

(No Model.)

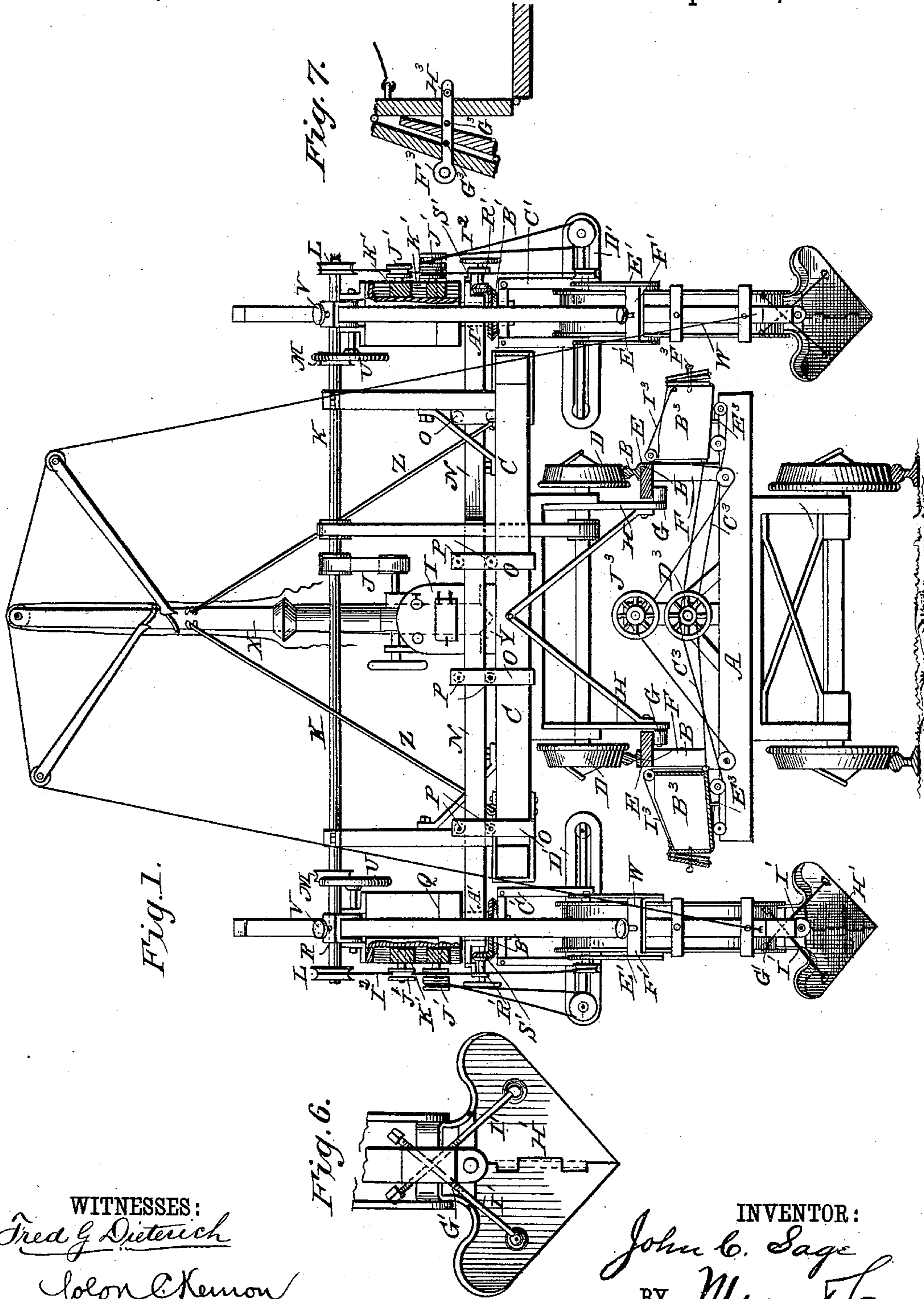
2 Sheets—Sheet 1.

J. C. SAGE.

SLOPE GRADER AND DITCHING MACHINE.

No. 370,089.

Patented Sept. 20, 1887.



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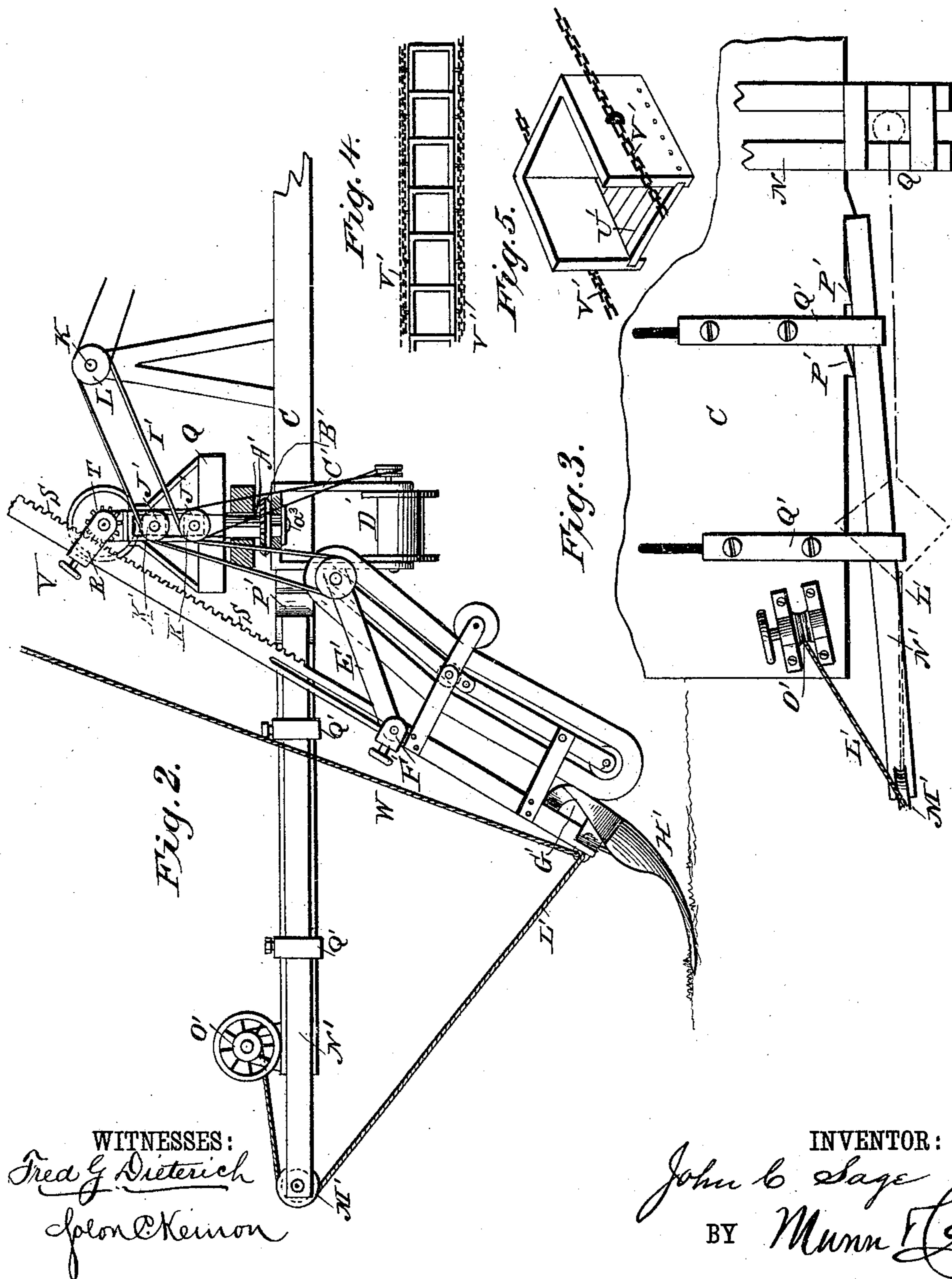
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UNITED STATES PATENT OFFICE.

JOHN C. SAGE, OF GAINESVILLE, GEORGIA.

SLOPE-GRADER AND DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 370,089, dated September 20, 1887.

Application filed October 29, 1886. Serial No. 217,526. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. SAGE, of Gainesville, in the county of Hall and State of Georgia, have invented a new and useful Improvement in Slope-Grader and Ditching-Machine, of which the following is a specification.

My invention consists in an improved ditching-machine, which comprises new and useful improvements on the invention for which Letters Patent were granted to me, the same being numbered 354,745.

My improved ditching-machine will be hereinafter fully described and claimed.

Referring to the accompanying drawings, Figure 1 is an end elevation of my improved ditching and slope-grading machine. Fig. 2 is a detail side view of the same. Fig. 3 is a detail plan view of same. Figs. 4 and 5 are views of a portion of the carrier-belts. Fig. 6 is a detail view of one of the shovels, and Fig. 7 is a detail view of a portion of the dirt-receptacle.

Referring to the several parts by letters, A indicates the truck or platform car, which carries the rails B B, on which the ditching-machine proper runs.

C represents the body proper of the ditching-machine, consisting of an ordinary platform-car, the flanged wheels D of which run on the rails B, and the beams E, which support these rails on top of the posts F, are wider than the flange of the rails and extend on the inner side of the same, as shown, and beneath the inner portions of these beams fit the friction-rollers G on the lower ends of the braced downwardly-extending hangers or arms H. This arrangement braces the ditching-machine on the rails B, as will be seen.

I indicates a suitable engine on the body C, which, through a belt, J, rotates the drive-shaft K, which carries at each end two grooved pulleys, L M, which are adjustably keyed on the drive-shaft to permit of their being adjusted laterally on the said shaft, for the purpose hereinafter set forth. This shaft is also connected by a belt with a pulley on one of the axles of the ditching-machine, the engine thus propelling the machine along the tracks B. Across the platform or body of the ditching-machine extend the parallel bars N, which are

held adjustably in position by the clips O, having the small friction-rollers P, between which the said bars pass. On the outer ends of each pair of parallel bars rests a supporting-frame, Q, each of the said frames having on its top a pivoted stirrup, R, through which one of the shovel-beams passes, the lower edges of the said beams having the teeth or racks S, engaging with the pinions T, which are rotated by the hand-wheels U to raise or lower the shovel-beams, which are held in their adjusted positions by the stops V, these several parts being of the same construction as the corresponding parts in my previous invention heretofore referred to.

Near lower end of each shovel-beam is secured the lower end of a hoisting-rope, W, these ropes passing over the grooved pulleys in the detachable arms of the removable mast X and similar pulleys in the top of the mast, the lower end of the mast being stepped in a seat, Y, when the braces Z hold the mast securely in its operative position, while by removing them the mast may be taken down, when desired, and packed, with its detachable arms, on the car, and by means of these ropes W the lower ends of the shovel-beams and the shovels may be swung up out of the way when required.

The lower portion of each frame Q has a vertical shaft, A', which extends down between the outer ends of the parallel bars N and has rigidly secured on it, immediately below the said bars, the bevel-wheel B', while immediately below the said bevel-wheel the lower end of the shaft A' is squared and secured, by means of the screw a', in the upper part of a frame, C', around the rollers, journaled in the lower part of which revolves one of the horizontal auxiliary conveyer-belts D', which discharge the earth into the boxes or receptacles on the lower truck, A, which will be hereinafter described. Beneath the lower portion of the shovel-beams are secured the frames around which the main conveyer-belts pass, the upper portion of these frames being hinged to permit of their upper ends being adjusted (by means of the pivoted connecting-bars E' and the stirrups F', having the set-screws and sliding on the slotted portions of the shovel-bars,)

so that the said ends will always extend over the auxiliary horizontal conveyer-belts, as shown and described in my Letters Patent hereinbefore referred to.

5 The shovels, which are secured, as shown, to the lower ends of the shovel-beams, consist each of an upper part, G', having the upward extensions, whereby it is bolted to the end of the shovel-beam, the upper end of this part, 10 the sides of which are curved up to prevent the earth from falling off until it reaches this end, being open to discharge the earth into the cups of the conveyer-belt, and the lower or operative blade portion, H', consisting of 15 the two halves hinged together at their inner edges, having the raised upper edges to guide the earth out from the ditch up through the upper part G', and having swiveled near their outer upper edges the lower ends of adjusting- 20 rods I', which are formed with an exterior screw-thread and pass through threaded apertures in the lower ends of the shovel-beams, as shown, the upper ends of these threaded adjusting-rods being squared to adapt the rods 25 to be turned by means of an ordinary wrench; and by this means the two sections of the shovels may be drawn nearer together or spread farther apart, or one-half of a shovel may be raised at a greater angle than the other, 30 as the halves of each shovel are separately adjustable.

The drive shaft K is rotated, as described, by the engine I, and endless belts I² pass around the grooved pulleys on its ends and over pulleys J', journaled in movable boxes K' in one 35 side of the frames Q, and then around the grooved pulleys secured on one end of the upper rollers around which the main conveyer-belts pass, the boxes K' moving sufficiently to 40 give to the movement of the belts when the machine is being adjusted or in operation.

As before described, the bars N, which support the frames carrying the shovel-beams and conveyer-belts, can be moved out or in, according to the points where the shovels are to 45 work, the pulleys on the drive-shaft being adjusted at the same time. To the lower ends of the shovel-beams are secured the lower ends of the draft-chains L', which pass up over 50 grooved pulleys M' in the outer ends of adjustable bars N', which I shall term the "draft-bars," and are secured at their upper ends around windlasses O', by means of which the draft-chains are kept at the proper tension. 55 These bars N', the inner ends of which engage the stops P' when the bars are adjusted to hold them in their adjusted positions, are inclined outwardly, as shown, and slide in the stirrups Q', the object of thus inclining these 60 bars being to keep their outer ends over the pulleys in which the draft-chains pass always directly in front of and in line with the lower ends of the shovel-beams when the said beams are moved out or in, as described.

65 At the outer end of one of each pair of bars N is journaled a short shaft, R', having at its outer end a hand-wheel and at its inner end

a bevel-pinion, S', these pinions meshing with the bevel-wheels B', and it will be seen by rotating the pinions that the frames Q, and thus 70 the shovel-beams, shovel, and main and auxiliary conveyer-belts, can be swung around in a half-circle to enable the ditching-machine to work in the opposite direction, the belts I² being disengaged from the outer pulleys, L, of the 75 drive-shaft and passed around the inner end pulleys, M, the draft-chains being of course changed to that end of the car.

Although any suitable form of conveyer-belts can be used, I prefer to use that construction illustrated in the accompanying drawings, 80 consisting of the boxes having the three sides, in the lower grooved ends of which are driven the bottom boards, U', secured in place by screws, the boxes being connected together by 85 the chains V', so that the back of each box forms the front or fourth side of the one behind it. The boxes or dirt-receptacles B³ are substantially similar in construction to those of my Letters Patent hereinbefore referred to, 90 with the exception of their hinged doors, the boxes being operated by the ropes C³, passing around the lower windlass, D³, while stops E³ limit their outward motion. The doors of these boxes consist of three sections, the lower 95 or inner section, which is hinged at its lower edge to the outer edge of the bottom of the box, the middle section, and the outer section, each section having a central aperture, which apertures register with each other when the 100 sections are folded together. An eyebolt, F³, having transverse apertures G³, passes through these apertures, and pins H³ are inserted through this bolt between the folded doors to prevent them coming in direct contact when 105 folded and to hold them in their folded positions. The doors are held up in their closed positions by the ropes I³, wound around the upper windlass, J³, and when the doors are to be swung open and their central sections un- 110 folded the pins are removed from the inner ends of the eyebolts F³ and the outer ends of the ropes I³ hooked in the eyes of the bolts, thus holding the central sections up level with the inner sections, and in the same way the 115 outer sections are unfolded and held up by the ropes, as shown in the drawings.

By unscrewing the screws from the lower ends of the shafts A' the auxiliary conveyer-belts can be removed and packed on the up- 120 per car, and the bars N pushed in to carry the frames Q on the car, and the shovel-beams and main conveyer-belts swung up and packed on the car, the mast and its detachable arms being also packed thereon, thus securely and 125 compactly stowing the whole machine for transportation.

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

1. The combination, with the lower truck 130 having the outer and inner rollers arranged as described, of the boxes or receptacles having the folding doors, consisting of the three

hinged sections having the registering apertures, the eyebolt having the transverse apertures and the pins fitting in the said apertures, the lower and upper windlasses, and
5 the operating-cords, arranged as set forth.

2. The combination, with the upper truck having the parallel transverse bars, of the frames adjustably supporting the upper ends of the shovel-beams and having the vertical
10 shafts carrying the bevel-wheels, the frames secured to the lower ends of the said shafts and carrying the auxiliary conveyer-belts, the adjustable beams carrying the shovels at their lower ends and supporting the main conveyer-
15 belts, and the short shafts having the bevel-pinions at their inner ends meshing with the said bevel-wheels, and having the hand-wheels at their outer ends, substantially as set forth.

3. The combination, with the transverse
20 adjustable parallel bars, of the frames adjustably supporting the upper ends of the shovel-beams and having the vertical shafts carrying the bevel-wheels, the frames secured to the lower ends of the said shafts and carrying the
25 auxiliary conveyer-belts, the adjustable beams having the shovels at their lower ends and supporting the main conveyer-belts, the short shafts having the bevel-pinions at their inner ends and the hand-wheels at their outer ends,
30 the draft-chains, and the inclined adjustable draft-beams, all constructed and arranged substantially as and for the purpose set forth.

4. The herein-described adjustable shovel,
35 the upwardly-bent sides and the upward

extensions, the adjustable lower part composed of the two halves or sections hinged together at their inner edges, and the threaded adjusting-rods swiveled at their lower ends to
40 the said sections, passing through threaded apertures in the lower end of the short beam, and having the squared upper ends, as set forth.

5. The combination, with the upper truck having the transverse adjustable parallel bars
45 and carrying the engine which propels it, of the drive-shaft operated by the said engine and having the adjustable grooved rollers, the frames adjustably supporting the upper ends of the shovel-beams and having the vertical
50 shafts carrying the bevel-wheels and having secured at their lower ends the frames which carry the auxiliary conveyer-belts, the single and double pulleys journaled in movable boxes in the said frames, the adjustable shovel-beams
55 carrying at their lower ends the adjustable shovels and supporting the main conveyer-belts, the connecting-belts, the short shafts having the bevel-pinions at their inner ends and the hand-wheels at their outer ends, the
60 inclined adjustable draft-beams having the pulleys in their outer ends, and the draft-chains and their windlasses, substantially as set forth.

The above specification of my invention signed by me in the presence of two subscrib-
65 ing witnesses.

JNO. C. SAGE.

Witnesses:

SOLON C. KEMON,
CHAS. A. PETTIT.