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[54] **DUMPING CAR**

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[51] **Int. Cl.** **B61d 9/02**

[58] **Field of Search** ..... 105/263, 270, 271, 273; 298/18, 22 P, 22 C

[56] **References Cited**

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[57] **ABSTRACT**

A car intended to be used on a railroad for the carrying of materials and including a frame on which a pair of outwardly swinging box-like hoppers are pivotally mounted longitudinally thereof for outward movement relative to each other to dump the contents of the hoppers on opposite sides of the track, the hoppers being controlled and operated either independently or simultaneously at the selection of the individual operating the same by a control of the hydraulic mechanism effecting the dumping action.

4 Claims, 6 Drawing Figures

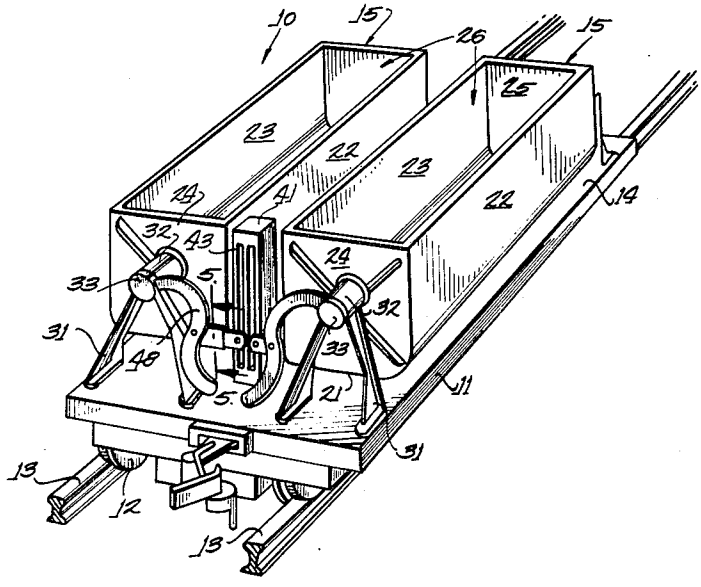


Fig. 1

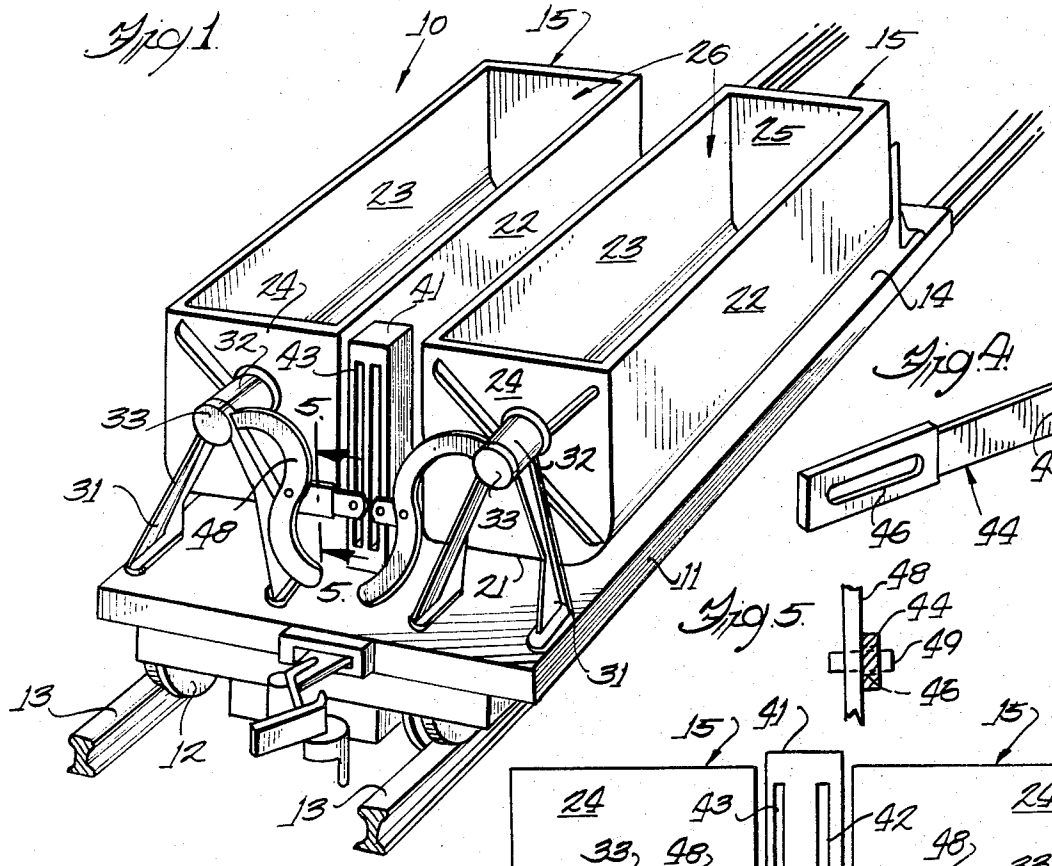


Fig. 4

Fig. 5

Fig. 2

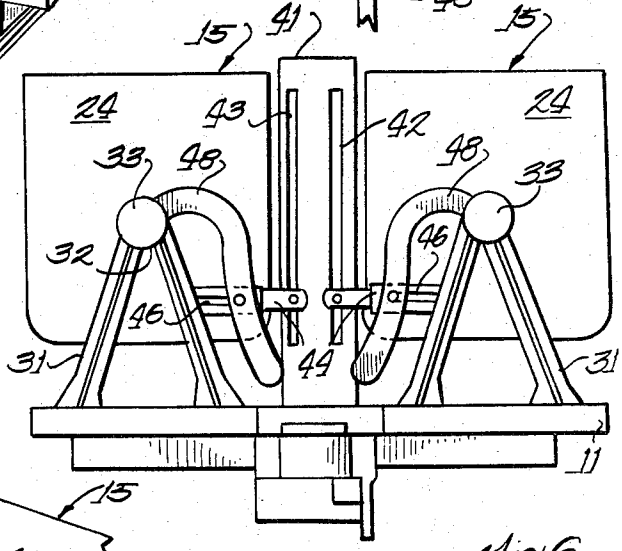


Fig. 3

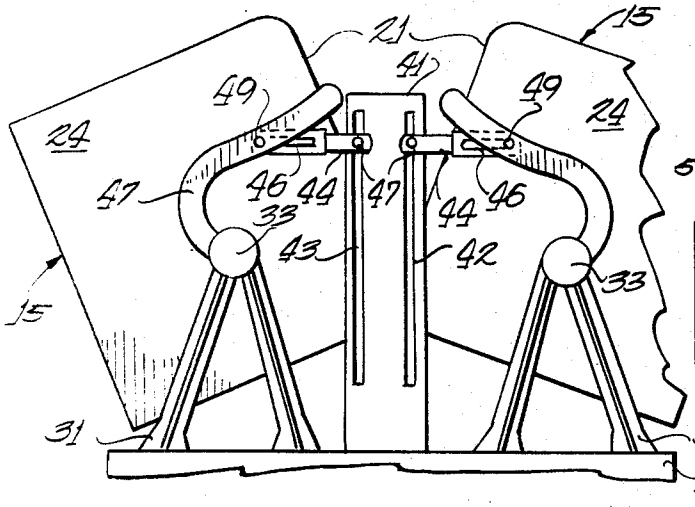
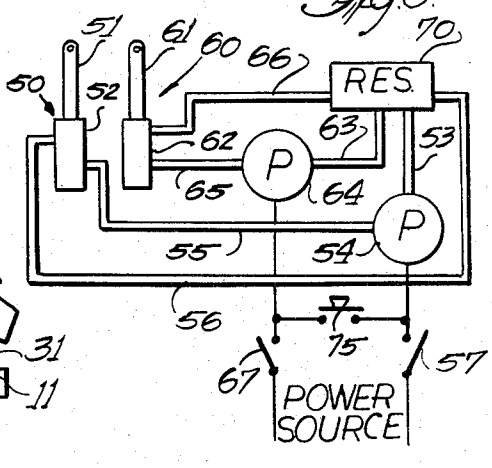


Fig. 6



DUMPING CAR

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to railroad cars and more particularly to a novel railroad dump car on which is mounted twin carrying hoppers adapted to be rotated outwardly to discharge their contents on opposite sides of the railroad track with such dumping taking place either independently or simultaneously.

2. Description of the Prior Art

In constant use in railroads today are railroad cars adapted to be used in a carrying capacity for the bulk carrying of materials such as gravel, coal, stone, sand, cement and the like for the transportation of such materials between a point of loading into the hopper car and a point of unloading therefrom at the point of destination thereof. However, presently available dumping cars suffer from one or more difficulties normally associated with such dumping cars making them disadvantageous either to the railroad or to the user, the foremost disadvantage being that the hopper cars are expensive to construct and being of a rather complicated nature utilizing many components such that they frequently malfunction requiring constant repair and maintenance and thus expensive time during which such cars are not available for use.

A further disadvantage of present hopper cars is that they may only carry a single commodity at a time so that should only a partial quantity be desired by an individual which is not sufficient to fill a complete hopper car the individual must still incur the expense of renting the complete hopper car for the transportation of such commodity. This is not only overly expensive to the individual, but is also a waste of railroad facilities in having to transport partially loaded hopper cars.

SUMMARY OF THE INVENTION

The present invention recognizes the deficiencies and disadvantages of presently available dumping cars as used on railroads and provides a novel solution thereto in the form of a dump car having a platform in which is mounted twin longitudinally extending hoppers disposed in side-by-side relationship with each adapted to be rotated in an outward direction about its axis to discharge the contents thereof on opposite sides of the track, the hoppers operable either independently of each other or simultaneously with each other in a manner to discharge their contents completely and at a safe distance to the side of the track such that the hoppers may be filled with different commodities which, in turn, may be discharged at different points of destination such that maximum use of railroad facilities is provided by the use of such dumping cars.

It is a feature of the present invention to provide a railroad dumping car which is possessed of few parts and thus devoid of complicated parts liable to get out of order such that the car requires minimum maintenance and a high degree of reliability.

A further feature of the present invention provides a railroad dumping car which is easy to use and reliable and efficient in operation.

Still a further feature of the present invention provides a railroad dumping car having a pair of hoppers which can be loaded with the same or different contents in a manner such that the contents will be entirely separate from each other and wherein an improved mechanism is provided for the dumping of the two contents on opposite sides of the track in a rapid and effective manner requiring a minimum expenditure of time and effort on the part of operating personnel.

Yet still a further feature of the present invention provides a railroad dumping car having a pair of hoppers thereon which are mounted in such a manner that they are each nearly balanced in their bearings thus requiring the application of only a moderate tilting force to rotate each of the hoppers in a swinging outward movement about their axis to effect the discharging of the contents therefrom.

Yet still a further feature of the present invention is the provision of a railroad dumping car which is uncomplicated, inexpensive, efficient, durable, and constructed of the least material while possessing the greatest strength so as to provide many years of trouble free service.

Other features and advantages of this invention will be apparent during the course of the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings forming a part of this specification, and in which like reference characters are employed to designate like parts throughout the same:

FIG. **1** is a perspective view of a railroad dumping car constructed in accordance with the present invention;

FIG. **2** is a side elevational view of the operating mechanism for controlling the dumping of the hoppers of the car;

FIG. **3** is a fragmentary side elevational view similar to FIG. **2** but illustrating the hoppers in their respective tilted positions for dumping;

FIG. **4** is a perspective view of the horizontal arm;

FIG. **5** is a cross-sectional view taken along line **5—5** of FIG. **1**; and

FIG. **6** is a diagrammatic view of the hydraulic operating mechanism.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in detail there is illustrated a preferred form of a railroad dumping car constructed in accordance with the principles of the present invention and designated generally in its entirety by the reference numeral **10** and which is comprised of a substantially flat horizontal platform **11** supported on railroad trucks **12** of conventional construction adapted to roll along railroad tracks **13**, the platform having a top surface **14** on which there is mounted twin rectangularly shaped box-like open topped hoppers **15** adapted to be rotated outwardly relative to each other to discharge their contents on opposite sides of the tracks **13**.

Each hopper **15** includes a bottom surface **21**, opposed side surfaces **22** and **23**, and opposed end surfaces **24** and **25**, such surfaces defining therebetween an open topped compartment **26** which are adapted to be loaded with the same or different contents in a manner to transport such contents entirely separate from each other.

The hoppers **15** are disposed in side-by-side adjacent relationship with there being provided at both ends of

each of the hoppers an A-shaped bracket **31** having its base mounted on the top surface **14** of platform **11** and extending upwardly therefrom terminating at the apex portion which carries bearings **32** adapted to receive therein trunnions **33** projecting axially outwardly from each of the ends **24** and **25** of the hoppers **15.** The positions of the trunnions **33** on each of the hoppers is preferably disposed at the center of gravity thereof in order that the forces required to effect the tilting of the hoppers to dump the same may be minimized.

Positioned at one end of platform **11** intermediate ends **24** of the hoppers **15** is an upright guiding post **41** having a pair of horizontally spaced apart vertically extending slots **42** and **43** disposed therein. A pair of horizontal arms **44** are provided each being of an elongated rectangular configuration having an aperture **45** at one end thereof and having an elongated longitudinally extending slot **46** disposed in the opposite end thereof, one of the arms **44** being associated with slot **42** and having a pin **47** extending through aperture **45** into slot **42** for fixed guiding movement of the arm **44** in a reciprocal vertical manner while maintaining the horizontal disposition of the same. Similarly, the other arm **44** is associated with slot **43** and is likewise provided with a pin **47** connected to the aperture **45** for guiding the associated arm **44** in reciprocal vertical movement along the slot while maintaining the horizontal disposition of the arm. A pair of angle arms **48** are provided each having one end affixed to an associated trunnion **33** of one of the hoppers **15** with each of the arms extending outwardly from its associated trunion in a direction towards the guide post **41** so as to have its opposite end portions pivotally connected to associated arms **44** by means of pivot pins **49** extending from the angle arms to be slidingly received in associated slot **46.**

Disposed inwardly of guide post **41** are a pair of hydraulically operated piston and cylinder combinations **50** and **60,** the combinations **50** having a piston rod **51** and a cylinder **52** with the combination **60** having a piston rod **61** and a cylinder **62.** The free ends of piston rods **51** and **61** are each associated with slots **42** and **43** respectively to engage the pin **47** associated with the respective slot. A suitable hydraulic reservoir **70** is provided and is connected by suitable tubings **53** and **63** to separate hydraulic pumps **54** and **64** respectively which in turn are connected by tubes **55** and **65** to cylinders **52** and **62** respectively, the outlets of the cylinders being connected by tubes **56** and **66** back to the reservoir **70.** The pumps **54** and **64** may be of the air operated type, electric operated type, or the like with pump **54** provided with a separate operating control **57** and pump **64** provided with a separate operating control **67** each of which is adapted to separately energize its associated pump when desired by operating personnel. In addition, a control switch **75** is provided so as to connect such pumps in parallel relationship for the simultaneous operation thereof at the desires of the operating personnel. Thus, the pumps **54** and **64** may be operated either individually or simultaneously in a manner to effect either the individual or simultaneous swinging movement of the hoppers **15** about the trunnions **33** in a manner to effect the discharge of the contents from the compartments **26** to opposite sides of the tracks **13.**

As seen in FIG. **2** the hoppers are shown in their normal transporting position, with FIG. **3** illustrating the tilted dumping positions of the hopper, it being seen that the arrangement of the piston rods **51** and **61,** slots **42** and **43,** horizontal arms **44** and angle arms **48** effect the swinging movement of the hoppers **15.** For example, referring to the right-hand hopper of FIGS. **2** and **3,** it is seen that as arm **44** is driven upwardly of slot **42** it effects simultaneous swinging movement of angle arm **48** which is affixed to the hopper car trunnion **33** to effect the tilting movement of the hopper car, the continued upward movement of the arm **44** tilting the car to the dumping position with pivot pin **49** sliding in slot **46** to complete the maximum tilting position of the hopper. After the contents of the hopper have been dumped, the piston returns the arm **44** vertically through the slot **42** thus returning the hopper car to its initial position.

It is to be understood that the form of this invention herewith shown and described is to be taken as preferred examples of the same, and that this invention is not to be limited to the exact arrangement of parts shown in the accompanying drawings or described in this specification as various changes in the details of construction as to shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention, the scope of the novel concepts thereof, or the scope of the sub-joined claims.

Having thus described the invention, what is claimed is:

1. A railroad dumping car of the type having a mounting platform supported on railroad trucks for guided movement along conventional railroad tracks, the dumping car comprising:

a pair of longitudinally extending rectangularly shaped open topped box-like hoppers each having a content receiving compartment formed therein adapted to carry the same or different contents entirely separate from each other, the hoppers disposed in side-by-side adjacent relationship with each hopper having opposed end wall surfaces;

a pair of side-by-side aligned brackets disposed on each side of said platform adjacent each associated end of said associated hopper and extending upwardly from said platform;

each mounting bracket having a bearing assembly mounted at the top portion thereof;

each hopper having a pair of axially aligned trunnions affixed to opposite end wall surfaces of the hopper and projecting outwardly therefrom and adapted to be rotatably received in an associated bearing for rotative support of said hopper thereabout;

an upright vertically extending guiding post disposed intermediate adjacent ends of said hoppers and having one end affixed to said platform with said posts projecting upwardly therefrom, a pair of horizontally spaced apart vertically extending slots formed in a side member of said post;

a pair of hydraulic cylinders and piston arrangements, each of said arrangements associated with one of said guiding post slots and disposed inwardly of said guiding posts, each of said piston rods having its free end disposed in alignment with the associated slot and reciprocally movable therealong between the top and bottom ends of said slot;

hydraulic means connected to said cylinders to effect the operation thereof;

control means associated with said hydraulic means and selectable for the independent or simultaneous operation of said hydraulic means; and

linkage means interconnecting each of said free ends of said piston rods to one of said hopper trunnions to effect the tilting rotation of said associated hopper about its axis when said piston rod moves upwardly along said slot to the top end of the slot and wherein said hopper is returned to its initial position upon said piston rod moving downwardly of said slot to its initial position adjacent the bottom of said slot.

2. The dumping car as set forth in claim **1** wherein said linkage means comprises a pair of horizontal arm members, each arm member having one end associated with one of the slots with the opposite end projecting normal to the plane of the slot, the horizontal arms projecting in opposite directions from said slots, each opposite end of each of said horizontal arms having an elongated longitudinally extending slot formed therein and extending therethrough, a pair of angle arm, each angle arm associated with one of said hopper cars, each angle arm having one end affixed to an adjacent trunnion of the associated hopper car with the opposite end extending outwardly therefrom in a direction toward said guide post to be pivotally joined by a pivot pin to said slot of an associated horizontal arm member for horizontal movement therethrough upon vertical reciprocal movement of said arm member along said associated slot to effect the dumping action of said hopper.

3. The dumping car as set forth in claim **2** wherein said trunnions are disposed approximately along the axis of the center of gravity of each hopper.

4. The dumping car as set forth in claim **3** wherein said mounting brackets are of an A-shaped configuration having the base portion thereof mounted to the top surface of said platform and having said bearing assembly mounted at the apex portion thereof.

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