

July 3, 1923.

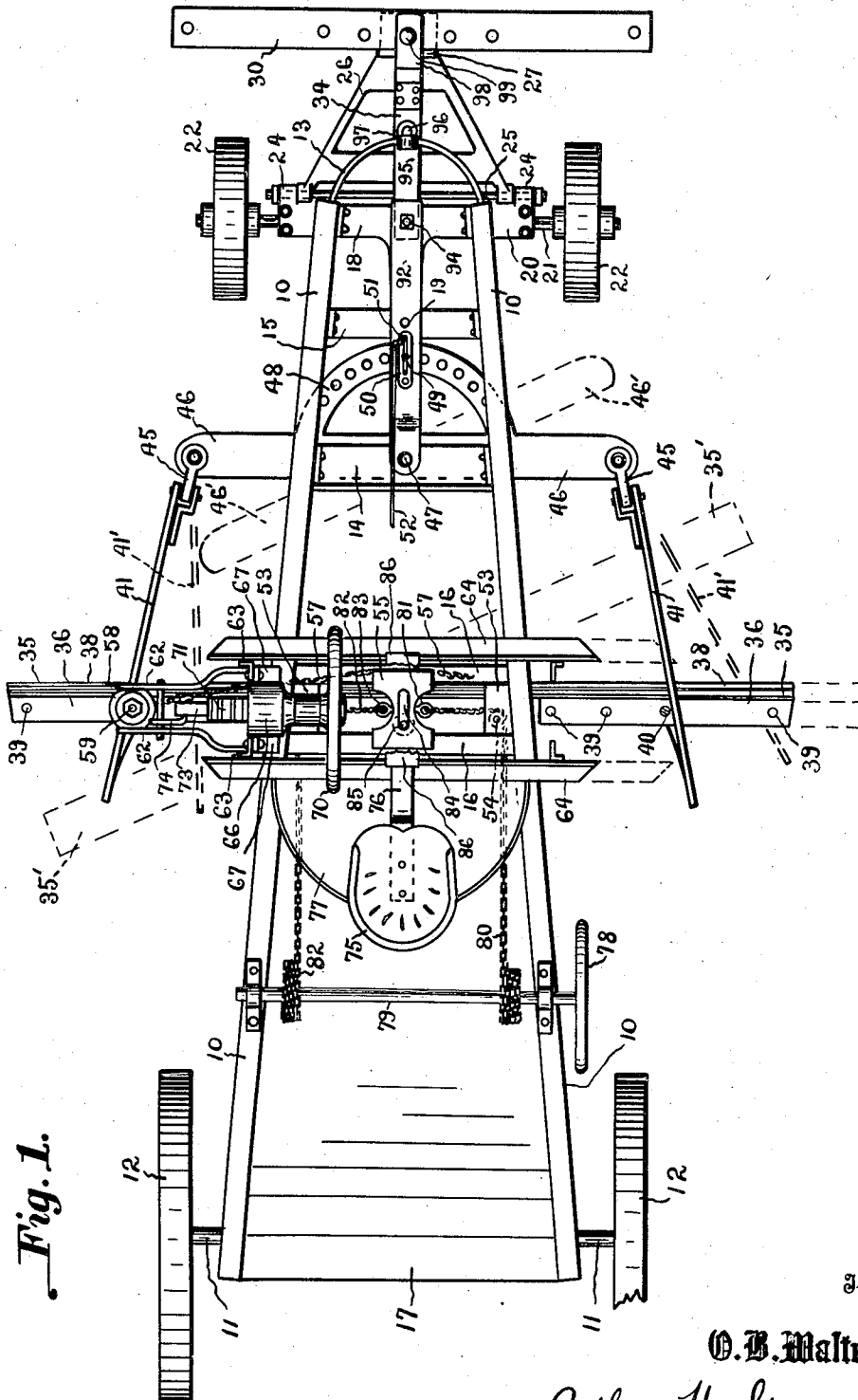
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O. B. WALTERS

ROAD MAINTAINING AND RESURFACING MACHINE

Filed Dec. 9, 1922

4 Sheets-Sheet 1



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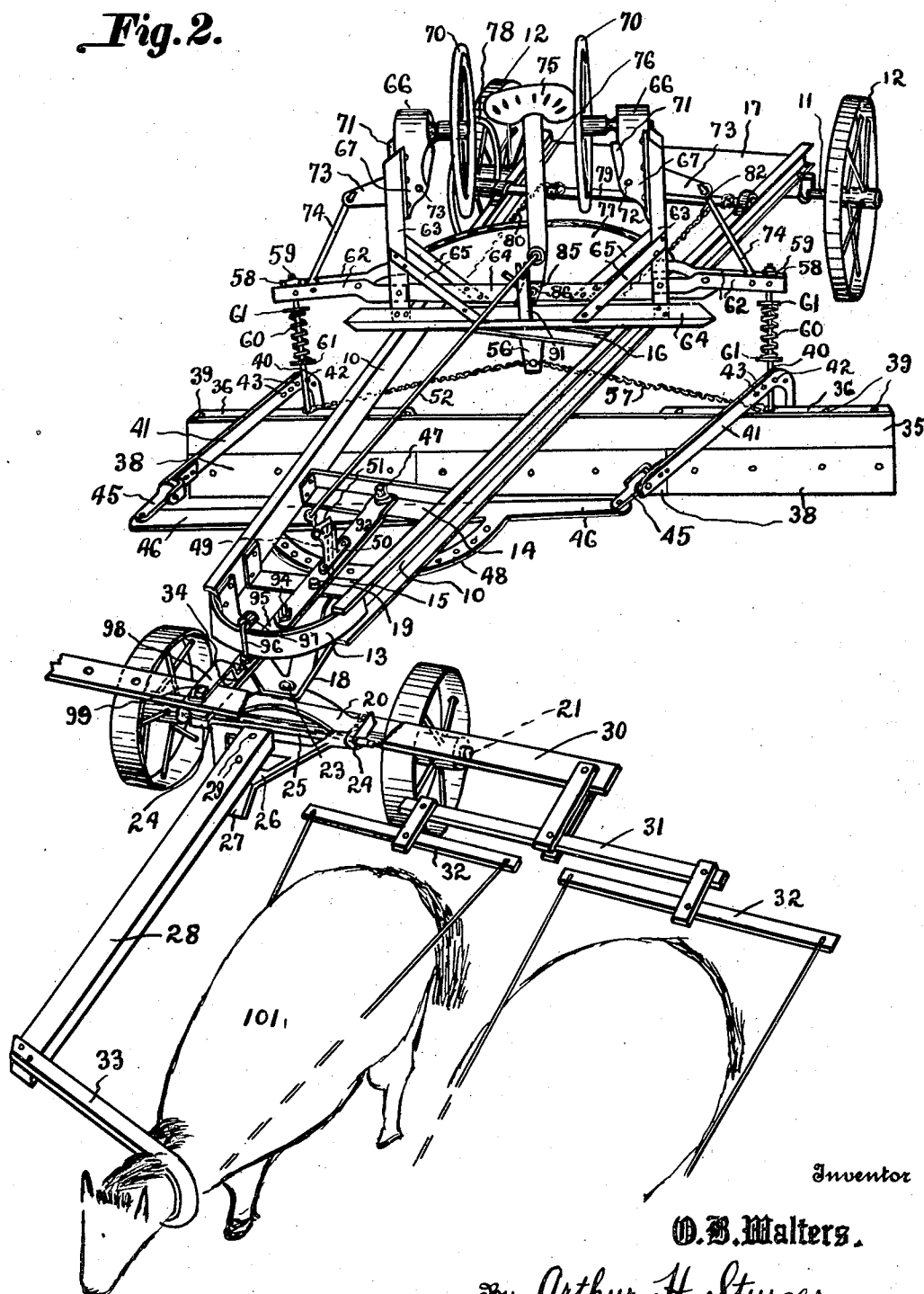
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Fig. 2.



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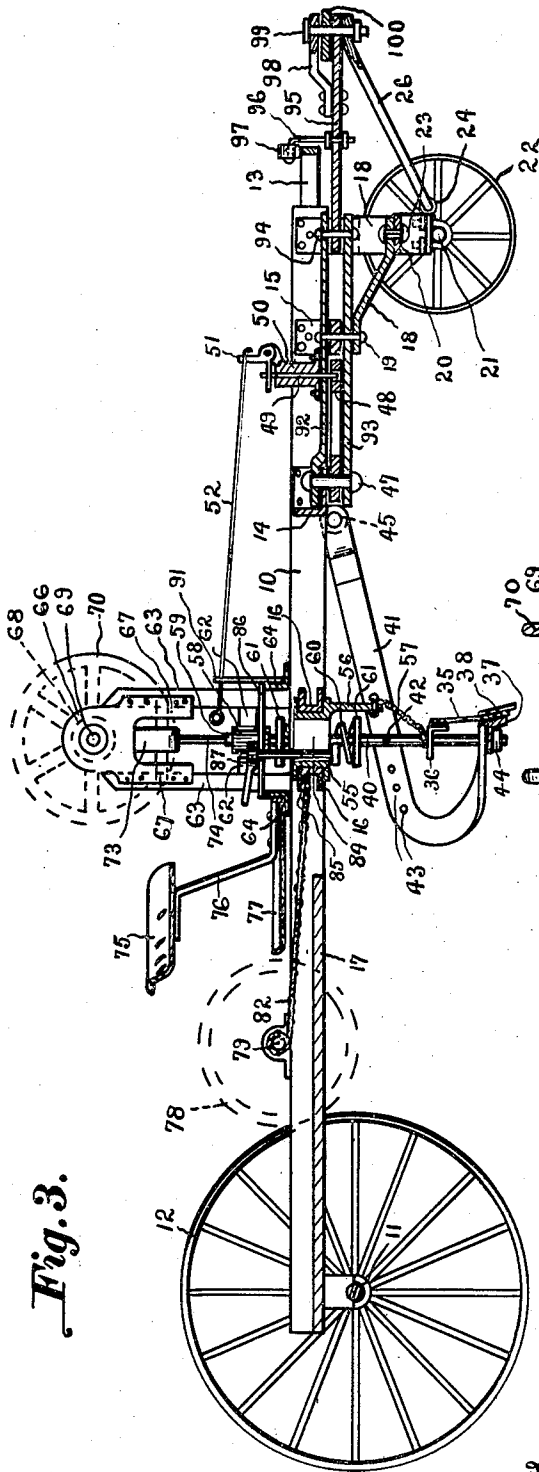


Fig. 3.

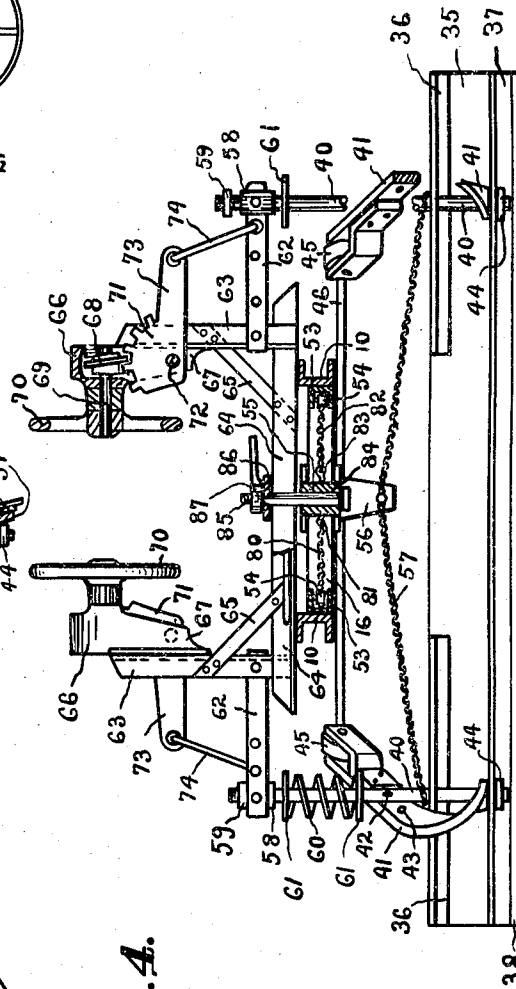


Fig. 4.

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Fig. 5.

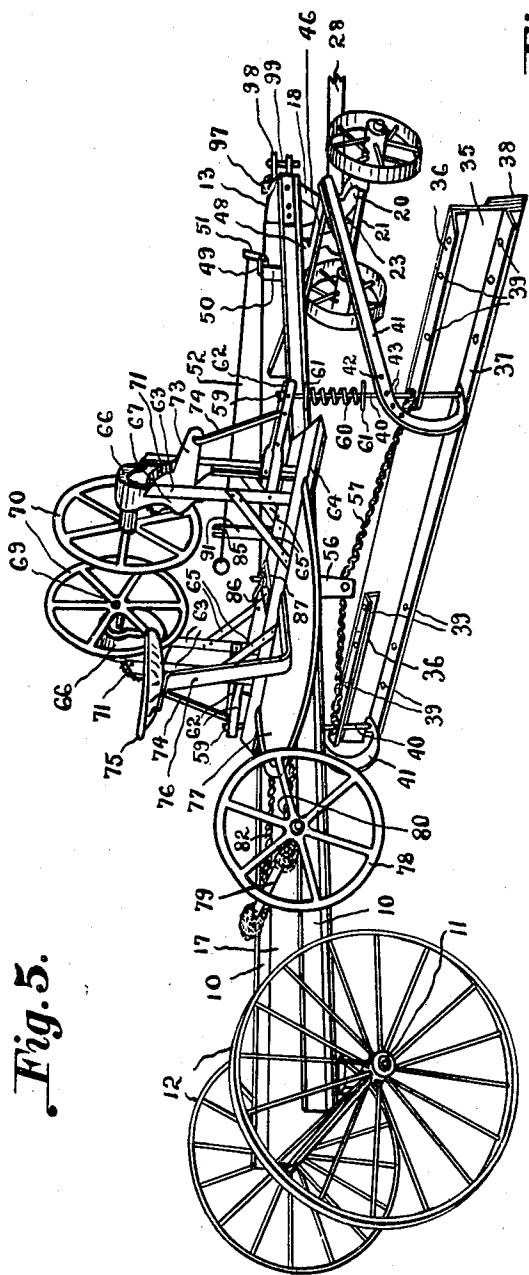


Fig. 6.

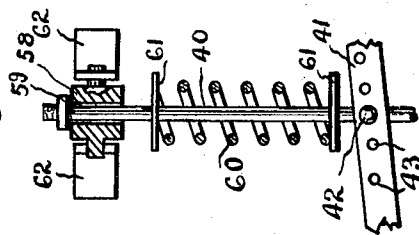
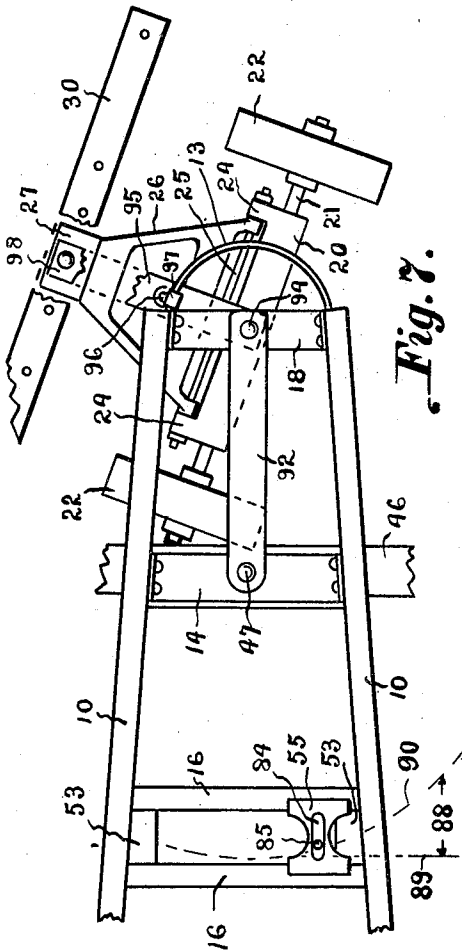


Fig. 7.



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UNITED STATES PATENT OFFICE.

ODIN B. WALTERS, OF COUNCIL BLUFFS, IOWA.

ROAD MAINTAINING AND RESURFACING MACHINE.

Application filed December 9, 1922. Serial No. 605,753.

To all whom it may concern:

Be it known that I, ODIN B. WALTERS, a citizen of the United States, residing at Council Bluffs, in the county of Pottawattamie and State of Iowa, have invented certain new and useful Improvements in Road-Maintaining and Resurfacing Machines, of which the following is a specification.

This invention has reference to road machines of that type used for maintaining roads in proper condition by resurfacing, ditching and smoothing out the roads.

The invention has for an object to provide a road maintainer which has a relatively long wheel base; may be easily operated; has a positive lifting and lowering means for the scraper; has a support for the scraper, which is of the full or semi-floating type; has releasable and adjustable pressure means for the scraper; is relatively light in weight; may be operated by one man; and supports the operator above the work out of the path of dust and the like which is lifted by the operation of the machine and so that the operator may have the work in full view at all times.

The invention also aims at the provision of a road maintainer which may be used as a light grader, a maintainer, a planer, a snow plow, and a ditch former and clearer; which has adjustable supporting and tension means for the scraper which may be moved transversely to an extent sufficient to project the scraper into a ditch at either side of the road while the machine may remain on the road, and so that the machine may be operated down grade for ditching at either side of the road; and which has a reversible blade capable of adjustment to the desired angle at either side of the machine.

Another object of the invention is to provide a scraper or blade which may operate by its own weight only, upon which may be placed a moderate adjustable pressure, and upon which may be placed the entire weight of the machine for heavy work.

A further object is to provide a road maintainer with a scraper blade and a draft connection which is directly between the traction source and the scraper to remove all strain and side draft on the frame of the machine to provide an improved locking device for holding the reversible scraper at the desired angle; to provide a mechanical means for shifting the scraper with its raising and lowering mechanism, a platform

and a seat for the operator, all as a unit so that the operator may have the same relative position with respect to the scraper and parts at all times to more efficiently and accurately adjust the mechanism; and to provide a shifting means for the scraper which may be adjusted while the machine is in motion.

The above and various other objects and advantages of this invention will in part be described in, and in part be understood from, the following detailed description of the present preferred embodiment, the same being illustrated in the accompanying drawings, wherein:—

Figure 1 is a top plan view of the machine showing the raising and lowering means for the left end of the scraper blade as in use, the corresponding mechanism for the right end being removed for the sake of clearness, and the dotted lines showing angular and lateral adjustments of the scraper mechanism.

Figure 2 is a perspective view of the machine looking towards its forward end with the draft rigging as in use with horses.

Figure 3 is a longitudinal vertical section taken through a road scraping machine constructed according to the present invention, the view being taken substantially along the medial longitudinal center of the machine.

Figure 4 is a transverse section taken through the machine rearwardly of the scraper blade and looking forwardly, parts being omitted for the sake of clearness.

Figure 5 is a perspective view of the machine looking at its rear end.

Figure 6 is a fragmentary enlarged section taken vertically through one of the pressure devices for the scraper blade.

Figure 7 is a fragmentary top plan view of the forward portion of the frame, parts removed for clearness and with the front steering wheels in a turned position.

Referring to the drawings, 10 designates a pair of side bars connected together at their rear end portions by a transverse axle 11 upon opposite ends of which are mounted road wheels 12 for supporting the rear end of the frame. The side bars 10 of the frame converge forwardly and are connected together by a forwardly bowed cross piece 13, the frame being reinforced by cross braces 14, 15 and 16, spaced apart at intermediate points lengthwise of the frame, and which serve as supports for the mecha-

nism hereinafter described. The rear end of the frame is provided with a platform 17 formed of cross boards or the like fitted between the side bars 10.

5 The frame is provided at its forward end with a three armed bracket or bolster 18 two opposed arms of which are secured to the side bars 10, while the intermediate arm is secured to the brace 15 by a bolt 19. Piv-
10 otally mounted beneath the bolster 18 is an arched axle support 20 which carries an axle 21 held thereto by U-bolts or the like. The axle 21 carries the front road wheels 22 for supporting the forward end of the
15 frame. The axle support 20 is pivoted to the bolster 18 by a bolt 23, and is provided at its end with forwardly extending bearings 24 in which is mounted a transverse rod 25 secured by nuts or the like on op-
20 posite ends. The rod 25 provides a pivotal mounting for the inner end of a forwardly and upwardly extending web or plate 26 having an upper substantially horizontal portion 27. As shown in Figure 2, the ma-
25 chine may be drawn by draft animals, and in this case the tongue 28 is attached to the web 26 by means of bolts 29 and the portion 27 of the web is not in use. With this form of draft, the horses are connected to
30 the machine by a draft equalizer having a bar 30 and double and single trees 31 and 32. It will be noted that the tongue 28 is used for steering purposes only it being connected to the inside horses by means of
35 a neck yoke 33. The strain of the draft comes on the bar 30 only. This bar is connected directly to a draw bar 34 as will be later explained.

As shown in Figure 3, the portion or
40 lip 27 of the web 26 may be used when the tongue 28 is removed; such as when a tractor is employed as will subsequently be explained.

The bolster 18 spaces the front wheels 22
45 below the plane of the frame 10 and permits the short turning of the wheels beneath the frame. This construction permits of the use of a frame with a relatively long wheel base so that the scraper blade, which is
50 supported intermediate the length of the frame, may be maintained at an even height without individual adjustment for normal variations in the roadway.

As shown particularly in Figures 2 and
55 5, the frame 35 of the scraper is preferably in one piece from end to end, and is provided at its upper edge and at opposite end with angle bars 36 riveted or otherwise suitably secured to the rear side of the frame 35 for
60 adjusting purposes. The lower edge of the frame 35, is reinforced by an angle bar 37 which is preferably of substantially the length of the frame 35. The frame 35 is preferably in the form of a flat metal strip
65 presenting front and rear flat faces pro-

viding the upper portion of the scraper. One or more scraper blades 38, preferably three in number, are removably secured to the scraper frame 35 by bolts or the like. The blades 38 may be removed and sharp-
70 ened, interchanged and renewed.

The bars 36 and 37 are provided with rows of registering apertures 39 adapted to selectively receive rods 40 which project
75 down from the superstructure of the machine. The lower ends of the rods 40 pass through the apertured lower ends of draft bars 41 which are curved upwardly and forwardly over the upper edge of the frame
80 35. The draft bars 41 are also secured to the rods 40 in a selective manner by bolts 42 carried by the rod 40 and fitted in desired openings of corresponding rows of openings 43 formed in the curved portions
85 of the draft bars 41 the rods 40 have nuts 44 on their lower ends which engage the angle bar 37 and support the scraper.

As shown in Figure 2, the draft bars 41 extend forwardly to coupling pieces 45
90 which are pivoted, not only to the forward ends of the bars 41, but also to the opposite ends of a cross bar 46. The cross bar 46 is mounted intermediate its ends upon a pivot 47 supported upon the cross brace 14
95 of the frame 10. The draft bars 41 are substantially of equal length and consequently swinging of the cross bar 46 moves the opposite ends of the scraper back and forth beneath the opposite sides of the
100 frame.

An apertured segment 48 is carried by the cross bar 46 and extends forwardly there-
from beneath a locking pin 49 which is mounted in a casting 50 carried by the frame. The pin 49 is connected to a bell crank lever
105 51 pivoted in the tap of the casing 50 and operated by a rod 52 extending rearwardly from the bell crank lever 51 to a position near the platform 17 where the operator may
110 raise and lower the pin 49 without leaving his seat.

As will be noted particularly in Figures 3, 4 and 7 the central cross brace 16 is formed of two-spaced rails of channel iron, their smooth sides toward each other and joined
115 together by end blocks 53 which, as best shown in Figures 1 and 4, are provided with pulleys 54 as anti-friction supports for chains as will later appear. The blocks 53 may be welded to the rails 16, and the whole
120 brace welded to the side bars 10 of the frame, or otherwise suitably secured thereto. Before the rails 16 and end blocks are secured together a transversely slidable block or locking member 55 is fitted upon and between the
125 rails, and is provided with a downwardly, extending arm 56 to which is attached the intermediate portion of a chain 57. The ends of the chain 57 are connected to the rods 40 and thus to the opposite ends of the 130

scraper 35. The chain 57 is provided with a small amount of slack, but is sufficiently taut to maintain the scraper 35 in a substantially medial position with respect to the slidable block 55 at all times.

As shown in Figure 6 each rod 40 is slidably mounted at its upper end in a trunnion 58 and is suspended by a nut 59 on its upper end. A coil spring 60 is interposed between the trunnion 58 and the draft bar 41. Washers 61 are placed on each rod 40 at opposite ends of the spring 60, the lower washer being fixed to the rod to support the spring, and the upper washer being adapted to engage the trunnion 58. This spring 60 is brought into play to provide a resilient bumper or buffer and take up the strain when the scraper 35 encounters stones, roots or other obstructions on the road, and is adapted to provide a yieldable tension on the blade at all time.

Each trunnion 58 is pivoted between the outer ends of a pair of arms 62 each pair of arms 62 being pivoted at their inner ends upon an adjacent standard 63. There is a standard 63 at each side of the machine and the standards 63 are mounted on a sliding cross frame 64 comprising spaced angle bars and each standard comprising a pair of uprights one for each angle bar, and braced thereto by a brace 65. The uprights of each standard 63 are joined at their upper ends by a worm housing or casting 66 forked at its lower end to provide branches 67 which are attached to the uprights of the standard 63. As best shown in Figure 4, a worm 68 is keyed to and mounted on a shaft 69 which is journaled in each housing 66, the shaft 69 having a hand wheel 70 to turn the worm by the operator. The worm 68 meshes at all times with the teeth of a sector 71 which is pivoted at 72 in the casting 66 to swing between the uprights of each standard.

The sectors 71 have outwardly extending arms 73 to which rods 74 are pivoted, the rods 74 being adjustably hooked into the adjacent arms 62 for raising and lowering the same. By this means it will be apparent that rotation of a hand wheel 70 will be converted into oscillating movement of the corresponding lever arm 73, and arm 62 to effect the vertical adjustable movement of the rods 40. The leverage may be governed by the gear ratio of the worm 68 and sector 71 for forcing the scraper against the road surface with the desired resilient pressure. The mechanism for raising and lowering each end of the scraper is identical, excepting that one wheel 70 is for the operator's right hand and the other for his left. Both mechanisms are secured to the cross frame members 64 and the whole is slidable transversely of the main frame 10, to shift the scraper 35 to various positions transversely of the line of travel of the machine, and to reach out

laterally, as shown in Figure 5 into a ditch at the side of the road and beyond the machine to scrape back onto the crown of the road earth which has been washed and worked into the ditch. As also shown adjustment is further effected by placing through selected apertures 39 of the angle bars 36 and 37. The scraper 35 may be shifted in like manner to the other side of the machine by an opposite adjustment of the parts.

The operator's seat 75 is mounted on a standard 76 which rises from a platform 77 and, as best shown in Figs. 3 and 5, the platform 77 and standard 76 are secured, by welding or otherwise, to the rear cross member 64 for adjustment therewith to at all times position the operator properly in one place for controlling the operation of the machine and lending weight to the scraper. Rearwardly of the platform 63 is a hand wheel 78 mounted on a transverse shaft 79 which is journaled in pillow blocks secured to the side bars 10. A chain 80 is wound over one end of the shaft 79 with a number of turns for paying out purposes. This chain extends over the adjacent pulley 54 (Figure 4), to an eye 81 carried by the slidable block 55. A second chain 82 is wound reversely upon the opposite end of the shaft 79 with a number of turns and extends over the opposite pulley to a similar eye 83 on the other side of the slidable block. By turning the hand wheel 70 the block 55 will be moved transversely of the machine in either direction governed by the direction of rotation of the hand wheel 70, the chain 80 pulling it in one direction while the chain 82 is payed out, and vice versa. As best shown in Figures 3, 4 and 7 the block 55 has flanges above and below the cross brace 16 which prevent vertical movements and permit transverse sliding movements. As the block 55 is moved by the hand wheel 70 it is adapted to correspondingly move the scraper 35 through the chain 57 and arm 56 of the block 55. Also, the upper cross members 64, their adjunct parts and the operator's seat will be moved as a unit. The block 55 is provided with an elongated slot 84 receiving a bolt 85 having its head against the bottom of the block. The upper end of the bolt 85 passes through a locking plate 86 which rests on the upper edges of the cross members 64. The bolt 85 is threaded for receiving a locking nut 87 having a handle, and which rests on the upper face of the plate 86 for binding the plate when adjusted.

When adjusting the scraper 35 transversely or angularly the operator releases the nut 87 and moves the scraper to the desired position by means of the hand wheel 78, the chains 80 and 82, the block 55 and the chain 57. The pressure mechanism will

be moved, at the same time by the chain 57 pulling through the rods 40. After the desired position is attained the nut 87 is turned up tightly, thereby clamping the members 5 64 upon the frame bars 10.

The slot 84 of the block 55 must be elongated for the following reason:

Referring particularly to Figures 1 and 7 it will be noted that the scraper 35 is pivotally attached to the bars 41 and the latter are pivoted to the bar 46 by the couplings 45. This permits swinging movements of the scraper 35, the bolts at the ends of the bar 46 serving as pivotal points. As shown in 15 Figure 1, the raising gear and its locking bolt 85 is at the rearward position of the slot 84, but if the whole is moved transversely the bolt 85 is free to slide forwardly in the slot 84 various distances represented 20 in Figure 7 by the space 88 between the dotted lines 89 and 90. Line 89 represents the line of travel of the block 55 while line 90 represents the arcuate path of travel of the pivot of swing of the bolt 85, or pivotal center of the scraper 35 and its parts, struck on the radius of the cross bar 46. The slot 84 further compensates for inequalities during the angular adjustment of the scraper as later explained.

The machine is particularly adapted for removing snow from the road, and for this purpose a comparatively great angle of inclination of the scraper is required, such as approximately at 45 degrees, much greater 35 than the inclination for planing or scraping earth from the road. As shown in Figure 1, the scraper 35 may be swung to the position shown in the dotted lines 35' by releasing the clamping nut 87 and withdrawing the locking pin 49 from a selected aperture of the sector 48 of the bar 46. On the front bar of the cross member 64 is an upstanding bracket arm 91, Figures 2, 3 and 5, providing a rest for the rod 52. When the 40 pin 49 is withdrawn, the scraper 35 is free to swing to the position 35', and such swinging movements effect the corresponding movements of the bar 46, it assuming the position shown in the dotted lines 46', and the bars 41 assuming the position substantially as shown by the dotted lines 41'. The pin 49 is now inserted into a selected aperture of the sector 48 and the nut 87 turned to clamp the transverse shifting gear in the 50 new position. It will be noted that the bars 41, when the scraper 35 is shifted to the position 35', will assume the position shown by the dotted lines 41' out of parallelism, the bar 41 at the left side of the machine being substantially parallel with the side bars 10 while the bar 41 at the right side will be at a greater divergent angle to the side bars 10, and cause an inequality which moves the pivotal point of the scraper 35 forward as 60 shown in Figure 1. The bolt 85 is at all

times the pivot from which the scraper 35 is swung, and is permitted to move forward on account of the elongation of the slot 84 in which it moves when the bar 46 is swung.

As shown in Figures 1 and 3 a longitudinal bar 92 is placed above the cross braces 14 and 15 to which the locking pin casting 50 is attached. A similar bar 93 is placed below the braces 14 and 15. These bars 92 and 93 are secured by the pins or bolts 19 and 47. The bolt 47 serves as a pivot for the sector 48 which is positioned between the bars 92 and 93 as clearly shown in Figure 3. The pin 19 also secures the rear arm of the bolster 18 to the frame. 70 Directly above and in vertical alignment with the pin 23 is another pivot pin 94, secured to the bars 92 and 93' and between which a draw bar 95 is pivoted for horizontal swinging movements. This draw bar 95 is adapted to transmit the strain of the draft directly to the bars 92 and 93, and through them to the bar 46 and scraper 35. It will be noted that this form of draft is useful for direct, transmission of the great 80 strain between the road scraper 35 and the bar 95 which functions as a draw bar, and thereby removes all strain from the king bolt 23 upon which the front steering wheels may be turned. 85

In order to support the weight of the draft animal gear, such as shown in Figure 2, the draw bar 95 is provided with an upstanding bolt 96 provided on its upper end with an anti-friction roller 97 overhanging and moving along the top edge of the semi circular track or bowed bar 13 when the front wheels are turned. This roller 97 supports the weight of the draft or evenner bar 30 and its gear for the draft animals. It furthermore removes the strain from the web plate 26 when a downward pull is exerted on the draw bar 95. As shown in Figure 3 the draft gear is assembled for use with a tractor as follows: 100

A strap iron 98 is secured by rivets or the like to the upper side of the draw bar 95 and is offset upwardly at its forward end. A pin 99 is carried through the forward ends of the strap iron and the draw bar 95, and, serves to connect the lip 27 of the web plate 26 to the draw bar 95. The draw bar 95 is thus coupled to the web plate 26 and moves therewith during turning of the front wheels. For use with a tractor a coupling plate 100, Figure 3, is fitted between the strap iron 98 and the draw bar 95 for connection at its forward end to a tractor. When draft animals are used the evenner bar 30 is substituted for the coupling plate 100, as shown in Figure 2, and the roller 97 supports the weight of the bar and the tongue 28 with its neck yoke 33, the latter engaging the adjacent draft animal 101 for steering purposes only. 110 115 120 125 130

It will be noted from Figure 7 that when a tractor is used and the web 27 is locked to the draw bar 95, the turning of the front wheels is limited by the roller 97 which abuts the forward ends of the sides 10 of the frame. When animals are used the web 27 is not locked to the limited draw bar and the web and wheels may turn further about for effecting a short turn on a narrow road.

Considerable pressure may be applied to the scraper 35 at either or both of its ends by manipulation of the hand wheels 70 in a manner to cause the arms 73 of the worm gear to descend far enough to overcome the compression of the springs 60. As a consequence the weight of the rear end of the machine may be placed directly on the scraper for holding it against the road surface.

When in use for light planing, such as in removing snow, the scraper blades may lightly contact with the ground and at this time the resistance of the compression springs 60 may be employed for maintaining the scraper contact with the ground. Should stones be encountered by the blade the springs 60 will yield and thus prevent injury to the scraper and other parts connected thereto.

I do not wish to be restricted to the size, form, and proportions of the various parts, and obviously changes could be made in the construction herein described without departing from the spirit of the invention, it being only necessary that such changes fall within the scope of the appended claims.

What is claimed is:

1. In a road maintainer, a frame, a superstructure on the frame, manually operable means for transversely shifting the superstructure on the frame, means for angularly adjusting the superstructure across the frame, clamping means for binding the superstructure upon the frame when adjusted and a scraper suspended from the superstructure and adapted for adjustment transversely and angularly with the same.

2. In a road maintainer, a frame, a superstructure slidably and pivotally mounted on the frame, a scraper suspended from the superstructure for adjustment therewith, manual means for moving the superstructure and scraper transversely across the frame to project the scraper beyond opposite sides of the frame, means for shifting the scraper into various angular positions across the under side of the frame, means for locking said last named means when adjusted, and locking means for the superstructure for securing it to the frame in adjusted position.

3. In a road maintainer, a frame, a superstructure slidably and pivotally mounted on the frame, means for manually shifting the

superstructure crosswise of the frame, means for binding the superstructure to the frame when adjusted, a scraper suspended beneath the superstructure for adjustment therewith crosswise of the frame and pivotally into various angles beneath the frame, and means for locking the scraper in various angular positions.

4. In a road maintainer, a frame having an intermediate brace, a traveler mounted on the brace, manual means connected to the traveler for shifting it transversely of the frame, a cross member seated on the frame over the traveler, a clamping bolt carried by the traveler and engaging the cross member for binding the latter upon the frame and for shifting the cross member with the traveler into various transverse positions of adjustment, and a scraper suspended beneath the frame and supported upon the cross member.

5. In a road maintainer, a frame having a cross brace therein, a block slidable transversely upon the cross brace, a hand operated shaft mounted in the frame and having reversely wound connectors on opposite ends leading to the opposite sides of the block for shifting the latter upon the turning of the hand operated shaft, a cross member pivotally mounted on the block and resting on the top of the frame, means for binding the block and cross member together and upon the frame when adjusted, a scraper suspended from the cross member beneath the frame for transverse and angular adjustment therein, and draft means for holding the scraper in adjusted positions.

6. In a road maintainer, a frame, a cross member resting upon the top of the frame, transversely slidable block mounted in the frame and having pivotal connection to the cross member to shift the same transversely and permit the free angular adjustment of the cross member on the frame, a clamping bolt connecting the block with the cross member for binding the same together when adjusted, a scraper suspended from the cross member beneath the frame, a pivoted cross bar carried by the frame forwardly of the cross member and provided with a segment, draft connections between the opposite ends of the cross bar and the scraper, and a releasable locking bolt carried by the frame and engaging the segment for locking the cross bar in various angularly adjusted positions for holding the scraper in such positions when adjusted.

In testimony whereof, I have affixed my signature in presence of two witnesses.

ODIN B. WALTERS.

Witnesses:

ARTHUR H. STURGES,
HIRAM A. STURGES.