

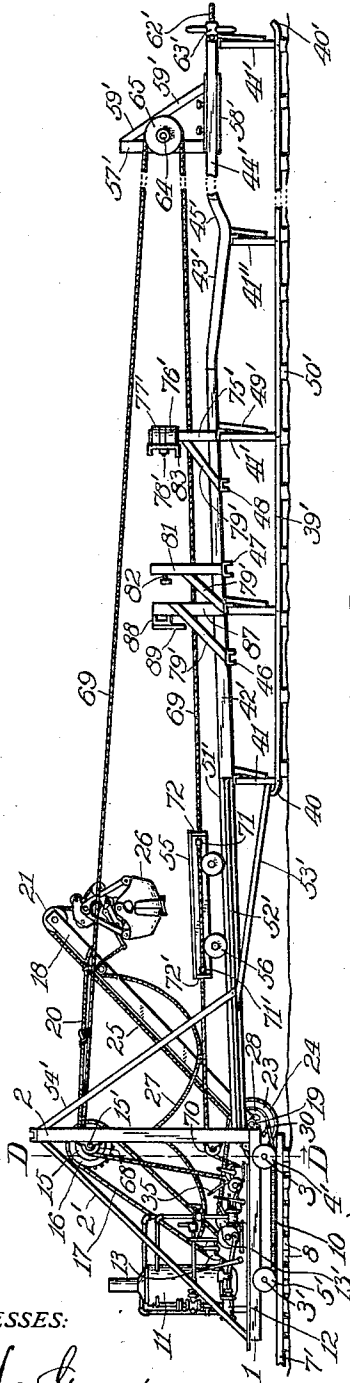
J. L. POTTER.
EXCAVATING AND CONVEYING APPARATUS.
APPLICATION FILED AUG. 13, 1910.

1,018,359.

Patented Feb. 20, 1912.

5 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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Fig. 2.

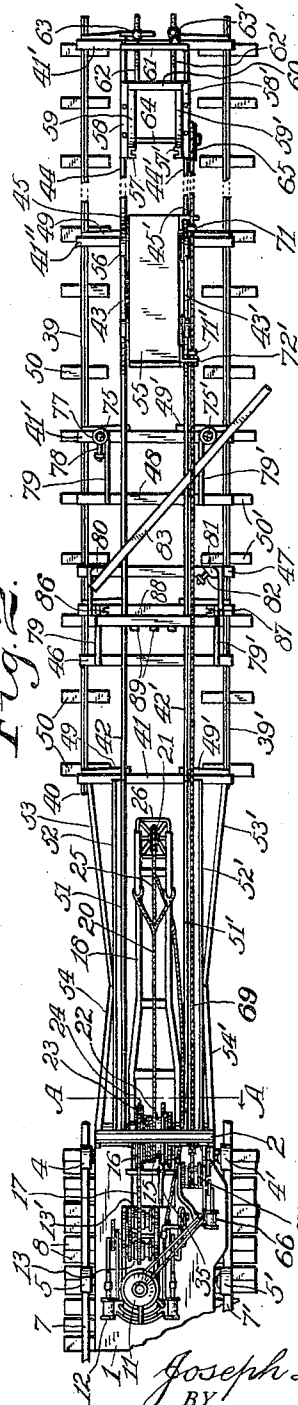
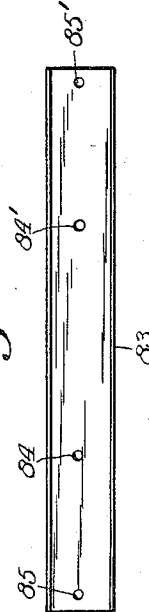


Fig. 3.

Fig. 4.



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5 SHEETS—SHEET 2.

Fig. 6.

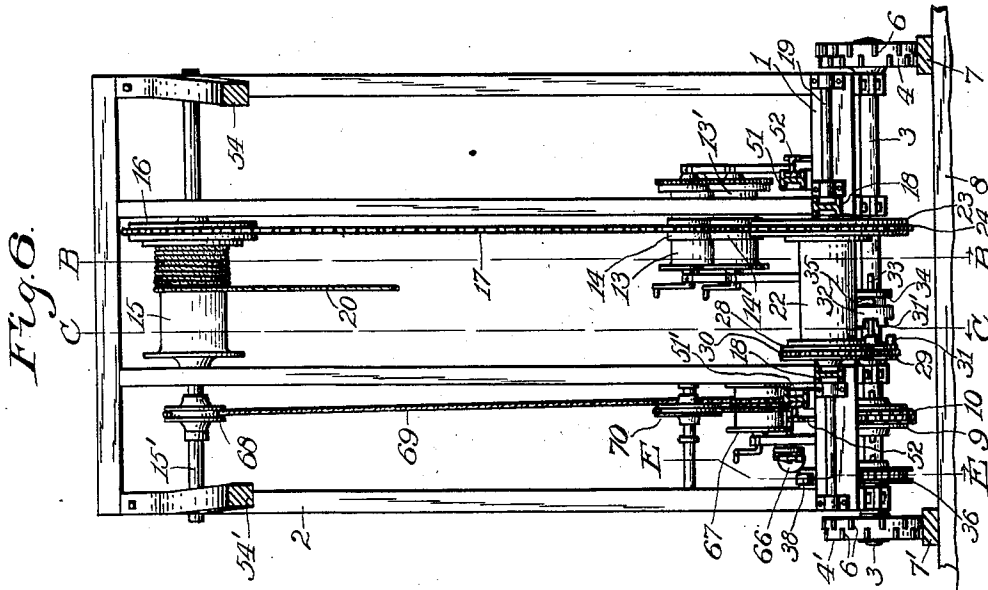
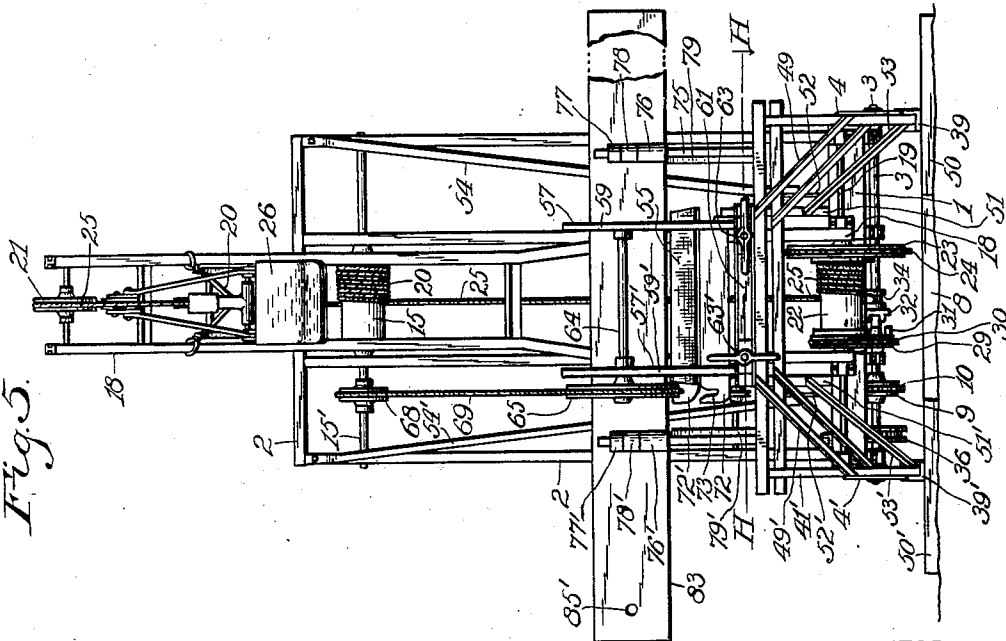


Fig. 5.



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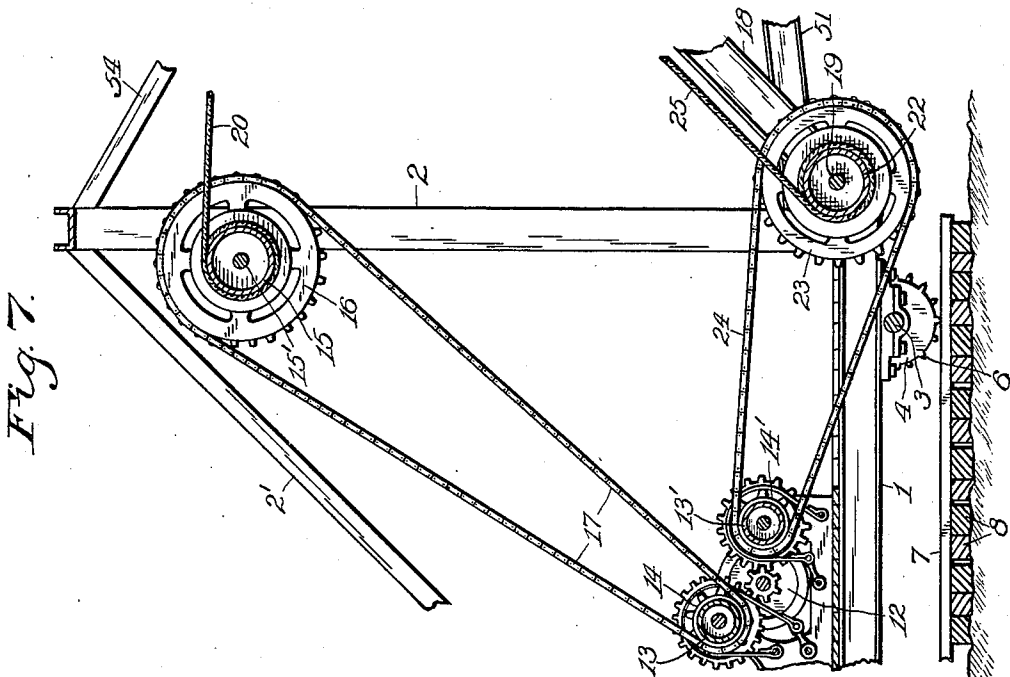
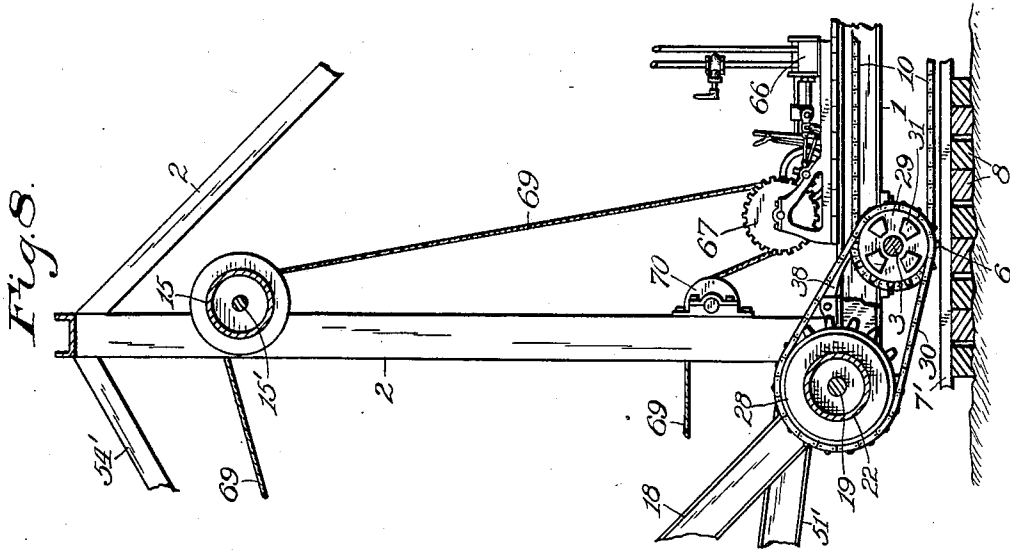
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5 SHEETS—SHEET 3.



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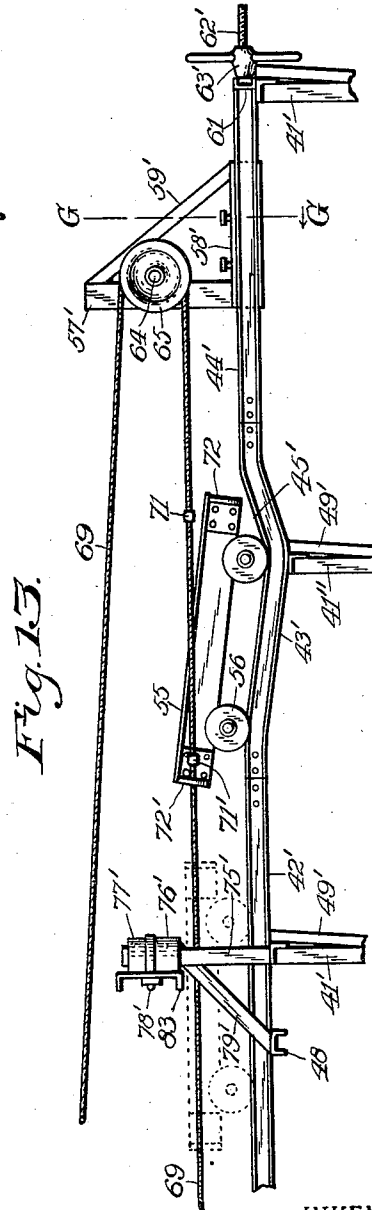
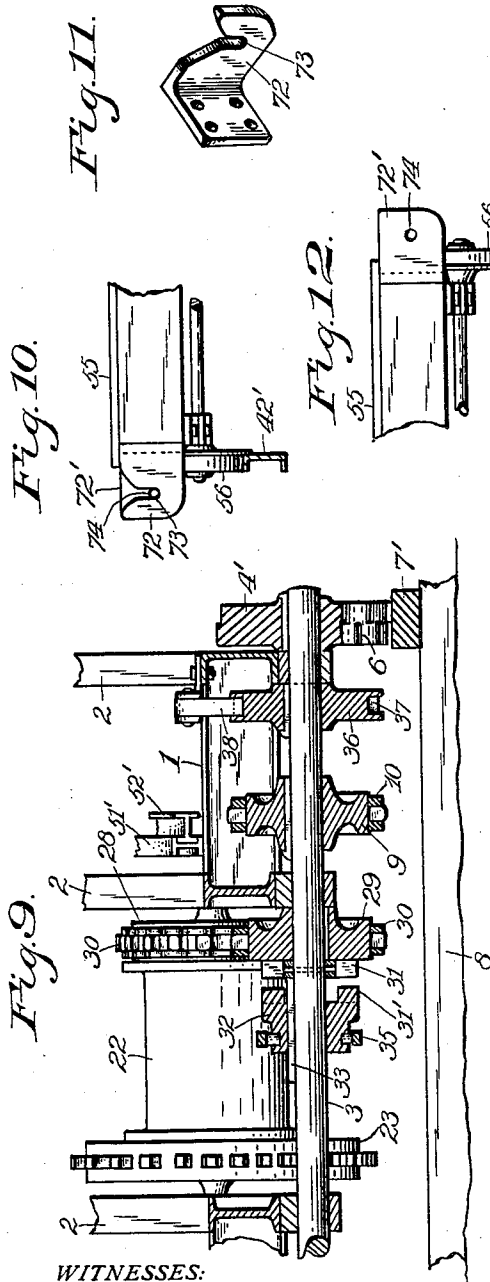
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5 SHEETS—SHEET 4.



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5 SHEETS—SHEET 5.

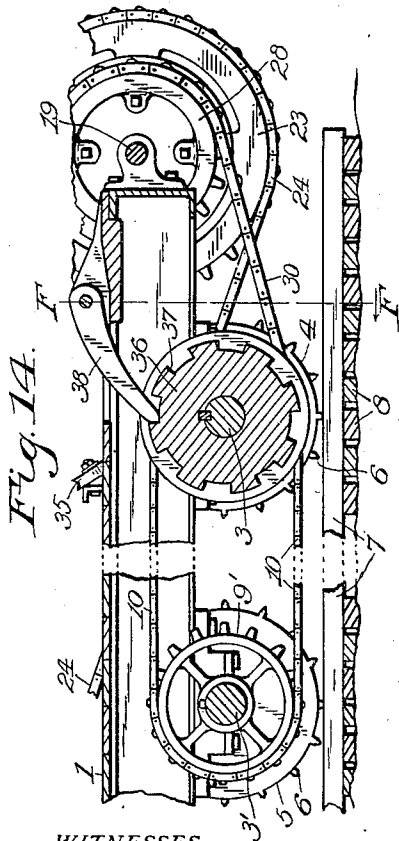
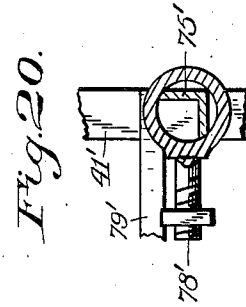
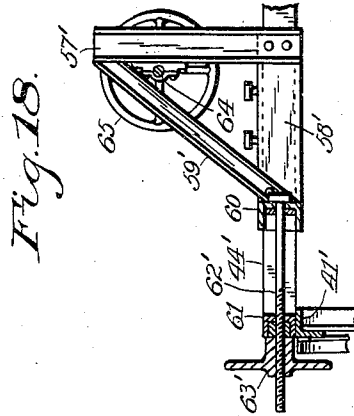
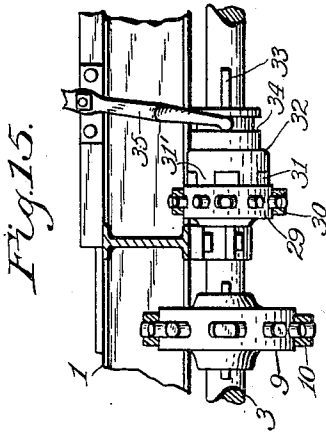


Fig. 17.

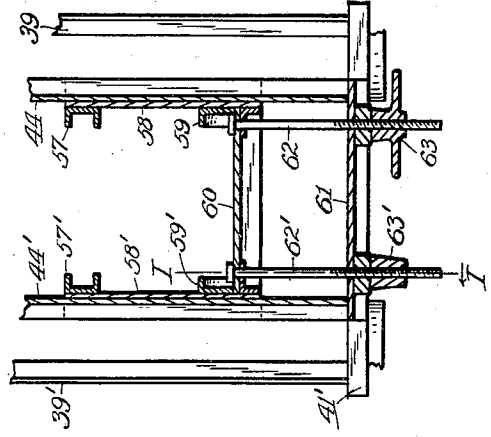
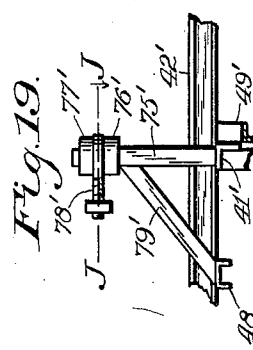
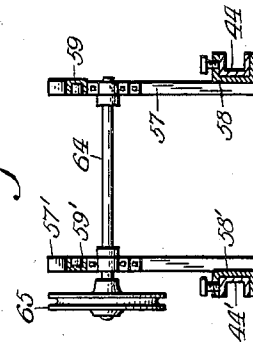


Fig. 16.



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UNITED STATES PATENT OFFICE.

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EXCAVATING AND CONVEYING APPARATUS.

1,018,359.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed August 13, 1910. Serial No. 576,951.

To all whom it may concern:

Be it known that I, JOSEPH L. POTTER, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Excavating and Conveying Apparatus; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to apparatus for excavating and for conveying the earth away from the excavations, and it has reference more particularly to apparatus adapted especially for digging sewer or other trenches, and conveying the earth taken from the excavations and delivering it into the trenches in order to fill them after the masonry or similar work has been done.

The object of the invention is to provide improved apparatus of the above mentioned character that will be adapted to be cheaply constructed, expeditiously operated, and be durable and economical in use.

The invention comprises an engine car of novel construction that is adapted to propel itself and operate excavating apparatus, a trestle of novel construction, a conveying car, and novel means for unloading the conveying car either into or alongside of an excavation; and further, the invention consists in the novel parts and in the combinations and arrangements of parts, as hereinafter particularly described and claimed.

Referring to the drawings, Figure 1 is a side elevation of the improved apparatus partially broken away; Fig. 2, a top plan thereof; Fig. 3, a front elevation of a part of one of the unloading devices; Fig. 4, a front elevation of another part of the unloading devices; Fig. 5, a rear end elevation of the apparatus in which the main engine and other parts are omitted; Fig. 6, a fragmentary sectional elevation on the plane of the line A A in Fig. 2, parts of the main engine being omitted; Fig. 7, a fragmentary section on the plane of the line B B in Fig. 6; Fig. 8, a fragmentary section on the plane of the line C C in Fig. 6; Fig. 9, a fragmentary section on the plane of the line

D D in Fig. 1; Fig. 10, a fragmentary end elevation of the conveying car; Fig. 11, a perspective view of one of the lugs of the conveying car; Fig. 12, a fragmentary elevation of the conveying car; Fig. 13, a fragmentary side elevation of the trestle and conveying car thereon; Fig. 14, a fragmentary section on the line E E in Fig. 6; Fig. 15, a fragmentary section on the plane of the line F F in Fig. 14; Fig. 16, a fragmentary section on the line G G in Fig. 13; Fig. 17, a fragmentary section on the line H H in Fig. 5; Fig. 18, a fragmentary section on the plane of the line I I in Fig. 17; Fig. 19, a fragmentary side elevation of the trestle; and Fig. 20, a fragmentary section on the plane of the line J J in Fig. 19.

Similar reference characters throughout the drawings indicate corresponding elements or features of construction herein referred to.

In practically carrying out the objects of the invention an engine-car is provided which comprises a body 1 including an upright frame 2 and braces 2', two axles 3 and 3' being mounted rotatively on the under side of the body and having wheels 4 and 4' and 5 and 5' secured thereto respectively, the wheels supporting the body and being preferably adapted to run on a trackless roadway of any suitable construction, the wheels preferably having projections 6 on their peripheries, so as to prevent slipping on wooden stringers or rails 7 and 7' or upon transverse timbers 8 if desired and propel the engine-car and its machinery, an aim being to avoid the necessity of providing elaborate tracks. The axles have sprocket-wheels 9 and 9' secured thereto, respectively, and a sprocket-chain 10 is connected with the sprocket-wheels.

A suitable steam-boiler 11 is mounted on the engine-car, as is also a hoisting engine 12 which is supplied with steam from the steam boiler, the engine including two drums 13 and 13' or similar devices, but in the present case instead of being adapted for winding ropes thereon they are provided with sprocket-wheels 14 and 14' respectively, and are operated and controlled in the usual manner by the main engine. It should be understood that the main engine may be variously constructed in detail

and need not be necessarily a steam-engine. A drum 15 is supported on a shaft 15' mounted on the upper portion of the frame 2 so as to be rotatable, and it has a sprocket wheel 16 secured thereto which is connected by a sprocket-chain 17 that is connected with the sprocket-wheel 14, thus affording positive drive without slippage. A boom 18 of suitable construction is supported on a shaft 19 which is mounted on the lower portion of the engine-car body, and a cable 20 is connected to the free end portion of the boom and also to the drum 15, for operating the boom which moves in a vertical plane and has a sheave 21 mounted on the free end thereof. A drum 22 is mounted on the shaft 19 or so as to have its axis coinciding therewith and be rotative, and it has a sprocket-wheel 23 secured thereto about which extends a sprocket-chain 24 that extends also about the sprocket-wheel 14'. A cable 25 is connected to the drum 22 and extends over the sheave 21, there being a suitable excavating implement 26 connected to the cable, being preferably a clam shell type provided with an operating cord 27. A sprocket-wheel 28 is secured also to the drum 22, and a sprocket-wheel 29 is secured to the axle 3, the two sprocket wheels being connected with a sprocket-chain 30, the sprocket-wheel 29 being loose on the axle and provided with clutch members 31. A clutch device 32 is mounted on the axle and adapted to drive it by means of a spline 33, the device having clutch members 31' adapted to engage the members 31 when the device is moved along the axle, so that the axle 3 may be driven by the sprocket-chain 30 and the axle 3' also driven by the sprocket-chain 10. The clutch device 32 has a groove 34 therein into which extends the forked end of a shifting lever 35 mounted on the body of the engine-car for operating the clutch. A wheel 36 is secured to the axle 3 and has notches 37 therein to receive a dog 38 mounted on the body of the engine-car, for holding the engine-car in position during excavating operations.

The improved trestle comprises two runners 39 and 39' having up-turned ends 40 to enable the runners to slide in the direction of the engine-car, the runners preferably having also opposite up-turned ends 40', the better to enable them to move in the opposite direction if required. The trestle comprises also a suitable number of bents 41, 41', 41'', of suitable height which are secured upon the runners, and stringers 60 constituting track rails secured upon the tops of the bents, there being ordinary rails or stringers 42 and 42' of suitable length to which are connected downwardly bent or depressed rail portions 43 and 43' from which extend ordinary rails 44 and 44', the

rails preferably being composed of channel iron section. The depressed portions are inclined abruptly to form stops 45 and 45' at the farther end of the depression from the engine-car, in order to prevent the conveying-car from moving farther than necessary. The combined stringers and track-rails have a suitable number of beams 46, 47, 48, secured to the under sides thereof between the bents, the latter including lateral braces 49, 49'. The runners of the trestle are supported and are movable slidingly on transversely arranged timbers 50 for one runner, and 50' for the other runner, and the timbers are lifted from behind the trestle and transferred to the front thereof as the work progresses. Two span-rails 51 and 51' are substantially secured to the trestle at the end nearest the engine-car and in alinement with the track-rails, and they are secured also to the engine-car and constitute relatively long rails for the conveying car, being practically a continuation of the trestle without ground support, thus permitting the excavating implement to work freely between the engine-car and the near end of the trestle proper. The span-rails preferably are composed of structural beams and have strengthening beams 52 and 52' secured to the outer sides thereof, so as to constitute lateral reinforcement. A pair of pull-and-push bars 53 and 53' are secured to the span rails and extend downwardly and divergently therefrom to the lower portions of the trestle to which they are secured. Two braces 54 and 54' preferably are employed and secured to the upper portion of the frame 2 and also to the span rails.

A suitable conveying car 55 including flanged wheels 56 is mounted movably on the track rails and is moved onto the span-rails to be loaded. On the farther end of the trestle from the engine car a sheave frame is adjustably mounted and preferably comprises two standards 57 and 57' secured to two slides 58 and 58', angle braces 59 and 59' and a transverse member 60, the sheave frame normally being on the track-rails near a bulk-head 61 mounted on the trestle. Two adjusting screws 62 and 62' are connected to the sheave frame and extend through the bulk-head, the end portions of the screws having adjusting nuts 63, 63', that normally are in contact with the farther side of the bulk-head. A shaft 64 is mounted on the sheave frame and has a sheave 65 thereon. An auxiliary engine 66 is mounted on the engine-car and is supplied with steam from the boiler 11, the engine including a winding drum 67. A guide-sheave 68 is mounted on the shaft 15' supported on the upper portion of the frame 2. An endless cable or rope belt 69 is wound a few times about the winding drum 67 and

extends over the guide-sheave 68 and thence about the sheave 65 and back to the winding-drum, preferably over a guide-sheave 70 mounted on the engine-car at a suitable height to guide the cable properly, the latter having two suitable tug devices 71 and 71' secured thereto with suitable space between the devices. The conveying car is provided with two lugs 72 and 72' at a suitable distance apart which permit the two tug devices to normally be between the two lugs. The lug nearer the sheave 65 has a slot 73 in the upper side thereof to receive the cable, and the other lug has an aperture 74 therein through which the cable extends, the device 71' when brought into engagement with the lug 72' acting to draw the conveying-car toward the engine-car, and when the device 71 is moved into contact with the inner side of the lug 72 the conveying-car is drawn toward the sheave 65 into the depression in the track-rails. As the advance end of the car descends into the depression the cable, being taut, is prevented from being deflected and consequently the lug 72 is drawn away from the cable, the latter continuing its movement until the operator can stop it and reverse the motion. The device 71' may be carried above the lug 72, but when carried back to the lug 72' serves to connect the cable with the conveying-car for moving it back to be reloaded.

A pair of posts 75 and 75' are mounted on the trestle and have collars 76 and 76' thereon above which are other collars 77 and 77', there being preferably a pair of collars on each post, and two eye-bolts 78 and 78' are mounted on the posts, each between the two collars thereon. The posts are provided with angle braces 79 and 79'. Another pair of posts 80 and 81 are mounted also on the trestle and are provided each with a bolt 82, the posts being suitably braced. A scraper 83 is provided which has two bolt-holes 84 and 84' to receive the eye-bolts 78 and 78' for supporting the scraper transversely to the trestle, the end portions of the scraper having bolt-holes 85 and 85', respectively, to receive the bolts 82, as when the scraper is disconnected from the eye-bolt 78 and brought into contact with the post 80 and connected thereto, so as to be at oblique angles to the track-rails, as illustrated in Fig. 2. It will be understood that in this position the earth may be unloaded from the conveying car and deposited at one side of the trench; and if the scraper be connected to the posts 75 and 81 the earth may be deposited at the opposite side of the trench. It will be clear that the earth is unloaded into the trench when the scraper is connected to the posts 75 and 75'.

In order to loosen the earth on the conveying car so that it may be easily removed

therefrom, two posts 86 and 87 are mounted on the trestle between the scraper and the conveying-car, and a beam 88 is removably mounted on the posts and provided with a suitable number of teeth 89 extending downward substantially to the plane of the top of the conveying car, so as to loosen and assist in removing the earth from the passing car.

In practical use the excavating implement is lowered between the span-rails and filled with earth and then elevated, after which the conveying car is moved under the implement and receives the earth therefrom. Then the car is moved outward on the trestle beneath the rake (if the latter is not detached,) and beneath the scraper and is thereby unloaded either into the excavation or alongside, as may have been predetermined. Considerable force is required to be applied to the cable during unloading operations and after the car passes from under the scraper, which is a considerable distance from the operator, the car might collide with the sheave frame before the operator could stop the cable under ordinary conditions of operation, but in the present case collision is prevented by disconnecting the car from the cable, as hereinbefore explained. The excavating apparatus is again operated while the car is being unloaded. As progression is required in the operations the clutch device 32 is moved into connection with the sprocket wheel 29 on the driving axle 3 of the engine-car, and the main engine being operated causes the movement of the engine-car the desired distance, after which the clutch devices are disconnected and operations continued, it being clear that when the engine-car propels itself it also moves the trestle with it. In some cases the whole apparatus may be backed or reversed in motion from the usual direction of movement.

Having thus described the invention, what is claimed as new, is—

1. Excavating and conveying apparatus including traction wheels, axles secured to the traction wheels, a frame supported on and carried by the axles, an engine mounted on the frame, an excavating implement mounted also on the frame, a drive wheel secured to one of the axles, and gearing mounted on the frame for detachably connecting the drive wheel with the engine to rotate the traction wheels.

2. Excavating and conveying apparatus including a movable unitary structure, one end portion of the structure being provided with supporting traction wheels, a hoisting engine mounted on the structure, an excavating implement and a conveying car mounted also on the structure, the implement being connected detachably with the hoisting engine, and gearing mounted on

the structure for detachably connecting the hoisting engine with the traction wheels to rotate the traction wheels.

3. Excavating and conveying apparatus including an engine-car having rotatable driving wheels for support, a hoisting-engine mounted on the engine-car, an excavating implement mounted on the engine-car and operatively connected with the hoisting-engine, a movable trestle, a conveying car movable on the trestle, and means mounted on the engine-car cooperating to lock the driving wheels for preventing movement of the engine-car toward the excavating implement when the latter is operating.

4. Excavating and conveying apparatus including a trestle, a car movable on the trestle, a sheave mounted on the trestle, a cable guided by the car and extending about the sheave, means for operating the cable, and means for operatively connecting or disconnecting the cable and the car at a predetermined position during operation of the cable.

5. Excavating and conveying apparatus including a trestle, a car movable on the trestle, a sheave mounted on the trestle, a hoisting-engine, an excavating implement for loading the car operatively connected with the engine, a cable extending about the sheave, means for operating the cable, means for operatively connecting the cable with the car when the cable moves from the sheave, means for releasing the car from the cable at a predetermined position when the cable moves toward the sheave, and means for stopping the car when released from the cable.

6. Excavating and conveying apparatus including a movable engine-car having rotatable driving-wheels for support, a movable trestle connected with the engine-car, a hoisting engine mounted on the engine-car, excavating apparatus mounted on the engine-car and operatively connected with the hoisting-engine, a sheave mounted on the trestle, a cable extending about the sheave, means for operating the cable, a conveying car movable on the trestle and connectible to the cable, and means mounted on the engine-car for detachably connecting the driving-wheels with the hoisting-engine to move the engine-car and the trestle.

7. Excavating and conveying apparatus including a plurality of rotatable wheels, a car-frame carried by the wheels, a hoisting-engine mounted on the car-frame, excavating apparatus mounted on the car-frame, a longitudinally movable trestle connected with the car-frame, a conveying-car movable on the trestle, and means mounted substantially on the car-frame cooperating therewith and also substantially with one

of the rotatable wheels for locking the wheel substantially to the car-frame and preventing movement of the wheels and the trestle.

8. Excavating and conveying apparatus including a plurality of wheels, axles secured to the wheels, a car-frame mounted on the axles, a notched wheel secured to one of the axles, a dog mounted on the car-frame and movable into engagement with the notched wheel, a hoisting-engine mounted on the car-frame a movable trestle connected with the car-frame, a car movable on the trestle, and excavating apparatus operatively connected with the hoisting-engine for loading the car.

9. Excavating and conveying apparatus including a car-frame, two axles rotatably mounted on the car-frame, wheels secured to the axles, a movable trestle connected with the car-frame, a car movable on the trestle, a hoisting engine mounted on the car-frame, excavating apparatus movably supported and connected with the hoisting-engine for loading the car, two sprocket wheels secured to the two axles respectively, a sprocket-chain connected with the two sprocket-wheels, and gearing detachably connecting one of the axles with the hoisting-engine.

10. Excavating and conveying apparatus including an engine-car, a trestle including two track-rails, two span-rails secured to the engine-car and connected with the track-rails, a hoisting engine mounted on the engine-car, an excavating implement mounted on the engine-car and connected with the hoisting-engine, the implement being movable between the span-rails, and a conveying car movable on the track-rails and the span-rails.

11. Excavating and conveying apparatus including a trestle provided on the top thereof with a stationary scraper and also track-rails extending under the scraper, a conveying car movable on the track-rails and beneath the scraper, a cable operatively connected with the conveying car, an engine-car, an excavating implement mounted on the engine-car, and an engine operatively connected with the cable.

12. Excavating and conveying apparatus including an engine-car, a trestle including two track-rails, a trestle-span comprising two reinforced span-rails secured to the engine-car and connected with the track-rails, a hoisting engine mounted on the engine-car, an excavating implement mounted on the engine-car and connected with the hoisting engine, and a conveying car movable on the track-rails and the span-rails.

13. Excavating and conveying apparatus including a trestle provided on the top thereof with a stationary rake and also a stationary scraper, the trestle including a track extending under the rake and the

scraper, a conveying car movable on the track and beneath the rake and the scraper, means for forcibly moving the conveying car, an engine-car, and means mounted on the engine-car for loading the conveying car.

14. Excavating and conveying apparatus including a movable trestle provided on the top thereof with a stationary unloading device, a track on the trestle extending under the unloading device, a conveying car movable on the track and beneath the unloading device, means for forcibly moving the conveying car, a movable engine-car connected with the trestle, and excavating means mounted on the engine-car for loading the conveying car.

15. Excavating and conveying apparatus including removable timbers, an engine-car having flangeless driving wheels rotative upon the timbers, a hoisting engine mounted on the engine-car, means for connecting the driving wheels with the hoisting engine, excavating apparatus mounted on the engine-car and operatively connected with the hoisting engine, a movable trestle, and a conveying car movable on the trestle.

16. Excavating and conveying apparatus including a movable engine-car having driving wheels, removable timbers, a trestle having runners slidingly mounted on the timbers and connected with the engine-car, a hoisting engine mounted on the engine-car, excavating apparatus mounted on the engine-car, means for connecting the driving wheels detachably with the hoisting engine, and a conveying car movable on the trestle.

17. Excavating and conveying apparatus including a movable trestle provided on the top thereof with an angularly-adjustable stationary unloading device, the trestle including a track extending under the unloading device, a conveying car movable on the track and beneath the unloading device, means for forcibly moving the conveying car, a movable engine-car connected with the trestle, and means mounted on the engine-car for loading the conveying car.

18. Excavating and conveying apparatus including a trestle, an engine-car, an excavating implement mounted on the engine-car, a winding-drum mounted on the engine-car, a sheave mounted on the trestle, a track on the trestle, a scraper mounted on the trestle above the track, a cable connected with the winding-drum and extending under the scraper and about the sheave, and a conveying car connected with the cable and movable on the track and beneath the scraper.

19. Excavating and conveying apparatus including an engine-car, an excavating implement mounted on the engine-car, a winding-drum mounted on the engine-car, a trestle connected with the engine-car, a sheave-frame mounted adjustably on the trestle, a

track on the trestle, a sheave rotative on the sheave-frame, a cable connected with the winding-drum and extending about the sheave, a conveying car movable on the track and connected with the cable, and means for adjusting the sheave-frame toward or from the winding-drum.

20. Excavating and conveying apparatus including an engine-car, a trestle including track-rails, a hoisting boom mounted on the engine-car, a hoisting engine mounted on the engine-car, a cable connected with the boom and the hoisting engine, two span-rails secured to the engine-car and connected with the trestle in alinement with the track-rails, each span-rail having a stiffening-bar secured to one side thereof, and a conveying car movable on the track-rails and the span-rails.

21. Excavating and conveying apparatus including a trestle, an engine-car, an excavating implement mounted on the engine-car, a winding-drum mounted on the engine-car, a sheave mounted on the trestle, a scraper mounted on the trestle, a rake mounted on the trestle between the engine-car and the scraper, a cable connected with the winding-drum and extending under the rake and the scraper and about the sheave, and a conveying car connected with the cable and movable on the trestle beneath the rake and the scraper.

22. Excavating and conveying apparatus including a movable engine-car, a movable trestle including two track-rails, a trestle-span comprising two reinforced span-rails secured to the engine-car and connected with the track-rails, a hoisting engine mounted on the engine-car, an excavating implement mounted on the engine-car and connected with the hoisting engine, the implement being movable between the two span-rails, and a conveying car movable on the track-rails and the span-rails.

23. Excavating and conveying apparatus including an engine-car, an engine mounted on the engine-car and comprising a sprocket-wheel, a boom pivotally mounted on the engine-car, a sheave mounted on the boom, a drum mounted on the engine-car and having a sprocket-wheel secured thereto, a cable connected to the drum and extending over the sheave, an excavating implement connected to the cable, and a sprocket-chain connected with the two sprocket-wheels.

24. Excavating and conveying apparatus including an engine-car comprising a body and an upright frame thereon, a trestle including two track-rails, two span-rails secured to the engine-car and connected with the trestle in alinement with the track-rails, two pull-and-push bars secured to the span-rails and also to the lower portion of the trestle, two braces secured to the upright frame and also to the span-rails, excavating

apparatus mounted on the engine-car, and a conveying car movable on the track-rails and the span-rails.

25. Excavating and conveying apparatus including an engine-car, an excavating implement mounted on the engine-car, a winding-drum mounted on the engine-car, a trestle provided on the top thereof with a stationary unloading device, a track on the trestle connected with the engine-car and extending under the unloading device, a conveying car movable on the track and beneath the unloading device, a sheave mounted on the trestle, a cable connected with the winding-drum and extending about the sheave, means for connecting the cable to the conveying car, and means for loading the conveying car.

26. Excavating and conveying apparatus including an engine-car, a main engine and an auxiliary engine mounted on the engine-car, a boom mounted movably on the engine-car and operatively connected with the main engine, an excavating implement, a cable operatively connected with the main engine and the implement and guided on the boom, a trestle, a conveying car movable on the trestle, a sheave mounted on the trestle, and a cable connected with the auxiliary engine and the conveying car and extending about the sheave.

27. Excavating and conveying apparatus including a plurality of driving wheels with projections on their peripheries to rotate on a trackless roadway, a car-frame mounted on the driving wheels, a trestle having runners to slide on a trackless roadway and connected with the car-frame, a hoisting engine mounted on the car-frame, an excavating implement mounted on the car-frame and connected with the hoisting engine, a conveying car movable on the trestle, and means cooperating with the hoisting engine and therewith actuating the driving wheels.

28. Excavating and conveying apparatus including an engine-car comprising a plurality of wheels, an excavating implement mounted on the engine-car, axles secured to the wheels, a trestle connected to the engine-car, a conveying car on the trestle, a sprocket-wheel secured to one of the axles, two sprocket-wheels mounted on the engine-car, means connecting the two sprocket-wheels together, a sprocket-chain connecting one of the two sprocket-wheels with the sprocket-wheel on the axle, an engine mount-

ed on the engine-car and comprising a sprocket wheel, and a sprocket-chain connecting the other one of the two sprocket-wheels with the sprocket-wheel of the engine.

29. Excavating and conveying apparatus including an engine-car, an excavating implement mounted on the engine-car, a winding-drum mounted on the engine-car, a guide-sheave mounted on the upper portion of the engine-car remote from the winding-drum, excavating apparatus mounted on the engine-car, a trestle connected to the engine-car and having a scraping device mounted fixedly thereon, a sheave mounted on the trestle, a cable connected with the winding-drum and extending under the scraping device and about the sheave on the trestle and thence over the scraping device and the sheave on the engine-car and down to the winding-drum, and a conveying car movable on the trestle beneath the scraping device and connected with the cable.

30. Excavating and conveying apparatus including a movable engine-car, a main engine mounted on the engine-car, a movable trestle, two span-rails secured to the engine-car and the trestle, an excavating implement mounted on the engine-car and movable between the span-rails, operating connections between the main engine and the implement, a conveying car movable on the trestle, a sheave mounted on the trestle, an auxiliary engine supported fixedly relatively to the trestle, and a cable connected with the auxiliary engine and the conveying car and extending about the sheave.

31. Excavating and conveying apparatus including an engine-car, a trestle connected to the engine-car, a track on the trestle, a main engine mounted on the engine-car, an excavating implement mounted on the engine-car and operatively connected with the main engine, a conveying car movable on the track, a cable guided on the trestle at one side of the plane of the track, an auxiliary engine fixedly supported relatively to the trestle and connected with the cable, and means for connecting the cable to one side of the conveying car.

In testimony whereof, I affix my signature in presence of two witnesses.

JOSEPH L. POTTER.

Witnesses:

HARRY D. PIERSON,
E. T. SILVIUS.