

Feb. 23, 1937.

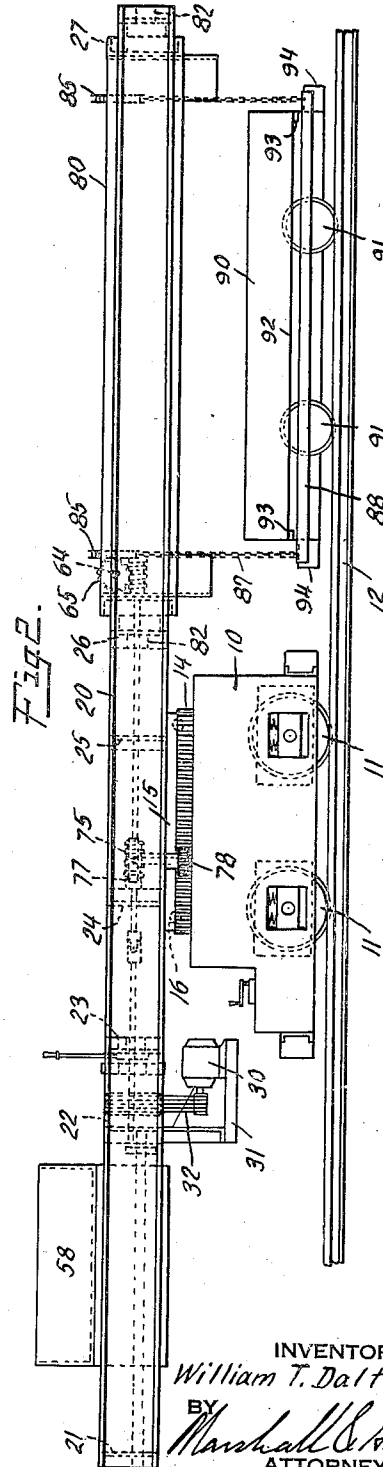
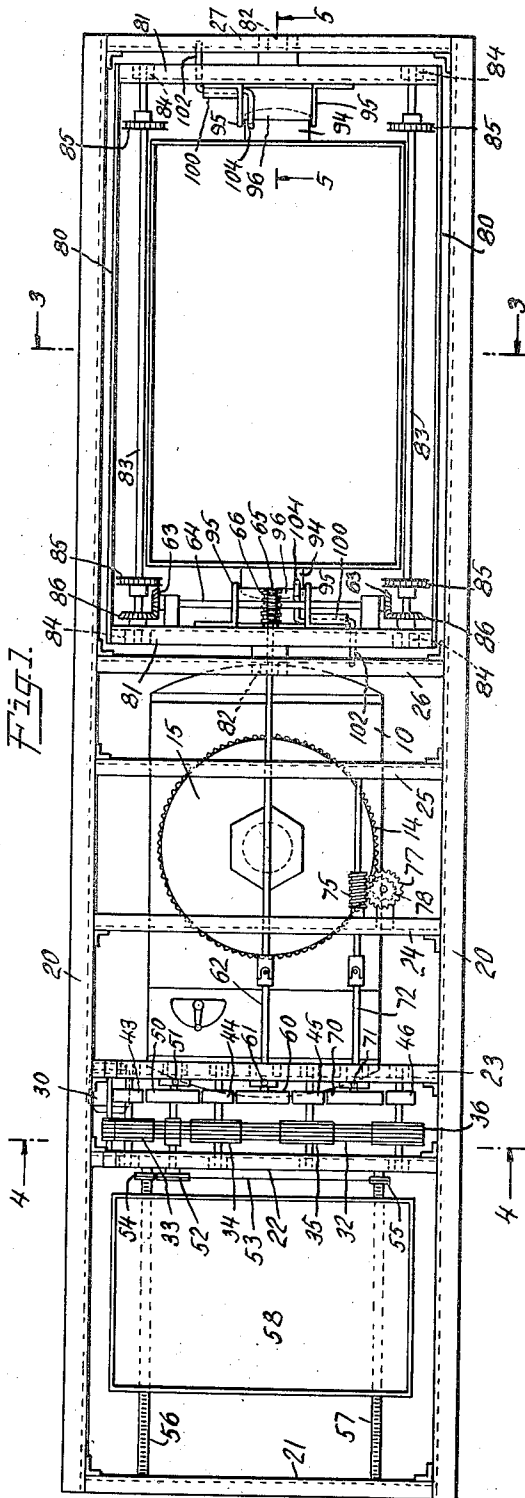
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2,071,503

CAR DUMPER

Filed April 29, 1935

2 Sheets-Sheet 1



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2,071,503

CAR DUMPER

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Application April 29, 1935, Serial No. 18,717

17 Claims. (Cl. 214—98)

This invention relates to improvements in car dumpers.

Its object is to provide a simple and efficient arrangement of a self-propelled vehicle, such as a mining locomotive, provided with a vertically pivoted overhanging structure for raising, laterally moving and dumping flat cars.

Another object is to provide a mechanism for moving a pair of lifting rods which clear the sides of the car to be elevated when below the edges of such sides and to move these rods inwardly under the sides of the car as they are raised.

Another object is to mount the hoisting mechanism on a frame horizontally pivoted on the overhanging structure and to provide means for securing a raised car to the frame.

A further object is to provide a locking device for the pivoted frame and means for automatically releasing the lock as the car becomes secured to the frame.

Other objects of the hoisting moving and dumping mechanism will appear in the following specification.

A still further object of this invention is to provide a car which is especially equipped to cooperate with the aforesaid mechanisms and to make a combination of such a hoisting and dumping arrangement and such a car as will be set forth fully hereinafter.

Referring to the drawings,

Fig. 1 is a plan view of a locomotive equipped with a mechanism which embodies my invention and of a flat car which cooperates therewith;

Fig. 2 is a side elevation of the parts which are shown in Fig. 1;

Fig. 3 is a sectional end elevation of some of the parts on a somewhat larger scale, the section being taken on the line 3—3 of Fig. 1;

Fig. 4 is a similar section taken on the line 4—4 of Fig. 1, illustrating the drive mechanism; and

Fig. 5 is a sectional side elevation of the locking device, the section being taken on the line 5—5 of Fig. 1.

Like characters of reference designate corresponding parts on each side of the figures.

10 designates the body of an ordinary electric mine locomotive mounted on wheels 11 which in this case are flanged and arranged to run on rails 12. The motors are not shown but they may be directly geared to the wheels or connected therewith by a drive chain. 14 is a large gear affixed in a horizontal position to the top of the body 10. 15 is a turn-table supported above gear 14 by anti-friction bearings 16.

Supported on the turn-table is a main frame comprising parallel side members 20 and a plurality of transverse members 21, 22, 23, 24, 25, 26 and 27. Two of the frame members, 24 and 25, rest upon and are affixed to the turn-table 15. A counterweight 58 is on one end of this frame.

30 is an electric motor mounted upon a shelf 31 below the main frame. It is connected to drive ropes or cables 32 which run alternately under and over grooved sheaves 33, 34, 35 and 36 mounted upon shafts which run between the transverse members 22 and 23 of the main frame and are kept in driving tension therewith by a cable tightener 37 which is pulled downwardly by a spring 38. Affixed to the shafts of the grooved sheaves are friction pulleys 43, 44, 45 and 46.

50 is a friction pulley between the pulleys 43 and 44. It is mounted upon an eccentric bushing, the angular position of which may be shifted by a lever 51, to bring pulley 50 into driving engagement with either pulley 43 or 44. Affixed to the shaft of pulley 50 is a rope sheave 52. A rope or cable 53 runs over sheave 52 and similar sheaves 54, 55 on threaded parallel shafts 56 and 57. 58 is a weight or a receptacle which may be weighted, supported by and in threaded engagement with the shafts 56 and 57.

When the pulley 50 is moved into driving engagement with pulley 43 the threaded shafts 56 and 57 will be driven in one direction by the connections thus described. When the pulley 50 is moved into driving engagement with pulley 44, shafts 56 and 57 will be driven in the opposite direction. Thus, by a movement of lever 51 the weight or receptacle 58 will be moved toward or away from the end of the main frame to vary its counterbalancing effect.

60 is a friction pulley between the pulleys 44 and 45. It may be moved into driving engagement with either of them by a manipulation of a lever 61 to cause its shaft 62 to be driven in one direction or the other. Shaft 62 is arranged to actuate the car raising and dumping mechanism which will be described later.

70 is a friction pulley between the pulleys 45 and 46. It may be moved into driving engagement with either of them by a manipulation of lever 71 to cause its shaft 72 to be driven in one direction or the other. 75 is a worm on shaft 72 in mesh with a gear 77 which is on a shaft with a pinion 78 which is engaged with the large gear 14 on the body 10. This arrangement enables the operator to rotate the main frame around the axis of the gear 14 in either direction.

A secondary frame is pivotally mounted in the

end of the main frame opposite the counterweight 58. It comprises parallel side members 80 connected at their ends by transverse members 81 which are centrally supported on bearings 82 in the transverse members 26 and 27 of the main frame. This secondary frame is in a part of the main frame which extends beyond the body 10 of the locomotive.

83, 83 are parallel shafts in bearing 84, 84 in the transverse members 81. On each of these shafts are two chain gears 85 and a bevel gear 86. The latter mesh with bevel gears 63 on the ends of a shaft 64 in bearings on one of the transverse members 81. In the center of shaft 64 is a gear 65 which is in mesh with a worm 66 on the end of shaft 62.

It is evident that the operator may, by manipulation of the lever 61 and the mechanism previously described, cause the shaft 64 to be driven in either direction.

87, 87 are chains, one end of each of which is affixed to one of the chain gears 85, and the other ends of which are connected to lifting rods 88. It may be seen that when the chain gears are in the positions in which they are shown in Fig. 3, the lifting bars 88 will hang directly under the shafts 83.

90 is a flat car having wheels 91 adapted to run on the tracks 12. The body of the car overhangs the wheels and forms shoulders 92 which are to be engaged by the lifting rods 88. 93 are lugs at the outer edges of the shoulders. 94 are parallel sided bumpers at the ends of the car. On the transverse members 81 of the secondary frame are guides 95 into which the car bumpers 94 fit when the car is raised. Angle irons 96 run across between the guides to limit the upward movement of the car.

100 is a lock horizontally pivoted in a bracket in one of the transverse members 81 of the secondary frame. On one side of the bracket the lock extends downwardly, as at 101, and rearwardly, as at 102, through an opening in transverse member 81 and into a socket in the transverse member 26 of the main frame. This locks the secondary frame against rotation relative to the main frame. The other end of the lock extends forwardly, as at 103, and downwardly, as at 104, beyond and below the angle iron 96. When the car 90 is raised to the position in which it is shown in Fig. 5, its bumper engages and lifts the end 104 of the lock and rocks it to remove its end 102 from engagement with the main frame.

I will now describe the operation of the apparatus. The locomotive and/or a loaded car are moved on the track until they are in the relative positions shown in Figs. 1, 2 and 3. Shafts 83 are then turned in opposite directions to cause the chain gears 85 to rotate in the directions indicated by the arrows in Fig. 3. The first effect of this rotation is to move the lifting bars 88 into the positions indicated at 88A (Fig. 3), under the shoulders 92 of the car and inside the lugs 93. Further rotation of gears 65 will cause the chains 87 to be wound up on them to lift the car. The gears 85 are flanged to receive the chains.

During this part of the operation the position of the weight 58 is shifted to counterbalance the weight of the car and its load.

As soon as the bumpers 94 of the car are within the guides 95, the rotation of shafts 83 is stopped. Then the main frame is rotated about the axis of large gear 14 until the car 90 is over

a desired point relative to the track 12. Further rotation is then imparted to shaft 83 to lift the car until its bumpers engage the angle irons 96. The car is then secured firmly to the secondary frame. As the car nears its final upward position, one of its bumpers 94 lifts the end 104 of the lock and moves its end 102 out of engagement with the transverse member 26. Further rotation of shaft 62 will thereafter be imparted to the secondary frame and to the car on it. This movement may be continued until the secondary frame and the car have been turned over 180° to dump its load, and then reversed until they reach their initial position. Or, if desired, they may be rotated 360° to their initial position.

After the car has been dumped the main frame may be rotated back to its initial position and the car lowered to its initial position on the track, or it may be rotated 180° from its original position and the car lowered onto the track on the other side of the locomotive.

The mechanisms shown and described are for illustrative purposes only, as changes and structural modifications may be made within the spirit and scope of the invention and I intend no limitations other than those which are imposed by the appended claims.

What I claim is:

1. A vehicle, a main frame thereon overhanging and extending beyond the vehicle, a vertical pivotal support for said frame, a secondary frame constructed and arranged to receive a receptacle, a horizontal pivotal support for the secondary frame on said main frame, and hoisting mechanism on the secondary frame arranged to hoist a receptacle into engagement with the secondary frame.

2. A vehicle, a main frame thereon overhanging and extending beyond the vehicle, a vertical pivotal support for said frame, a secondary frame constructed and arranged to receive a receptacle, a horizontal pivotal support for the secondary frame on said main frame, hoisting mechanism on the secondary frame arranged to hoist a receptacle into engagement with the secondary frame, and means for actuating the hoisting mechanism and rotating the secondary frame.

3. A vehicle, a main frame thereon overhanging and extending beyond the vehicle, a vertical pivotal support for said frame, a weight on one end of the main frame, a secondary frame on the other end of the main frame constructed and arranged to receive a receptacle, a horizontal pivotal support for the secondary frame on said main frame, hoisting mechanism on the secondary frame arranged to hoist a receptacle into engagement with the secondary frame, and means for actuating the hoisting mechanism and rotating the secondary frame.

4. A vehicle, a main frame thereon overhanging and extending beyond the vehicle, a vertical pivotal support for said frame, means for rotating the main frame on the vehicle, a weight on one end of the main frame, means for shifting the position of said weight on the main frame, a secondary frame on the other end of the main frame constructed and arranged to receive a receptacle, a horizontal pivotal support for the secondary frame on said main frame, hoisting mechanism on the secondary frame arranged to hoist a receptacle into engagement with the secondary frame, and means for actuating the hoisting mechanism and rotating the secondary frame.

5. A vehicle, a main frame thereon overhang-

ing the vehicle, a vertical pivotal support for said frame, a secondary frame, a horizontal pivotal support for the secondary frame on said main frame, hoisting mechanism on the secondary frame arranged to hoist a receptacle into engagement with the secondary frame, means for locking the secondary frame to the main frame against relative rotation therewith, and means actuated by the upward movement of the receptacle for releasing said locking means.

6. A vehicle, a main frame thereon overhanging and extending beyond the vehicle, a vertical pivotal support for said frame, a secondary frame constructed and arranged to receive a receptacle, a horizontal pivotal support for the secondary frame on said main frame, and hoisting mechanism on the secondary frame comprising hoisting members, combined with a wheeled receptacle constructed to be engaged by said hoisting members and to be raised thereby into engagement with the secondary frame.

7. A vehicle, a main frame thereon overhanging the vehicle, a vertical pivotal support for said frame, a secondary frame, a horizontal pivotal support for the secondary frame on said main frame, and hoisting mechanism on the secondary frame having guides thereon and comprising hoisting members, combined with a wheeled receptacle having projections thereon arranged to enter said guides, said receptacle being arranged to be engaged by said hoisting members and to be raised thereby into engagement with the secondary frame with its projections within the guides thereon.

8. A vehicle, a main frame thereon overhanging the vehicle, a vertical pivotal support for said frame, a secondary frame, a horizontal pivotal support for the secondary frame on said main frame, hoisting mechanism on the secondary frame having guides thereon and comprising hoisting members, combined with a wheeled receptacle having projections thereon arranged to enter said guides, said receptacle being arranged to be engaged by said hoisting members and to be raised thereby into engagement with the secondary frame with its projections within the guides thereon, means for rotating the secondary frame and receptacle, a device for locking the secondary frame to the main frame against rotation, and means for releasing said locking device when the receptacle is in engagement with the secondary frame.

9. A vehicle, a main frame thereon overhanging the vehicle, a vertical pivotal support for said frame, a secondary frame, a horizontal pivotal support for the secondary frame on said main frame, hoisting mechanism on the secondary frame having guides thereon and comprising hoisting members, combined with a wheeled receptacle having projections thereon arranged to enter said guides, said receptacle being arranged to be engaged by said hoisting members and to be raised thereby into engagement with the secondary frame with its projections within the guides thereon, means for rotating the secondary frame and receptacle, a device for locking the secondary frame to the main frame against rotation, and means actuated by the upward movement of the receptacle for releasing said locking device.

10. A vehicle having wheels adapted to run on rails, a main frame thereon overhanging the vehicle, a vertical pivotal support for said main frame, a secondary frame, horizontal pivotal supports at the ends of the secondary frame on the

main frame, and hoisting mechanism on the secondary frame comprising hoisting members at the sides of the secondary frame, combined with a railroad car having wheels adapted to run on rails and constructed to form side shoulders overhanging its wheels adapted to be engaged by said hoisting members and to be raised thereby into engagement with the secondary frame.

11. A vehicle having wheels adapted to run on rails, a main frame thereon overhanging the vehicle, a vertical pivotal support for said main frame, a secondary frame, horizontal pivotal supports at the ends of the secondary frame on the main frame, hoisting mechanism on the secondary frame comprising hoisting members at the sides of the secondary frame, combined with a railroad car having wheels adapted to run on rails and constructed to form side shoulders overhanging its wheels adapted to be engaged by said hoisting members and to be raised thereby into engagement with the secondary frame, and motor means on the main frame for actuating the hoisting mechanism and rotating the secondary frame and the car.

12. A vehicle having wheels adapted to run on rails, a main frame thereon overhanging the vehicle, a vertical pivotal support for said main frame, a secondary frame, horizontal pivotal supports at the ends of the secondary frame on the main frame, vertical guides on the secondary frame near said supports, and hoisting mechanism on the secondary frame comprising hoisting bars at the sides of the secondary frame, combined with a railroad car having wheels adapted to run on rails, bumpers on the ends of said car, said car being constructed to form side shoulders overhanging its wheels adapted to be engaged by said hoisting bars and to be raised thereby into engagement with the secondary frame with its bumpers in the guides thereon, and motor means on the main frame for actuating the hoisting means and rotating the secondary frame and the car.

13. A vehicle having wheels adapted to run on rails, a main frame thereon overhanging the vehicle, a vertical pivotal support for said main frame, a secondary frame, horizontal pivotal supports at the ends of the secondary frame on the main frame, vertical guides on the secondary frame near said supports, and hoisting mechanism on the secondary frame comprising hoisting bars at the sides of the secondary frame, combined with a railroad car having wheels adapted to run on rails, bumpers on the ends of said car, said car being constructed to form side shoulders overhanging its wheels adapted to be engaged by said hoisting bars and to be raised thereby into engagement with the secondary frame with its bumpers in the guides thereon, a device for locking the secondary frame to the main frame against rotation, means actuated by the upward movement of the car for releasing said locking device, and motor means on the main frame for actuating the hoisting means and rotating the secondary frame and the car.

14. A vehicle having wheels adapted to run on rails, a main frame thereon overhanging the vehicle, a vertical pivotal support for said main frame, a secondary frame, horizontal pivotal supports at the ends of the secondary frame on the main frame, vertical guides on the secondary frame near said supports, and hoisting mechanism on the secondary frame comprising hoisting bars at the sides of the secondary frame, combined with a railroad car having wheels adapted

to run on rails, bumpers on the ends of said car, said car being constructed to form side shoulders overhanging its wheels adapted to be engaged by said hoisting bars and to be raised thereby into engagement with the secondary frame with its bumpers in the guides thereon, a device for locking the secondary frame to the main frame against rotation, means actuated by the upward movement of the car for releasing said locking device, and motor means on the main frame arranged to actuate the hoisting means until the car has released the locking device and thereafter to rotate the secondary frame and the car.

15 15. A vehicle having wheels adapted to run on rails, a main frame thereon overhanging the vehicle, a vertical pivotal support for said main frame, a weight on one end of the main frame, means for rotating the main frame on the vehicle, means for shifting the position of said weight, a secondary frame on the other end of the main frame, horizontal pivotal supports at the ends of the secondary frame on the main frame, vertical guides on the secondary frame near said supports, and hoisting mechanism on the secondary frame comprising hoisting bars at the sides of the secondary frame, combined with a railroad car having wheels adapted to run on rails, bumpers on the ends of said car, said car being constructed to form side shoulders overhanging its wheels adapted to be engaged by said hoisting bars and to be raised thereby into engagement with the secondary frame with its bumpers in the guides thereon, a device for locking the secondary frame to the main frame against rotation, means actuated by the upward movement of the car for releasing said locking device, and motor means on the main frame arranged to actuate the hoisting means until the car has released the locking device and thereafter to rotate the secondary frame and the car.

16. A vehicle having wheels adapted to run on rails, a main frame thereon overhanging the vehicle, a vertical pivotal support for said main frame, a weight on one end of the main frame, means for rotating the main frame on the vehicle, means for shifting the position of said weight, a secondary frame on the other end of the main frame, horizontal pivotal supports at the ends of the secondary frame on the main frame, vertical

guides on the secondary frame near said supports, and hoisting mechanism on the secondary frame comprising a pair of pulleys in axial alinement with each other, a hoisting bar under said pulleys, flexible elements affixed to said pulleys near the peripheries thereof and to the hoisting bar, another pair of pulleys in axial alinement with each other, spaced from said first mentioned pulleys, a second hoisting bar under said other pair of pulleys, flexible elements affixed to said other pair of pulleys near the peripheries thereof and to said second hoisting bar, means for rotating said pairs of pulleys in opposite directions to raise the hoisting bars simultaneously and to impart to said bars an initial lateral movement, combined with a railroad car having wheels adapted to run on rails, bumpers on the ends of said car, said car being constructed to form side shoulders overhanging its wheels adapted to be engaged by said hoisting bars and to be raised thereby into engagement with the secondary frame with its bumpers in the guides thereon, a device for locking the secondary frame to the main frame against rotation, means actuated by the upward movement of the car for releasing said locking device, and motor means on the main frame arranged to actuate the hoisting means until the car has released the locking device and thereafter to rotate the secondary frame and the car.

17. A vehicle, a main frame thereon overhanging the vehicle, a hoisting mechanism on said frame beyond the vehicle comprising a pair of pulleys in axial alinement with each other, a hoisting bar under said pulleys, flexible elements affixed to said pulleys near the peripheries thereof and to the hoisting bar, another pair of pulleys in axial alinement with each other, spaced from said first mentioned pulleys, a second hoisting bar under said other pair of pulleys, flexible elements affixed to said other pair of pulleys near the peripheries thereof and to said second hoisting bar, said lifting bars being parallel to and spaced from the longitudinal axis of said frame, and means for rotating said pair of pulleys in opposite directions to raise the hoisting bars simultaneously and to impart to said bars initial lateral movement toward each other.

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