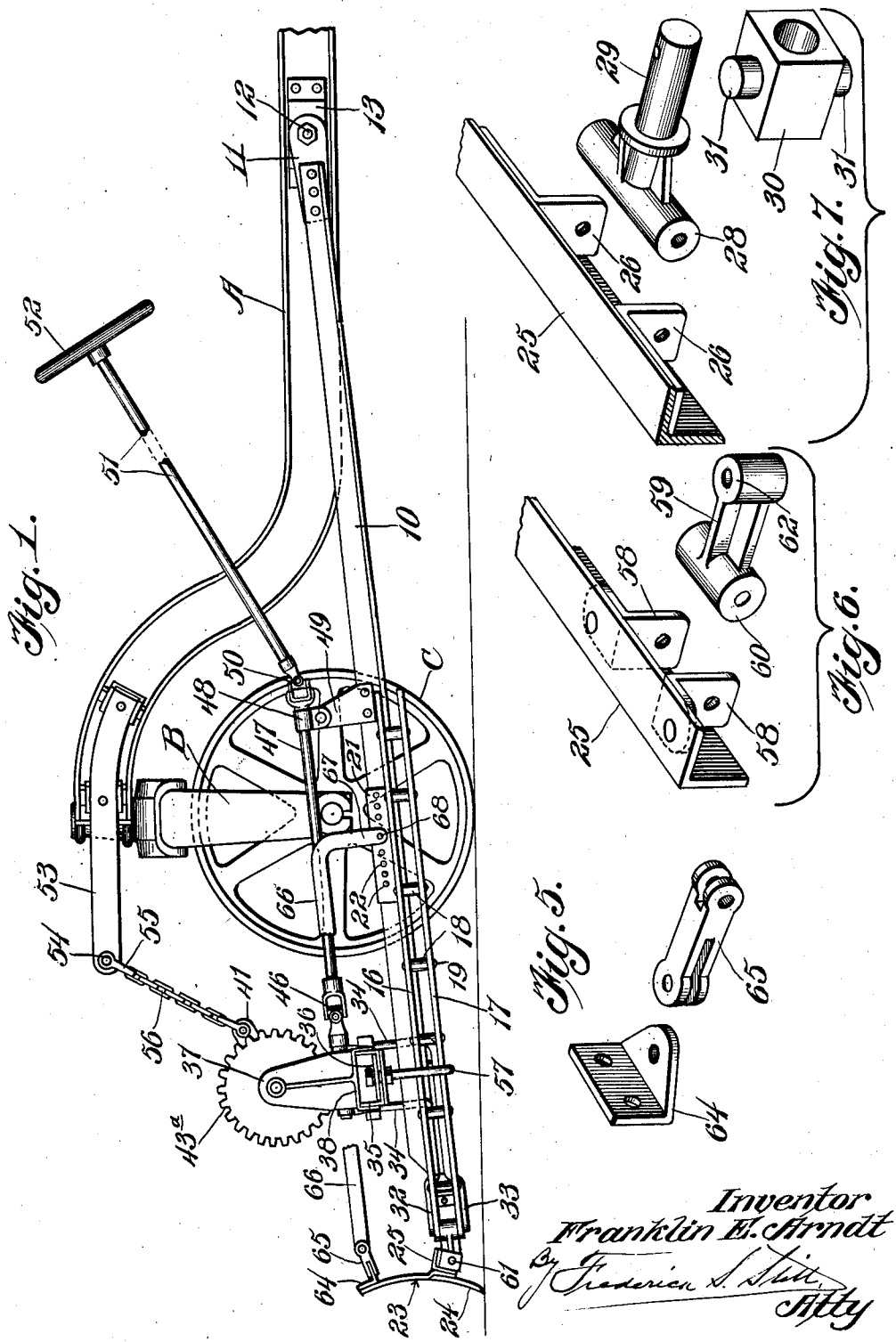
March 17, 1925. 1,530,100

F. E. ARNDT

ROAD ROLLER AND MAINTAINER

Filed Aug. 12, 1924 2 Sheets-Sheet 1

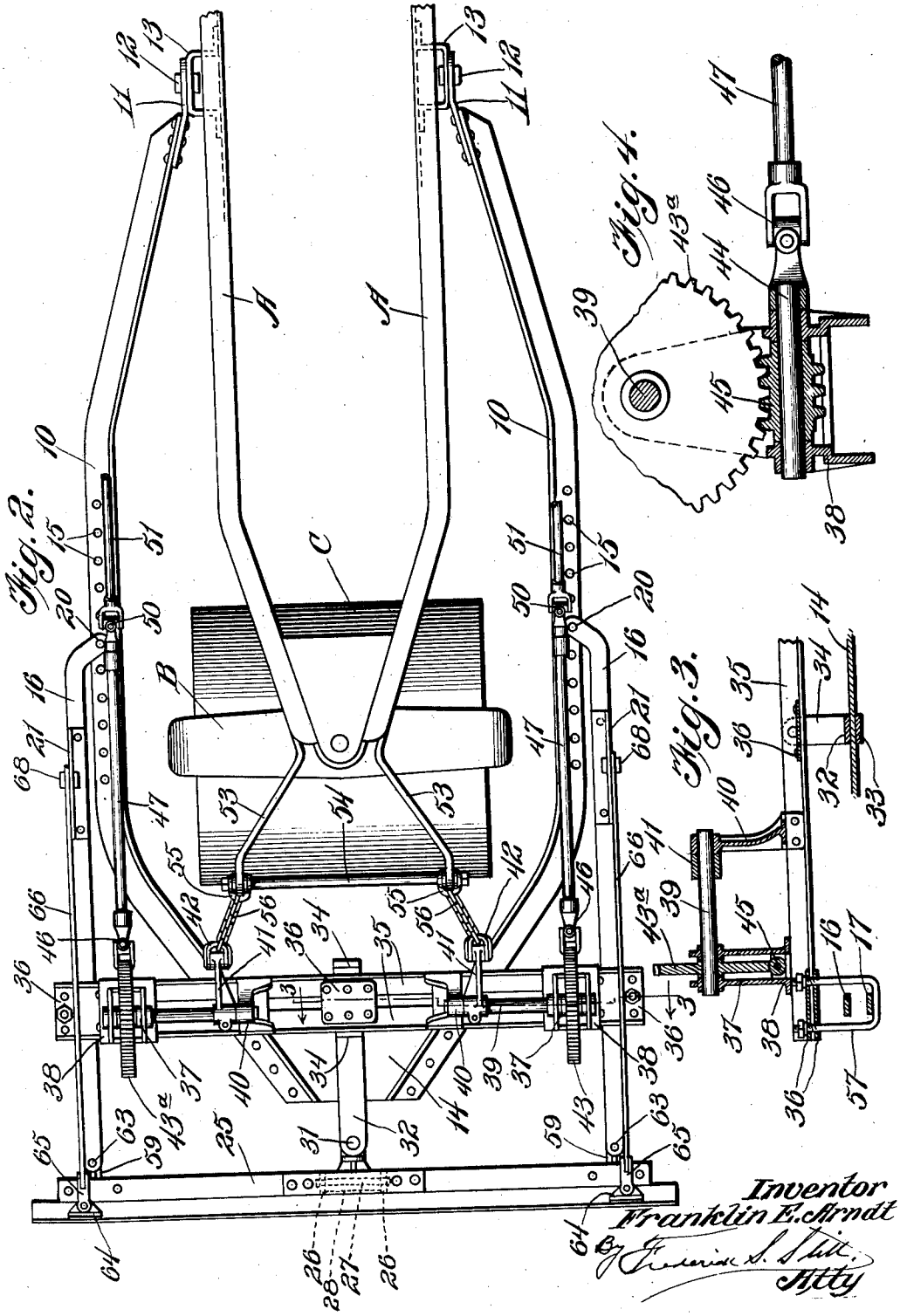


March 17, 1925. 1,530,100

F. E. ARNDT

ROAD ROLLER AND MAINTAINER

Filed Aug. 12, 1924 2 Sheets-Sheet 2



Patented Mar. 17, 1925. 1,530,100

UNITED STATES PATENT OFFICE.

FRANKLIN E. ARNDT, OF GALION, OHIO, ASSIGNOR TO THE GALION IRON WORKS & MFG. CO., OF GALION, OHIO, A CORPORATION OF OHIO.

ROAD ROLLER AND MAINTAINER.

Application filed August 12, 1924. Serial No. 731,646.

To all whom it may concern:

Be it known that I, FRANKLIN E. ARNDT, a citizen of the United States, residing at Galion, in the county of Crawford and State of Ohio, have invented certain new and useful Improvements in Road Rollers and Maintainers, of which the following is a specification.

This invention relates to road machines, and particularly to machines of that class in which a maintainer is used in connection with a road roller so that the road may be scraped or planed and the road thereby maintained while the road is being simultaneously rolled.

One of the objects of the present invention is to provide a construction of this character wherein the maintainer is disposed in front of a road roller so that the maintainer will be pushed ahead of the road roller to thereby plane or scrape the road and the wheels of the road roller will follow the maintainer and roll down the road or any inequalities which may be left.

A further object is to provide a very simple maintainer which is adapted to be readily applied to a small road roller and in which provision is made for raising or lowering the maintainer to thereby vary the depth of cut or lift the maintainer entirely from the road, the means for this purpose being located at the operator's station.

A still further object is to provide a maintainer of this character in which the scraping blade of the maintainer may be disposed at an angle to a horizontal plane so that one side of the maintainer is depressed while the other side is raised.

Another object is to provide improved means whereby the blade of the maintainer may be disposed at an angle to the line of draft greater than a right angle.

Still another object is to provide means whereby the scraping blade may be adjusted either to a vertical position, to a downwardly and forwardly inclined position, or a downwardly and rearwardly inclined position.

A further object is to provide improved means for supporting the maintainer blade and adjusting the blade so that either end of the blade may be disposed in advance of the other end of the blade.

A still further object is to provide improved means for raising or lowering the maintainer.

Other objects have to do with the details of construction and arrangement of parts as will appear more fully hereinafter.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of the forward end of a roller tractor showing my maintainer applied thereto;

Figure 2 is a top plan view of the structure shown in Figure 1;

Figure 3 is a section on the line 3—3 of Figure 2;

Figure 4 is a sectional view of the worm shaft and its bearings, showing the worm wheel in elevation;

Figure 5 is a perspective view of the link connection whereby the blade 23 is tilted;

Figure 6 is a perspective view of the links for connecting the blade to the blade supporting and adjusting bars;

Figure 7 is a perspective view of the means whereby the central portion of the blade is supported for movement in horizontal and vertical planes;

In these drawings, I have illustrated the forward portion of a tractor and tractor roller of a common type, the frame of this tractor consisting of the longitudinally extending beams A which are extended upward at their forward ends and converged and which rotatably support the yoke B within which is disposed the front roller C, it being understood that the rear ends of these beams A are supported upon two rollers which are of such width as to overlap the track of the front roller C. I have illustrated a tractor of this description but do not wish to be limited to this form of tractor.

The maintainer consists of a transversely extending blade and a pair of longitudinally extending thrust bars 10, which at their rear ends are attached to a strip 11, in turn pivoted by a bolt 12 to a U-shaped bracket 13 riveted or otherwise attached to the channel frame bars A. The thrust bars are curved so that their rear ends converge and their forward ends extend laterally and forward so as to pass beyond the ends of the roller C and then their forward ends are converged and connected together by a gusset 14 or in any other suitable manner. These thrust bars are preferably of angle iron and the outwardly projecting flange at the middle of each thrust bar is formed with a plurality of perforations 15.

Coacting with each of the thrust bars is a side adjusting arm formed of upper and lower metallic bars, designated 16 and 17, these bars being held in spaced relation to each other by spacing sleeves 18 and rivets 19. These bars at their rear ends are inwardly bent so as to embrace the lower flange of the thrust bar 10 and are held in place upon the thrust bar by means of a pin 20 passing through any one of the apertures 15. Attached to the upper face of the upper bar 16 is an angle iron 21, the vertical flange of which has a series of perforations 22 disposed approximately an inch apart in actual practice. It will be seen that these side adjusting arms composed of the bars 16 and 17 are pivotally supported upon the thrust bars so that these side adjusting arms may be shifted in a horizontal plane and that the thrust bars 10 are so mounted that they may be turned upward or downward and furthermore that the side adjusting arms may be adjusted upon the thrust bars forward or rearward.

The maintainer blade 23 consists of two parts, a body and a blade proper 24 which may be reversed upon the body. The detailed construction of this scraper blade forms no part of my present invention. Riveted, bolted or otherwise attached to the maintainer blade adjacent the lower ends of the body is an angle iron 25 having a vertical flange disposed adjacent the blade and a horizontal flange. To the horizontal flange at the middle thereof are attached the angular brackets 26, and mounted on the depending ears of these brackets is a pintle 27 which passes through the barrel 28 of a swivel pin 29. This swivel pin extends through a pivot block 30 having trunnions 31 which extend vertically upward and downward and are engaged in openings in upper and lower supporting bars 32 and 33. These bars are bent so as to be spaced apart at their forward ends to embrace the block 30. The rear ends of the bars are upwardly turned, as at 34, and riveted, bolted or otherwise attached to a cross beam formed of the angle irons 35 held together by the three plates 36 which are riveted through the horizontal flanges of the angle irons. Extending over these angle irons at the ends thereof are the worm gear brackets, designated generally 37, each having a base 38 having depending flanges which embrace the upwardly extending flanges of the angle irons, each bracket extending upward and having reinforcing ribs and being formed with a bearing at its upper end.

Mounted in the bearing is a shaft 39 which extends inward from the bearing and at its inner end is carried in a bearing 40 which has a base portion fitting into the space between the flanges of the angle irons 35 and which also carries a bearing at its upper end for the shaft 39. Mounted upon each shaft 39 is an arm 41 carrying at its end a clevis 42 for a purpose to be later stated, and mounted upon each shaft 39 is a worm gear wheel 43. Carried in bearings in each bracket 37 is a worm shaft 44 carrying upon it a worm 45 engaging the worm gear 43a. Each shaft at its rear end has a universal joint connection, as at 46, with an operating shaft 47 which extends rearward and at its rear end is operatively supported in a bearing 48 mounted on a pivot plate 49 attached to the vertical flange of the corresponding thrust bar 10. The rear end of this shaft section 47 has a universal joint connection 50 with an upwardly and rearwardly extending operating shaft section 51 carrying at its upper end a hand wheel 52 whereby it may be operated.

Mounted upon the convergent forward ends of the frame beams A are the bracket irons 53 which converge and then diverge, as shown in the plan view in Figure 2, and which are riveted or otherwise attached to the beams A, the forward ends of these bracket irons 53 carrying a transverse brace 54. Clevises 55 engage the cross bar 54 at the junction of the cross bar with the irons 53, and chains 56 extend downward from these clevises and engage the clevises 42. Thus it will be seen that as the shafts 39 are oscillated by the worm and worm wheels, the U-shaped frame of the planer will be either lifted or allowed to move downward. The supporting beams formed of the bars 16 and 17 are supported from the transverse beam formed of the angle irons 35 by means of U-shaped bolts or stirrups 57. This allows the beams formed of the members 16 and 17 to shift through the U-bolts 57 when these beams are longitudinally adjusted.

As before described, the scraper blade is mounted upon the brackets 32 and 33 for oscillation in a horizontal plane and also for tilting movement transversely to the machine. The supporting bars formed of the members 16 and 17 are connected to the scraper blade adjacent the ends thereof to provide not only for the tilting movement of the scraper from front to rear but also for the lateral tilting movement of the scraping blade. To that end there is attached to the under side of the angle iron 25 at each end thereof the two angular brackets 58 between which is disposed one end of a knuckle, designated generally 59, this end being formed with a barrel 60 through which passes a pintle 61. The opposite end of this knuckle has a vertically disposed barrel 62 through which passes a pin 63. Thus it will be seen that the supporting arms or bars formed of the members 16 and 17 are connected by a universal joint with the scraper blade, which joint will per-

mit the scraper blade to be tilted in a plane extending from front to rear or shifted laterally relative to the arms.

For the purpose of tilting the blade, I provide at both ends of the blade the angular ears 64, to which is pivoted the clip 65, this clip being in turn pivoted to the longitudinally extending rod 66 which extends rearward and at its rear end is turned downward, as at 67, and the lower end of this downwardly turned portion is perforated for the passage of a pin 68 which may be adjusted in any of the openings 22. Thus by drawing back on the bar 66, the blade may be tilted to extend downward and forward and by pushing forward upon the bar the blade may be tilted to extend backward and rearward or if the proper adjustment has been made the blade is held in a vertical position. Where the blade is extended downward and forward, it acts as a planer, and when disposed in a vertical position and extending downward and rearward, it acts as a scraper.

The operation of this mechanism will be obvious from what has gone before. The tractor is propelled under its own power, of course. The maintainer is disposed in front of the front wheel of the tractor and is pushed by the tractor and planes, scrapes and levels the ground. The depth of the planer may be regulated by turning both hand wheels 52 an equal amount which will lift both sides of the maintainer or permit both sides to descend equally. If it be desired, one of the supporting bars 16 of the blade may be lowered or raised above the other supporting bar of the blade so that the scraper will be laterally tilted. One of the supporting bars 16 may be pushed forward in order to shift one end of the blade beyond the other end of the blade and thus the blade may be disposed in a position at an obtuse angle to the line of draft. The blade may be tilted forward, set in a vertical position, or tilted rearward, as occasion may require, by adjusting the blade through the action of the rods 66. It will be seen that the thrust on the middle of the blade is carried by the cross beam which is mounted upon the forward ends of the thrust bars and that the thrust upon the ends of the maintainer blade is carried by the thrust bars themselves through the action of the pins 20. The maintainer, it is obvious, may be readily attached to or detached from the frame of the tractor by simply removing the bolts 12 and by disconnecting the clevises 55 from the brackets 53 or disconnecting the clevises 42 from the arms 41.

While I have illustrated a construction which embodies features found to be very effective in actual practice, I do not wish to be limited thereto as changes might be made in the details of construction and arrangement of parts without departing from the spirit of the invention as defined in the appended claims.

I claim:—

1. In mechanism of the character described, the combination with a road roller, of a maintainer including a blade disposed in front of the road roller, pivoted vertically swinging means by which the roller pushes the maintainer, said means permitting either end of the maintainer blade to be raised or lowered independently of the other end, an operator's station on the roller, means manipulatable from the operator's station for elevating or depressing each end of the maintainer independently of the other including shafts mounted upon the maintainer at each end thereof and each shaft having a member mounted on the shaft and movable concentric thereto, a flexible connection between said member and the frame of the roller, and means rearward of the operator's station whereby each shaft may be manipulated independently of the other shaft.

2. In mechanism of the character described, the combination with a road roller, of a maintainer including a blade disposed in front of the road roller, pivotal vertically swinging means by which the roller pushes the maintainer, said means permitting either end of the maintainer blade to be raised or lowered independently of the other end, an operator's station on the roller, means manipulatable from the operator's station for elevating or depressing each end of the maintainer independently of the other including shafts mounted upon the maintainer at each end thereof and each shaft having a member mounted on the shaft and movable concentric thereto, a flexible connection between said member and the frame of the roller, a worm gear wheel on each shaft, a worm engaging the worm gear wheel, and means extending rearward to the operator's station whereby each worm may be independently manipulated.

3. In mechanism of the character described, the combination with a three-wheeled road roller, a U-shaped maintainer mechanism enclosing the front wheel of the roller, means pivotally mounted on the roller by which the roller positively pushes the maintainer, an operator's station on the roller, independent shafts mounted upon the maintainer and having arms, flexible connections between said arms and the supporting frame of the roller, gear wheels mounted upon said shafts, and means extending from the maintainer to the operator's station whereby said gear wheels may be operated, said means including a series of sectional shafts connected to each other by universal joints.

4. In a mechanism of the character described, a road roller carrying an operator's station, a maintainer disposed in advance of the roller, a frame supporting the maintainer and pivotally connected to the road roller and constituting means whereby the maintainer may be pushed in front of the road roller, members operatively connected at their upper ends to the road roller, means mounted upon the maintainer frame and engaging said members and shiftable to raise or lower the maintainer frame, and means disposed at the operator's station manipulatable therefrom for operating said first named means.

5. A maintainer attachment for road rollers comprising a maintainer, thrust bars operatively connected to the extremities of the maintainer and at their rear ends adapted to be pivoted to the frame of the road roller, independent rotatable members operatively supported upon the thrust bars and having flexible connections extending therefrom and adapted to extend upward and be operatively connected to the forward end of the road roller, and means for rotating said rotatable members and including shaft sections flexibly connected to each other and extending rearward from said rotatable members and operatively supported upon the thrust bars.

6. In mechanism of the character described, a road roller and a maintainer in combination therewith, the maintainer including thrust bars pivotally connected at their rear ends to the frame of the road roller extending forwardly and medially, supporting bars mounted upon the thrust bars for forward and rearward adjustment and for swinging movement in a horizontal plane, means operatively connecting the blade to said supporting bars and permitting the blade to swing with relation thereto, an operator's station upon the roller, and means manipulatable from the operator's station whereby the thrust bars may be independently raised or lowered.

7. In mechanism of the character described, a road roller and a maintainer in combination therewith, the maintainer including a maintainer blade disposed transversely and in advance of the road roller, thrust bars pivoted upon the road roller for movement in a vertical plane and extending forward, means for independently raising or lowering either of said thrust bars, blade supporting bars detachably and adjustably connected to the thrust bars for swinging movement in a horizontal plane and for adjustment forward or rearward upon the thrust bars, means operatively connecting the blade to the supporting bars permitting the upper edge of the blade to be adjusted forward or rearward relative to the lower edge, means for adjusting the blade and holding it in this adjusted position, and means for operatively supporting the blade supporting bars for vertical movement with the thrust bars.

8. In mechanism of the character described, a road roller and a maintainer in combination therewith, the maintainer including a maintainer blade disposed transversely and in advance of the road roller, thrust bars pivoted upon the road roller for movement in a vertical plane and extending forward, means for independently raising or lowering either of said thrust bars, blade supporting bars detachably and adjustably connected to the thrust bars for swinging movement in a horizontal plane and for adjustment forward or rearward upon the thrust bars, means operatively connecting the blade to the thrust bars permitting the upper edge of the blade to be adjusted forward or rearward relative to the lower edge, means for adjusting the blade and holding it in this adjusted position, means for operatively supporting the supporting bars for vertical movement with the thrust bars including a transverse beam, means operatively connecting the transverse beam to the thrust bars, and means operatively connecting the transverse beam to the supporting bars.

9. In mechanism of the character described, a road roller and a maintainer in combination therewith, the maintainer including a maintainer blade disposed transversely and in advance of the road roller, thrust bars pivoted upon the road roller for movement in a vertical plane and extending forward, means for independently raising or lowering either of said thrust bars, blade supporting bars detachably and adjustably connected to the thrust bars for swinging movement in a horizontal plane and for adjustment forward or rearward upon the thrust bars, means operatively connecting the blade to the supporting bars permitting the upper edge of the blade to be adjusted forward or rearward relative to the lower edge, means for adjusting the blade and holding it in this adjusted position, means for operatively supporting the supporting bars for vertical movement with the thrust bars including a transverse beam, means operatively connecting the transverse beam to the thrust bars, and operatively connecting the middle of the scraper blade to the beam for pivotal movement with the scraper blade in a horizontal plane, and means operatively connecting the supporting bars to the transverse beam and permitting longitudinal adjustment of the supporting bars.

10. In a mechanism of the character described, the combination with a road roller having an operator's station, of a road maintainer coacting therewith comprising thrust bars pivotally connected to the frame of the

roller intermediate its ends for movement in a vertical plane, said thrust bars extending in advance of the forward end of the roller, blade supporting bars operatively connected to the thrust bars for independent adjustment forward and rearward thereon and for pivotal movement in a transverse plane, a scraper blade operatively mounted upon the ends of the supporting bars for swinging movement in a horizontal plane, a cross beam disposed above the supporting bars and the forward ends of the thrust bars, means operatively sustaining said cross beam from the frame of the roller at its forward end, said means permitting the vertical adjustment of the cross beam, means operatively connecting the cross beam to the forward ends of the thrust bars and operatively connecting the middle of the scraper blade to the cross beam for pivotal movement in a vertical plane and for pivotal movement in a horizontal plane, and means supporting the supporting bars from the ends of the cross beam and permitting longitudinal adjustment of the supporting bars.

11. In a mechanism of the character described, the combination with a road roller having an operator's station, of a road maintainer coacting therewith comprising thrust bars pivotally connected to the frame of the roller intermediate its ends for movement in a vertical plane, said thrust bars extending in advance of the forward end of the roller, blade supporting bars operatively connected to the thrust bars for independent adjustment forward and rearward thereon and for pivotal movement in a transverse plane, a scraper blade operatively mounted upon the ends of the supporting bars for swinging movement in a horizontal plane, a cross beam disposed above the supporting bars and the forward ends of the thrust bars, means operatively sustaining said cross beam from the frame of the roller at its forward end, said means permitting the independent vertical adjustment of each of the cross beams relative to the other end thereof, means operatively connecting the cross beam to the forward ends of the thrust bars and operatively connecting the middle of the scraper blade to the cross beam for pivotal movement in a vertical plane and for pivotal movement in a horizontal plane, and means supporting the supporting bars from the ends of the cross beam and permitting longitudinal adjustment of the supporting bars.

12. In a mechanism of the character described, a supporting frame and a road scraping blade, longitudinally extending bars having sliding engagement with the supporting frame and having operative pivotal engagement with the ends of the scraping blade, a member operatively connecting the middle of the scraping blade to the supporting frame pivoted to said scraping blade to permit forward and rearward tilting movement of the scraping blade, lateral tilting movement of the scraping blade, and angular swinging movement of the scraping blade in a horizontal plane, and means for raising or lowering either end of the scraping blade independently of the other end.

13. A maintainer for attachment to road rollers comprising thrust bars adapted at their rear ends to be pivotally and detachably connected with the frame of the road roller and extend forward of the forward end thereof, blade supporting bars mounted upon the thrust bars for longitudinal adjustment therealong, a scraping blade swingingly connected at its ends to the forward ends of the supporting bars, a transversely extending member with which the supporting bars have sliding engagement, means mounted upon said supporting frame and extending rearward therefrom and adapted to have portions thereof disposed adjacent the operator's station of the road roller whereby said cross beam may be operatively suspended from the roller frame and raised or lowered, and means operatively connecting the cross beam with the forward ends of the thrust bars and swingingly connecting the middle of the scraper blade with said beam.

14. The combination with a tractor, of thrust bars pivotally mounted upon the tractor and extending in front thereof, blade supporting bars adjustably mounted upon the thrust bars for independent forward and rearward movement, a blade operatively supported for pivotal movement in a vertical plane upon the ends of the supporting bars, means for adjusting the angle of the blade comprising rods pivotally connected adjacent the upper edge of the blade and extending rearward therefrom, a member carried upon each of the supporting bars and having a longitudinal series of perforations, and means for operatively connecting the rear ends of said rods to the members, said means being adapted to pass through any one of said perforations whereby to adjust the angle of the blade.

In testimony whereof I affix my signature.

FRANKLIN E. ARNDT.