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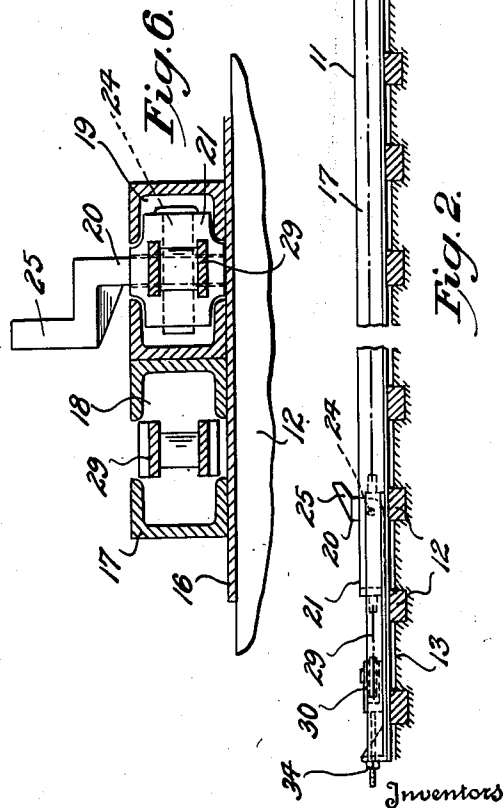
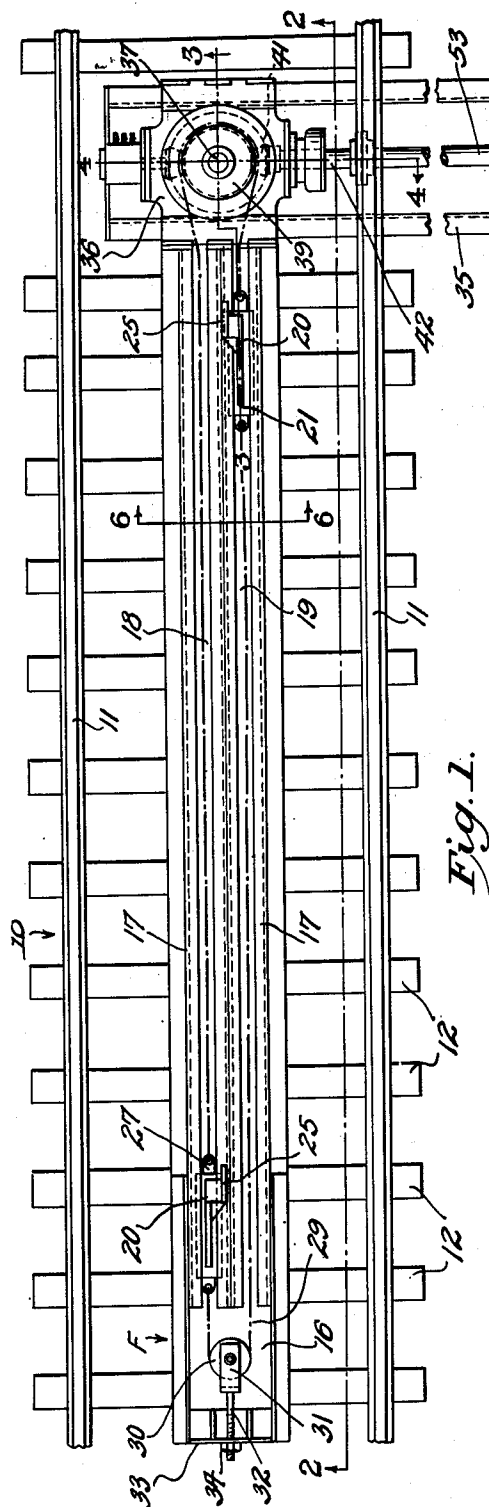
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2,642,006

TRACK POSITIONED CAR-FEEDING MECHANISM

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2 Sheets-Sheet 1



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2 Sheets-Sheet 2

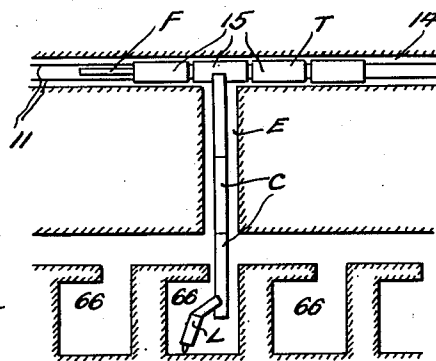
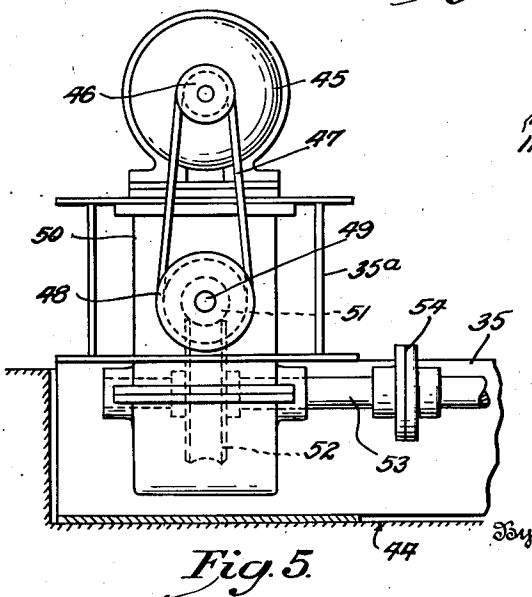
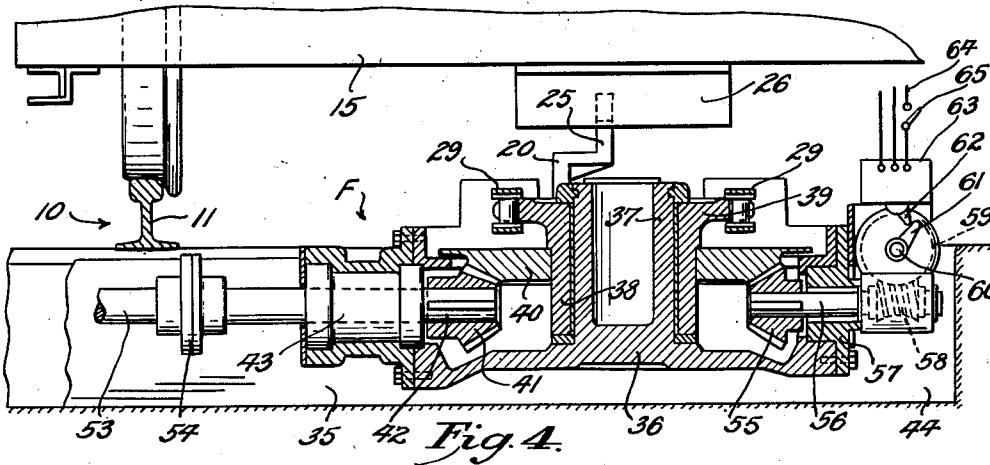
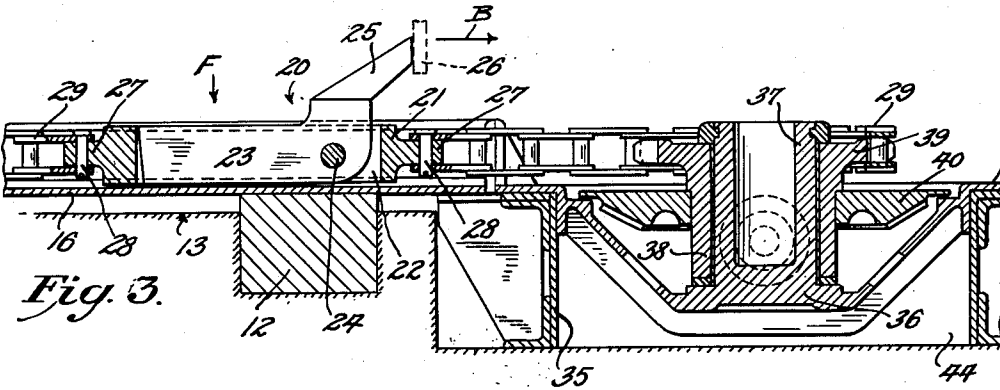


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2,642,006

TRACK POSITIONED CAR-FEEDING
MECHANISMGlenn W. Merritt and Clarence L. Muntz,
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13 Claims. (Cl. 104—172)

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This invention relates to an improved power-furnishing apparatus for use in connection with the trackways of underground mines in furnishing power for propelling cars in trip formation along the trackway.

Hitherto such car-feeding mechanisms, sometimes known as car hauls, have been characterized by their permanency in operating positions. Most of such mechanisms have been difficult, when once erected, to dismantle and move from one working location in a mine to another. Modern mining practice, through the use of mechanically operated mining and loading machines, provides constantly changing working locations or faces, and it is important that car feeders be freely portable and easy to install in order that they may be kept in as close order as is practicable with the changing working faces of a mining drift.

Accordingly, it is one of the objects of the present invention to provide a freely portable and readily installed car-feeding mechanism involving a frame structure having a horizontally disposed chain driven by a reversible electric motor, and wherein the chain is formed with car-engaging detents so disposed on the chain as to effect predetermined longitudinal movement of a trip of cars along an associated trackway in each operating cycle of the mechanism.

It is another object of the invention to provide a car feeder for use in association with the track structure of a mine haulage-way in which the feeding mechanism may be placed on the floor or track ties of the haulage-way without necessitating any extensive excavation in the floor of the haulage-way to produce a receiving pit for the feeder.

A further object of the invention is to provide a car feeder of the character indicated in which car-propelling detents are carried by the opposite runs of a motor-propelled chain which has its opposite runs disposed in the same horizontal plane.

A further object of the invention is to provide a car feeder which embodies a frame having at one end thereof a propelling chain sprocket which is driven by an associated motor and motion-transmitting gearing disposed in such a manner as to require the formation of but a shallow pit of limited dimensions in the mine floor at one end of the feeder frame.

It is a further object of the invention so to construct the feeder that when the same is to be moved from one working location to another, the parts thereof will be so formed as to admit of

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their ready separation and placement on cars for convenient transportation.

In the accompanying drawings:

Fig. 1 is a top plan view disclosing the improved car-feeding mechanism comprising the present invention in its installed position in connection with an associated trackway.

Fig. 2 is a vertical longitudinal sectional view taken through the mechanism on the plane indicated by the line 2—2 of Fig. 1.

Fig. 3 is a detail vertical longitudinal sectional view on the plane indicated by the line 3—3 of Fig. 1, disclosing more particularly the details of the driving sprocket of the feeder and one of the pivoted car-propelling detents carried by a chain driven by the sprocket.

Fig. 4 is a transverse vertical sectional view taken through said drive sprocket on the plane indicated by the line 4—4 of Fig. 1.

Fig. 5 is a detail end elevational view of the driving motor and its associated power-transmitting means for our improved feeder.

Fig. 6 is a detail vertical transverse sectional view taken through the chain structure and the associated guides therefor of our improved feeder, the plane of the figure being indicated by the line 6—6 of Fig. 1.

Fig. 7 is a diagrammatic view showing a typical working face and a haulage-way of an underground mine of the character in which our car-feeding mechanism is adapted for use.

Referring more particularly to the drawings, the numeral 10 designates a trackway composed of a pair of parallel rails 11 supported on transverse ties 12, the latter being suitably embedded in a floor 13 of a mine haulage-way 14 and over which wheeled motorless mine cars 15 are adapted for travel, either singly or in coupled trip formation. Usually such cars are moved by electrically operated mine locomotives, particularly when the same are disposed in train formation, that is trips composed of a considerable number of cars. Where a smaller number of cars is needed, as in operations in a mine taking place adjacent to working drifts, the services of a mine locomotive are not required and it is customary to employ track-mounted mechanisms known as car feeders or car hauls, whereby to move the smaller number of cars along the trackway. As previously stated, it is the purpose of the present invention to provide an improved feeder for such uses.

In accordance with the present invention the feeder, which is designated in its entirety by the letter F, embodies a frame structure composed

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advantageously of a bedplate 16 which is adapted to be placed on the upper surfaces of the ties 12 between and in parallel relationship with the rails 11. The plate is of a suitable length, somewhat greater than that of a standard mine car, but its proportions are limited so that it may be placed on a car for transportation in a mine from one working location to another. The plate is reinforced and rigidified by the employment of U-shaped channel beams 17 which are laid longitudinally on the upper surface of the plate and suitably secured thereto, the beams being arranged on their side flanges in engagement with the plate in cooperative pairs, forming guides, indicated at 18 and 19, for the reception and confinement of slidable car-propelling detents 20.

Each of these detents comprises an outer frame 21 formed with an opening 22 in which the weighted body 23 of the detent proper is adapted to be arranged in a substantially horizontal plane. The body of each detent is pivoted, as at 24, to its associated frame for tilting movement on the part of the detent about a substantially horizontal axis. Above the axis 24, the body of the detent terminates in an upwardly and angularly directed finger 25 which is disposed for engagement with a beam, lug or bracket 26 stationarily carried by and depending from the body of a mine car operated on the trackway.

To impart movement to the detents so that the same may be used alternately in effecting the advance of a trip of cars over the trackway in a single direction, the ends of the frames 21 of said detents are formed with ears 27 which receive pins 28 employed in uniting the ends of a link chain 29 with said detent frames. The opposite runs of the chain 29 are disposed in the same horizontal plane so that but little room or vertical space is required to receive the going and return runs of the chain; in fact, the height of the detent channels or guides 17 is sufficient for this purpose.

One end of the chain 29 passes around an idler guide 30 which is employed to take up slack in the chain, and for this reason includes a clevis 31 having a threaded stem 32 which passes through an opening formed in the transverse endplate 33 of the feeder frame, the outer end of the stem being equipped with a nut or the like 34 to adjust the clevis 31 and the guide 30 to maintain the desired operating position of the latter and appropriate tension on the chain.

At the end of the feeder frame opposite to the idler guide 30, the feeder frame includes a separable boxing 35 which extends below the horizontal plane 6 of the bedplate 16 and laterally or perpendicular with respect thereto. In longitudinal alignment with the bedplate the boxing 35 carries a saddle casting 36 which is formed with an upstanding hollow stud 37 for the reception of the hub 38 of a chain-driving sprocket 39. The detent-carrying chain 29 passes at one end around the sprocket 39 and is adapted to be driven by the rotation of the sprocket.

Such rotation may be effected conveniently by securing to the hub of the sprocket 39 an inverted bevel gear 40, shown more particularly in Figs. 3 and 4 of the drawings. The teeth of this gear mesh with those of a pinion 41 which is keyed on one end of a shaft 42 journaled in bearings 43, forming a part of the boxing 35. Since the boxing extends below the plane of the bedplate 16, a shallow pit 44 may be

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dug in the floor 13 of the haulage-way to accommodate the same, as indicated in Fig. 3.

At its outer end and laterally of the trackway the boxing 35a is formed to effect the support of a reversible electric motor 45. In this instance the armature shaft of the motor is provided exteriorly with a sheave 46 around which passes an endless belt 47. The lower portion of this belt passes around a sheave 48, as shown in Fig. 5, which is mounted on one end of a transverse shaft 49 journaled in a gear casing 50 carried by the end of the boxing. The shaft 49 within the casing is equipped with a worm 51 which meshes with a worm gear 52 mounted on a shaft 53. The shaft 53 is disposed in longitudinal alignment with the shaft 42 and may be joined with the latter by means of flexible couplings 54.

In this instance the bevel gear 40 meshes with a second pinion 55, as shown more particularly in Fig. 4. The pinion 55 is arranged on a shaft 56 which is journaled, as at 57, in connection with the casting 36. The outer end of the shaft 56 carries a worm 58 meshing with the teeth of a worm gear 59, the latter being mounted on a switch shaft 60 journaled for rotation in connection with the casting 36. The shaft 60 carries a crank arm 61 which engages with the pivoted actuating finger 62 of a motor-reversing switch 63, whereby following predetermined movement of the chain 29 in one direction, a distance paralleling normally the length of a mine car 15, the switch mechanism 63 is actuated to reverse the direction of movement of the chain so that the second of the propelling detents 20 may be engaged with another mine car to continue the imparting of longitudinal advancing movement to an associated trip of cars. The operation of the feeder thus becomes continuous and automatic, requiring very little manual supervision. When a given detent is pushing a trip of cars forwardly on its active or advancing stroke, the detent will be positioned as shown in Fig. 3, moving the trip of cars in the direction designated by the arrow B. During this movement the opposite detent will be moved on its inactive or retreating stroke by the chain in a direction opposite to that of car movement. Since the detents are pivoted in this supporting frames, it is obvious that when the finger of the idle or retreating detent, during its return to a starting position, engages with an associated car bracket 26, the same tilts upwardly to move under the bracket, and then by reason of the weighted body, drops downward so that its finger will be in a position to impart pushing or advancing movement to the car bracket or other stationary part.

The circuit 64 leading from the switch 63 to the motor 45 also includes a manually controlled switch 65 by means of which current flow to the rotor may be turned on or arrested at will.

In Fig. 7 there has been illustrated one of the operating installations of the feeder mechanism forming the present invention. As shown in this figure, the working drift or face of a coal mine includes one or more rooms 66 in which, for example, a loading machine L is shown as being arranged for moving coal from the working face into carriers. Such carriers may comprise one or more room conveyors C by means of which coal loaded by the machine L may be transferred through a cross entry E to the main haulage-way 14. The discharge

end of the conveyor or conveyors C is arranged over a trip of mine cars T, which is under the control of the feeder F. Coal or other mineral matter loaded by the machine L is thus transferred continuously from the working face to the mine cars in the haulage-way, effecting rapid transfer or transportation of the mined mineral. The chain of the apparatus is of the reciprocating type, that is, it is advanced by the motor 45 first in one direction and then in the other, the chain being equipped with two dogs or detents. The left hand dog or detent, as the same is illustrated in Fig. 1, will advance forwardly to move a car trip a distance equivalent to one car length. During this movement, the dog or detent shown at the right of Fig. 1 is moved on its idle or retreating stroke. The dogs or detents have the offset car-engaging faces 25 so that they may engage with the same attachment 26 on the bottom of an associated mine car. Since the dogs or detents work alternately, the motor 45 is of the reversible type. The arrangement is advantageous in that it enables the chain and detent construction to be flat and disposed in the same horizontal plane, thereby reducing depth or height requirements of the apparatus to a minimum.

It will be noted in view of the foregoing that our improved feeder may be readily placed in its operating position in association with the trackway over which wheeled cars operate. But little preparation is required in the floor of a haulage-way to receive the feeder so that the latter may be quickly set up for use by an ordinary mine crew. Similar convenience is obtainable in dismantling the feeder for transportation to other working locations. The mechanism is sturdy, relatively simple, efficient and reliable in use. It is capable of withstanding hard usage without sustaining undue damage or necessitating frequent repair.

While we have described in detail what we consider to be a preferred form of our improved feeder, nevertheless it will be understood by those skilled in the art that the construction of feeder is subject to certain variation, modification or mechanical change without departing necessarily from the spirit and scope of the invention as the latter has been defined in the following claims.

We claim:

1. Car-moving mechanism comprising a frame adapted to be positioned on a trackway between the rails thereof, one end of said frame being formed with a lateral extension projecting to one side of said trackway beneath one of the rails thereof, longitudinally extending chain guides carried by said frame, a drive sprocket rotatably supported at the end of said frame provided with said extension an idler guide supported at the other end of the frame, car-engaging and propelling detents slidably mounted in said guides, a chain passing around said sprocket and idler guide and having its opposite runs disposed in a horizontal plane for movement in said longitudinal guides, said chain being connected with said detents, the detents being pivotally mounted on the chain to operate in one direction only to engage a car and to tilt when moved in the opposite direction to pass a car, a reversible electric motor supported by the lateral extension of said frame at one side of said trackway, and motion-transmitting means driven by said motor and carried by said frame extension for impart-

ing rotary movement to said sprocket first in one direction and then in the other.

2. Power-applying mechanism for moving cars over rail trackways, comprising a frame having a track section adapted to be disposed flatly on a trackway between and in longitudinal and parallel relationship with the car-receiving rails of the trackway and a lateral extension joined with one end of said frame extending beneath one of the rails of said trackway to a position at one side of the latter, spaced longitudinally extending guides carried by the track section of said frame, a chain having its opposite runs disposed in said longitudinal guides, a pair of oppositely moving car-engaging and pushing detents mounted on said chain to move with said chain in one direction to push the car and to be inoperative to push said car when said chain moves in the opposite direction, a reversible electric motor supported by the lateral extension of said frame at one side of said trackway, and motion-transmitting means connected to said chain and driven by said motor for imparting sliding movement to said detents.

3. Portable trip-feeding mechanism comprising: a substantially flat base member formed for reception between rails of an associated trackway, parallel horizontally disposed chain guides arranged longitudinally on said base member, a drive sprocket rotatably supported at one end of said base member, an idler guide supported at the other end of said base member, car-engaging and propelling elements slidably mounted in said guides, a chain passing around said sprocket and idler guide and driven by said sprocket and having its opposite runs disposed in a common horizontal plane within said longitudinal guides for connection with said elements to move said elements with said chain in one direction to push the car and to be inoperative to push said car when said chain moves in the opposite direction, an extension projecting laterally from said frame structure at one end thereof beneath one of the associated track rails, and reversible power driven motor-transmitting means carried by said extension for driving said sprocket.

4. Portable trip-feeding mechanism comprising: a substantially flat base member formed for reception between rails of an associated trackway, parallel horizontally disposed chain guides arranged longitudinally on said base member, a drive sprocket rotatably supported at one end of said base member, an idler guide supported at the other end of said base member, car-engaging and propelling elements slidably mounted in said guides, a chain passing around said sprocket and idler guide and driven by said sprocket and having its opposite runs disposed in a common horizontal plane within said longitudinal guides for connection with said elements, the elements being pivotally mounted on the chain to operate in one direction only to engage a car and to tilt when moved in the opposite direction to pass a car, an extension projecting laterally from said frame structure at one end thereof beneath one of the associated track rails, reversible power driven motion-transmitting means carried by said extension for driving said sprocket, said means including a reversible electric motor, and switch mechanism actuated automatically by predetermined rotation of said sprocket in one direction to reverse the direction of movement of said motor whereby to cause said sprocket to be rotated in an opposite direction.

5. Portable track-mounted mechanism for

moving cars along trackways, comprising a frame formed to be placed horizontally on the bed of a trackway in parallel relationship with and between the rails of the trackway, spaced parallel longitudinally extending guides carried by said frame, said guides being disposed in a common horizontal plane, a drive sprocket supported by said frame at one end of said guides, an idler guide supported by said frame at the other end of said guides, a chain passing around said sprocket and said idler guide and arranged within said longitudinal guides, a car-engaging and propelling dog element arranged in each of said longitudinal guides for sliding movement therein and connected with said chain for movement in unison therewith, the elements being pivotally mounted on the chain to operate in one direction only to engage a car and to tilt when moved in the opposite direction to pass a car, and means for imparting movement to said sprocket and chain to move said elements longitudinally of said longitudinal guides first in one direction and then the other.

6. Portable track-mounted mechanism for moving cars along trackways as defined in claim 5 and wherein said dog elements are connected with said chain in such manner that when said elements reach the ends of their longitudinal movement in said longitudinal guides, the same are relatively disposed at opposite ends of the longitudinal guides.

7. Portable car haul mechanism comprising: a frame adapted to be placed on the bed of a trackway between the rails thereof, said frame at one end being formed with a lateral extension projecting to one side of said trackway beneath one of the rails thereof, spaced extending chain guides disposed longitudinally on said frame between the track rails, dog elements mounted for sliding movement in said guides, each of said dog elements embodying a frame and a car-engaging detent pivotally secured to the element frame to operate in one direction only to engage a car and to tilt when moved in the opposite direction to pass a car, a chain arranged in said guides and connecting with the frames of said dog elements for effecting movement thereof longitudinally of the guides, with one element moving in one direction and the other in an opposite direction, a sprocket rotatably supported by said frame at one end of said guides, an idler guide supported by said frame at the other end of said guides, and around which said chain passes, and reversible motor-driven motion-transmitting means carried by the lateral extension of said frame for imparting movement to said chain sprocket.

8. Portable car haul mechanism comprising: a frame adapted to be placed on the bed of a trackway between the rails thereof, said frame at one end being formed with a lateral extension projecting to one side of said trackway beneath one of the rails thereof, spaced extending chain guides disposed longitudinally on said frame between the track rails, dog elements mounted for sliding movement in said guides, each of said dog elements embodying a frame and a car-engaging detent pivotally secured to the element frame to operate in one direction only to engage a car and to tilt when moved in the opposite direction to pass a car, a chain arranged in said guides and connecting with the frames of said dog elements for effecting movement thereof longitudinally of the guides, with one element moving in one direction and the other in an op-

posite direction, a sprocket rotatably supported by said frame at one end of said guides, an idler guide supported by said frame at the other end of said guides, and around which said chain passes, reversible motor-driven motion-transmitting means carried by the lateral extension of said frame for imparting movement to said chain sprocket, and a switch mechanism operated automatically upon predetermined rotation of said sprocket in one direction for reversing the direction of operation of said motion-transmitting means.

9. Portable car haul mechanism comprising: a frame adapted to be placed on the bed of a trackway between the rails thereof, said frame at one end being formed with a lateral extension projecting to one side of said trackway beneath one of the rails thereof, spaced extending chain guides disposed longitudinally on said frame between the track rails, dog elements mounted for sliding movement in said guides, each of said dog elements embodying a frame and a car-engaging detent pivotally secured to the element frame to operate in one direction only to engage a car and to tilt when moved in the opposite direction to pass a car, a chain arranged in said guides and connecting with the frames of said dog elements for effecting movement thereof longitudinally of the guides, with one element moving in one direction and the other in an opposite direction, a sprocket rotatably supported by said frame at one end of said guides, an idler guide supported by said frame at the other end of said guides, and around which said chain passes, reversible motor-driven motion-transmitting means carried by the lateral extension of said frame for imparting movement to said chain sprocket, and wherein said chain longitudinal guides are formed with slots through and above which the pivoted detents of said dog elements project.

10. A car haul comprising: a flat frame adapted for bodily placement on the bed of a trackway between its rails and below the bottoms of wheeled cars passing thereover, said frame including a pair of spaced parallel longitudinally extending guides disposed in a common horizontal plane on the top of said frame, a horizontally placed drive sprocket supported by said frame at one end of said guides, an idler guide supported by said frame at the other end of said guides, a chain passing around said sprocket and said idler guide having parallel runs confined for longitudinal movement within said longitudinal guides, a car-engaging and propelling dog element arranged in each of said longitudinal guides for longitudinal sliding movement therein, means uniting said chain with the dog elements, the elements being pivotally mounted on the chain to operate in one direction only to engage a car and to tilt when moved in the opposite direction to pass a car, the elements including upwardly projecting car-engaging fingers having inwardly offset portions movable substantially in the longitudinal center of said frame with the offset finger portions of one of said dog elements arranged in close proximity to the offset finger portion of the other of said dog elements, a horizontally disposed extension formed laterally with the frame at the sprocket carrying end thereof, a reversible motor supported by said frame extension at one side of the associated trackway, and motor driven motion-transmitting means carried by said frame extension imparting rotary movement to said sprocket first in one

direction and then the other, the extent of such rotary motion in one direction being such as to effect longitudinal travel of said dog elements from one end of said longitudinal guides to the other.

11. A car haul comprising a substantially flat base member positioned on the cross ties of a trackway between its track, adjoining pairs of longitudinally extending channel bars mounted on said base member, said bars forming longitudinally extending parallel guides slotted at the top thereof, a car-engaging and propelling element slidably mounted in each of said guides, a horizontally arranged drive sprocket mounted on said base member at one end of said guides, an idler guide supported by said frame at the other end of said guides, a chain passing around said drive sprocket and trained through said longitudinal guides for connection with said elements, the elements being pivotally mounted on the chain to operate in one direction only to engage a car and to tilt when moved in the opposite direction to pass a car, the elements being arranged in relatively spaced order with one of said elements adapted to occupy one end of one of said longitudinal guides when the other element occupies the opposite end of the other longitudinal guide, each of said elements including an upwardly directed car-engaging finger inwardly offset toward the center of the base member and disposed over said longitudinal guide, a lateral horizontal extension provided at one end of said base member, said extension projecting beneath and to one side of said trackway, and a reversible electric motor mounted on said extension above said trackway effecting rotation of said sprocket first in one direction and then the other to produce simultaneously longitudinal

sliding movement of said dog elements in said longitudinal guides in alternate directions.

12. In car haul mechanism, a base member, an endless chain mounted on said base member for movement in a plane parallel thereto, oppositely movable car engaging and pushing detents mounted on said chain to move with said chain in one direction to push the car and to be inoperative to push said car when said chain moves in the opposite direction, and power means operatively connected to said chain for imparting reciprocating movement to the chain to move said detents successively in opposite directions.

13. Car haul mechanism as set forth in claim 12 wherein the chain has its opposite runs in close parallel contiguity to each other, and the detents are pivotally mounted on the chain to operate in one direction only to engage a car and to tilt when moved in the opposite direction to pass a car.

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