

Feb. 2, 1926.

A. E. NORRIS

1,571,732

CAR HAULAGE PLANT.

Filed May 5, 1924

5 Sheets-Sheet 1

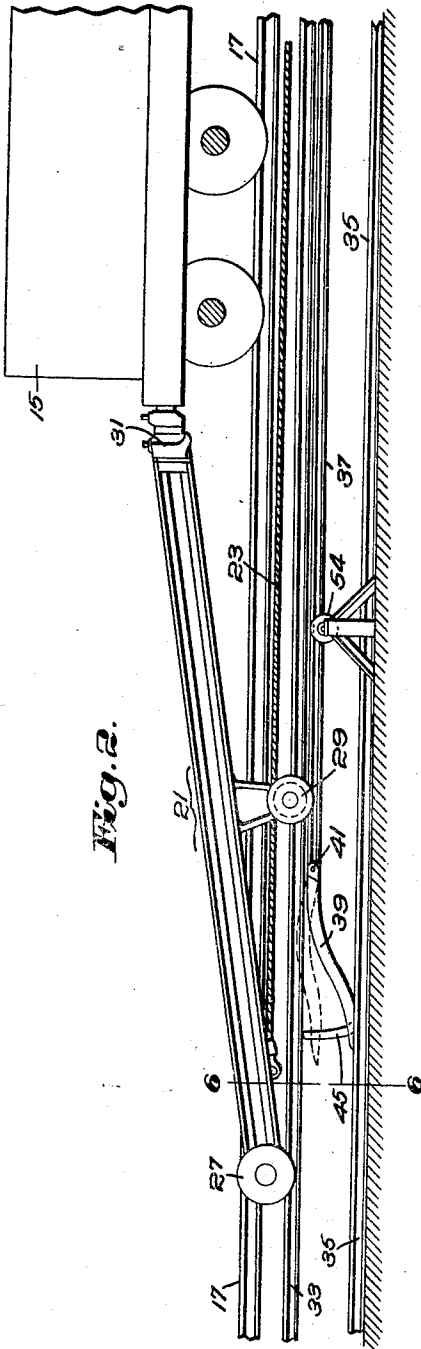


Fig. 2.

Fig. 1.

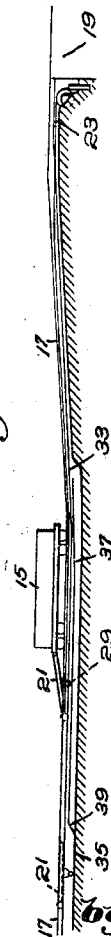
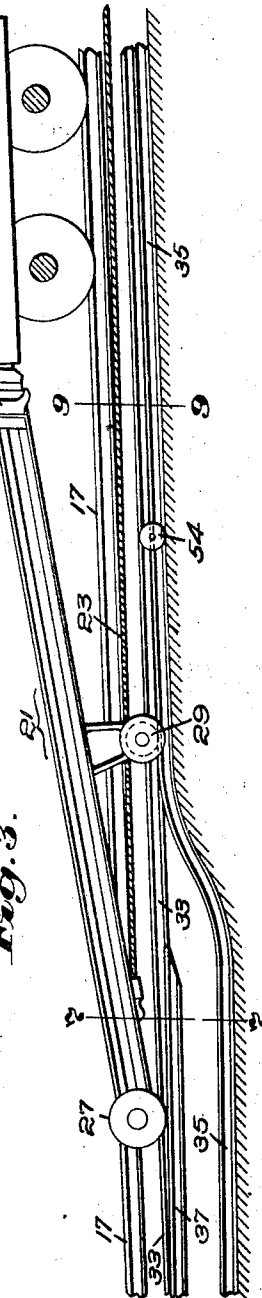


Fig. 3.



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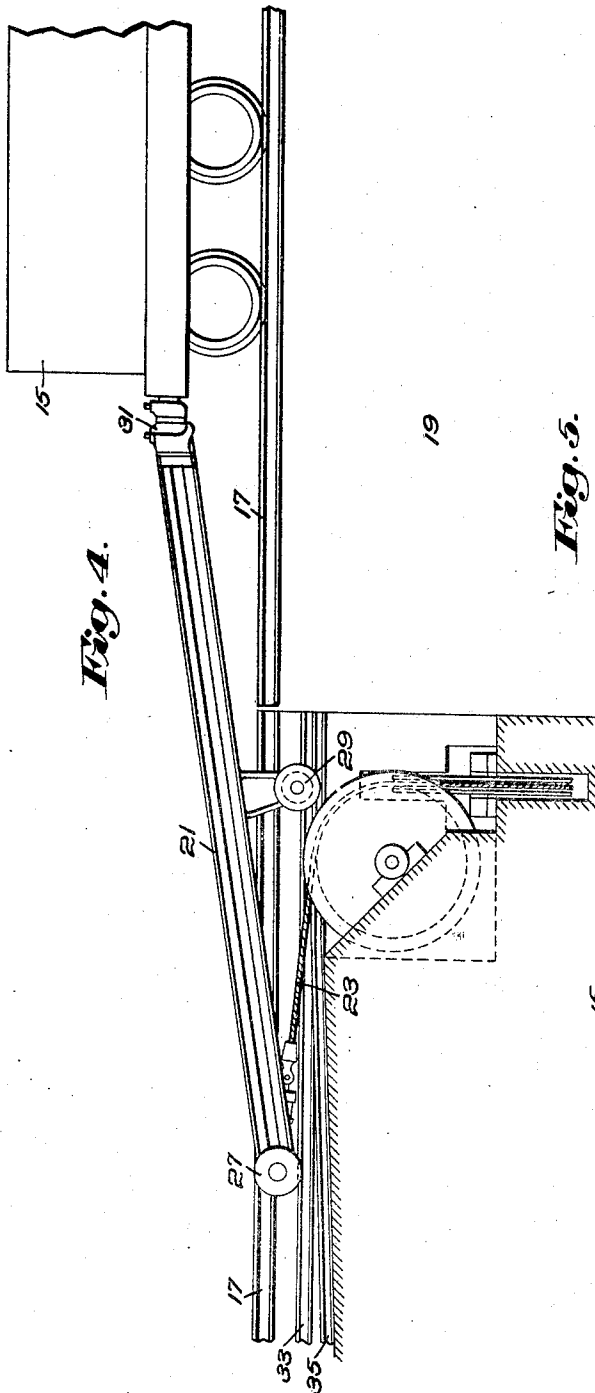


Fig. 4.

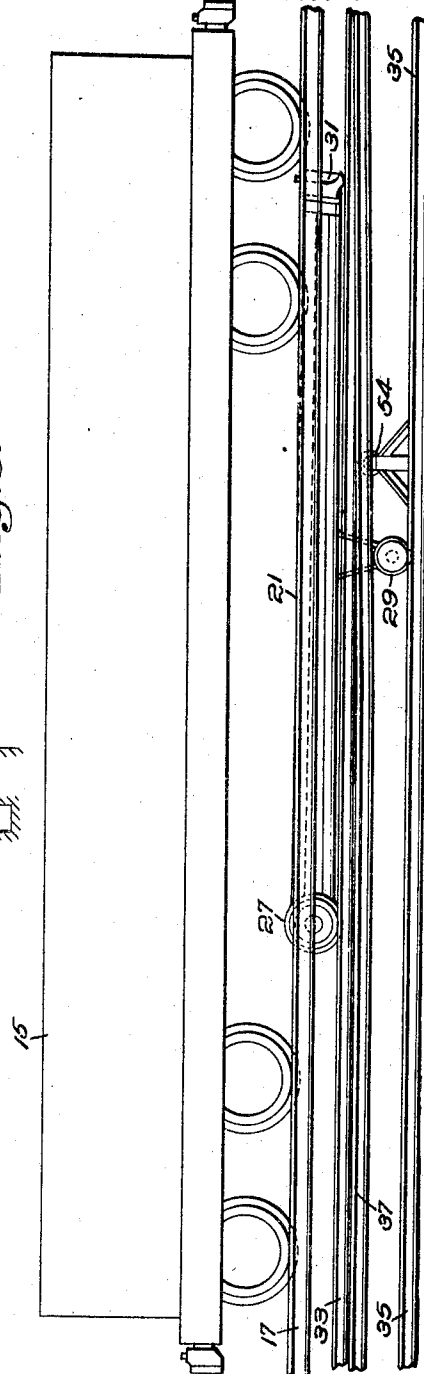


Fig. 5.

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Fig. 6.

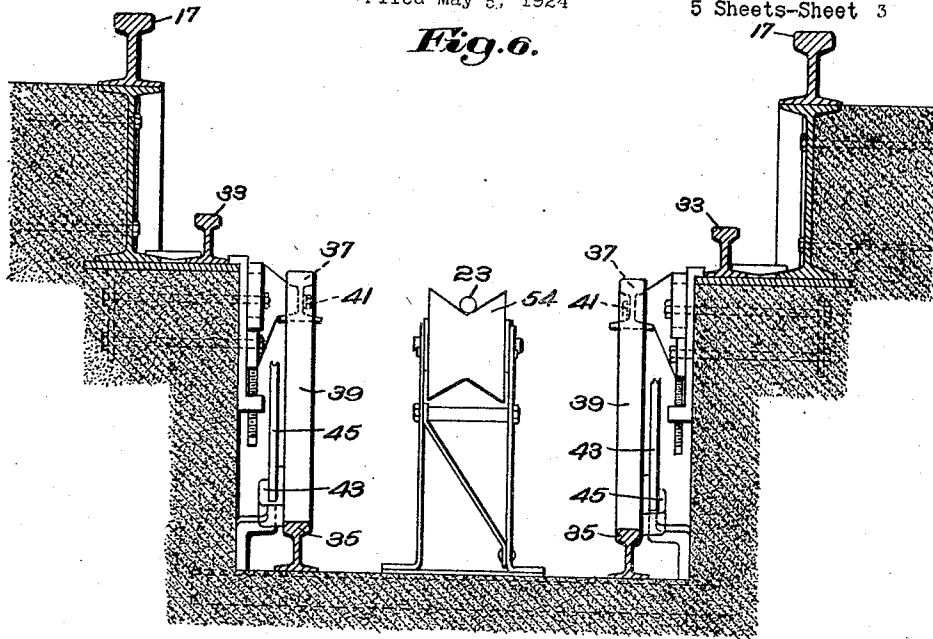
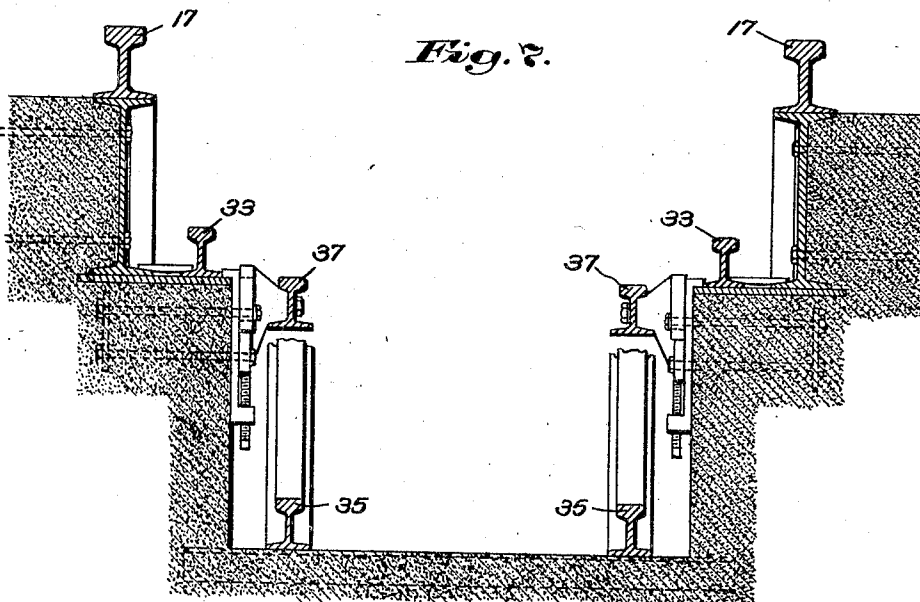


Fig. 7.



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Fig. 8.

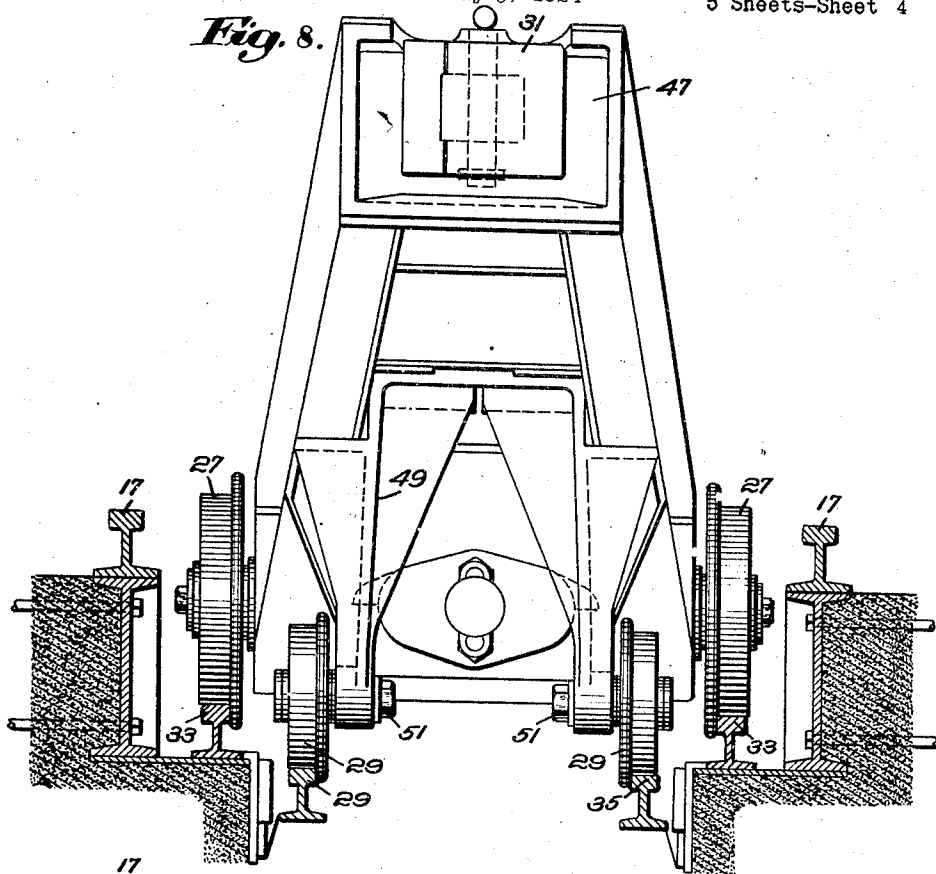
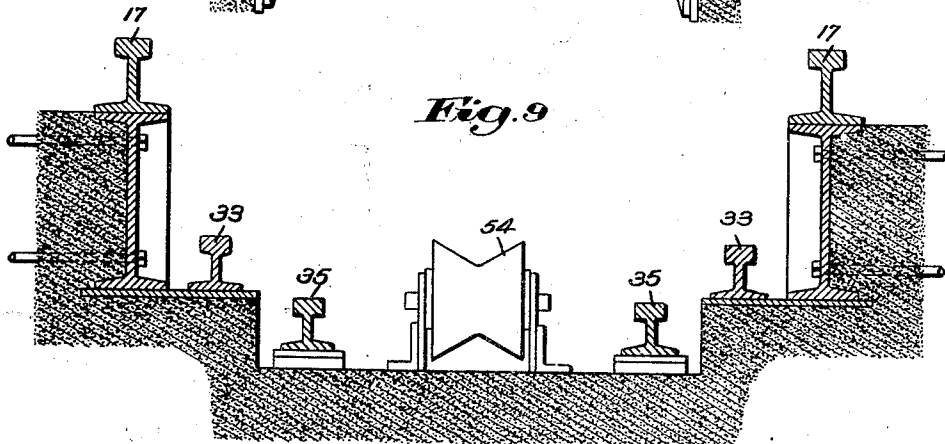


Fig. 9



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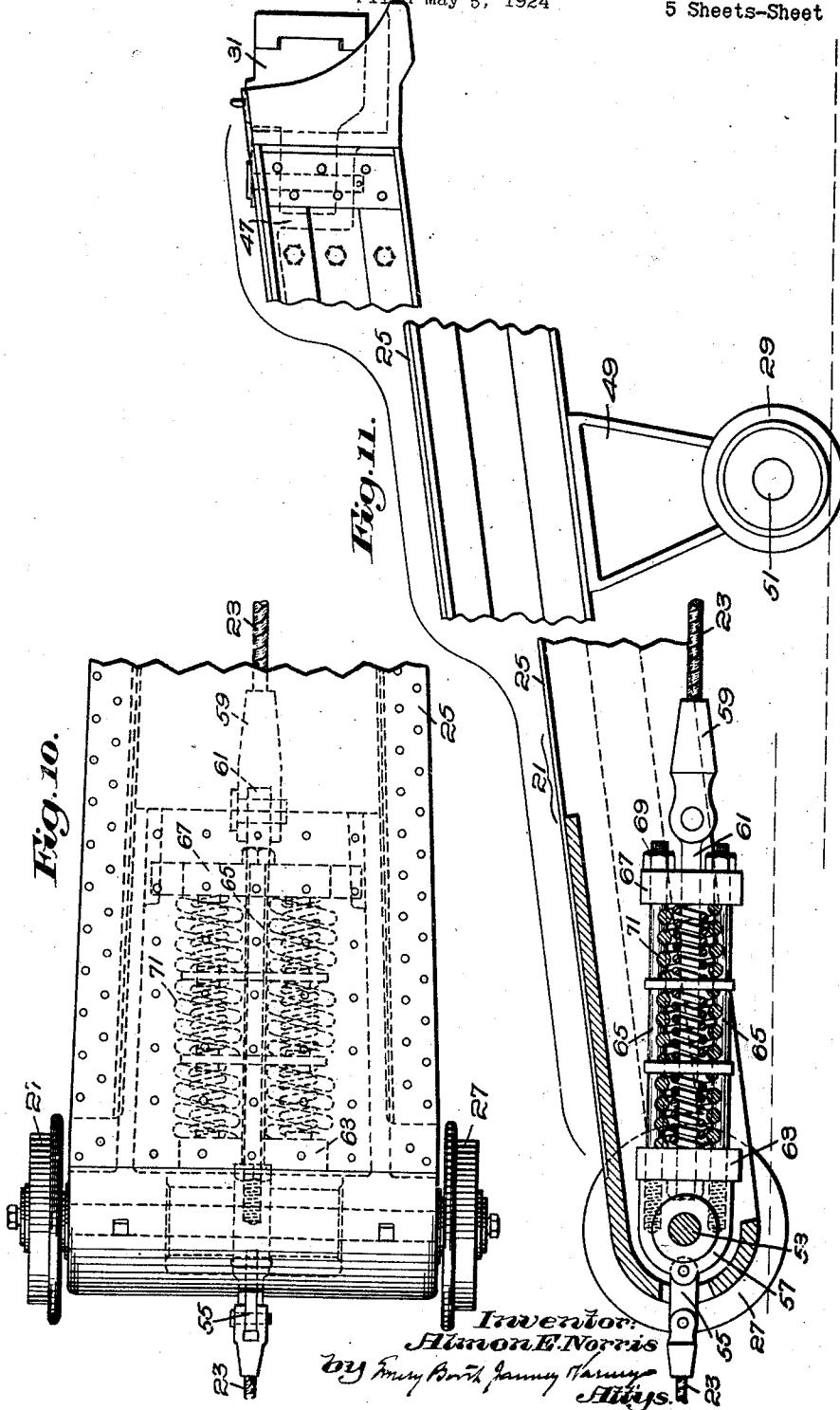
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Filed May 5, 1924

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Inventor:
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UNITED STATES PATENT OFFICE.

ALMON E. NORRIS, OF BROOKLINE, MASSACHUSETTS.

CAR-HAULAGE PLANT.

Application filed May 5, 1924. Serial No. 710,960.

To all whom it may concern:

Be it known that I, ALMON E. NORRIS, a citizen of the United States, and a resident of Brookline, in the county of Norfolk and State of Massachusetts, have invented an Improvement in Car-Haulage Plants, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to car haulage devices, and more particularly to car haulage plants or systems which utilize pusher or other haulage cars for moving a loaded freight car into position for the discharge or dumping of its load.

The invention will be best understood by reference to the following description when taken in connection with the accompanying illustration of one specific embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

In the drawings,—

Fig. 1 is a partial, longitudinal, sectional view of a car haulage plant embodying one form of my invention, the haulage car being shown in engagement with a loaded freight car and about to push the same into position for dumping;

Fig. 2 is a longitudinal, sectional view on a larger scale showing that part of the branch guide-track section which serves to bring the pusher car into position for engagement with a freight car;

Fig. 3 is a similar view showing the forward end of the branch guide-track section and the beginning of the inclined track portion;

Fig. 4 is a similar section showing the car dumper and the delivery end of the pusher car track section.

Fig. 5 is a similar section showing a portion of the guide-track section intermediate those shown in Figs. 2 and 3, and illustrating the return of the pusher car beneath the loaded freight car;

Fig. 6 is a cross sectional elevation on the line 6—6 in Fig. 2 showing the trackage arrangement thereat;

Fig. 7 is a similar view taken on the line 7—7 of Fig. 3;

Fig. 8 shows the front end of the pusher car and its relation to the separate pusher car tracks;

Fig. 9 is a sectional elevation showing the

trackage arrangement taken on the line 9—9 in Fig. 3;

Fig. 10 is a plan view partly broken away, showing the pusher car; and

Fig. 11 is a side elevation, partly in section and partly broken away, also showing the pusher car.

Referring to the drawings and to the embodiment of the invention there submitted for illustrative purposes, the invention is shown as embodied in a car haulage plant in which a loaded freight car 15 is adapted to be propelled either by gravity or otherwise along the main trackway 17 (Figs. 1 to 5 inclusive) to a substantially horizontal track section at a point short of a car dumper 19, which latter is reached over a short incline (Figs. 1 and 3) and to which the car is delivered by a haulage car, herein of the "pusher" type. For this purpose the rear of the loaded car on the horizontal track section is engaged by a pusher car 21, sometimes known as a "barney", the latter being propelled by a cable 23 to push the freight car up the incline onto the car dumper 19, where it is left by the pusher car or barney, which returns to engage and move a succeeding loaded car into dumping position. To permit the pusher car to pass the succeeding loaded freight car which has meantime been positioned on the horizontal track section, the latter is provided with what may be termed a transfer station, equipped with devices which permit the pusher car to pass beneath the loaded car but thereafter to engage the latter when the pusher car is moved in the opposite direction.

In the disclosed embodiment of the invention, the haulage car comprises a single frame member 25 (Figs. 10 and 11) supported on rear truck wheels 27 and forward truck wheels 29, the frame being preferably prolonged beyond the forward truck wheels and provided at its ends with a standard car coupler, designated at 31, through which it may be coupled to the rear end of the loaded freight car 15. The rear truck wheels of the pusher car or barney are mounted to run upon the main pusher track section 33 which (Figs. 6 to 9 inclusive) comprises a pair of rails, preferably arranged between the freight rails 17 and at a somewhat lower level, such that, with the pusher car frame in a substantially horizontal position, there is space for the latter

to pass beneath the freight car with ample clearance. In the illustrative embodiment of the invention, the tracks 33 have a substantially unvarying elevation with relation
5 to the freight car track 17.

The forward truck wheels 29, however, are arranged to run upon rails separate from the rails 33 and at a height which may vary relatively to the height of the rails 33,
10 so that the pusher car frame in its successive movements may be caused to tilt up into a position to engage and move the freight car, or to tilt down and pass beneath another car on its return movement, as may
15 be required. By having the two sets of truck wheels running on independent tracks at variable relative elevations, the front end of the pusher car may be raised or depressed as required by a simple tilting movement of
20 the car as a whole without the employment of movable parts on the car and without the necessity of raising or lowering the car as a whole.

Referring to the drawings, and more particularly to Figs. 1 to 9 inclusive, the forward truck wheels 29 are adapted to run upon the guide-track section comprising rails 35 which, as herein shown, have a slightly narrower gauge than the rails 33.
25 On the inclined portion of the trackway, the guide-track section 35 is arranged on a level slightly below that of the track section 33 (see Figs. 3 and 9), or, in other words, at such a height as to tilt up the
30 frame of the pusher car at a suitable angle for engagement with the rear end of the freight car 15. At the foot of the incline, however, there is arranged a transfer station having a pit or hollow into which the
40 guide-track section 35 is depressed relatively to the tracks 17 and 33 so that, after the pusher car has delivered a car to the dumper, been uncoupled therefrom and is hauled back on its return movement, the truck
45 wheels 29 descend on the depressed portion of the rails 35, tilting down the pusher car frame to a substantially horizontal position, as shown in Fig. 5, in which position it is adapted to pass with ample clearance
50 beneath the loaded car 15, which meantime has been placed or moved into position preparatory for haulage to the dumper. The depression in the guide-track 35 extends for a considerable distance so that
55 considerable latitude may be had in positioning the car 15, and at the same time the barney may be brought to the rear of the freight car without interference therewith.

To tilt back the pusher car so that the same may engage the loaded car after the pusher car has passed beneath the same, there is provided a branch track section 37 having the same gauge as the track 35 and immediately above the same, and means are
60 provided for transferring the truck wheels

to this branch track section on forward movement of the pusher car so as to bring car coupling 31 up into alignment with the cooperating coupling member on the freight car. For this purpose each rail of the elevated branch track section 37 terminates at its rear end in a rail section 39 hinged at 41 to the rail 37. The rail section 39 is inclined down to overlie the rail 35 and act as a switch for transferring the forward trucks
70 from the lower track section 35 to the upper track section 37 when the pusher car is moved forward. Each hinged switch rail 39 is secured to a guide block 43 which slides over a guide sector 45 (see Fig. 6) to
75 permit a limited up and down movement of the switch rail. On the return or idle movement of the pusher car the forward truck wheels 29 pass beneath the respective switch rails and lift them, the rails dropping into their normal depressed position after the truck wheels have passed beyond
80 the same. The switch is then set for guiding the trucks 29 up the incline and on the branch track 37, and for tilting the pusher car from the position shown in Fig. 5 to the position shown in Fig. 2 as soon as it is moved forward.

Referring now more particularly to Figs. 8, 10 and 11, and to the construction of the pusher car or barney, the frame 25 for the latter is composed of a single, unitary piece 25 tapered in plan from the rear to the front and terminating at the front end in a pusher head 47, in which is secured the standard car coupler 31. The forward end of the unitary frame is rigidly secured to a yoke-shaped support 49, the opposite legs of the latter being fixedly secured to axles 51 on which the truck wheels 29 are journaled. The rear end of the frame is keyed or otherwise fixedly secured to the rear axle 53, on which latter the rear truck wheels 27 are journaled. As the forward truck wheels 29 rise and fall with varying elevations of the trackway on which they run, the entire frame tilts up or down, as the case may be, varying the height of the pusher head and coupling.

The haulage cable 23, which is preferably in endless form and suitably controlled by power-driven, cable-winding apparatus to move the pusher car in either direction at will, passes over appropriately positioned guide rollers 54 and is connected at one end to the pusher car by the link 55 secured to the swivel coupling block 57, the latter mounted directly on the rear axle 53 of the pusher car but capable of relative rotation thereon. The remaining end of the cable is secured by the coupling 59 to an eye formed in the end of the draw-bar 61, which latter is attached to the draw-plate 63. The draw-plate is mounted for sliding movement on the upper and lower rods 65
115
120
125
130

which are threaded into the coupling block, the forward ends of the rods carrying a plate 67 secured thereto by nuts 69, the plate 67 serving as an abutment for two sets of springs 71 arranged on either side of the draw-bar. Single springs may be employed, but herein compound springs are utilized comprising several sections of large springs, with concentrically arranged smaller springs and interposed plates between the successive sections.

This arrangement of parts provides a shock absorbing connection for the cable to the pusher car so as to minimize the effects of sudden starts, stops or other shocks.

In the operation of the haulage plant described, the pusher car, having delivered a loaded car to the dumper, is uncoupled therefrom and hauled back down the incline through the movement of the haulage cable. When the car reaches the transfer station, the rear truck wheels continue their travel along the tracks 33 which retain substantially the same elevational relation to the tracks 17, but the forward truck wheels pass down the inclined portion of the track 35 and into the pit, serving to tilt down the front end of the pusher car frame with relation to the rear end and leaving the frame in substantially horizontal position, as shown in Fig. 5. In this relation the pusher car continues its travel, passing readily beneath the loaded freight car 15 which meantime has been positioned over the transfer station. After the pusher car has emerged from beneath the opposite end of the car 15, the forward truck wheels pass under the switch rails 39, which latter yield upwardly and then drop into position in front of the truck wheels. The movement of the cable is then reversed, propelling the pusher car forward and transferring the truck wheels up the inclined switch rails and onto the branch tracks 37, this serving to again tilt up the forward end of the pusher car frame and bring the coupling 31 into registration with its companion member on the freight car. The pusher car being coupled to the freight car, the Barney is propelled forward carrying the freight car up the incline and onto the dumper. In passing out of the transfer station, the truck wheels leave the branch track 37 and again engage with the auxiliary track 35, being sustained in passing the gap by the coupling connection of the front end of the Barney to the freight car.

It will be observed that the main pusher track 33 constitutes a pusher car guide extending lengthwise the main track and adapted to be engaged by a guide device on the pusher car, which herein comprises the rear truck wheels. Also that the auxiliary track 35 and branch auxiliary track

37, elevationally separated therefrom, constitute auxiliary guides separately engaged by an auxiliary guiding device on the pusher car, which herein comprises the front truck wheels, and that these are elevationally arranged with relation to each other and to the main tracks 33, so as to vertically tilt the engaging head of the frame as required from time to time.

While I have herein shown the pusher car frame tilted by varying the elevation of the front truck wheels, the rear wheels might be used for this purpose, or varying elevations might be imparted to both sets of wheels to secure the desired aggregate tilting effect, or various other arrangements of guides or guiding tracks and numerous other forms or relative arrangements of parts might be employed, all coming within the spirit of the invention.

Claims:

1. In a car haulage system, the combination with a main freight car track provided with a pit constituting a transfer station whereat a pusher car is adapted to pass under a car on the track, and provided beyond said pit with an incline, of a pusher car having a pusher head and a main truck, a pusher car track for the main truck, the same extending lengthwise the freight car track and arranged between the same and at a substantially unvarying elevation with relation thereto, said pusher car having also a forward truck and a unitary, rigid body mounted to tip up or down on said rear truck, said body projecting beyond said forward truck to present a pusher head, a separate auxiliary pusher track for the front truck of the pusher car, said auxiliary track being elevationally related at the incline to the main pusher car track to maintain the pusher head up in position to engage with the freight car but having a depression in said pit on which the front truck descends in the return movement of the car to lower the pusher head and permit the car to pass beneath a car on the freight car track, a branch auxiliary track at the pit above the depressed auxiliary track, and a switch comprising a hinged track section connecting said branch track and said depressed auxiliary track, said switch permitting the movement of the front truck past the same but serving to transfer the front truck to the elevated branch track on the forward movement of the pusher car to again cause the elevation of the pusher head thereof, and a haulage cable for propelling said pusher car in either direction.

2. A car haulage system having a pusher car provided with a pusher head, a main track provided with a transfer station of substantial length whereat the pusher car is adapted to pass beneath a car on the main track, a pusher car guide comprising a main

pusher car track extending lengthwise the main track, a guiding device on the pusher car comprising a main truck engaging the pusher car track, a separate auxiliary guide 5 comprising an auxiliary track also extending lengthwise the main track, an auxiliary guiding device on the pusher car comprising a second truck engaging said auxiliary track, the pusher head being elevationally controlled by the elevational variation of said 10 second truck, a branch auxiliary guide at the transfer station comprising a branch track elevationally separated from the auxiliary track, said second truck engaging with 15 one of said auxiliary tracks when the pusher car is moved in one direction, and a switch for transferring the auxiliary guiding truck to the other auxiliary track when the pusher car is moved in the opposite direction.

20 3. A car haulage system having a pusher car provided with a pusher head, a main track provided with a transfer station of substantial length whereat the pusher car is adapted to pass under a car on the main 25 track, a pusher car guide extending lengthwise the main track, a guiding device on the pusher car engaging the same, a separate auxiliary guide also extending lengthwise the main track, an auxiliary guiding device 30 on the pusher car engaging the said auxiliary guide, the pusher head being elevationally controlled by the elevational variation of said auxiliary guiding device, a branch auxiliary guide at the transfer station 35 elevationally separated from the auxiliary guide, said guiding device engaging one of said auxiliary guides when the pusher car is moved in one direction, and devices for transferring the auxiliary guiding 40 device to the other auxiliary guide when the pusher car is moved in the opposite direction, and devices for transferring the auxiliary guiding device to the other auxiliary guide when the pusher car is moved in the opposite 45 direction.

4. In a car haulage system, the combination with a freight track having a transfer station, whereat a pusher car is adapted to 50 pass under a car on the freight track, of a pusher car, a main track for the pusher car extending lengthwise the freight track and at a substantially unvarying elevation with relation thereto, a separate auxiliary 55 pusher car track having two elevationally separated branches at said transfer station, one of said branches being engaged by a pusher car part when the pusher car is moved in one direction, and devices for transferring the pusher car part to the other 60 branch when the car is moved in the opposite direction.

5. In a car haulage system, the combination with a freight track having a transfer station whereat a pusher car is adapted to 65 pass under a car on the freight track, of a

pusher car, a main track for the pushed car extending lengthwise the freight track, a separate auxiliary pusher car track having two elevationally separated branches at said 70 transfer station, one of said branches being engaged by a pusher car part when the pusher car is moved in one direction, and devices for transferring the pusher car part to the other branch when the car is moved 75 in the opposite direction.

6. In a car haulage system, the combination with a freight car track provided with a transfer station whereat a pusher car is adapted to pass under a car on the freight 80 car track, of a pusher car having front and rear trucks, a pusher car track for the rear truck extending lengthwise the freight car track, a separate auxiliary track for the front truck of the pusher car, said auxiliary 85 track having a depressed portion at the transfer station, a branch portion for said auxiliary track over and above the depressed track portion, and means for transferring the front truck wheels from one auxiliary 90 track portion to the other through movement of the pusher car.

7. In a car haulage system, the combination with a main freight car track provided with a transfer station whereat a pusher car is adapted to pass under the car on the 95 freight car track, of a pusher car track, and an auxiliary track engaged by devices on the pusher car separate from those engaging the pusher car track, said auxiliary 100 track being branched at the transfer station to provide overlapping but separate track sections, said devices being adapted to engage with one of said branches when the 105 pusher car is moved in one direction and with the other one when moved in the opposite direction.

8. In a car haulage system, the combination with a freight track, of a pusher track for the main truck of a pusher car, a separate 110 auxiliary guide track engageable by a device on the pusher car, said auxiliary track having a relatively depressed portion on which the pusher car device descends in the return movement of the car while the 115 main truck of the pusher car is in engagement with the pusher track, an overlapping branch track at a level above the depressed track portion, and a switch by which the 120 pusher car device is transferred to said branch on the forward movement of the pusher car.

9. In a car haulage system, the combination with a freight track, of a pusher track for the truck of a pusher car, a separate 125 auxiliary guide track engaged by a part on the pusher car, said guide track having a relatively depressed portion with which the pusher car device engages when the car is moved in one direction and while the pusher 130 car truck is still in engagement with the

pusher track, and having also a relatively elevated overlapping portion with which the pusher car device engages on movement of the car in the opposite direction.

5 10. In a car haulage system, the combination with a main freight car track provided with a transfer station whereat a haulage car is adapted to pass under a car on the freight track, of a haulage car having a rigid, unitary frame with an end adapted to engage with the freight car, a plurality of haulage car track sections separately engaged by devices on the haulage car and elevationally arranged to vertically tilt the engaging end of said frame relatively to the opposite end thereof.

11. In a freight car haulage system, the combination with a main freight car track provided with a transfer station, of a haulage car having a frame provided with an end adapted to engage with the freight car, a plurality of haulage tracks separately engaged by devices on the haulage car, and relatively positioned to tilt the engaging end of said frame up on movement through said transfer station in one direction and to tilt the same down on movement in the opposite direction.

12. In a car haulage system, the combination with a main freight car track provided with a transfer station, of a haulage car having a frame with an end adapted to engage with the freight car, a plurality of haulage car track sections separately engaged by devices on the haulage car, one of said sections having elevationally separated branches at the transfer station, and arranged to vertically tilt the engaging end of said frame upwardly on movement of the car in one direction and to tilt the same downwardly on movement of the car in the opposite direction.

13. In a car haulage plant, a main track for a car to be moved, a haulage track ex-

tending intermediate the same, a transfer station, a haulage car on said track, said haulage car comprising a single, unitary frame, the latter adapted to be moved upward by a tilting movement to engage a car on the main track, and to be moved downward by a reverse tilting movement so that the haulage car as a whole may pass beneath a car on the main track and means for upwardly tilting said car when the pusher car has moved to the opposite side of the transfer station.

14. A pusher car for a car haulage plant, comprising a rear truck, a single, unitary frame mounted to tilt about said rear truck, a forward truck, and a pusher head at the end of said frame beyond said forward truck.

15. A pusher car for a car haulage plant, comprising a frame, rear trucks on which the frame is mounted to tilt, forward trucks, and a cable connection for the rear trucks including a shock absorbing device.

16. In a car haulage system, the combination with a freight track having a transfer station whereat a pusher car is adapted to pass beneath and beyond the car on the freight track, of a pusher car having a pusher member, and a pusher car guide track having two elevationally separated branches at the transfer station, said pusher car having a part adapted to engage one branch when the car is moved in one direction to lower the pusher member relatively to another part of the pusher car and to engage the other branch when the car is moved in the opposite direction to raise the pusher member relatively to said other part of the pusher car and engage the same with a freight car at said transfer station.

In testimony whereof, I have signed my name to this specification.

ALMON E. NORRIS.