

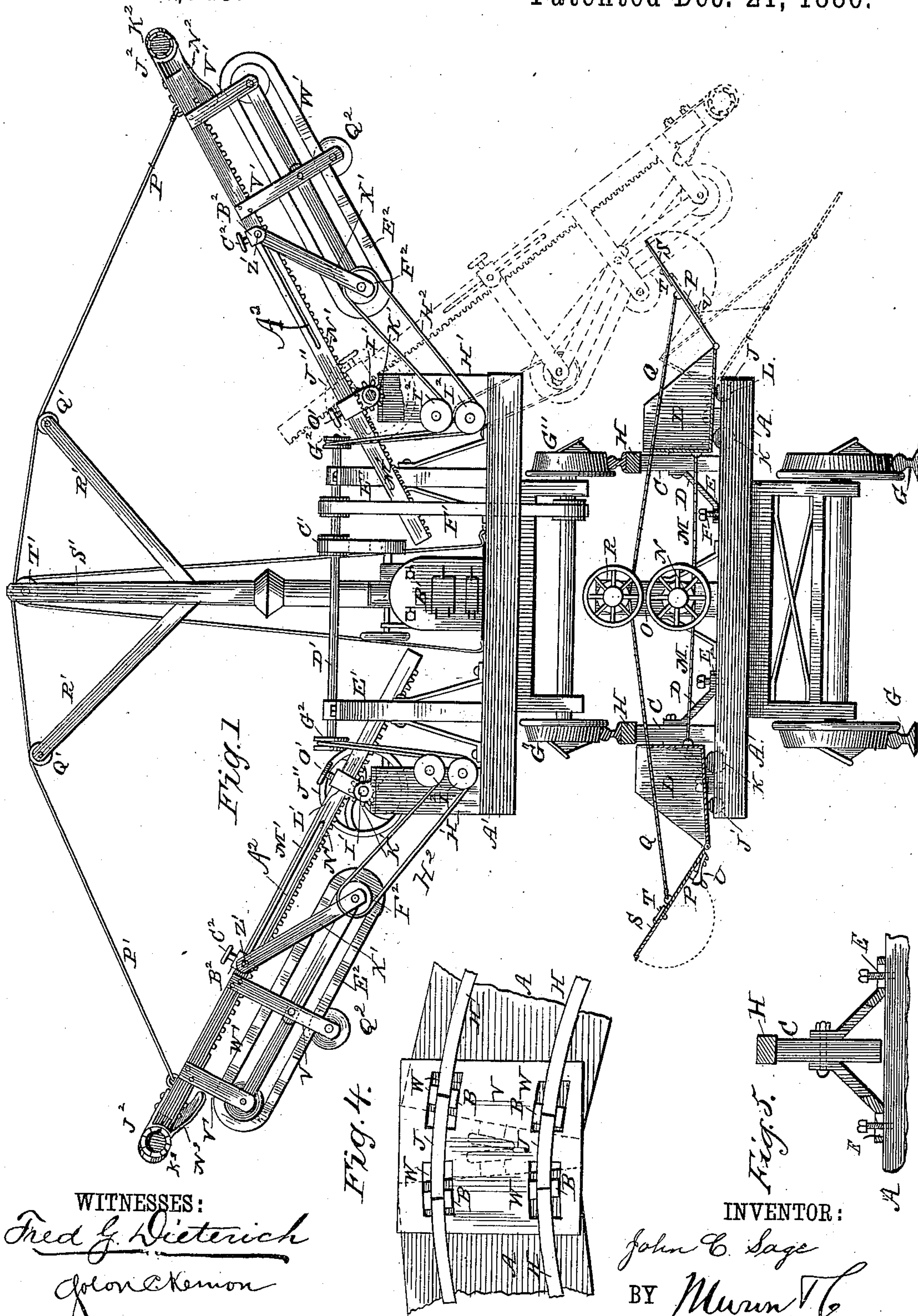
(No Model.)

2 Sheets—Sheet 1.

J. C. SAGE.  
GRADING MACHINE.

No. 354,745.

Patented Dec. 21, 1886.



WITNESSES:  
*Fred G. Dieterich*  
*John A. Kemmer*

INVENTOR:  
*John C. Sage*  
BY *Murphy*  
ATTORNEYS.



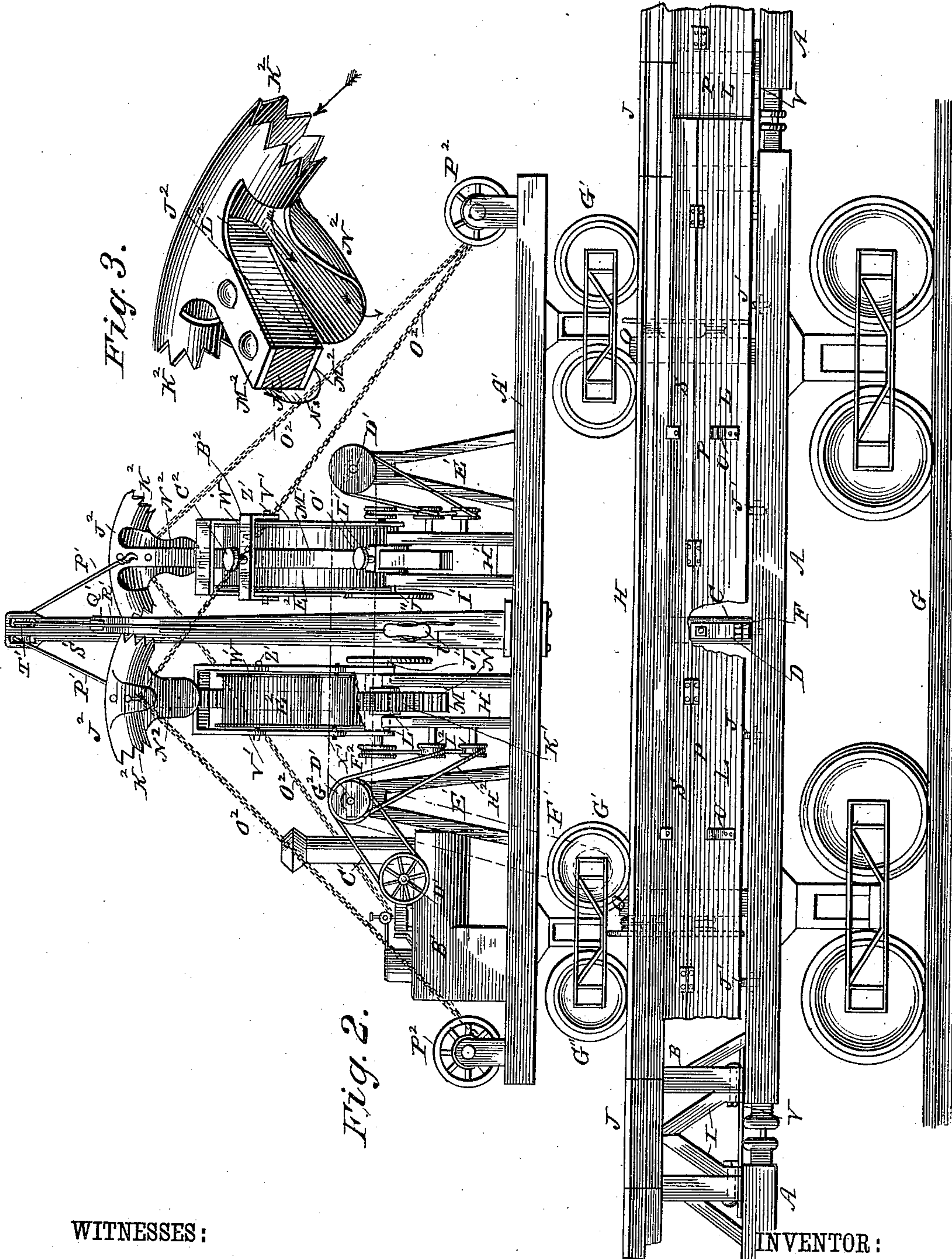
(No Model.)

2 Sheets—Sheet 2.

J. C. SAGE.  
GRADING MACHINE.

No. 354,745.

Patented Dec. 21, 1886.



WITNESSES:

*Fred G. Dieterich*  
*John E. Hemon*

INVENTOR:

*John C. Sage*  
BY *Munn & Co*  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

JOHN C. SAGE, OF GAINESVILLE, GEORGIA.

## GRADING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 354,745, dated December 21, 1886.

Application filed March 23, 1886. Serial No. 196,255. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN C. SAGE, a citizen of the United States, residing at Gainesville, in the county of Hall and State of Georgia, have invented certain new and useful Improvements in Grading-Machines, of which the following is a description.

My invention consists in the improved construction, arrangement, and combination of parts of a grading-machine, which is especially designed for use in widening the sides of cuts through which a line of railway passes, as will be hereinafter fully described, and pointed out in the claims.

Referring to the annexed drawings, Figure 1 is an end view, partly in section, of my improved grading-machine. Fig. 2 is a side elevation of the same. Fig. 3 is a perspective detail view of one of the double scoops. Fig. 4 is a top view of the adjacent ends of two cars as they appear when standing on a curve in the main track; and Fig. 5 is a detail sectional view of post and rail.

The same letters of reference indicate corresponding parts in all the figures.

Referring to the several parts by letter, A A represent the cars which support the dirt-receptacles and the tracks on which the grading-machine proper runs, the said cars being flat platform-cars, on which are rigidly braced and supported the end posts, B, which support the ends of the rails H, the central portions of these rails being supported by the movable posts C C, the lower ends of the braces D of which are provided with the longitudinal slots E, through which the retaining-screws F project down into the platform of the car. It will be seen that by this arrangement, when the lower cars, A, are standing on a curve in the track G, on which they run, the rails H may be curved in the arc of a circle to conform to the curvature of the main rails G, and secured by the retaining-screws F in their adjusted curved positions, as will be readily understood.

In order to make the rails H continuous, braces I are placed between the end posts at the adjacent ends of the cars, and on these braces are supported short lengths of rail J, the outer length on a curve being of course longer than the inner length, as clearly shown in Fig. 4 of the drawings.

In the upper surface of each side of each car A are journaled, outside of the posts B C, the inner series of rollers, K, and the outer series of rollers, J', the outer series being of less diameter than the inner series, the object of this arrangement being to incline forward the bottoms of the dirt-receptacles L, which rest upon these rollers, as shown clearly in Fig. 1 of the drawings. These dirt-receptacles L are connected by chains or ropes M to the lower windlasses, N, supported by posts O, secured centrally upon the platforms of the cars, and are provided with the outer hinged doors, P, which are connected by chains or ropes Q to an upper series of windlasses, R, supported by the central posts, O. These hinged doors are provided with the hinged folding outer portions, S, which are held in their extended positions by the catches T, but which may be folded in and held in their folded positions by the spring-catches U on the outer sides of the doors. The chief object of this construction of the doors is that when the beam is swung down into its lowest position the outer portion, S, of said doors may be folded in out of the way of the beam, as also shown in dotted lines, Fig. 1. The ends of these boxes or dirt-receptacles extend to the ends of the platforms of the cars; but the ends of their hinged doors extend beyond the ends of the platforms and overlap, so as to prevent any dirt from falling through between them, and beneath these overlapping ends are arranged the metal plates V, having the longitudinal slots W, through which the end posts, B, of two adjacent cars extend, the said plates serving to still further prevent any dirt from falling to the ground between the cars.

A' represents the flat platform-car which carries the ditching mechanism. Near one end of the platform of this car is mounted an engine, B', of suitable construction, which is connected by belting C' with two transverse shafts, D' D', which are supported in suitable bearings, E', on the platform of the car, one or both of these shafts being connected by belting F' with the drive-wheel G' of the car, so that the car is driven by the engine B', which operates the conveyer-belts.

H' H' indicate vertical bearing-posts at each side of the platform, which support at their



upper ends the transverse adjusting-shafts I', having the hand-wheels J'' and the central pinions, K', and on these shafts are also pivoted the lower ends of brackets L', in which slide the inner portions of the beams M', the outer ends of which project to each side of the car, and the beams being provided on their lower sides with the racks N', which mesh with the pinions K' on the adjusting-shafts, and it will be seen that the said beams may be adjusted laterally in these brackets, and they are secured in their adjusted positions by means of set-screws O', working in the upper sides of the brackets.

To the outer end of each beam is secured one end of an adjusting chain or rope, P', the said ropes passing over grooved pulleys Q' in the upper ends of the upwardly-inclined arms R' of the mast S', which is located in the center of the platform, and then over the two pulleys T', journaled in the top of the mast and having their ends wound around cleats U' on the sides of the mast. It will be seen that by means of these ropes the outer ends of the beams may be raised or lowered, as desired. The outer portion of each beam is provided with the downwardly-projecting arms V', which support the stationary portion W' of the conveyer-belt frame and also the pivoted outer end of the adjustable portion of the said frame, the inner end of this pivoted portion being adjustably supported by the lower ends of arms X', the upper ends of which are journaled upon the ends of a transverse shaft, Z', which slides in a longitudinal slot, A<sup>2</sup>, in the central portion of the beam, and to which are secured the ends of a bracket, B<sup>2</sup>, having the set-screw C<sup>2</sup>, by means of which the bracket may be secured in its adjusted position. Around the rollers in the ends of the conveyer-belt frames travel the flanged conveyer-belts E<sup>2</sup>, the extended end of the roller at the inner end of the conveyer-frame being provided with a grooved roller, F<sup>2</sup>, and the ends of the transverse shafts D' are provided with grooved rollers G<sup>2</sup>, and a cable, H<sup>2</sup>, round in cross-section, passes around these end rollers under two grooved guide-rollers, I<sup>2</sup>, journaled to the side of the uprights H' H', and around the grooved rollers F<sup>2</sup>, by which arrangement the conveyer-belts are rotated by the engine B'.

To the outer end of each beam is secured a double-scoop, J<sup>2</sup>, which is formed with the mouths K<sup>2</sup>, extending in opposite directions, and preferably having their cutting-edges serrated, as shown, to increase their cutting power, the scoop being further formed with the central partition, L<sup>2</sup>, the inwardly-projecting lips M<sup>2</sup>, by means of which the scoop is secured to the end of the beam, and the curved inwardly-projecting discharge-flanges N<sup>2</sup>, which receive the dirt from both mouths of the scoop and discharge it upon the flanged conveyer-belt. The scoops are connected to each end of the car by the chains O<sup>2</sup>, the outer ends of which pass around the windlasses P<sup>2</sup> at each end of the car, and by this arrange-

ment the scoops may be always held firmly to their work against any strain.

The scoops J<sup>2</sup> are moved outward and forced against the banks, right and left from the track, by means of the racks, &c., already described. In other words, their curved or convex outer sides (see Fig. 3) are thus caused to strike the earth, and as the grader moves along over the train of platform-cars (which are chained to the track and thus held immovable) the mouths of the scoops, which open in the direction the grader is moving, will necessarily take into and receive the dirt lying in their path. The dirt thus cut by the scoops falls upon the conveyer-belts, which are driven by the engine, as described, and the dirt is conveyed to and falls over the inner end of the belts into the dirt-receptacles, and also upon the slotted plates at the adjacent ends of the cars, which prevent it from falling to the ground between the cars, the overlapping ends of the hinged doors of the dirt receptacles also assisting to prevent the dirt from falling between the cars upon the ground. As the outer ends of the beams are lowered toward their lowermost point, as shown in dotted lines in Fig. 1 of the drawings, the brackets B<sup>2</sup> are slid toward the inner end of the slots A<sup>2</sup>, so as to swing the hinged portions of the conveyer-belt frames at an angle to the stationary portions thereof, for the purpose of keeping the inner discharge ends of the said belts over the dirt-receptacles. The lower ends of the arms V' project down below the lower portion of the conveyer-belts, and have journaled in them a roller, Q<sup>2</sup>, which supports the lower portion of the conveyer-belts at the proper angle when the inner portion of the conveyer-frame is adjusted as above described. When it is desired to discharge the dirt from the dirt-receptacles, the upper and lower windlasses, R N, are turned so as to loosen the chains or ropes M Q, when the weight of the receptacles will cause them to slide out on the rollers K and J into the position shown in dotted lines in Fig. 1 of the drawings, thereby discharging the dirt.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with each lower platform-car, of the end rail-supporting posts immovably braced upon the said car, and the laterally-adjustable middle rail-supporting posts, having the lower ends of their braces slotted longitudinally for the reception of the retaining-screws, as described.

2. The combination, with the lower rail-supporting cars having the central posts provided each with an upper and lower windlass, of the inner series of larger and outer series of smaller rollers journaled in the upper side of the platform of the said cars, as described, the movable dirt-receptacles extending the entire length of each side of the car and connected to the lower windlasses by chains or ropes, and having the hinged outer doors provided with



the folding outer portions and connected by chains or ropes to the upper windlasses, the said doors extending beyond the ends of the boxes, so as to overlap one another at their ends, as described, and the slotted plates covering and connecting the adjacent ends of the cars, as described, substantially as set forth.

3. The combination, with the lower platform-cars and rails supported thereon, of the posts located at the ends of the cars, braces arranged between the posts, and rail-sections supported on said braces, all as shown and described.

4. The combination, with the engine, of the transverse shafts driven through suitable belting from the same and having the grooved end pulleys of the vertically and laterally adjustable beams carrying at their outer ends the double scoops having the central partition and the inward discharge-flange, and the flanged conveyer-aprons supported beneath the said adjustable beams, as described, and driven by belting from the grooved end rollers of the transverse shafts, substantially as set forth.

5. The combination of the side supports having at their upper ends the transverse shafts provided with the adjusting hand-wheels and the central pinions, the brackets pivoted at their downward ends upon the said adjusting-shafts and having the set-screws in their upper sides, the beams sliding in the said brackets and provided on their lower sides with the racks and carrying at their outer ends the double scoops having the central partitions and the inward discharge-flange, and the supporting-chains secured to the rollers of the central mast and adjustably secured at their free ends to the sides of the said mast, substantially as described.

6. The combination of the vertically-adjust-

able beams having the longitudinal central slots, the conveyer-belt frames consisting of the stationary outer portion supported in downwardly-projecting arms on the said beams, and the inner pivoted section adjustably supported by the pivoted arms, the sliding bracket having the retaining-screw, to which the upper ends of these arms are pivoted, and the flanged conveyer-belts, and means, substantially as described, for rotating the same.

7. The herein-described double scoops having the serrated mouths or cutting-edges, the inwardly-projecting perforated lips, the central partition, and the curved discharge-flange, substantially as set forth.

8. The combination of the vertically and laterally adjustable beams having the double scoops at the outer ends, the conveyer-belt frames having the adjustable inner ends, the flanged conveyer-belts traveling around the said frames, and means, substantially as described, for rotating the same, the lower platform-cars having the series of larger and smaller rollers journaled in their upper surface, as described, and the movable dirt-receptacles having the hinged doors provided with the folding outer portions, and the chains connecting the body of the receptacles and the hinged doors, respectively, to the upper and lower windlasses supported on the platforms of the cars, all constructed and arranged to operate in the manner and for the purpose shown and set forth.

The above specification of my invention signed by me in the presence of two subscribing witnesses.

JOHN C. SAGE.

Witnesses:

SOLON C. KEMON,  
CHAS. A. PETTIT.