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3,407,750

RAILROAD CAR HANDLING APPARATUS

Filed Dec. 6, 1965

2 Sheets-Sheet 1

Fig. 1

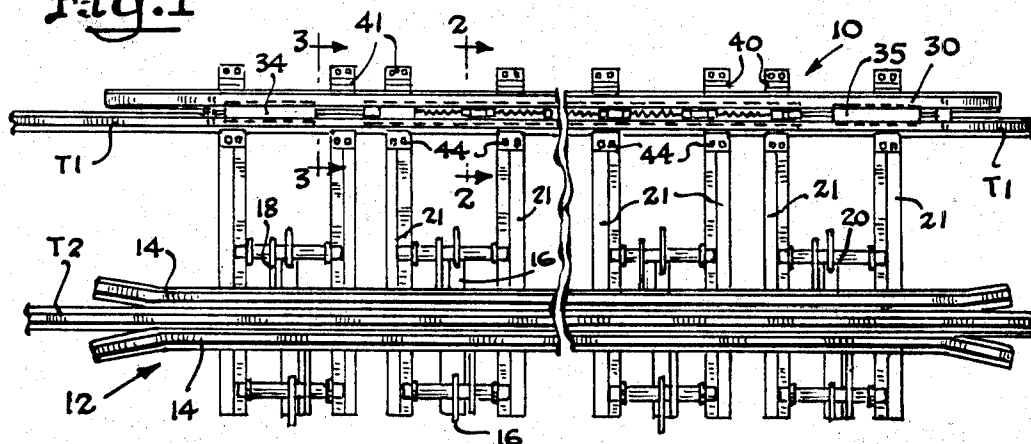


Fig. 2

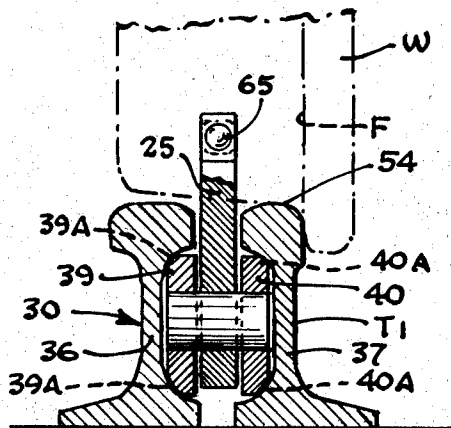
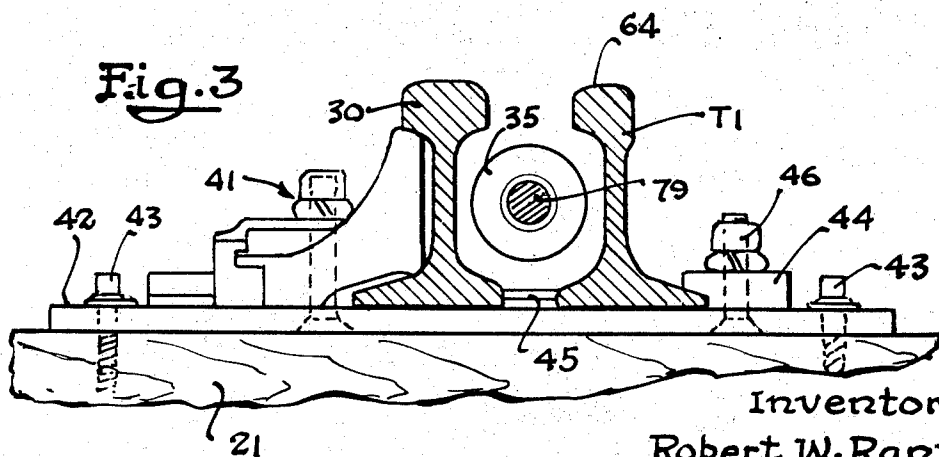


Fig. 3



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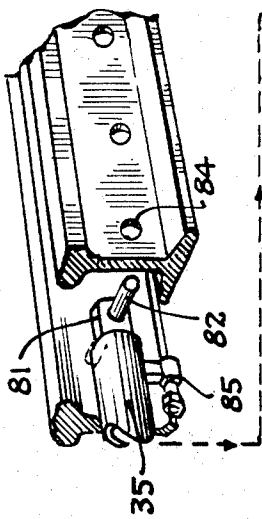


Fig. 4

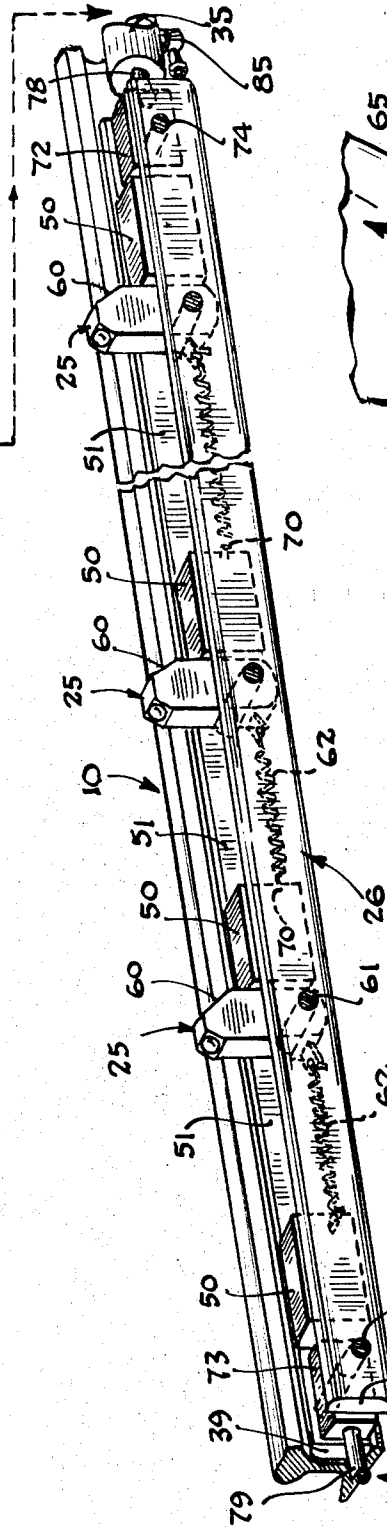
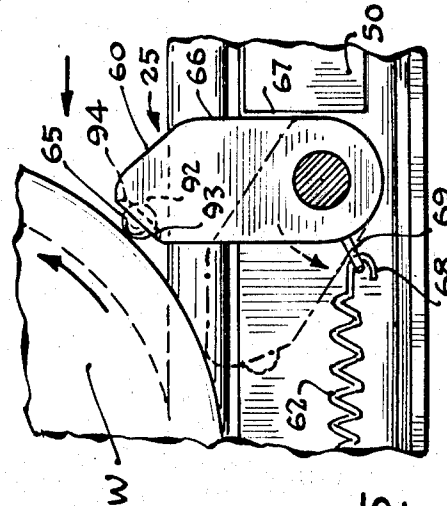
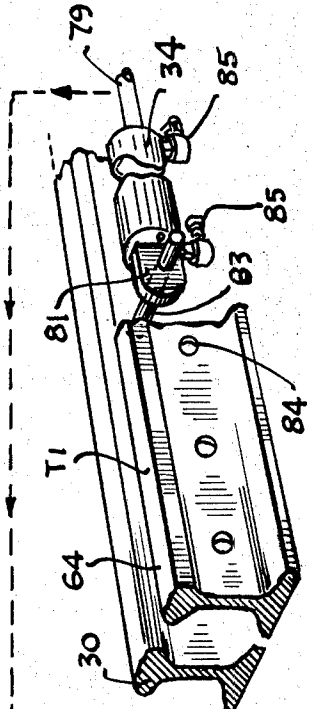


Fig. 5



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RAILROAD CAR HANDLING APPARATUS
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ABSTRACT OF THE DISCLOSURE

Impelling apparatus is afforded for engaging the wheel of a railroad car to impel the car along a traffic rail. The impelling apparatus comprises a slide reciprocal parallel to the traffic rail and supporting a plurality of pivotally mounted one-way dogs normally biased by a spring or the like to an effective upright wheel engaging position, and each dog is adapted to be moved to an ineffective or depressed position by a car wheel traveling thereover.

This invention relates to railroad car handling apparatus and more particularly to apparatus having the capability of impelling a railroad car along a track.

The present invention is of particular utility in railroad classification yards where railroad car retarders are placed along the tracks to reduce the velocity of a car or cut moving through the yard to a predetermined velocity. In one conventional type of classification yard, the car retarders are selectively operable to retard the cars to a temporary but complete standstill. After a railroad car is brought to a standstill, the retarder is opened to release the railroad car for further movement downstream under the influence of gravity. However, it occasionally happens that after the retarder is opened, the railroad car having particularly poor rolling characteristics, will not start rolling again and leave the retarder.

Classification yards are typically automatic in operation and cars are continually being routed through the various retarders. Hence, the failure of a railroad car to move from a retarder to its ultimate destination incapacitates that retarder and necessitates the employment of special measures to move the railroad car from the retarder and to start the car rolling onward on its path to its ultimate destination. The car retarders are relatively long in that they usually have at least one 39 foot braking section. When a car is brought to a standstill, it will have a car wheel, front or rear, disposed somewhere in the upstream, intermediate or downstream portion of the car retarder. Thus, a railroad car impeller should have the capability of impelling the car from the retarder whatever may be the position of the railroad car within the elongated retarder.

Accordingly, an object of the invention is to brake railroad cars to a standstill by a retarder and to exert sufficient force on a railroad car to cause it to roll from the retarder after the car is released by the retarder.

Another object of the present invention is to impel railroad cars, which are at a standstill in a car retarder, from the car retarder.

Although the classification yards are generally automatic in operation for the routing and controlling the velocity of cars as they move to their destinations, service, maintenance and other personnel move about the equipment in the classification yards. Accordingly, another object of the invention is to afford a railroad car impelling apparatus which minimizes the safety hazards to persons in the classification yard.

It will be appreciated that the car moving apparatus must generate considerable force to move railroad cars having heavy loads therein. The car moving apparatus is also exposed to such extreme environmental conditions

such as water, ice, and snow. Also, because a car moving apparatus will be employed with each of a plurality of group retarders in a classification yard, the car moving apparatus should be economical to manufacture and economical to install in the field with existing retarders. Accordingly, a further object of the invention is a rugged and simple car moving apparatus which is economical to manufacture and to install in the field.

Although the car impelling apparatus is of particular importance in conjunction with railroad car retarders, it can be employed separately from the retarder and in other environments. Accordingly, a further object of the invention is a railroad car impelling apparatus for engaging the wheels of a railroad car and impelling the railroad car along a track.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings which, by way of illustration, shows preferred embodiments of the present invention and the principles thereof and what is now considered to be the best mode contemplated for applying these principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

FIG. 1 is a plan view of a car moving device constructed in accordance with the preferred embodiment of the invention;

FIG. 2 is a sectional view taken along the lines 2-2 in the direction of the arrows showing a dog for engaging a railroad car wheel;

FIG. 3 is a sectional view taken along the lines 3-3 of FIG. 1 in the direction of the arrows and showing rails secured adjacent one another;

FIG. 4 is a perspective view showing a slide means and hydraulic cylinders for moving the slide means; and

FIG. 5 is an elevational view of a one-way dog engaging a car wheel.

Referring now to the drawings and more particularly to FIGS. 1 and 4, there is illustrated a car moving apparatus 10 for engaging and exerting a force on a railroad car wheel of a railroad car (not shown) on a first traffic rail T1. A car retarder 12 is disposed opposite the car moving apparatus 10 and has retarding rails or beams 14 for engagement with a car wheel riding on an opposite traffic rail T2. The car retarder 14 is typical of a plurality of group or intermediate retarders in a classification yard each of which is on a slope or grade and each of which controls the velocity of a cut moving over its respective traffic rails. The cars move from right to left, as viewed in FIG. 1, towards a downstream destination and on to a particular classification track as controlled by downstream track switches.

In a conventional classification yard, railroad cars are moved over a hump (not shown) and are released to move down a grade and through the retarder 12 where retarding beams 14 engage the car wheels riding over the rail T2 to exert a retarding force on the car wheels to slow the car down to a predetermined velocity. The predetermined velocity may be a very slow velocity of several m.p.h.; in some instances the predetermined velocity is zero. In this latter case, the cars are brought to a complete standstill within the car retarder 12.

Where the railroad car is brought to a complete standstill, the retarding brake beams 14 are selectively operated as by the hydraulic cylinders 16, FIG. 1, which pivot levers 18 about supporting posts 20 spanning adjacent ties 21 to move the brake beams 14 apart to release their grip on the car wheels. Conversely, after a car leaves the retarder, the levers 18 pivot to return the brake beams

14 close to one another to brake the next incoming railroad car. The illustrated car retarder 12 is the subject matter of U.S. copending application Ser. No. 346,168, filed Feb. 20, 1964.

The car retarder 12 is merely illustrative of one of a number of commercially available railroad car retarders, which may be employed with the car moving apparatus 10. In its broadest aspects, the present invention is not to be construed as limited to use only in conjunction with a car retarder since the car impelling apparatus may have utility in other situations where it is desired to impel a railroad car.

A typical car retarder will have at least one retarder unit which is 39 feet in length and theoretically the wheels of the railroad car may be brought to rest anywhere within the 39 feet of length. The presently described car moving apparatus 10 is particularly adapted to impart a force to the railroad car to start the car rolling from the retarder 12 irrespective of the position of the car wheels. For this purpose, the car moving apparatus 10 includes a series of pivotally mounted dogs 25, FIG. 4, held in a slide means 26 which slides between the traffic rail T1 and a parallel retaining rail 30. The slide means 26 is moved leftwardly, FIG. 4, to bring one of the dogs 25 into engagement with a car wheel W, FIG. 5, and moved rightwardly to return the dogs 25 to their initial starting position. The slide means 26 is moved by a pair of opposed actuating means in the form of fluid-operated cylinders 35 and 34, FIG. 4, secured to the upstream (right) and downstream (left) ends, respectively, of the slide means 26.

The traffic rail T1 and retaining rail 30 constitute a guiding means for guiding between their respective rail webs 36 and 37, and a pair of opposed elongated bars 39 and 40, FIG. 2, of the slide means 26. The elongated bars 39 and 40 are rectangular in cross section and have their outer ends 39A and 40A, respectively, curved to fit the general curvature between the head, flange and web of the respective rails 30 and T1.

As can best be understood from FIG. 3, the retainer rail 30 is secured and held in spaced parallel relationship to the traffic rail T1 by a security brace 41 extending over the base flange of the rail 30. The security brace 41 is secured to a base plate 42 extending beneath the respective rails T1 and 30. Each of the base plates 42 is secured by drive spikes 43 to one of the ties 21. To preserve the spacing between the rails T1 and 30 and thereby provide an accurate alignment for the guiding means, a small block 45, FIG. 3, is disposed between the inward flanges of the respective rails T1 and 30. The traffic rail T1 is also held by suitable securing clips 44 secured by suitable bolts and nuts 46 to the base plates 42. Preferably, the retaining rail 30 is a piece of railroad rail, which is readily available at relatively low cost.

The slide means 26 has a series of spaced blocks 50, FIG. 4, fastened to the respective slide bars 39 and 40 at spaced intervals. The blocks 50 assure that bars 39 and 40 remain parallel and stay within the slideway groove formed between the rail webs 36 and 37 of the respective rails T1 and 30. The blocks 50 are spaced such that open spaces 51 are formed between the respective slide blocks 50 and between the respective bars 39 and 40 into which the dogs 25 may pivot. Each of the dogs 25 pivots below the surface 54 at the top of the traffic rail T1 while a car wheel W is rolling thereover and through the car moving apparatus 10.

It will be appreciated that the car moving apparatus 10 is seldom actuated inasmuch as the great majority of cars will start rolling from the retarder 12 and down the grade on which the retarder 12 is placed without receiving any push from a dog 25. It is contemplated that only when a railroad car fails to move from the retarder under the influence of gravity that it will be necessary to operate cylinders 34 and 35 to cause the slide means 26 to bring a dog 25 against a car wheel W to exert sufficient force to initiate the rolling of the car wheels.

The dogs 25 are one-way dogs in that they are effective when moved leftwardly (FIG. 4) with the slide means 26 to impart a driving force to the car wheels and they are ineffective in that they pivot downwardly as wheels roll thereover when the slide means 26 is at rest. More specifically, the wheels W of a car moving along the traffic rail T1 engage the inclined surfaces 60 on the upper edges of the dogs 25 and force the dogs 25 to rotate downwardly and in a counterclockwise direction, as viewed in FIGS. 4 and 5, into the spaces 51 and about their pivot pins 61 against the urging of biasing springs 62.

However, when the slide means 26 is moved leftwardly, as viewed in FIGS. 4 and 5, that dog 25, which is nearest to one of the car wheels W, has its ball bearing 65 engaged with the car wheel W and continued movement of the slide means 26 imparts sufficient force to the wheel W to cause the wheel W to rotate in the counterclockwise direction, as shown in FIG. 5. The dog 25 is prevented from rotating clockwise, as viewed in FIG. 5, because its rearward surface 66 is in engagement with a vertical face 67 of the stationary block 50. Since the blocks 50 are rigidly secured to the respective opposed bars 39 and 40, the dogs 25 are prevented from clockwise rotation while exerting a force on a car wheel. The block 50 also serves to retain the dog 25 in its generally upright position, as seen in FIGS. 4 and 5, by limiting the clockwise pivotal movement of the dogs 25 under the influence of the contractile springs 62, which have their forward ends 68 inserted in a spring anchor 69 secured to the lower end of the dog 25. The opposite end of the spring 62 is hooked to a downstream block 50 by a similar spring anchor 70, FIG. 4.

It is preferred that the slide means 26 be connected to the respective cylinders 34 and 35, FIG. 4, by a clevis arrangement. Each clevis arrangement includes a clevis block 72 or 73 pivotally secured to the slide bars 39 and 40 by a respective pivot rod 74 and 75. The rods 74 and 75 each are disposed through aligned apertures in their respective bars 39 and 40 and through an aperture in its respective clevis block 72 and 73. The clevis blocks 72 and 73 are secured respectively to a piston rod 78 and 79, which are driven by the respective pistons (not shown) within the respective hydraulic cylinders 34 and 35.

The hydraulic cylinders 34 and 35 are nested between the rails T1 and 30 and below the top surface of the rails T1 and 30. For this purpose, the hydraulic cylinders 34 and 35 have apertured bosses 80 and 81, respectively, receiving a pin 82 and 83 respectively, the pins 82 and 83 extending into suitable apertures 84 in the respective rails T1 and 30. Suitable fittings 85 are on the underside of the hydraulic cylinders 34 and 35 for connection to the hydraulic lines for directing fluid against the pistons of the respective hydraulic cylinders 34 and 35 to move the piston rods 78 and 79 to actuate the slide means 26. Thus, the force applied to a wheel by the roller bearing 65 of a dog 25 is approximately along the centerline of the wheel W. The ball bearing 65 is disposed within a suitable cavity 92 in an inclined face 93 with the dog 25. A retainer plate 94 is welded or otherwise secured to the inclined face 93 of the dog to hold captive the ball bearing 65 in the cavity 92. The bearing 65 on the dog 25 is disposed in the inclined face 93 to permit its exerting a positioning force on the wheel W, FIG. 5, without binding thereagainst.

The stroke of the respective piston rods 78 and 79 is such that the dogs 25 are reciprocated through a distance sufficient to engage and cause a car wheel to move irrespective of its position between any two dogs 25. If greater spacing between dogs 25 is desired, then the stroke of the piston rods 78 and 79 is increased to assure engagement of a dog 25 with a car wheel.

It will be realized that the use of readily available rail stock for the rails T1 and 30 affords a long and inexpensive guiding means for the slide means 26. Application of a liberal amount of lubricant such as a grease

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along the engaged web surfaces of the respective rails T1 and 30 and the rounding of the corners 39A and 40A of the respective bars 39 and 40, facilitates the sliding of the bars 39 and 40 within the guideway formed between the rails T1 and 30. The blocks 50, dogs 25 and spring 62 form a simple and inexpensive means of affording a one-way operating drive means for impelling the car wheel to rotate irrespective of the position at which the car wheel is disposed within the retarder. Thus, the car moving apparatus 10 is formed of simple and inexpensive elements which are readily available and economically installed in the field.

Also, the slide means 26 is shielded within the two rails T1 and 30 from contacting persons in the classification yard when the hydraulic cylinders 34 and 35 are actuated thereby minimizing hazards to safety, safety being an important consideration in these types of operating equipment. The hydraulic cylinders 34 and 35 are preferably remotely controlled as from an observation tower; but, if desired the hydraulic cylinders 34 and 35 could be operated locally at the retarder installation.

Hence, while preferred embodiments of the invention have been described and illustrated, it is to be understood that they are capable of variation and modification, and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. A railroad car impelling apparatus for impelling a railroad car along traffic rails comprising: an elongated retaining rail secured adjacent to and in parallel relationship to a traffic rail to form an enclosed guide-way between the webs of the respective retaining and traffic rails; slide means slideable in said guide-way and including a pair of elongated bars disposed for sliding engagement against the respective webs of the retaining and traffic

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rails, a plurality of spaced dogs pivotally mounted on said slide means and movable by said slide means for engagement with a car wheel, biasing means urging said dogs to an effective wheel engaging position, said biasing means yielding to permit said car wheels to pivot said dogs to an ineffective position, means on said slide means limiting pivotal movement of said dogs when said dogs are in engagement with a car wheel, and fluid cylinder means connected to said slide means to reciprocate said slide means in said guide-way to move said dogs for engagement with a car wheel.

2. The car impelling apparatus of claim 1 wherein said dogs have a roller means movable into engagement with said wheel to prevent binding engagement between said wheel and a dog.

3. The car impelling apparatus of claim 1 wherein said means on said slide means limiting pivotal movement of said dogs are blocks disposed between said elongated bars and wherein said fluid cylinder means is disposed between said traffic rail and said elongated retaining rail.

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