No. 825,743.

PATENTED JULY 10, 1906.

E. B. MERRY.

EXCAVATING AND CONVEYING SYSTEM.

APPLICATION FILED APR. 27, 1905.

4 SHEETS—SHEET 1.

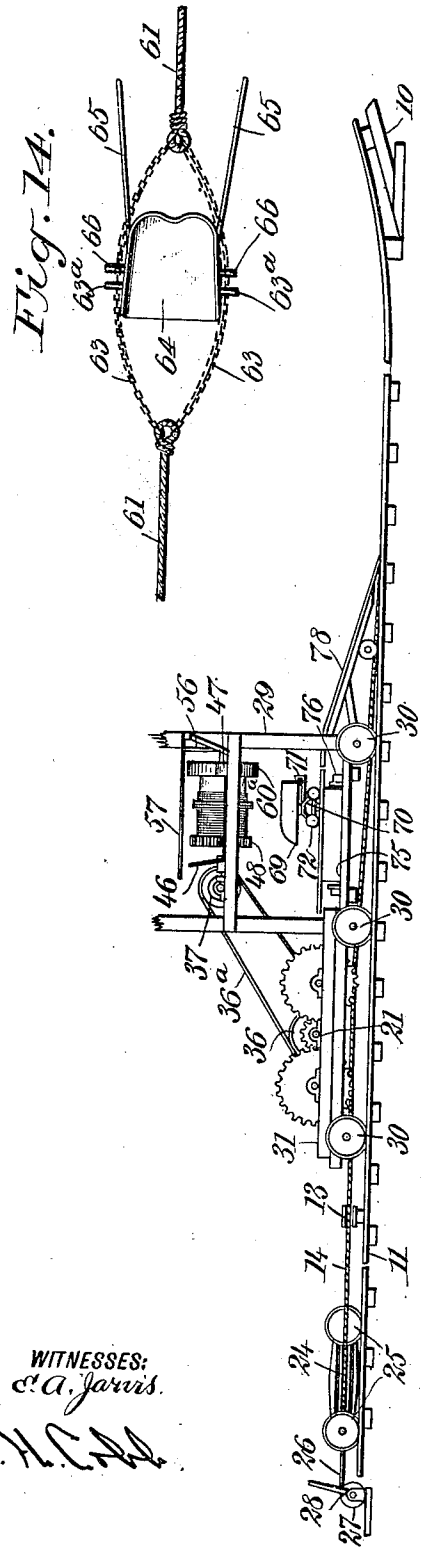


Fig. 1.

Fig. 1a.

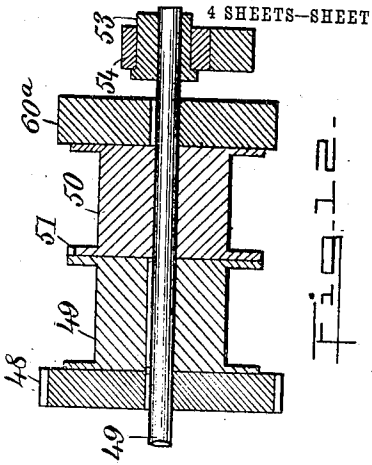


Fig. 1b.

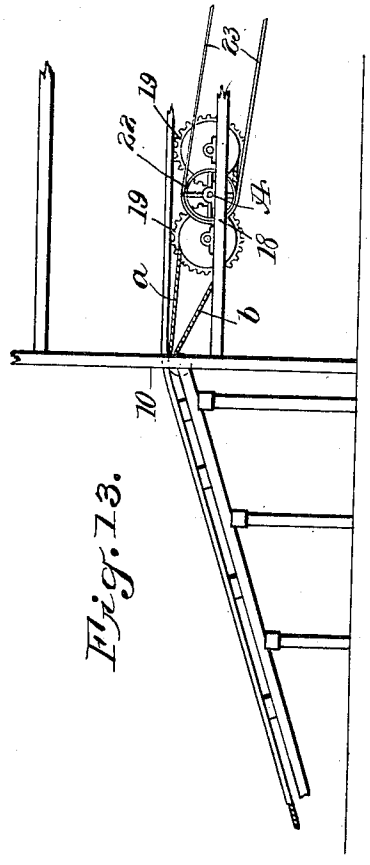


Fig. 1c.

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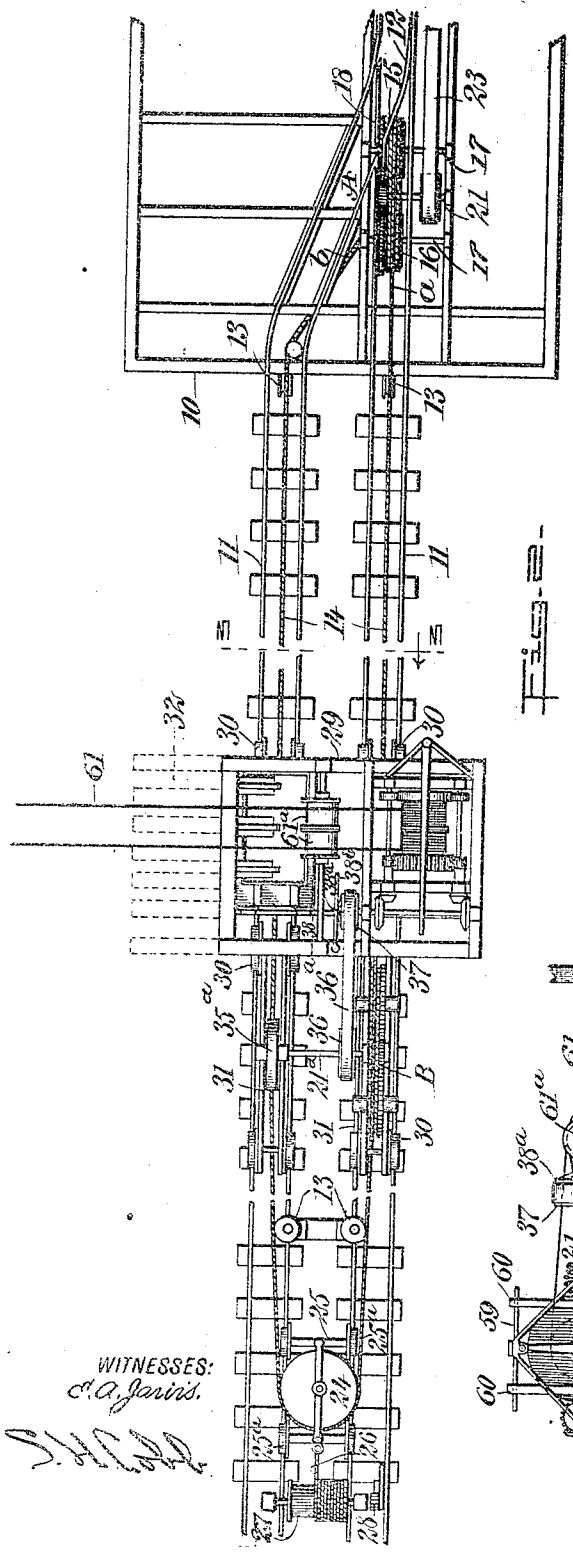


Fig. 2.

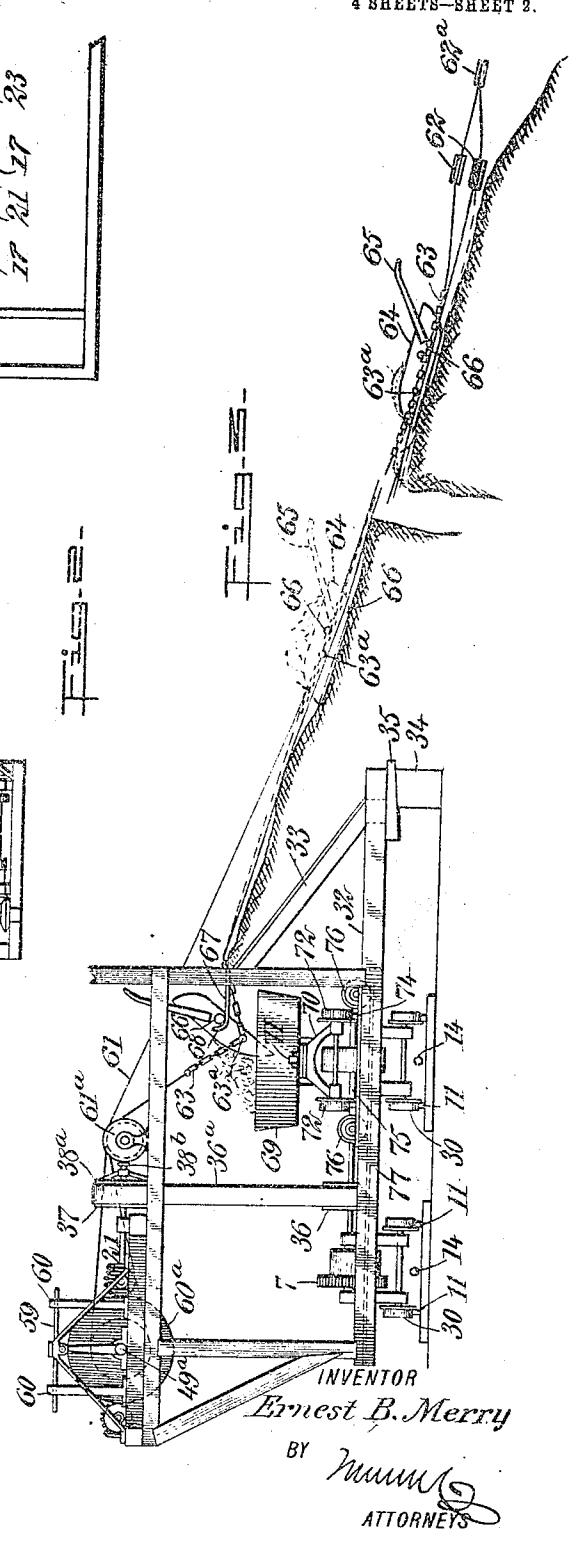


Fig. 3.

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4 SHEETS—SHEET 3.

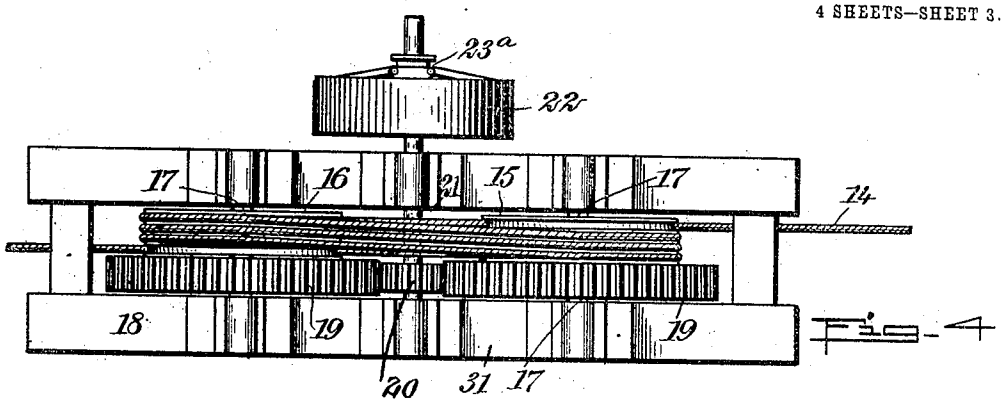


Fig. 4.

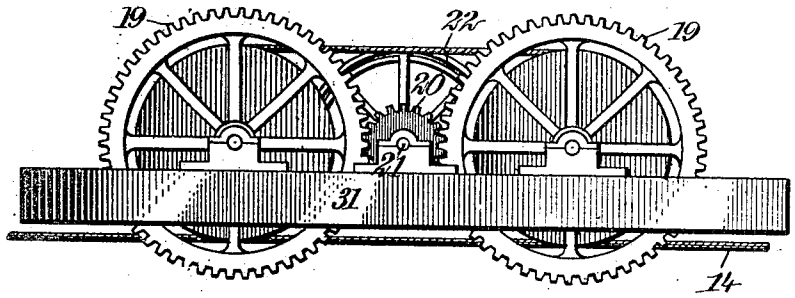


Fig. 5.

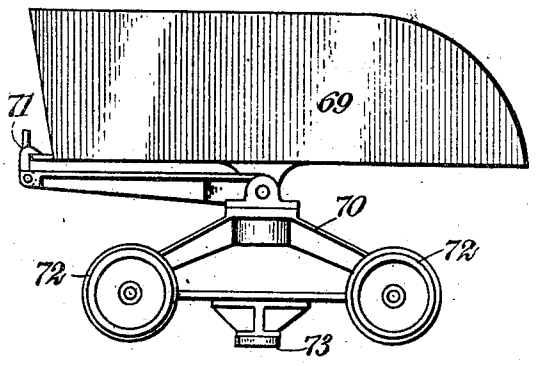


Fig. 6.

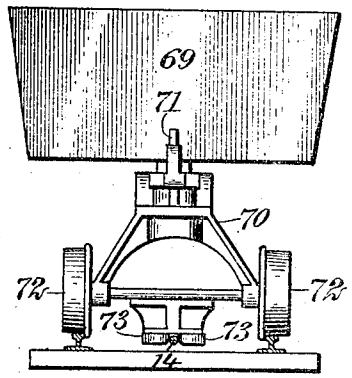


Fig. 7.

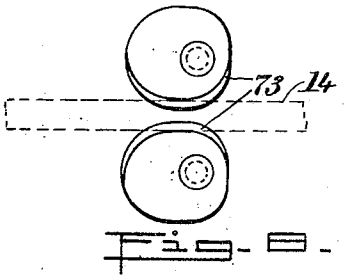


Fig. 8.

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4 SHEETS—SHEET 4.

Fig. 9.

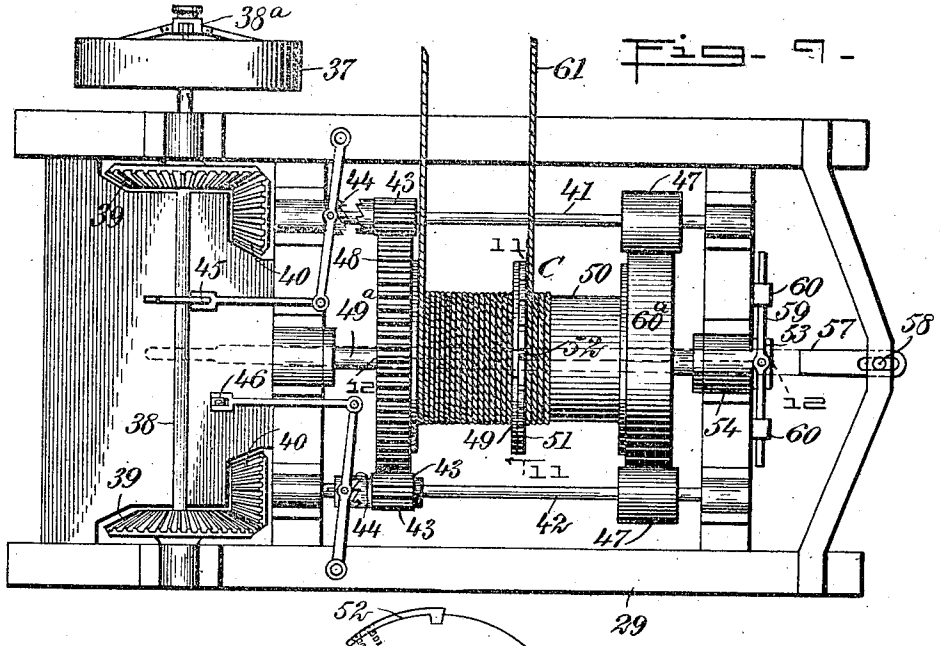


Fig. 11.

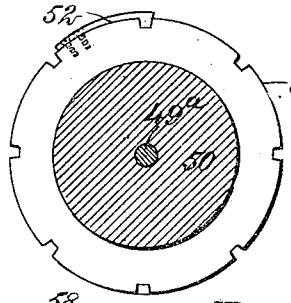
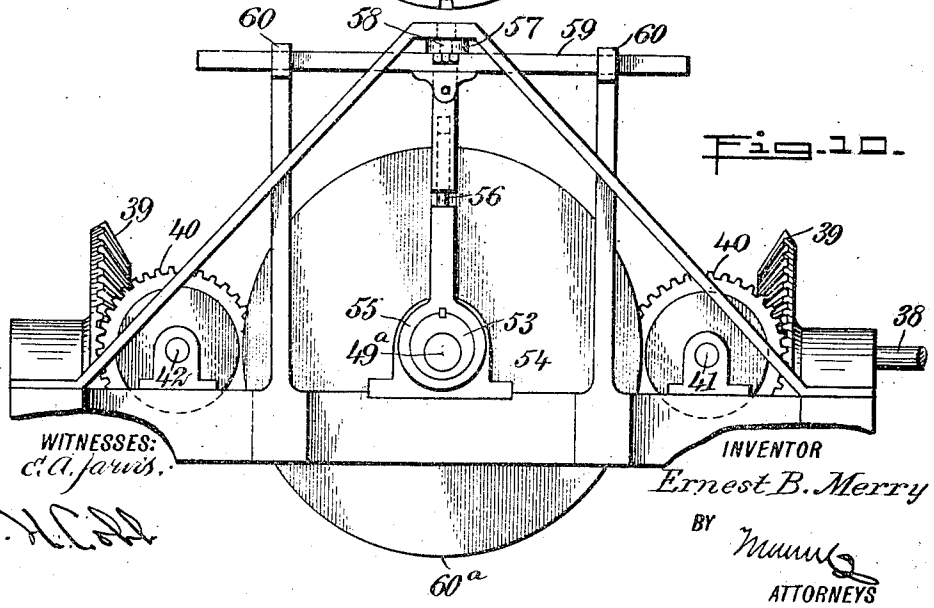


Fig. 10.



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ERNEST BRISCOE MERRY, OF AUGUSTA, GEORGIA.

EXCAVATING AND CONVEYING SYSTEM.

No. 825,743. Specification of Letters Patent. Patented July 10, 1906.

Application filed April 27, 1905. Serial No. 257,608.

To all whom it may concern:

Be it known that I, ERNEST BRISCOE MERRY, a citizen of the United States, and a resident of Augusta, in the county of Richmond and State of Georgia, have invented a new and Improved Excavating and Conveying System, of which the following is a full, clear, and exact description.

My invention relates to systems for excavating various materials and transporting them to desired points in suitable receptacles. Its principal object is to provide a simple and efficient system which will meet a wide range of requirements and be usable in many situations.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a broken side elevation of one embodiment of my invention. Fig. 2 is a top plan view thereof. Fig. 3 is a transverse section on the line 3 3 of Fig. 2 and more particularly illustrating the excavating apparatus. Fig. 4 shows one of the power-multiplying mechanisms in top plan. Fig. 5 is a side elevation thereof. Fig. 6 is a side elevation of one of the cars. Fig. 7 is an end elevation of said car, showing it in place upon the rails. Fig. 8 is a detail in top plan view of the gripping device. Fig. 9 is a top plan view of the operating mechanism for the excavator. Fig. 10 is an end elevation thereof looking from the right in Fig. 9. Fig. 11 is a sectional detail on the line 11 11 of Fig. 9. Fig. 12 is a similar view on the line 12 12 of Fig. 9. Fig. 13 is a detail view showing the construction and organization of certain parts more clearly; and Fig. 14 is a plan view of a scoop and a portion of the cable, showing the chain sections thereof and in engagement with the projections of the scoop.

10 designates a mill or structure to which the material is to be conveyed and to which lead tracks 11 11, which may extend in any desired direction and are preferably connected within the structure by a switch 12. Between the tracks throughout their length are rolls 13, which support and guide an endless cable 14. Within the structure this cable engages a power applying and multiplying mechanism A, this having sheaves 15 and 16, fixed upon shafts 17 17, journaled in a frame 18. In the sheaves are a suitable number of alined grooves to receive the cable, the cable first passing under the sheaves at *a* into the outermost grooves thereof, thence up over the sheave 15 and around the sheave 16, and so on until the number of turns necessary to transmit the power are made, after which the cable leaves the multiplying mechanism at *b*. (See Figs. 2, 4, and 13.) Fixed upon each of the shafts 17 is a gear 19, and with each of these gears, operating to rotate them in opposite directions, meshes a pinion 20, secured upon a shaft 21, extending between the sheaves. This shaft also carries a pulley 22, which may receive power from any suitable source through a belt 23. Associated with this pulley is shown a clutch 23ª for controlling the application of power. At the opposite end of the system the cable engages a take-up device comprising a sheave 24, over which it passes, said sheave being mounted upon a car 25, having wheels 25ª running upon the inner rails of the tracks. To the journal of the sheave is connected a cable 26, secured at its opposite extremity to a relatively fixed drum 27, associated with which is a ratchet-lever 28, by means of which the drum may be turned to move the car, and thus place the proper tension upon the cable.

Situated between the mill and the take-up device is a transferring-frame 29, mounted upon sets of wheels 30, coöperating with both tracks, a portion of these wheels being journaled upon extensions 31 31. The frame preferably has laterally-projecting beams or members 32, from which braces 33 may extend to the upper portion of the frame. Between the outer ends of the beams and relatively fixed blocks or members 34 wedges 35 may be driven, tending to fix the position of the frame and to take the strain off the wheels.

Carried by one of the frame extensions is a multiplying mechanism B, which may be in all respects similar to that designated as A and previously described, except that here the cable passes from the sheaves in opposite directions along the track. The shaft 21ª of this mechanism B may be provided with a driving-pulley 35ª, to which power may be applied, if for any reason it is more convenient to operate the system from this point rather than at the mill. The shaft also has fixed upon it a pulley 36, connected by a belt 36ª with a pulley 37, mounted upon a shaft 38,

journaled in the upper portion of the transferring-frame. This pulley 37 may be normally loose upon its shaft, but may be constrained to rotate therewith by a clutch 38[a], operable by a lever 38[b]. Fast upon the shaft 38 are opposite bevel-gears 39 39, with which mesh similar pinions 40, secured upon shafts 41 and 42. Loose upon these last-named shafts are spur-pinions 43, which, when desired, may be compelled to rotate with other shafts by clutches 44, having oppositely-inclined jaws. The clutches may be shifted into or out of engagement by levers 45 and 46, which are associated with the shafts 41 and 42, respectively. Near the opposite extremities of these shafts are fixed friction-rolls 47. The pinions 43 lie upon opposite sides of and mesh with a gear 48, carried by the section 49 of a drum C, said section being fixed to a shaft 49[a], journaled in the transferring-frame. Adjacent to the section 49 and being capable of turning loosely upon the shaft is a second section 50, which is shown as having a notched ring or flange 51, which may be engaged by a spring-detent 52 upon the extremity of the companion section. The outer bearing 53 of the shaft 49[a] is movable in a housing 54 and has an eccentric portion embraced by an eccentric-strap 55, from which projects an arm 56, conveniently formed in telescoping sections. Engaging the upper end of this eccentric arm is a lever 57, fulcrumed at its outer end at 58 and guided adjacent to the arm 56 by a transverse bar 59, movable through opposite supports 60 60. The lever 57 may be shifted in either direction and by virtue of the eccentric support of the bearing bring a cylindrical friction-surface 60[a] upon the drum-section 52 into coöperation with one of the friction-rolls 47, these being of greater diameter than the pinions 43, and thus producing rotation of the drum at a greater speed, but presenting the capability of slipping if there is undue resistance.

Attached to the drum-sections are the opposite ends of a cable 61, which runs over said sections in opposite directions, so that for rotation in either direction one will be unwound as the other is wound. From the drum both runs of the cable pass over guide-rolls 61[a], journaled upon the frame, and at the outer looped end of the cable are supporting and guide rolls 62 62 and 62[a]. The rolls 62 62 space the runs the proper distance apart, while the rolls 62[a] may be mounted for independent movement to enable the slack to be taken up. In the cable-runs are double chain sections 63, which are secured to projections 63[a] from opposite sides of excavating members or scoops 64, which are preferably provided with handles 65 to control their application. The scoops also have opposite projections 66, which may engage pairs of guide members 67 67, extending inwardly from one side of the transferring-frame beneath the cable 61. At the inner ends of these guide members are stop portions 68, with which the projections 66 contact to limit the inward movement of the scoops, which are then freed to swing downwardly and discharge their load.

The scoops deliver to cars or receptacles 69, each of which has a body portion carried by a frame 70, upon which it may turn and tilt, it being locked in its normal position by latch mechanism 71. The frames are mounted upon wheels 72, adapted for coöperation with the tracks, and have grip mechanism 73, which may be as illustrated in Fig. 8 of the drawings, its relation to the cable being such that movement of said cable in one direction will tend to automatically set the grip and effect the movement of the cars therewith. This grip mechanism may also be operated in any customary manner to release it from the cable to stop the car. Beneath the points of discharge of the scoops is a track 74, mounted upon a platform 75, having at its under side wheels 76, which operate over rails or ways 77, situated at the lower portion of the transferring-frame. This platform may be shifted upon the frame to bring the track 74 into alinement with one or the other of the main tracks 11, and as the tracks upon the frame are, for convenience in delivering material to the cars, above the level of the main tracks inclines 78 are provided, having rails connecting the tracks 11 with the platform-track 74.

A car being upon the frame-platform beneath the guide members 67 and one of the scoops at the outer end of the cable 61 adjacent to the guide-rolls, the lever 45 is moved to throw the clutch of the shaft 41 into engagement. This causes the drum to be positively rotated at a comparatively slow speed, winding up the run of the cable to which the outer scoop is attached and unwinding its companion. This draws the scoop over the surface from which the material is to be taken and upon a proper manipulation of the handle is loaded as it advances. This having been accomplished, the lever 45 is moved to release the clutch and the lever 57 shifted to bring the surface 60[a] into coöperation with the friction-roll upon the shaft 41. This continues the travel of the scoop toward the transferring-frame, but at a greater speed, and allows the driving mechanism to slip in event of its striking an obstruction. When the projections 63[a] of the scoop reach and ride upon the guides 67, the lever 57 is brought to its central position, separating the friction-surfaces and stopping the cable. The scoop now swings upon the guides and its load is delivered to the car waiting to receive it. As the scoop is being drawn toward the frame with its load, as has just been described, a companion scoop upon the opposite run of the cable which has pre-

viously delivered its charge is moved outwardly and carried to a point adjacent to the guide-rolls 62. The operation of the clutch-lever 46 and an opposite movement of the lever 57 rotate the drum C in the same manner, but in the opposite direction, causing a reverse movement of the cable and the delivery of a load by the companion scoop, the frame-platform having been moved to bring the car into the proper position. When the loading of the car is completed, it is started down the incline to the track along which the cable 14 is moving toward the mill, and its gripping device engaging the cable causes it to be moved into the mill. Here it is emptied and transferred by the switch to the out track, its gripping mechanism brought into engagement with this run of the cable, and is thus carried back to the platform of the transferring-frame. The operation of loading and delivery may then be repeated. When it is desired to change the field over which the excavating apparatus works, it is only necessary to knock out the wedges 35 and move the transferring-frame to a new position on the track, resetting the guide-rolls 62 and 62[a] to correspond therewith. If one wishes to lengthen or shorten the cable 61, the latch between the drum-sections is thrown out of engagement, whereupon the cable may be wound upon or unwound from the drum. With the sections secured to one another this would obviously be impossible, since rotation in either direction would pay off one run as rapidly as the other was wound on. It will be obvious that by a slight rearrangement of the elements upon the frame the excavating-cable may be caused to operate at either side of the tracks.

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

1. In an excavating and conveying system, the combination with tracks, of a frame movable thereon, an excavating apparatus delivering to the frame, and a car movable upon the tracks to a point within the frame.

2. In an excavating and conveying system, the combination with tracks, of a frame carried thereby and having a platform, an excavating apparatus delivering to the frame, an incline connecting the tracks and frame-platform, and a car movable upon the tracks and incline.

3. In an excavating and conveying system, the combination with tracks, of a frame carried thereby and having a platform movable independently of the frame, an excavating apparatus delivering to the frame, an incline connecting the tracks and frame-platform, and a car movable upon the tracks and incline.

4. In an excavating and conveying system, the combination with tracks, of a frame, an excavating apparatus delivering to the frame, a conveying apparatus associated with the tracks and comprising a traveling cable, and means for transmitting the movement of the cable to the excavating apparatus.

5. In an excavating and conveying system, the combination with tracks, of a frame, an excavating apparatus delivering to the frame, a conveying apparatus associated with the tracks and comprising a traveling cable, and a power-multiplying mechanism through which the movement of the cable may be transferred to the excavating apparatus.

6. In an excavating and conveying system, the combination with tracks, of a frame, an excavating apparatus delivering to the frame, a conveying apparatus associated with the tracks and comprising a traveling cable, and a power-multiplying mechanism through which the movement of the cable may be transferred to the excavating apparatus and including a power-receiving member.

7. In an excavating and conveying system, the combination with tracks, of a frame, an excavating apparatus delivering to the frame, a conveying apparatus associated with the tracks and comprising a traveling cable, means for transmitting the movement of the cable to the excavating apparatus, and means for varying the speed of the excavating apparatus independently of the travel of the cable.

8. In an excavating and conveying system, the combination with tracks, of a frame, an excavating apparatus delivering to the frame, a conveying apparatus associated with the tracks and comprising a traveling cable, means for transmitting the movement of the cable to the excavating apparatus, and means comprising positive and frictional gearing for varying the speed of the excavating apparatus independently of the travel of the cable.

9. An excavating apparatus comprising a drum, a cable having its ends secured to the drum and extending about it in opposite directions, a guide for the outer loop of the cable, excavating members attached to the cable at opposite sides of the guide, and means for rotating the drum in opposite directions and including positive and frictional gearing.

10. An excavating apparatus comprising a drum, a cable having its ends secured to the drum and extending about it in opposite directions, a guide for the outer loop of the cable, excavating members attached to the cable, and means for rotating the drum at different speeds.

11. An excavating apparatus comprising a drum, a cable having its ends secured to the drum and extending about it in opposite directions, a guide for the outer loop of the cable, excavating members attached to the ca-

ble, positive gearing for rotating the drum, and frictional gearing for rotating said drum more rapidly.

12. An excavating apparatus comprising a drum, a cable secured to the drum, an excavating member attached to the cable, toothed and frictional gearing for rotating the drum, a clutch associated with the toothed gearing, and means for moving the frictional gearing into and out of engagement.

13. An excavating apparatus comprising a drum, a cable secured to the drum, an excavating member attached to the cable, toothed and frictional gearing for rotating the drum, and means for moving the drum to engage and disengage the frictional gearing.

14. An excavating apparatus comprising a drum having a section fixed to a shaft and a section loose on the shaft, means, whereby the sections are caused to turn together, a cable having its ends secured to the drum-sections, and an excavating member attached to the cable.

15. An excavating apparatus comprising a drum, a cable secured to the drum, a scoop attached to the cable, and stop-arms upon which the scoop may swing.

16. An excavating apparatus, comprising a drum formed of sections, one fixed to a shaft and the other loose on said shaft, one of the sections being provided with a notched rim, a spring-detent on the companion section and engaging the notched rim, a cable having its ends secured to the sections of the drum, and an excavating device attached to the cable.

17. In an excavating apparatus, the combination of a drum, a cable having its ends wound in opposite directions on the drum, an excavating device attached to the cable, positive and frictional gearing for alternately operating the drum, and means whereby when the frictional gearing is thrown into action the positive gearing will be thrown out of action.

18. In an excavating apparatus, the combination of a drum, provided at one end with a gear-wheel and at the other end with a friction-wheel, a cable having its ends wound in opposite directions on the drum, an excavating device attached to the cable, a shaft having a pinion and friction-roll for engaging respectively the gear and friction wheels of the drum, and means whereby the pinion and friction-roll are rendered alternatively active and inactive.

19. In an excavating apparatus, the combination of a drum, mounted in a movable bearing at one end and provided at one end with a gear-wheel and at the other end with a friction-wheel, a cable having its ends wound in opposite directions on the drum, an excavating device attached to the cable, a drive-shaft, shafts geared with the drive-shaft and arranged on opposite sides of the drum, a pinion loose on each of the said shafts, clutches for connecting the pinions with the shafts, friction-rolls on the shafts, and means for operating the movable bearing of the drum,

20. In an excavating and conveying system, a frame, tracks leading to the frame, a car movable upon the tracks and adapted to enter the frame, an excavating device delivering to the car, and means within the frame, whereby the car may be shifted to either of the tracks.

21. In an excavating and conveying system, tracks, a frame mounted upon the tracks, inclined tracks leading from the main tracks to the frame, a car movable on the tracks and adapted to enter the frame, an excavating device delivering to the car, and means within the frame, whereby the car may be shifted to either of the tracks.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ERNEST BRISCOE MERRY.

Witnesses:
J. T. OLIVE,
M. B. GRIFFIN.