June 9, 1925. 1,541,310

A. C. ANDERSON

ROAD CLEANER

Filed Dec. 23, 1924 5 Sheets-Sheet 1

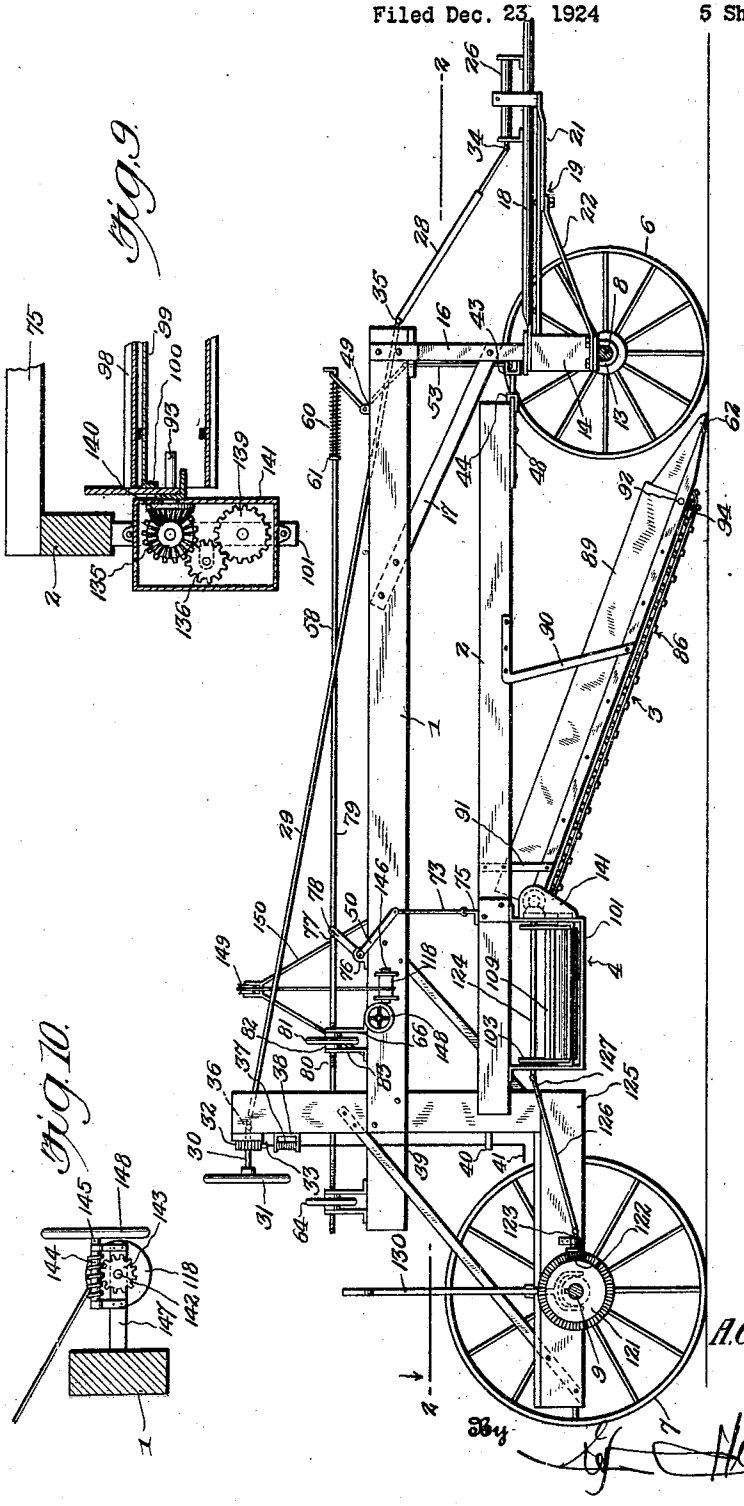


Fig. 7.

Fig. 10.

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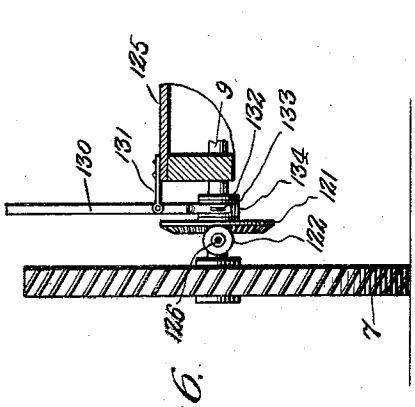


Fig. 6.

Fig. 2.

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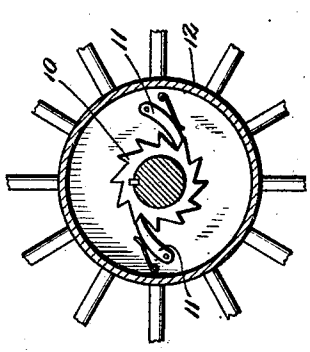


Fig. 8

Fig. 3.

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ROAD CLEANER

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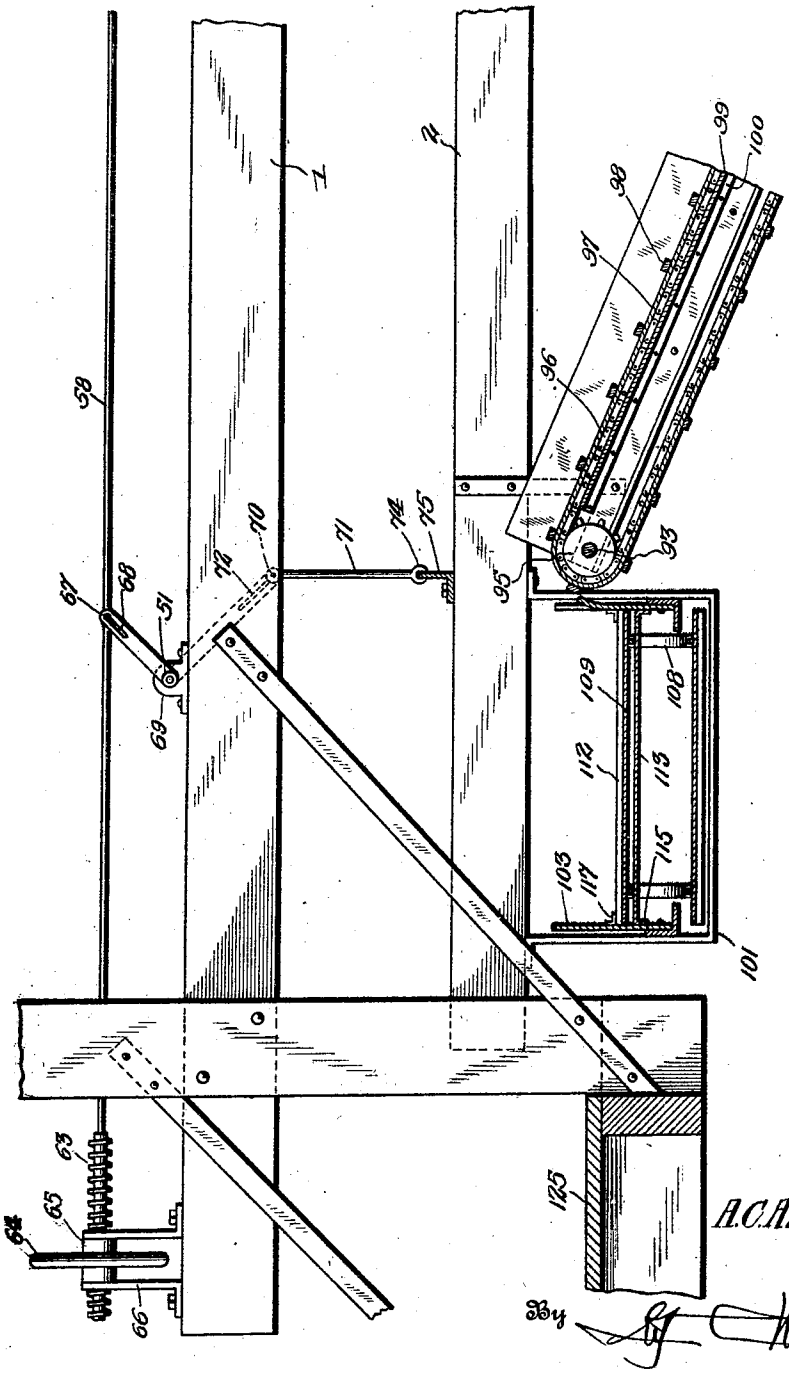


Fig. 4.

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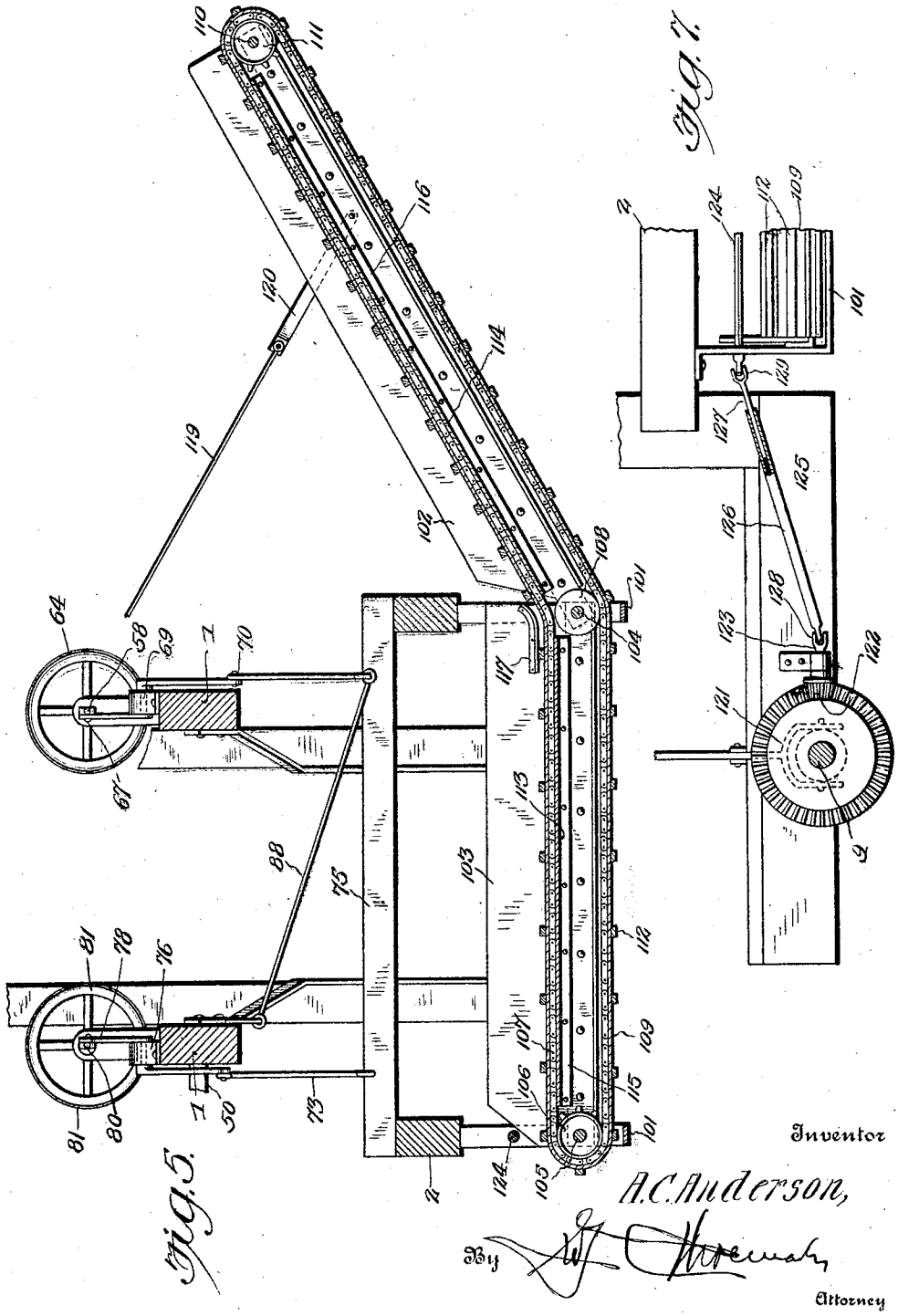


Fig. 5.

Fig. 7.

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Patented June 9, 1925. 1,541,310

UNITED STATES PATENT OFFICE.

ANDREW C. ANDERSON, OF HAZARD, NEBRASKA.

ROAD CLEANER.

Application filed December 23, 1924. Serial No. 757,728.

To all whom it may concern:

Be it known that I, ANDREW C. ANDERSON, a citizen of the United States, residing at Hazard, in the county of Sherman and State of Nebraska, have invented new and useful Improvements in Road Cleaners, of which the following is a specification.

This invention relates to a road cleaner.

The object of the invention is to improve the construction of road cleaners and to provide a simple, practical and efficient machine of strong, durable and comparatively inexpensive construction designed for cleaning the ditches at the sides of a road and capable of transferring the dirt removed from the ditches to the crown of the road thereby enabling roads to be readily repaired and placed in proper condition for travel.

Another object of the invention is to enable the mechanism for cleaning the ditches and for carrying the earth from the ditches to the center of the road to be readily adjusted for raising and lowering the same into and out of operative position and for also adjusting such mechanism laterally of the machine to arrange it in proper position to suit the angle or inclination of the side of the road on which the machine is operated.

Another object of the invention is to enable the adjusting means and the means for guiding or steering the machine to be readily controlled by an operator at the back of the machine.

With these and other objects in view, the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:

Figure 1 is a side elevation of a road cleaner constructed in accordance with this invention.

Fig. 2 is a plan view partly in section, the section being taken on line 2—2 of Fig. 1.

Fig. 3 is an enlarged longitudinal sectional view of the front portion of the road cleaner.

Fig. 4 is a similar view through the rear portion of the road cleaner.

Fig. 5 is a transverse sectional view taken substantially on the line 5—5 of Fig. 2.

Fig. 6 is a detail transverse sectional view through one side of the rear portion of the machine illustrating the construction of the gearing for transmitting motion from the rear axle.

Fig. 7 is an enlarged detail sectional view illustrating the construction of the driving gearing.

Fig. 8 is a detail sectional view illustrating the clutch mechanism for connecting the rear wheels with the rear axle.

Fig. 9 is a detail sectional view illustrating the arrangement of the gearing for transmitting motion from the longitudinal drive shaft to the longitudinal and transverse endless conveyors.

Fig. 10 is a detail view of the worm gearing for operating the hinged section of the transverse conveyor.

In the drawings in which is illustrated the preferred embodiment of the invention the road cleaner comprises in its construction a wheeled frame 1 and an adjustable frame 2 carrying a longitudinally disposed endless conveyor 3 and a transversely disposed laterally projecting conveyor 4. The main frame 1 which is provided at its rear end with a platform 5 for the accommodation of the operator is supported by front and rear wheels 6 and 7 mounted on front and rear axles 8 and 9. The rear axle which is journalled in suitable bearings of the main frame is connected with each of the rear wheels by a suitable clutch mechanism for causing rotary motion to be transmitted from the rear wheels to the rear axle in the forward movement of the machine and for preventing the rear axle and the mechanism connected therewith from being operated when the machine is backed. In the form of clutch illustrated in Fig. 8 a ratchet wheel 10 is keyed or otherwise secured to the rear axle and is engaged by opposite spring actuated pawls 11 mounted in the hub or housing 12 of the rear wheel. When the rear wheel moves forwardly the pawls 11 will engage the ratchet wheel and lock the rear wheel to the rear axle for rotating the latter and when the rear wheel is rotated rearwardly the pawls will slide or ratchet over the teeth of the ratchet wheel 10 and will not rotate the rear axle.

The front wheels 6 are loosely journalled on the front axle 8 which has clamped to it by suitable clips 13 a bolster 14 arched transversely of the front of the machine and pivotally connected with the front of the main frame by a vertical elongated king bolt 15. The king bolt 15 is mounted in the arched bolster 16 of approximately inverted V-shaped having its terminal portion suitably secured to the front of the frame and supported by inclined braces 17 extending from the lower portion of the sides of the bolster 16 upwardly and rearwardly to the sides of the main frame. The main frame and the bolsters 14 and 16 are pierced by the king bolt 15 which also passes through the rear end of a tongue 18 for connecting the machine with a tractor or other means for drawing it along the road operated on. The front axle is adapted to be turned on the king bolt for changing the direction of the road cleaner and the lower bolster 14 has connected to it the rear end of a horizontal steering frame 19 composed of a central longitudinal frame member 20 and front and rear divergent braces 21 and 22. The frame is provided at the front with a transverse guide 23 composed of spaced upper and lower bars forming a transverse slot or opening through which passes the tongue 18 and the said guide is provided at its ends with upwardly extending lugs 24 to which are secured the terminals of a chain 25 having its central portion wound around a longitudinal drum 26 carried by the tongue 18. The drum 26 is mounted in suitable bearing brackets 27 and its rear end is connected by an inclined extensible shaft 28 with an inclined longitudinal shaft 29 extending to the rear portion of the machine and connected with a horizontal operating shaft 30 having a hand wheel 31 and carrying a toothed wheel 32 adapted to be engaged by a slidable spring actuated latch member 33 for holding the operating shaft 30, the drum 26 and the connections between the same against rotary movement. The front inclined extensible shaft 28 is composed of telescoping sections which are connected at their ends by universal joints 34 and 35 with the drum 26 and the front end of the inclined longitudinal shaft 29. The latter is connected by a universal joint 36 with the horizontal operating shaft 30. The horizontal operating shaft 30 is journalled in suitable bearings of the main frame and the spring 37 for actuating the latch member is mounted in a suitable bracket 38. The latch member is provided with a rod connection 39 extending downwardly to a lower guide 40 and passing through the same and provided at its lower end with a horizontal foot receiving portion 41 adapted to be depressed by the foot of the operator for withdrawing the latch from engagement with the toothed wheel 32 when it is desired to operate the steering mechanism for changing the direction of the machine. The hand wheel 31 is adapted to be turned in either direction for producing a corresponding movement of the front axle and a consequent change of the direction of the machine.

The adjustable frame is flexibly connected at its front end with the king bolt 15 by means of a coupling 42 which permits the vertical adjustment of the frame 2. The coupling 42 consists of a front yoke 43 and a rear yoke 44 provided with a longitudinal stem or pivot 45 preferably formed integral with the rear yoke and having its front portion arranged in a bearing opening in the rear portion of the front yoke. The stem or pivot 45 which is horizontal is capable of rotary movement in the bearing of the front yoke and it is provided with a head 46 arranged within the front yoke between the upper and lower sides thereof as clearly illustrated in Fig. 3 of the drawings. The front yoke 46 is composed of upper and lower sides and a rear connecting portion and the king bolt 15 passes through the upper and lower sides. This permits a pivotal movement of the coupling on the vertical king bolt and also a pivotal movement on the horizontal pivot or stem 45 thereby providing a swivel or flexible connection between the front of the adjustable frame and the front of the main frame. This pivotal movement on vertical and horizontal pivots provides for the lateral adjustment of the frame 2 and a sliding movement of the yoke 46 upwardly and downwardly on the king bolt provides for the vertical adjustment of the frame 2. The rear yoke 44 constitutes a clip and is secured by a bolt 47 to a front transverse bar 48 connecting the sides of the adjustable frame 2 and having attaching portions extending along said sides of the frame 2 as clearly illustrated in Fig. 1 of the drawings.

The adjustable frame 2 is raised and lowered by mechanism located at opposite sides of the machine and independently operable to enable the adjustable frame to be arranged at the desired lateral inclination to suit the angle or inclination of the surface of the road being cleaned and repaired. The adjustable frame is connected at the center of the front and at opposite sides of the rear portion with a front bell-crank lever 49 and rear side bell-crank levers 50 and 51. The front bell-crank lever 49 which is mounted in a suitable bearing 52 consists of a shaft or pivot portion arranged in the said bearing 52 and having upwardly and downwardly extending arms, the downwardly extending arms being connected by a rod or link 53 with the yoke 43 of the coupling 42 and when the bell-crank lever 49 is oscillat-

ed the yoke 43 will be caused to slide upwardly or downwardly on the king bolt 15 according to the direction of the movement of the bell-crank lever. The adjustment of the frame 2 arranges the road cleaning mechanism at the desired lateral inclination and also raises and lowers the mechanism to engage it with the ground and to lift it out of such engagement. The lower end of the connecting rod or link 53 is preferably threaded and secured by nuts 54 to the upper side of the yoke 43 as clearly shown in Fig. 3 of the drawings and the upper portion of the rod 53 slides through a guide opening 55 in the front portion of the main frame. The lower arm of the bell-crank lever 49 is pivoted to the upper end of the rod 53 at 56 and the upper arm of the bell-crank lever 49 is provided with a slot 57 through which passes the front end of a longitudinal worm shaft 58 which is provided at its front end with a suitable stop 59. The stop 59 is preferably in the form of a head and is adapted to retain the front end of the worm shaft 58 in the slot 57 of the upper arm of the bell-crank lever. In order to cushion the operating mechanism and prevent the same from being injured by any accidental upward movement of the ditch cleaning mechanism a coiled spring, 60 is arranged on the front portion of the worm shaft and is interposed between the upper arm of the bell-crank lever 49 and an adjustable collar 61 which forms a stop for the rear end of the cushioning spring 60. Any tendency of the front portion of the frame to rise by reason of the ditch cleaning blade 62 striking a hard substance or an obstruction will be cushioned by the coiled spring 60 and injury to the operating mechanism thereby prevented and the said spring will operate to urge the front portion of the adjustable frame 2 downwardly and will cause the same with the assistance of gravity to resume its normal operative position after being thrown upward.

The rear portion of the longitudinal worm shaft 58 is provided with a worm or thread 63 which is engaged by a hand wheel 64 having a hub 65 journalled in suitable bearing brackets 66 and provided with an interior thread engaging the worm or thread of the shaft 58 and operating as a nut for moving the shaft 58 longitudinally when the hand wheel 64 is rotated. The bearing brackets 66 are approximately L-shaped and the hub of the hand wheel 64 has reduced terminal portions which are journalled in suitable bearing openings of the said brackets but any other suitable means may of course be employed for mounting the worm shaft and the operating wheel for moving the worm shaft longitudinally to adjust the frame 2. The worm shaft is also provided at its rear portion with a lateral projection 67 which passes through a longitudinal slot 68 of the upwardly extending arm of the bell-crank lever 51. The bell-crank lever 51 consists of a shaft portion which is journalled in a suitable bearing 69 and which is provided with upwardly and downwardly extending arms, the upward arm being connected by the slot and projection with the worm shaft and the lower arm being connected by a suitable pivot 70 with the upper end of a link 71 which is connected at its lower end to the rear portion of the frame 2. A slot 72 may be provided in the lower arm of the rear bell-crank levers if desired but the pivotal connections of the links 71 and 73 will enable such a slot to be dispensed with. The lower end of the link 71 is provided with an eye 74 which is linked into a suitable perforation of a transverse angle bar 75 secured to the rear portion of the adjustable frame 2 and extending across the same. A slot 68 in the upwardly extending arm of the bell-crank lever 51 will permit the arm to swing in an arc without affecting the pivotal connection between the same and the worm shaft which has only a longitudinal sliding movement. Any suitable means may be provided for guiding the longitudinal worm shaft 58 between its ends if desired.

The bell-crank lever 50 is constructed similar to the bell-crank lever 51 and consists of a shaft journalled in a suitable bearing 76 and having upwardly and downwardly extending arms, the upwardly extending arms being provided with a longitudinal slot 77 for the reception of a pin or projection 78 of a relatively short longitudinal worm shaft 79 which controls the adjustment of the bell-crank lever 50 and the upward and downward adjustment of the right hand side of the frame 2. The worm shaft 79 is provided at its rear portion with a worm or thread 80 which is engaged by a hand wheel 81. The hand wheel 81 which is constructed similar to the hand wheel 64 is provided with a hub 82 which is journalled in suitable bearing brackets 83 mounted upon the main frame at the right hand side thereof as clearly shown in Figure 1 of the drawings. The hub 81 which has reduced terminal portions to fit in the bearings of the brackets 83 is provided with an interior worm thread for engaging the thread or worm of the shaft 79. The worm shafts are located at opposite sides of the frame and the operating hand wheels 64 and 81 are arranged within easy reach of the operator who stands upon the rear platform 5. The said worm shafts are capable of independent adjusment and the right hand worm shaft controls the adjacent side of the adjustable frame and is connected only with the rear portion thereof while the left hand shaft is connected with the front and rear bell-crank levers 49 and 50 at the left hand

side of the frame. The worm shafts are operated simultaneously to lower the blade 62 to the ground and to raise the same from the ground and there are independently operated to adjust the frame and set the blade at the proper lateral inclination to correspond with the surface of the road and the ditch being cleaned. The machine travels along the side of the road with the blade 62 operating in the ditch thereof for cleaning shallow ditches and for removing an accumulation of earth and other surface of the road bed washed from the same into the ditches at the sides of the road. The blade 62 which may be constructed of any suitable material, preferably steel, is provided at the outer or right hand side with a tapered extension 84 which is flanged at the side edge 85 for holding the dirt scraped from the bottom of the ditch and for directing the same upwardly and inwardly to a longitudinally disposed endless carrier 86 which carries the dirt cleaned from the ditch upwardly and rearwardly and deposits the same upon a lateral projecting transversely disposed endless carrier 87 which extends from the left hand side of the machine inwardly over the road and is designed to be of sufficient length to discharge the material onto the ground of the road bed. This will enable the ditches at the side of a road to be easily and quickly cleaned and the road repaired by transferring the dirt from the ditch to the center of the roadway. The adjustable frame is held against lateral movement by an inclined link 88 extending downwardly from the right hand side of the main frame at the rear portion thereof and connected at its upper end to the same and at its lower end to the transverse bar 75. The link 88 is preferably provided at its ends with eyes to form a hinged or pivotal connection and it is arranged above the transverse conveyor and is adapted to counteract any tendency of the transverse conveyor causing a shifting of the adjustable frame when the outer portion of the transverse conveyor is elevated as illustrated in Fig. 5 of the drawings. Any number of link connections may be employed and the flexible connections of the same will be such as to not interfere with the vertical and lateral angular adjustment of the frame 2. The inclined longitudinal conveyor is provided with a suitable conveyor frame 89 rigidly hung from the adjustable frame 2 by means of front and rear brackets 90 and 91 and provided with front and rear bearings for the reception of front and rear conveyor shafts 92 and 93 having front and rear sprocket wheels 94 and 95 on which are arranged endless sprocket chains 96 located at opposite sides of the endless conveyor and carrying the endless belt or apron 97 thereof. The endless belt or apron is provided with transverse slats 98 and it is supported by a metallic web or plate 99 extending across the conveyor frame and having side flanges 100 which are suitably secured to the sides of the conveyor frame. The slats 98 are suitably connected with the endless chains 96 and they are adapted to hold the material on the apron or belt while the same is traveling upward from the blade to the transverse conveyor. The plate 99 presents a smooth surface to the upward flight of the endless belt or apron and prevents same from sagging under the weight of material carried upward.

The transverse conveyor 87 is mounted in rear hangers 101 located at opposite sides of the rear portion of the adjustable frame 2 and composed of vertical sides and a connecting bottom portion. The said transverse conveyor is composed of an inner fixed section and an outer hinged adjustable section 102 which is adapted to be raised and lowered to arrange it in position for operation and also to swing it upward out of the way when the machine is not in operation. The relative fixed section 103 of the transverse conveyor is provided with a conveyor frame rigidly secured to the said hangers 101 and supporting inner and outer transverse shafts 104 and 105. The outer shaft 105 is provided with sprocket wheels 106 for meshing with the sprocket chains 107 of the transverse conveyor 87. The inner shaft 104 is equipped with a smooth roller 108 for guiding the sprocket chains while the same are passing from one section of the transverse conveyor to the other. The transverse conveyor consists of an endless belt or apron 109 extending from the outer end of the relatively fixed section 103 to the outer end of the hinged section 102 and said hinged section is provided at its outer end with suitable bearings for an outer transverse shaft 110 on which are mounted sprocket wheels 111 for the sprocket chains 107. The endless belt or apron 109 is provided with transverse slats 112 which are suitably secured to the links of the endless sprocket chains and the upper flight of the endless belt or apron 109 is supported by transverse plates or webs 113 and 114 provided with side flanges 115 and 116 which are suitably secured to the sides of the frames of the sections of the transverse conveyor. The plates or webs 113 and 114 prevent the upper flight of the endless apron from sagging and the said upper flight of the endless apron is guided at the adjacent ends of the sections of the conveyor by means of curved guide members 117 located above the chains and suitably secured to the frame of the fixed section of the transverse conveyor. The guide members are provided with attaching flanges and they present a lower curved surface to the endless belt or apron at the juncture of the said sections

and they are engaged by the slats and prevent the upper flight of the endless belt from lifting and loosening the sprocket chains. In practice suitable tensioning devices will be employed for tightening the sprocket chains but as any suitable tensioning device may be used a detailed description and illustration of the same is deemed unnecessary. The transverse conveyor which receives the dirt from the upper end of the longitudinal conveyor is adapted to carry the dirt outwardly and discharge the same at a distance from the side of the main frame and onto the road bed at the center of the same and by this construction the machine is adapted to travel in a ditch at the side of the road bed and clean a shallow ditch and discharge the dirt cleaned from the ditch onto the road at the central portion thereof.

The outer section is preferably hinged to the inner section of the transverse conveyor by means of the inner shaft 104 as clearly indicated in Fig. 5 of the drawings and the outer section is adapted to be raised and lowered. The adjustment of the outer section of the transverse conveyor is affected by means of a drum 118 and a cable 119 or other suitable flexible action connected at one end to the drum and at its other end to a yoke 120 which straddles the outer portion of the adjustable section of the transverse conveyor and is pivotally secured to the same. The cable 119 is adapted to be wound around and unwound from the drum 118 to raise and lower the hinged outer section of the transverse conveyor and this operation is effected by means of worm gearing comprising a relatively short longitudinal drum shaft 142 upon which the drum is mounted and which has keyed or otherwise secured to it a worm wheel 143 meshing with a worm 144 of a short transverse worm shaft 145. The longitudinal shaft 142 is journaled in suitable bearing brackets 146 secured to the right hand side of the main frame. The transverse worm shaft 145 is mounted in a suitable bearing bracket 147 and is provided at the outer end with a suitable hand wheel 148. In order to provide for an easy lifting of the outer section of the transverse conveyor the cable 119 is arranged on a guide pulley 149, mounted in a substantially V-shaped bracket 150 secured to and projecting laterally from the left hand side of the main frame of the machine.

The cable 119 extends downwardly from the pulley 149 to the yoke 120 and provides for a more direct upward lift than would be the case were the cable to extend directly to the side of the frame. This bracket 150 may be of any desired length and is preferably inclined upwardly from the frame.

The endless conveyors are driven from the rear axle 9 which is adapted to be rotated by the rear wheels 7 through the clutch mechanism heretofore described and mounted on the rear axle and slidably connected therewith by means of a key or other suitable connection is a bevel gear 121 which meshes with a bevel pinion 122 mounted on the rear section 123 of a drive shaft composed of the said rear section 123 and front section 124 and an inclined intermediate section 125 having telescoping members 126 and 127 forming an extensible intermediate section and enabling the drive shaft to adjust itself to the raising and lowering of the adjustable frame 2. The rear section 123 and the front section 124 of the drive shaft are horizontal and are journalled in suitable bearings of the main and adjustable frames and the intermediate extensible section is connected by universal joints 128 and 129 with the said sections 123 and 124. The universal joints 128 and 129 permit the rotation of the angularly related section of the drive shaft which accommodates itself to the adjustment of the frame 2. The bevel gear 121 of the rear axle is shifted to move it into and out of mesh with the bevel pinion 122 by means of a shifting lever 130 fulcrumed on a suitable bracket 131 and having a forked lower portion 132 which is connected by a slot and pin connection 133 with a collar 134 operating in a groove of the hub of the gear wheel 121, but any other suitable means may of course be employed such as an ordinary clutch for throwing the machine into and out of operation. The front end of the drive shaft carries a compound gear wheel 135 having spur and bevel gear teeth, the spur teeth meshing with an idler gear 136 which transmits motion from the bevel gear to a lower gear wheel 137 mounted on the outer conveyor shaft 105. The transverse conveyor is rotated in the proper direction by the train of gears connecting the outer shaft 105 with the drive shaft and the upper flight of the endless apron of the transverse conveyor will move outwardly when the machine moves forwardly. The bevel gear teeth of the compound gear 135 mesh with the bevel gear wheel 140 mounted on the upper rear conveyor shaft 93 of the longitudinal conveyor and the said shaft 93 will be rotated to move the upper flight of the endless apron of the longitudinal conveyor upwardly for carrying the dirt from the ditch to the transverse conveyor. The gearing for connecting the drive shaft with the longitudinal and transverse conveyors is designed to be arranged within a suitable gear case 141 to protect the same.

What is claimed is:

1. A road cleaner comprising a wheeled frame, an adjustable frame, means carried by the adjustable frame for cleaning a ditch

and for discharging dirt from the ditch to a point beyond the machine, and independent means located at opposite sides of the main frame and connected with the adjustable frame for raising and lowering the same and for tilting the frame laterally to suit the angle or inclination of a road bed and a ditch at the side thereof, the raising and lowering means at one side of the main frame being connected with the adjustable frame at the front and back thereof for simultaneously raising and lowering the same.

2. A road cleaner of the class described, comprising a wheeled frame, an adjustable frame, means carried by the adjustable frame for cleaning a ditch at the side of a road and for discharging the material at a point beyond the main frame, a front bell-crank lever mounted on the main frame and connected with the front of the adjustable frame, a pair of rear bell-crank levers mounted on the main frame at opposite sides thereof and connected with the rear portion of the adjustable frame at the sides of the same, and independent means for operating the said bell-crank levers for raising and lowering the adjustable frame and for tilting the same laterally of the main frame, the operating means at one side of the wheeled frame being connected with the front bell-crank lever and with one of the rear bell-crank levers for simultaneously raising and lowering the adjustable frame at that side of the wheeled frame.

3. A road cleaner of the class described, comprising a wheeled frame, an adjustable frame, means carried by the adjustable frame for cleaning a ditch at the side of a road and for discharging the material at a point beyond the main frame, a front bell-crank lever mounted on the main frame and connected with the front of the adjustable frame, a pair of rear bell-crank levers mounted on the main frame at opposite sides thereof and connected with the rear portion of the adjustable frame at the side of the same, independent operable means located at opposite sides of the main frame, one of the said means being also connected with the front bell-crank lever, for simultaneously raising and lowering the adjustable frame at that side of the main frame one of the rear bell-crank levers and the other of the said means being connected with the other bell-crank lever, said means being operable to raise and lower the adjustable frame and tilt the same laterally of the main frame.

4. A road cleaner of the class described, comprising a wheeled frame, an adjustable frame, means carried by the adjustable frame for cleaning a ditch at the side of a road and for discharging the material at a point beyond the main frame, a front bell-crank lever mounted on the main frame and connected with the front of the adjustable frame, a pair of rear bell-crank levers mounted on the main frame at opposite sides thereof and connected with the rear portion of the adjustable frame at the sides of the same, worm shafts located at opposite sides of the main frame, one of the worm shafts being extended to the front of the machine and connected with the front bell-crank lever and with one of the rear bell-crank levers for simultaneously raising and lowering the adjustable frame at that side of the wheeled frame and the other worm shaft being connected with the other rear bell-crank lever, and means for operating the worm shafts for raising and lowering the adjustable frame and for tilting the frame laterally of the main frame.

5. A road cleaner of the class described, comprising a wheeled frame, an adjustable frame, means carried by the adjustable frame for cleaning a ditch at the side of a road and for discharging the material at a point beyond the main frame, a front bell-crank lever mounted on the main frame and connected with the front of the adjustable frame, a pair of rear bell-crank levers mounted on the main frame at opposite sides thereof and connected with the rear portion of the adjustable frame at the sides of the same, worm shafts located at opposite sides of the main frame and connecting with the rear bell-crank levers, one of the worm shafts being extended to the front bell-crank lever and connected with the same for simultaneously raising and lowering the adjustable frame at that side of the main frame, and operating means having worm threads engaging the worms of the said shafts.

6. A road cleaner of the class described, comprising a wheeled frame, an adjustable frame, means carried by the adjustable frame for cleaning a ditch at the side of a road and for discharging the material at a point beyond the main frame, a front bell-crank lever mounted on the main frame and connected with the front of the adjustable frame, a pair of rear bell-crank levers mounted on the main frame at opposite sides thereof and connected with the rear portion of the adjustable frame at the sides of the same, worm shafts mounted on the main frame on opposite sides thereof and connected with the rear bell-crank levers, one of the worm shafts being extended to the front of the frame and having a slidable connection with the front bell-crank lever for simultaneously raising and lowering the adjustable frame at that side of the wheeled frame, a spring mounted on the extended worm shaft and arranged to cushion the same and the front bell-crank lever, and means for operating the worm shafts.

7. A road cleaner including a wheeled frame, an adjustable frame provided with means for cleaning a ditch at the side of a road and for discharging the dirt at a point beyond the wheeled frame, a front bell-crank lever, a pair of rear bell-crank levers, said bell crank levers being mounted on the wheeled frame, links connecting one arm of the bell-crank levers with the adjustable frame, independent sets of worm gearing connected with the other arm of the bell-crank levers for adjusting the same, one of the sets of worm gearing being connected with the front bell-crank lever and with one of the rear bell-crank levers for simultaneously raising and lowering the adjustable frame at that side of the wheeled frame, and means for cushioning the front bell-crank lever and the worm gearing and connected therewith.

8. A road cleaner including a wheeled frame having a front truck provided with an extended king bolt, an adjustable frame slidably connected at its front end with the king bolt, means carried by the frame for cleaning a ditch and for conveying the earth from the ditch to a point beyond the wheeled frame, front and rear bell-crank levers connected with the adjustable frame for raising and lowering the same and for tilting the adjustable frame laterally, and independent operating mechanism for each side of the wheeled frame for swinging the bell-crank levers and for securing the same in their adjustment, one operating mechanism being connected with the front bell crank lever and one of the rear bell-crank levers for raising and lowering the adjustable frame at one side of the wheeled frame.

9. A road cleaner including a wheeled frame having a front truck provided with an extended king bolt, an adjustable frame provided at the front end with a coupling having a swiveled member slidable upwardly and downwardly on the king bolt, an independently operable means located at opposite sides of the wheeled frame connected with an adjustable frame at the center of the front and at opposite sides of the rear portion thereof for raising and lowering the adjustable frame and for tilting the same laterally, the operating means at one side of the machine being connected with the adjustable frame at the front and back thereof for raising and lowering the same simultaneously and the operating mechanism at the other side of the machine being only connected with the rear of the adjustable frame and excavating and conveying means carried by the adjustable frame.

10. A road cleaner including a wheeled frame having a front truck and provided with an extending king bolt, an adjustable frame having a swiveled member slidable upwardly and downwardly on the king bolt, a rod connected with the swiveled member, means connected with the rod for raising and lowering the front of the adjustable frame, means connected with the rear of the adjustable frame for raising and lowering the same, said means being provided at one side of the wheeled frame with the front and back of the adjustable frame for raising and lowering the same simultaneously and at the other side of the wheeled frame with the rear only of the adjustable frame for independent operation, and excavating and conveying means carried by the wheeled frame.

11. A road cleaner including a wheeled frame having a front truck and provided with an extended king bolt, said front truck being also provided with a forwardly extending frame, an adjustable frame slidably and pivotally connected at the front with the king bolt, independently operable means located at opposite sides of the wheeled frame and connected with the adjustable frame for raising and lowering the same and for tilting the same under the adjustable frame laterally, one of the operating means being connected with the adjustable frame at the front and back thereof for raising the same simultaneously and the other operating means being connected with the adjustable frame only at the rear portion thereof for independent operation, and steering means located between the said frame adjusting means and connected with the frame of the front truck.

12. A wheeled frame provided with a rear platform and having a front truck, an adjustable frame, means located at opposite sides of the wheeled frame and connected with the adjustable frame for raising and lowering the same, the operating means at one side of the wheeled frame being connected with the adjustable frame at the front and back thereof and the operating means at the other side of the frame being connected with the adjustable frame only at the rear portion thereof for independent operation, said means having operating devices located adjacent to the platform and centrally arranged steering mechanism having a longitudinal steering shaft provided adjacent to the platform with an operating device and extending to the front portion of the machine, said steering mechanism being connected with the front truck for turning the same.

13. A road cleaner including a wheeled frame, an adjustable frame, means for raising and lowering the same including a worm shaft extending along the wheeled frame at one side thereof, a longitudinal conveyor carried by the adjustable frame and having a front blade, a transverse conveyor also carried by the adjustable frame and having a hinged outer section arranged to swing upwardly and downwardly, an operating

mechanism for raising and lowering the outer section of the transverse conveyor provided with a drum mounted on the worm shaft and having a flexible connection connected with the said hinged section.

14. A road cleaner including a wheeled frame, an adjustable frame, means carried by the wheeled frame for raising and lowering the adjustable frame, a longitudinal conveyor carried by the adjustable frame and having a blade for cleaning a ditch, a transverse conveyor also mounted on the adjustable frame and composed of inner and outer sections, the outer section being hinged, said transverse conveyor having an endless apron extending substantially the entire length of the said sections and composed of upper and lower flights, and a rotary element located at the adjacent ends of the sections for guiding the lower flight of the apron, and curved guides also located at adjacent end of the sections and arranged above the upper flight of the apron for guiding the latter.

15. A road cleaner including a wheeled frame having front and rear wheels, an adjustable frame, means carried by the wheeled frame for raising and lowering the adjustable frame and for tilting the same laterally, a longitudinal conveyor carried by the adjustable frame and having a blade at the front end, a transverse conveyor located at the rear end of the longitudinal conveyor and projecting laterally from the wheeled frame, gearing for transmitting motion from the rear axle to the said conveyors including a longitudinal drive shaft having front and rear substantially horizontal sections journalled respectively on the adjustable frame and the wheeled frame and an intermediate extensible section composed of telescoping sections and connected at its ends by universal joints with the front and rear sections.

In testimony whereof I have hereunto set my hand.

ANDREW C. ANDERSON.