket 32 at one side of the main frame, and at the opposite side in a bearing bracket 36, as shown in Figure 6. Crank-arms 37 are keyed to the ends of the cross shaft 35 and have bearing pins or studs 38 secured thereto upon which the rear carrying wheels 39 are rotatably mounted. A worm wheel 41 is also keyed to the cross shaft 35 and meshes with a worm 42 secured to a short shaft 43 rotatably mounted in a bracket 44 secured to the upright post 33, as shown in Figures 6 and 7. A control rod or shaft 45 is connected to the shaft 43 by means of a universal coupling 46, and has its forward end similarly connected to a shaft 47 telescopically connected with the control shaft 48, having an operating wheel 49 terminally mounted thereon as shown in Figure 2.

When the hand wheel 49 is rotated, rotary movement will be transmitted to the worm wheel 41, thereby causing the cross shaft 35 to be rotated with the result that the main frame will be lowered to permit the blades to engage the road surface, as shown in Figure 7. If desired, the rear carrying wheels 39 may be moved out of engagement with the ground surface as indicated by the dotted line in Figure 7, thereby causing substantially the entire weight of the machine to be supported upon the blades resting on the road surface.

The forward end of the main frame is vertically adjustable by means of a worm 51 and gear 52 mounted upon a shaft 53 having crank arms 54 secured thereto which are connected by means of links 55 to the forward end of the main supporting frame, shown in Figure 4. The cross shaft 53 is rotatably mounted in suitable bearings secured to an arched frame 56 having its rear end pivotally connected to the main frame 11, as indicated at 57 in Figures 1 and 4. The forward end of the arched frame 56 is supported upon the front axle 58 by means of a fifth wheel 59, as shown in Figures 1 and 4. The fifth wheel 59 is preferably of comparatively large diameter in order to provide a substantial support for the main frame to prevent the outer ends of the blades from lifting when striking bumps or high places in the road surface. The two halves of the fifth wheel are preferably yieldably held together by means of a compression spring 61 coiled about the upper portion of the king pin 62, as particularly shown in Figure 4. The worm 51 and gear 52 are operable by means of a telescopic shaft 63 having a hand wheel 64 terminally mounted thereon whereby it may be conveniently rotated. The control shafts 48 and 63 are preferably telescopic as above described, in order that they may be extended forwardly, as indicated in dotted lines in Figure 2, to position them adjacent the operator for convenient manipulation. The fifth wheel is provided with the usual draft bar 65 whereby it may be connected to a tractor or other propelling means in the usual manner.

The machine is preferably provided with means for digging up and loosening the dirt or road surface ahead of the blades, as shown

in Figures 1, 2, 4 and 5. Such means preferably consists of a scarifier frame 66 arranged transversely of the main frame and pivotally and adjustably connected therewith by means of thrust members 67 having pivotal connections with the main frame as indicated at 68. The usual scarifier teeth 69 are demountably secured to the frame 66, and are adapted to be moved into and out of engagement with the ground surface as shown in Figures 4 and 5. Brackets 71 are secured to the scarifier bar or frame 66 and have link connections with crank arms 72 secured to a cross shaft 73 rotatably mounted in suitable bearing brackets 74 secured to the forward portion of the main frame. A gear segment 75 is secured to the shaft 73 and is engaged by a worm 76 mounted upon a short operating shaft 77 having a hand wheel 78 secured thereto as shown in Figure 1. Rotation of the hand wheel 78 will cause the scarifier teeth to be moved into and out of engagement with the ground surface as shown in Figures 4 and 5.

In the operation of this novel machine, the blades are moved into engagement with the road surface, the pressure of the blades with the ground being controlled entirely by means of the hand wheels 49 and 64. If it is desired to use the machine as a drag, the rear wheels may be moved substantially out of contact with the ground, thereby causing practically the entire weight of the machine to be supported upon the blades. In actual practice, however, the rear wheels are left in contact with the ground so that the rear blade 21 may be vertically adjusted with respect to the road surface to cause the loosened material or gravel delivered thereto to be uniformly distributed substantially over the surface of the road. As as result of the fifth wheel being comparatively large, the main frame will be supported against transverse tilting or rocking, thereby causing the blades to be held in constant contact with the ground surface and also preventing them from riding over bumps and high spots in the road surface which might occur if the frame were not supported as above described. The structure is so constructed and arranged that the adjustment of the main frame to raise and lower the blades into and out of contact with the road surface, may be controlled by the operator positioned upon the tractor at the forward end of the machine.

I claim as my invention:

1. A machine of the class described comprising a frame having rear carrying wheels, road finishing blades mounted in said frame and depending therefrom, an auxiliary frame having a pivotal connection with the middle portion of said main frame, forward carrying wheels whereon the forward end of said auxiliary frame is mounted, a shaft mounted on said auxiliary frame, a crank thereon, a worm and worm wheel for operating said shaft and a link connecting said crank with the forward portion of said main frame whereby when said worm is operated, said auxiliary frame and the forward portion of said main frame will be raised or lowered.

2. A machine of the class described comprising a main frame and rear carrying wheels therefor, a plurality of blades supported by said frame and arranged in angular relation to one another, an auxiliary frame pivotally connected at one end to the intermediate portion of said main frame, mechanism mounted on said auxiliary frame and having connections with said main frame for raising or lowering said frame and blades, and operating means for said mechanism positioned forwardly of said auxiliary frame, whereby it may be manipulated by an operator positioned forwardly of the machine.

3. A road finishing machine comprising in combination, a main frame having rear carrying wheels, a plurality of blades supported on said frame and arranged one before the other and in angular relation with respect to one another, mechanism for vertically adjusting said frame upon said wheels to move the blades into and out of engagement with the ground, an auxiliary frame pivotally connected with said main frame, extending forwardly thereof and provided at its forward end with carrying wheels, a scarifier mounted at the forward end of said main frame and adapted for vertical adjustment, and means on said auxiliary frame for vertically adjusting the forward end of the main frame to move the forward blade into and out of engagement with the ground.

4. A road finishing machine comprising in combination a main frame, a plurality of blades supported on said frame and arranged in angular relation with respect to one another, carrying wheels for the rear end of the frame, means for vertically adjusting said main frame upon said carrying wheels to move the blades into and out of engagement with the ground, an auxiliary frame connected to the forward end of said main frame, carrying wheels therefor, means also at the forward end of said main frame for vertically adjusting the latter, a scarifier pivotally connected to the forward end of said main frame beneath said auxiliary frame, and means for vertically adjusting said scarifier independently of said main frame.

5. A machine of the class described, comprising a main frame having scraper blades mounted thereon and depending therefrom, an auxiliary frame connected with said main frame, extending forwardly thereof and provided at its forward portion with suitable carrying wheels, mechanism on said auxiliary frame for vertically adjusting the forward portion of said main frame, and means located at the forward portion of the auxil-

iary frame whereby said mechanism may be actuated by an operative position forwardly of the machine.

6. A machine of the class described, comprising a main frame having scraper blades mounted thereon and depending therefrom, an auxiliary frame having a pivotal connection with said main frame, extending forwardly thereof and provided at its forward portion with suitable carrying wheels, mechanism mounted on said auxiliary frame and connected with said main frame and adapted to move said blades into or out of engagement with the ground, and means for actuating said mechanism adapted to be manipulated by an operator positioned forwardly of the machine.

7. A machine of the class described, comprising a main frame having scraper blades mounted thereon and depending therefrom, an auxiliary frame connected with said main frame, extending forwardly thereof and provided at its forward portion with suitable carrying wheels, a shaft mounted on said auxiliary frame and having link connections with said main frame, and means for operating said shaft to vertically adjust the forward portion of said main frame to move the blades into or out of engagement with the ground.

8. A machine of the class described, comprising a main frame having scraper blades mounted thereon and depending therefrom, an auxiliary frame having a pivotal connection with said main frame, extending forwardly thereof and provided at its forward portion with suitable carrying wheels, a shaft mounted on said auxiliary frame and provided with crank arms, links connecting said arms with said main frame, and a worm-and-gear mechanism for operating said shaft to vertically adjust the forward portion of said main frame to move said blades into or out of engagement with the ground.

9. A machine of the class described, comprising a main frame having scraper blades arranged thereon, one before the other, wheels supporting the rear end of said frame, means for vertically adjusting said frame upon said wheels to adjust the position of the rear blade with respect to the ground, an auxiliary frame connected with the forward portion of the main frame, extending forwardly thereof and provided at its forward end with suitable carrying wheels, adjusting means on said auxiliary frame for vertically adjusting the forward portion of the main frame independently of the rear portion thereof, and means located at the forward portion of said auxiliary frame for actuating said rear and forward adjusting means.

10. A machine of the class described, comprising a main frame having scraper blades mounted thereon, supporting wheels connected with the rear end of said frame, means for vertically moving said frame with respect to said wheels to adjust the position of the blades with respect to the ground, an auxiliary frame having its rear portion pivotally connected with said main frame and its intermediate portion movably connected with the forward portion of the main frame, carrying wheels for the forward portion of said auxiliary frame, and means mounted on the intermediate portion of said auxiliary frame and connected with the main frame and adapted to raise or lower the forward portion thereof independently of the rear portion, said adjusting means being operable from the forward end of said auxiliary frame.

11. A machine of the class described, comprising a main frame having scraper blades mounted thereon, wheels for supporting the rear portion of said main frame, means for vertically moving said frame with respect to said wheels to adjust the position of the blades with respect to the ground, an auxiliary frame having its rear portion pivotally connected with said main frame and having its other end positioned forwardly of the main frame and supported upon suitable carrying wheels, means on said auxiliary frame for vertically adjusting the forward end of said main frame independently of the rear portion thereof, and a scarifier mounted at the forward end of said main frame and adapted for vertical adjustment independently of said main frame.

12. A machine of the class described, comprising a main frame having scraper blades mounted thereon and depending therefrom, an auxiliary frame connected with said main frame, extending forwardly thereof and provided at its forward portion with suitable carrying wheels, a shaft mounted on said auxiliary frame and having connections with said main frame and means for operating said shaft to vertically adjust the forward portion of said main frame to move the blades into or out of engagement with the ground.

13. A main frame having blades thereon, an auxiliary frame, means pivotally supporting an end portion of the main frame, means pivotally supporting an end portion of the auxiliary frame, a pivotal connection between the opposite end portion of said auxiliary frame and an intermediate portion of the main frame, and an adjustable connection between an intermediate portion of the auxiliary frame and the end portion of the main frame opposite its pivotal supporting means.

14. A main frame having a forward and a rearward scraper blade thereon, an auxiliary frame, means pivotally supporting an end portion of the main frame, means pivotally supporting an end portion of the auxiliary frame, a pivotal connection between the

opposite end portion of said auxiliary frame and an intermediate portion of the main frame, an adjustable connection between an intermediate portion of the auxiliary frame and the forward end portion of the main frame whereby the forward scraper blade may be adjusted relative to the ground, and means for raising and lowering the rearward scraper blade.

15. A main frame having scraper blades mounted forwardly and rearwardly thereof, an auxiliary frame, carrying wheels supporting the rear end portion of the main frame, means pivotally supporting the forward end portion of the auxiliary frame, a pivotal connection between the rear end portion of said auxiliary frame and an intermediate portion of the main frame, and an adjustable connection between an intermediate portion of the auxiliary frame and the forward end portion of the main frame whereby the forward scraper blade may be adjusted relative to the ground.

16. A main frame having scraper blades mounted forwardly and rearwardly thereof, an auxiliary frame, carrying wheels supporting the rear end portion of the main frame, wheels supporting the forward end portion of the auxiliary frame, a pivotal connection between the rear end portion of said auxiliary frame and an intermediate portion of the main frame, an adjustable connection between an intermediate portion of the auxiliary frame and the forward end portion of the main frame whereby the forward scraper blade may be adjusted relative to the ground, and means for raising and lowering the rear portion of said main frame with respect to its carrying wheels, to adjust the rearward scraper blade relative to the ground.

17. A main frame having a plurality of scraper blades supported thereon, an auxiliary frame, wheels supporting the rear end portion of the main frame, means supporting the forward end portion of the auxiliary frame, a pivotal connection between the rear end portion of said auxiliary frame and an intermediate portion of the main frame, an adjustable connection between an intermediate portion of the auxiliary frame and the forward end portion of the main frame, whereby the forward end portion of said main frame may be adjusted relative to the ground, and a scarifier adjustably supported on the forward end portion of the main frame.

18. A main frame having a plurality of scraper blades supported thereon, an auxiliary frame, wheels supporting the rear end portion of the main frame, means supporting the forward end portion of the auxiliary frame, a pivotal connection between the rear end portion of said auxiliary frame and an intermediate portion of the main frame, an adjustable connection between an intermediate portion of the auxiliary frame and the forward end portion of the main frame, whereby the forward end portion of said main frame may be adjusted relative to the ground, a scarifier supported on the forward end portion of the main frame, and means on the intermediate portion of the auxiliary frame for adjusting the scarifier relative to the ground.

In witness whereof, I have hereunto set my hand this 24th day of August, 1926.

CARL A. GUSTAFSON.