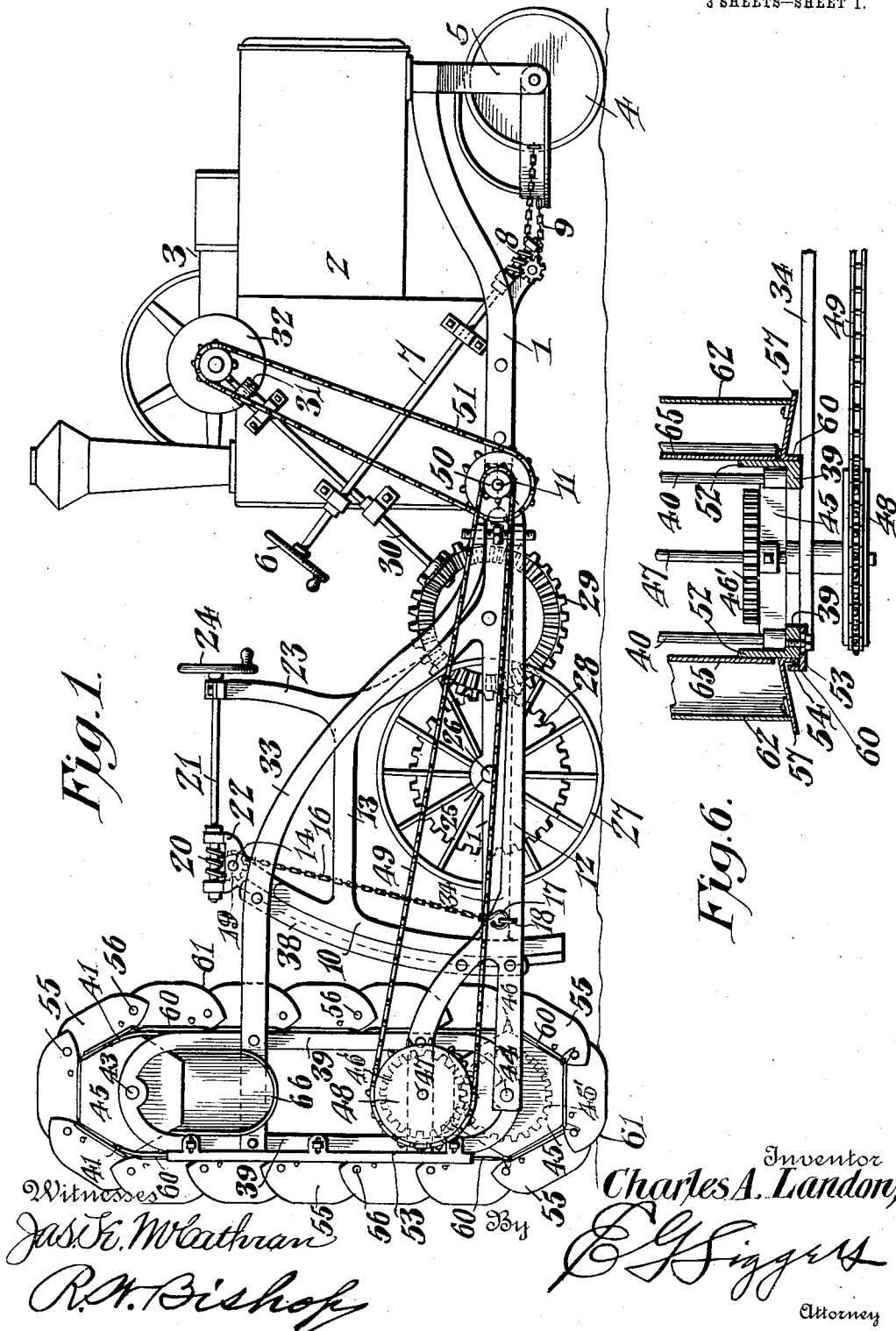


C. A. LANDON.
ROAD GRADER AND ROLLER.
APPLICATION FILED FEB. 17, 1910.

1,017,894.

Patented Feb. 20, 1912.

3 SHEETS—SHEET 1.



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Fig. 3.

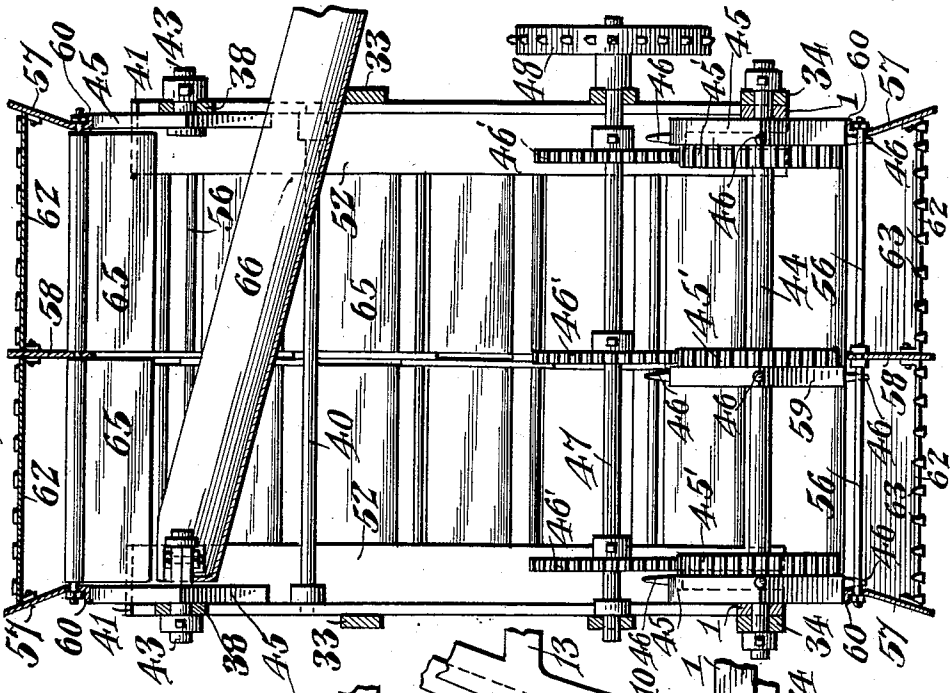
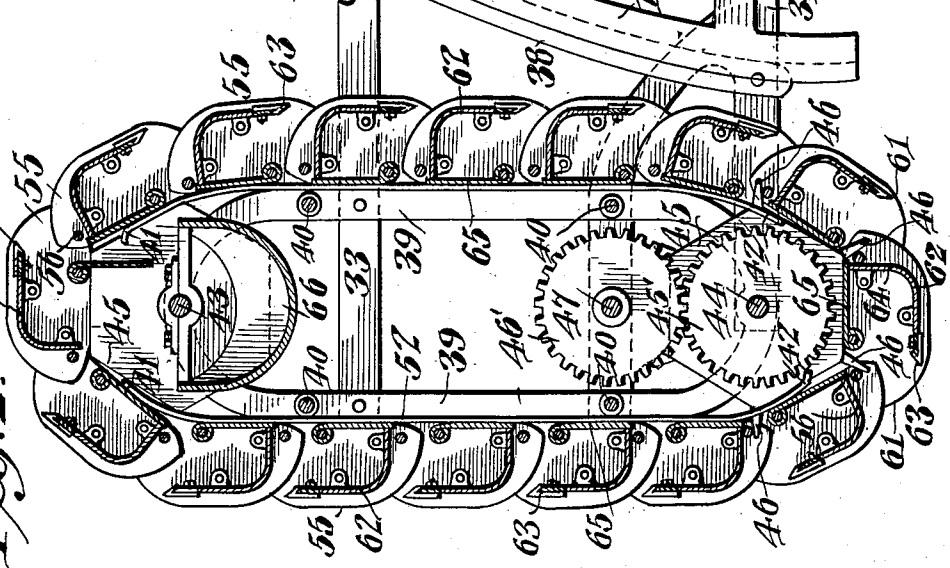


Fig. 2.



Charles A. Landon, Inventor

Witnesses

Jas. E. McEachran
R. W. Bishop

By

E. G. Siggers

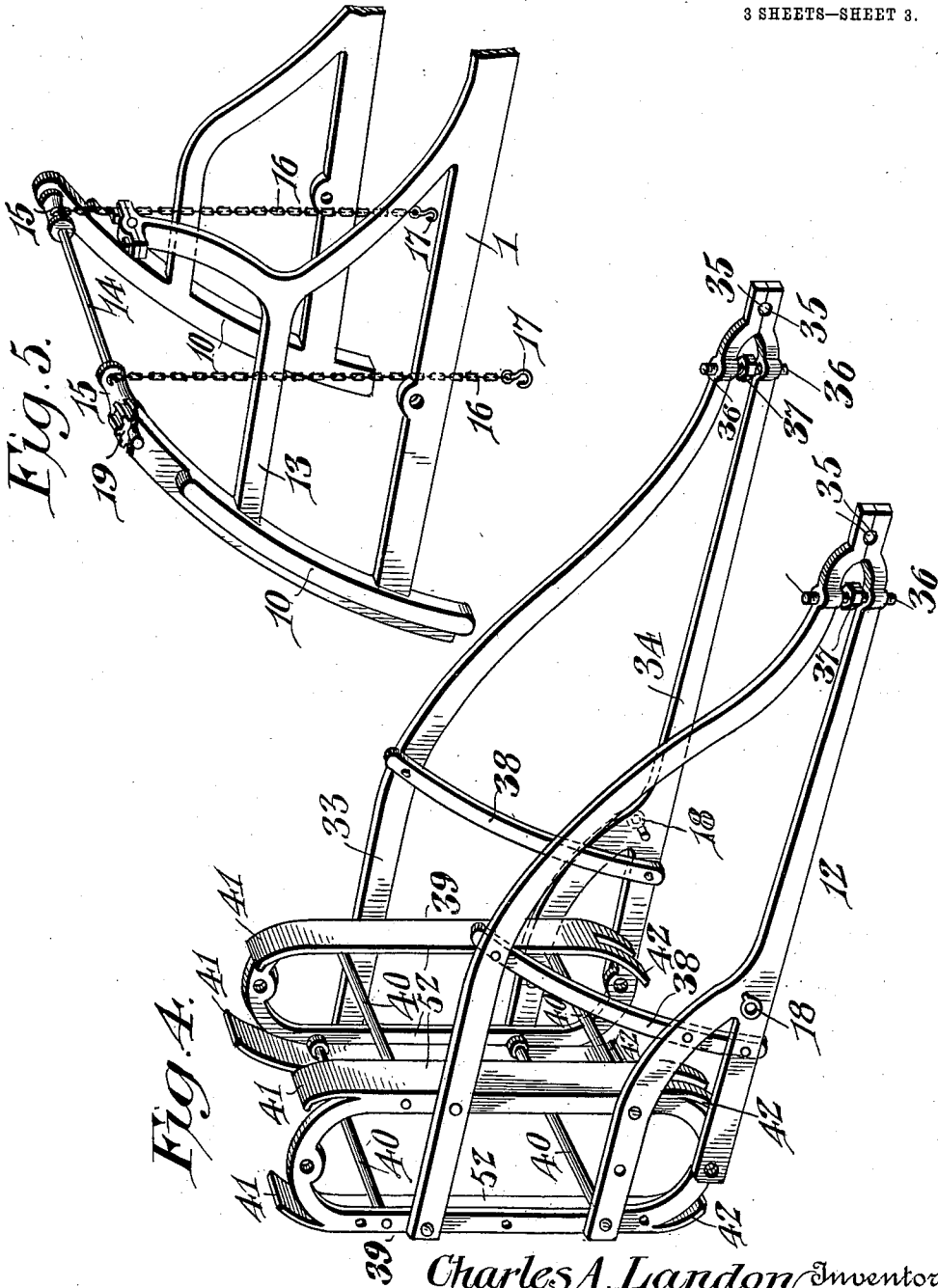
Attorney

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3 SHEETS—SHEET 3.



Charles A. Landon, Inventor

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UNITED STATES PATENT OFFICE.

CHARLES A. LANDON, OF COLUMBUS, OHIO.

ROAD GRADER AND ROLLER.

1,017,894.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed February 17, 1910. Serial No. 544,373.

To all whom it may concern:

Be it known that I, CHARLES A. LANDON, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a new and useful Road Grader and Roller, of which the following is a specification.

My invention relates to road-making machines and the object is to provide a machine by the use of which the roadbed may be simultaneously excavated and brought to the desired grade and rolled as to be provided with the desired smooth surface.

The invention also seeks to improve the construction and operation of road-making machinery and consists in certain novel features of the mechanism illustrated in the accompanying drawings, as will be hereinafter first fully described and then pointed out at length in the appended claims.

In the drawings: Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a vertical longitudinal section through the excavator. Fig. 3 is a transverse section through the excavator. Fig. 4 is a detail perspective view of the supplemental frame. Fig. 5 is a similar view of the guiding end of the main frame. Fig. 6 is a detail horizontal section through a portion of the excavator.

In carrying out my invention, I employ a main frame 1 upon which I secure a boiler 2 connected with an engine 3, all of which may be of any desired construction, an ordinary type of traction engine being suitable for the purpose. A roller 4 is mounted in one end of the main frame by means of a fork 5 pivotally secured in the main frame and this roller constitutes the steering roller, and is therefore placed under the end of the boiler, as clearly shown in Fig. 1. The main frame has its intermediate portion arranged in a plane lower than its ends, as clearly shown in Fig. 1, so as to permit the engineer to readily reach a platform secured to and extending between the side bars of the frame adjacent the end of the boiler, and a hand wheel 6 is provided at the end of the boiler on the upper end of a shaft 7 which is mounted in suitable bearings on the boiler

and connected through a worm gear 8 and chains 9 with the support of the roller 4, whereby the said roller may be turned to any desired angle relative to the longitudinal line of the boiler, in order to guide the machine to one or the other side, as may be necessary. This steering mechanism is of ordinary type and a detailed description of the same is unnecessary in this case. The sides of the main frame are carried some distance beyond the fire-box of the boiler and are provided at their extremities with guides 10 which extend upward and, in the present form of the invention, are shown as curved, the center of the curve being a pin or shaft 11 upon which the supplemental frame 12 is pivoted. The guides 10 are in the form of angle irons integral with the side bars of the main frame and extending above the same, the upper portions of the guides being connected with the side bars of the frame through upper bars or braces 13, whereby the bending or breaking of the guides, under the strain to which they are subjected, will be avoided. In the upper extremities of the guides 10, I journal a windlass or transverse shaft 14 provided at its opposite ends with drums 15 to which chains 16 are attached, the said chains being provided at their lower ends with hooks 17 adapted to engage eyes or rings 18 on the sides of the supplemental frame and thereby serve to support the said supplemental frame in the position to which it may be adjusted. On one end of the shaft or windlass 14, I provide a worm pinion 19 which meshes with a worm 20 on a shaft 21 which is journaled in a suitable bracket 22 secured to the upper end of one of the guides 10. The said shaft 21 extends longitudinally of the frame and is journaled at its end opposite the worm 20 in a suitable bearing on the upper end of an upstanding arm 23 of the main frame and is provided at the said end with a hand wheel 24, by which it may be operated.

The extended portion of the main frame is provided with suitable bearings 25 in which is mounted an axle 26 carrying a pair of rollers 27 between the side bars of the

main frame and connected, through gears 28 and 29, with a driving shaft 30 mounted on the side of the boiler and provided at its upper end with a friction disk 31 adapted to engage a driving friction wheel 32 on the driving shaft of the engine, the said disk being shiftable by any convenient type of mechanism to vary the speed of the engine.

It will be understood that while a single large roller may be employed upon the axle 26, I prefer to use a pair of rollers which will be arranged to travel outside of the line of travel of the roller 4 so that the entire roadbed will be rolled uniformly. In the drawing, only one of the rollers 27 appears for the reason that the other roller lies immediately in line with and is hidden by the roller shown.

The supplemental frame 12 is pivoted at its inner end upon the pin or shaft 11 and consists of upper and lower longitudinal bars 33 and 34, the upper bars being curved downward at their inner ends so as to meet the inner ends of the lower bars and provide clearance to permit the engineer to readily reach the operating platform. The meeting ends of the said bars 33 and 34 are provided with notches 35 in their opposed faces adapted to fit around the pin or shaft 11 and thereby pivot the frame on the said shaft. The bars are held to and around the said pin or shaft so as to work freely thereon but at the same time not slip therefrom by means of a turn-buckle or double screw 36 having its ends engaged in the said bars and provided between the said bars with an adjusting nut or handle 37, whereby when the said nut or handle is rotated, the screw will be caused to draw the bars together or to separate the same, as will be readily understood. These bars 33 and 34 lie close against the sides of the main frame, and the rollers 27 are arranged between the sides of the main frame in order that the frame and the rollers may lie entirely between the sides of the cut made by the excavator carried by the supplemental frame and the machine consequently permitted to travel readily through the cut. To the inner sides of the bars 33 and 34, I secure runners 38 adapted to ride upon the guides 10 of the main frame and lie closely against the same, whereby the supplemental frame will be guided in its movements and an extended bearing will be provided to support the supplemental frame and resist the thrust placed thereon by the excavator when the same is in operation. The particular shape and arrangement of the parts of the supplemental frame also aid in resisting the thrust put upon the same in the operation of the excavator for the reason that the lower bar 34 extends in a straight line from the lower end of the excavator to the pivot or support on the main frame and, consequently, brings the

greatest strength of the supplemental frame directly in line with the point where the greatest strain is placed upon the excavator. To the ends of the bars 33 and 34, I secure the vertically-disposed excavator guides and supports 39 which are connected by transverse rods 40 and have semi-circular upper and lower ends 41, 42, as clearly shown. In the upper and lower ends of the said supports or guides 39, I journal transverse shafts 43 and 44, to the ends of which I secure disks or plates 45 having angular edges adapted to engage and support the excavator buckets and provided at the angles formed on the said edges with outwardly projecting pins 46 adapted to actuate the said buckets, as will be presently described.

Motion is imparted to the lower shaft 44 by means of gear wheels 45' secured thereon and meshing with gear wheels 46' secured upon a countershaft 47 journaled in the supplemental frame 12 above the shaft 44 and having one end projecting laterally beyond the guides 39 and provided with a sprocket wheel 48 which is connected by a chain 49 with a sprocket pinion 50 on the pin or shaft 11. This pin or shaft 11 is set in motion by means of a sprocket chain 51 and suitable sprocket pinions on the said shaft 11 and on the driving shaft of the engine, as will be readily understood. The supports 39 are provided on their front and rear edges with inwardly-extending flanges 52, which serve as guides and supports for the backs or doers of the excavator buckets, and to the outer edges of the front members of the supports 39, I bolt or otherwise secure guide-plates 53 having inwardly-projecting lips 54 which are adapted to be spaced from the flanges 52 and thereby provide a space or groove in which the edges of the excavator buckets may travel.

The excavator consists of an endless chain of buckets 55 hinged together by means of transverse rods 56 inserted through the side plates of adjacent buckets at the overlapping ends of the same, and the side plates 57 of each bucket are flared so that their edges will project beyond the outer sides of the frame or excavator support and, consequently, permit the excavator to cut to a depth up to the shaft 44. The excavator buckets are further provided with central partitions 58 so that the bottoms of the buckets will be braced and buckling of the same prevented and in order to prevent bending and buckling of the rods 56, an intermediate disk 59, similar in all respects to the disk 45, is provided, the projecting pins on these disks engaging the said rods 56 and thereby imparting movement to the chain of buckets in the operation of the apparatus. For the same reason, the gear wheels 45' and 46' are provided at the ends and at the centers of their respective shafts in order that distor-

tion of the shafts may be prevented and the excavator consequently caused to run smoothly and easily. The inner edges of the end plates 57 of the excavator buckets are provided with outturned flanges 60 which engage between the lips 54 and the outer edges of the flanges 52, so as to guide and support the excavator buckets when they are filled and moving upward so as to prevent the spilling of the contents thereof. The end edges of the side plates are slightly curved, as indicated at 61, so that the said end plates will serve as runners when the bucket is in its lowermost position, as will be readily understood on reference to Figs. 1 and 2, and the edges of the end plates project beyond the bottoms 62 of the buckets, so that when large rocks or other obstructions are met by the excavator, the said end plates will engage the same and ride thereover and thereby cause the excavator to swing upward on its pivotal connection with the main frame so that the said obstruction will be passed and will not be struck by the teeth 63 on the front edge of the bottom 62 so as to break the said teeth. The bottom 62 is formed integral with the back, 64, of the bucket so as to form a scoop therewith to take into and lift the earth in the usual manner. A door 65 is pivotally mounted between the end plates 57 and extends across the bucket so as to rest against the flanges 52, as clearly shown in Fig. 6, whereby the dirt taken up by the bucket will be held therein until the bucket has cleared the upper ends of the said flanges, as will be readily understood from Fig. 2, after which the weight of the door will cause the same to drop, as shown in the said figure, and discharge the contents of the bucket into a chute 66 secured to one side of the supports 39 at the upper end of the same, and extending through the opposite open side of the excavator support, so as to convey the said material into a wagon or other receptacle placed at the side of the cut.

It is thought the operation of my improved machine will be readily understood from the foregoing description, taken in connection with the accompanying drawings.

The machine is propelled through the gearing connecting the engine with the driving rollers 27 and is steered by shifting the roller 4, as before explained, and as will be readily understood, and as it travels, motion is imparted to the excavator through the sprocket chains 51 and 49 and the gearing connected therewith, so that the chain of buckets is caused to continuously pass upward on the advance side of the excavator support and over the same, and then down upon the rear side of the said support, taking into the ground and removing the earth as they successively pass under the support. The supplemental frame can be adjusted to

any desired angle by manipulating the hand wheel 24 and thereby acting upon the drums 15, through the worm 20 and pinion 19, so as to wind or unwind the chains 16 on the said drums and, consequently, raise or lower the excavator. Should the excavator strike an unyieldable obstruction, the flexible connection between the supplemental frame and the main frame, presented by the said chains 16, will permit the excavator to rise readily and pass over the obstruction without any damage resulting to any of the parts. The runners 38 moving upon the guides 10, serve to hold the excavator in its proper position relative to the main frame, notwithstanding any vertical movement of the excavator, and also present an extended bearing by which rigidity of the excavator, when at work, will be obtained.

Should it be desired to use the machine merely as a land roller, it is necessary only to disengage the hooks 17 from the rings or eyes 18 and then manipulate the nuts 37, so as to separate the ends of the bars 33 and 34, to clear the pin or shaft 11, after which the supplemental frame may be drawn from its position in engagement with the main frame, leaving the machine ready for operation without the excavator.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. A road grader comprising a self moving road roller having front rolling wheels and a rear rolling and steering wheel, an elongated frame carried by the road roller structure and extending in advance of the front supporting members of the road roller and also extended to the rear of the front rollers of the road roller and there pivoted to the road roller structure, means independent of the road roller for elevating and lowering the frame with relation to the surface to be treated in a direction substantially perpendicular thereto, said means yielding to upward movements of the elongated frame, an endless elevating excavator carried by said frame in advance of the supporting members of the road roller and having a run movable in shearing or stripping relation to the surface to be graded and of a width sub-

stantially the same as the road engaging portions of the road roller, and means for actuating the excavator at relatively different speeds with respect to the speed of travel of the road roller.

2. A road grader comprising a self moving road roller, an elongated frame pivoted to the road roller and extending in advance of the supporting members of the road roller, the pivot connections being readily separable for detaching the frame as a whole from the road roller, means for adjusting the forward end of the frame toward and from the base line of the roller in a direction substantially perpendicular thereto, and an endless elevating excavator carried by the frame in advance of the supporting members of the road roller, said excavator and the road roller being of substantially the same width, and the excavator having a run movable into shearing or stripping relation to the surface to be graded and provided with means for the actuation of the excavator at relatively different speeds with respect to the speed of travel of the road roller.

3. A self propelling and self sustaining road-rolling machine provided with a frame extending in advance of the supporting members of the road-rolling machine and there formed with upright curved guides, and an excavator having its active portions wholly in advance of the supporting members of the road-rolling machine and provided with a carrying frame exterior and pivoted to the frame of the road-rolling machine to turn on a horizontal axis central to the guides carried by the frame of the road-rolling machine, said excavator frame being provided with parts movable on the guides in co-active relation thereto.

4. A road-rolling machine provided with a supporting frame, front and rear rollers constituting supports for the frame and journaled within the confines of the frame, said frame extending beyond the front supporting rollers and there formed with upright curved guides, another frame having side members in embracing relation to the first named frame and at the rear end pivotally connected thereto at the center of curvature of the curved guides of the first named frame, said second frame having guide members co-acting with the first named guide members, and excavator mechanism carried by the second frame and of a width substantially that embraced by the supporting rollers of the road-rolling machine, and power means carried by the road-rolling machine for actuating the latter and the excavator.

5. A road-rolling machine provided with a supporting frame, front and rear rollers constituting supports for the frame and journaled within the confines of the frame, said

frame extending beyond the front supporting rollers and there formed with upright curved guides, another frame having side members in embracing relation to the first named frame, and at the rear end pivotally connected thereto at the center of curvature of the curved guides of the first named frame, said second frame having guide members coacting with the first named guide members, and an endless elevating excavator carried by the second frame and of a width substantially that embraced by the supporting rollers of the road-rolling machine, and power means carried by the road-rolling machine for actuating the latter and the excavator.

6. A self sustaining road rolling machine provided with a frame extending beyond the front supports of the machine, and an elevating excavator provided with a carrying frame in embracing relation to the front end of the frame of the road rolling machine and pivotally carried by the frame of the road rolling machine, the frame of the road rolling machine being provided where embraced by the excavator carrying frame with guides, and the said carrying frame being provided with members coacting with the guides, the said guides and mating portions being curved about the axis of the pivot connections between the two frames.

7. A self propelled road rolling machine having a framework extending in front of the front supporting rollers thereof and there formed into substantially upright curved guides, and an excavator provided with a supporting frame having curved guide members in substantially embracing relation to the guides on the forwardly extending framework of the road rolling machine, and pivot supports on the main frame carrying corresponding portions of the excavator frame located at the center of curvature of the guides.

8. In a machine of the character described, a supporting vehicle provided with a main frame having at one end curved guides erected thereon, a supplemental frame carried by the main frame and having a pair of longitudinal bars on each side of the main frame and provided with guide members adapted to the curved guides of the main frame, pivot supports on the main frame for the supplemental frame at the center of curvature of the guides, an excavator carried by the supplemental frame and comprising an endless series of buckets, and guides or supports on the supplemental frame for the excavator buckets, said guides or supports being discontinuous at the upper and lower portions.

9. The combination of a main frame having upstanding guides at one end, a supplemental frame pivoted to the sides of the main frame substantially in line with the

lower end of the said upstanding guides, the
said supplemental frame engaging the
said guides, vertically-disposed supporting
guides secured to the end of the supplemen-
5 tal frame, and an excavator mounted on the
said supporting guides.

In testimony that I claim the foregoing as

my own, I have hereto affixed my signature
in the presence of two witnesses.

CHARLES A. LANDON.

Witnesses:

JOHN H. SIGGERS,

R. W. BISHOP.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."