

J. L. POTTER.  
 SCRAPING EXCAVATOR AND CONVEYER.  
 APPLICATION FILED NOV. 1, 1909.

985,546.

Patented Feb. 28, 1911.

3 SHEETS—SHEET 1.

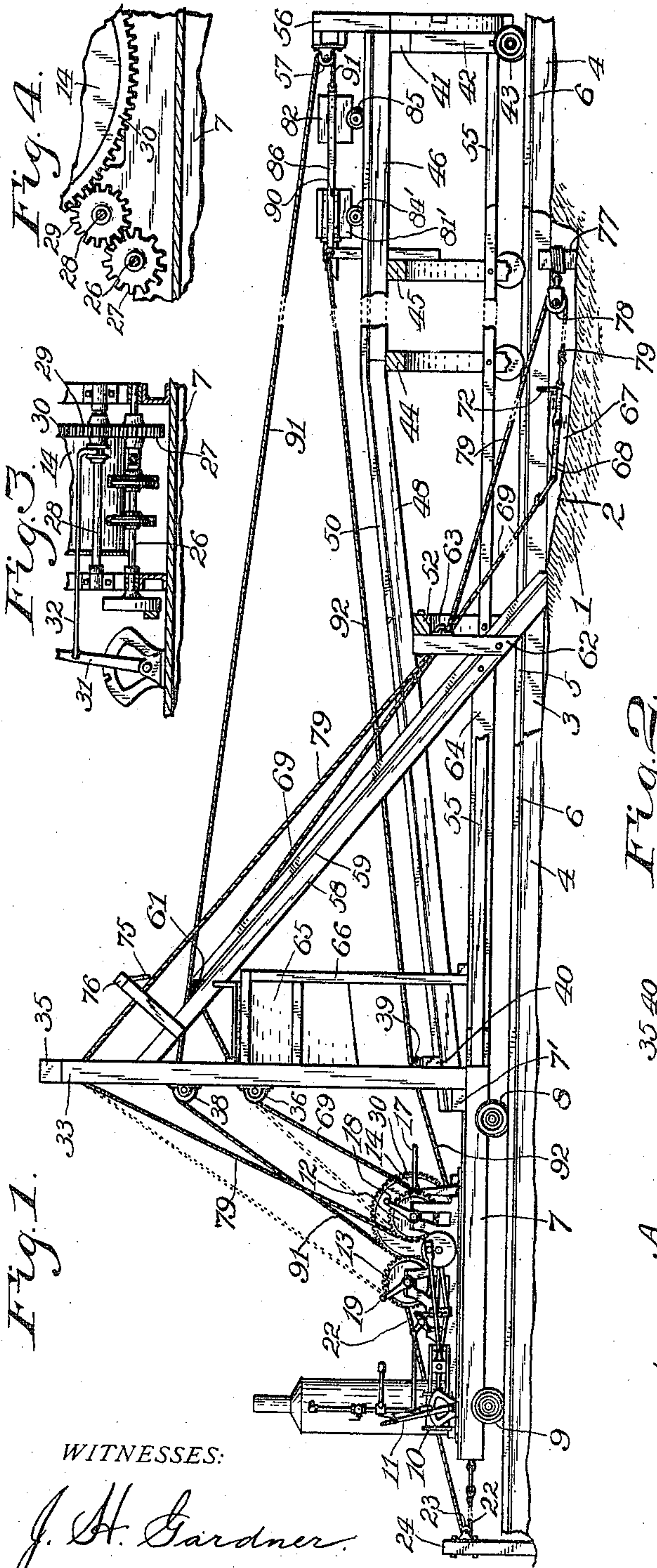


Fig. 1.

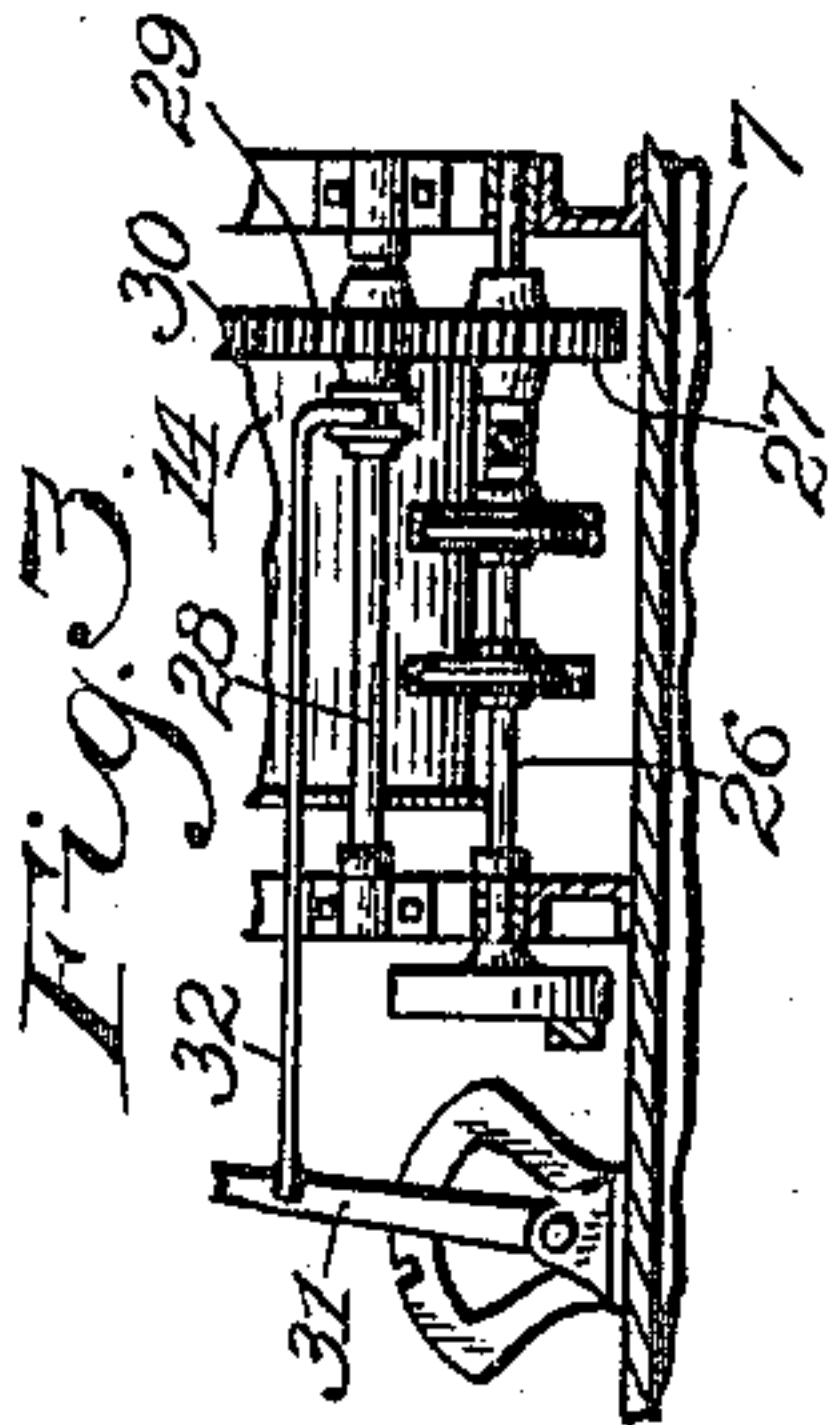


Fig. 3.

Fig. 4.

WITNESSES:

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 H. R. Woddell.

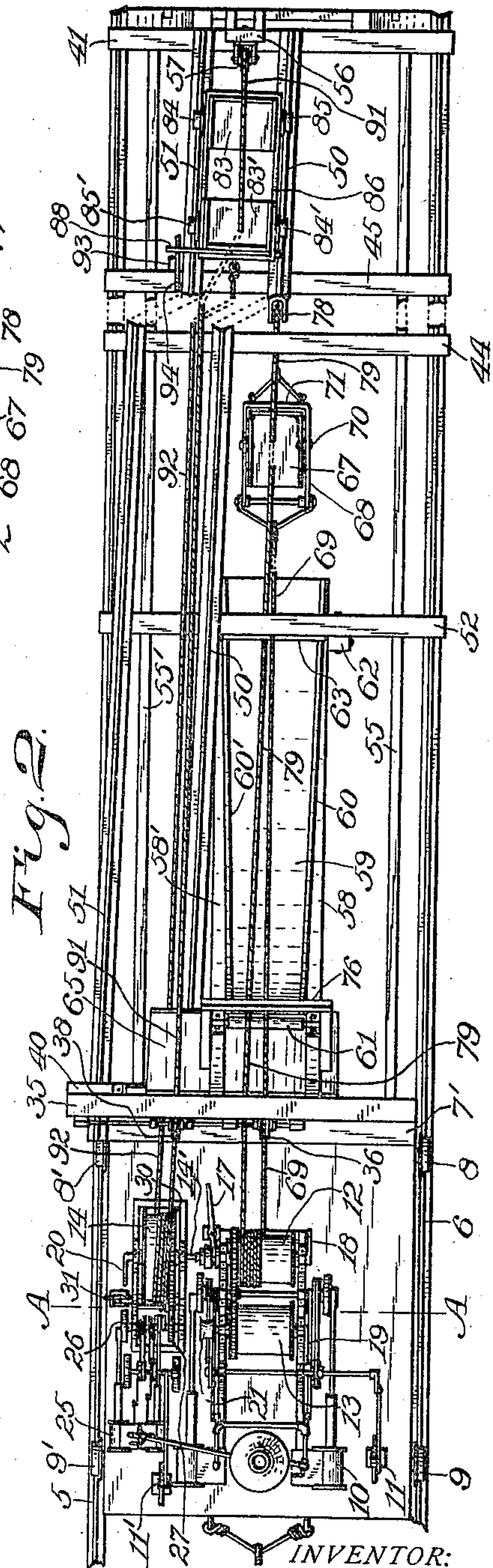


Fig. 2.

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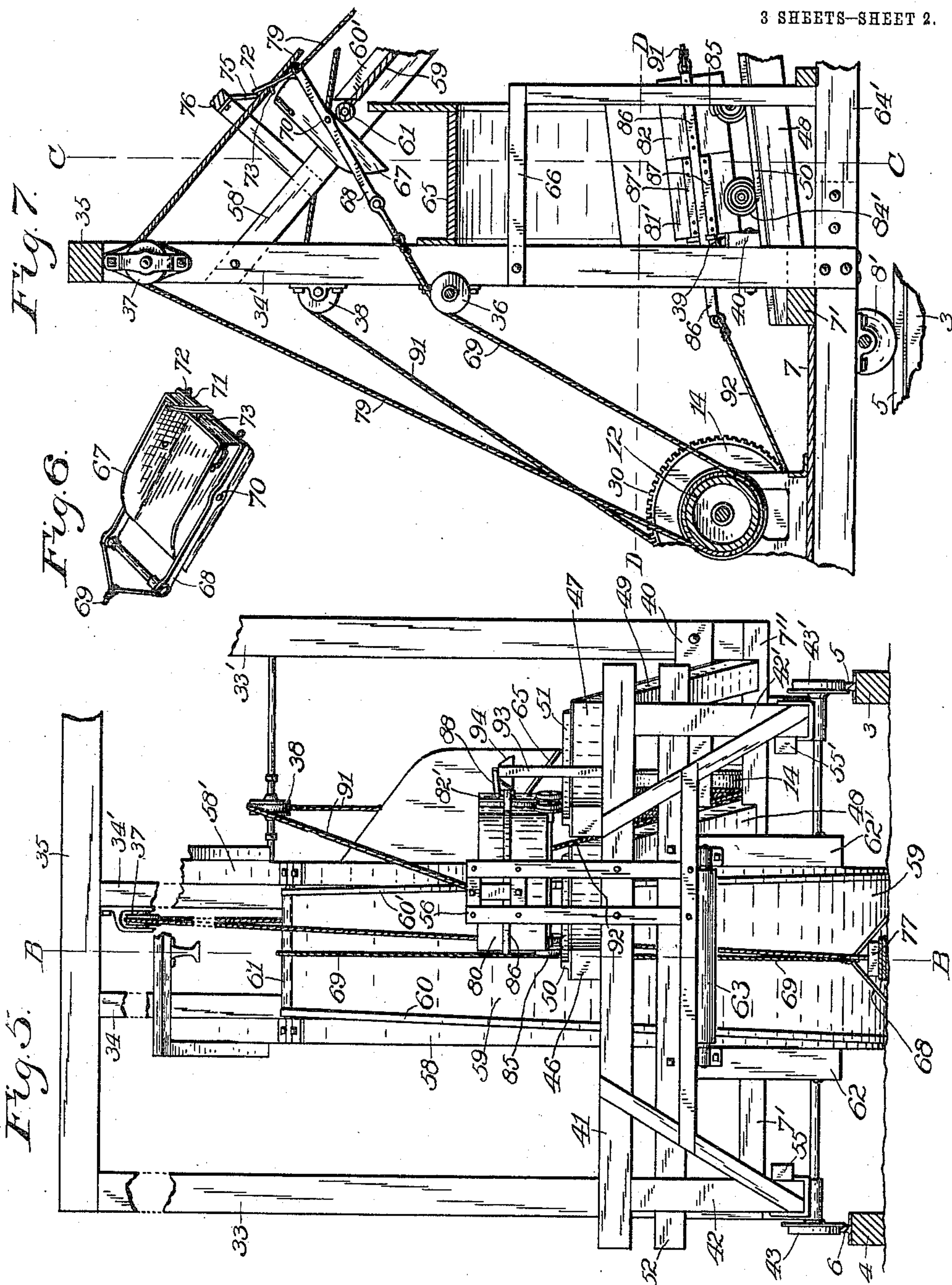


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3 SHEETS—SHEET 2.



WITNESSES:

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INVENTOR:

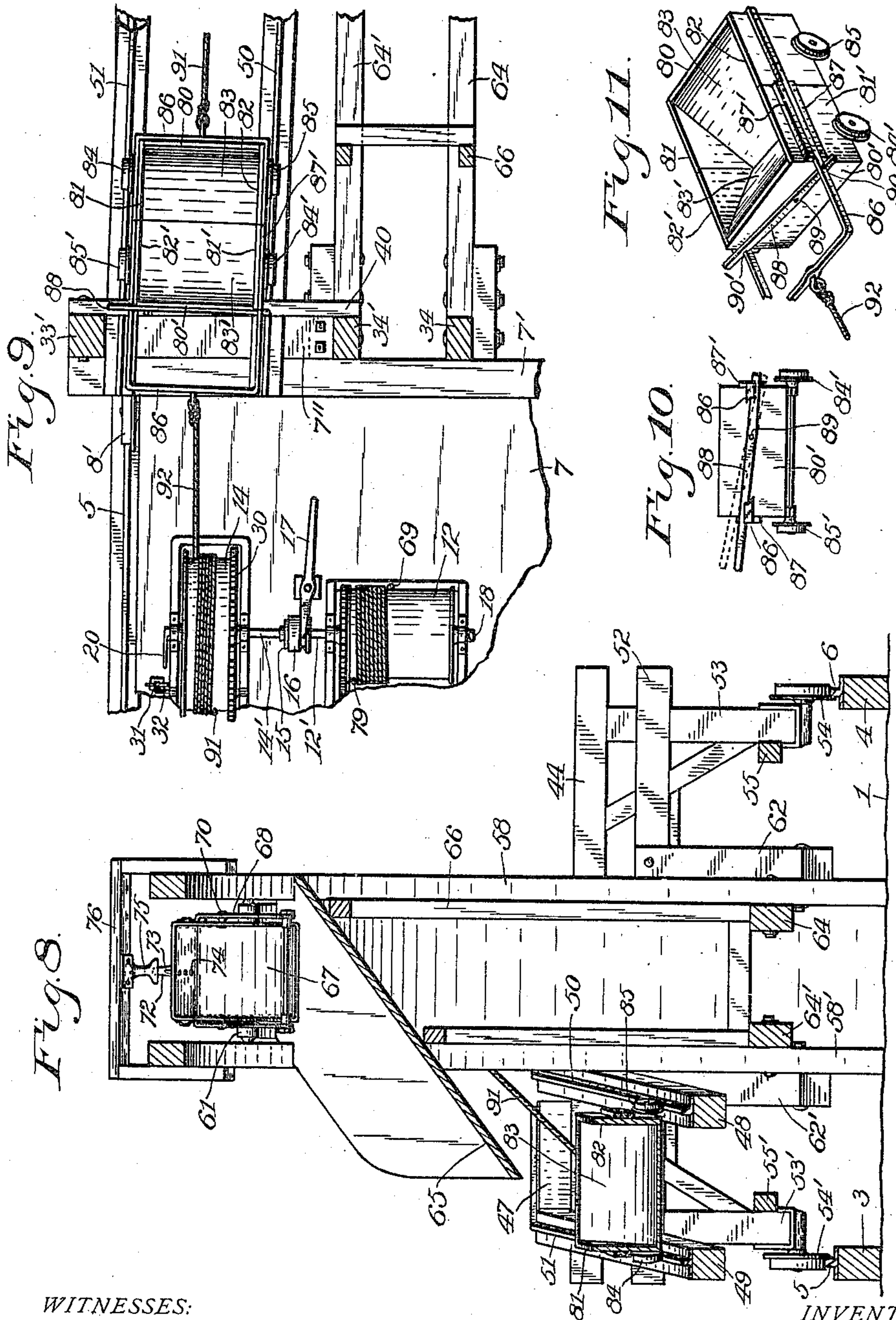
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

JOSEPH L. POTTER, OF INDIANAPOLIS, INDIANA.

SCRAPING-EXCAVATOR AND CONVEYER.

985,546.

Specification of Letters Patent.

Patented Feb. 28, 1911.

Application filed November 1, 1909. Serial No. 525,674.

*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 Scraping-Excavators and Conveyers; 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 whereby excavations may be made and the earth from the excavations conveyed and dumped into the excavations after completing the structural work therein as the work proceeds while constructing sewers or the like, the invention having reference particularly to the structure and arrangement for operation of the excavating implement, and the structure and arrangement of the conveying apparatus, and also the mechanism for their operation.

The object of the invention is to provide simple, compact and relatively cheap apparatus of the above-mentioned character that will be adapted to be operated expeditiously by the least number of attendants, and particularly when it is desirable to convey the earth a considerable distance back of the point of excavating operations, which apparatus will be reliable, durable and economical in use.

With the above-mentioned and other objects in view the invention consists in improved excavating and conveying apparatus comprising a novel scraping and elevating implement, a novel conveying car to receive the earth from the implement and convey it back beyond the place of operations in the excavation, and a novel arrangement of means for operating and controlling the implement and the conveying car.

The invention consists further in the parts and combinations and arrangements of parts as hereinafter particularly described and then defined in the accompanying claims.

Referring to the drawings, Figure 1 is a side elevation of the apparatus partially broken away; Fig. 2, a top plan thereof in which parts are broken away; Fig. 3, a fragmentary detail on the line A A in Fig.

2; Fig. 4, a fragmentary detail showing parts of the preceding figure in elevation; Fig. 5, an end elevation of the apparatus partly broken away; Fig. 6, a perspective view of the excavating implement as preferably constructed; Fig. 7, a fragmentary vertical sectional view on the plane of the line B B in Fig. 5; Fig. 8, a transverse sectional view approximately on the plane of the line C C in Fig. 7; Fig. 9, a fragmentary horizontal section approximately on the line D D in Fig. 7; Fig. 10, an end elevation; and Fig. 11, a perspective view of the improved conveying car.

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

In the drawings the numeral 1 indicates the earth or ground in which an excavation 2 has been begun, and at opposite sides of which stringers 3 and 4 rest on the surface of the ground and support track-rails 5 and 6. A suitable engine-car 7 is provided and has carrying wheels 8, 8', 9, 9', that are mounted on the rails. A suitable hoisting engine 10 is mounted on the car and may be either non-reversible or reversible, the latter type being illustrated and having a reversing lever 11, the engine including two winding-drums 12 and 13 which are desirable if the engine be non-reversible, and one of the winding-drums may be omitted if desired and the engine be reversible. The shaft 12' of the winding-drum 12 projects a suitable distance for driving another winding-drum 14 which is mounted on the engine car in proximity to the winding-drum 12, and its shaft 14' projects toward and in alinement with the shaft 12' and has a clutch member 15 thereon to be engaged by a companion clutch-member 16 suitably mounted on the shaft 12' and controlled by an operating lever 17, the winding-drum 14 preferably being considerably larger in diameter than the winding drum 12. The winding-drums 12 and 13 are provided with suitable clutch operating levers 18 and 19 respectively as usual, and the winding-drum 14 is provided with a similar lever 20, so that the winding-drums may be locked to or unlocked from their driving shafts, as will be understood. The engine is provided with a winding-spool 21 on which a cable 22 may be wound



for moving the apparatus on its track as the work proceeds, the cable extending about a sheave 23 mounted on an anchor or "dead-man" 24.

5 When it is required to move the conveying car an unusually long distance it is preferable that an auxiliary hoisting engine 25 be mounted also on the engine car having a reversing lever 11', the engine being detachably connected to the winding-drum 14  
10 in any suitable manner, as by providing the crank shaft 26 of the engine with a pinion 27 and suitably supporting a shaft 28 parallel to the crank shaft and mounting a pinion 29 movably thereon, so as to be moved  
15 into or out of engagement with the pinion 27 and a gear wheel 30 with which the winding-drum 14 is provided, the pinion 29 being operated and controlled by means of a suitable lever 31 to which is connected an operating rod 32 that is suitably connected to  
20 the pinion, whereby the pinion may be moved along the shaft 28.

On one end of the engine-car a suitable upright frame is erected and preferably  
25 comprising two main posts 33 and 33' and intermediate posts 34 and 34' to the tops of which a beam 35 is secured. A rotatable guide 36 of suitable construction is mounted  
30 on the upright frame, and farther up on the frame another rotatable guide 37 of suitable form is mounted between the two intermediate posts, and another suitable cable-guide 38 is mounted between the posts 33' and 34',  
35 a guide roller 39 being mounted preferably on a dead-stop timber 40 adjacent to the lower portion of the upright frame.

A trestle is connected to the engine car, so as to be moved thereby and extends from the  
40 end that has the upright frame thereon, the trestle comprising a suitable number of bents, as 41, including legs 42 and 42' mounted on wheels 43 and 43' which are movable on the ground track rails, and  
45 other similar bents 44, 45, on which are stringers 46 and 47 that are approximately horizontal and from which extend two inclined stringers 48 and 49 respectively that rest on the bent 44 and also on timbers 7' and 7'' of the engine car between the posts  
50 33' and 34' of the upright frame, the stringers supporting two track-rails 50 and 51. The track rails on the trestle as will be seen extend in the vertical plane that is angular to the ground track rails. Another  
55 bent 52 comprising legs 53 and 53' provided with wheels 54 and 54' constitutes a part of the trestle, being mounted on the ground track rails and supports the middle portions of the inclined stringers 48 and 49, the bent  
60 having less height than the other bents. A pair of horizontal tie-rails 55 and 55' are connected to the engine car and also to the legs of the bents of the trestle. The terminal end portion of the trestle has a frame

56 mounted thereon which supports a guide sheave 57. An inclined guide for the excavating implement comprises preferably two beams 58 and 58' that extend from the surface of the ground to the upper portion  
70 of the upright frame to which they are suitably connected, and a floor 59 attached to the beams and extending from the lower ends up to within a suitable distance from the upper ends thereof, the floor preferably  
75 having a pair of upwardly converging guide-bars 60 and 60' thereon, and a guide roller 61 is suitably mounted at the upper end of the floor. A pair of hangers 62 and 62' are attached to the bent 52 and also to the  
80 beams of the inclined guide, and a guide-roller 63 is suitably supported under the beam of the bent. A pair of horizontal tie-bars 64 and 64' are secured to the lower portions of the beams 58 and 58' and also to  
85 the frame of the engine-car. An inclined chute 65 is supported on a suitable frame 66 adjacent to the upright frame and beyond and below the upper end of the guide-floor 59, the chute being arranged transversely of  
90 the apparatus, so as to receive from the excavating implement and deliver the earth above the track of the trestle at the lower end thereof.

An excavating implement of suitable construction comprises a scoop 67 provided  
95 with a yoke 68 that extends beyond the forward end of the scoop, and for the purpose of scraping or digging in order to excavate and to elevate the earth so that it may be  
100 discharged into the conveying car, a cable 69 is connected to the yoke and extends under the guide-roller 63 (when the implement is in excavating position) and thence  
105 up and over the guide-roller 61 and over the rotatable guide 36, thence to the winding-drum 12 to which it is suitably connected. The yoke 68 is preferably connected to the sides of the scoop 67 by pivots  
110 70 and the yoke includes a tail-bar 71 that extends across the rear end of the scoop and has a spring-finger 72 attached thereto that is provided with a projection 73 adapted to enter one of several holes 74 (Fig. 8,) that  
115 are in the rear end of the scoop, the latch being designed to normally prevent pivotal movement of the scoop in the yoke during digging operations and permitting the angle of the scoop to be adjusted with respect to the line of draft of the cable. A trip device 75 of suitable construction is supported  
120 on a frame 76 that is mounted on the inclined guide, so that when the scoop is at the upper end of the floor 59 the finger 72 may engage the trip device to release the scoop and permit it to swing pivotally in its yoke,  
125 as illustrated in Fig. 7. In order to return the excavating implement to the trench a suitable anchor or "dead-man" 77 is fixedly supported in any suitable manner in the  
130



trench and has a guide-sheave 78 connected thereto, so that the guide-sheave may be lowered in the trench as the digging proceeds, a cable 79 being connected to the tail-bar 71 of the yoke and extending about the guide-sheave and thence under the guide-roller 63 and upward above the inclined guide and thence over the rotatable guide 37, thence down to the winding-drum 12 to which it is suitably connected, it being understood that the cables 69 and 79 which for convenience are indicated as two cables may be one cable wound a few times about the winding-drum, as is obvious. In case that the main engine is non-reversible and both winding-drums 12 and 13 are supplied, the two cables 69 and 79 may be wound on the two winding-drums as indicated by broken lines in Fig. 1 instead of both cables being connected to one of the winding-drums with a reversible engine.

The improved conveying-car which is adapted to automatically discharge its load comprises two separable body parts, one part comprising an end 80, two sides 81, 82, and a sloping bottom 83 extending from the lower portions of the ends of the sides to the upper portion of the end 80, the part being provided with a pair of carrying wheels 84 and 85, the companion part comprising an end 80', two sides 81' and 82' matched to the ends of the sides 81 and 82 and an inclined bottom 83' similar to the bottom 83, but arranged in reverse order thereto, said companion part having carrying-wheels 84' and 85', all the wheels being mounted on the rails 50 and 51. The car comprises also a draft frame 86 which is secured to the sides 81 and 82 and extends between guide-bars 87 and 87' secured to the sides 81' and 82', and beyond the end 80' when the two parts or sections of the car are joined together. A lock-bar 88 is connected by a pivot 89 to the end 80' and normally rests by gravity in notches 90 and 90' in the draft frame when the two parts of the car are together in normal position after contact with the dead stop 40, the lock-bar 88 being unbalanced on its pivot and extending beyond one side of the car. When the lock-bar is moved out of the notches the part of the car on which it is mounted may move away from the other part within the draft frame. A cable 91 is connected to the end 80 of the conveying car and extends about the guide-sheave 57 and thence over the rotatable guide 38 to the winding-drum 14 to which it is connected, for moving the car outward on the trestle with its load, and another cable 92 is connected to the draft frame 86 and extends over the guide-roller 39 to the opposite side of the winding-drum 14 to which it is connected, it being understood that the two cables 91 and 92 may consist of a single cable wound a few times

about the winding-drum to prevent slippage. In order to dump the load from the conveying car a post 93 is supported on the trestle and has a guide-bar 94 thereon adapted to be engaged by the projecting end of the lock-bar 88 to tilt it from the notches in the draft frame and thus permit the cable 91 to draw one part of the car away from the companion part, and thus permit the load to fall out between the two separated parts.

In practical use the main engine 10 will operate the excavating implement and draw it up and down the inclined guide, and the winding-drum 14 being connected with the winding-drum 12 will be operated also by the main engine to automatically move and control the conveying car, the auxiliary engine 25 being disconnected from the other apparatus, but in case it be desired to move the earth an unusual distance out on the trestle the winding-drum 14 may be disconnected from the main-engine by means of the lever 17, and the auxiliary engine may be connected to the winding-drum 14 by means of the lever 31, so that the conveying car may be operated and controlled independently by the auxiliary engine which, however, may be operated by the attendant who operates the main engine. When the excavating implement is filled and drawn to the upper end of the inclined guide, so that it may be tilted over the guide roller 61 to discharge the earth into the chute 65, the conveying car will stand below the lower end of the chute against the dead stop 40 to receive the load and will be moved outward on the trestle, while the excavating implement descends into the trench, and as will be apparent the excavating implement and the conveying car may be moved simultaneously in harmony by means of the main engine alone.

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

1. An excavator and conveyer including an inclined scoop-guide, and a trestle having track-rails thereon arranged in a plane intersecting the plane of the scoop-guide.

2. An excavator and conveyer including an inclined scoop-guide, and a trestle having track-rails thereon arranged in an inclined plane oppositely to and intersecting the plane of the scoop-guide.

3. An excavator and conveyer including an engine-car, an upright-frame on the engine-car, a trestle attached to the engine-car, track-rails on the trestle, an inclined guide having its lower end secured to the trestle remote from the engine-car and extending upward at one side of and beyond the track-rails toward the upright frame.

4. An excavator and conveyer including an inclined scoop-guide, a trestle having track-rails thereon arranged in a plane in-



intersecting the plane of the scoop-guide, an excavating implement movable on the scoop-guide, a conveyer-car movable on the track-rails, and means operatively connecting the excavating implement and the conveying-car together.

5. An excavator and conveyer including an engine-car, a trestle attached to one end of the engine-car, a scoop-guide extending from below the trestle upwardly through the trestle a distance above the top thereof at an inclined angle thereto, track-rails on the trestle extending past one side of the scoop-guide, and means for supporting the scoop-guide.

6. An excavator and conveyer including an inclined scoop-guide, a trestle having track-rails thereon arranged in a plane intersecting the plane of the scoop-guide, means for connecting the scoop-guide and the trestle together, a hoisting-engine, means for supporting and connecting the hoisting-engine substantially to the scoop-guide and the trestle, an excavating implement movable on the scoop-guide, a conveying-car movable on the track-rails, and means operatively connecting the excavating implement and the conveying-car and also the hoisting-engine operatively together.

7. An excavator and conveyer including a trestle, wheels movably supporting the trestle, track-rails on the trestle, an inclined scoop-guide which intersects the plane of the track-rails and is connected at its lower portion to the trestle for support and is thereby carried by the supporting-wheels, means for supporting the upper portion of the scoop-guide fixedly with respect to the trestle, an excavating implement movable on the scoop-guide, means for moving the excavating implement, a conveying-car movable on the track-rails, and means for moving the excavating-car.

8. An excavator and conveyer including an engine-car, a trestle secured to the engine car with its top extending upwardly therefrom, a scoop-guide extending from below the trestle upwardly a distance above the top thereof at an inclined angle thereto in the direction opposite to the inclination of the top of the trestle, and track-rails on the trestle extending substantially from the engine-car upwardly past one side of the scoop-guide and over to the vertical plane of the scoop-guide and thence beyond in said plane.

9. An excavator and conveyer including a movable engine-car, an engine mounted on the engine-car and comprising two winding-drums operative on one axis, an upright frame on the engine-car, a movable trestle attached to the engine-car, track-rails on the trestle extending from a position opposite one of the winding-drums, an inclined guide at one side of the track-rails with its back opposite the other one of the winding-

drums, rotatable guides mounted on the upright frame, and cables connected to the winding-drums and extending over the rotatable guides.

10. An excavator and conveyer including an engine-car, an engine on the engine-car including two winding-drums operative on one axis, a trestle extending from the engine-car, track-rails extending substantially from one of the winding drums, an inclined guide at one side of the track-rails with its back opposite the other one of the winding-drums, cables connected to the winding-drums and extending respectively along the track-rails and the inclined guide, and a clutch between the adjacent ends of the winding-drums for connecting or disconnecting one with the other.

11. An excavator and conveyer including an engine-car, a main engine and also an auxiliary engine on the engine-car, two winding-drums on the engine-car and operative on one axis, one of the winding-drums being relatively smaller than the other and connected to the main engine, clutch mechanism connecting the winding-drums detachably together, mechanism for detachably connecting the larger winding drum with the auxiliary engine, an excavating implement, a cable connected with the smaller winding-drum and also with the implement, a conveying car, and a cable connected with the larger winding-drum and also with the conveying-car.

12. An excavator and conveyer including an engine-car with an upright-frame thereon, track-rails and also an inclined guide extending substantially from the upright frame in two vertical converging planes, the track-rails extending upwardly from the lower portion of the frame, the guide extending downwardly from the upper portion of the frame, a car on the track-rails, a trestle supporting the track-rails and also partially supporting the inclined guide, a rotative guide mounted on the upright frame at one side of the plane of the inclined guide, a cable extending over the rotative guide to the car, an excavating implement, and a cable extending above the inclined guide to the implement.

13. An excavator and conveyer including an engine-car, an upright frame on the engine-car, a trestle attached to the engine-car, an inclined scoop-guide having its lower end attached to the trestle and its upper end supported on the upright frame, a guide-roller mounted on the trestle above the lower portion of the inclined guide, a guide-sheave anchored remote from the engine-car and beyond the guide-roller, an excavating implement, two rotatable guides mounted on the upright frame, a cable connected with the rear end of the implement and extending about the guide-sheave and under the guide-



roller and thence over one of the rotatable guides, and a cable connected with the forward end of the implement and extending over the other one of the rotatable guides to  
5 be drawn under the guide-roller for guiding the implement from beyond to the lower end of the scoop-guide.

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

JOSEPH L. POTTER.

Witnesses:

WILLIAM H. PAYNE,  
E. T. SILVIUS.

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

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