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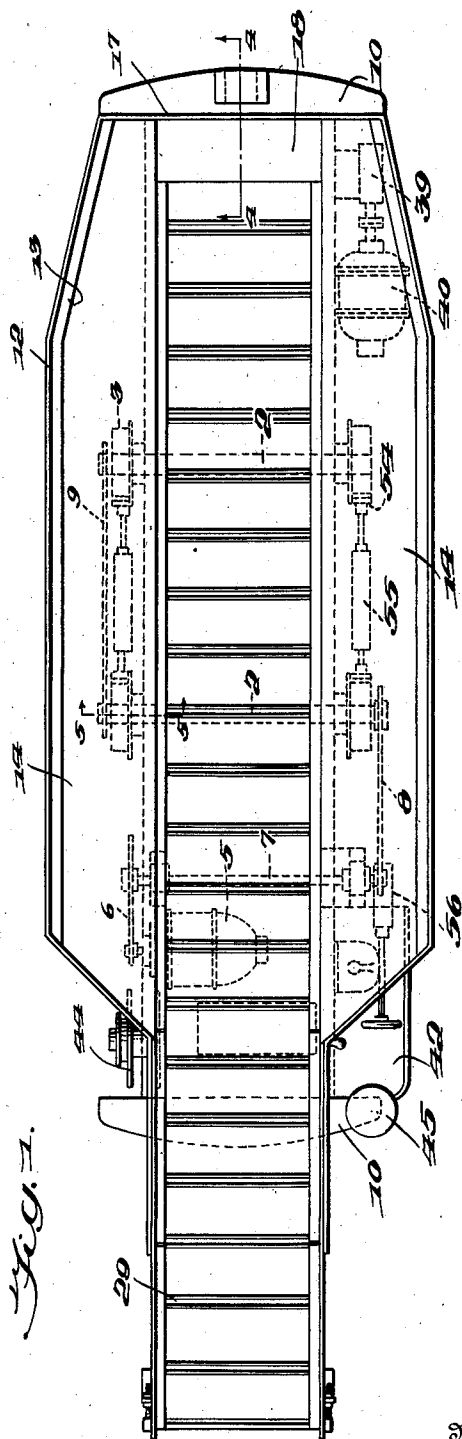
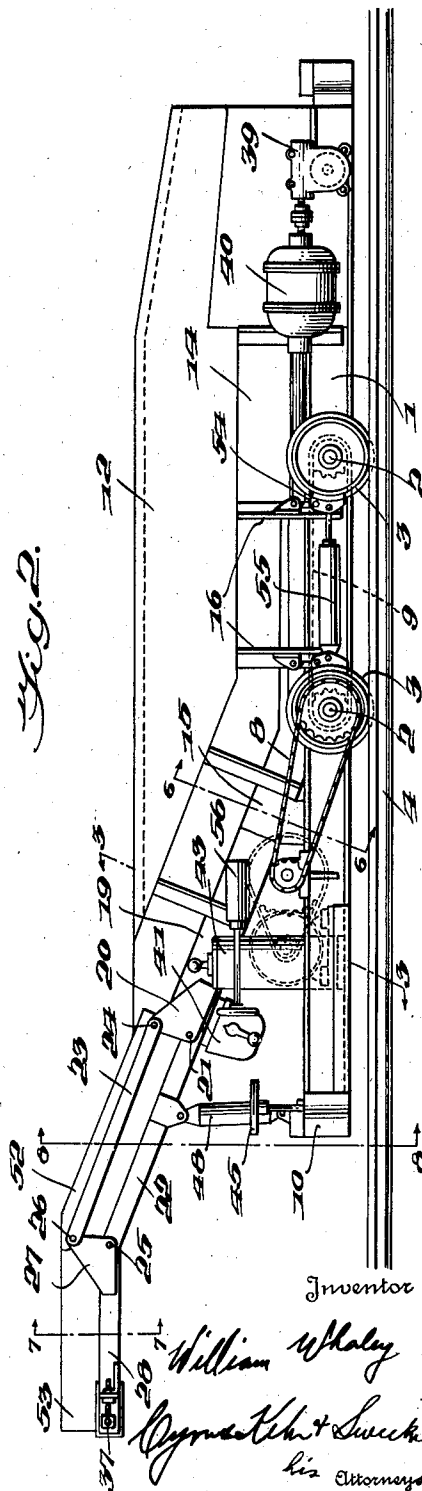
W. WHALEY

2,274,313

TRANSFER CAR

Filed Sept. 19, 1938

4 Sheets-Sheet 1



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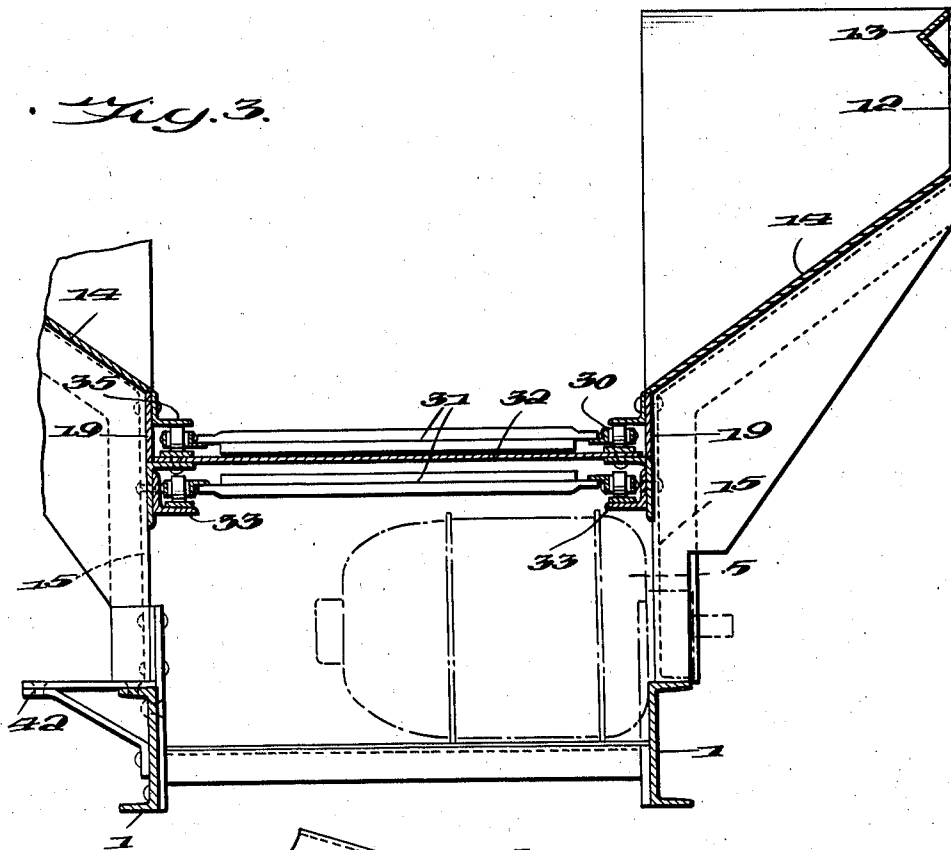
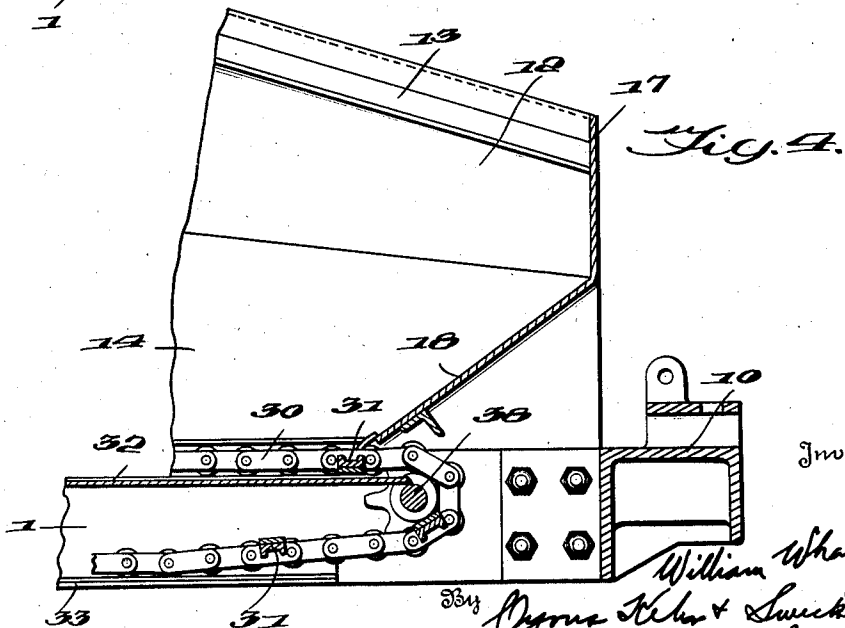
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TRANSFER CAR

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4 Sheets-Sheet 2



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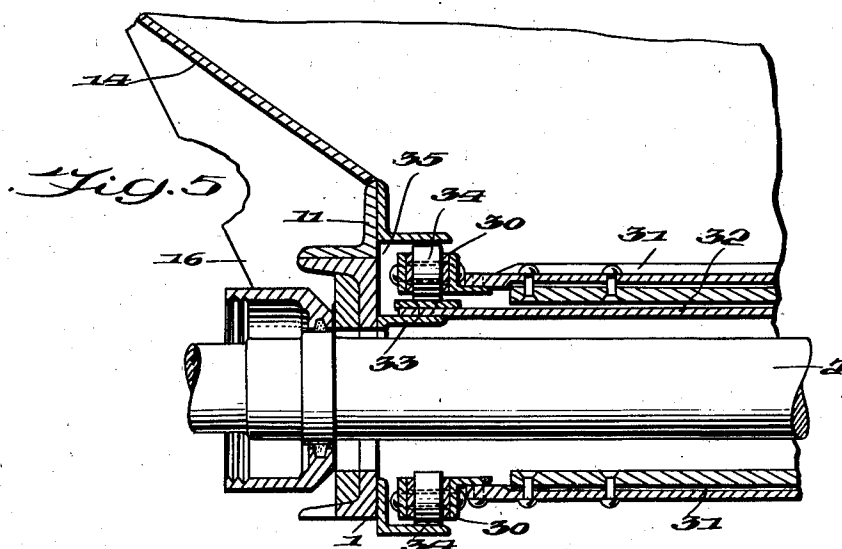
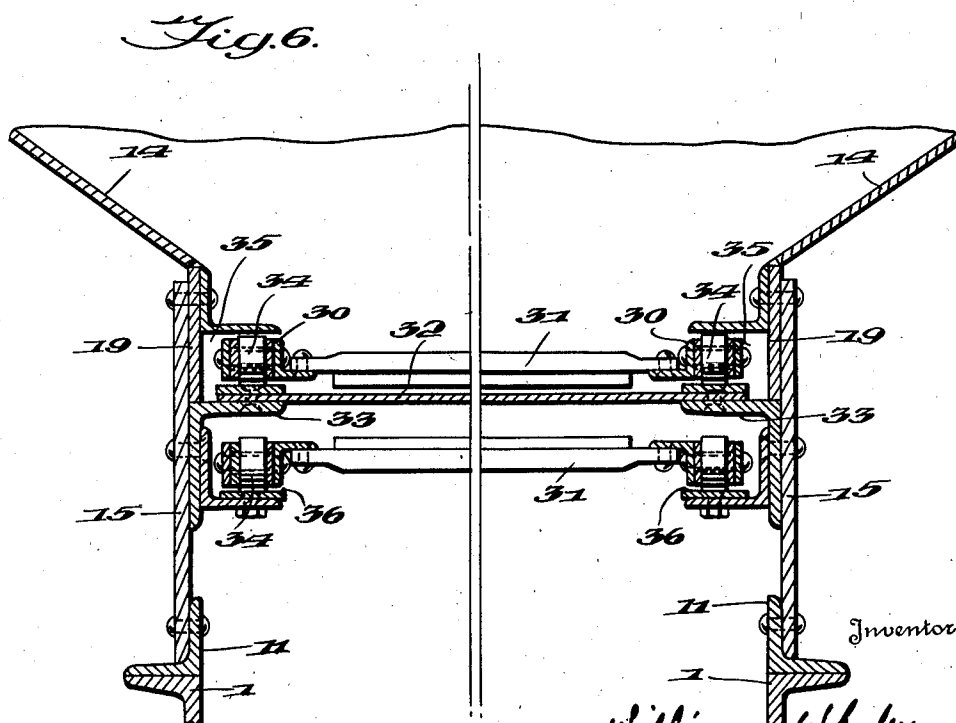
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4 Sheets-Sheet 3



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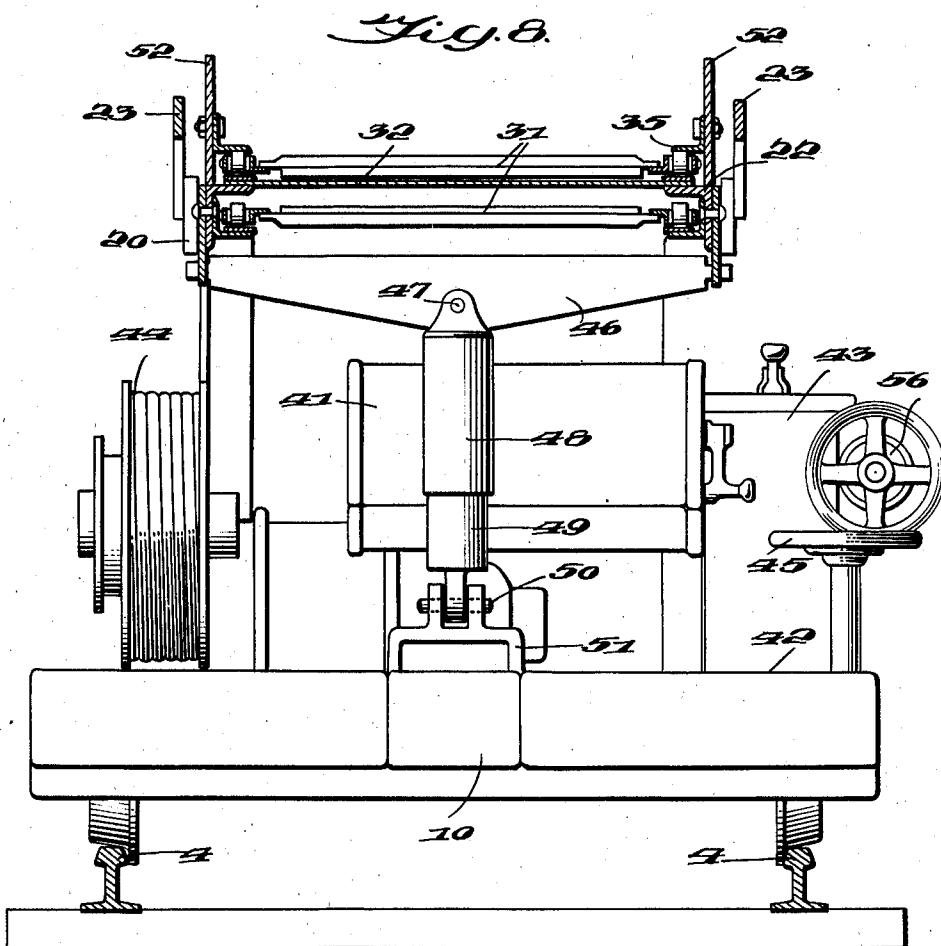
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TRANSFER CAR

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,274,313

TRANSFER CAR

William Whaley, Knoxville, Tenn.

Application September 19, 1938, Serial No. 230,670

11 Claims. (Cl. 214—83)

This invention relates to an improvement in transfer cars for use in connection with loading machines to receive coal or other material therefrom and to transfer the same to a discharge point.

Heretofore it has been customary for the loading machine as used particularly for the gathering and lifting of coal or similar material, to discharge said material directly into mine cars which are moved into proximity with the loading machine. Frequently it is impractical to move one or more mine cars into the room where the loading machine is operating.

The object of this invention is to provide a simple and effective transfer car which may be filled by the loading machine, is self-propelling, and moves from the loading machine to the entry at the room neck or other discharge point and discharges the material over the sides of the respective mine cars, which are moved by locomotive or other means under the discharge end of the transfer car for filling of the respective mine cars.

A further object of the invention is to produce in such a car a conveyor structure such as to enable the car to travel in low head-room and yet when it reaches the discharge point to be quickly and readily adjusted to a height such as to overlie and discharge into a mine car as high or even higher than the body of the transfer car itself. The discharge of the coal from the transfer car is effected by a conveyor in the bottom of the car which is inclined to the discharge point. The discharge end portion of the transfer car conveyor is adjustable vertically so that the car may travel in low head-room and yet by ready adjustment may be raised to deliver the material into the mine cars at the entry.

The transfer car embodying this invention is constructed of side walls and an end wall, the opposite end being formed preferably by the inclined flight conveyor which extends throughout the bottom of the transfer car and into which the lading is shed by sloping side and end walls for discharge at the desired point. Provision is made for raising and lowering the discharge end of the conveyor while permitting said conveyor to overlie and discharge into a mine car at the entry. The transfer car is self-propelled under the control of an operator who has provision also for controlling the operation of the conveyor thereof at the discharge point.

A preferred embodiment of this invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a top plan view of this improved transfer car;

Fig. 2 is a side elevation thereof;

Fig. 3 is a vertical sectional view through the car body substantially on the line 3—3 of Fig. 2, parts being omitted for clearness;

Fig. 4 is a vertical longitudinal sectional view through the end of the car on the line 4—4 of Fig. 1;

Fig. 5 is a detail transverse sectional view substantially on the line 5—5 of Fig. 1;

Fig. 6 is a similar view substantially on the line 6—6 of Fig. 2, with parts omitted;

Fig. 7 is a transverse sectional view through the discharge end portion of the conveyor on the line 7—7 of Fig. 2; and

Fig. 8 is a similar view through the intermediate portion of the conveyor structure and showing parts in elevation.

This transfer car, in the form illustrated, is constructed with longitudinal members or side sills designated generally by the numeral 1, and through which car axles 2 extend, having track wheels 3 fixed thereon adapted to travel on track rails 4, which may be the same rails on which the loading machine travels. The transfer car is self-propelled, being driven by an electric motor 5, as illustrated, which operates sprocket gearing 6 to drive a countershaft 7, and the countershaft 7 operates through sprocket gearing 8 to drive one of the axles 2, the other one being driven therefrom by sprocket gearing 9. This driving mechanism is conventional and any suitable means may be used as desired for driving the transfer car or transporting it from place to place.

The side sills 1 carry bumpers 10 at opposite ends thereof.

The body of the car is generally of hopper shape and is supported upon the side sills 1, as shown more clearly in Figs. 3 to 6. Each of the side sills 1 has an angle bar 11 mounted on the top flange thereof, to which it is secured by welding or otherwise and extending throughout a portion of the length of the side sills. Side walls 12 extend substantially lengthwise of the car with stiffening rim angle braces 13 at their upper edges and sloping lower sections 14 that extend downwardly to the upper edges of the angle bars 11 in the middle and forward portions of the car, as shown in Fig. 5, but in the inclined portion thereof, the sloping sides 14 extend substantially to the upper edges of supporting plates 15, as shown in Fig. 6. The side walls are suitably braced at intervals by angular brace plates 16.

At the forward end of the car the side walls 12 are connected together by an end wall 17, having a sloping lower portion 18, as shown in Fig. 4.

At the rear portion of the car, the side plates 15 have secured thereto inclined plates 19, extending along the under edges of the sloping sides 14 of the car body, and at the rearmost end of each plate 19 is a bracket plate 20 secured thereto. Pivotally connected at 21 with each bracket plate 20 is one end of a lower link 22, while a second link 23 has one end pivotally connected at 24 with the bracket plate 20. The opposite ends of each pair of links 22, 23 are pivotally connected respectively at 25 and 26, with a bracket plate 27 secured at each side of a conveyor trough 28.

An endless conveyor is designated generally by the numeral 29 and extends from one end of the transfer car to the opposite end thereof, being preferably of the type designated as a flight conveyor comprising a pair of chains 30 with flight bars 31 extending from side to side therebetween for raking the material over a trough plate 32 extending between the side sills 1 in the main portion of the car, being supported upon angle bars 33, which are secured to said side sills and to the side plates of the upper portion of the conveyor structure. Each of the chains 30 has rollers 34 for guiding the same in trackways 35 at the upper run of the conveyor and upon tracks 36 for the lower run of the conveyor.

The conveyor 29 has its chains 30 passing over sprocket wheels on a shaft 37 at the rearmost end of the car (Fig. 2) and over sprockets on a shaft 38 at the forward end of the car, the latter shaft being driven through reduction gearing designated generally by the numeral 39 from an electric motor 40 under the control of the operator.

The controller for the motor 40 of the conveyor structure is designated generally by the numeral 41 and is mounted beside a platform 42 where an operator may be stationed for controlling the movements of the car. A similar controller 43 is mounted on the platform for controlling the electric motor 5 that operates the car forward and backward. These are shown as electric motors and separate for convenience of operation, but any desired source of power may be used for propelling the car and for operating the conveyor. Separate motors avoid the use of clutches that would be required if only one source of power were provided. A take up reel 44 may be provided on the car for winding of the electric cable thereon. The platform 42 is provided also with a seat 45 for the operator, if desired.

The discharge end portion of the conveyor structure is somewhat similar to that set forth in my prior patent on Conveyor for loading machines, No. 1,839,625, granted January 5, 1932, inasmuch as there is a discharge section of the conveyor that is maintained substantially in horizontal position by being supported upon parallel links, such as the links 22 and 23, pivotally connected respectively with the brackets 20 and 27 at opposite ends thereof, so that joint tilting movements of the links maintains them in parallel relation and moves the discharge section of the conveyor, having the conveyor trough 28, vertically while maintaining said section in the same horizontal position. To accomplish this raising and lowering movement of the discharge end portion of the conveyor, a bar

46 is connected between the links 22 and is pivotally connected intermediate its ends at 47 (Fig. 8) with a cylinder 48 receiving a piston 49 pivotally connected at 50 with a bracket 51 supported on the bumper 10 at the rear end of the car. The cylinder 48 is adapted to receive liquid or other fluid being preferably a hydraulic motor, having any suitable source of supply under the control of the operator for raising the inclined section of the conveyor and with it the horizontal section 28, these parts being lowered in turn by the release of fluid from the cylinder.

At opposite sides of the inclined tiltable section of the conveyor 29 are secured side plates 52, as shown in Fig. 8, being supported upon the links 22, while corresponding side plates 53 are secured to and extend along opposite sides of the trough 28, as shown in Fig. 7, in order to increase the height of the trough through which the coal or other material is conveyed by the conveyor.

The operation of the transfer car will be obvious from the foregoing description. The transfer car is designated to operate behind the loading machine and to be filled directly therefrom. The sides of the transfer car body are sufficiently low to receive the coal from the discharge conveyor of the loading machine. While the transfer car is in the room being loaded or is moving to or from the point of loading, the discharge end portion of the conveyor 29 is in its lowered position to facilitate travel in low head-room. After being loaded, the transfer car is caused to travel out to the entry at the room neck or other discharge point, being operated by its own power from the electric motor 5, and when it reaches this point, the hydraulic motor 48 is actuated to lift the discharge end of the conveyor sufficiently high so as to clear the top of a mine car and project thereover or over the mine car track. Then the operator causes energizing of the electric motor 40 to drive the conveyor whereby the lading is moved outward over the trough plate 32 and discharged at the rear end of the car directly into the mine car. The flight conveyor continues operating until all of the lading has been discharged from the transfer car or until the mine car is filled, the body of the transfer car having a capacity at least sufficient to fill the mine car. The sloping side portions 14 and end portion 18 facilitate the flow of the material into the bottom portion of the transfer car onto the conveyor, the angle of these sloping portions being greater than the angle of repose of coal or other loose material, such as would be conveyed in this transfer car. After the transfer car is emptied, it is backed off from the mine car, the discharge end portion of its conveyor lowered, and then it is returned to the loading machine for refilling, such movements being under the control of the operator. This transfer system is claimed in my application, Ser. No. 404,708, filed July 30, 1941.

The car wheels 3 are shown as provided with brake mechanism 54 expanded by a hydraulic cylinder 55 actuated by a manually actuated power unit 56 adjacent the platform 42 for control by the operator in stopping or braking the movement of the transfer car.

In this way, the transfer car may be utilized for conveying the coal or other lading from the loading machine to a train of mine cars at the entry. The pivoted construction of the discharge end portion of the conveyor conserves head room in the mine while maintaining the discharge end

always in a horizontal position when either raised or lowered.

I claim:

1. In a conveyor vehicle, the combination of a wheeled chassis, power driving means thereon for propelling the chassis, a vehicle body containing a hopper for material and carried by and extending throughout the length of the chassis both forwardly and rearwardly of the wheels thereof, a conveyor structure extending from said vehicle body in association therewith and having an approximately horizontal discharge section, and an inclined section arranged to direct material from the vehicle body to the horizontal section.

2. In a transfer vehicle, the combination of a chassis having forward and rearward supporting wheels therefor, a vehicle body carried by the chassis and having side walls extending throughout the length of the chassis forwardly and rearwardly of the respective forward and rearward supporting wheels, a conveyor extending lengthwise from an end portion of said vehicle body, said conveyor including an approximately horizontal discharge section, an inclined section for directing material from the vehicle body to the horizontal section, and parallel motion means for raising and lowering said horizontal section relative to the vehicle body.

3. In a transfer car, the combination of a chassis having forward and rearward supporting wheels therefor, a car body carried by the chassis and having side walls extending throughout the length of the chassis forwardly and rearwardly of the respective forward and rearward supporting wheels, a conveyor structure therefor including a section extending lengthwise of the car body in the bottom thereof, an inclined section extending therefrom at one end of the car, and an approximately horizontal discharge section at the free upper end of the inclined section and spaced above said bottom section, and means for raising and lowering the horizontal section in parallel directions.

4. In a transfer car, the combination of a chassis having forward and rearward supporting wheels therefor, a car body carried by the chassis and having side walls extending throughout the length of the chassis forwardly and rearwardly of the respective forward and rearward supporting wheels, a conveyor structure for said body having a section extending lengthwise in the bottom thereof, a parallel link section operatively connected with the car body for vertical swinging movement relative thereto, and a discharge section carried by the parallel link section and arranged approximately in a horizontal direction, and means for raising and lowering said horizontal section approximately in parallel positions.

5. In a transfer car, the combination of a chassis having forward and rearward supporting wheels therefor, a car body carried by the chassis and having side walls and one end wall, said side walls extending throughout the length of the chassis forwardly and rearwardly of the respective forward and rearward supporting wheels, said walls having sloping lower portions for directing material toward the center thereof, an endless conveyor structure for said car body including a section having a run underlying the sloping wall portions and extending to the end of the car opposite the end wall with an inclined section at the last-mentioned end of the car, an

approximately horizontal discharge section forming a continuation of the inclined section, and parallel link means at opposite sides of the conveyor structure for supporting said horizontal section for movement to different horizontal parallel positions.

6. In a transfer car, the combination of a car body having side walls and one end wall, said walls having inclined lower portions for directing material toward the center of the car, an endless conveyor structure including a section extending approximately throughout the length of the car body underlying the inclined wall portions and forming the bottom of the car, means directing a portion of said bottom section upwardly in an inclined direction at the end of the car opposite the end wall to a height approximately corresponding with the height of the side walls whereby said inclined portion forms an end of the car, an approximately horizontal conveyor section, and a parallel link section connecting said horizontal section with the end of the car and through which sections an endless conveyor extends, said parallel link section having a pair of parallel links at each opposite side thereof and pivotally connected respectively with the horizontal section and the car body for raising and lowering said horizontal section in parallel positions.

7. In a transfer car, the combination of a car body having side walls and one end wall, said walls having inclined lower portions for directing material toward the center of the car, an endless conveyor structure including a section extending approximately throughout the length of the car body underlying the inclined wall portions and forming the bottom of the car, means directing a portion of said bottom section upwardly in an inclined direction at the end of the car opposite the end wall to a height approximately corresponding with the height of the side walls whereby said inclined portion forms an end of the car, an approximately horizontal conveyor section, a parallel link section connecting said horizontal section with the end of the car and through which sections an endless conveyor extends, said parallel link section having a pair of parallel links at each opposite side thereof and pivotally connected respectively with the horizontal section and the car body for raising and lowering said horizontal section in parallel positions, power means connected with said parallel link section for swinging the same in a vertical direction, and propelling means for the car.

8. In a transfer car, the combination of a supporting frame having side sills, supporting wheels therefor, a car body supported on the frame and having side walls and one end wall, said side walls having inclined lower portions extending inwardly approximately to the upright planes of the inner faces of the side sills, a trackway extending lengthwise of the car at the inner faces of the side sills, an endless conveyor having an upper run extending through said trackway below the inclined portions of the side walls in a position to receive material therefrom, one end of the car opposite the end wall having inclined side plates extending upwardly from the side sills with a trackway at the inner sides of said side plates and forming a continuation of the first-mentioned trackway and through which said endless conveyor operates, an approximately horizontal discharge section having a trackway therein receiving said endless conveyor, a pair of parallel links at each opposite side of the con-

veyor and pivotally connected respectively with the side plates and with the discharge section for swinging movement to raise and lower the discharge section to different parallel horizontal positions, and power means operatively connected with said links for raising and lowering the same.

9. In a transfer car, the combination of a supporting frame having side sill means with inner faces, supporting wheels therefor beneath the side sill means with said side sill means extending lengthwise of the car on opposite sides of the supporting wheels, a car body supported on the frame and having side walls and one end wall, said side walls having inclined lower portions extending inwardly approximately to the upright planes of the inner faces of the side sill means, and an endless conveyor having an upper run extending between the side sill means below the inclined portions of the side walls in a position to receive material therefrom, one end of the car opposite the end wall having inclined side plates extending upwardly from the side sill means with guide means along which said endless conveyor operates.

10. In a transfer car, the combination of a supporting frame having side sill means with inner faces, supporting wheels therefor, a car body supported on the frame and having side walls and one end wall, said side walls having inclined lower portions extending inwardly approximately to the upright planes of the inner faces of the side sill means, an endless conveyor hav-

ing an upper run extending between the side sill means below the inclined portions of the side walls in a position to receive material therefrom, one end of the car opposite the end wall having inclined side plates extending upwardly from the side sill means with guide means along which said endless conveyor operates, an approximately horizontal discharge section receiving said endless conveyor, means pivotally connected respectively with the side plates and with the discharge section for swinging movement to raise and lower the discharge section to different positions, and self contained power means on the car for propelling said car.

11. In a transfer car, the combination of a car body having side walls and one end wall, said walls having inclined lower portions for directing material toward the center of the car, an endless conveyor structure including a section extending approximately throughout the length of the car body underlying the inclined wall portions and forming the bottom of the car, means directing a portion of said bottom section upwardly in an inclined direction at the end of the car opposite the end wall to a height approximately corresponding with the height of the side walls whereby said inclined portion forms an end of the car, an approximately horizontal conveyor section, and a parallel link section connecting said horizontal section with the end of the car and through which sections an endless conveyor extends.

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