Jan. 20, 1970 G. H. BROWN 3,490,389

DROP-CENTER RAILROAD CAR WITH TURNTABLE

Filed Sept. 13, 1967 4 Sheets-Sheet 1

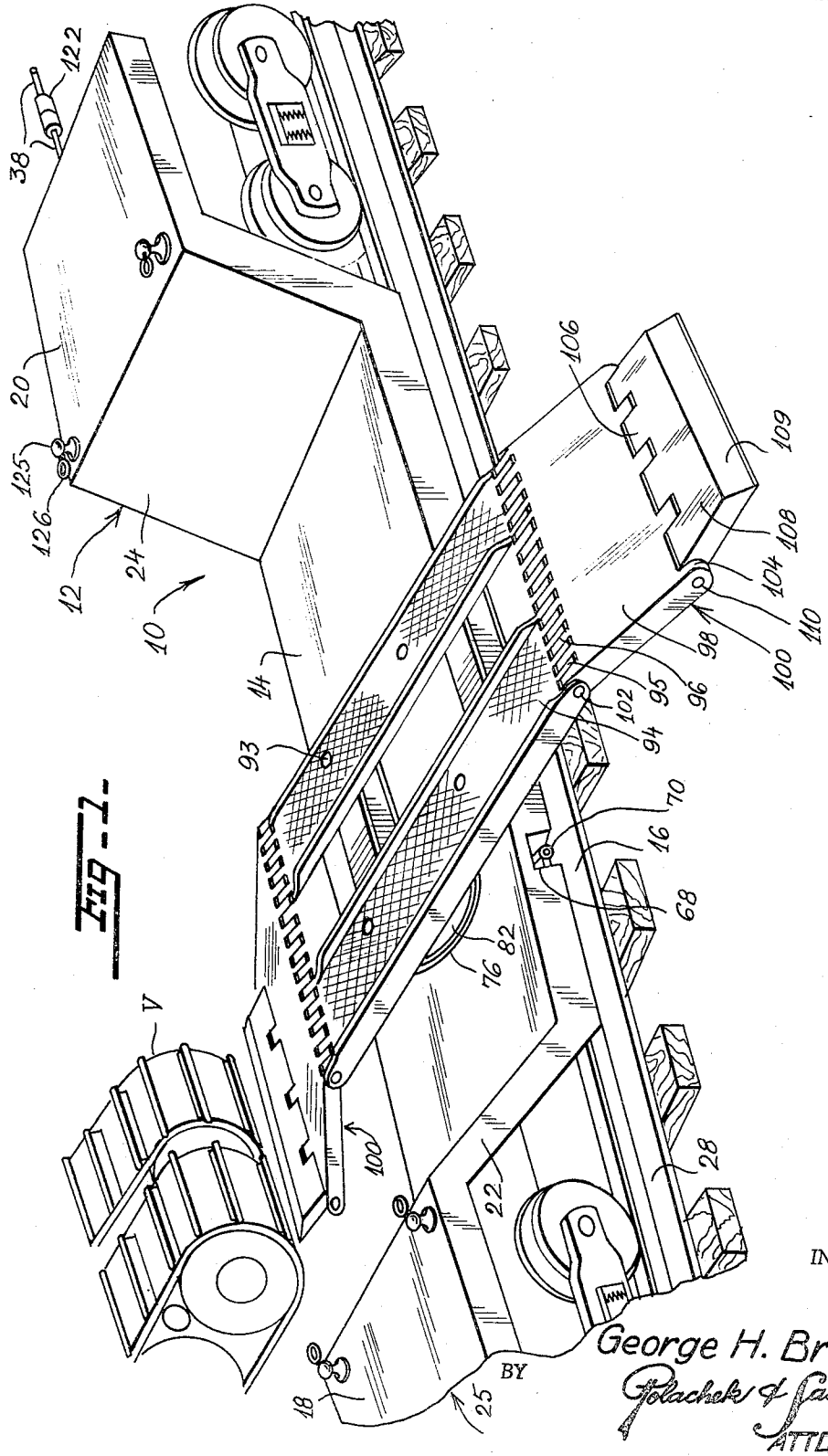


Fig. 1.

INVENTOR

George H. Brown

BY Polachek & Saulsbury

ATTORNEYS

Jan. 20, 1970 G. H. BROWN 3,490,389

DROP-CENTER RAILROAD CAR WITH TURNTABLE

Filed Sept. 13, 1967 4 Sheets-Sheet 2

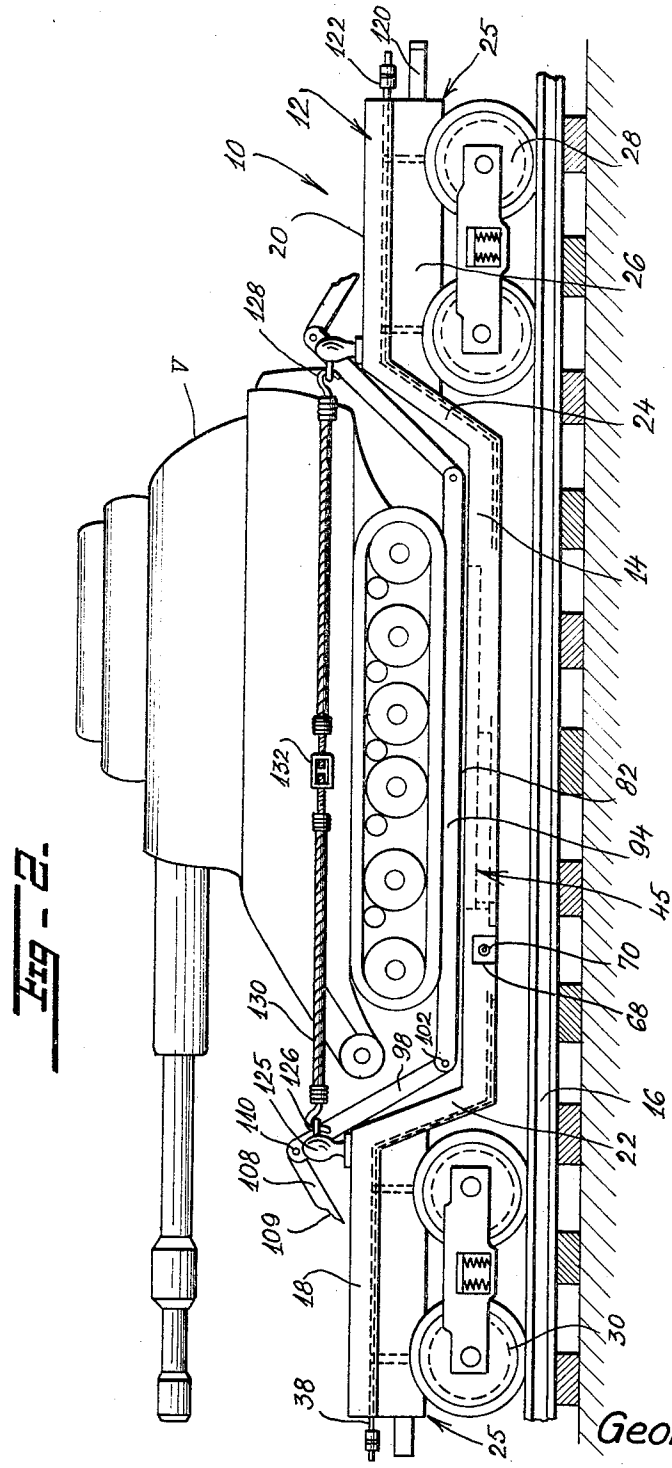


Fig - 2.

INVENTOR

George H. Brown

BY

Polachek & Saulsbury

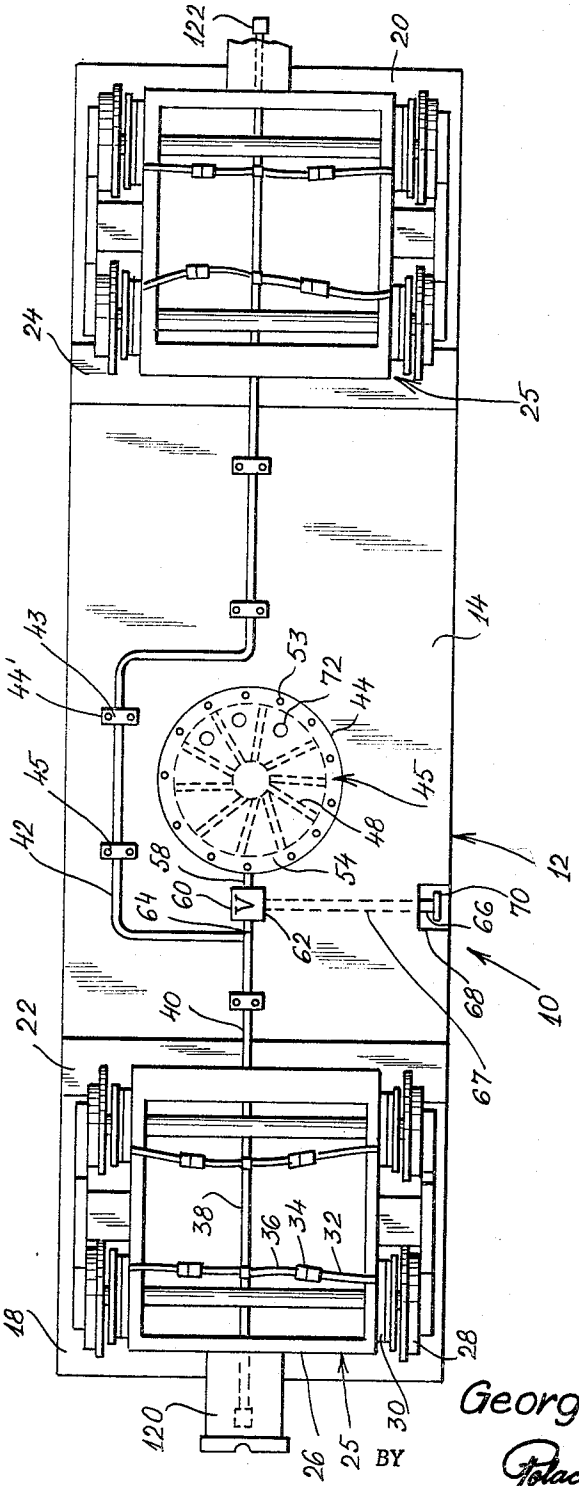
ATTORNEYS

Jan. 20, 1970 G. H. BROWN 3,490,389

DROP-CENTER RAILROAD CAR WITH TURNTABLE

Filed Sept. 13, 1967 4 Sheets-Sheet 3

Fig. 3.



INVENTOR

George H. Brown

BY

Golacheck & Saulsbury

ATTORNEYS

Jan. 20, 1970 G. H. BROWN 3,490,389

DROP-CENTER RAILROAD CAR WITH TURNTABLE

Filed Sept. 13, 1967 4 Sheets-Sheet 4

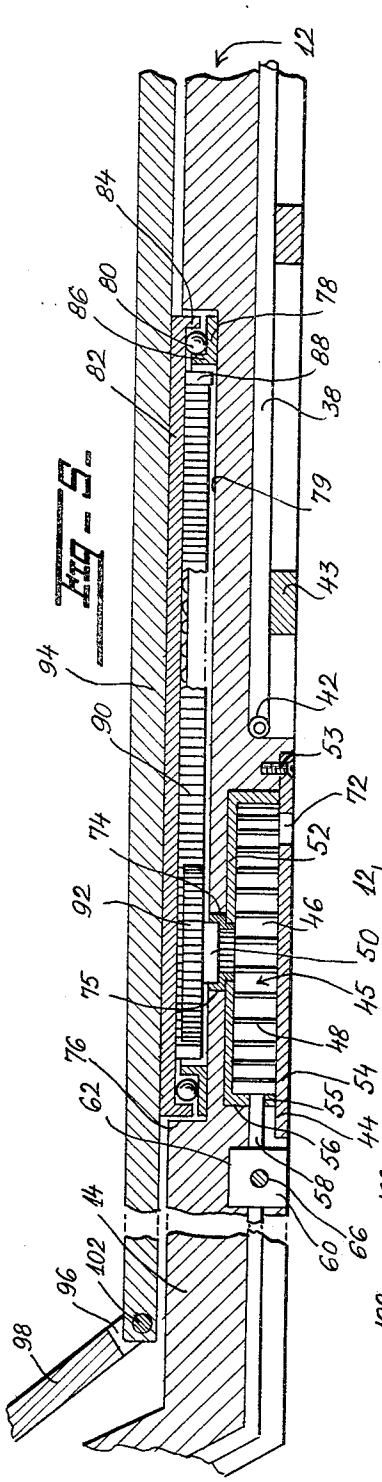


Fig. 5.

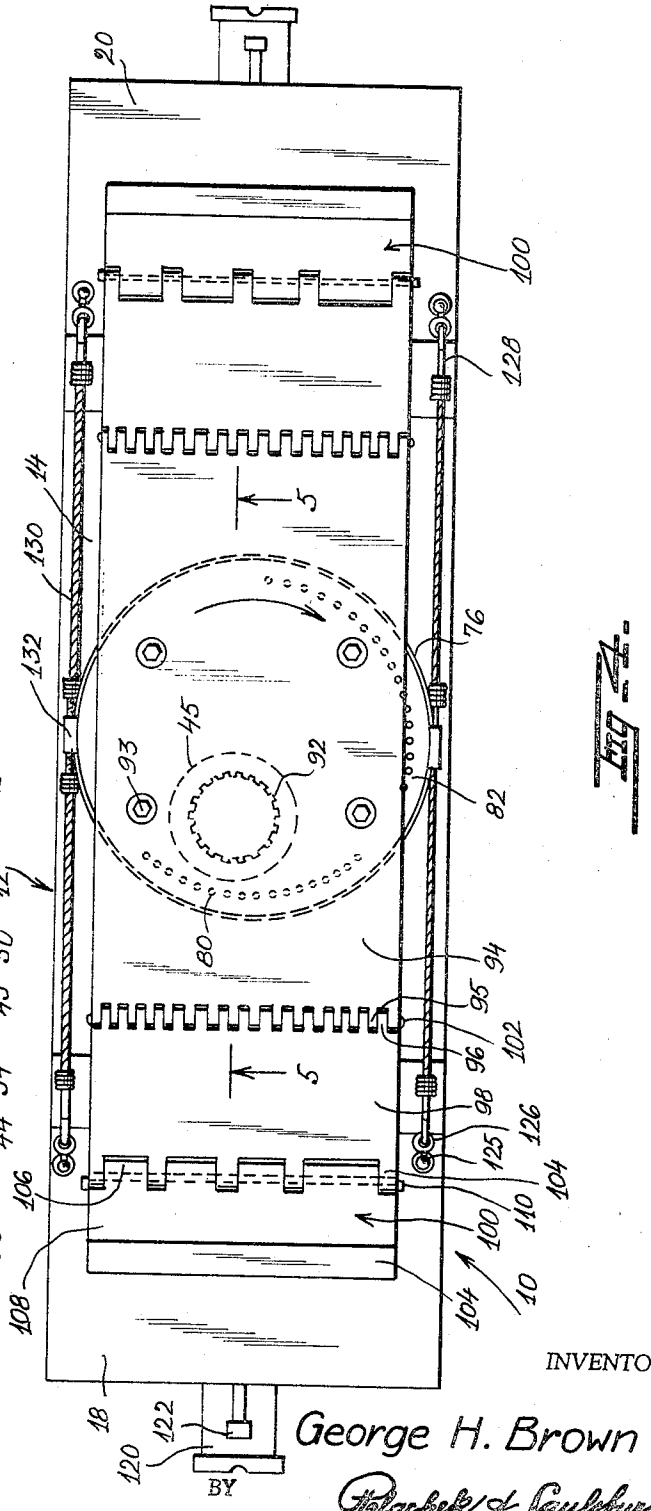


Fig. 4.

INVENTOR

George H. Brown

BY

Blackett & Saulsbury

ATTORNEYS

United States Patent Office 3,490,389 Patented Jan. 20, 1970

3,490,389

DROP-CENTER RAILROAD CAR WITH TURNTABLE

George H. Brown, 1151 Randolph Road, McLean, Va. 22101

Filed Sept. 13, 1967, Ser. No. 667,556
Int. Cl. B61d 3/04
U.S. Cl. 105—455 10 Claims

ABSTRACT OF THE DISCLOSURE

The disclosure describes a drop-center railroad car provided with a platform on a rotatable turntable for quick loading and unloading of self-propelled heavy rolling stock such as loaded vans, mobile construction equipment, military vehicles such as full tracked tanks, etc. The turntable is rotated by a pneumatic motor driven by compressed air. The platform has articulated hinged loading ramps which extend laterally of the railroad car when the turntable is rotated. The ramps can be lifted to serve as end abutments for the load on the platform. Quick detachable cables serve as lateral retainers for load on the platform.

The invention is directed at an improved drop-center railroad car.

Railroad cars for transporting heavy vehicles have heretofore been proposed. The railroad car described in U.S. Patent No. 2,782,733 is typical of the prior art, wherein a turntable is provided in a railroad car. Such railroad cars have not proven practical and have not received general commercial acceptance for a number of reasons. They are very complex in structure and very expensive to build. Manual labor is generally required to rotate the loaded turntable, or complicated hydraulic hoists and rams are required. Wheel chocks must be placed manually. Loading and unloading of vehicles takes more time than is generally allotted to a normal train stop so train schedules are disrupted. In some prior railroad cars loading and unloading can only be done at specially equipped and prepared stations or loading docks.

The present invention is directed at overcoming the above and other difficulties and disadvantages of prior railroad cars of the type described. According to the invention there is provided a railroad car having a one-piece car bed formed as a cast steel structure with a drop-center. In the drop-center is a well in which a turntable rotates on ball bearings. The turntable is gear driven by an air turbine in another well. On the turntable is secured a platform having articulated, hinged end ramps. Double wheel trucks support the car bed on railroad tracks. The truck wheels are provided with pneumatically operated disk brakes. The car bed is provided with channels through which compressed air lines extend for actuating the disk brakes and for driving the air turbine.

It is therefore a principal object of the invention to provide a railroad car of simplified and improved construction.

A further object is to provide a railroad car of the type described with a turntable in a well in the car bed driven by an air turbine seated in another well in the car bed.

Further objects of the invention are to provide a railroad car of the type described which:

(1) Carries a heavy load safely;

(2) Presents no clearance problems horizontally or vertically;

(3) Loads and unloads in minimum time, such as that normally allotted to a station stop on a long run;

(4) Loads and unloads with a minimum use of hand labor;

(5) Requires no highly skilled labor to operate nor any special tools;

(6) Has less working parts than prior railroad cars of the same general type;

(7) Uses trucks having pneumatically operated disc brakes energized by air lines installed in channels in the car bed;

(8) Is simpler and more economical to maintain and service;

(9) Employs simplified stops and locks and simplified controls;

(10) Has a flat bottom so that it requires only minimal clearance underneath and so that the drop distance between the platform and the ground is minimized;

(11) Which uses articulated hinged end ramps;

(12) Loads and unloads anywhere there is enough room to drive a vehicle on or off the turntable at right angles to the railroad car;

(13) Requires no special loading and unloading dock facilities; and

(14) Is arranged so that a plurality of similar railroad cars in a train can be simultaneously loaded and unloaded.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings and to the appended claims in wnich the various novel features of the invention are more particularly set forth.

In the arcompanying drawings forming a material part of this disclosure:

FIG. 1 is a perspective view with parts broken away of a railroad car embodying the invention, the platform of the car being rotated and extended to loading and unloading position.

FIG. 2 is a side view of the railroad car on a reduced scale shown loaded with a heavy vehicle.

FIG. 3 is a bottom plan view of the railroad car.

FIG. 4 is a top plan view of the railroad car, and

FIG. 5 is an enlarged fragmentary vertical sectional view taken on line 5—5 of FIG. 4.

Referring to the drawing there is shown a railroad car **10** of standard single or double length. The car has a horizontal car bed **12**. The car bed has a horizontal rectangular center section **14** which is located close to the railroad tracks **16** on which the car rides. Rectangular horizontal end decks **18** and **20** of the car bed are integral with inwardly and downwardly inclined walls **22**, **24**. These walls are integral with ends of center section **14**. The entire car bed is a single strong cast steel unit which can be made by well known metal casting procedures at relatively low cost as compared with a car bed assembled from individual rails, brackets, hardware, etc.

Two railroad trucks **25** are provided at opposite ends of the car bed. The truck bodies **26** are secured to undersides of decks **18**, **20** and inclined walls **22**, **24**. Flange wheels **28** of the trucks ride on tracks **16**. The wheels **28** have pneumatically operated disc brakes **30** indicated in FIGS. 2 and 3 actuated by compressed air supplied through short hoses **32** via snap couplings **34** from branch pipes **36** connected to main air line or conduit **38**. The main air line is set into channels **40**, **42** in the bottom of the car bed. The channels are continuous with each other and extend from end to end of the car bed. Cleats **43** set in recesses **44'** and held by screws **45** retain the air line **38** in the channels.

Channel **42** extends in a loop around a shallow circular well **44** shown in FIGS. 3 and 4, formed in the bottom of section **14** of the car bed. In well **44** is a turbine **45**. The turbine has a rotor **46** with vanes **48** tangentially arranged around a central axially vertical shaft **50**. The rotor is disposed in an inverted dished casing **52** closed by bottom plate **54** held by screws **53**. An opening **55** is

provided in side **56** of the casing **52**. A nozzle **58** extends from a manually controllable valve **60** to opening **55** to supply air under pressure which impinges on the vanes and turns the rotor. Valve **60** is set into a recess **62** in the bottom of section **14**, and receives air from main line **38** via branch pipe **64**. The valve is controlled by a shaft **66** which extends horizontally through a bore **67** in section **14** and terminates in lateral recess **68** where handle **70** is attached for operating the valve to open or close the passage of air to the turbine. Air exhaust holes **72** are provided in bottom closure plate **54** of the turbine.

Shaft **50** extends through a bearing **74** set in an opening **75** in the bottom of a well **76** formed in the top of section **14**; see FIGS. 1, 4 and 5. In this well is a ball bearing assembly including a ring **78** secured to the flat bottom **79** of the well. Ball bearings **80** extend circumferentially around the ring. Overlaying ring **78** is a turntable **82**. The turntable has an outer peripheral flange **84** which defines a channel with inner flange **86** of the ring **78**. The underside of the turntable rests rotatably on the ball bearings **80**. Another annular flange **88** is formed concentrically with and inside of flange **84**. This flange is inside of flange **86** and is formed with gear teeth **90**. Flange **88** is in effect a ring gear with internal teeth. Engaged with teeth **90** are teeth of a spur gear **92** mounted on shaft **50** and rotated thereby. Mounted on top of turntable **82** by recessed bolts **93** is a rectangular platform **94**. It will be apparent that the turntable and platform can be turned when the turbine is pneumatically driven by compressed air under control of valve **60**.

Platform **94** has hinge fingers **95** at opposite ends as clearly shown in FIGS. 1 and 4. These fingers are interfitted with hinge fingers **96** of a rigid ramp plate **98**. Two articulated ramps **100** are provided at opposite ends respectively of the platform **94**. Each ramp has a ramp plate **98** rotatably engaged by a cross shaft **102** with one end of platform **94**. Further hinge fingers **104** are formed at outer ends of plates **98**. Hinge fingers **106** of end plates **108** interfit with fingers **104** and are rotatably engaged by cross shafts **110**. Outer ends **109** of plates **108** are tapered or beveled to facilitate driving a vehicle upon the ramps. Plates **108** can be made of tough, shock absorbing artificial rubber.

FIG. 1 shows the platform **94** rotated to open position transversely to the longitudinal direction of the car **10**. The ramp plates **98** incline outwardly and downwardly to the ground and end plates **108** rest on the ground. A heavy vehicle V such as a full track tank can ride up either one of the articulated ramps **100** onto the platform **94**. Then the turbine can be operated by turning valve handle **70** to admit air under pressure to the turbine. The rotor **46** will turn the platform 90° to the closed position extending longitudinally of car **10** as shown in FIGS. 2 and 4, whereupon the valve **60** can be closed to stop the rotor. Air under pressure will be supplied from an air compressor (not shown) carried by the locomotive (also not shown) which pulls car **10**. Couplings **120** extend out of the trucks **25** for coupling the car **10** to the other similar cars and to a locomotive. Opposite ends of air line **38** extend out of opposite ends of decks **18, 20** and are provided with couplings **122** for engaging similar couplings of an air supply line and air lines of other similar cars.

At inner corners of decks **18, 20** are posts **125**. These posts carry rings **126**. Hooks **128** at the opposite ends of flexible steel cables **130** can be engaged on these rings. As shown in FIG. 2 and FIG. 4, the cables will serve as lateral retainers to prevent rotation of the vehicle V on platform **94** while the car **10** is in transit. Turnbuckles **132** are provided for tightening the cables. The cables are quickly attached and detached which facilitates and speeds up loading and unloading of the car **10**.

The disc air brakes **30** will be applied automatically while turbine **45** is being operated. This is a safety feature not found in known drop center railroad cars employing turntables. Thus no manual labor or attention of operators is required to the brakes while the car **10** is being loaded or unloaded.

Only light manual efforts are required in loading and unloading, such as hooking and unhooking of cables **130**, raising and lowering the articulated ramps, and operating valve handle **70**. This is in sharp contrast to prior known types of railroad cars where heavy manual labor is required to turn the loaded turntables, or else complex hydraulic rams and hoists are required.

The elevated articulated ramps **100** serve as end abutments to help hold the vehicle V in place while in transit. The shock absorbing end plates **108** shown turned outwardly in FIG. 2 can be turned inwardly to serve as resilient abutments between the vehicle V and end walls **22, 24**.

The railroad car described is of simplified and improved construction. As a one-piece structure the car bed is more economical to manufacture, simpler to service and easier to maintain than complex, multiple part frame structures heretofore used for drop center railroad cars. The use of an integrated pneumatic system in the car provides savings in working time and labor and improves overall operating efficiency.

What is claimed is:

1. A railroad car for conveying heavy self-propelled vehicles, comprising a one-piece cast bed having a horizontal lower central rectangular drop section, two horizontal upper end decks and two inclined walls integral with and joining the end decks and opposite ends of the central section, said central section having first and second shallow circular wells respectively formed in top and bottom sides thereof; a circular turntable rotatably disposed in the first well on the top of the central section; a bearing ring under the turntable engaging ball bearings supporting the turntable; a rotor of an air driven turbine rotatably disposed in the second well at the bottom side of the central section; a ring gear integral with the turntable at its underside; a drive gear carried by the rotor and engaged with the ring gear for turning the turntable when air is supplied to the turbine to drive the rotor; said bed having recessed channels formed in its underside, a main air line for conducting air under pressure seated in said channels; an adjustable valve interposed between said air line and turbine for controllably passing air to the turbine to turn the rotor; and a rectangular platform secured to the turntable and rotatable therewith, whereby the platform can be turned in a direction perpendicular to the longitudinal direction of the car bed for loading and unloading a vehicle on and off the platform.

2. A railroad car as defined by claim **1**, further comprising railroad trucks mounted underneath the two decks respectively, said trucks having flanged wheels for riding on railroad tracks; pneumatically operable disc brakes associated with the wheels of the trucks respectively; and flexible hoses coupled to main air line for supplying air to the brakes to engage the brakes with the wheels, whereby the brakes are applied automatically when air under pressure is supplied via the main air line to the turbine to turn the rotor, turntable and platform.

3. A railroad car as defined by claim **1**, further comprising articulated ramps hinged to opposite ends of the platform, each of said ramps comprising a first plate hinged to one end of the platform and disposable in an outwardly and downwardly inclined position extending from the platform down to the ground; and a second plate hinged to the first plate for resting on the ground, the second plate having a beveled end to facilitate driving a heavy vehicle up the ramp onto the rotatable platform.

4. A railroad car as defined by claim **1**, further comprising spaced supports carried by the upper decks of the car bed near outer lateral edges thereof; and cables detachably engaged with said supports for holding a vehicle against rotation while on the platform.

5. A railroad car as defined by claim **2**, further com-

prising articulated ramps hinged to opposite ends of the platform each of the ramps comprising a first plate hinged to one end of the platform and a second plate hinged to the first plate, said ramps being extensible down to the ground when the platform is turned to a position perpendicular to the longitudinal direction of the car bed, said ramps being retractable inside of the inclined walls of the car bed when the rotatable platform is turned to a position parallel to the longitudinal direction of the car bed, so that the hinged plates of the ramps serve as end abutments for a vehicle on the platform.

6. A railroad car as defined in claim **5**, wherein the second plates of the ramps are made of resilient material to serve as shock absorbers between the first plates and the vehicle on the platform.

7. A railroad car as defined by claim **5**, further comprising spaced posts carried by the upper decks near outer lateral edges thereof for detachably engaging cables therebetween extending longitudinally of the car bed at outer lateral edges thereof to hold a vehicle on the platform against rotation.

8. A railroad car as defined by claim **7**, further comprising cables having hooks at opposite ends engaged with rings on the posts, said cables having turnbuckles for adjusting the lengths thereof.

9. A railroad car as defined by claim **3**, further comprising spaced posts carried by the upper decks near outer lateral edges thereof for detachably engaging cables therebetween extending longitudinally of the car bed at outer lateral edges thereof to hold a vehicle on the platform against rotation.

10. A railroad car as defined by claim **9**, further comprising cables having hooks at opposite ends engaged with rings on the posts, said cables having turnbuckles for adjusting the lengths thereof.

References Cited

UNITED STATES PATENTS

2,546,507	3/1951	Holmes	105—455
2,994,159	8/1961	Bonidie.	
2,933,053	4/1960	Mellam.	
3,207,087	9/1965	Goby.	

ARTHUR L. LA POINT, Primary Examiner

RICHARD A. BERTSCH, Assistant Examiner

US. Cl. X.R.

104—35; 105—368